

TENSIOBAR flying splice

**Pneumatic tension control
with additional wiring for flying splice**

Fitting and maintenance instruction No.721 (Edition 05.1990)

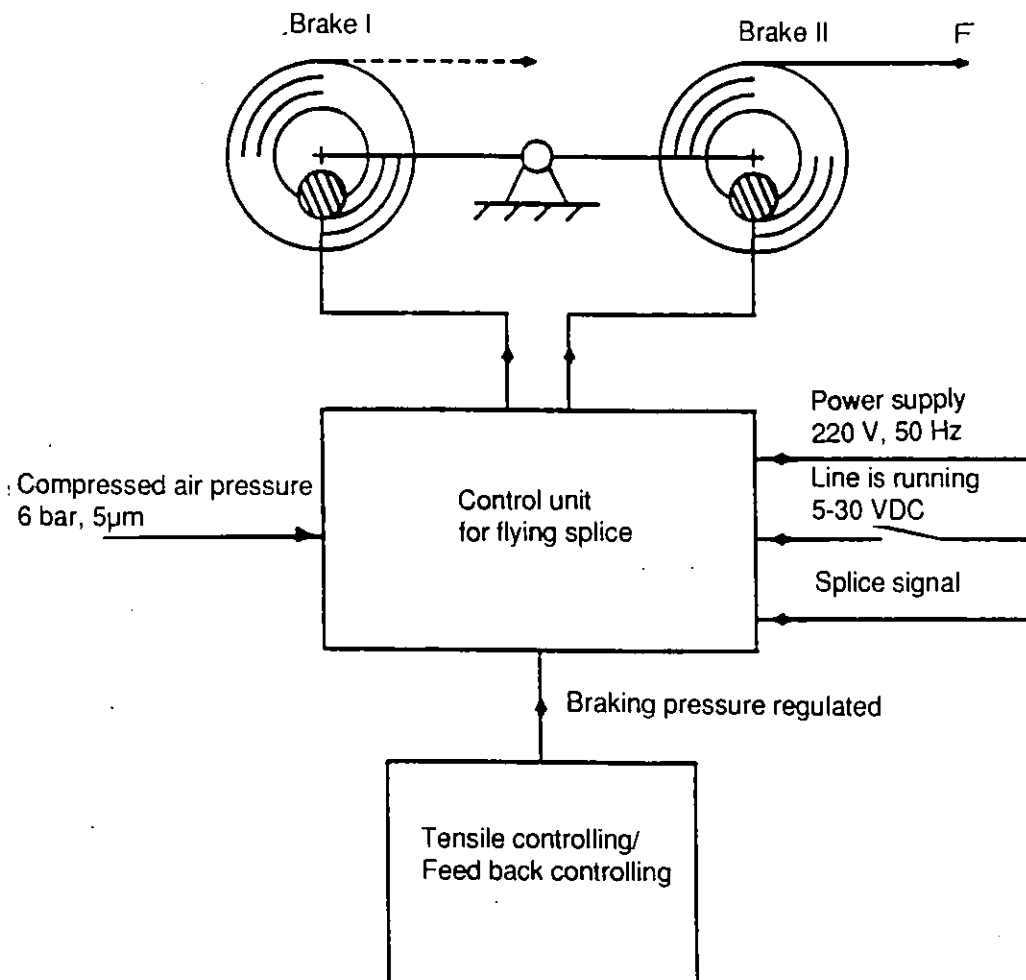
1. Description of function

During the unwinding process the selected tensile strength (line tension) is to be kept constant. With the bale diameter decreasing the braking torque affecting the unwinding shaft has to be readjusted by means of the regulating unit. The regulating unit comprises the measuring device, the control unit and the pneumatically actuated brake as the actuator.

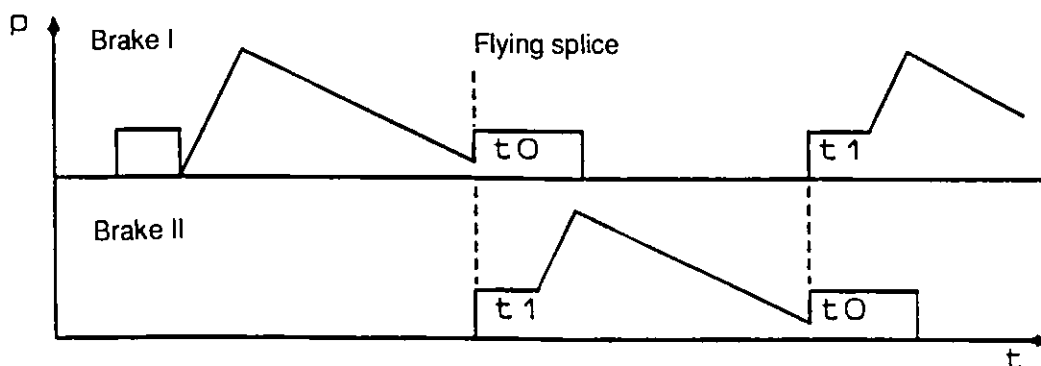
1.1 Structure and function of the regulating unit

The given nominal value of the line tension is compared to the actual value of the measuring device. The deviation results in an increase resp. a decrease of the working pressure at the brake. The eccentrically positioned measuring roller (line guide roller) carries out a slight reciprocation of some 1/10 mm which does **not lead to an inclination of the axis.**

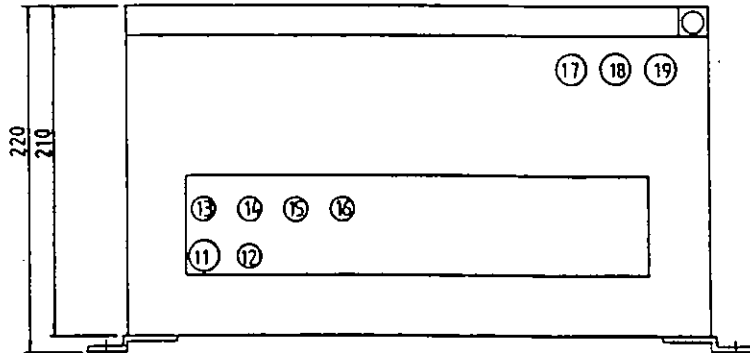
When receiving the signal "cut of paper web" the regulation switches the brake pressure regulated from the empty to the full bale. At the same time the empty bale is been stopped by the brake.



Sequence of brake pressure during splice process

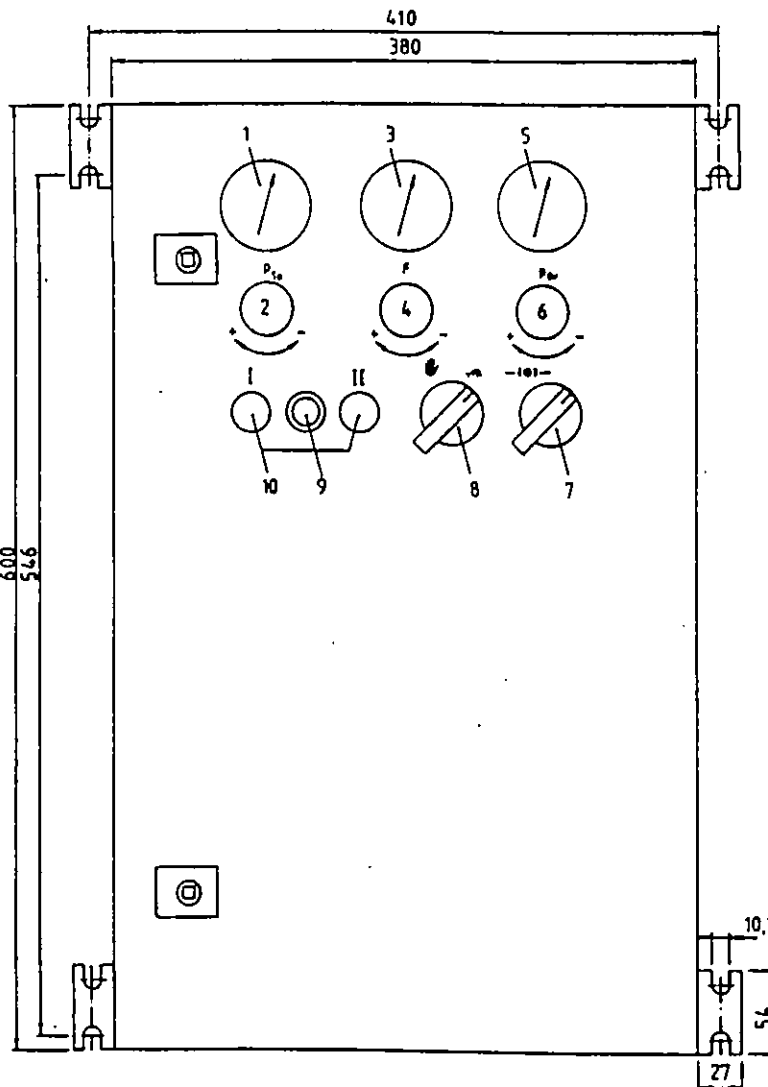


Control unit 0-087-454-00-153-000



Connections (bottom of housing)

- 11 Air pressure from pressure supply 6 bar, hose NW6
- 12 Signal from pressure regulator, hose NW4
- 13 Air pressure for pressure regulator, hose NW4
- 14 Air pressure for nominal value cylinder, hose NW4
- 15 Air regulated to brake I
- 16 Air regulated to brake II



Line input

- 17 Power supply 220 V, 50 Hz
- 18 Signal "line running"
- 19 Signal "web material cut"

Control elements

- 1 Pressure display splice brake pressure
- 2 Pressure regulator for splice brake pressure
- 3 Nominal value display
- 4 Pressure regulator for nominal value
- 5 Brake pressure display
- 6 Pressure regulator for manual brake pressure/operation pressure
- 7 Bleeding of brake
- 8 Switching over for manual/automatic
- 9 Pulser for brake preselection
- 10 Indication lamp brake I/II

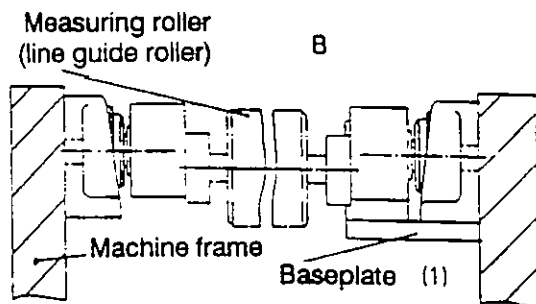
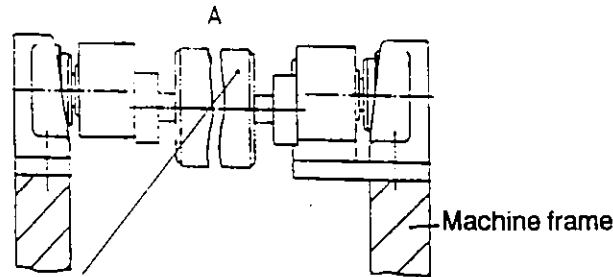
2. Measuring device

0-087-456-00-005: 200 - 2000 N

0-087-456-00-006: 60 - 600 N

Fix the measuring device to the machine frame with 4 screws M10 as a pedestal bearing (A) or flanged bearing (B).

- watch for measuring direction
- arrange base plate horizontal



Connect the two bearings together with the line guide roller (measuring roller).

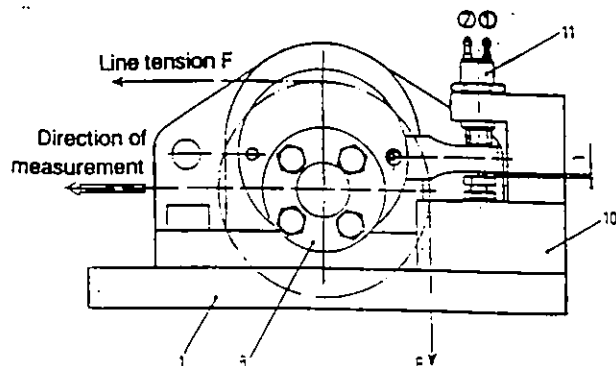
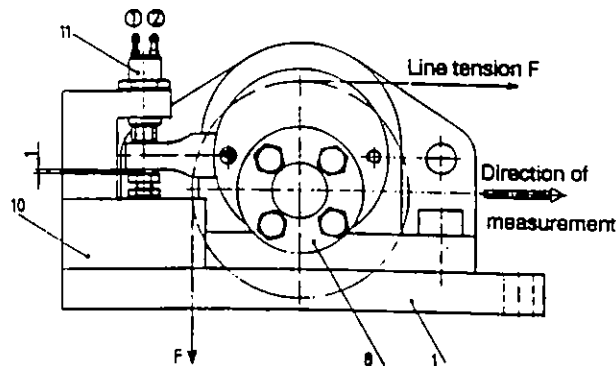
Carefully align the measuring roller.

