USER MANUAL FOR THE AWETA ROSE SORTER TRS

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1 General information

1.1 Introduction

This manual provides information on operating the computer control panel on the TRS console. It includes instructions on how to make a grading program and how to verify it. After that, the bunching station and the transport-part of the machine are explained.

Included in the manual is also a checklist of possible problems that the users themselves can often solve and an overview of the machine maintenance.

Appendix 1 and 2 give a short overview of all setting-screens (menu's) and the last page gives an index of the page numbers of all discussed menu's in this manual.

1.2 The TRS system

The TRS as a whole is a flexible, low-noise system consisting of the sorting computer, the transport system and the bunching stations.
All bunching stations are virtually the same and are very easy to set for the length of the roses to be bunched. If one station is malfunctioning, it is very simple to continue with another.
Also it is possible to use multiple bunching stations for the same rose length when there are many of them. This way, the machine (and workers) is equally employed. This will significantly increase the production capacity.

By means of the 'flexible bunch setting' on the TRS, the machine can handle virtually every variety, both those with large blooms and those with small blooms. Switching from one sort to the other is done in no time at all.

The length measurement is done centrally by multiple electronic sensors and is very reliable. With help of special DSP techniques, an image is made of every rose passing by. In this image the stem will be found to determine the length and the thickness of the rose.
The sensors continuously provide an optimal image. Possible filthiness will be detected and excluded for the length measurement

The borders for the different length ranges (sorts) can freely be set with centimetre intervals, which provides the facility for sorting 'intermediate sizes'.
Also the thickness of the rose will be measured accurately and can be used to determine the final length class of the rose.

New is the maturity option. Here a camera monitors the bloom-bud accurately and with this information the rose can be sorted on bud-quality (raw/ripe/color).

2 **Operating the computer**

2.1 **General**

The control panel consists of a screen with four lines and 40 characters on every line. The keys are distributed as follows:

-       four function keys (A, B, C and D)
-       four cursor keys
-       10 numerical keys
-       ESC (Escape)
-       ◄⎯┘ (Enter)

Figure 2.1.1 contains a graphical representation of the control panel.
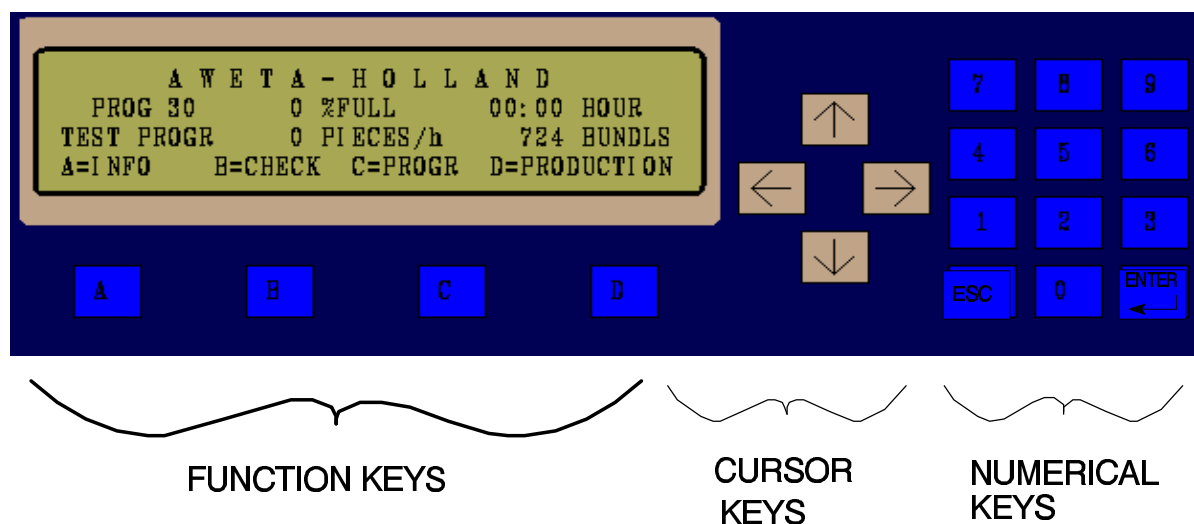
Figure 2.1.1, The control panel.

The LC (liquid crystal) display is backlit (i.e. `illuminated from behind') to improve the visibility of the characters on the display. If the machine has been switched off for a certain period and the control panel has not been in use, this light will switch off automatically.

2.2 Menu

2.2.1 Using the menu system

When the computer is switched on, an information screen appears with data on the sorter (see figure 2.2.1.1).

```
         A W E T A - H O L L A N D
 PROG 01        99 %FULL        00:00 HOUR
WHITE SUCC  6000 PIECES/h  000000 BUNDLS
A=INFO     B=CHECK  C=PROGR  D=PRODUCTION
```

Figure 2.2.1.1, The information screen after switching the computer on.

This information screen provides a summary of the sorting results. The data refers to the following:

A W E T A - H O L L A N D   : Name of the dealer.
PROG 01   : Number of the program being used to sort.
WHITE SUCC   : Name of the program.
99 % FULL   : Percentage of filled forks on the machine.
6000 PIECES/h   : Actual number of sorted roses per hour.
00:00 HOUR   : Daytotal number of sorting hours (work time).
000000 BUNDLS   : Daytotal number of sorted bundles.

The work time to make the bundles can directly be seen by looking at the daytotal data.

The bottom line displays the options that are available by pressing the function keys:

- **A = Information**   (requests information about the sorter or bunching stations)
- **B = Verify**   (verifies operation of the sorter parts and bunching stations)
- **C = Program**   (setting length/thickness/rpb and program selection)
- **D = Production**   (how much has already been sorted?, print if required)

Pressing these function keys leads immediately to separate main menus. In this main menu an overview of further options will be found.

By pressing a function key it is possible to choose between any of four different menus. Pressing the <A>, for example, will display the menu shown in figure 2.2.1.2:

```
┌────────────────────────────────────────────┐
│ [A] 1 GRADER              4 VERSION NUMBER  │
│     2 PRODUCTION                            │
│     3 TIME                                  │
│ A=INFO    B=VERIFY   C=PROGR   D=PRODUCTION │
└────────────────────────────────────────────┘
```

Figure 2.2.1.2, Display after pressing function key <A>.

The '[A]' is displayed in the top left-hand corner of the screen, this is the 'menu path'. The menu path states which choices were made to arrive at this menu. Here, an A is displayed, in other words: only the function key <A> has to be pressed to get to this menu. Also a black flashing block can be seen, this is the cursor. The function of this cursor will be explained later.
Furthermore, this example gives four options to retrieve information. Each option is preceded by a number:

- 1 GRADER
- 2 PRODUCTION
- 3 TIME
- 4 VERSION NUMBER

A menu option can be selected in two ways:

1) Choosing from the menu by pressing the preceding number. To see the time for instance, which is preceded by the number 3, just press the <3> key, which will cause the time menu to appear.
2) By using the cursor keys to move to the option of choice, for instance time. Pressing <Enter> after the selection will lead to the chosen menu.

☞ **Remark:** Pressing one of the function keys will (always) return you to one of the main menus (A, B, C or D).

In the example one will proceed to menu A3 (see figure 2.2.1.3):

```
[A3] DATE/TIME GRADER

   DATE :   01-02-1992
   TIME :   13:31
```
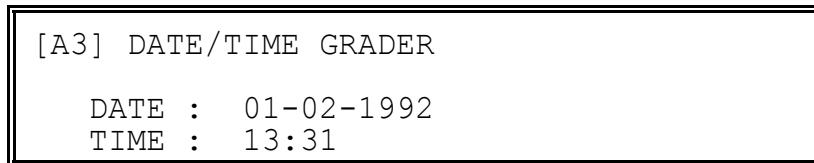
Figure 2.2.1.3, Display after pressing keys <A> and <3>.

The menu path is again displayed in the top left: [A3]. One have moved here by pressing function key <A> and subsequently <3>. One can leave this menu by pressing <ESC> (Escape), which brings you to the previous menu, in this case menu A.

An example:
Suppose one is in menu C55. Pressing <ESC> leads to menu C5. Pressing <ESC> again leads to menu C. In fact the same way back is taken, but in the opposite direction.

Pressing <ESC> again displays the information screen with data about the sorter (see figure 2.2.1.1). This applies for every main menu. So if one is in one of the main menus (A, B, C or D), a return to the information screen is done on pressing <ESC>.

2.2.2 Different menus

The sorting computer is operated and controlled by menus. In appendix 1 the function of the different menus is briefly explained and in appendix 2 a diagram of the different menus is used to illustrate how a particular menu can be selected.

Broadly speaking, we can distinguish between three different types of menus:

-       selection menus
-       information menus
-       setting menus

The selection menus have been discussed before, they are used to make a menu selection.
The information menus only display data. For example the total number of roses, bundles and operational hours.
The setting menus will be discussed below.

2.2.3 Menu summary

The previous sections discussed the actions that have to be undertaken to work your way through the menu structure (the collection of menu paths). It is shown that a certain menu can be selected by entering a unique key sequence. This key sequence is shown in the menu path which is displayed in the top left-hand corner of every menu. A menu can also be selected by using the cursor keys.
The function keys are special keys that enables quick movement to one of the four available main menus, any time and anywhere:

- **A = Information**   (requests information about sorter or bunching stations)
- **B = Verify**   (verifies working of the sorter parts and bunching stations)
- **C = Program**   (setting length/thickness/rpb and program selection)
- **D = Production**   (how much has already been sorted?, print if required)

It is possible to make further selections from these main menus.
A special menu is the information screen. It appears on the screen after the computer is switched on, but it is also possible to view it when one is in a main menu (A, B, C or D) and then presses the <ESC> key.

In a setting menu a cursor is present which can be moved, using the cursor keys, to the setting that the user wants to change. The cursor will only move to those positions where something may be set.
For example menu D5. In figure 2.3.1.1 the setting positions are shaded. Only on those positions the cursor can be placed.

```
[D5] BATCH EXCHANGE      TYPE     : abcdef
     BATCH NR   : 12345 TICKET No: AB1234
     BRS ACTION : EMPTY CYCLE
```

Figure 2.3.1.1, In setting menus the cursor can only be located on the setting positions.

Three types of data can be set:

1)   numerical values (numbers)
     alphanumeric values (also texts)
3)   choice or selection (Yes/No or for example EMPTY CYCLE)

These are discussed separately below.

2.3.2 Numerical values (numbers)

In figure 2.3.1.1, BATCH NR. is a numerical value, a number may be entered. This is possible with the keys in the numerical field.

The cursor is first moved using the cursor keys to the specified BATCH NR. The cursor is now a flashing block, i.e. you are now in the point mode. The cursor is only used to point to the data.
Simply by typing in the new value using the keys from the numerical section proceeds automatically to the 'setting mode'. The cursor then becomes a flashing underscore.

When the number has been entered correctly, it has the desired value, the new setting can be confirmed by pressing <enter>. The cursor now becomes a flashing block,

If the number has not been entered correctly, it does not have the desired value, the

one must still be in the setting mode.
After pressing <ESC> while in the setting mode, the number retains its old value and the setting mode is left.

<enter> had been pressed).

2.3.3 Alphanumeric values

Alphanumeric data in figure 2.3.1.1 are, for example, TICKET No. and TYPE.

This type of data is set in almost the identical way as that for setting numbers, the user points to the piece of data to be changed with the cursor and selects the setting mode (using <enter> or type something immediately). The numbers from the numerical section are displayed immediately but cursor keys <↑> and <↓> must be used for letters (in the setting mode). The numbers and the letters in the alphabet then appear in succession. In other words, the cursor keys must be used for each letter separately, namely the keys <←> and <→> to select the letter that is to be changed, and <↑>, <↓> to change it.

The new text can be confirmed by pressing <enter> or rejected by pressing <ESC> (old text returns). The user then proceeds automatically to the point mode.

2.3.4 Options

Some menus contain settings that have to be set in a particular 'mode' (on/off or other option), for example the option to sort on thickness or not. It is then possible to make a choice by pressing <enter> which will cause a new text to appear.
For example:

THICKNESS: NO (see menu [C51])

Another choice that may appear to the user is, for example, the question:

Are you sure : Yes / No

The cursor keys can be used to point to the desired option.
When pointing to the desired option, this is confirmed and immediately activated by pressing <enter>.

2.3.5 Summary of settings

From the preceding pages it can be seen that there are two different 'modes' in the
point mode (cursor is a flashing block) and the **setting
mode**

In the point mode a choice from various setting data can be made. The settings are

The setting mode can be reached in two ways: with the aid of the <enter> key

If a setting has been changed as desired, the change can be confirmed with the

of numbers, it is also possible to use the cursor keys for confirmation.

old value is retrieved by pressing
the <ESC> key (only if the setting mode is still active).

It is also possible to enter texts for alphanumeric data. This is achieved by using
<↑> - <↓> in the setting mode. **Numbers and letters** will then appear in
succession on the screen.

3 Information menu's

3.1 General

Pressing function key <A> results in an overview of the available information menus of the TRS. It is not possible to change any settings in these menus. The menus provide brief information on the following:

Menu [A] Information menus
1 - sorter (machine speed, %full, etc.)
2 - production (run/stop time)

3.2 Information screen

A special information screen is the screen that appears after the computer has been switched on, or after pressing, for example, <A> <ESC>. This screen presents the

frequently to obtain a quick overview during the sorting process.
When the computer is not touched, then after some time automatically this information

3.3 Messages

3.3.1 General

```
          - M E S S A G E -

          CHANGE SETTING?
<ESC> = NO                    <ENTER> = YES
```
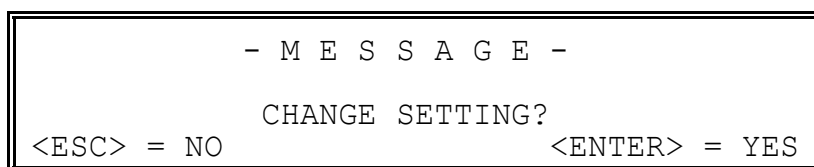
Figure 3.3.1.1, Possible message after pressing a function key.

Messages are intended to provide the user with instructions when operating the computer and disappear automatically. In this example, the user is still busy with

menu.

3.3.2 Sorter error messages

Possible errors that may occur while using the TRS are announced by means of the error message menu (see figure 3.3.2.1).

```
          - E R R O R   M E S S A G E -
    CODE:  5
 MESSAGE: MACHINE RUNS TOO FAST
 A=INFO    B=VERIFY   C=PROGR   D=PRODUCTION
```

Figure 3.3.2.1, Error messages are displayed in a separate screen.

If the error does not disappear, then the user can proceed to an other menu by

The following table provides an overview of possible error messages for the sorter

GRADER ERROR MESSAGES	
Number	Meaning of the message
Er.01	PRINTER <off line>, the printer is set off line.
Er.02	
Er.03	
Er.04 (♪)	LENGTH SENSOR DIRTY, CLEAN IT, or a rose/leaf in the sluice.
Er.05 (♪)	MACHINE RUNS TOO FAST, according to the speed setting in menu [C1].
Er.06	SER.CHANNEL TOO BUSY, or interference on mains 220V from switching OFF/ON.
Er.07	
Er.08	
Er.09 (♪)	BUNCHING STATION ERROR, error detected for a bunching station (see chapter bunchingstation errors)
Er.10	CAN->NETPROBLEMS, faulty (wire)connection to the bunching stations (or humidity?).
Er.11	
Er.12	
Er.13	CAN->TIMEOUT ERROR, a bunching station is switched off? Check with menu [B4].
Er.14	
Er.15	
Er.16 (♪)	
Er.17 (♪)	
Er.18 (♪)	
Er.19 (♪)	
Er.20 (♪)	
Er.21 (♪)	

Table 3.3.2.1, Brief overview of grader error messages, (♪) means that also a sound signal is made.

When an error message occurs that is not given in this table, and the grader does not operate well, then the best thing to do is call the dealer.

3.3.3 Bunchingstation error messages

The following table provides an overview of possible error messages for the bunching stations (table 3.3.3.1). These messages also appear in the screen on the sorting computer. The 'error message number', indicated in the table, appears also on the display of the bunchingstation itself.

BUNCHINGSTATION ERROR MESSAGES	
Number	Meaning of message
Er.02	Out of elastic -> put a new roll on.
Er.03	Stem escort sensor defect (or air/380V switched off?)
Er.04	Rowholder sensor defect (of air/380V switched off?)
Er.05	Binder sensor defect (of air/380V switched off?)
Er.06	Bundlepusher returns too late
Er.07	24V supply defect (or fuse in bunchingstation cabinet?, see appendix 7)
Er.08	+24V supply defect (or fuse in bunchingstation cabinet?, see appendix 7)
Er.09	Not safe for cutting, door still open / or the robotarm sensors defect?
Er.10	Robothand returns too late, caught?
Er.11	reserved
Er.12	reserved
Er.13	internal error
Er.14	reserved

Table 3.3.2.2, Possible error messages for the bunching stations are also displayed on the sorting computer screen.

3.3.4 DSP error messages

The DSP is a special computer for image processing. On the TRS, the DSP is used among other things for length- and thickness measurement.
When the grader is not operating well due to the exceptional case of a DSP error, the only advice is calling the dealer.

4 **Button <C>: Setting the program**

4.1 **General**

All settings, such as:

-    the thickness YES/NO option
-    length limits, outlets, number of roses per bundle
-    thickness limits

are known as a sorting program.

Thirty of these programs are available. The number of the active sorting program, the one currently used for sorting, is always displayed on the information screen.
The program number can be changed in menu [C1], PROGRAM SELECT. Valid program numbers are 1 through 30. After a new program number has been set, the 'PROGRAM EXCHANGE' message appears on the display.
Menu [C1] can be used to assign a name to the program (see: alphanumeric data, Chapter 2.3.3).

The active program can be copied to another program number in menu [C52]. This can be used for the rapid creation of a new program which deviates only slightly from the current sorting program.

The following sections contain an explanation for creating sorting programs.
It is recommended to take an unused program to gain familiarity with the operations of the computer.
When a new program is made, it can be verified with menu [B1]. The menu's for verification are described in detail in chapter 5.

☞   **Caution!:** Due care should be taken when changing the program number while the sorter is operating. The computer will immediately start to sort according to the newly selected program.

4.2 Program configuration (MODE)

The first step in creating a sorting program is to establish the features to sort with.
For example: sort by length alone or by length & thickness.
This can be done in menu [C51] PROGRAM MODE. There are several options for thickness, and when the quality option is also present, several options for maturity. In this example we presume that all options are disabled, so, thickness and maturity are set to 'NO'.

The next step, building a length program, will be discussed separate hereafter.

In menu [C1] it is also possible to set a maximum speed. For machines without automatic motor control this is essentially a reminder. For some (large-bloomed) roses better results are achieved by sorting at a lower speed (approx. 6000 f/h) than at the normal speed (approx. 8600 f/h). In order not to forget the maximum speed at which the roses may be sorted, it is possible to set a maximum here. If a different sorting program is selected then the speed is automatically controlled, or a message appears prompting the re-adjustment of the speed (only with manual speed control).

The remaining program settings are found in menu [C2] through menu [C4]. The following sections contain more information on this.

4.3 Setting the length

Menu [C2] can be used to set the length and outlets. Figure 4.3.1 shows the screen that appears here.

```
[C2] LENGTH      NAME   OUTLET    -D-
  1  028-038   30 CM    6  0  0    0
  2  038-048   40 CM    5  4  3    0
  3  048-058   50 CM    2  0  0    0
```

Figure 4.3.1, Screen for setting the length limits and outlets.

The cursor can only appear in the middle line of settings. If the other data are also to be set, then the cursor keys <↑>, <↓> must be used. Cursor keys <←>, <→> are used to select the piece of data on the setting line.

The data in this screen have the following meaning:

LENGTH Limits for length class in centimeters: lower limit at which the roses are cut, followed by the upper limit.
The upper limit will be automatic the lower limit of the next class.
NAME Name assigned to this length class.
OUTLET Outlet (bunching station) where the rose in this class must be sent.

The roses are hung by their heads in the forks, and only that beneath the fork is measured. For this reason the bud height of the rose must be accounted for in the length limits. The bud height is therefore subtracted from the length limit. In this example (figure 4.3.1) the bud height is 2 cm.

Figure 4.3.2 shows the setting to be adjusted for the rose length.
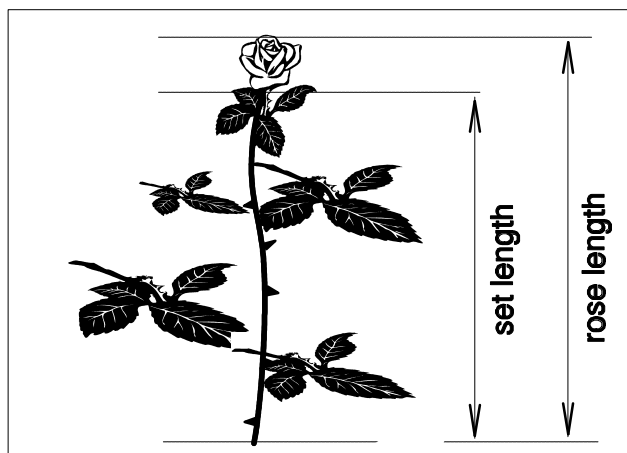
Figure 4.3.2, The bud height of the rose must be accounted for when setting the length.

If the desire exists to take advantage of the auction house's tolerance conditions, the length limits can then be set very slightly shorter. The roses that are really slightly too short, but still fall within the auction house's tolerance, can still be classified in the (longer) length class.
In practice this means that some roses are not even cut off and this may save a lot of centimeters.

It is possible to assign a name to every length class. If this is not done, then the lower limit (of the class) will automatically be adopted as the name.

4.4 Setting the number of sorts

When setting the last length limit in menu [C2], the text 'GRADES' appears at the right hand side of the display. The setting below that represents the number of length classes and can be changed if desired (max number of sorts/grades is 12). See figure 4.4.1.

```
[C2] LENGTH      NAME   OUTLET    -D-
  5 068-078  70 CM   2  0  0    0 GRADES
  6 078-999  80 CM   1  0  0    0    6
```

Figure 4.4.1, The number of sorts can be set at the last line.

☞ **Remark:** After changing the number of sorts, the cursor automatically returns to the first line of the sorting program (first sort).

4.5 Setting the outlet

Outlets can be set behind each length class (figure 4.3.1). If more than one outlet has been set (with a maximum of four), the computer will select them consecutively. Therefore, in Figure 4.3.1, the sequence for the fours will be:

5 - 4 - 3   5 - 4 - 3   5 - 4 - 3   etc.

The highest outlet number that may be set depends on the number of bunching stations that the machine has. This is usually six (6).

☞ **Remark:** It is also possible to bunch two grades separate with only one bunching station. For this option the last column is marked with a '-D-'. This option will be discussed later on in the chapter about 'double grades', chapter 9.1.

4.6 Setting the thickness

4.6.1 General

When sorting by thickness it is possible to set a thickness limit for each length class. If a rose falls within a certain length class, but no longer meets the thickness associated with this, then the rose will be moved to a shorter class until the thickness limit is also met.

Momentary there are two different methods available for thickness grading. Selecting the thickness option is done in menu [C51] PROGRAM MODE by pressing <enter>. The options are:

- NO   Don't sort on thickness
- %AVG   sort on thickness with 'average thickness dependent' limit
- MIN   sort on thickness with 'absolute (fixed) minimum' limit

Depending on the choice made, menu [C3] displays an other setting screen.

4.6.2 Thickness sorting with percentage of average thickness (%AVG)

The menu for this option, menu [C3], is presented in Figure 4.6.2.1.

```
[C3] NAME     ThAVG-%AVG = Thmin     %THIN
  4  60 CM    3.0   100     0.0       0.0
  5  70 CM    4.0    20     3.2       5.0
  6  80 CM    5.5    10     4.9       6.0
```

Figure 4.6.2.1, Setting screen for sorting by thickness with %AVG.

The data have the following meaning:

NAME   The name assigned to these length class. If this was left blank, then the lower limit (cm) of the length class automatically appears as the name.
ThAVG   Average stem thickness that the computer has measured for this class.
%AVG   **The setting**: Percentage that the stem may be thinner (compared with the average thickness for this sort).
Thmin   The calculated minimum thickness limit.
%THIN   The percentage of roses that are too thin that is now obtained.

Here, there is **no thickness value** to be set, but a percentage by which the stem may be thinner in respect of the average. So, when the **setting is smaller** -> the **more roses will be sorted out on thickness**. How many is sorted out can be seen by the percentage too thin roses.

With this option, the setting '100' means that the stem may be 100% thinner than the average, everything is acceptable, thin, thick, very thin.
However, setting '0' means that the stem may be only 0% thinner than the average, and everything that is thinner than the average will be considered as 'too thin' (and sent on to shorter classes).

The advantage of this method (%AVG) is that the computer now monitors the whole batch. At the end the bunches of the batch will all have the same thickness quality. When the absolute thickness of a certain section or greenhouse becomes thinner or thicker, the thickness sorting setting also changes with the average.

4.6.3 Thickness sorting with absolute minimum limit (MIN)

The menu for this option, menu [C3], is presented in figure 4.6.3.1.

```
[C3]  NAME      ThAVG      Thmin         %THIN
  4   60 CM      3.0        0.0           0.0
  5   70 CM      4.0        3.2           5.0
  6   80 CM      5.5        4.9           6.0
```

Figure 4.6.3.1, Setting screen for sorting by thickness with MIN.

The data have the following meaning:

NAME   The name assigned to these length class. If this was left blank, then the lower limit (cm) of the length class automatically appears as the name.
ThAVG   Average stem thickness that the computer has measured for this class.
Thmin   **The setting:** The minimum thickness limit setting.
%THIN   The percentage of roses that are too thin that is now obtained.

Here, there **is a thickness value to be set**. So, when the **setting is smaller** -> the **fewer roses will be sorted out on thickness**. How many is sorted out can be seen by the percentage too thin roses.

With this method the setting is fixed, no matter if the average thickness of the batch changes. This can be used when one wants to meet a certain thickness-demand all the time.

If the thickness is switched off with menu [C51], the settings in this menu (menu [C3]) are not operational and cannot be accessed.

4.7 Setting the bundle

The bunching stations are set to a default of twenty roses per bundle.
If required, a different count can be set in menu [C4] at PIECES (see figure 4.7.1).

```
[C4] BUNDLER UNIT PIECES D-CUT  E-FORK
           1          20     0      [0]
           2          20     0      [0]
           3          20     0      [0]
```

Figure 4.7.1, Setting screen for bunching station.

The data in this screen have the following meaning:

BUNDLER UNIT   Bunching station (outlet) number.
PIECES   The number of roses per bundle (RPB) for the bunching station.
D-CUT   Double cutting: 0,1 or 2 for extra cutting of thick stems.
E-FORK   The number of empty forks between the bunches, change this
                              by pressing here at <enter>: 0,1,2 or 5.
                              This is for extra space between bunches with many leaves.

The data can be set separately for each bunching station. Even if two bunching stations are being used for one grade, it is still possible to have one bunching station make bundles of twenty roses and the other bunching station simultaneously make bundles of, e.g., fifteen.

These bundle setting belongs to the program of the sorter and can therefore be adjusted for every program. When switching to another program, the bunching stations are assigned a new bundle setting by the sorter.

So, it is possible to create separate programs for both large and small-bloomed roses. The settings D-CUT (double cutting) and E-FORK (empty fork) are a help for conveniently bunching large bloomed roses.

D-CUT is used when the stems are so thick that the knife is not able to cut the whole bunch at once. By setting double cutting (1 or 2), the bunch cutting starts earlier in parts.

E-FORK is used for giving the bunches more room in the station. For example when a variety has many leaf. It is also possible to set a smaller 'roses per bundle' count. According to the settings E-FORK and PIECES (RPB), the computer determines the best fitting of the bunch along the forks of the bunching station.

☞ **Remark:** When switching to an other E-FORK setting, the bunching station automatically starts an empty cycle. This to be able to work with the new fork configuration.

4.8 Setting the time

The computer's time and date can be set in menu [C53], program - special - time. The correct time is important for the computer since the daily total is automatically cleared at 23:^{00} o'clock in the evening (see chapter 6).

5 **Button <B>: Verify**

5.1 **General**

Should any doubt exist regarding the correct adjustment of the length/thickness settings or measurement of length/thickness, this can be checked with the aid of the verification menus. The verification menus can be found by pressing the function key <B> and have the following functions:

> **Menu [B] Verification menus**
> 1 - sorting (product information: length, thickness, outlet, etc.)
> 2 - length sensor (check LED sensors separately)
> 3 - thickness measurement (check thickness sensor)
> 4 - bunching station (status info)

These menus make it possible to verify both the entire sorting process and the various components separately that influence the eventual sorting result.

5.2 **Grading verification**

An important verification menu, menu [B1], is presented in figure 5.2.1.

```
[B1]  L(cm)    Th(mm)          SORT   OUT
04      120     6.5              6      1
03       56     4.3-1            4      3
02  SL   34     3.3              3      4
```

Figure 5.2.1, Verification of sorting by length and thickness in one menu.

The meaning of the data in this screen is:

L (cm)   Measured length for this rose in centimeters.
Th (mm)   Measured thickness for this rose in millimeters. Behind this, the possible grades that this rose is moved on to a shorter class when the stem thickness is too thin (e.g. -1 = moved on one grade).
             Menu [C3] shows the percentages and settings for too thin roses.
SORT   Eventual sort/grade for the rose (sort line, see menu [C2]).
OUT   Eventual outlet (bunching station) for the rose.
SL   Positions from length sensor, B1..Bx (bunching station outlet) is also possible, or Wx (eject outlet for too short roses). The position of this screen can be 'moved' with the cursor keys.

☞ **Remark:** When the quality option is also present on the machine, this menu also shows the camera measurement data -Q-.

As said before, with the cursor keys the screen can be moved, as it were, over the machine. Normally speaking, the data is viewed that of the roses that move past the length sensor (02 SL). It is also possible to view the roses at a certain bunching station outlet (00 Bx) or an eject outlet (00 Wx) (i.e. browse further to what has passed the length sensor).
It is possible to review the data up to no more than ten forks after the last eject outlet (Wx).

The data move on when the machine is running.

When a new sorting program is made, it can be verified by hanging one rose in the machine and verify the sorting in menu [B1].

5.3 Length sensor verification

With menu [B2] the operation of the length sensor (light sluice) can be verified. What is displayed in this menu are the conditions of all sensors separate. The data shown on the first line are the sensors from the lowest part of the sluice. This walks through to the upper part of the sluice. So the data on the bottom line represents the upper sensors of the sluice. See also figure 5.3.1.

```
[B2] VERIFY LENGTH SENSOR
   -------- -------- -------- -------6
   -------- -5------ ---4---- -----3--
   -------2 -------- -1------ -------- .
```

Figure 5.3.1, Verify all sensors of the light sluice for length measurement.

The symbols in this menu represent the following:

- a '−' means that a sensor has a clear view, there is nothing in front of it
- a 'figure' represents the position of a length class, for example a '3' is the position of the third grade (= third line in menu [C2])
- a '*' or 'X' means that the sensor is dark, there is something in front of it

With help of the light sluice an image of the rose is made. The rose is X-rayed, as it were.
The light sluice automatically adapts the image to exclude filthiness from the measurements. When possible filthiness becomes a problem, a message will appear and one must clean the sluice. In this menu can be verified if the cleaning action was successful.
Most of the time one only has to pick up a rose or leaf out of the sluice.

☞ **Caution:** that the machine is always switched off when cleaning. When the machine is running it is possible to see some data changing in this menu. This is normal.

5.4 Bunching station verification

The bunching stations of the TRS can be operating in various conditions. This will be discussed later (see Chapter 7). A useful menu, where the condition can be verified at a single glance, is menu [B4] (see figure 5.4.1).

```
[B4] OVERVIEW BUNDLER UNITS
    1  2  3  4  5  6
    A  A  B  H  L  ?
(B)BUSY   (A)AUTO (H)MANU (L)EMPT   (?)-?-
```

Figure 5.4.1, Menu to verify all bunching stations at the same time.

The explanations of the symbols appearing in the figure appear on the bottom line:

-   ?   Means that no communication exists with a bunching station. This also
           happens when the power of the bunching station is switched off.
-   A   (Automatic) Is for normal operation, when the bunching station is used for
           bunching.
-   H   (Manual) In this mode the automatic bundling will be stopped. The
           bunching station will only respond when a button on the control panel (in
           front of the cabinet or by the binder) is pressed.
-   L   (Empty cycle) The bunching station is busy with the empty cycle.
-   B   (Busy) This means that the bunching station is still busy with rose pickup
           after it is set to the manual state (H-00).
           This message will automatic disappear when the machine is running.

While grading, normally for every bunching station an 'A' should be displayed.

6 **Button <D> Production menu's**

6.1 General

The production menus are located under function key <D>. Everything can be found here that is related to sub- and daily totals.

Subtotals can be created by oneself by carrying out a 'Batch exchange' in menu [D5]. Note that when a program is changed a new subtotal is also always made with the same data as were entered for Batch exchange.

When switching to another program, a new subtotal is created since a different program usually also sorts a different type of product. It is often not possible to combine the data from different products.

Menu [D2] gives an overview of the daytotal. This is the aggregate of all subtotals of the same day. An overview is given here of the totals per outlet (bunching station) since there is a possibility that different sorting programs have been used during the day.

Menu [D3] offers the facility to clear or delete the totals. The totals can be printed using menu [D4].

Other menus that also display production information are located under function key <A> (Information). Menu [A1] gives an overview of current production (pieces,filling) and menu [A2] gives an overview of the machine working hours and totals per batch (sub-) and per day.

When the machine is equipped with the productionregistration option (for rosehangers and the rosecutters), the data obtained with this option also can be displayed on the sorting computer. This is discussed in the manual

    'PRODUCTION REGISTRATION ON THE ROSE SORTER TRS'.

6.2 Subtotals

It is possible to divide the production into subtotals and to store these in the computer's memory. To distinguish between the various subtotals, a subtotal of a batch must be numbered before it is sorted.
There are two possibilities for BATCH EXCHANGE, namely a short or long entry mode. This depends on TABLE(66) of the TRS. The TABLE is a list of machine data.

In the long entry mode it is possible to pass on two extra pieces of data in addition to a number from the batch to the computer (see menu [D5]).

The respective data are:

1.   BATCH NR.   (number of subtotal)

and if required

2.   TYPE   (remark)
3.   TICKET No.

By carrying out a 'batch exchange', the production total of the previous batch (if this already existed) is added to the subtotals file. In the short entry mode this takes place immediately after the batch number has been entered and for the long entry mode this takes place after the question 'are you sure?' has been confirmed with 'Yes' (see menu [D5]).

Besides the above-mentioned data, the system also remembers:

-       the PROGRAM No. used to sort the batch
-       the DAY and the MONTH

A maximum of 40 subtotals can be stored. In the event that actually 40 subtotals are present and a new subtotal is added, the oldest subtotal will be lost.

Subtotals can be stored in two different ways, viz.:

-       per day (date active)
-       over a longer period (date not active)

The method selected depends on the value in TABLE(63). The factory setting is that of storage 'per day'.
TABLE settings are usually only carried out by service engineers.

Figure 6.2.1 shows the menu for batch exchange (menu [D5]).

```
[D5] BATCH EXCHANGE    TYPE     :  ABCDEF
     BATCH NR.  :12345 TICKET NR:  AB1234
     BRS ACTION :  EMPTY CYCLE
```

Figure 6.2.1, Menu [D5] for performing a batch exchange.

The 'BRS ACTION' feature has three different options. A choice is made by pressing <enter> here:

-       EMPTY CYCLE: This starts an empty cycle for the bunching stations. It results in
        a good separation between the batches. For this, the machine must still be running to be sure that all bunching stations have picked up all roses. After the empty cycle is finished the bunching stations return to their original state again.
-       NEW BUNDLE: When there are already roses in the bunching station then the last (half) bundle is bind and hereafter the bunching station is ready for processing the next bundles. This option can be used when one thinks that the empty cycle takes too much time.
-       NONE: Here, no bunching station action is done. The next batch is bunched together with the present batch. Only a new subtotal is opened.

The batch exchange is executed when something is set for 'batch nr', or after <enter> has been pressed when the cursor points to 'batch nr'.

Depending on the value in TABLE(66) the sorter returns to menu [D5] BATCH EXCHANGE after 'batch exchange', or to menu [C1] PROGRAM SELECT. The latter possibility (factory setting) is useful if every batch is to be sorted using a different program number. Usually a different batch is also a different type of product.

6.3 Storage per day

The moment a value is specified for Batch Number, the computer scans the subtotals in its memory and looks for a file with the same label data as that of the batch that is being introduced at that moment.
The following label data are relevant here:

1.   the BATCH No.
2.   the PROGRAM No.
3.   the DAY and the MONTH

If the search action is unsuccessful, a new file is always added. If the search action is successful the existing subtotal is added to the subtotal of the data that have just been entered.

The data will NOT be added together if:

-     the BATCH NUMBER is zero

In this mode (storage per day) the following activities are performed automatically at 23:^{00} hours in the evening:

-     If more than 20 roses have been sorted in the current subtotal, it is added to the subtotal file.
-     If the printer is switched on the daily total will be printed out.
-     All the data in the current subtotal will be cleared
-     The daytotal will be cleared.

6.4 Storage over a longer period

After the BATCH NUMBER has been entered, the search criterium now consist of:

1.   the BATCH NUMBER
2.   the PROGRAM No.

The further processing is now identical to storage per day. As the DAY and the MONTH are no longer important, it is possible, for example, to add together all the subtotals with the same NUMBER and PROGRAM No. over a period of one week.
A new period is started by carrying out the following commands via the computer's operating panel:

-     'delete all subtotals' in menu [D331]
-     'delete daytotal' with menu [D32]

☞ **Caution!:** All subtotals in memory will now be deleted.

6.5 Viewing subtotals

The productiondata of the <u>outgoing</u> stream, thus the bundles bunched by the bunching stations, are sheltered in a so called 'machine subtotal'.

☞ **Remark:**   It is also possible to registrate the <u>incoming</u> stream with the productionregistration option. Thus, totals from the rosecutters and rosehangers. This option is discussed separate in the manual 'PRODUCTIONREGISTRATION ON THE TRS'.

Selecting machine subtotals is done in menu [D11]. Figure 6.5.1 shows this menu.

```
[D11] MACHINE  SUBTOTAL    (AVAILABLE    4)
  0 00000 P05 WHITE SUCC 08-07-1991
> 1 00000 P01 FRISC OUD  05-07-1991< 25%
  2 00001 P04 FRIS NIEUW 02-07-1991
```

Figure 6.5.1, Menu for selecting subtotals.

The screen indicates the number of subtotals stored in memory (available). The current subtotal (number 0) is always present. To select a subtotal, the cursor keys can be used (<↑> and <↓>) or the numerical keys (<0>..<9>). The <0> key means 'go to position 0% of the available subtotals'. The <6> key means 'go to position 60% of the available subtotals.

De subtotal data are arranged in the screen as follows:

```
    ->   1     00000     P01  FRISC OLD    05-07-1991     <-
         |     |          |    |               |
         |     |          |    |               Subtotal date
         |     |          |    |
         |     |          |    Program name
         |     |          Program number
         |     Section/Batch number
         Subtotal number (number zero is the current subtotal)
```

When <Enter> is pressed, the subtotal residing between the arrows will be displayed. See figure 6.5.2.

```
[D11x]  SUB: 01  PIECES  BUNDLS   %PCS  %THI
  5     70 CM      000000 000000    00    0.0
  6     80 CM      000000 000000    00    0.0
000 00.0   TOT: 000000 000000         00:00h
```

Figure 6.5.2, Viewing a machine subtotal.

The bottom line in the subtotal gives information about average length and thickness, the totals and the work time for the batch (runtime).

With the aid of the cursor keys <↑> - <↓> the other lines (sorts) can be viewed.

6.6 Printing subtotals

When a printer is connected to the sorting computer, subtotals can be printed via the computer's operating panel using menu [D41].
Here it is possible to choose to print the subtotal with the desired number.

7 Bunching station

7.1 Operating the bunching station

The bunching station is simple to operate, four buttons on the panel and another two at the binding section.
Figure 7.1.1 shows the operating panel which is on the bunching station's cabinet.
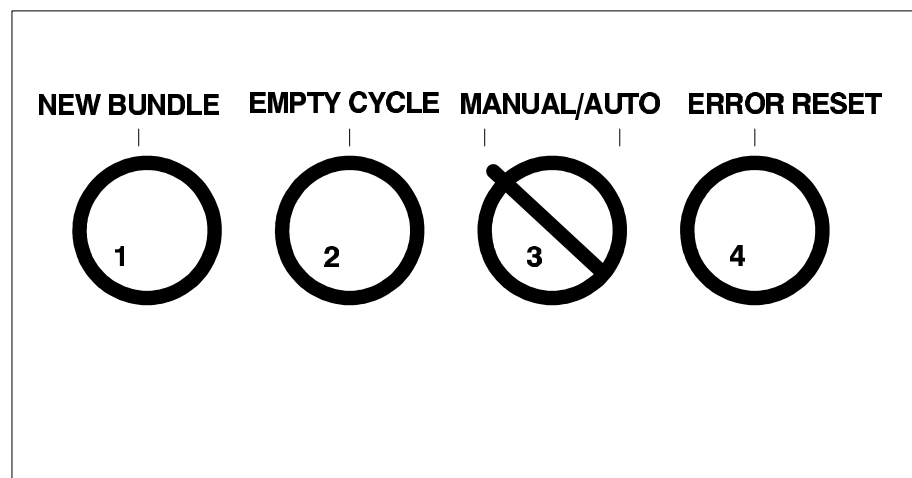
Figure 7.1.1, Operating panel on the cabinet of the bunching station.

The most important button is the MANUAL/AUTO button (button 3). When sorting, this must be set to AUTO in order that the roses are automatically picked up and bunched.

If a malfunction occurs, this will be indicated on the display. Then, the ERROR RESET button can be used to remove the message and continue the bunching process. However, this is only possible if the malfunction has been resolved.

The buttons are discussed in detail in the following.

7.2 Automatic

For automatic bunching, button (3) must be set to AUTO. This is necessary during the sorting process if at least the bunching station has also been set in the program.

The screen now displays: **A-00**

'A' means Automatic. The number that follows indicates the number of roses that have been picked for the bundle that has to be made. Counting restarts at zero after binding.

The roses are now automatically picked up from the transport system, transported past the binder and the knife, and placed in the buffer canvas.
The other buttons do not work when the machine is in the automatic mode with the exception of RESET ERROR. In this mode it is also impossible to use the bind buttons.

7.3 Manual operation

Button (3) must be set to MANUAL for manual operation. In the manual-operated mode, the bunching station stops picking up roses.
If the bunching station still has roses to pick up, the screen indicates this by means

of: **BSY**

When all roses have already been picked up: **H-00**

'H' means manually operated, the number after H again means the number of roses picked for the new bundle.
The other buttons are also in operation in the manual-operated mode. These will be discussed in the following.

7.3.1 New bundle

For 'new bundle' the bundle unit must be in the manual-operated mode. After NEW BUNDLE has been pressed (button 1) the machine starts making a new bundle. An empty fork moves forward and counting starts again at zero. The 'old bundle' is bound.
New bundle is usually used to start with a clean slate after a new roll of elastic has been loaded or to create a division when a switch is made to sorting a different variety of roses.

☞ **Remark:** The function 'new bundle' will not work when the machine is equipped with the automatic height set option (for binder and knife). Button 1 is then used for height setting (see chapter 9.3).

7.3.2 Empty cycle

In order to start an 'empty cycle' the bunching station must be in the manual-operated mode. The empty cycle usually takes place at the end of a batch, when all the roses have been sorted. The roses still present in the bunching station are processed further into a bundle following this command. Thus, they are bound, cut, and placed in the buffer canvas. The last bundle might then consist of too few roses, but it is still bound.

The screen now displays: **L-00**

'L' Means empty-cycle. The number following it indicates the number of bundles.

The empty cycle can also be executed after performing a batch exchange in menu [D5] on the gradercomputer. In this situation, an empty cycle via the gradercomputer, the bunching stations just must be in the automatic mode (A-00). During the empty cycle, the bunching stations will now temporary enter the manual state.

Thus, the empty cycle can be used to separate various batches of roses. The advantage of this is that if the following batch is being sorted after the empty cycle command, the roses of this batch will not continue to be placed on top of the old batch in the buffer canvas. This means that the old batch can first be transferred to the buckets.

7.3.3 Binding

The operation of the binder is located on a panel close by the binder. This panel has two buttons:

- BINDING
- SERVICE

Both buttons only work in the manually-operated mode.

Pressing BINDING will cause the binder to carry out a binding cycle.

The other button, SERVICE, is intended for the service engineer. With this button the binder can be operated in steps.

7.4 Reset error

If the bunching station detects an error, for example a sensor that no longer works, it will signal this via a message on the display. In the event of such an error, the bunching station stops all activity until the error status has been resolved.

The screen then displays: **Er.00**

'Er.' stands for Error, the number following it indicates which error.

Possible error messages are presented in appendix 3. These messages also appear on the sorting computer screen. The 'error message number' that appears in the table appears on the display of the bunching station itself.

Button (4) RESET ERROR can be used to remove the error messages that appear on the screen. If this is not successful, the error is still occurring and this must first be resolved.

8 Operating the machine

8.1 General

Appendix 4 shows a 'ground plan' of the sorting machine and appendix 5 gives an overview of the switchboard cabinet operation.
One might need the plan to find the concerning safety switches or photocells.
The switchboard cabinet of the sorter is located beneath the computer.

8.2 Starting up the machine

The following contains a step-by-step description of the actions required to start working with the sorter.

1)   Main switch on the left hand side of the switchboard cabinet must be in position 1 (red switch which is not shown on the drawing)
2)   Switch the control current 'on' with the key switch
3)   Now press the button that switches on the air supply (AIR PRESSURE ON)
4)   Wait until the red lamp that indicates the air pressure goes off (AIR PRESSURE TOO LOW)

☞   **Caution:** Ensure that the correct sorting program has been set before the sorting procedure is started.
    If a bunching station is to be changed to a different cut/bind height, then this must also be carried out.
    The bunching stations must also be set to the automatic mode (A-00).

5)   The machine can now be started using the pushbutton (MACHINE ON).
6)   The speed of the machine can be set using the black button on the main motor on the rosehanger side of the sorter (see appendix 6).
    When the machine is equipped with automatic main motor control, the speed can be set in menu [C1].

The machine will always refuse to start when a red error lamp is on. Known malfunctions, which oneself easily can solve are:

-    The door at the light sluice (length measurement) is not closed correctly, see appendix 4.
-    The safety switch for the forks is active, see appendix 4.
-    The lightbeam detection in front of the bunching stations is active (for example due to a fallen bunch of roses), see appendix 4.

9 **Options**

9.1 **OPTION: Double grades**

This option enables bunching of **two different grades** with only **one** bunching station. The shortest graded bunch will not be cut then. The grade which is currently not handled by the bunching station remains waiting in the forks on the machine (they just turn round).
For this option, the grading program is set as follows (see figure 9.1.1):

```
[C2] LENGTH   NAME OUTLET      -D-
 x  xxx-xxx ......  0  0  0   u     (double grade)
 x  xxx-xxx ......  u  0  0   0     (normal grade)
 x  xxx-xxx ......  x  0  0   0     (normal grade)
```

Figure 9.1.1, Setting double grade in the grading program.

The 'double' grade option becomes active when only one outlet '**u**' in the last column '-D-' is set. The other three columns on this line must be set at '0'.
With the normal grade, the outlet '**u**' is set in (at least) one of the first three columns.
So, the outlet '**u**' is seen at minimal two lines in the grading program.

Every time when there are enough roses in the machine to bunch a double grade, a signal is sent to the concerning bunching station to bunch the roses. This station then first finishes its bundle, and after that is done it bundles the double grade.
This way, the grades are bunched separate.

When a bunching station is busy with a double grade, it can be seen by a flashing dot at the display.

The number of roses per bundle for the double grade is default set at half the count of the 'normal grade'. This to easily recognize the two different grades at a bunching station. Also other RPB settings for the double grade are possible but this has to be set by a service engineer.

☞ **Caution:** There must be enough roses available for both the grades. This to ensure that the machine is not waiting too long for a grade and the forks on the machine will at last not only be filled with the 'waiting grade'.

☞ **Caution:** Be sure that both grades can pass the binder. They must be long enough so that they are bind. Also they may not be too long according to the position of the binder because else they might get hooked.

9.2 OPTION: Productionregistration

This option is discussed in detail in the manual 'PRODUCTIONREGISTRATION ON THE TRS'.

Productionregistration keeps up what the rosehangers hang in at the TRS. The production data from every box/container and every rosehanger is registrated in a so called subtotal. This gives the next advantages:

-       the productivity per rosehanger can be measured
-       the productivity per rosecutter can be measured
-       the productivity per path/section/greenhouse can be measured
-       motivation for rosehangers by direct backfeed of the production data

The grower can determine where in the greenhouse problems with production are hiding because every boxsubtotal gives an overview of the grades and totals.
The problems could be cut-problems (same rosecutter always cuts short roses) or grow-problems (lots of short/thin roses from a certain section in the greenhouse).
The rosehangers can deliver a higher performance because they can see directly what their performance is.

At every rosehangers place on the rosehanger side of the TRS a photocell will be placed for detection of the passing roses. With this, the gradercomputer can determine the origin of every rose which is measured.

Also a 'rosehanger keypad' will be mounted at every rosehanger place.
On this keypad the identification for the rosehanger (personal ID) and the number of the box with roses to hang are entered.

At the end of the day the rosehangers aswel as the rosecutters can view their own performance on the gradercomputer.

9.3 OPTION: Automatic height setting

With this option the height adjustments for the binder and knife are automatically handled. The height settings are stored per sorting program and are adjusted automatically after a program exchange in menu [C1].
For this, the bunching stations must already have been set as an outlet in the new sorting program.

The operating buttons on the front panel of the bunching stations now get other functions. See figure 9.3.1.
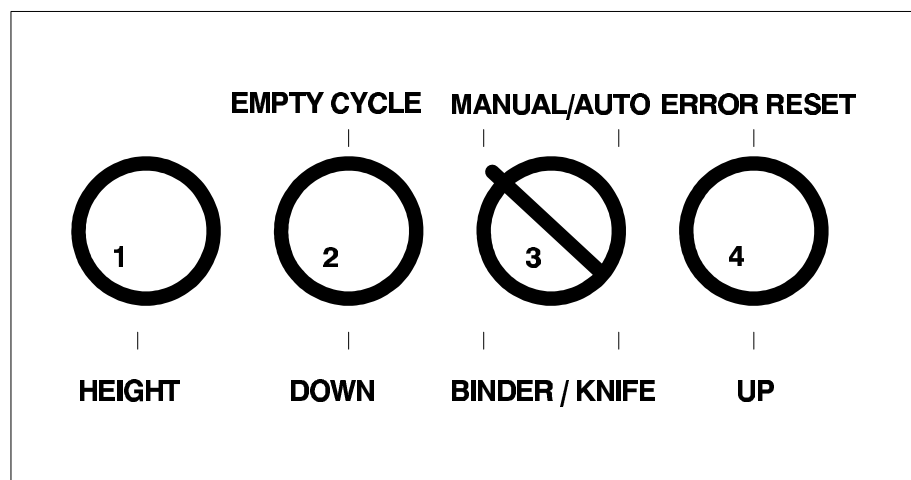
*Figure 9.3.1,   With height setting the operating buttons on the
cabinet of the bunching stations get other functions.*

The height set functions (DOWN/UP) will only work if button (1) HEIGHT is held pressed at the same time. The display then shows the height in centimeters together with a symbol which is an indicator for the direction.
When button (1) is not held pressed, then the buttons (2), (3) and (4) get their normal function back, namely: EMPTY CYCLE, MANUAL/AUTOMATIC and ERROR RESET.

Programming the height is done at the bunching stations. Every time a new sorting program is made, the height has to be set separate at every bunching station. Programming the height is done as follows:

- press button (1) HEIGHT and hold this button pressed
- make a selection: button (3) turned clockwise is KNIFE, button (3) turned counterclockwise is BINDER
- make a selection: button (2) go DOWN, or button (4) go UP
- release the buttons when the desired height is set

The sorter computer stores the height settings automatically in the current program. The height programming is ready when all bunching stations are set.

9.4 OPTION: Automatic motor control

This controls the main motor of the TRS transport system to the desired speed for the sorting program. The speed can be set per program in menu [C1].

9.5 OPTION: Quality camera (maturity)

The TRS can be equipped with a camera system for measuring the quality of the rose-bud. This camera system consists of:

-       a camera that is mounted on the corner of the grader
-       an extra DSP board in the computer rack

With this system the bud of every rose is analyzed for shape and color. Now the grader can determine the quality class of the rose (raw, mature, pale color, normal etc.).
The TRS can be expanded with extra eject outlets or bunching stations so that all roses are handled in only one pass.

This option will be discussed in detail in an other manual.

10 **How to solve problems**

10.2 **Machine doesn`t grade correct on length**

```
        ┌─────────────┐
        │    Start     │
        └──────┬──────┘
               │
```

	Yes		Yes	
Roses in the bunching station are to long ?		Roses come against the legs of the light sluice		- Decrease the speed of the machin and try again.

No   No

- The percentage for thickness grading is to low adjusted, see menu C3 with the concequence that roses are sent to a shorter length sorting
- Check if the right bunching stations are selected for the length sortings, see menu C2.
- Roses cling together

	No	
Roses in the bunching station are to short ?		- Check if the right bunching stations are selected for the length sortings, see menu C2. - Roses dreg other roses from the flour. In that case the length sluice will measure the rose wrong. Keep the flour, on the side where workers hanging roses in the machine, free of roses.

10.3 The machine doesn`t start

```
                    ┌──────────────┐
                    │    Start     │
                    └──────┬───────┘
                           │
┌──────────────────────────┐   No
│ The lamp "control current │────────
│ available" On the control │
│ panel is on ?             │
└──────────────┬────────────┘
               │ Yes
```

-The main switch and the key switch of the switch box must be switched on.

```
┌──────────────────────────┐   Yes
│ The lamp "air pressure to │────────
│ low" on the control panel │
│ is on.                    │
└──────────────┬────────────┘
               │ No
```

- The pressure of the compressed air is to low (below 7 bar) Check the compressor (no part of the machine).
- The (automatic) supply valve doesn`t open because of air leakage.
Repair the air leakage.
- The (automatic) supply valve doesn`t open because of air leakage. It is possible that during starting a control valve is in position "deventilate". This can be solved by disconnecting the couplings of the tubes to the bunching stations. After that press the switch "air pressure on" on the switch box, wait until the lamp "compressed air low" is of and connect the couplings of the tubes of the bunching stations again.

```
┌──────────────────────────┐
│ The lamp "Emergency stop  │
│ active/photocell          │   Yes
│ onderbroken" op de        │────────
│ schakelkast is aan.       │
└──────────────┬────────────┘
               │ No
```

- Emergency stop activated: Reset the Emergency stop on the switch box.
- Safety photocell in front of the bunching stations interrupted: When nowbody is there and the photocell is not interrupted the safety photocell can be reset on the switch box with the reset emergency stop/ photocell button.

```
┌──────────────────────────┐   Yes
│ The lamp "Failure safety  │────────
│ switch" on the control box │
│ is on.                    │
└──────────────┬────────────┘
               │ No
```

- One of the forks didn`t go backward, thats why the machin has been switched of by the safety switch (see appendix 4).
. Check the concerning fork
. Check/replace the spring of the fork
. The slide pieces can going stiff: Clean the slide pieces, lubricate the slide pieces with triflow. Place the safety switch in the correct position (vertical), see appendix 4).
The machine can be start again now.
- The door of the light sluice is not (not good) closed : close well the door near the light sluice.

```
┌──────────────────────────┐   Yes
│ The lamp "Phase failure"  │────────
│ on the switch box is on.  │
└──────────────┬────────────┘
               │ No
```

- One or more phases of the electrical supply is not present: care that all phases are present (check fuses).
- The phases are not equal: call the service engineer.
The automatic fuse has blown of: ask a classified engineer to check the machine.
Switch off the main switch of the switch box and after that reset the automatic fuse in the switch box.

```
┌──────────────────────────┐
│ The lamp "failure inverter" │   Yes
│ on yhe switch box is on.  │────────
└──────────────────────────┘
```

-Inverter failure. Reset the inverter by activating the emergency stop.

10.4 Roses are not going to one bunching station

```
                    ┌─────────────────┐
                    │      Start      │
                    └────────┬────────┘
                             │
   ┌─────────────────────────┴───┐     Yes
   │ Menupath B4: The grading    │─────────
   │ computer shows the status   │
   │ for the concerning          │
   │ bunching station "H" of "?" │
   └─────────────┬───────────────┘
                 │ No
   ┌─────────────┴───────────────┐     Yes
   │ Errors are displayd on the  │─────────
   │ bunching station:           │
   │           ER..              │
   └─────────────┬───────────────┘
                 │ No
   ┌─────────────┴───────────────┐     Yes
   │    The lamp "Failure        │─────────
   │ bunching stations" on the   │
   │    switch box is on.        │
   └─────────────┬───────────────┘
                 │ No
```

- Check the program (outlet number has been set??)
- The bunching station doesn`t function well: reset the bunching station by switching off the electrical supply of the bunching station a few minutes
- Solenoid in the main machin, for sending out the fork to the bunching station, doesn`t work: Check the solenoid and the mechanism, for this job remove the wooden plate on top of the machin.

- Bunching station not switched in "Auto": Switch the bunching station in position "Auto"
- No good electrical connected between bunching station and the machine: check the plug of the electrical connection of the bunching station with the machine. (The plug can be found 20 cm above flour level).

ER02: The switch of the elastic: "No elastic present": import the elastic in de binder again
ER03: The switch of the cylinder of the stem support doesn`t work, or bunching station not connected to the compressed air:
- Check/replace the switch of the aircylinder of the stem support and/or replace the cable of the switch, see appendix 8.
- Check the air tube connection of the bunching station.
ER04: Rowholder switch fault or no electrical supply.
- Check the plug of the electrical connection of the bunching station with the machine. (The plug can be found 20 cm above flour level).
- Check/replace fuses of the computer of the bunching station, see appendix 7: 1, 2, 3
- Check/replace the switch of the motor of the rowholders, see appendix 12.
ER05: The switch of the motor of the binder doesn`t work proper. Contact AWETA or a dealer
ER06: Check/replace the switch of the air cylinder that pushes the bundle out of the bunching station
ER07: Fuses of the bunching stations are blown of: Check/replace fuses 6 en 2, see appendix 7
ER08: Fuses of the bunching stations are blown of: Check/replace fuses 1 en 5, see appendix 7
ER09: "Cutting the bunch is not save", The switch of the air cylinder of the door of the bunching station doesn`t work proper, or the switches of the robotarm doesn`t work proper:
- Robotarm has been blocked: remove blockade
- Check fastening of the switch of the air cylinder of the door of the bunching station
- Check/replace the switch of the air cylinder of the door
- Adjust, if needed, the speed of the cylinder of the door see appendix 13
- Check/adjust the switches of the robotarm, see appendix 10.

-Check/reset thermal protection in the switch box (mounted beneath the grading computer)

10.5 Roses are not going to the bunching stations at all

```
                    ┌─────────────────┐
                    │      Start      │
                    └────────┬────────┘
                             │
    ┌────────────────────────┴─┐  Yes
    │ Menu-path B1: The        ├──────────   The grading program is not correct. Correct the
    │ grading computer shows   │             program
    │ the sorting class (for   │
    │ example. 1.1), but no    │
    │ number of the  bunching  │
    │ station                  │
    └────────────┬─────────────┘
                 │ No
    ┌────────────┴─────────────┐  Yes
    │ All bunching stations    ├──────────   Switch the bunching stations in  "auto"
    │ are in position "hand"    │
    │                          │
    └────────────┬─────────────┘
                 │ No
```
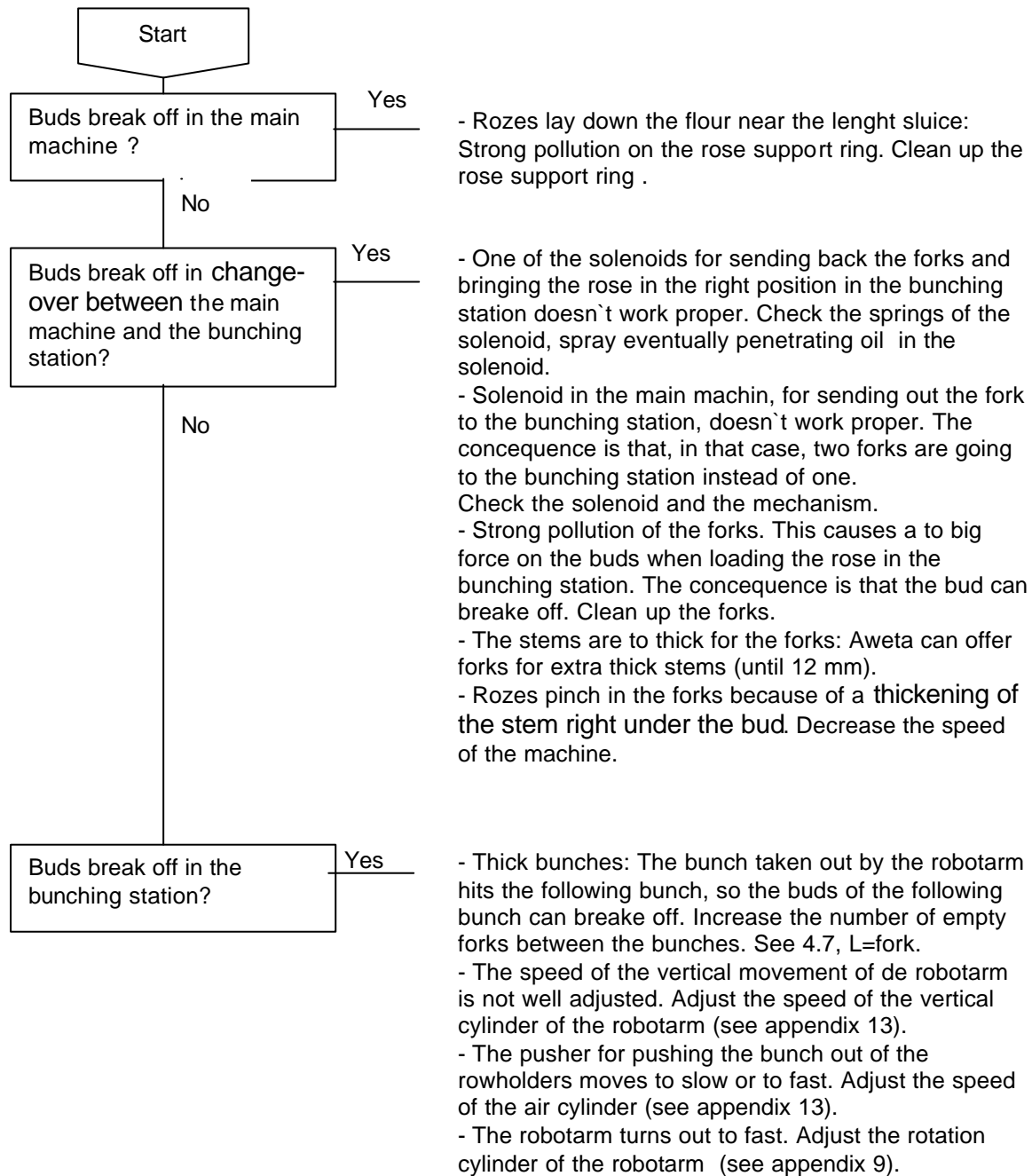
- The computer doesn`t function
well. Reset the computer by
switching off the electrical supply of
the computer a few minutes.
- Check/replace the fuses of the
computer, see appendix 12.

10.6 Too little roses in the bundles

```
        ┌─────────────┐
        │    Start     │
        └─────────────┘
```

Too little roses in a bunch, only in one bunching station ? — **Yes** →

- Buds are break off near the change over to the bunching station, so the rose fals down the flour and will be missed in the bunch see 10.7
- Solenoid in the main machin, for sending out the fork to the bunching station, doesn`t work proper: Check the solenoid and the mechanism, for this job remove the wooden plate on top of the machin.

No

Too little roses in all bunching stations ? — **Yes** →

- Buds are break off in the main machine, so the rose fals down the flour and will be missed in the bunch see 10.7
- Rozes are on the flour between the main machine and the bundle stations: The bolt, after the fork is sent out, doesn`t work proper, so the fork is going backwards to early and the rose falls down the flour.
Find out the oncerning fork and repair or replace the fork.
-A wheel of the fork unit can be broken. Replace the wheel.

10.7 Buds break off in the machine

```
           ┌─────────────┐
           │    Start     │
           └──────┬──────┘
                  │
    ┌─────────────┴───────┐  Yes
    │ Buds break off in the│────────
    │ main machine ?       │
    └──────────┬──────────┘
               │ No
    ┌──────────┴──────────┐  Yes
    │ Buds break off in     │────────
    │ change-over between   │
    │ the main machine and  │
    │ the bunching station? │
    └──────────┬──────────┘
               │ No
               │
    ┌──────────┴──────────┐  Yes
    │ Buds break off in the │────────
    │ bunching station?     │
    └─────────────────────┘
```

- Rozes lay down the flour near the lenght sluice: Strong pollution on the rose support ring. Clean up the rose support ring .

- One of the solenoids for sending back the forks and bringing the rose in the right position in the bunching station doesn`t work proper. Check the springs of the solenoid, spray eventually penetrating oil in the solenoid.
- Solenoid in the main machin, for sending out the fork to the bunching station, doesn`t work proper. The concequence is that, in that case, two forks are going to the bunching station instead of one.
Check the solenoid and the mechanism.
- Strong pollution of the forks. This causes a to big force on the buds when loading the rose in the bunching station. The concequence is that the bud can breake off. Clean up the forks.
- The stems are to thick for the forks: Aweta can offer forks for extra thick stems (until 12 mm).
- Rozes pinch in the forks because of a thickening of the stem right under the bud. Decrease the speed of the machine.

- Thick bunches: The bunch taken out by the robotarm hits the following bunch, so the buds of the following bunch can breake off. Increase the number of empty forks between the bunches. See 4.7, L=fork.
- The speed of the vertical movement of de robotarm is not well adjusted. Adjust the speed of the vertical cylinder of the robotarm (see appendix 13).
- The pusher for pushing the bunch out of the rowholders moves to slow or to fast. Adjust the speed of the air cylinder (see appendix 13).
- The robotarm turns out to fast. Adjust the rotation cylinder of the robotarm (see appendix 9).

10.8 Various problems

10.8.1 Cutting of the bundle doesn`t function well

- Pressure of the compressed air is too low: the pressure may be 10 bar at maximum, adjust the air service unit at 8 bar.
- Hinge point of the cutter is not well greased: grease the hinge point with the grease gun.
- Very thick stems: The cutter cannot cut the bundle in one time. Set the bunching station on two times cutting, see menupath C4, D-cut of the computer, see 4.7.

10.8.2 Many roses don`t go to the bunching stations and apear on the "in hang

- One bunching station doesn`t work, see 10.3.
- Program fault: for example: rozes are out of the adjusted borders of the sortings

10.8.3 Automatic hight adjustment doesn`t function.

Check if control by hand functions well.

If not: Check/ replace the fuse 1.2.3 or .4, see appendix 7.

If yes: There is a serieus problem with the automatic hight adjustment, call the service engineer.

Note: When, with a program exchange, the same value has been adjusted as in the program before, the hight will not change.

10.8.4 -

10.8.5 The binder doesn`t function well

- The elastic is too tight and break loose from the binder:
  The roll elastic must turn a bit every stroke of the binder nidle.
  Adjust the supply of elastic with the elastic brake (= two plates with adjusting screw)).

10.8.6 Incorrect moving of the robotarm

When the robotarm is going inside the bunching station, the rotation speed of the "hand" is irregular:
Check/replace the rotation spring of the robothand, see appendix 11.

10.8.7 Compressed air leakage near the air service unit (near the air dryer)

Leakage between the three blocks of the air service unit: Replace the slowstarter.
For a quick temporary solution, see appendix 14.

11 Maintenance and cleaning the trs

11.1   General

The sorting machine can only continue to function properly if it is regularly serviced and cleaned in the prescribed manner.

Time invested in maintenance will pay off in the form of long life and a high degree of reliability.

Cleaning the sorting machine properly will prolong its life and enhance its performance and reliability.

It's recommended to have the machine checked by an acknowledged expert each two season.

☞   **Care!**   When carrying out any work on the machine, the control current must be switched 'off' using the key contact on the switchboard cabinet. Further, the main switch must be set to the '0' position.

Before lubricating an individual part, first check whether it is in need of lubrication.

If necessary, remove any dust and dirt before lubricating the part.

Apply the lubricant at the right place and in the right amount.

The sorting machine must be lubricated in accordance with the diagram on the following page with the lubricant described below

The oil in the motors hardly ever needs changing, and when it does, this job must be left to a specialist.

11.2   Service indication

The sorting computer registers the number of operating hours itself. After a period that the service engineer has set (TABLE(48)), the following message appears on the computer screen (see Figure 10.2.1):

    ---> MESSAGE <---

 MACHINE NEEDS SERVICING: 02
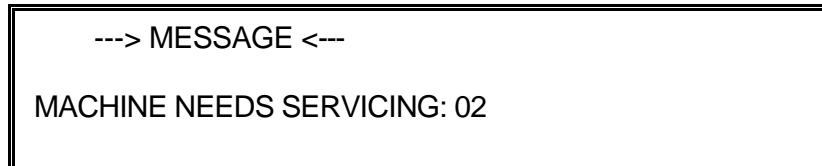
Figure 10.2.1, Service message on the screen after the requisite number of operating hours.

The message is intended as a reminder and appears on the screen when the period has elapsed and the computer panel has been inactive for two minutes. It is a reminder that the sorter requires regular maintenance.

By pressing the <Enter> key the message disappears again until the next service interval has been reached.

The following contains a description of the various maintenance activities that the sorter requires.

11.3   lubricans

The lubricants that are to be used:
-        In the grease-gun: MOLYNKOTE LONGTERM W 2 (white grease)
-        On chains and moving parts: ULTRA GEL SPRAYING GREASE / CHAIN SPRAY
-        Thin oil: TRIFLOW

11.4   Lubricating scedule

| | INTERVAL | | | | |
| | OF THE MAINTENANCE | | | | |
	PER DAY	PER TWO WEEKS	PER 2 MONTHS	PER HALF YEAR	PER YEAR
COMPRESSED AIR					
1.MAKE EMPTY THE CONDENSATION RESERVOIR WITH THE VALVE	X				
2. CHECK WHETHER THE DRYER IS SWITCHED ON , THIS CAN BE HEARD BY A SLIGHT PURRING SOUND.		X			
CLEANING THE MACHINE					
3. KEEP THE ROWHOLDERS CLEAN (WITH SCOTCH BRITE SCOURER)			X		
4. CLEAN THE LIGHT SLUICE		X			
4A. CLEAN THE CAMERA MIRROR					
4B. SUPPORT RING OF THE ROSES (WITH SCOTCH BRITE SCOURER)		X			
4C. DISMANTLE THE FORKS OF THE MAIN MACHINE AND CLEAN THE FORKS WITH WATER AND SOAP (PUT IN SOAK 1 NIGHT)			X		
LUBRICATE THE CUTTER					
5. LUBRICATE THE NIPPLE AT THE HINGE POINT OF THE KNIFE WITH THE GREASE-GUN		X			
6. LUBRICATE THE HINGE POINTS OF THE AIR CYLINDER OF THE CUTTER WITH CHAIN SPRAY		X			
6B. SUPPORT OF THE VERTICAL MOVEMENT OF THE CUTTER					X
LUBRICATE/CLEANING BINDER					
7. THE CHAIN OF THE MOTOR AND THE CHAIN THAT DRIVES THE BINDER NEEDLE THE CHAIN OF THE MOTOR AND THE CHAIN THAT DRIVES THE BINDER NEEDLE WITH CHAIN SPRAY			X		
7B. LUBRICATE ALL BALL JOINTS WITH GREASE			X		
REMOVE THE STAINLESS STEEL CAP OF THE BINDER					
8. CLEAN THE INTERIOR (REMOVE ELASTIC RESIDUE).			X		
9A,B,C,D,E,F,G,H. ENSURE THAT THE GEARS AND THE VARIOUS MOVING PARTS HAVE BEEN TREATED WITH A THIN LAYER TRIFLOW.			X		
REPLACE THE STAINLESS STEEL CAP					

	PER DAY	PER TWO WEEKS	PER 2 MONTHS	PER HALF YEAR	PER YEAR
LUBRICATE THE ROBOT ARM					
10.VERTICAL SUPPORT OF THE ROBOT ARM WITH TRIFLOW			X		
11-			X		
12.THE CHAIN OF THE ADJUSTMENT OF THE HIGHT OF THE ROBOTARM WITH TRIFLOW			X		
13.			X		
14. THE ROTATION SPRING AT THE END OF THE SHAFT WITH GREASE			X		
15. THE GEARS WITH GREASE			X		
16 -					
LUBRICATE THE THE PARTS BEHIND THE BINDERS					
17.THE VERTICAL SUPPORT OF THE BINDER WITH TRIFLOW				X	
18. THE SPINDLE WITH SCREW THREAD FOR THE VERTICAL MOVEMENT OF THE BINDER WITH TRIFLOW				X	
19. -					
20.THE DRIVE CHAIN OF THE SPINDLE WITH SCREW THREAD WITH TRIFLOW				X	
LUBRICATE THE TRANSPORT SYSTEM WITH THE ROWHOLDERS OF THE BUNCH STATION					X
22.THE CHAINS OF THE ROWHOLDERS WITH TRIFLOW					X
23 -					
24.THE ROTATION SPRINGS OF THE ROWHOLDERS WITH TRIFLOW					X
LUBRICATE THE MAIN MACHINE					
25.THE DRIVE CHAIN OF THE ENCODER WITH TRIFLOW					X
26. THE TRANSPORT CHAIN WITH TRIFLOW					X
27. THE WHITE PLATES FOR SUPPORT OF THE CHAIN WITH TRIFLOW					

☞   CARE: NEVER USE GREASE FOR POINT 27. IT WILL BLOCK THE MACHINE.

3

4B

4C

9C 6D   **9E 9F 9G**   **9H**

9B

9A

13 11.02

15

10

14

20
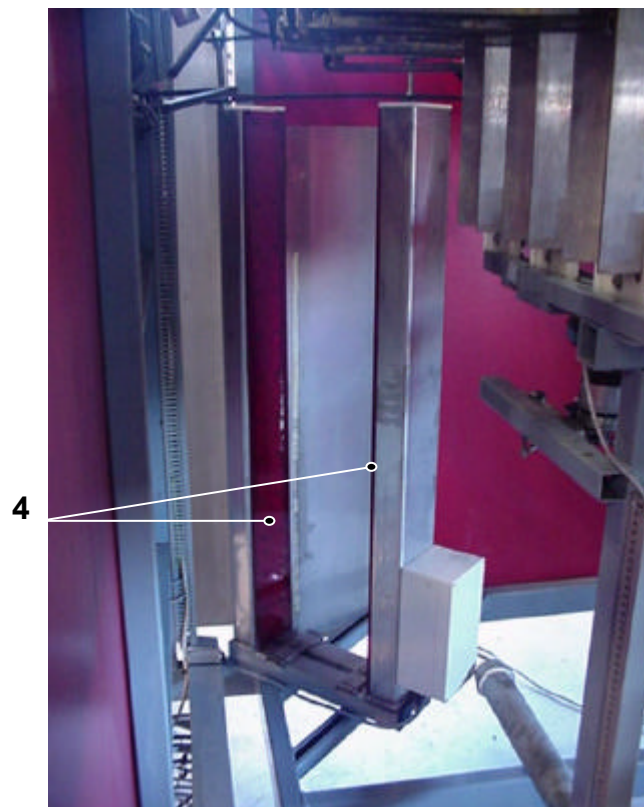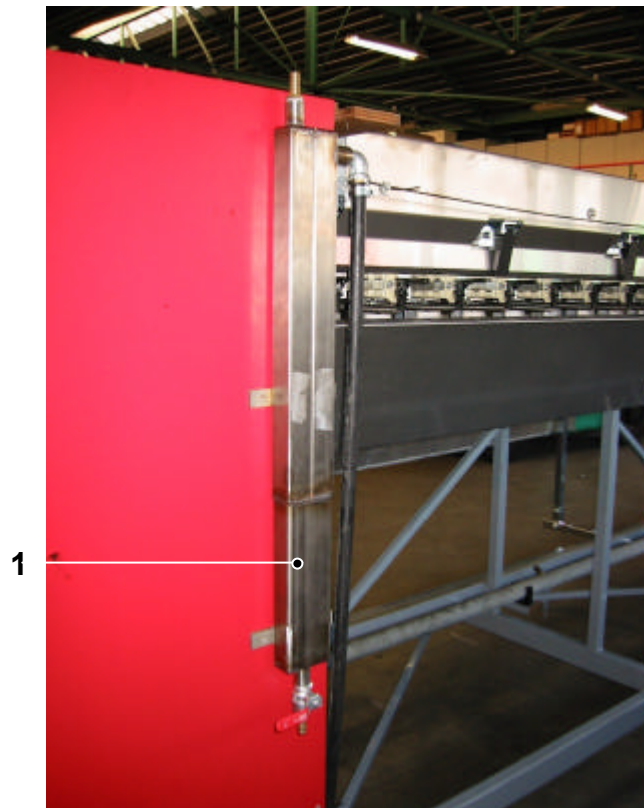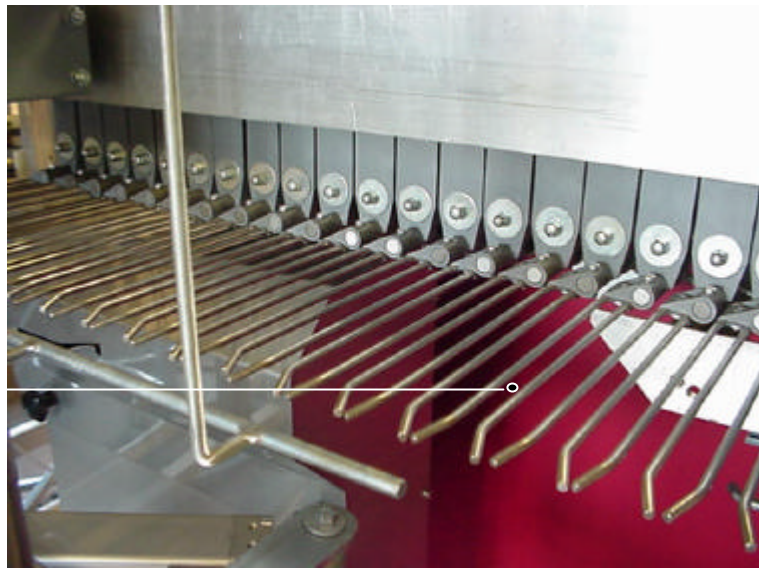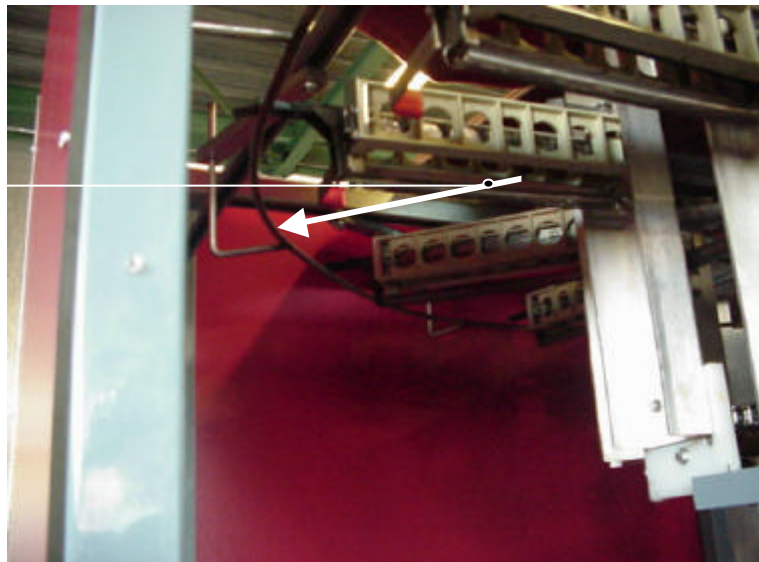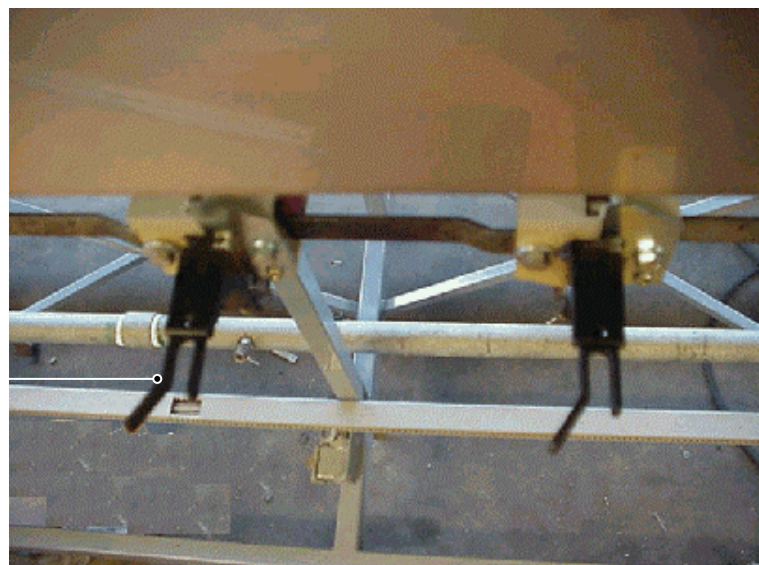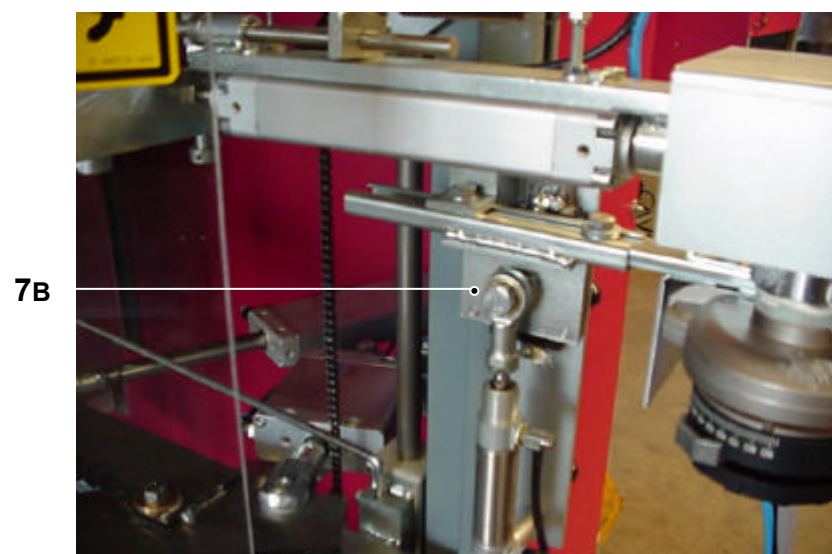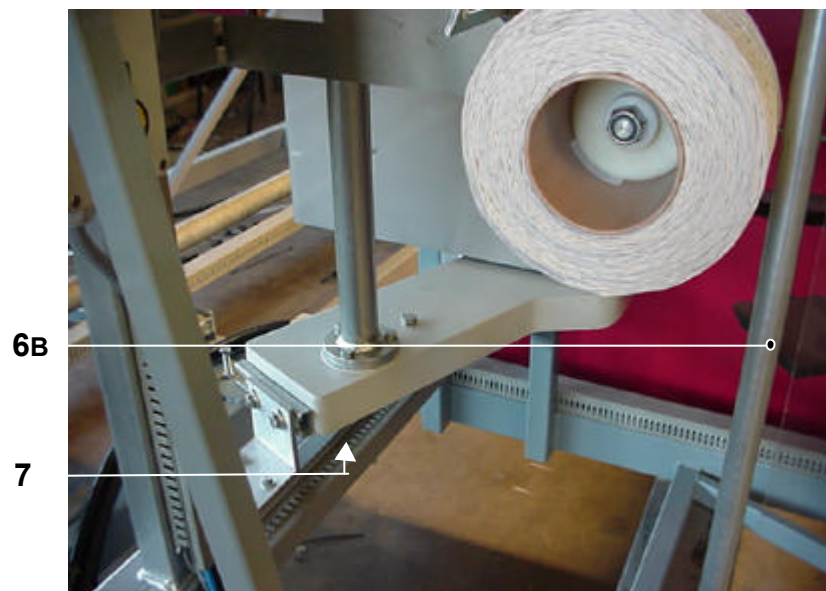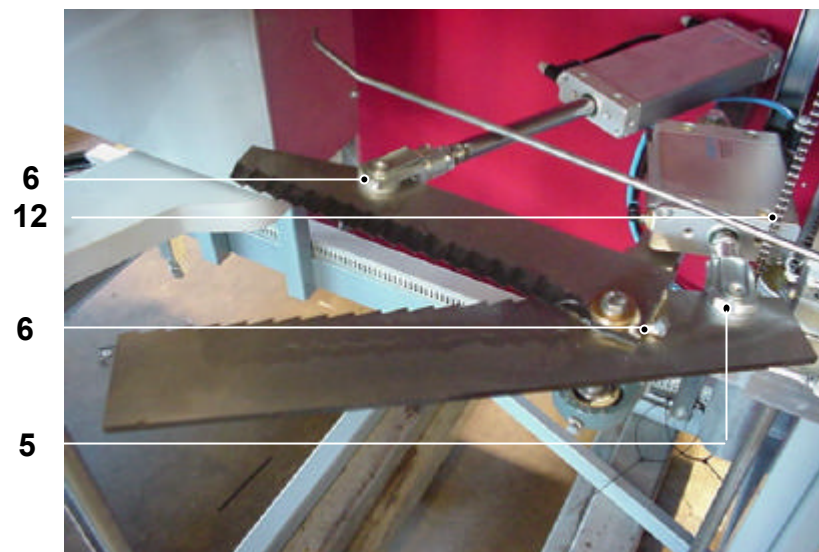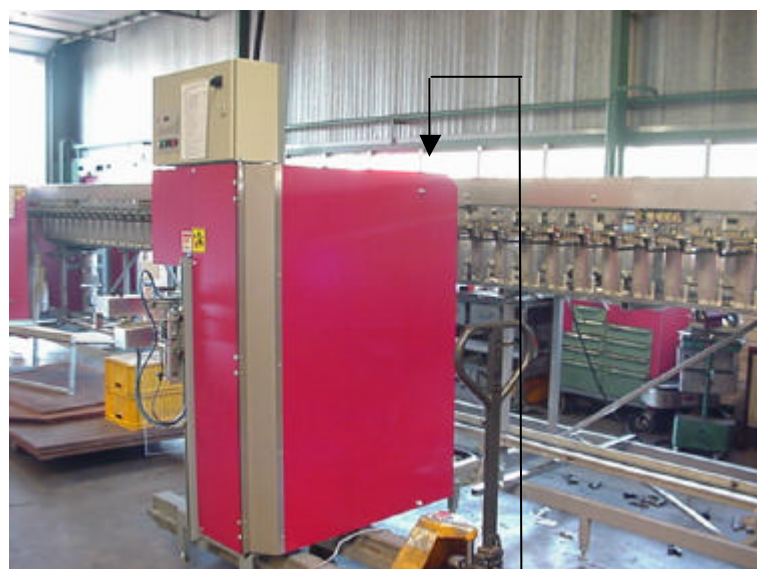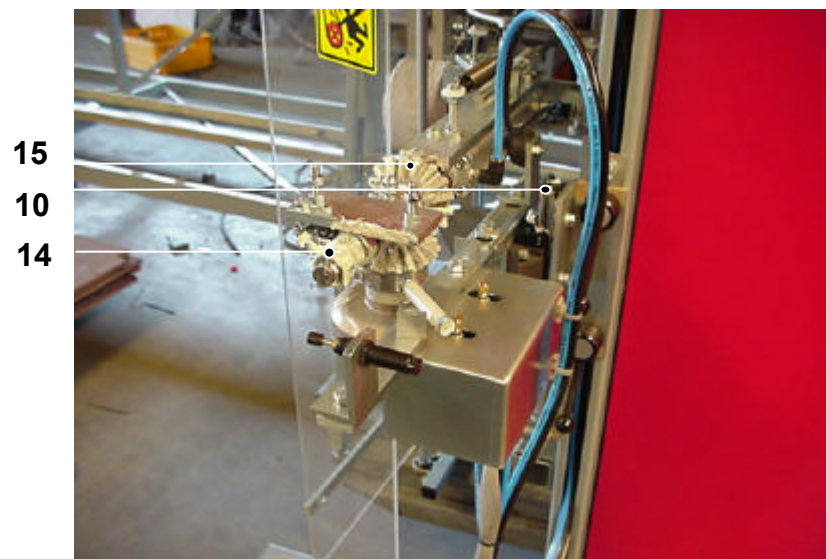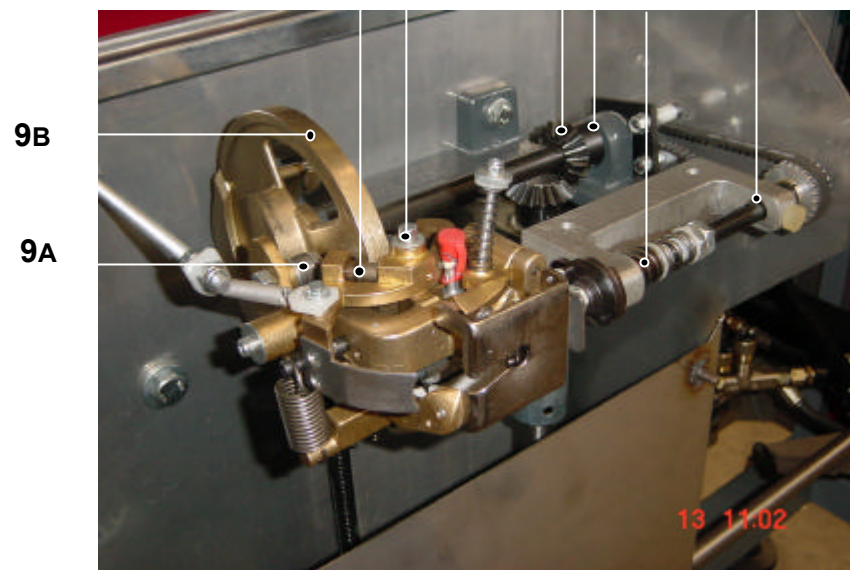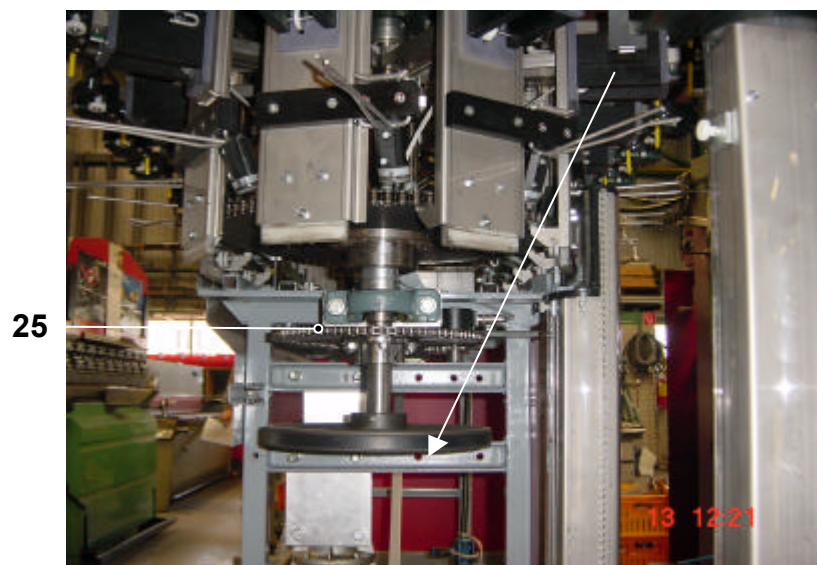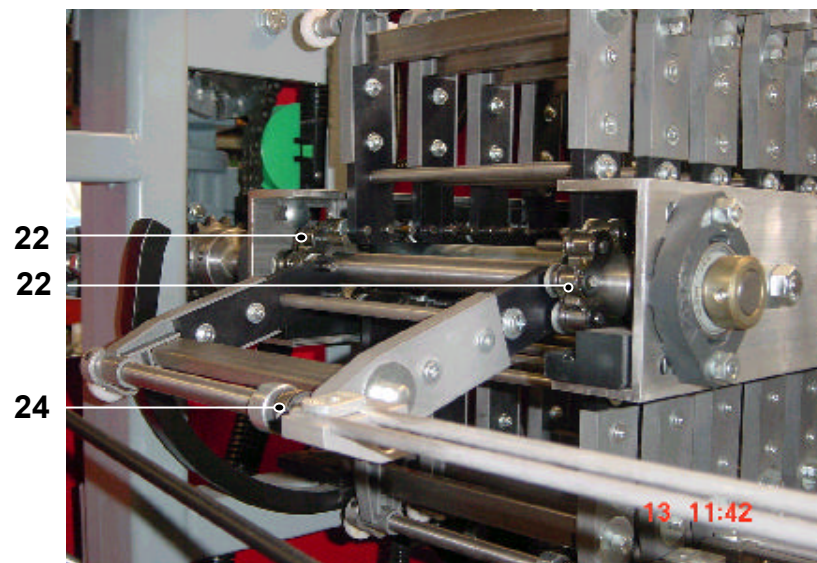
12 **Appendixes**

-     APPENDIX 1, Brief description of the menu functions.
-     APPENDIX 2, TRS menu overview.
-     APPENDIX 3, Overview of error messages.
-     APPENDIX 4, TRS Ground plan.
-     APPENDIX 5, Switchboard cabinet operating panel.
-     APPENDIX 6, Drive and length measurement on the machine.
-     APPENDIX 7, Location of the fuses.

APPENDIX 1 MENU FUNCTIONS

The following contains a brief description of the various menus:

Menu **A** Information menus
      1 - sorter (machine speed, %full, etc.)
      2 - production (run/stop time)
      3 - date/time sorter
      4 - software version numbers

Menu **B** Verifications menus
      1 - sorting (product information: length, thickness, outlets, etc.)
      2 - length sensor (LED sensor verification)
      3 - thickness measurement (thickness sensor verification)
      4 - bunching station (status info)

Menu **C** Program menus
      1 - choice of program used for the sorting process
      2 - setting the length/outlet for the sorting program
      3 - thickness setting for the sorting program
      4 - bundle setting for the sorting program
      5 - special functions: **1** setting mode for grading
                                     2 copying the current sorting program
                                         3 setting the time
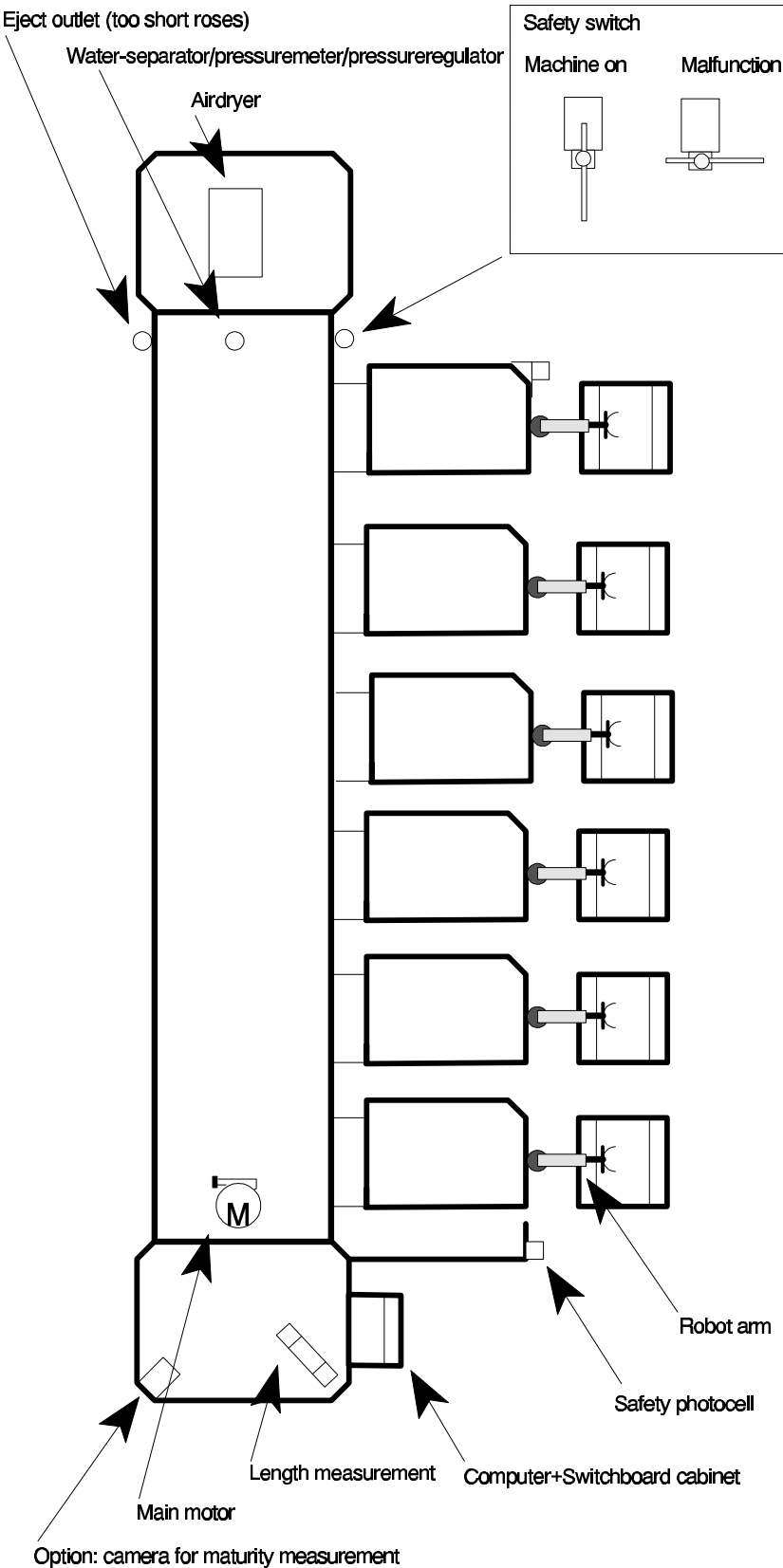   **4** (quality option)
                                         5 service menu for the engineer

Menu **D** Production menus
      1 - view subtotals
      2 - view daytotal
      3 - clear sub- and daytotals
      4 - print sub- and daytotals and sorting programs
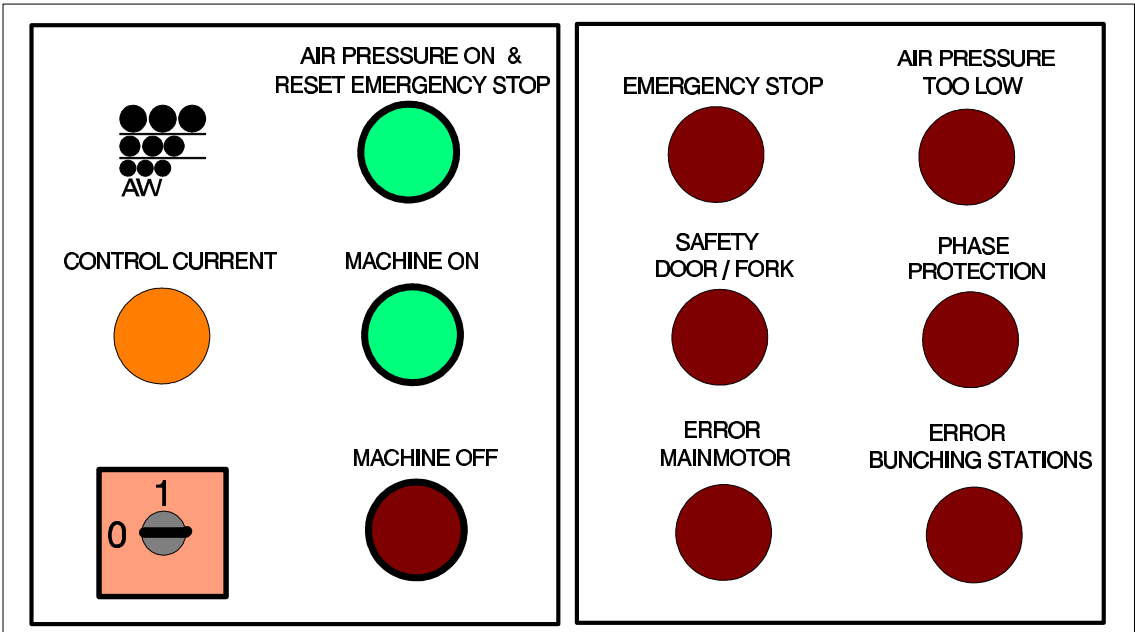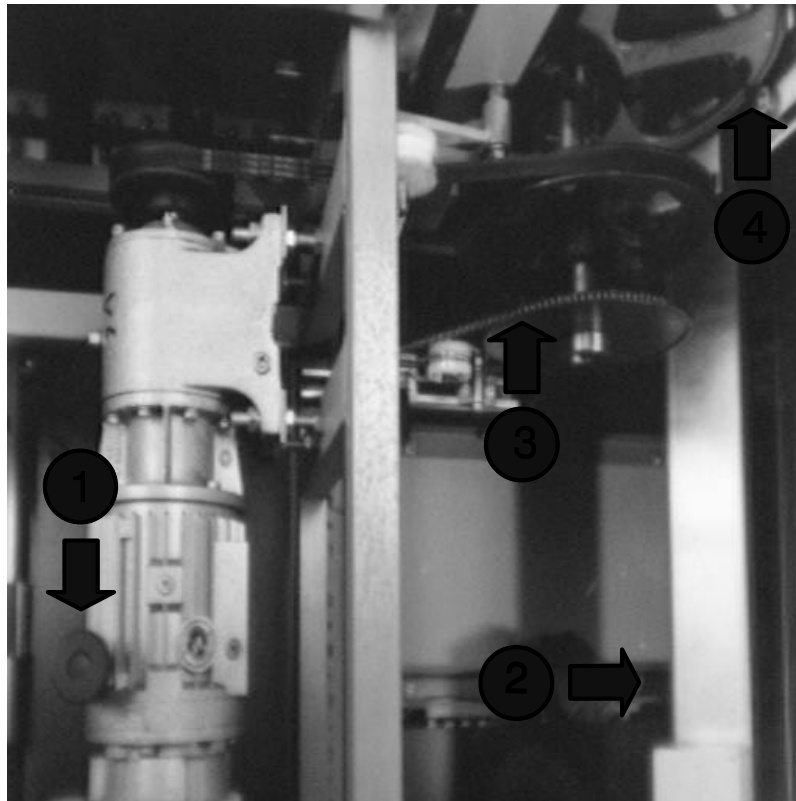   **5** - batch exchange

APPENDIXES 2 TRS MENU OVERVIEW

Error message screen	A=Information	1.Speed	
		2.Production	
		3.Grader	1. Grader
		4.Version numer	2. Bundler unit
			3. DSP
Message screen	B= Verify	1. Grading	
		2.Length sensor	
		3.Quality	
		4.Bundler unit	
Information screen	C=Program	1.Program select	
		2.Length outlets	
		3.Thickness	1.(reserve)
		4.Bundler unit	2.Copy
		5.Special	3.Set date time
		6. Quality	4.(reserve)
			5.Service
	D=Production	1.Subtotal	1.Machin overview
		2.Daytotal	2. Subtotal/box
			3.Subtotal/ number
		3.Clear	1.Subtotal
		4.Print	2.Daytotal
		5.Batch exchange	3. Subtotals in memory
			1.Subtotal
			2.Daytotal
			3.Program

APPENDIX 3 OVERVIEW OF ERROR MESSAGES

BUNCHINGSTATION ERROR MESSAGES	
Number	Meaning of message
Er.02	Out of elastic -> put a new roll on.
Er.03	Stem escort sensor defect (or air/380V switched off?)
Er.04	Rowholder sensor defect (of air/380V switched off?)
Er.05	Binder sensor defect (of air/380V switched off?)
Er.06	Bundlepusher returns too late
Er.07	24V supply defect (or fuse in bunchingstation cabinet?, see appendix 7)
Er.08	+24V supply defect (or fuse in bunchingstation cabinet?, see appendix 7)
Er.09	Not safe for cutting, door still open / or the robotarm sensors defect?
Er.10	Robothand returns too late, caught?
Er.11	reserved
Er.12	reserved
Er.13	internal error
Er.14	reserved

GRADER ERROR MESSAGES	
Number	Meaning of the message
Er.01	PRINTER <off line>, the printer is set off line.
Er.02	
Er.03	
Er.04 (♪)	LENGTH SENSOR DIRTY, CLEAN IT, or a rose/leaf in the sluice.
Er.05 (♪)	MACHINE RUNS TOO FAST, according to the speed setting in menu [C1].
Er.06	SER.CHANNEL TOO BUSY, or interference on mains 220V from switching OFF/ON.
Er.07	
Er.08	
Er.09 (♪)	BUNCHING STATION ERROR, error detected for a bunching station (see chapter bunchingstation errors)
Er.10	CAN->NETPROBLEMS, faulty (wire)connection to the bunching stations (or humidity?).
Er.11	
Er.12	
Er.13	CAN->TIMEOUT ERROR, a bunching station is switched off? Check with menu [B4].
Er.14	
Er.15	
Er.16 (♪)	
Er.17 (♪)	
Er.18 (♪)	
Er.19 (♪)	
Er.20 (♪)	
Er.21 (♪)	

APPENDIX 4 TRS GROUND PLAN

Eject outlet (too short roses)

Water-separator/pressuremeter/pressureregulator

Airdryer

Safety switch

Machine on   Malfunction

Robot arm

Safety photocell

Length measurement   Computer+Switchboard cabinet

Main motor

Option: camera for maturity measurement

APPENDIX 5   SWITCHBOARD CABINET OPERATING PANEL

APPENDIX 6 DRIVE AND LENGTH MEASUREMENT ON THE MACHINE.

(1) Machine speed adjustment (manual control system).

(2) Length measurement sensor (light sluice).

(3) Encoder drive chain.

(4) Machine's main chain (out of view, another is mounted above on the same shaft).

APPENDIX 7 LOCATION OF THE FUSES

Fuses in the
grader
computer cabinet.

1 2 3

Computer
Main switch

Fuses for
TRS computer
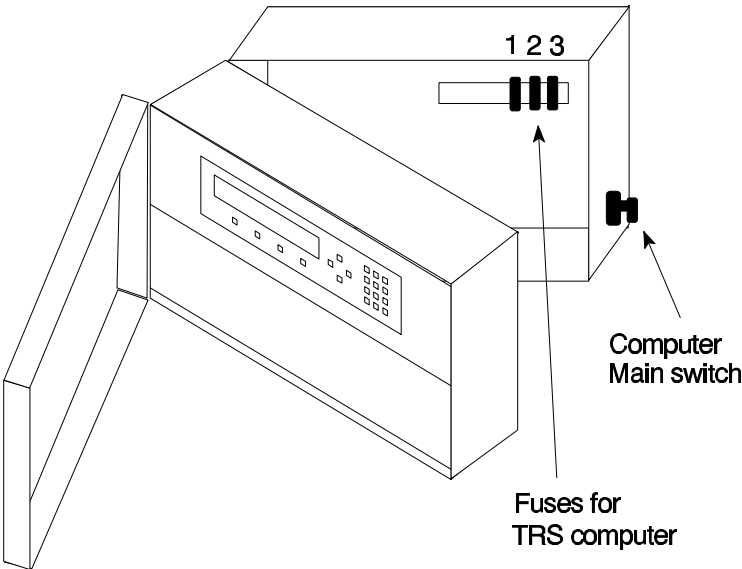
Fuses in the
bunching station
computer cabinet.

2 3

4

1

4   5 6

1 2 3

Computer
Main switch

Fuses for
Height adjustment (option)

Fuses for
Bunching station computer

13 **Menu index**

APPENDIX 8: THE SWITCH OF THE STEM SUPPORT

Rowholder

Stem support

The switch of the
cylinder of the stem
support

Pay attention: When replacing the cable of the switch it is important to fix the cable exactly the same as the orriginal cable. This is to prevent breakage of the kabel.

APPENDIX 9: ADJUSTMENT OF THE SPEED OF THE ROBOT ARM GOING IN AND OUT

The rotation cylinder can adjusted as follow:

- The speed of the robotarm going out can be adjusted with screw 1.
- The speed of the robotarm going in can be adjusted with screw 2.
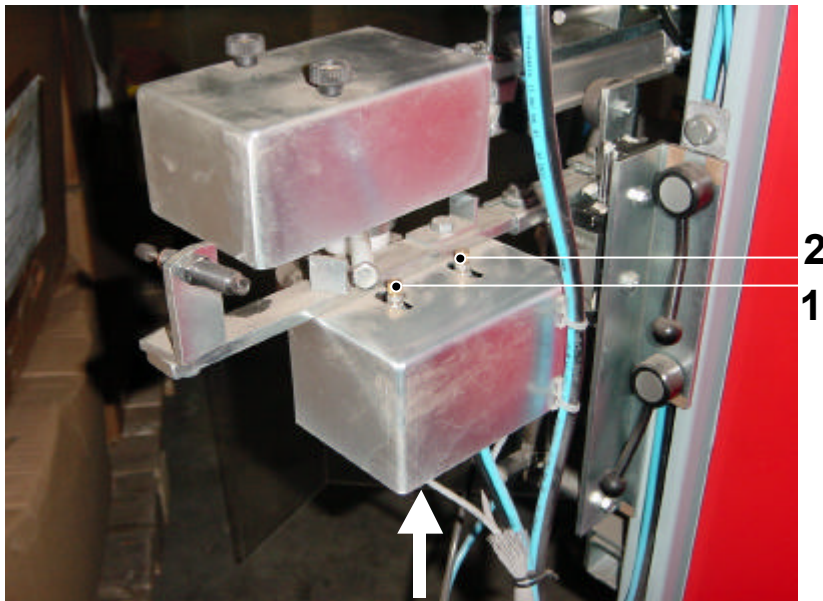
APPENDIX 10 CHECKING/ADJUSTING THE SWITCHES OF THE ROBOTARM

Checking and adjusting the switches of the rotation cylinder (see white arrow in photo) of the robotarm can be done the most easy when the bunching station is diconnected from the compressed air.

When movig the robotarm in and out by hand, the work of the switches can be checked in the computer of the bunching station: LED`s are going on and off.

When the LED do not give a reaction the possible causes can be:
- The switch is not wel adjusted: move the switch to the cam of the rotation cylinder (Pay attention: the switch may not touch the cam).
- Switch 2 or 3, see pfoto, fault: Replace the switch.
- Cable of the swich fault: Replace the cable.
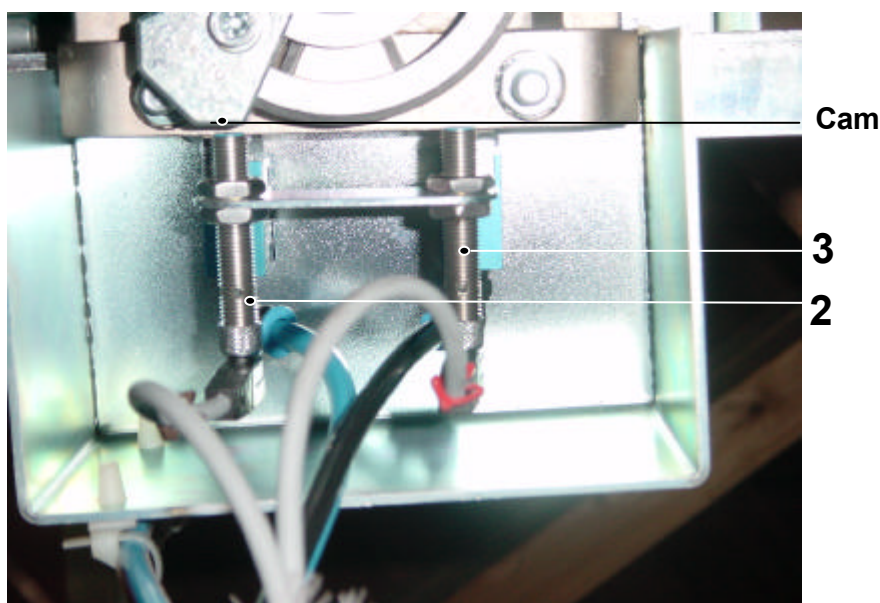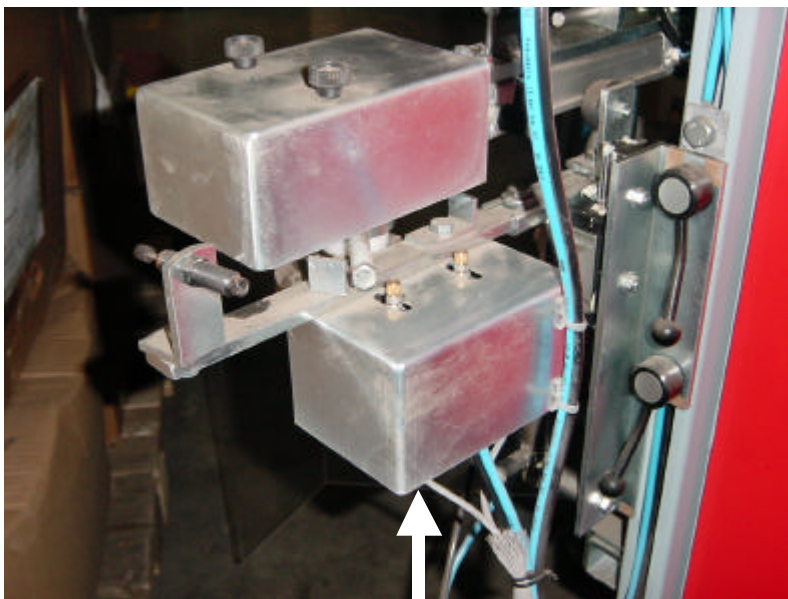
APPENDIX 11: REPLACING THE TORSION SPRING OF THE ROBOT HAND

Remove the cap to replace the torsion spring.
Remove the adjusting ring; and replace the torsion spring.
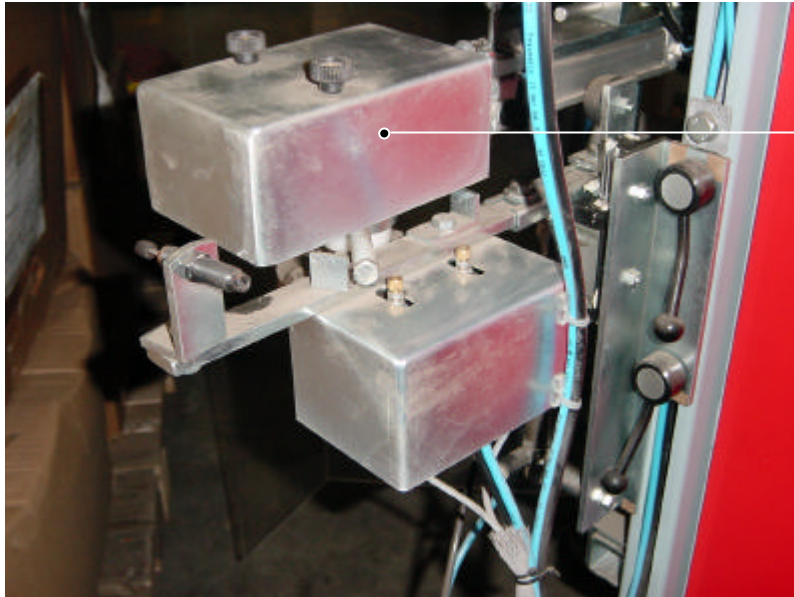
Cap
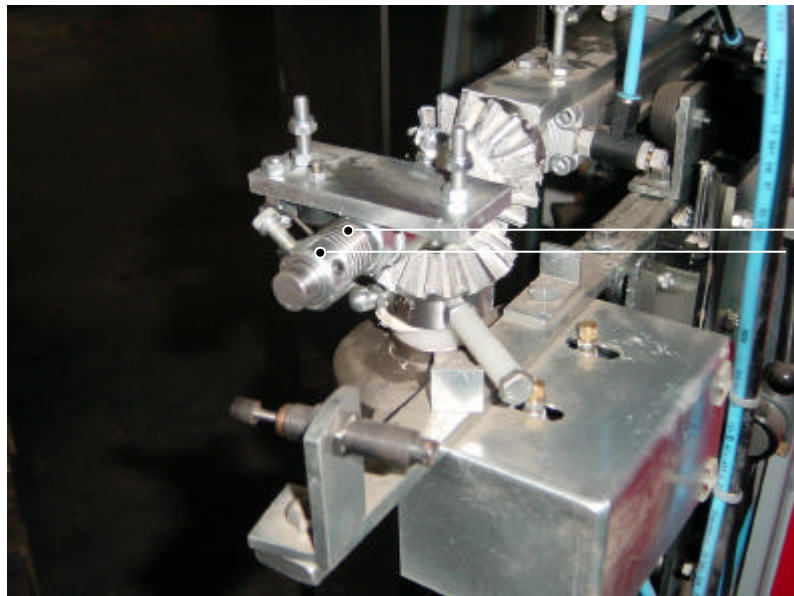
Torsion spring
adjusting ring

APPENDIX 12 SWITCH ROWHOLDERS

The switch can be found behind the cover plate.
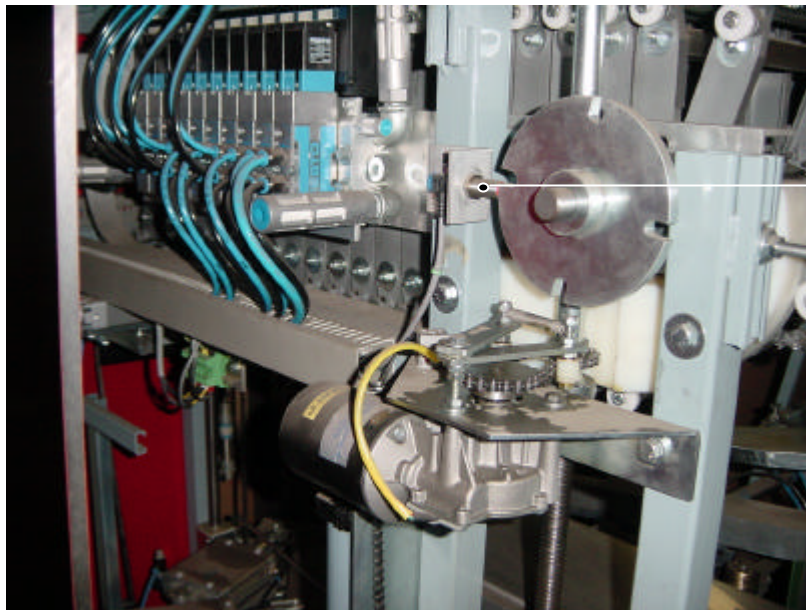
APPENDIX 13 ADJUSTMENT OF THE SPEED OF A CYLINDER

Adjusting the speed :

Direction arrow A faster: Turn open Screw 1.
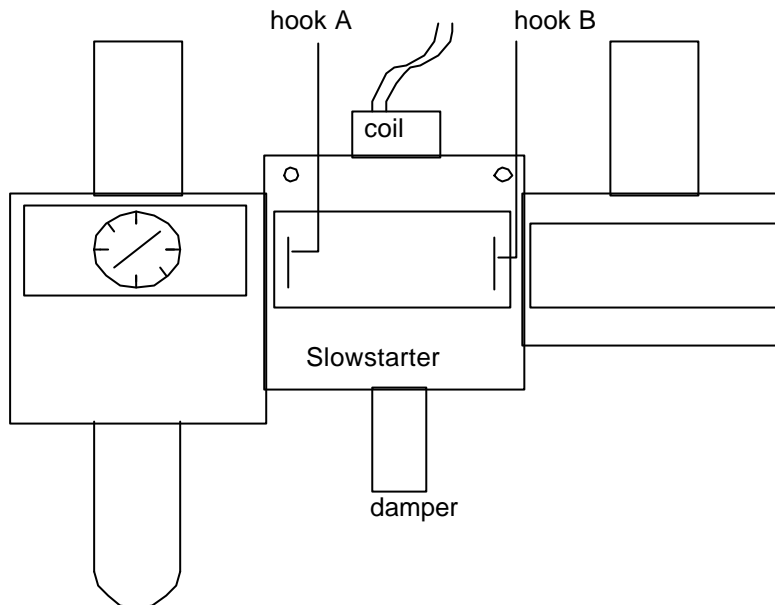Direction arrow A slower: Turn close Screw 1.

Direction arrow B faster: Turn open Screw 2.
Direction arrow B slower: Turn close Screw 2.
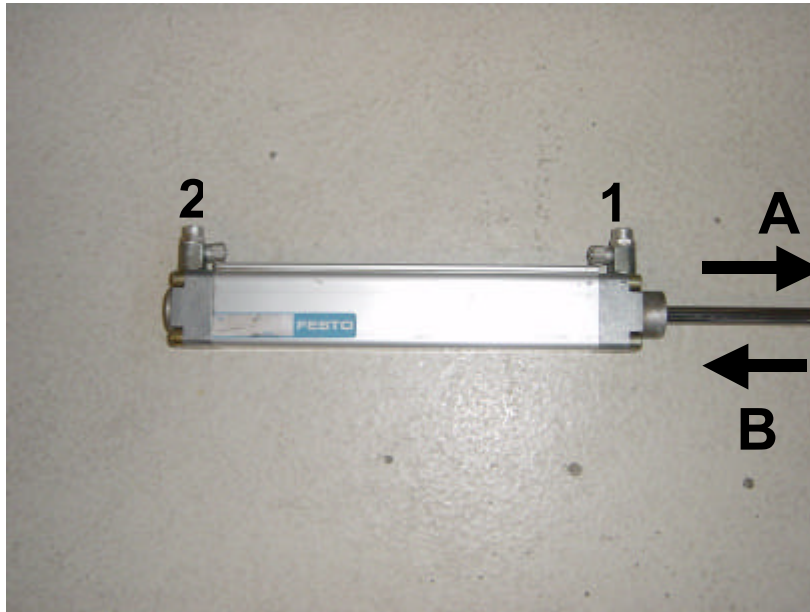
BIJLAGE 14 REPLACING THE SLOWSTARTER

- Close the air supply.

- Remove the black cover plate of the right block.
- Remove hook B with a screwdriver.
- Remove the right block.
- Remove the four screws from the block in the middle (the slowstarter) and remove the black cover plates.
- Remove hook A from the slowstarter with a screwdriver.
- Replace the slowstarter.
- Fix all parts again in reverse sequence.

Pay attention: In case of an emergency, the slowstarter can be removed. Connect in that case the left block to the right block.

Appendix 15 Replacing the "brugcel" in the computer of the bunching station
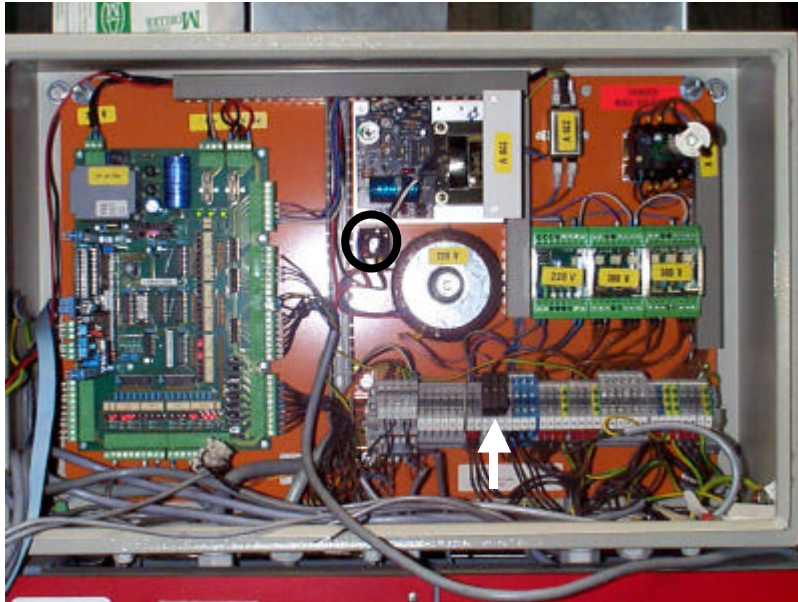
When after replacing, the fuse (white arrow) blows of again, mostly the "brugce
is fault.

Replacing the "brugcel" as follows:

-       Switch of the supply of the bunching station
-       Pay attention how the cables of the "brugcel" are connected
-       Disconnect the wires of the "brugcel"
-       Replace the "brugcel"
-       Connect the wires again to the "brugcel"

Appendix 16 The brake for the elastic

The switch Yes/no elastic

The brake of the elastic

14 APPENDIX 17: GRADING ROSES BY QUALITY

The TRS-XL has a camera system to measure the quality of the rose bud. The system can be used to analyse the form and colour of the bud of any rose. The grader uses this to determine the quality class of the rose ('mature', 'raw', 'deviating colour', etc.). Additional ejectors and/or bunching stations can be added to the TRS-XL so that the roses can be graded out separately.

This appendix includes the basic information concerning the quality system of the rose grader machine. Should you have any special wishes concerning quality grading not described here, please contact Aweta.

Before quality grading of a certain variety can be started, the service mechanic must first send the right configuration of the camera to the grading computer.

A configuration of the camera can be represented as a recipe with which a variety can be sorted by quality.

Once the service mechanic has adjusted the configuration of the camera, a quality program can be adjusted.

To make a quality program, select the qualities to be used for grading in menu [C1]. These are:
- Maturity
- Bud length
- Bud colour

You can copy a grade program and then adapt it for a certain variety (see menu C52). Such copies can be changed as desired. An adapted program is used for deviating lots (for instance, after the weekend) or if other lengths are desired.

☞ **Caution!** Do not grade on a configuration other than that intended for the variety concerned, otherwise there will be grading errors.

☞ **Remark:** C1 lists the name of the configuration of the camera of the program concerned.

☞ **Remark:** When grading a badge of roses with a quallity program, the first 100 roses stay in the machine for calibrating the camera system.

14.1 CREATING A QUALITY-GRADING PROGRAM

As mentioned, the variety concerned requires a camera configuration that must have been adjusted by the service mechanic.

If this has been done, proceed as follows to create the quality grading program:

- In menu C1, adjust the qualities that must be graded for (see 14.1.1).
- In menu C2, adjust which length grades must be graded by which quality and to which exits the grades must travel (see 14.1.2).
- In the menu C6, adjust the limit values of the quality grades (see 14.1.3).

14.1.1 ADJUSTING THE DESIRED QUALITIES

Proceed as follows to adjust the quality for grading:
- In menu C1, adjust the screen, select 'quality' and press 'enter' in order to
  call up the quality screen.

```
[C1] PROG SELECT          PROG     : 2

THICKNS : NO              NAME     : TEST
SPEED:    9500 f/h        QUALITY: NEE
```

```
[C1] QUALITY SELECTION


    QUALITY:            NO
```

-Select 'quality' and press 'enter'.

```
[C1] QUALITY SELECTION
  1   QUALITY :           YES
  2   GROUP 2:            NO
  3   RAW     :           NO
```

Lower in the window, it says:

```
    5 RIPE                    NO
    6 EXTREME RIPE            NO
    9 TE KLEINE KNOP          NO  (too small buds)
```

- Here, the desired quality can be activated or deactivated by selecting the quality concerned and pressing 'enter'.
-Quality grading is entirely deactivate by adjusting 'Quality' to 'No'.

☞   **Note!** The qualities that are listed in C1 depend on the camera configuration.

14.1.2 ADJUSTING THE LENGTHS AND EXITS IN A QUALITY PROGRAM

In menu C2, it is indicated which length grades must be graded by which quality and to which exits the grades must travel.

Each line position in the program represents a grade.
The number of desired grades is adjusted under 'GRADES'
Following each length grades, one or several exits can be adjusted.

Group 1
Group 1 comprises the 'good' roses, that is, those remaining once the other qualities (e.g. too mature, too raw, too small buds) have been graded out.

```
[C2] LENGTH      NAME          OUTLET           -D-
GROUP1
1.01 28 – 38     30 CM          0    0    0    0
1.02 38 – 48     40 CM          0    0    0    0
1.03 48 – 58     50 CM          0    0    0    0
1.04 58 – 68     60 CM          0    0    0    0
1.05 68 – 78     70 CM          0    0    0    0   GRADES
1.06 78 – 999    80 CM          0    0    0    0   6
```
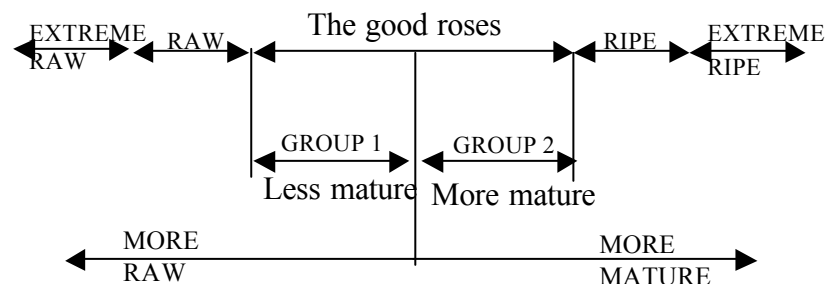
Groep2
The following figure could represent the maturity distribution of a lot.
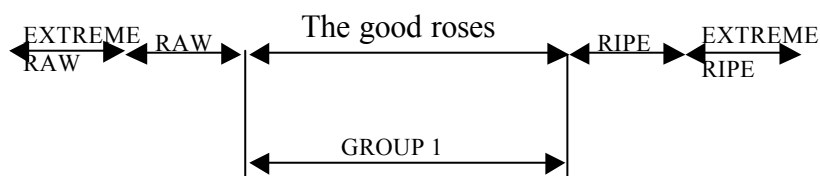
Group 2 is an extra group that can be used to divide the 'good' roses into two groups (a more mature and a less mature group).
It is now possible to divide the lot into more mature and less mature grades as shown in the following figure.

```
[C2]  LENGTH      NAME          OUTLET        -D-
GROUP2
2.01 28 - 38    30 CM          0    0    0    0
2.02 38 - 48    40 CM          0    0    0    0
2.03 48 - 58    50 CM          0    0    0    0
2.04 58 - 68    60 CM          0    0    0    0
2.05 68 - 78    70 CM          0    0    0    0    GRADES
2.06 78 - 999   80 CM          0    0    0    0       6
```

Raw, Ripe, Extreme ripe, Extreme raw

```
[C2]  LENGTH      NAME          OUTLET        -D-
RAUW
3.01 28 - 38    AFVAL          0    0    0    0
3.02 38 - 68    40/50          0    0    0    0    GRADES
3.03 48 - 999   50/70          0    0    0    0       3
```

'Too small bud'

Also, often 'raw' roses are smaller than the 'good' roses.
The qualities 'raw' and 'too small bud' are therefore difficult to separate from each other.

Roses with too small buds can be passed to a shorter length grade.

☞   **Note!** The length difference in the bunching station must not be too large, otherwise processing in the station will be problematic.

The procedure is as follows:
Make the number of grades and their names identical to those of group 1.
It is especially interesting to grade out too small buds for the longer lengths.
Also the number of lengths that are passed can be different for each length.
The following table provides a realistic example.

Outlet	Length grade "Group 1"	Length grade with 'too small bud'
1	100 cm	-
2	90 cm	-
3	80 cm	100 cm 90 cm
4	70 cm	80 cm
5	60 cm	70 cm 60 cm
6		
7	50 cm	50 cm

This example prevents roses from the 100 cm grade with too small buds that are also too small for the 90 cm length grade winding up between the 'good' 90 cm grade roses.

The grading program for the above example is as follows.

```
GROUP1
1.01 47 -  57    50 CM        7    0    0    0
1.02 57 -  67    60 CM        5    0    0    0
1.03 67 -  77    70 CM        4    0    0    0
1.04 77 -  87    80 CM        3    0    0    0
1.05 87 -  97    90 CM        2    0    0    0       GRADES
1.06 97 - 999    100CM        1    0    0    0       6

TE KLEINE KNOP
9.01 47 -  57    50 CM        7    0    0    0
9.02 57 -  67    60 CM        5    0    0    0
9.03 67 -  77    70 CM        5    0    0    0
9.04 77 -  87    80 CM        4    0    0    0
9.05 87 -  97    90 CM        3    0    0    0       GRADES
9.06 97 - 999    100CM        3    0    0    0       6
```

14.1.3 ADJUST THE LIMIT VALUES FOR THE VARIOUS QUALITIES.

Group 2

The limit values for the various qualities are adjusted in menu C6.

```
[C6] SET QUALITY


  2   GROUP 2            MENU SELECTION
  3   RAW
```

In menu [C6] you can select the grade to be adjusted.
Then press 'enter'.

For instance, if you select 'group 2' the following will appear:

[C63]   GROUP 2

                                       SETTING LIMITS 0-200
30 CM   100   MORE SORTING OUT: HIGHER
40 CM   100   FEWER SORTING OUT: LOWER
50 CM   100
60 CM   100

The values under 'group 2' are the limits.
The value of the quality 'group 2' is adjust by length grade.
If the value of a rose is below the adjusted value, it is sorted out as group 2.
If the value is set lower, a lower number of roses travels to the 'group 2' grade.
The value is between 0 and 200.
If the limit value says 0, no further roses will travel to the 'group 2' grade.

'Mature' and 'raw' roses:

For, for instance, 'raw' the following will appear:

[C63]   RAW

                                       SETTING LIMITS 0-100
30 CM   60   MORE SORTING OUT: HIGHER
40 CM   60   FEWER SORTING OUT: LOWER
50 CM   65

The values under 'raw' are the limits.
If the value of a rose is below the adjusted value, it is sorted out as 'raw'.
The value of the quality 'raw' is adjusted by length grade.
If the value is set lower, fewer roses will travel to the 'raw' grade.
The value is between 0 and 100.
If the limit value is 0, no further roses will travel to the 'raw' grade.

The adjustments for 'extremely raw,' 'mature' and 'extremely mature' are handled in the same way.

'Too small bud'

Below are the limit values for the 'too small bud'.

[C63]   TOO SMALL BUDS

		SETTING LIMITS 0-100
70 CM	90	MORE SORTING OUT: HIGHER
80 CM	90	FEWER SORTING OUT: LOWER
90 CM	90	
100CM	90	

The values under 'too small buds' are the limits.
If the value of a rose is under the adjusted value, it is regarded as a 'too small bud' and the rose will be passed to the shorter length.
The value of the quality 'too small bud' is adjusted by length grade.
If the value is set lower, fewer roses will travel to the 'too small bud' grade.
The value is between 0 and 100.
If the limit value says 0, no further roses will travel to a shorter-length grade.

Realistic values are between 85 and 92.

14.2 QUALITY AND THICKNESS MEASUREMENT

In C3, the thickness measurement can be adjusted in the following quality groups:
- Group 1
- Group 2
- Too small bud

14.3 THE ROSE QUANTITIES TRAVELLING TO THE GRADES 'MATURE', 'RAW', 'TOO SMALL BUD', ETC.

Menu B3 can be used to check which lengths and qualities can make up the production.

```
[B3] VERIFY QUALITY
  GROUP 1
     30 CM            400            20.1 %
     40 CM            600            10.0 %
```

The screen above, for instance, indicates that 400 roses from the 30 cm length grade from group 1 have been graded. These 400 roses represent 20.1% of the total lot graded so far.

☞   **Note!** It takes quite some grading before the composition of the production can be established. A minimum of some tens of roses of a certain quality must have been graded before these numbers can be used to draw a conclusion concerning the adjustment of the quality.

☞   **Note!** Once the limit values for the qualities have been changed, the numbers of roses are erased so they can adapt to the new adjustment.

☞   **Note!** To check which roses can be sorted out as 'too small bud', use menu C1 to temporarily adjust the ejectors for all exits