

MINI-STOP

QE3760

CE

Type

Q41MSII

Instruction Manual

Part 2

QUICK-ROTAN Elektromotoren GmbH
Königstraße 154
67655 Kaiserslautern
Tel: 0631 / 200 38 80
Fax: 0631 / 200 38 62
E-Mail: tech.suppl@quick-rotan.com
www.quick-rotan.com

Englisch 2002-02-21

Contents

Page

Part 2

7.	Description of the MINI-STOP Drive System	7.1 - 7.6
7.1	Motor QE 3760	
7.2	Control system	
7.3	Speed control unit SWG2	
7.4	External operator panel OC-TOP	
7.4.1	External operator panel OC-TOP/AQ	
7.4.2	External operator panel OC-TOP/FQ	
7.5	Drive System Application	
8.	Application	8.1 - 8.12
8.1	Sewing without an external operator's control panel	
8.2	Sewing with external operator's control panel OC-TOP	
8.2.1	Sewing without sewing program (manual sewing)	
8.2.2	Sewing with sewing program (programmed sewing)	
8.2.3	Sewing programs	
8.2.4	Backtack / Darning programs	
8.3	Error messages (Malfunction Diagnostics)	
9.	Programming by the user	9.1 - 9.14
9.1	User programming with operator panel OC-TOP	
9.1.1	Direct programming	
9.1.2	Parameter programming	
9.1.2.1	Programming level A (operator level)	
9.1.2.2	Programming level B (technician level)	
9.1.2.3	Programming level C (special level)	
9.1.3	Reset	
9.2	User programming via the Internal Mini Programming Panel (MPF)	
9.2.1	Indication 1: Backtack Stitches	
9.2.2	Indication 2: Speed	
9.2.3	Indication 3: Sewing functions	
9.2.4	Indication 4: Control Parameters	
9.2.5	Reset	
10.	Start of operation	10.1 - 10.4
10.1	Control of the direction of rotation and of the reference position from the needle bar (needle position NPO)	
10.2	Control of the needle positions NP1 / NP2 / NP3 / NP9	
10.3	Control of the needle positions for thread trimming (Parameters 704, 705, 706)	
10.4	Control of the maximum speed	
10.5	Hardware test	

Technical updatings reserved!

7. Description of the MINI-STOP Drive System

The MINI-STOP Drive System is an electronically commutated, brushless DC motor.

The system is composed of the following subassemblies

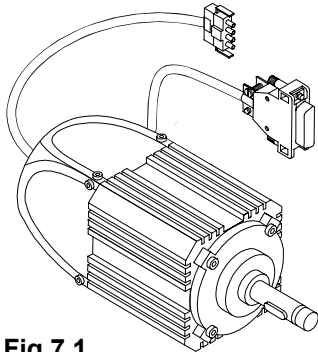


Fig.7.1

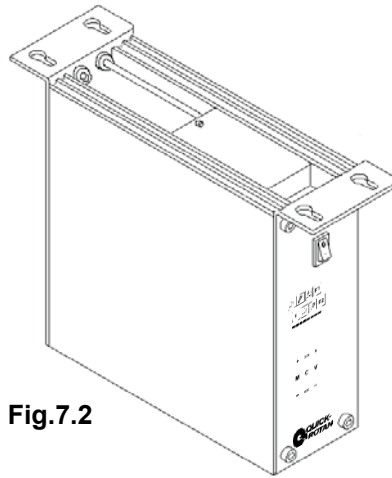


Fig.7.2

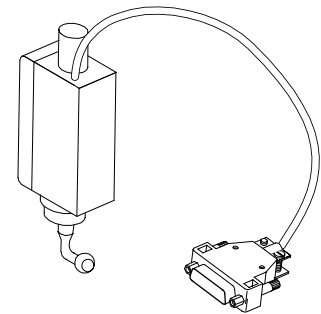


Fig.7.3

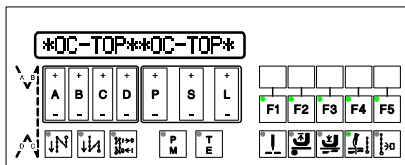


Fig.7.4

Motor QE3760 (Fig.7.1) with integrated optoelectronic incremental encoder for commutation and positioning.

Control (Fig.7.2) with

- integrated mains switch
- mains connection with interference rejection circuit
- electronically controlled combinational circuit
- intermediate DC circuit
- motor-driven current inverter
- electronic control for motor control and machine specific functions

Speed control unit SWG2 (Fig.7.3)

Control panel OC-TOP (Fig.7.4 - optional)

7.1 Motor QE3760

The motor is a synchronous motor. It has a permanent-magnetic rotor, a stator with three-phase winding and an optoelectronic increment encoder for commutation and positioning.

The rated capacity of the motor (shaft capacity) is 370 W in S5 mode. The rated speed of the motor is 6000 rpm, the maximum speed is 9000 rpm.

The motor has two mains leads:

- four-wire with special quadripolar AMP plug (X1) for connecting the stator coil to the control system
- six-wire shielded with nine-pole D-sub plug (X2) for connecting the increment encoder to the control system.

7.2 Control system

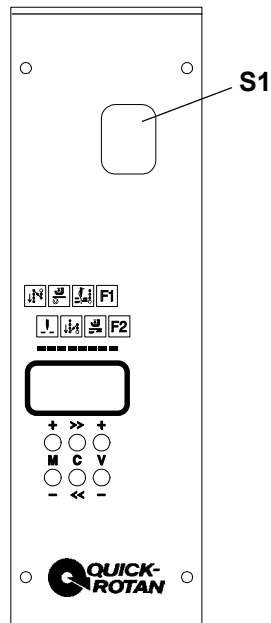


Fig. 7.5

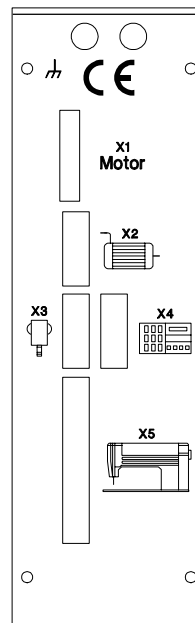


Fig 7.6

The control box is attached to the underside of the machine table by means of the four enclosed screws.

The mains connection is single-phase, using the three-wire cord protruding from the rear and a standard safety plug.

The control system has peripheral functions

on the front panel (Fig. 7.5):

1 mains switch **S1**

the Mini control panel (MPF)

contents: an LCD Display with 8 places

and 6 small keys: **M+ / M-**
 C>> / C<<
 V+ / V-

on the rear panel (Fig. 7.6):

sockets or connector plugs

- X1** quadripole socket for connecting the motor's stator coil
- X2** nine-pole D-sub jack for connecting the motor's increment encoder
- X3** nine-pole D-sub plug for connecting set point adjuster SWG2 (Art. No. 63.012)
- X4** nine-pole D-sub plug for connecting the control panel OC-TOP/AP (Art. No. 64.175)
- X5** 37-pole D-sub jack for connecting the process control system (keys, switches, solenoids, solenoid valves) on the machine.

The control system is connected with the sewing machine/ sewing equipment via:

inputs (Ex), such as for keys, switches, proximity switches, monitors, and
outputs (Ax), such as for solenoids, solenoid valves, signal indicators.

Function of the inputs (Ex) and the outputs (Ax) in dependence on <799>

E/A	<799> = 1	<799> = 2	<799> = 3
E1:	Chopper	Fast scissors	-
E4:	Program-switch over		
E6:	Light barriere	Light barriere	Light barriere
E13:	Flip-Flop	Fast scissors	
A1:	Chopper	Fast scissors forwards	
A2:	Flip-Flop		Chaining-off finger
A3:	Chain blowing	Chain blowing	Chain blowing
A4:	Presser foot lift	Presser foot lift	Presser foot lift
A5:	Chain vacuuming	Chain vacuuming	Chain vacuuming
A6:	Thread tension release	Thread tension release	Thread tension on
A7:	Signal lamp		
A8:	Motor runs	Motor runs	Motor runs
A10:		Fast scissors backwards	
A16:	Count signal	Count signal	Count signal

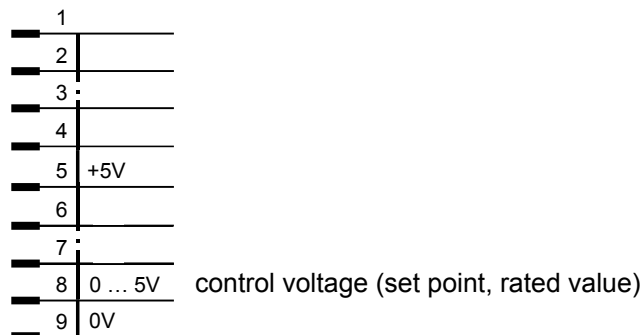
7.3 Speed control unit SWG2

The SWG2 is attached to the underside of the machine table with the enclosed brackets and connected mechanically to the machine's pedal by means of the enclosed rod assembly. The mains connection of the SWG2 is by means of a nine-pole connector on plug X3 on the rear control panel.

The SWG2 is an analogous mechatronic converter, which converts the pedal path into analog voltage. This analog output voltage of the SWG2 is digitized in the control system so that the pedal path can be divided into 16 steps (positions).

Level	Position	Voltage [V]	Meaning
0	-2 (full backwards)	0,00 - 0,50	Seam end, thread trimming
1	-1 (a little backwards)	0,50 - 0,94	Presserfoot up
2	0 (neutral position)	0,94 - 1,76	Treadle position 0
3	+1	1,76 - 2,21	Presserfoot down
4	+1 D	2,21 - 2,43	Speed n1
5	+2 D	2,43 - 2,66	Speed n2
6	+3 D	2,66 - 2,90	Speed n3
7	+4 D	2,90 - 3,13	Speed n4
8	+5 D	3,13 - 3,37	Speed n5
9	+6 D	3,37 - 3,60	Speed n6
10	+7 D	3,60 - 3,84	Speed n7
11	+8 D	3,84 - 4,07	Speed n8
12	+9 D	4,07 - 4,31	Speed n9
13	+10 D	4,31 - 4,54	Speed n10
14	+11 D	4,54 - 4,78	Speed n11
15	+12 D	4,78 - 5,00	Speed n12

Pin connection of speed control plug (X3) of the SWG2



7.4 External Operator Panel OC-TOP / DQ

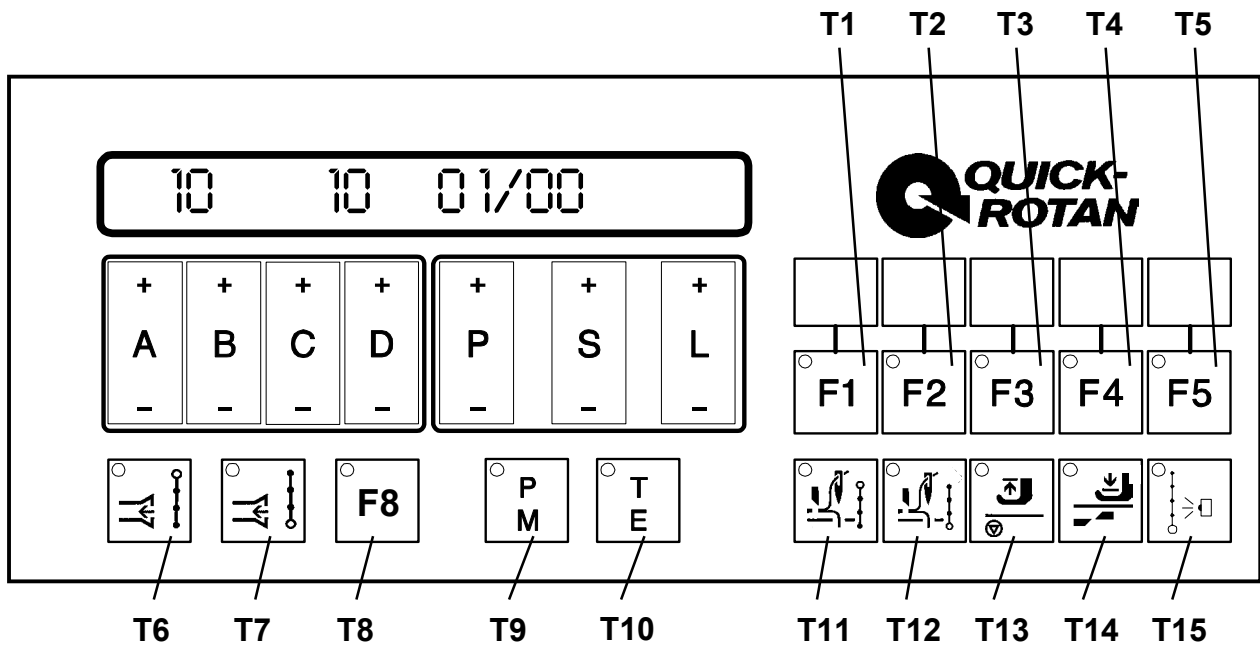


Fig. 7.2

The operator panel **OC-TOP / DQ** (Fig. 7.2) has the following components:

- **a display:** 16-digit LCD matrix
- **14 programming keys:**
A+ / A-, B+ / B-, C+ / C-, D+ / D-, P+ / P-, S+ / S-, L+ / L-
- **two keys (T9, T10)** for selection of the operating mode
- **13 keys (T1...T8, T11...T15)** for machine functions
- **one connector for a light sensor** at rear for connection of one or two (with adapter) light sensors

Function of the programming keys in operating mode "manual sewing"

(key T9 is dark key T10 is dark)

- **A+/A-/B+/B-** adjustment of stitchcount S1 at seam start (vacuum)
- **C+/C-/D+/D-** adjustment of stitchcount S2 at seam end (vacuum)

Function of the programming keys in operating mode "programmed sewing"

(key T9 is bright, key T10 is dark)

- **A+/A-** adjustment of speed nx in program x
- **A+/A-/B+/B-** adjustment of stitchcount S1 at seam start (chopper)
- **C+/C-/D+/D-** adjustment of stitchcount S2 at seam end (chopper)
- **D+/D-** preselection of the program following program x
- **P+/P-** adjustment of program x (program number x = 01 ... 05)
- **S+/S-** adjustment of seam section 01 in program x NS = 01 ... 05
- **L+/L-** adjustment of the cycle counter for stacker activation, if NS = 00
- **L+/L-** adjustment of stitchcount of the activated NS (01 ... 05)

Function of the programming keys in operating mode "parameter programming"
(key **T9** is dark, key **T10** is bright)

- **P+/P-** switch over of the hundreds of the parameter numbers
- **S+/S-** switch over of the parameter number in the switched on hundred section
- **L+/L-** programming of the parameter value of the switched on parameter number

Function of the keys T9 and T10 for selection of the operating mode

- **T9** dark, **T10** dark: manual sewing
- **T9** bright, **T10** dark: programmed sewing
- **T9** dark, **T10** bright: parameter programming

Function of the programming keys for machine functions

- **T5** function change-over for keys **T1 ... T4** (shift key)
- **T1** chain close-off (<425> = I)
- **T5+T1** automatic change-over between program 1 and program 2 (see Item 8.2.2)
- **T2** speed during programmed sewing:
variable (treadle-controlled) when **T2** is dark or
constant (automatic) when **T2** is bright
- **T5+T2** no function
- **T3** blow chain at seam end
- **T5+T3** light barrier start
- **T4** no function
- **T5+T4** piece counter on display
- **T6** vacuum at start of seam
- **T7** vacuum at end of seam
- **T8** currently no function
- **T11** chopper at start of seam
- **T12** chopper at end of seam
- **T13** presser foot position at sewing stop
- **T14** presser foot position at end of seam
- **T15** light barrier

Caution: After programming push key **T5** till LED goes out

The keys **T1...T15** are provided with one signal lamp each (LED). Each LED provides optical feedback on the control position of the function assigned to each key. If the function is ON, the LED is bright; if the function is OFF, the LED is dark.

8. Application

The **MINI-TOP** Type **Q41MS** is specially designed for overlock machines and is mainly conceived for light-barrier control.

The connection of the light-barrier is possible either via the the external operators control panel **OC-TOP** or directly at the socket X5 at the control box (Input E6).

The drive system includes three different functional sequences.

Selection of the functional sequences is made via parameter <799>.

Sewing work can be manual or programmed. Programmed sewing is only possible in conjunction with the external operator panel **QC-TOP/DQ**

Extent and contents of sewing programs

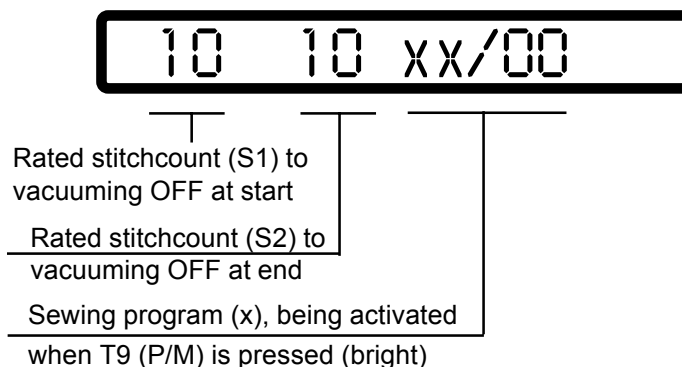
- a) Number of sewing programs: 5
- b) To each sewing program can be assigned the following functions

function:	adjustment via:
rated stitchcount S1.x	via keys A+/A-/B+/B-
rated stitchcount S2.x	via keys C+/C-/D+/D-
rated stitchcount S3.x	via keys L+/L-
chain vacuuming at start	via key T6
chain vacuuming at end	via key T7
chopper at start	via key T11
chopper at end	via key T12
presser foot position at sewing stop	via key T13
presser foot position at program end	via key T14
light-barrier	via key T15

- c) Sewing speed (rated speed) for seam sections S1.x and S2.x can be selected via keys A+/A-.
- d) Sewing speed can be changed over between constant (automatic) and variable (treadle-controlled) via key T2.
- e) There is the possibility of running various sewing programs consecutively. During programming, the subsequent sewing program is shown in digits 6 and 7 of the display and is entered via keys D+ or D-.
00 means that only the current program is run. At the end of the program concerned, return is made to its beginning.

Display showing

- before or after start, when <605> = II,



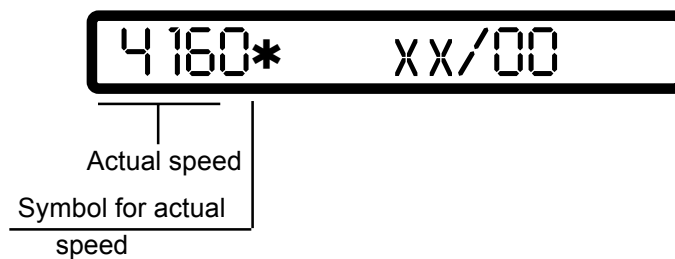
Setting the rated stitchcount S1 and S2 is possible only with the machine stopped.

S1 via keys A+/A-/B+/B-

S2 via keys C+/C-/D+/D-

Display showing

- after start, when <605> = 1,



Meaning of the rated stitches S1 and S2

S1 rated stitches at the seam beginning:

- chopper if <799> = 1

- fast scissors or chain vacuum, if <799> = 2

- thread tension on, if <799> = 3

S2 rated stitches at the seam end:

- chopper if <799> = 1

- fast scissors or chain vacuum, if <799> = 2

- thread tension off, if <799> = 3

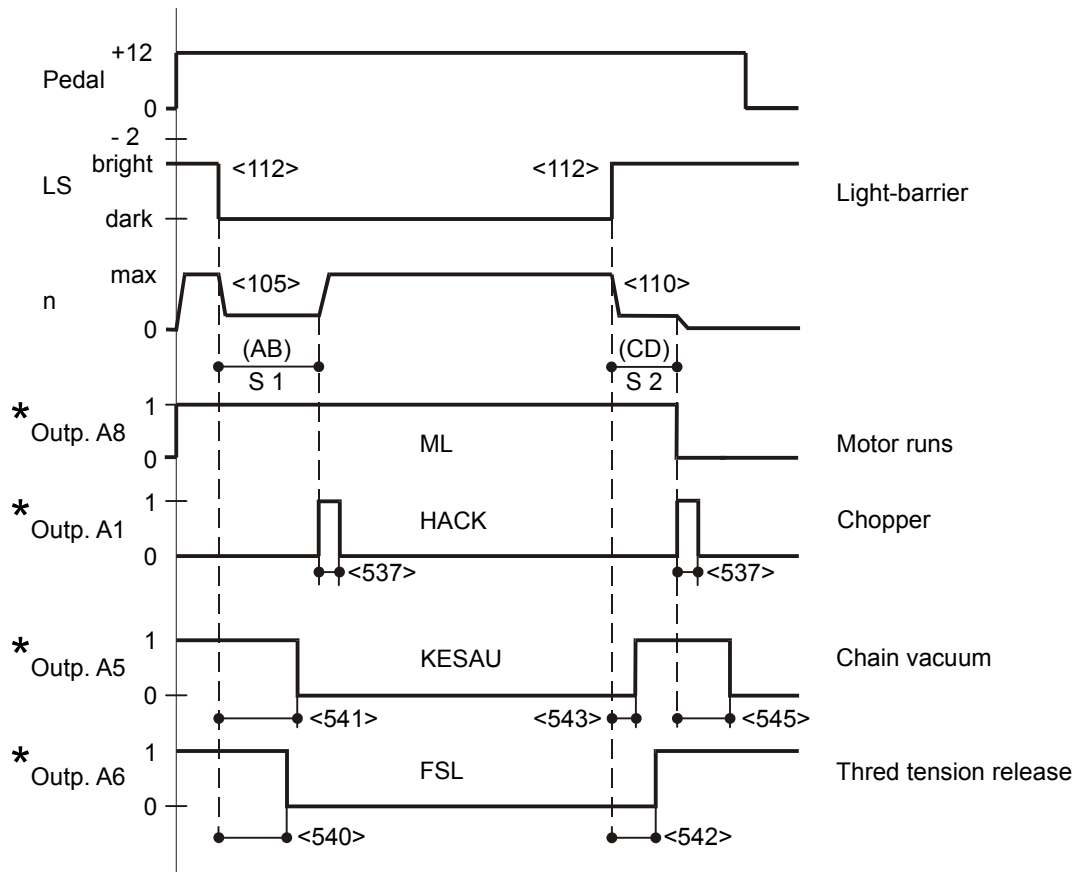
8.1 Sewing without Sewing Program (manual Sewing)

8.1.1 Functional sequence 1 (<799> = 1) with stop after seam end (<603> = I)

Functions: chop at start
 chop at end
 chain vacuuming at start
 chain vacuuming at end
 thread tension release at start and at end

Switch condition of the keys at the **OC-TOP**:

Key **T9** (P/M) off (dark)
 Key **T10** (T/E) off (dark)
 Key **T6** on (bright)
 Key **T7** on (bright)
 Key **T11** on (bright)
 Key **T12** on (bright)
 Key **T15** on (bright)



* see electrical connections diagram page 12.2

Fig. 8.1a

8.1.2 Functional sequence 1 (<799> = 1) without stop after seam end (<603> = II)

Functions: chop at start
 chop at end
 chain vacuuming at start
 chain vacuuming at end
 thread tension release at start and at end

Switch condition of the keys at the **OC-TOP**:

Key **T9** (P/M) off (dark)
 Key **T10** (T/E) off (dark)
 Key **T6** on (bright)
 Key **T7** on (bright)
 Key **T11** on (bright)
 Key **T12** on (bright)
 Key **T15** on (bright)

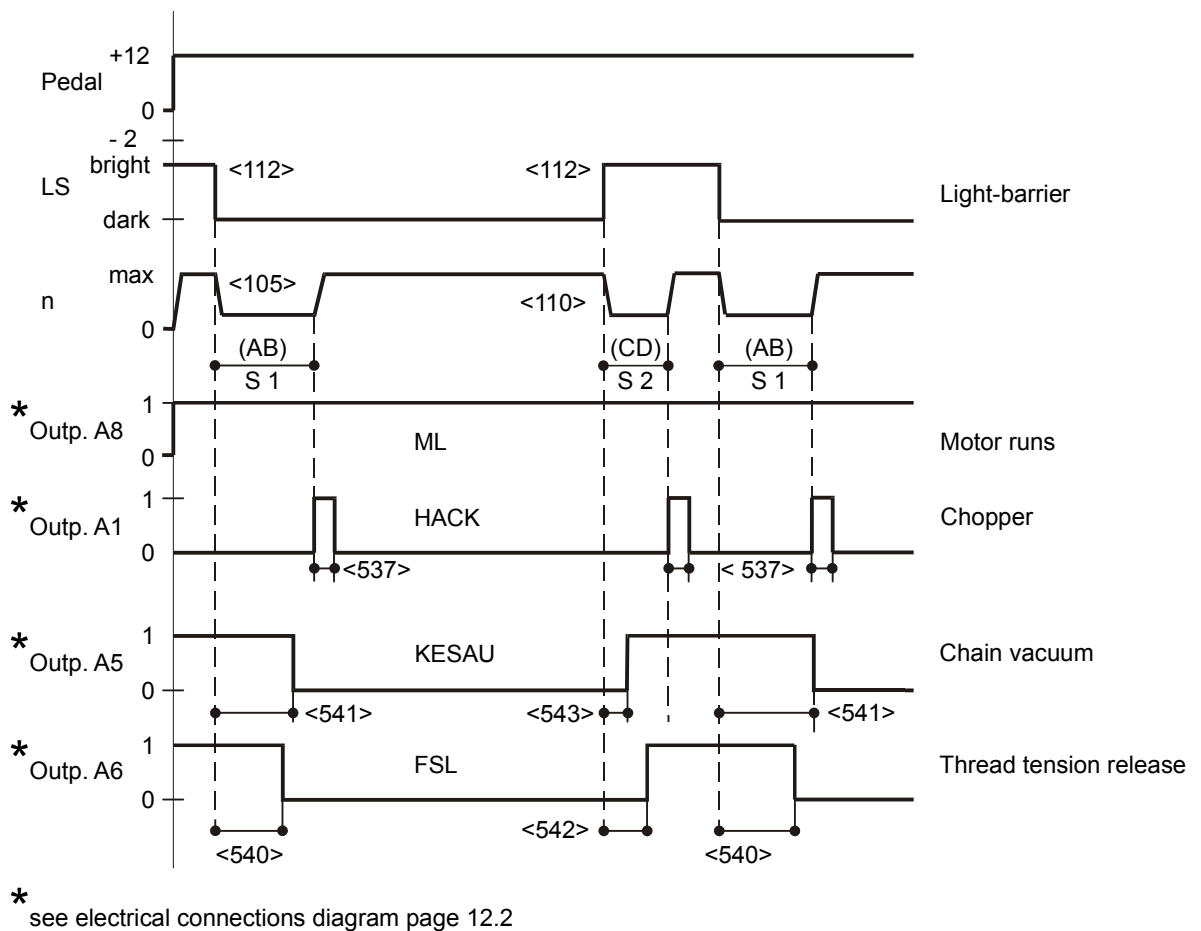


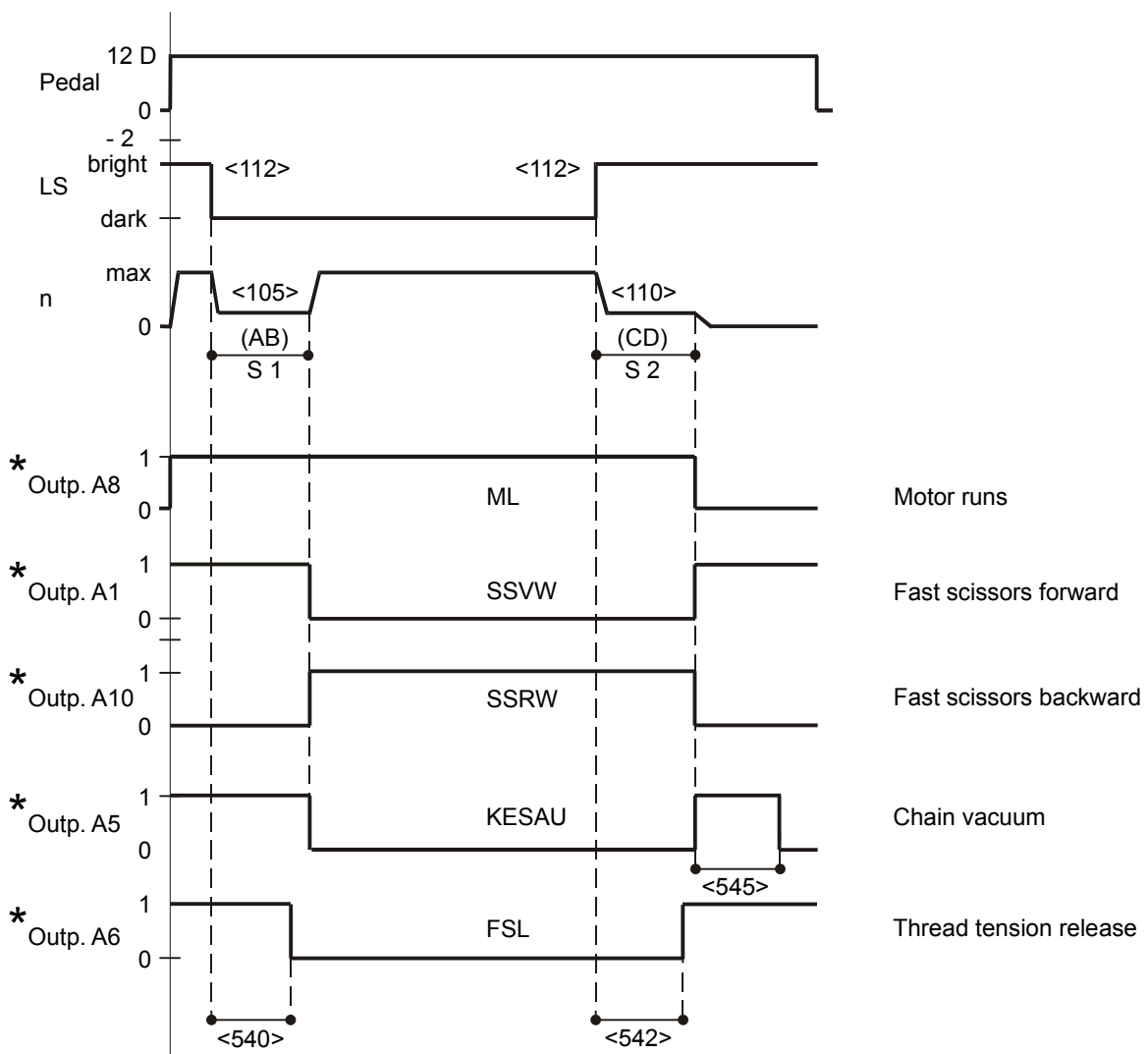
Fig. 8.1b

8.1.3 Functional sequence 2 (<799> = 2) with stop after seam end (<603> = I)

- Functions:
- fast scissors at start
 - fast scissors at end
 - chain vacuuming at start
 - chain vacuuming at end
 - thread tension release at start and at end

Switch condition of the keys at the **OC-TOP**:

- Key **T9** (P/M) off (dark)
- Key **T10** (T/E) off (dark)
- Key **T6** on (bright)
- Key **T7** on (bright)
- Key **T11** on (bright)
- Key **T12** on (bright)
- Key **T15** on (bright)



* see electrical connections diagram page 12.2

Fig. 8.2a

8.1.4 Functional sequence 2 (<799> = 2) without stop after seam end (<603> = II)

- Functions:
- fast scissors at start
 - fast scissors at end
 - chain vacuuming at start
 - chain vacuuming at end
 - thread tension release at start and at end

Switch condition of the keys at the **OC-TOP**:

- Key **T9** (P/M) off (dark)
- Key **T10** (T/E) off (dark)
- Key **T6** on (bright)
- Key **T7** on (bright)
- Key **T11** on (bright)
- Key **T12** on (bright)
- Key **T15** on (bright)

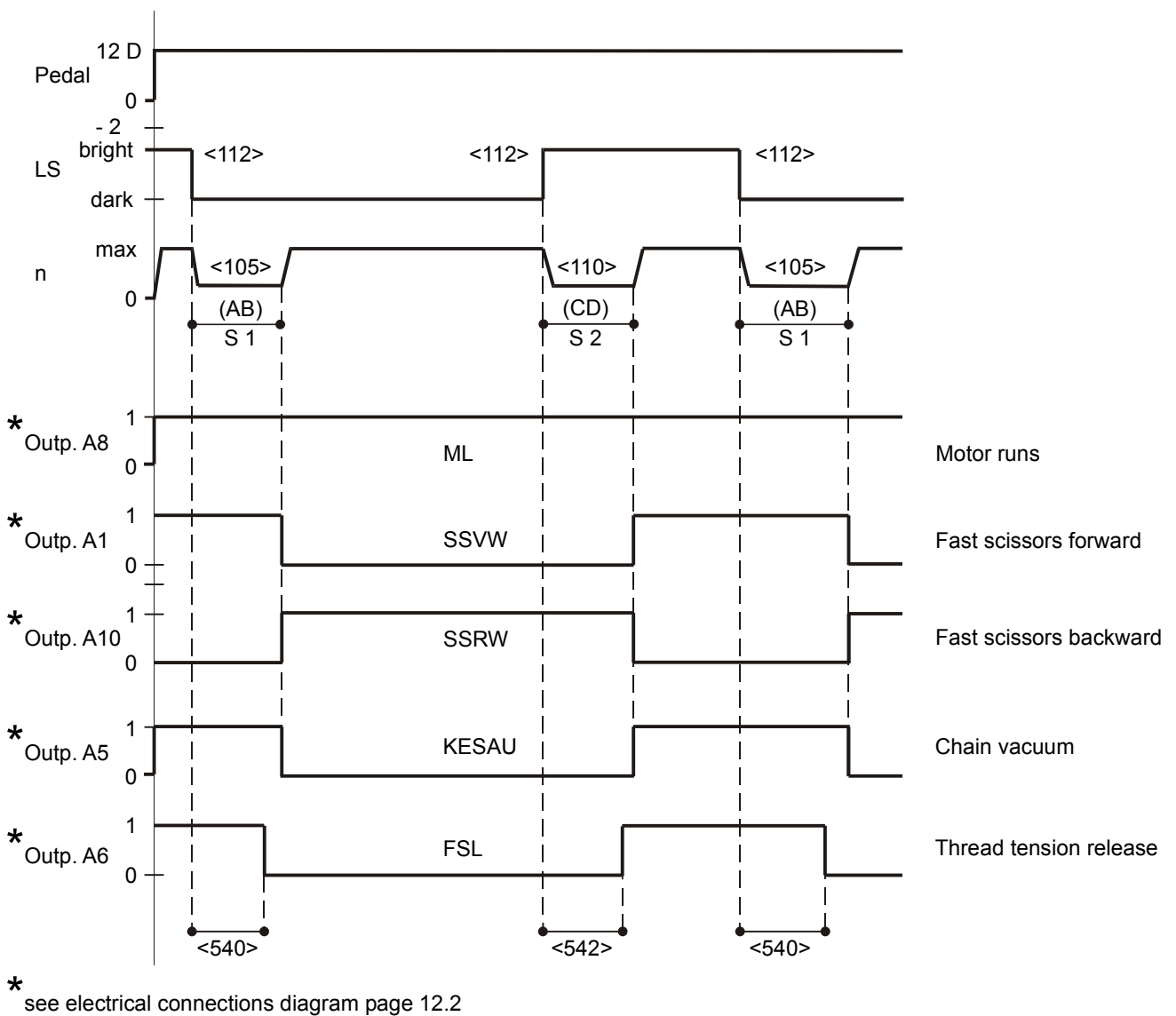


Fig. 8.2b

8.1.5 Functional sequence 3 (<799> = 3) with stop after seam end (<603> = I)

For Pegasus EX(T) 5214 ... BT250 with stitch lock at the beginning

Functions: chain vacuuming at start
 chain vacuuming at end
 thread tension on between start and end
 chain-off finger between start and end

Switch condition of the keys at the **OC-TOP**:

Key **T9** (P/M) off (dark)
 Key **T10** (T/E) off (dark)
 Key **T6** on (bright)
 Key **T7** on (bright)
 Key **T15** on (bright)

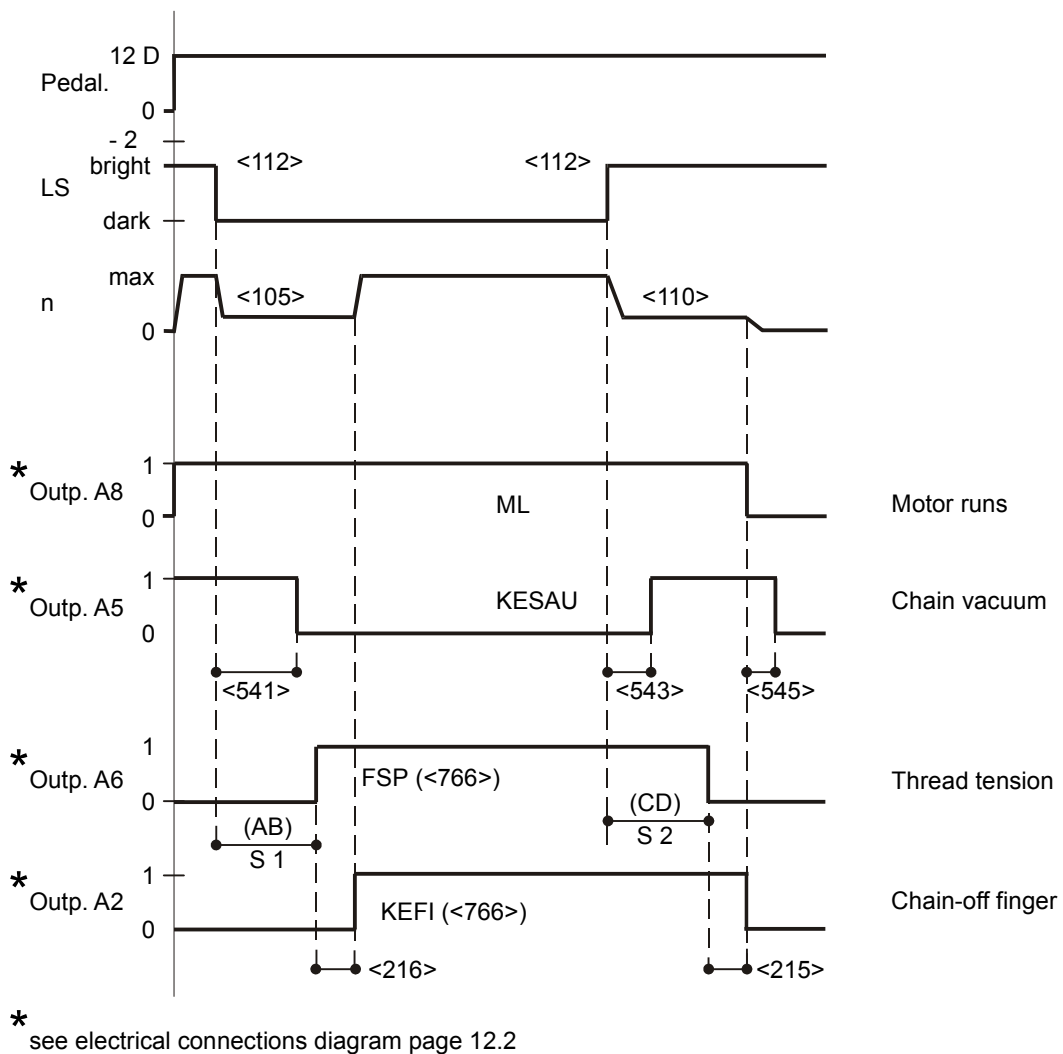


Fig. 8.3a

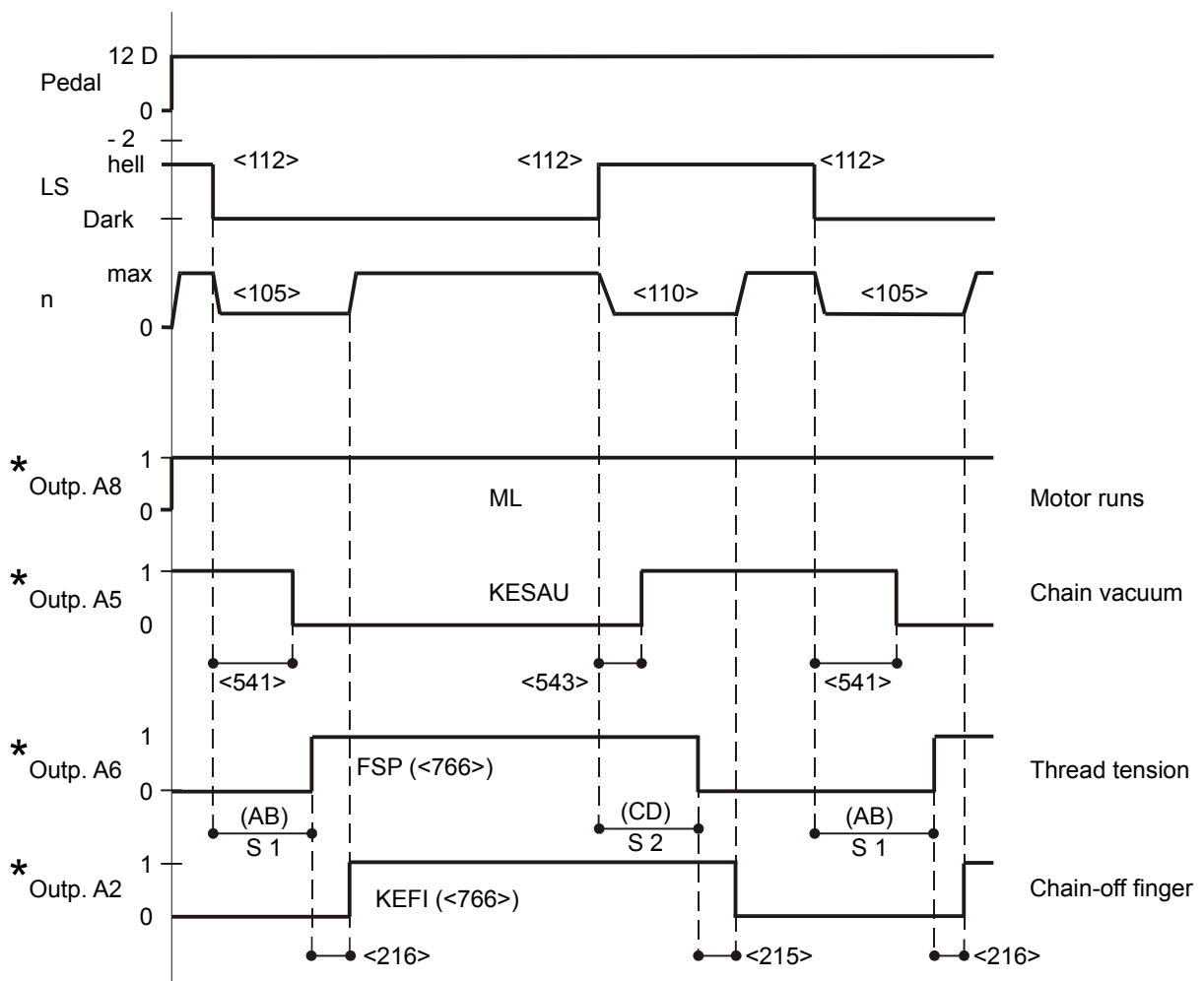
8.1.6 Functional sequence 3 (<799> = 3) without stop after seam end (<603> = II)

For Pegasus EX(T) 5214 ... BT250 with stitch lock at the beginning

Functions: chain vacuuming at start
 chain vacuuming at end
 thread tension on between start and end
 chain-off finger between start and end

Switch condition of the keys at the **OC-TOP**:

Key **T9** (P/M) off (dark)
 Key **T10** (T/E) off (dark)
 Key **T6** on (bright)
 Key **T7** on (bright)
 Key **T15** on (bright)



* see electrical connections diagram page 12.2

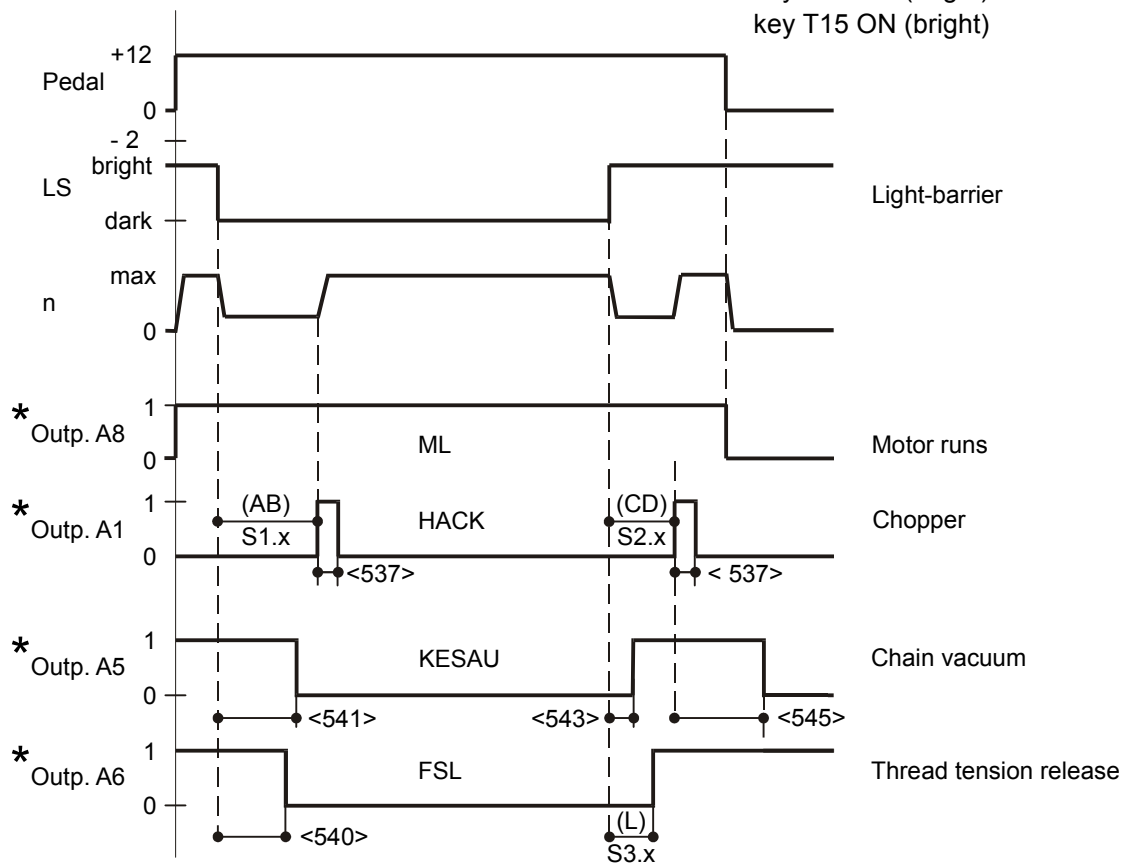
Fig. 8.3b

8.2 Sewing with Program - Functional Sequence 1 (<799> = 1)

Switch Condition of the keys at the OC-TOP:

- key T9 (P/M) ON (bright)
- key T10 (T/E) OFF (not bright)
- key T6 ON (bright)
- key T7 ON (bright)
- key T11 ON (bright)
- key T12 ON (bright)
- key T15 ON (bright)

8.2.1 Sewing with Trimming (Chopping) Twice



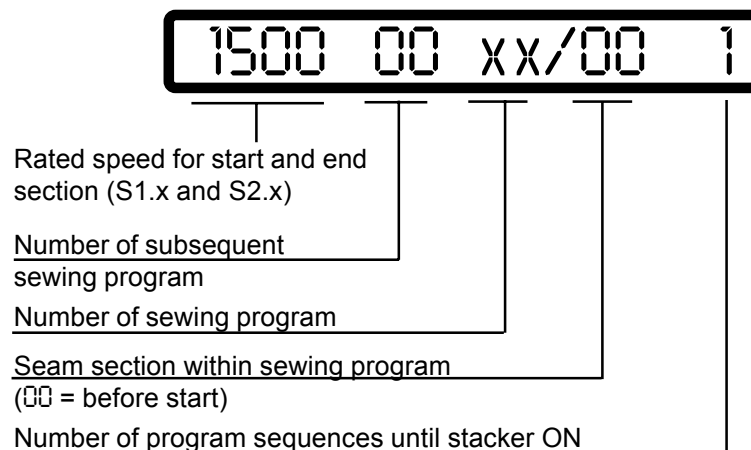
* see electrical connections diagram page 12.2

Fig. 8.4

Meaning:

- S1.x: Stitchcount 1 (from light barrier dark to chopper ON at start) within the running program x (x = 01...25), programmable via keys A+, A-, B+, B-
- S2.x: Stitchcount 2 (from light barrier to chopper ON at end) within the running program x (x = 01...25), programmable via keys C+, C-, D+, D-
- S3.x: Stitchcount 3 (from light barrier bright to thread tension release ON at end) within the running program x (x = 01...25)
Condition for thread tension release at end: $S3.x \leq S2.x$

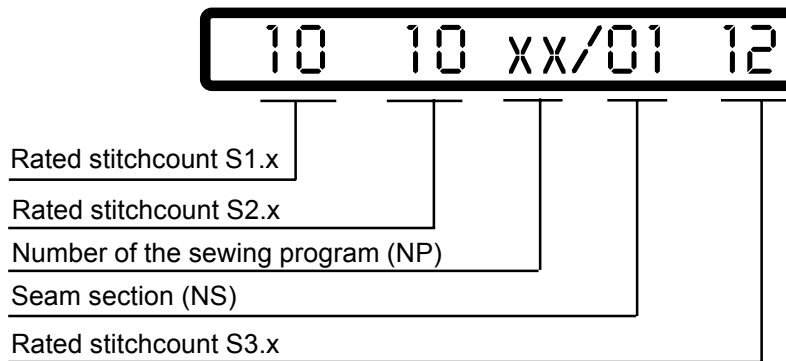
Display showing before start, when a seam section isn't switched on



In this display, the following can be modified:

- the program (NP): by actuating keys P+ or P-
- the seam section (NS): by actuating keys S+ or S-
- the cycles: by actuating keys L+ or L-, when no seam section is activated
- the subsequent sewing program via key D+ or D-
- the rated speed of the program: by actuating keys A+ or A-.
This speed is limited via parameter <607>.

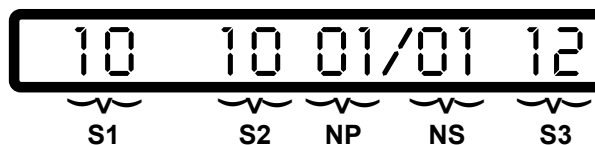
Display showing before start when a seam section is activated



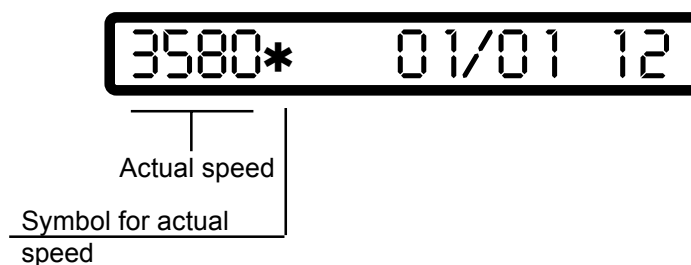
In this display, the following can be modified:

- the rated stitchcount S1.x via keys A+/A-/B+/B-
- the rated stitchcount S2.x via keys C+/C-/D+/D-
- the rated stitchcount S3.x via keys L+/L-
- the sewing program (NP) via keys P+/P-
- the seam section (NS) via keys S+/S-

Display showing after start, when <605> = II



Display showing after start, when <605> = I



8.2.2 Sewing with Trimming (Chopping) Four Times

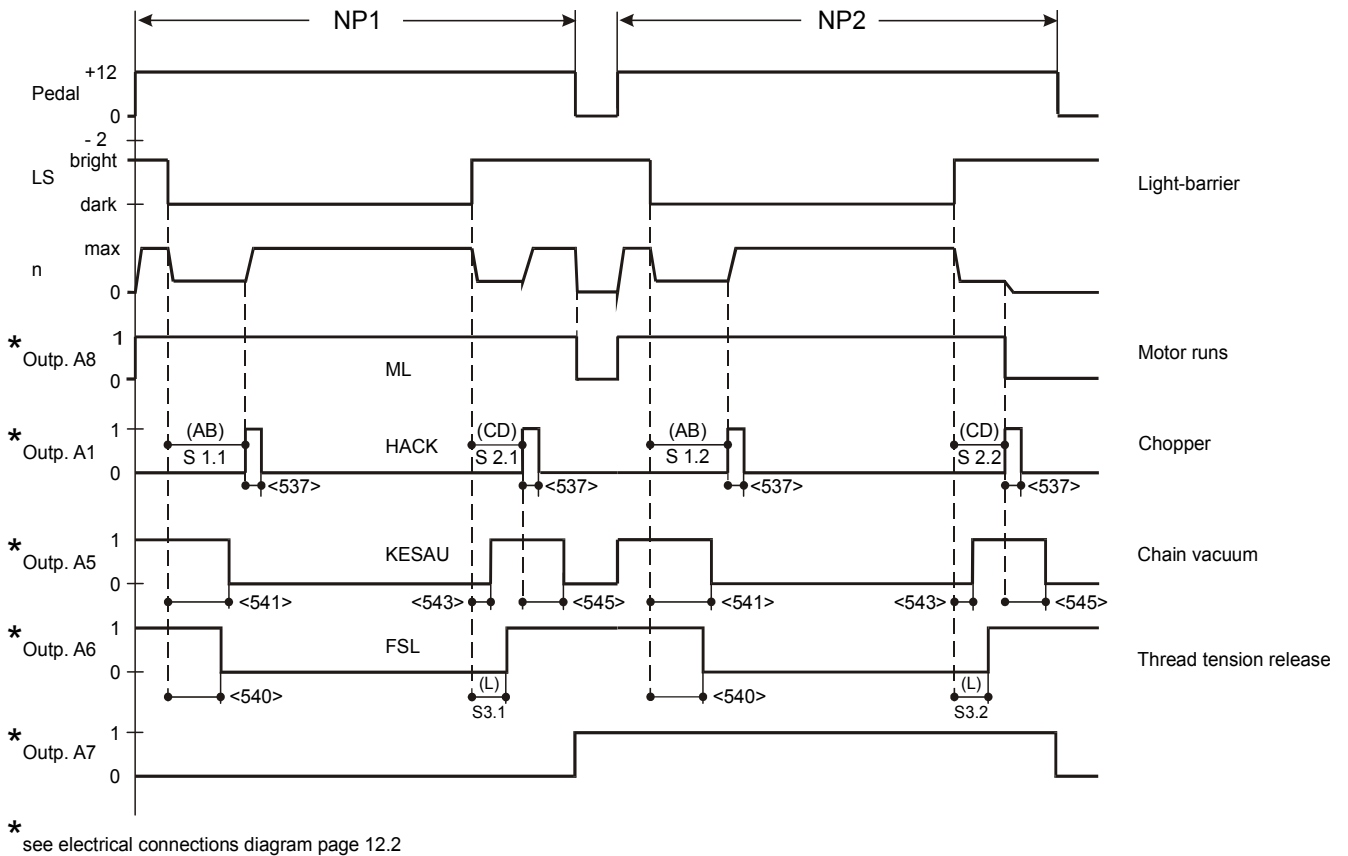


Fig. 8.5

The sequence as per **Fig. 8.5** is basically the same as that in Fig. 8.4, except for two differently programmed sections being sewn consecutively.

Section 1 is sewn with program 01 (NP1) and section 2 with program 02 (NP2).

Interlinking the two programs is made by entering the program number of the subsequent program before the program number of the running programming:

Display showing for program 01 (NP1) before start

1500 02 01/00 1

Display showing for program 02 (NP2) before start

1500 01 02/00 1

Program 01 involves programming of stitchcounts S1.1, S2.1 and S3.1
 Program 02 involves programming of stitchcounts S1.2, S2.2 and S3.2

Sewing of the second section can be optically indicated. This requires connection of an indicator light to output A7 and <563> = 1.

8.3 Error Messages (Malfunction Diagnostics)

The control system of the drive cyclically tests its own functional condition and the functional condition of the complete drive system.

Malfunctions are signalled via the display of the external operator panel, for instance:



List of possible error codes:

1	Treadle not in zero position when mains power is turned ON
9	Start lock
10	Machine class, <799> was changed; remedy: turn mains power switch OFF and ON again
62	Short circuit on 24 V (32 V) DC
63	Overload on 24 V (32 V) DC, load current > 4 amps
64	Power supply monitor: voltage too low (90 V - 150 V)
65	Power electronics not operational after mains power ON, mains power < 130 V
66	Earth short (motor or motor supply line has earth short in one or more phases)
67	Internal malfunction
68	Power electronics shut-off
	a) Overcurrent, short circuit in motor or supply line
	b) Overvoltage, mains voltage too high (>300 V), motor overloaded while decelerating
	c) Undervoltage
70	Machine blocked, no increment from synchronizer at max. motor torque
71	Commutation transmitter plug not inserted
73	Motor overloaded
75	Internal malfunction
90	EEPROM does not exist
91	EEPROM not programmable
92	Start lock while motor running
93	Wrong EEPROM
100- 117	} Internal malfunction

In case of error messages ≥ 62 , the motor will stop in undefined positions.

Control system reset possible only by mains power OFF/ON.

9. Programming by the User

Enables machine functions and parameters to be switched on or set up.

User programming of the **SERVO-TOP** can be carried out via

- external operator's control panel **OC-TOP** or
- the miniature integrated control panel (MPF)

The user programming of the **SERVO-TOP** is possible by means of the OC-TOP via:

- **direct programming** (only with drives from function level 40) and/or
- **programming parameters.**

The programming of parameters is possible via three levels of program:

- **Programming on level A** (operator level)
- **Programming on level B** (technician's level)
- **Programming on level C** (special level)

9.1 User Programming with Operator Panel OC-TOP / DQ

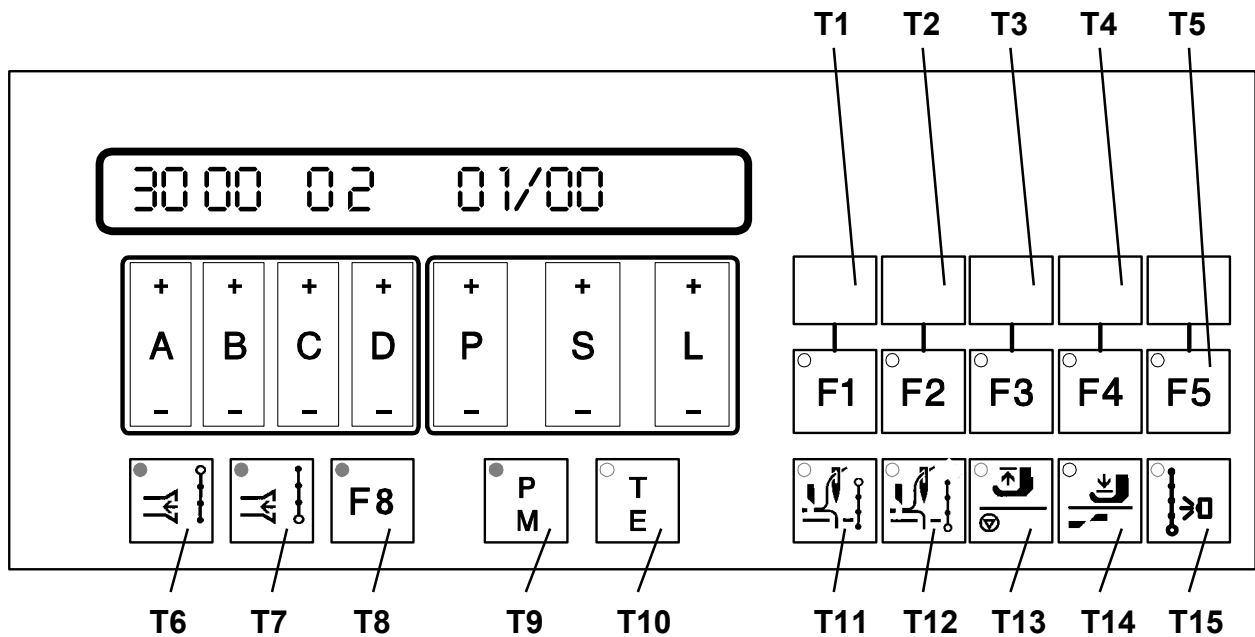


Fig. 9.1

9.1.1 Direct Programming

Attention! All values modified within direct programming are stored only when
a) the drive system is started or
b) key T9 (P/M) are pressed.
If the drive system is switched off via the mains power switch immediately after any values were modified, the values set before modification will be retained!

Regardless of the programming levels, certain values can be programmed without calling up parameter numbers - i.e. directly.

The following values can be modified by direct programming:

Stitch rating S1.x
Stitch rating S2.x
Stitch rating S3.x
Speeds for seam sections
Functions for seam sections

a) Modification of Stitch Rating S1.x, S2.x, S3.x

Display shown when "manual sewing" is ON (T9 (P/M) and T10 (T/E) not luminous)

A rectangular digital display with a black border. The text inside is '10 10 0x/00' in a white, segmented font. The first '10' is on the left, the second '10' is in the middle, and '0x/00' is on the right.

Display showing: when "programmed sewing" (T9 (P/M) being bright, T10 (T/E) not being bright) and the seam section are activated

A rectangular digital display with a black border. The text inside is '10 10 xx/01 12' in a white, segmented font. The first '10' is on the left, the second '10' is in the middle, 'xx/01' is on the right, and '12' is at the far right.

The keys located below the display permit to modify the values shown:

rated stitchcount S1.x	via keys A+/A-/B+/B-
rated stitchcount S2.x	via keys C+/C-/D+/D-
rated stitchcount S3.x	via keys L+/L-
program number	via keys P+/P-
seam section	via keys S+/S-

b) Programming of Stitch Rating by „Teach-in“ (Performing Work, with <799> = 3 only)

Condition: Key T9 (P/M) is bright
Key T10 (T/E) is bright
The machine must have performed at least one stitch before.

Activate the desired program x in the display via keys P+ or P- and the seam section to be programmed via keys S+ or S-.

Cycle:

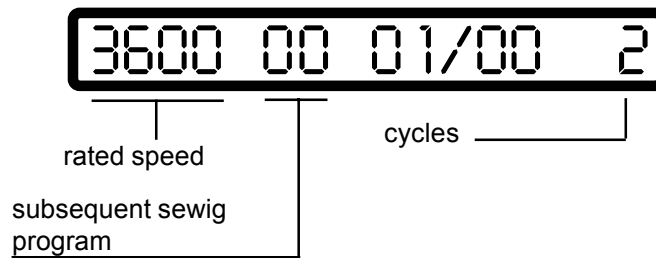
- Treadle forward
Reaction: the stitchcount which has been registered up to now will be eliminated
- Treadle returns to zero position
- Treadle forward
Reaction: machine sews, the sewed stitches will be added in, shown in the display and registered

Correction of the value shown in the display is possible via key L+ or L-.

c) Programming of Cycles (Number of Sequences of Program) to Stacker ON, of Program x Speed and of the Subsequent Program

Condition: Operation mode „programmed sewing“ is on, i.e. key T9 (P/M) is bright and key T10 (T/E) is dark, machine not sewing

Display showing



Cycle programming is made via the keys L+ (number increased) or L- (number decreased)

Programming of the **speed** for the program is made via key A+ (value increased) or A- (value decreased)

Programming of the **subsequent sewing program** is made via keys D+ or D-.

d) Programming of Functions

Functions for the program x are controlled via the functional keys

- **T5** function change-over for keys **T1 ... T4** (shift key)
- **T1** chain close-off (<425> = I)
- **T5+T1** automatic change-over between program 1 and program 2 (see Item 8.2.2)
- **T2** speed during programmed sewing:
variable (treadle-controlled) when **T2** is dark
constant (automatic) when **T2** is bright
- **T5+T2** no function
- **T3** blow chain at seam end
- **T5+T3** light barrier start
- **T4** no function
- **T5+T4** piece counter on display
- **T6** vacuum at start of seam
- **T7** vacuum at end of seam
- **T8** currently no function
- **T11** chopper at start of seam
- **T12** chopper at end of seam
- **T13** presser foot position at sewing stop
- **T14** preset foot position at end of seam
- **T15** light barrier

Caution: After programming push key T5 till LED goes out

9.1.2 Parameter Programming

9.1.2.1 Programming Level A (Operator Level)

This level is used for programming control parameters which immediately affect the operation sequence.

These are the parameters for the following functions:

- Light barrier compensation stitches <111>
- Light barrier fade-out <112>
- Softstart <116>
- Stitches from start (photocell dark) to thread tension release off <540>
- Stitches from start (photocell dark) to vacuum off <541>
- Stitches from photocell clear to vacuum on <543>
- Seam start: stitches from photocell dark to stop <565>

a) Activation of Programming Level A

Conditions Mains power switch ON
 Drive system not running
 Operating mode: manual sewing must be ON (key T9 (P/M) dark)



The LCD display shows the text "10 10 XX/00" in a digital font, enclosed in a rectangular border.

Press key T10 (T/E)

Response:

Key T10 (T/E) becomes bright, the display shows in its righthand half the first parameter (parameter no. and parameter value) associated with programming level A.
Sewing is not possible



The LCD display shows the text "10 10 111 6" in a digital font, enclosed in a rectangular border.

- Programming
The **parameter number** is set by using keys P+ or P- (hundreds of parameter no.) and keys S+ or S- (tens and units of parameter no.). The **parameter value** is programmed by using key L+ or L-

b) Deactivation of the Programming Level A

Press key T10 (T/E)

Response:

Key T10 (T/E) goes dark, the display returns to initial condition.
Sewing is possible.



The LCD display shows the text "10 10 XX/00" in a digital font, enclosed in a rectangular border.

9.1.2.2 Programming Level B (Technician Level)

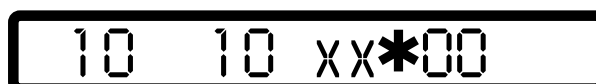
This level is used for programming the control parameters which have to be modified or adapted very rarely or only for starting operation of the system.

a) Preparation for Activation of the Programming Level B

Turn mains power switch OFF
Press and hold keys T9 (P/M) and T10 (T/E) simultaneously
Turn mains power switch ON
Release keys

Response:

The display shows a „*“ between program number and seam section.
Sewing is possible.



The LCD display shows the text "10 10 XX*00" in a digital font, enclosed in a rectangular border.

b) Activation of Programming Level B

Deactivate key T9 (P/M) (going dark) and activate key T10 (T/E) (going bright).

Response:

In the righthand half of the display are shown: a parameter number (at first 105, then the number selected last) and the associated value.

Sewing is not possible.



10 10 105 1500

Modification of **parameter number**:

for hundreds of parameter numbers use key P+ or P-

for tens and units of parameter numbers use key S+ or S-

Modification of **parameter value**: via key L+ or L-

c) Deactivation of Programming Level B

Deactivate key T10 (T/E) (going dark)

Response:

Parameters shown disappear from the display, the display returns to initial condition

Sewing is possible.



10 10 XX*00

9.1.2.3 Programming Level C (Special Level)

At this level, control parameters are stored the values of which have to be modified in exceptional cases only. Correction of these parameters should therefore be made only after consultation of the manufacturer.

a) Activation of Programming Level C

- Activate programming level B (see 9.1.2.2)
- Call up parameter 798
- Set parameter value <798> to I
- Deactivate programming level B
- Turn mains power switch OFF, wait for >2 secs. to elapse
- Turn mains power switch back ON
- Deactivate key T9 (P/M) (going dark)
- Activate key T10 (T/E) (going bright)

Response:

In the righthand half of the display appears the first parameter of programming level C.

Calling up further parameter numbers and correcting the parameter values can be made in the same way as described for programming levels A and B.

b) Deactivation of Programming Level C

- Deactivate key T10 (T/E) (going dark)
- Turn mains power switch OFF

9.1.3 Reset

a) Reset of Parameter Values

All parameter values having been modified from the ex-factory condition (standard value) are reset to their standard values by this procedure.

Exceptions: parameters 700, 799 and 800
For these parameters, the values programmed by the user are retained even after -Reset- has been performed.

-Reset- procedure:

- turn mains power switch OFF
- press treadle fully forward and hold in that position
- press and hold keys P- or P+, S- or S+ and L- or L+ simultaneously
- turn mains power switch ON
- release the three keys and the treadle

Response: Display showing



RESET Y -- N

Now -Reset- can be performed.

Located below the display Y (yes) there is key P+. Press this key P+ to start the reset. The display briefly shows:



MASTER-RESET

After that the display shows the power-on display for approx. 2 secs.



Q41MS 7Z-932-5

and then shows the display corresponding to the operating mode selected



10 10 XX/00

If it is not desired to start the -Reset-, press key L+ located below the display saying N (no).

b) Reset of Parameter Values and Sewing Programs

The reset procedure including the data of the sewing programs is analog to that described under a), until the following appears in the display:



RESET Y -- N

In order to reset the data of the sewing programs to their original values, it is now required before pressing key P+ to press at first key T8 and hold until activation is acknowledged in the display.

9.2 User Programming via the Internal Mini Programming Panel (MPF)

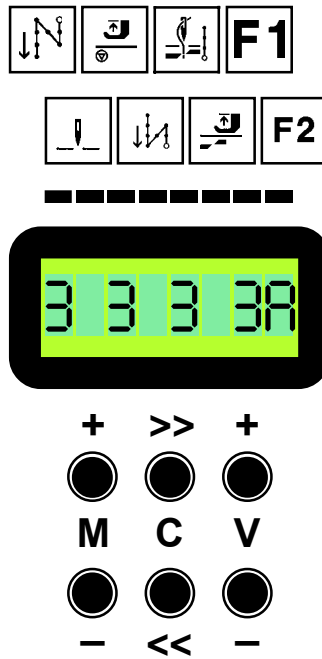


Fig. 9.2

The **MPF** comprises the following functional elements:

- the six programming keys: **M+** / **M-** / **C<<** / **C>>** / **V+** / **V-**
- the display: eight-digit LCD matrix

Each digit on the display is identified by a symbol for a sewing function.

The **MPF** is activated only when no external operating panel **OC-TOP** is connected to the control system.

When the drive system is turned on, message 01 is shown on the display for approx. 1 sec: type of control system (e.g. Q41MSII).

Indication 01:



Subsequently, Indication 02 is shown on the display: software status (e.g. 7Z_932_5).

Indication 02:

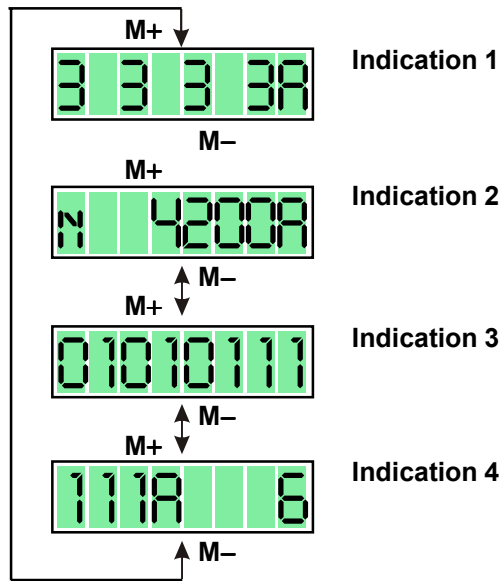


After approx. 1 sec has elapsed, the display will show the indication 1

The following different options can be selected on the display:

- Indication 1:** rated stitches for seam section S1 at seam beginning
- Indication 2:** speed and rated stitches for seam section S2 at seam end
- Indication 3:** sewing functions
- Indication 4:** control parameters
- Indication 5:** hardware test (<797> = I, see chapter 10.5)
- Indication 6:** reset

Change-over from indication 1 to indication 4 is made by actuating keys M+ or M- and is possible only when the drive stopped.



Sewing:

Sewing can be performed under any of the options 1, 2, 3 and 4 if none of the digits is blinking.

Programming:

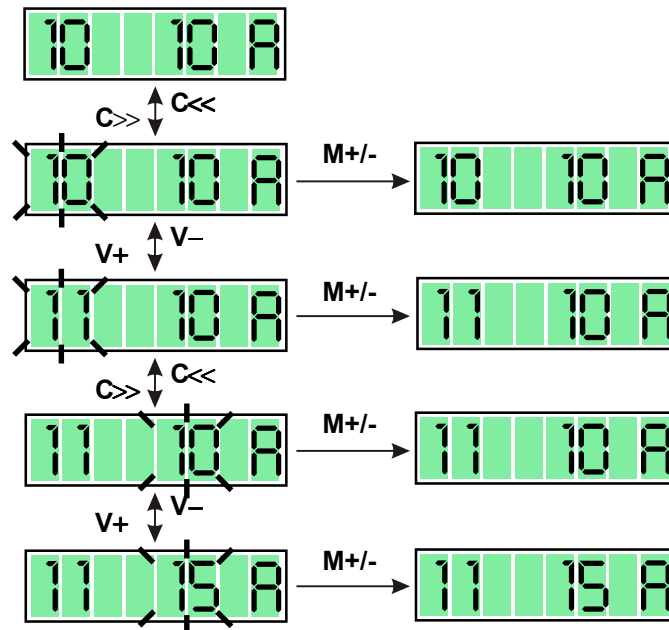


Programming is possible when one of the digits is blinking.

Release for programming and advance from digit to digit is made by actuating keys C>> / C<< and is possible only when the drive unit is at standstill.

9.2.1 Indication 1: Rated stitches for seam sections S1 and S2

Programming of the rated stitches S1 and S2

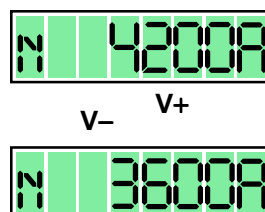


Programming Procedure

- Use keys C>> or C<< to make digits blink; sewing is not possible.
- Use keys V+ or V- to increase or decrease the number of blinking digits.
- Use keys M+ or M- to cause blinking to stop; sewing is possible again.

9.2.2 Indication 2: Speed

This option can be used for selecting the machine's operating speed (nominal speed) between maximum speed (<607>) and minimum speed (<606>), when parameter <676> = 1.



Adjustment of Nominal Speed

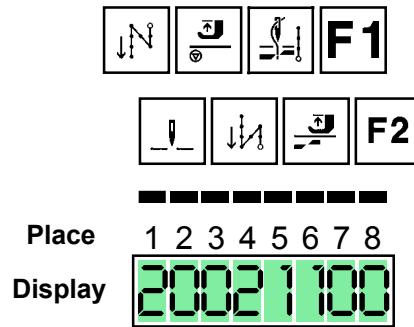
- Use keys V+ or V- to increase or decrease the figure shown in discrete steps.

Display of Actual Speed (<605> = 1)

During machine operation, the current operating speed (actual speed) of the machine is displayed. While actual speed is shown, „*“ appears in the 2nd digit of the display.

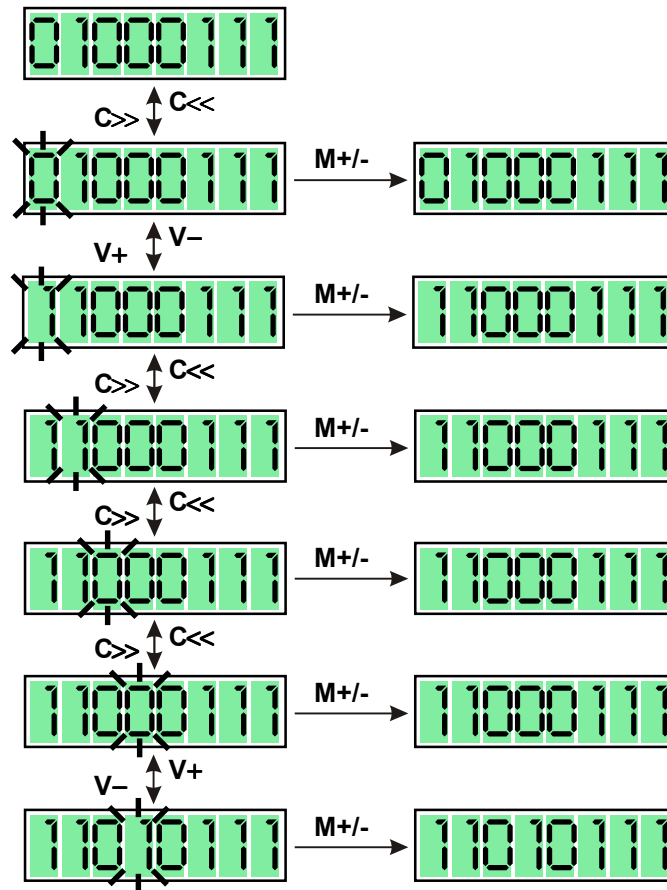


9.2.3 Indication 3: Sewing functions



Place	Symbol	Function	Display	Meaning
1		vacuum at start of seam	0 1	without vacuum vacuum till stitch count S1 resp. <541>
2		chopper at start of seam	0 1	without chopper/fast scissors chopper/fast scissors after stitch count S1
3		chopper at end of seam	0 1	without chopper/fast scissors chopper/fast scissors after stitch count S2
4		vacuum at end of seam	0 1	without vacuum vacuum till stitch count S2 resp. <543> till stop
5		presser foot position at sewing stop	0 1	down up
6		presser foot position at end of seam	0 1	down up
7			0	without function
8			0	without function

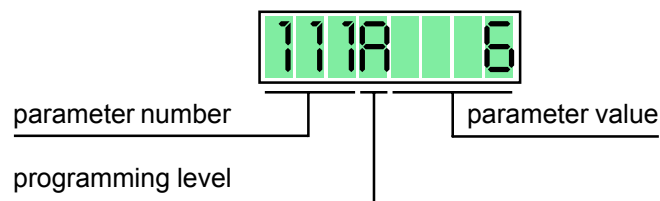
Programming of the Sewing Functions



Programming Procedure

- Use keys **C>>** or **C<<** to make digits blink; sewing is not possible.
- Use keys **V+** or **V-** to increase or decrease the number of blinking digits.
- Use keys **M+** or **M-** to cause blinking to stop; sewing is possible again.

9.2.4 Indication 4: Control Parameters



The meaning of the control parameters can be seen from Chapter 11.4 „List of Parameters“.

The control parameters are arranged on three different programming levels (A, B, C).

Programming Level A

Parameters on level A can be accessed when the drive unit is turned ON in the normal way.

Programming Level B

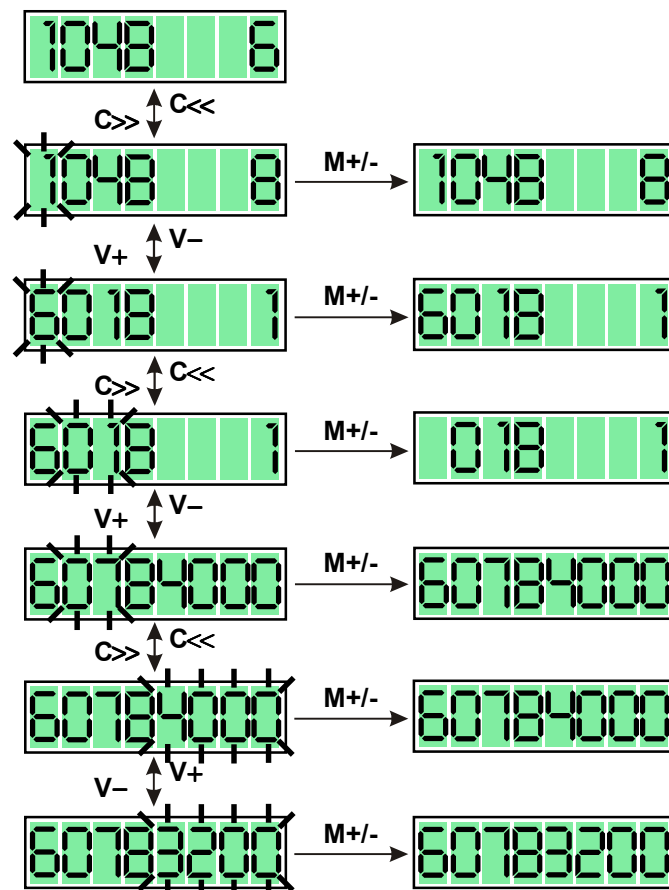
In order to access parameters on programming level B, proceed as described below when turning power on:

- Turn OFF power switch **S1**
- Press and hold key **M+** and **V+** simultaneously
- Turn ON power switch **S1**

⇒ Indication 1 shows „B“ in its extreme righthand (8th) digit.

Use keys **M+** or **M-** to advance to Indication 4.

Programming of Control Parameters



Programming Procedure

- Use keys **C>>** or **C<<** to make digits blink; sewing is not possible.
- Use keys **V+** or **V-** to increase or decrease the number of blinking digits.
- Use keys **M+** or **M-** to cause blinking to stop; sewing is possible again.

Programming Level C

In order to access parameters on programming level C, at first take preparatory action on programming level B by changing parameter (software switch) 798 to I (<798> = I). Then either change display by actuating keys **M+** or **M-** or call up a different parameter by actuating keys **C>>** or **C<<** and **V+** or **V-**. Now turn the power switch OFF and immediately ON again.

⇒ Indication 1 shows „C“ in its extreme righthand (8th) digit.

Use keys **M+** or **M-** to advance to Indication 4.
This activates programming level C.

Programming level C includes all parameters (including those on levels A and B).

9.2.5 Reset

Any parameters having been modified from their original (standard) condition can be restored to their standard condition by „reset“.

Exceptions:

Parameters 700, 799, 800 and some further parameters identified by „*“ in the list of parameters. For these parameters, the conditions programmed by the user will be maintained even after a „reset“ is performed.

Reset Procedure

- Turn OFF power switch **S1**.
- Toe the treadle fully forward and hold in that position.
- Press and hold keys **M-** and **V-** simultaneously.
- Turn ON power switch **S1**.
- Stop pressing keys and stop toeing the treadle.

Response: Indication 6



To make „reset“, subsequently press key **M+**.
If it is intended not to make a „reset“, press key **M-**.

Subsequently, the display will show the indication 1.



10. Start of operation

If the MINI-STOP has been stored at a temperature of $<+5^{\circ}\text{C}>$, then a working temperature of between $+5^{\circ}\text{C}$ and $+40^{\circ}\text{C}$ must first be obtained.

The equipment must be dry.

Before work with the machine can be started, make sure to perform the following:

- a) Control the direction of rotation and the reference position of the needle bar
- b) Control the needle positions
- c) Control the maximum speed

10.1 Control of the direction of rotation and of the reference position from the needle bar (needle position NPO)

- a) Activate programming level B (technician level) (see section 9.1.2.2 „programming level B“)
- b) Set parameter 700
- c) Actuate treadle briefly forward:
Reaction: The machine performs a full revolution and then positions in a random position.
- d) Is the direction of rotation correct?
When yes, then proceed to adjust the reference position, proceed with e) below
If no, then activate parameter 800 and change the value $<800>$ ($\text{I} \rightarrow \text{II}$ or $\text{II} \rightarrow \text{I}$) than proceed as b)
- e) Turn the handwheel of the machine in the direction of rotation until the point of the needle coming from up to down touches the level of the throat plate (= reference position).
When doing this it is important that parameter $<701> = \text{I}$.
- f) Actuate the treadle briefly forward:
Reaction: The machine performs one revolution and positions in the same position that had been previously obtained by hand.
- g) As soon as new parameter numbers are activated, or the programming level B is negated, then the parameter value $<700>$ is memorized and the reference position adjustment is completed.

10.2 Control of the needle positions NP1/NP2/NP3/NP9

NP1 - needle down position ($<702>$)

NP2 - thread take up lever in the up position ($<703>$)

NP3 - needle up ($<710>$)

NP9 - thread tension release / thread catcher start ($<707>$)

- a) Activate programming level B (technician level) (see section 9.1.2.2 „programming level B“)
- b) Activate parameter 702
- c) Actuate the treadle briefly forward
Reaction: The machine performs a revolution and then positions at the programmed $<702>$.
- d) Is the needle position correct?
When yes, then proceed as with g) below.
When no, then the position must be changed by turning the hand wheel (when $<701> = \text{I}$) or via key L+ or L- (when $<701> = \text{II}$)
- e) Actuate the treadle briefly forward
Reaction: The machine performs a revolution and positions in the same position.
- f) The position can again be corrected.
When no further correction is needed, then proceed as with g) below.
- g) As soon as another parameter number is called up, e.g. example 703, the previously programmed value of $<702>$ is memorized.
- h) With parameter 703 and 710 correction is obtained as described above for parameter 702.
- i) Deactivate programming level B (see section 9.1.2.2 „programming level B“).

10.3 Control of the maximum speed

- a) Activate programming level B (see section 9.1.2.2 "programming level B")
- b) Set to parameter 607
- c) Check the parameter value <607> and make correction if necessary via keys L+ or L-
- d) Deactivate programming level B (see section 9.1.2.2 "programming level B")

10.4 Hardware Test

Hardware Test is a check routine permitting to use the operator panel **OC-TOP** or the mini programming panel **MPF** for testing various components of the drive system (control system) and of the machine installation.

Activation of the „hardware test“ = „HW-Test“ routine

- a) Activate programming level „B“ and call up parameter 797
- b) Set <797> to I
- c) Deactivate programming level „B“
- d) Turn off mains switch **S1**
- e) Wait for approx. 2 secs. to elapse, and turn on main switch S1 again.

Response: The display shows „HARDWARE TEST“ for approx. 2 secs.

indication **OC-TOP**:



indication **MPF**:



After that, the display shows the first test block: Inputs.
All OC-TOP keys equipped with LEDs become bright

Survey of test blocks:

Test-Block	Check	indication OC-TOP	indication MPF
1	Inputs		
2	Outputs		
3	Speed control-unit		
4	Synchronizer		

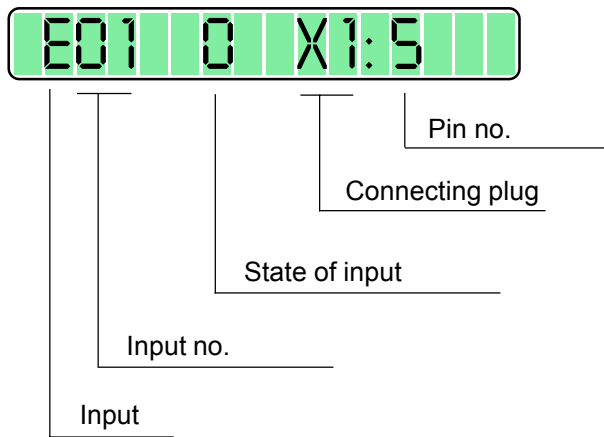
To call up the test blocks (advancing from test block to test block), use keys **A+** and **A-** on the **OC-TOP** or with the keys **M+** / **M-** on the **Mini Control Panel (MCP)** in front of the control box.

To call up various functional elements within a test block such as advancing from an Input to the next, use keys B+ and B- on the control panel **OC-TOP** or with the keys C>> / C<< on the **MCP**.

To activate functional elements selected, use key **D+** on the **OC-TOP** or the key **V+** on the **MCP**.

Test block 1: Inputs

Indication:



The function assigned to the input displayed can be seen from chapter 12 „Connections Diagram for Connectors“.

The designations E (for input) are located on the lefthand side of the connectors shown.

The keys or selectors assigned to the inputs are designated S in the connections diagram and have the same numbers as the associated inputs, i.e.

key S1 is connected to input E1

key S2 is connected to input E2

key Sx is connected to input Ex.

The operating state of the input is signalled in the 7th digit of the display.

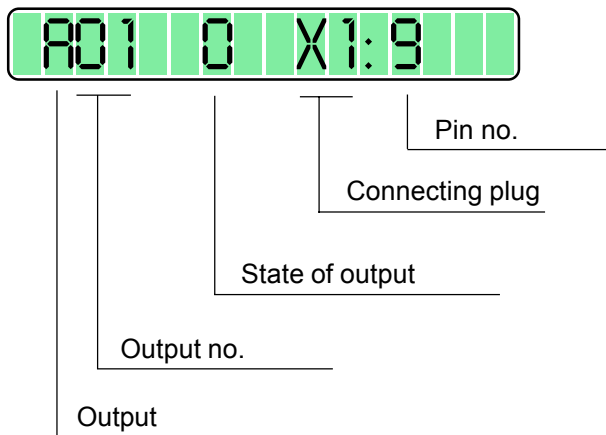
Key/switch open → Indication: 0

Key/switch closed → Indication: 1

In the righthand part of the display, the connecting plug and the pin number to which the displayed input is connected are shown for the purpose of reference.

Test block 2: Outputs

Indication:



The function assigned to the output displayed can be seen from chapter 12 „Connections Diagram for Connectors“.

The designations A (for output) are located on the lefthand side of the connectors shown.
The solenoids/solenoid valves assigned to the outputs are designated Y in the connections diagram and have the same numbers as the associated outputs, i.e.
solenoid Y2 is connected to output A2
solenoid Y3 is connected to output A3
solenoid Yx is connected to output Ax

The operating state of the output displayed is signalled in the 7th digit of the display.
Output not activated → display: 0
Output activated → display: 1

To activate an output, use key D+. Deactivation is made automatically after approx. 2.5 secs have elapsed or can be caused by using key D-.

In the righthand part of the display, the connecting plug and the pin number to which the displayed output is connected are shown for the purpose of reference.

Test block 3: Speed control unit (SWG)

Indication:



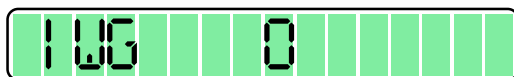
The treadle can be actuated to operate consecutively all 16 steps of the speed control unit.

The following is displayed in digits 6, 7 and 8

-2 / -1 / 0 / +1 / 10 / 20 / ... / 120, when the speed control unit is in proper condition.

Test block 4: Synchronizer (IWG)

Indication:



This test block permits to check the synchronizer (increment encoder). For this purpose, the shaft of the motor is rotated manually.

The increments (pulses) of the synchronizer are counted and shown in display digits 7, 8 and 9. This display runs from 0 through 127 when the synchronizer is in proper condition.