Fasten the axle ends with the tensioners (8).

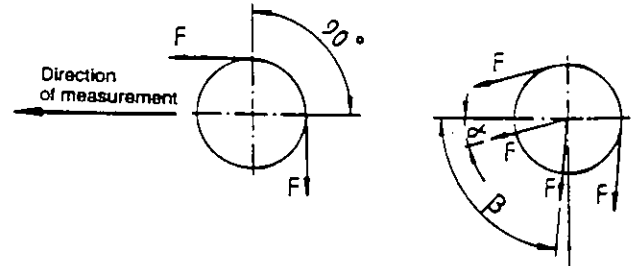
Maximum misalignment (axle displacement) = 2-4°

The slight reciprocation of the measuring roller must be smooth.

When the winding material is inserted the measuring direction should be taken into account.



Only the line tension force component acts on the measuring device in the direction of measurement. The specified tensile force range results from the combination of measuring device and control unit (Table 1). It applies to a winding angle of 90°, the direction of measurement and direction of force being identical.



In the case of deviations, the maximum tensile force is calculated as follows:

$$100\% = \frac{F_{max}}{\cos \alpha + \cos \beta}$$

*F_{max} in accordance with Table 1

Tensile force range [N]	Control unit 0-087-454-00-153-000
Measuring device 005 0-087-456-00-...	200 - 2000
006	60 - 600

3. Control unit

3.1 Installation of the unit

3.1.1 Mounting of the case

The unit should be mounted to a vertical arrangement (e.g. machine frame) close to the unwinding unit (avoid vibrations).

3.1.2 Air pressure plug in

Air pressure plug in at bottom of housing

hose data: line 11 NW6

line 12 13,14,15,16, NW4

Input

11 Main supply pressure 6 bar, filtered 5 µm (arrange maintenance unit in front)

12 Air response from transmitter (11), connection (2 yellow)

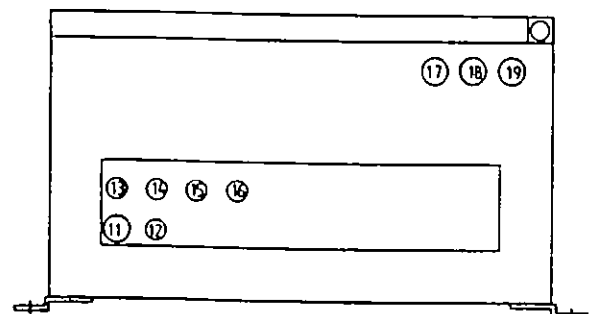
Output

13 Air pressure to transmitter (11), connection (1 black)

14 Air pressure to nominal value cylinder (10)

15 Regulation air to tension brake I

16 Regulation air to tension brake II



3.1.3 Electrical connections

The three lines at the bottom of the housing provide for power supply, control line for the machine control and control line for paper cut.

Pass through 17: power supply 220 V, 50 Hz
 Pass through 18: pulse "Paper web cut"
 Pass through 19: signal "Line is running"
 Connection of the line is inside the housing.

Attention!

Do not open the housing before power has been switched off. For easy wiring pull off contact strips from plug connection.

Clamp		
1		
2		power supply 220 V, 50 Hz
3		N
4		n.c.
5		n.c.
6		relay contact
7		"Paper web cut" (pulse)
8		n.c.
9		relay contact "Line is running"
10		(continuous contact as long as line is running)

The brake pressure regulated should be kept constant especially with quick regulating down, even when the line of the driving motor is dead already. The valve should be de-energized with a time delay of about 5 s.

3.2 Control elements/operating function

The control elements on top of the housing provide for the functions followed:

- 1 Pressure display splice-brake pressure
- 2 Pressure regulator splice-brake pressure
The affecting brake pressure during flying splice is to regulate with pressure regulator (2), pressure gauge (1) gives the display. This pressure should have about 1/3rd of the pressure regulated at largest roll diameter.
- 3 Nominal value display
- 4 Pressure regulator for nominal value
With pressure regulator (4) it is possible to set the nominal value. Pressure gauge (3) gives the display (bar resp. % of max. tension)
- 5 Brake pressure display
Pressure gauge (5) gives the display of the affecting brake pressure of the brake
- 6 Pressure regulator for manual brake pressure/retaining pressure
Pressure regulator (6) allows the manual setting of the brake pressure. This pressure only is active, if preselector (8) is in manual mode.
7. Selector "Release brake"
- 8 Selector MAN/AUT
Position regulating brake pressure is active
Position pressure, that has been set by pressure regulator valve (6) is active
- 9 Pulsar "Brake preselection"
Whenever there has been a dump of power supply one brake has to be preselected again.
It is only possible to switch over if there is no signal "Line running".
Indicator lamp (10) displays the actual active brake.
- 10 Indicator lamp

4. Starting up

The unit is to mount and connected according to section 2 and 3.

Main pressure p = 6 bar is to set

Power supply 220 V/50 Hz is to set

Preselection of the brake with pulser (9)

Brake pressure that should be active during splice is to set by pressure regulator (2) [about 1/3rd of the pressure regulated at largest roller diameter]

Nominal value is to set by pressure regulator (4)

Selector (8) is to set in position

Starting machine line.

The throttle is to be adjusted in case of vibrations of the control loop so that the display stabilizes.

Attention!

A stronger damping affects inaccuracy of the regulation

(Position of the throttles, see pneumatic plan 9-087-454-00-153-000)
 Nominal position (set by Ortlinghaus):

Pressure increases between 1 and 5 bar for about 5 s.

Pressure decreases between 5 and 1 bar for about 5 s.

Procedure of splice operation:

after connecting of the new roll the old paper bale has to be cut off. At the same time the control unit receives the pulse to change over the brakes according to the sequence shown later.

With respect to the machine facilities, time t_0 and t_1 is adjustable.

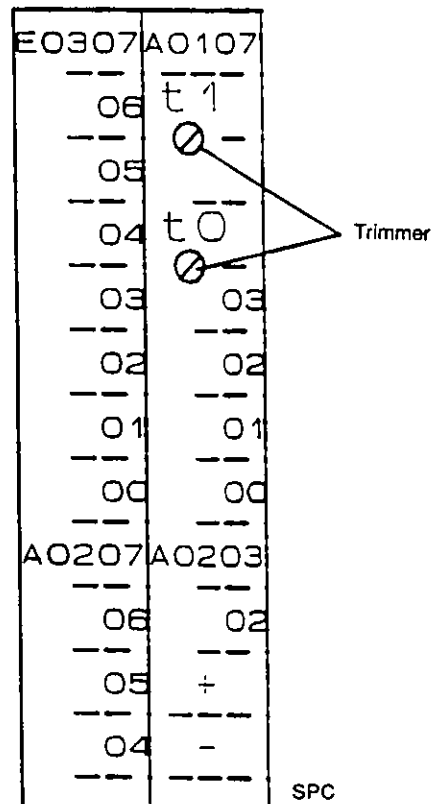
Switch off power supply.

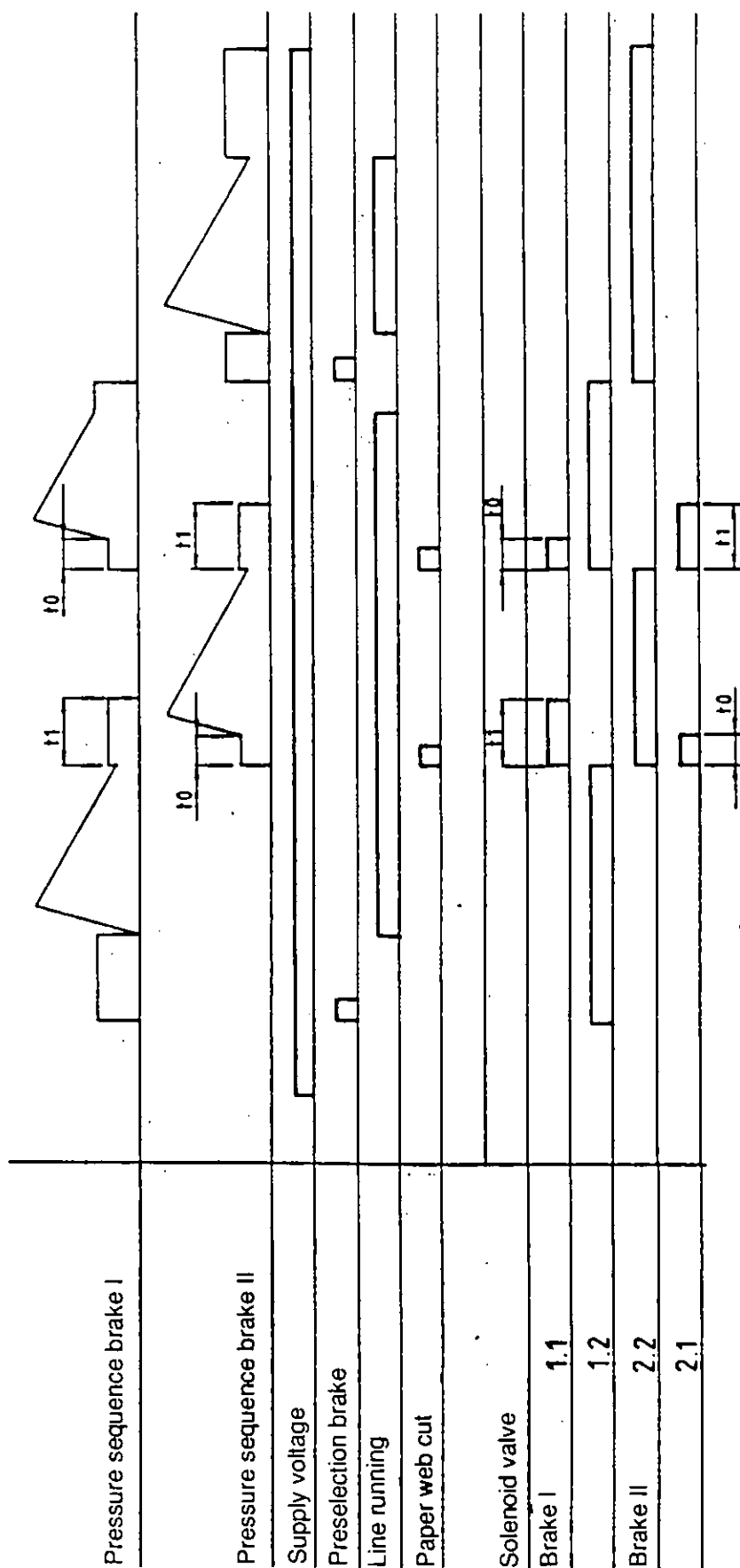
The trimmer are located in the upper, right section of the SPC.

time extending
 time abbreviation

Times are adjustable between 20 ms and 10 s.

Please handle trimmer with care!





5. Disturbing

Disturbing	Cause	Clearance of disturbing
Indicator lamp (10) is not working	No power supply	Provide for power supply 220 V/50 Hz
	No brake preselected	Select brake with key (9). Signal "line running" should not be active at this time.
	Lamp defect	Replace lamp(24 V/80 mA) - switch off power supply - unscrew green light stop of the lamp base - Replace lamp 24 V/80 mA - screw on green light stop
	Fuse of internal power supply defect	Replace fuse (1.8 a MT): - switch off power supply - open control unit - unscrew slot bolt of rectifier cover. Rectifier is situated at the lower right side of mounting plate. - remove cover of rectifier - remove fuse with mounting from socket - replace fuse - installation: the same order but vice versa
	Line connection defect	Fixing of the line: - switch off power supply - open control unit - test connections of lamp/push button and stored program controller For selecting of right connection see wiring plan 9-087-454-00-153-001
	Stored program controller (SPC) defect	Do not repair, call for our service
Controlling shows no reaction to signal "Brake selection", "paper web cut", or "line running"	All inputs of SPC are locked	Notation: To avoid operating failure the SPC input/exit is locked until the correct input data are stated
	No power supply	See for "indication lamp defect"
	Line connection defect	See for "Indication lamp defect"
	SPC defect	Do not repair, call for our service
Switching time for splice too long/short		Times can be adjusted at SPC, see section 4
Brake pressure controlled varies	The web bale that is undrawn is out-of-balance	There is little possibility in damping by integrated throttle, see section 4

