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New System M16:

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1090E

Photo Eye, Back Tack and Trim System

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Introduction:

Front Back Tack (SBT, “start” back tack)

To select, press the “SBT button: sgl (single); dbl (double) or off
The front back tack can be sewn automatically or manual.

End Back Tack (EBT)

To select, press the “EBT” button: sgl (single), dbl (double) or OFF
The end back tack runs always automatically.

It starts by heeling the pedal full back or uncover the photo eye

Photo eye:

Starts the end of the seam, if it gets

I

Indicator LED's at the front panel:

Yellow: No motor connected (no encoder pulses detected at power-on)

Red: Over current error (Motor)

Before using the new system, please read this carefully !!!

a) Power-On:

Due the motor does not use commutator lines, the system has to check the location of the index in the power-on procedure. The motor has to be connected completely to the box (power- and encoder cable) before the power is turned on! The motor will not work, if it is connected after the power is already turned on. (old system: The motor can be connected any time)

a) LCD- display box (Programmer)

The LCD- display can be connected any time, even during the power is already turned on. (old system: The power has to be turned off)

3. Going to the “Hidden Parameters” or “MASTER RESET”:

The same procedure as with the old system: Turn the power on by pressing the desired buttons.

In some cases, when the power was completely off and is turned on, the LCD- display stays blank for as couple of seconds. The reason is a longer RESET- mode. In this case, turn on the power, wait until the display is initialized (something is written into the display) and now turn the power off.

The display reads: “.....saving data” and then “goodbye, see you”

Before the display is blank again, turn on the power and follow the procedure to go into the “HIDDEN PARAMETER” or “MASTER RESET”

a) Set the Positions

This is similar to the old system using the mini motor. There is a ‘teach-in’ mode in the ‘hidden parameters’, group ‘ POSITIONS’.

Go to the desired parameter: ‘NEEDLE UP’, ‘NEEDLE DN’ or ‘TRIM”, then turn the hand wheel to the desired position and press the NU-ND button.

This will store the position. You can see the result in the display.

Caution:

You can not turn on the power and set the positions. The hand wheel has to turn at least one revolution to know about the location of the index.

MODES OF OPERATION:

The LCD display can be operated in three (3) different modes.

They are:

1. **OPERATING MODE:** To operate the machine
2. **PROGRAMMING MODE:** To change a parameter
3. **TEST MODE** An easy way to maintain and check the system.

Two different parameter levels are available:

OPERATORS LEVEL
MECHANICS LEVEL

To use the **MECHANICS LEVEL**, please see the section 2.0.0 (Access to “**HIDDEN PARAMERTERS**”)

1.0.0. HOW TO CHANGE A PARAMETER:

Four parameter groups are available (OPERATORS LEVEL)

SPEEDS
TIMERS
COUNTERS
TOGGLE SWITCHES.

To change a parameter, please proceed the following sequence:

STEP 1

Push the ‘ARROW ROUND’ button repeatedly until the desired parameter group is displayed.

STEP 2

Push the ‘SET’ button repeatedly until the desired parameter is displayed

STEP 3

Change the parameter with the buttons:

 ‘ARROW-UP’ (increase the value)
 or ‘ARROW DOWN’ (decrease the value)

In the group ‘TOGGLE SWITCHES’ , either button, “ARROW UP” or “ARROW DOWN” will toggle the parameter.

PLEASE NOTE:

To optimize a certain parameter, it may be necessary to go repeatedly from the operation mode back to the same parameter.

It can be easy done by pressing the ‘SET’ button.

If the program is in the OPERATION MODE, the SET button takes you right back to the last displayed parameter.

Exemption:

If you are in the group “TOGGLE SWITCHES”, the “SET” button brings you to the first parameter of the group “TOGGLE SWITCHES”

If a parameter was changed by accident and the machine doesn’t work properly, it is possible to go back to the original factory setup by using the feature of the MASTER RESET (section 3.0.0).

2.0.0 ACCESS TO the 'HIDDEN PARAMETERS'

Step 1:

Turn power OFF

Step 2:

Press the NEEDLE UP / DOWN and ARROW RIGHT buttons at the same time.

Step 3:

Turn the power ON while both buttons are held down.

wait until a string of stars is displayed (*****), which are counting down.

Step 4:

Release both buttons and press the 'SBT' button before the stars disappear.

Go to the programming mode, the "HIDDEN PARAMETERS" follow after the regular parameters.

The hidden parameters display stars in front of the group name:

Normal parameter: SPEEDS

Hidden parameter: **** SPEEDS

The 'HIDDEN PARAMETER' groups are displayed after going through the OPERATOR level.

Note: Access to HIDDEN PARAMETERS is disabled after power was turned OFF.

HIDDEN PARAMETERS are enabled automatically after proceeding a MASTER RESET.

3.0.0 MASTER RESET: (Caution: Overwrites the program memory with the default settings)

Step 1:

Turn the power off

Step 2:

Press 'NEEDLE UP / NEEDLE DOWN','ARROW RIGHT' and 'ARROW UP' button at the same time.

Step 3:

Turn the power ON while all three push buttons are held down. The display alternates between:

' PUSH SET '

' FOR RESET '

Step 4:

Push the 'SET' button within 10 cycles. The display reads: ' PROGRAMMING '

Note:

If the 'SET' button is not pushed within 10 cycles, the program goes to the main menu without executing the MASTER RESET.

4.0.0 Operators Parameters:

SPEEDS: rpm (spm, stitches per minute)

4.0.1 Soft Strt. **Soft start after End of Cycle**
Range: 150 to 1000
Steps: 10
Default: 700

TIMERS ms (milliseconds)

4.1.1 Strt Del. **Start Delay**
The delay from presser foot down to start.
If the foot is already down, this time will not affect.
Range: 30 to 2500
Steps: 10
Default: 60

4.1.2 TR-stp **Trim Stop**
If this time is zero (0), the machine will not stop
Range: 0 to 2500
Steps: 10
Default: 80

4.1.3 Wiper **Wiper Time**
Range: 10 to 2500
Steps: 10
Default: 80

4.4.0 COUNTERS, (Numbers of Stitches)

4.4.1 Soft St **Soft Start after End of Cycle**
Range: 1 to 30
Steps: 1
Default: 3

4.6.0 TOGGLE SWITCHES

4.5.1	PF/EOC	Presser Foot End of Cycle Default: DOWN	UP / DOWN
4.5.2	PF/seam	Presser foot in the seam Default: DOWN	UP / DOWN
4.5.1	Slow End	ON / OFF Default: ON	
4.5.3	Pos in Cyc	Needle Position in Cycle Default: DOWN	UP / DOWN
4.5.4	Soft Start	ON / OFF Default: OFF	

5.0.0 HIDDEN PARAMETER

5.1.0 *** SPEEDS (rpm)**

5.1.1 MIN/TRM Minimum and Trim Speed
Range: 30 to 600
Steps: 10
Default: 230

5.1.2 MAXIM. Maximum Speed
Range: 500 to 9000
Steps: 100
Default: 4200

5.2.0 *** TIMERS (milliseconds)**

5.2.1 RES.BRK Residual Brake, The time the residual brake is turned on after stop
Range: 10 to 2000
Steps: 10
Default: 40

a. *** POSITIONS**

Default settings are not important because the position depends on the location of the Index.

Using the “teach-in” mode, this parameter can be set the following way:

1. Go to the desired parameter (for example needle up)
The display reads the parameter and a number
2. Turn the hand wheel to the desired position (needle-up)
The display does not change
3. Press the NEEDLE-UP/NEEDLE-DOWN” button
The display changes the number, this is the new position
This number can be corrected by using the ARROW-UP
Or ARROW-DOWN button

5.3.1 DN. POS

Needle Down Position

This parameter can be changed by:

- a) Arrow-Up / Arrow-down Buttons
- b) Teach-in mode

5.3.2 UP POS

Needle Down Position

This parameter can be changed by:

- a) Arrow-Up / Arrow-down Buttons
- b) Teach-in mode

5.3.3 TRM POS

Needle Trim Position (turn trim signal ON)

This parameter can be changed by:

- c) Arrow-Up / Arrow-down Buttons
- d) Teach-in mode

5.4.0 *** MISCELEN (Miscellaneous)**

Presser foot duty cycle:

Due the voltage is too high to turn a solenoid permanent on all time, the current is turned on only permanently a short time, after that, the current has to be chopped.

For example: Duty cycle 40% means 40% on, 60% off

If the duty cycle is too low, the solenoid will not stay on.

If too low, the solenoid will turn too hot!

5.4.1 PF 100% Presser foot on 100 %
Range 10 to 2000
Steps: 10
Default: 200

5.4.2 PF DUTY Presser foot duty cycle
Range 10 to 100
Steps: 10
Default: 50 (50%)

Acceleration / Deceleration Ramp:

The lower the number, the slower the Ramp!

5.4.3 ACCEL Acceleration ramp
Range 15 to 50
Steps: 1
Default: 40

5.4.3 DECEL Deceleration ramp
Range 15 to 50
Steps: 1
Default: 40

5.5.0 **TOGG SW TOGGLE SWITCHES**

- 5.5.1 DIRECTN** **Direction of Rotation (CCW / CW)**
Default: **CW (Clockwise)**
- 5.5.2 START** **The next start after end of cycle**
the front eye (eye 2) must be covered or not covered
Default: **covered**
- 5.5.3 POSITION** **fast or normal**
Default: **normal**

7.0.0 OPTIONS

Download a “HEX”- file to program a memory chip:

The original program for the M16 system starts at address “F0000” HEX and ends at “FFFFF”

The addresses from 00 to “EFFFF” are reserved for the internal ROM of the CPU. After downloading the hex file from your computer to your programmer, the hex file has to be moved from the higher address to the start address “00000”

7.1.0 Using the Built-in Test Program

To enter: Press simultaneously the ARROW- RIGHT and the SBT button., release the ARROW-RIGHT button first! Otherwise you are back in the main program!

The display should read: **TEST MODE**

To go to the first group, press the “ARROW-ROUND” button

The display reads: **TEST TREADLE** for about 2 seconds

Then it reads the position of the threadle:

This can be:

1. NEUTRAL
2. FORWARD and a number
- e) HEEL 1
- f) HEEL 1 / HEEL 2

If the threadle is in forward position, the displayed number is the reading of the ADC- converter.

The lowest number should be below ten (10) and the highest number at least 245

To go to the next group, press the “ARROW-ROUND” button again

The next group is: **test inputs**

(this will be displayed for two seconds)

Then activated inputs are displayed

If no inputs are activated, the display reads “ ----- ”

To go to the next group, press the “ARROW-ROUND” button again

The next group is: **test outputs**

After two seconds, the display reads: **-1- PRESSERFOOT**

To activate the output, press the “NEEDLE-UP / NEEDLE-DOWN button.

To go to the next output, press the “ARROW-UP” button.

The next reading is; **- 2 – NEEDLE COOLER**

To go to the next output, press the “ARROW-UP” button.

To go to the former output, press the “ARROW-DOWN” button

To go to the next group, press the “ARROW-ROUND” button again

The next group is:

Test Encoder / Index

The LCD- display reads the number of pulses of the encoder. Turn the hand wheel
And the number counts up or down, dependent on the direction. The index signal
resets the counter at 2000 (up) or 1 (down). If the encoder counts up and the
number changes at 2000 to 1, every thing is fine.

To go to the next group, press the “ARROW-ROUND” button again

The next group is:

Test Motor (Balance)

This test allows testing the “balance” of the motor. If this adjustment is not
correct, the motor turns hot while operating.

To perform the test the motor has to be disconnected from the machine.

Push the NU/ND- button, the motor starts running with a low speed (100 rpm) for
about three revolutions. The display reads: **“WAITING FOR INDEX”**

After the motor stops, the following message will be displayed:

“CALCULATE OFFSET”. When the offset is calculated, the result will be
displayed: **“ADJUSTMENT: + xx “** or **“ADJUSTMENT – xx”**

“+xx” or “- xx” represents a number. This number should not be higher then 15.

If the reading is not correct, please repeat the test (Press NU/ND again).

5.6 counts is one degree.

Display the PIN (Program Identification Number)

- 1. Turn the power OFF**
- 2. Press the pedal forward**
- 3. Turn the power ON while the pedal is held in forward position
(Don't worry, the machine (Motor) will not move)**
- 4. The LCD- display reads the PIN as long as the pedal is held down**

Trim Systems:

This is the last parameter group. Default setting is: "NO TRIM SYSTEM".

Select the desired system with the arrow-up or arrow-down button.

IMPORTANT:

Before selecting the system, the positions of the needle have to be set.

LOCK STITCH SYSTEMS

"Needle-up":	Take-up upper dead point center
"Trim"	Take-up down (when the needle thread crosses the bobbin
"Needle-down"	see specs of the manufacturer

1. CLINTON:

The machine stops in the take-up's lower dead point center for the stop-time (parameter group "TIMER"). During the stop, the trimmer gets activated. After the stop time, the machine goes in take-up position and the trim signal turns off.

2. JUKI / DUERKOPP:

The trim signal gets activated in needle-down position and stays on to take-up position (cam guided system)

3. PFAFF MECHANIC:

Same as Duerkopp except the trim signal turns off in take-up down position

4. BROTHER / PFAFF pneumatic:

Same as CLINTON lock stitch, but without stop at take-up down position

CHAIN STITCH SYSTEMS: