

**DA-58**  
**Operation Manual**  
**of version VA.12 GB**

**Note :** VA.14 version include VA12 Version plus KO Tables permitting selection of IT or ST machines.

**April 1990**  
**DA580MGB.WP**

## DA-series Press Brake Controllers

### Description of Machine Parameters of DA-controllers.

#### Limited warranty

1. The DA-control has no safety provisions with respect to operator or machine.  
Application of the DA-control is totally for the responsibility of the customer. Safety measures must be taken outside the DA-control in order to guarantee a machine operator a safe operation, also in case of any malfunctioning of the DA-control.  
Delem can not be held responsible for eventual damages, caused directly or indirectly by the DA-control in normal operation or even when it fails to function according to its specifications.
2. Delem provides the manual "as is" without warranty of any kind, either expressed or implied; including but not limited to the particular purpose. Delem may make improvements and/or changes in the product(s) and or program(s) described in the manual at any time.

This manual could include the technical inaccuracies or typographical errors. Changes are periodically made in its information. These changes will be incorporated in new editions of the publication.

Requests for copies of this product and for technical information about the products can be made to Delem employees authorised to give this information.

#### **CAUTION:**

The product, as described, is equipped with a grounded plug for the safety of the user.

It is to be used in conjunction with a properly grounded receptacle to avoid electrical shock.

DA-58 OPERATION MANUAL

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## 1. OPERATION OVERVIEW

### 1.1. Operation modes

The DA-58 has the 4 following modes:



Manual mode



Programming mode



Automatic mode



Step by step mode

Each of these modes is selected with these frontpanel pushbuttons. The selected mode will be indicated with a LED indication in the pushbutton.

#### Manual mode:

In this mode it is possible to program all parameters of just one bending. After pushing the start button all parameters are active and the X-axis will go into position. It is also possible to move the axes manually.

#### Programming mode:

In this mode bend programs can be made or edited and also be written or read to or from the floppy disc, the external memory facility.

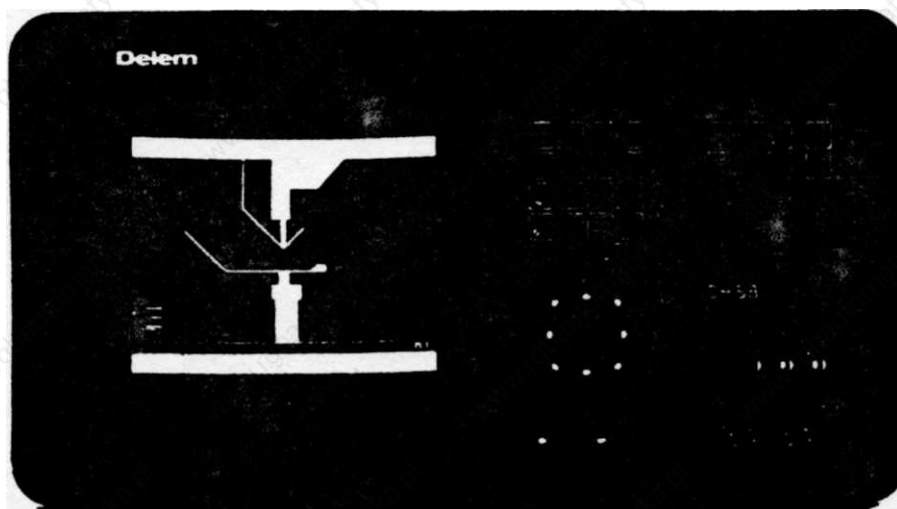
#### Automatic mode:

The selected program can be executed automatically.





#### Step by step mode:

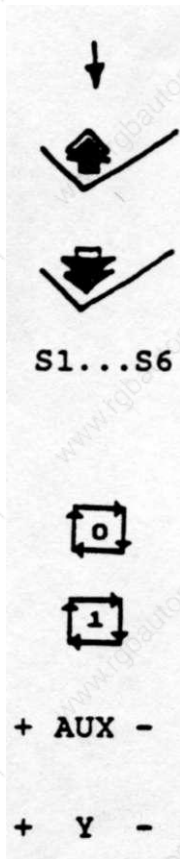
The selected program can be executed bend by bend.

## 1.2. Frontpanel



The pushbutton functions besides the 4 operation mode buttons:

0 through 9	Numerical keys
"."	Decimal point
"+/-"	Sign
	"Teach in" key
"?"	Help key
END	End of menu program
	Clear. . . ., Clearance of the input data field in the left lower corner on the VDU
	"Enter key" Data entering is always closed with enter-key
	Cursor "up" movement



Cursor "down" movement

Previous bend selection

Next bend selection

"Soft keys"

The function of these keys is stated at the bottom side of the VDU


Stop button

Start button

Manual control auxiliary axis

Manual control Y-axis

## 2. PROGRAMMING MODE

With the  key the programming mode is selected.

DELEM	
PRODUCT DRAWING.....:1	PUNCHES.....:7
PRODUCT EDIT.....:2	BOTTOM DIES.....:8
DATA PREPARATION.....:3	MACHINE UPSIDE.....:9
DATA EDIT.....:4	MACHINE UNDERSIDE.....:10
PRODUCT SELECTION.....:5	PROGRAM CONSTANTS.....:11
PRODUCT BACKUP.....:6	TOOL BACKUP.....:12

enter number: 0	0.1

Fig. 2.a

The programming possibilities are selected by entering the menu-number and pushing the enter key.

- 1 - PRODUCT DRAWING, to draw your product on the VDU-screen and compute the bendsequence (only with the bendcalculation option)
- 2 = PRODUCT EDIT, to make correction of your product and compute the bendsequence (only with the bendcalculation option)
- 3 = DATA PREPARATION, creation of a new program
- 4 = DATA EDIT, to edit a program
- 5 = PRODUCT SELECTION, to select a program out of the memory
- 6 = PRODUCT BACKUP, write programs to or read programs from the floppy disc. The floppy can be put into the slot on the rearside of the DA-58.

7 = PUNCHES, to program the dimensions of the uppertools

8 = BOTTOM DIES, to program the dimensions of the undertools

9 = MACHINE UPPERSIDE, to program the dimensions of the  
upperside of your machine.

10= MACHINE UNDERSIDE, to program the dimensions of your  
machine table

11= PROGRAM CONSTANTS, to program specific programming data

12= TOOL BACKUP, write or read tooling data and machine  
shapes to or from the floppy disc.

## 2.1\_\_Graphical programming

From the main menu you can select one of the programming possibilities.

In order to design or edit a new product in Menu selection 1 or 2, the bendcalculation option (OP-BCAL) must be installed. This option allows fast and simple programming with your DA-58.

The graphical programming option "OP-BCAL" is based upon the "PROFILE" software.

"PROFILE" is a complete product design tool that allows you to draw the profile of your product. "PROFILE" consists of a machine - and tool-library which allows you fast automatic, interactive or manual bending sequence computations with display of possible product/tool/machine collisions and developed length.

"PROFILE" provides you to select the most optimal bending sequence either to obtain minimum production time or manipulation possibilities of your product.

Features of the "PROFILE" design tool are:

- \* Graphical design of product shapes
- \* Auto scaling
- \* Horizontal and vertical projected dimensions can be entered
- \* Blank length computation
- \* Real scale tool design
- \* 100 different machines memory each with 10 different upper side shapes and 10 different under side shapes (tables)
- \* Changing of length and angles
- \* Bumping (big radius)
- \* Adding or deleting of angles
- \* Existing products can be copied, changed and be stored as a new product
- \* Product time indication
- \* Closing dimension or highest precision tolerance selection
- \* Connecting programs for 3D - production

"PROFILE" bending sequence computation

- \* Fast automatic computation for minimum production time
- \* Interactive bending sequence fixation
- \* Manual bending sequence fixation
- \* Collision visualisation of product with tools and machine
- \* Free tool and machine shape selections
- \* Assignments of turn times, backgauge speed etc.
- \* Bending sequence simulation
- \* Free selection of R-axis position

## Postprocessing of drawings

The postprocess facility computes:

- \* Fully automatic
- \* Machine adjustment such as:
  - Y-axis valve
  - Decompression
  - X-axis position
  - X-axis retract
  - Y-opening
  - R-axes
  - Z-axes

### 2.2. Product drawing / Product **edit**

With Menu selection 1 you can draw a new product.

With Menu selection 2 you can make changes in an existing product.

After selecting 1 in the program menu you will have page 1.1 on the VDU/screen. All input data can be found in the enter field in the lower left corner of the screen. On this page you have to enter first the product number and then the drawing number. This last input can be alphanumeric and depending on which letter, you have to press first S4 or S5.

The "+" key prompts a "/" character and the "." key prompts a "-" character in the drawing number.

<b>PRODUCT PROGRAMMING</b>		product nr: 11	
		drawing :	
<b>DRAWING NUMBER:</b>		<b>EXAMPLE</b>	<b>1.1</b>
		alphanumeric	alphanumeric

Fig. 2.2.a

After finishing this input you will get page 1.2 on which you have to enter specific product data. You can start drawing the product on page 1.3.

Selecting the edit mode in the program menu, you will get page 2.3 giving the drawing of the existing product. Via softkey S2 you can go backwards to page 2.2 for changing the product data like in page 1.2.

<b>PRODUCT PROGRAMMING</b>		outside dim. product nr: 11
		drawing :
THICKNESS.....TH= 1.00 mm		
MATERIAL.....M = 1	1= steel 2= aluminium 3= zinc 4= stainless 5= material 5 6= material 6	
LENGTH.....L = 200 mm		
DIMENSIONS out/inside Ø/1.....D1= 0		
TH= 1.00		<?> 1.2
		draw

Fig. 2.2.b

On these pages you can program/change the thickness, kind of material and length in the Z-dimension of your product. Every input must be finished by pressing the enter-key. Also you must specify whether the dimensions of your drawing will be inner or outer dimensions. The definition about inner (B) and outer dimensions (A) is given in figure 2.2.c

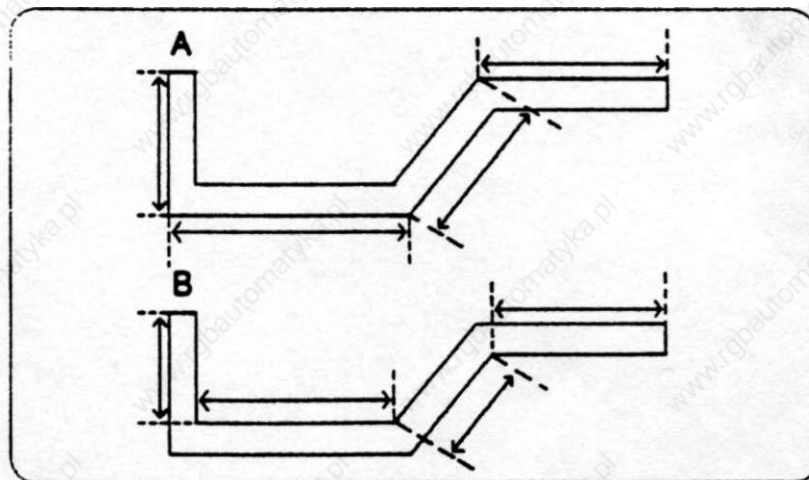


Fig. 2.2.C Inner/outer dimensions

On page 1.3/2.3 you can create/change the product drawing. In the upper information row you will find the information about product number, drawing number and inside/outside dimensions selection.

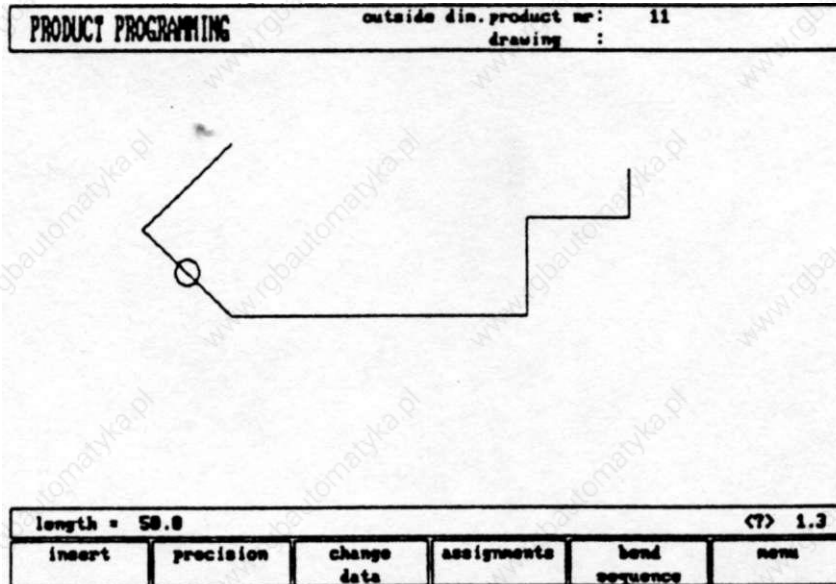


Fig. 2.2.d

For creating the product drawing you have to enter the length of a line and the angle to bend in figures or with help of the drawing cursor for angles of multiple 45 degrees.



## Horizontal or vertical projections

After you entered the length of the line interval you can specify if this line interval is either the nominal length, horizontal or vertical projection. The given length dimension in the enter field is the line length  $L$  if the drawing cursor is in the concerning line.

Horizontal projection with " " or >> key.

Vertical projection with " " or " " key.

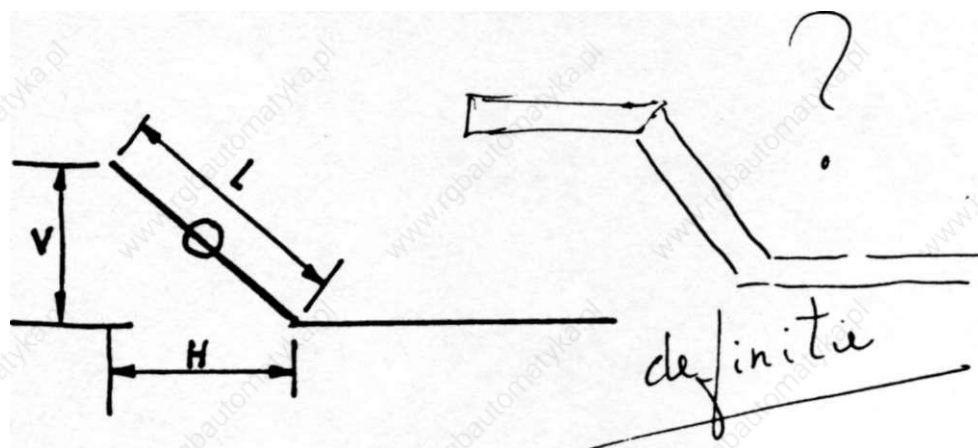


Fig. 2.2.e

$L$  is normal entered line length

$V$  is vertical projected line length

$H$  is horizontal projected line length

It will be noted on the screen if projection is not possible.

### Zoomfunction:

The zoomfunction is only active in the simulation drawing.

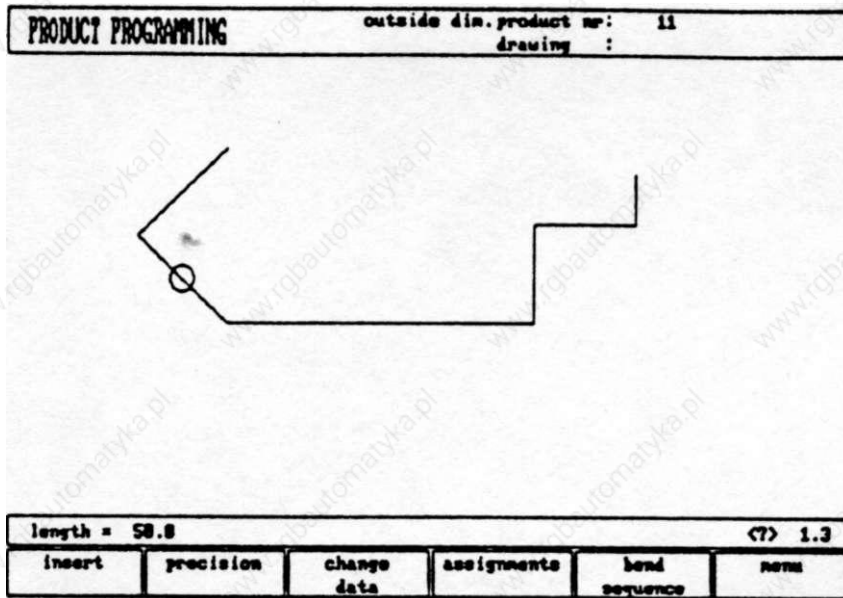


Fig. 2.2.f

Function keys:

paragraph

- |    |       |  |
|----|-------|--|
| S1 | 2.2.2 | Delete of an angle/line or insertion of an angle, depending on the drawing cursor position                                 |
| 82 | 2.2.3 | Precision: to define selected line segment, with round cursor, for high precision or if it is to be a "closing" dimension. |
| S3 | 2.2.4 | Change data:<br>To page with product data (page 1.2/2.2)   |
| S4 | 2.2.5 | Assignments:<br>To select assignments for bending sequence computations  |
| S5 | 2.2.6 | Bend sequence program  |
| S6 |       | Return to selection menu   |

These functions will be explained in the paragraphs as indicated in the abovementioned overview.

### 2.2.2 Delete of an angle/line or insertion of an angle (S1)

The function of this softkey is depending on the position of the drawing cursor.

- If the cursor is within a line segment, it is possible to insert a new angle to bend.
- If the cursor is positioned on an angle, it is possible to delete that angle.
- If the cursor is at an end line of the product, the line can be deleted.

### 2.2.3 Precision selection (S2)

When the drawing cursor (small circle) is in a line segment, with S2 high precision or closing dimension can be selected.

With S2 these functions will be toggled giving 3 possibilities (high precision - closing dimension - normal situation)

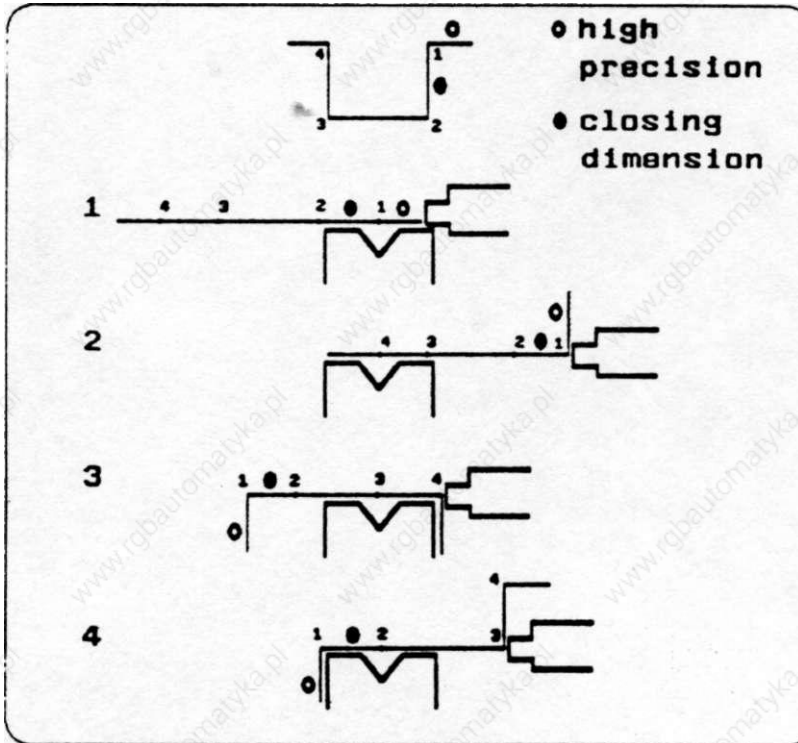
- High precision (marked green) :

At bend sequence computation the backgauge stop position will be chosen to get the highest possible precision of this line interval.

- Closing dimension (marked red) :

At bend sequence computation the backgauge stop position will be chosen to get the resulting tolerances in this line interval.

Example:



Line interval marked with the open circle is never between back stop and the centre of the die.

Notes:

Specifying line intervals with high precision and closing dimensions may result in longer production time. Also it will have priority over the "front extend ratio", if that is selected to "comply if possible".

### 2.2.4 Big Radius (Bumping)

When the cursor is on an angle you can select a big radius by pressing function key S2. After pressing S2 you are prompted to program the following parameters.

radius = the desired radius in mm  
tolerance = the allowed tolerance in mm

A smaller tolerance will result in more bendings necessary to realize the radius. The V-die opening which must be used to realize the big radius is decreasing when a smaller tolerance is specified. For the tolerance definition see figure 2.2.4.a.

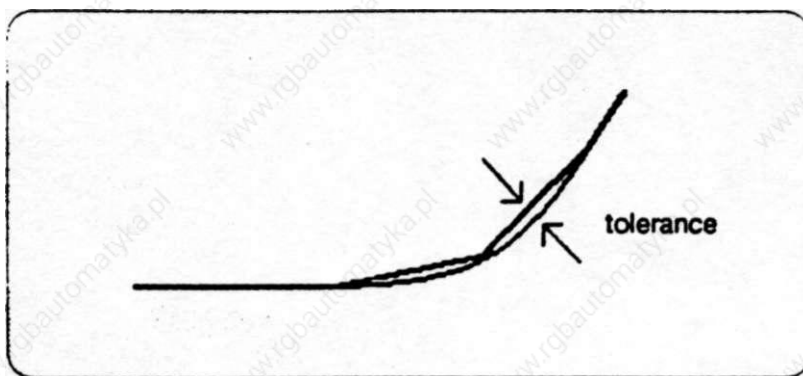


Fig. 2.2.4.a

For the definition of the line lengths to be programmed in the part connected to a bump radius segment, see figure 2.2.4.b.

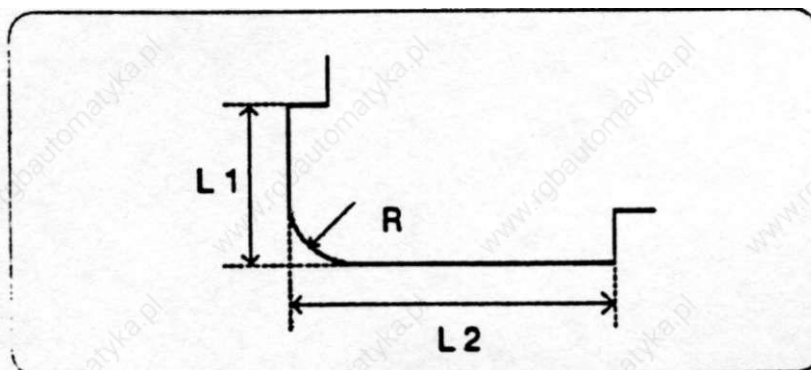


Fig. 2.2.4.b

Lengths L1 and L2 must be equal or bigger than the radius R. After programming these parameters the radius is drawn in the product and the maximal V-die opening which can be used is displayed on the screen.

When the cursor is on a radius and S2 is pressed again the radius will be deleted and changed back to a single angle (toggle function). For the screen information see figure 2.2.4.C

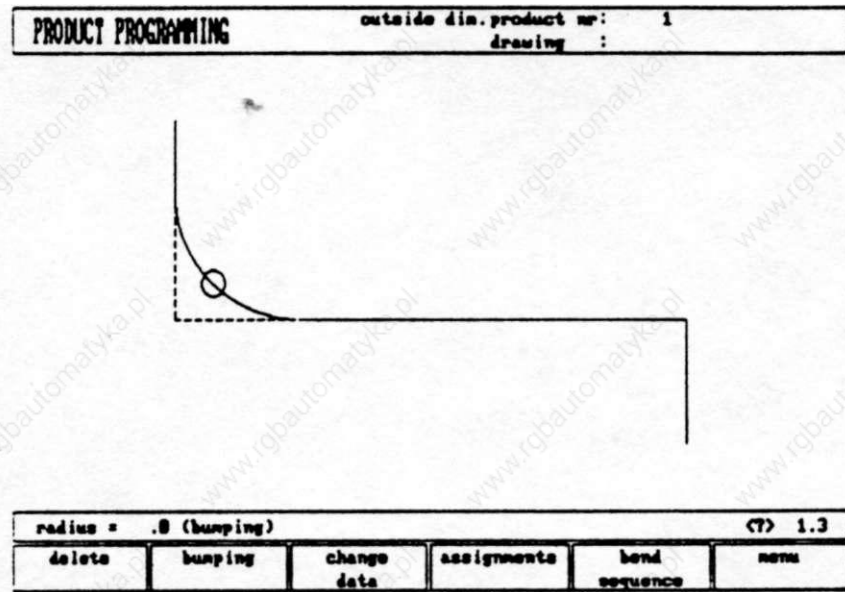


Fig. 2.2.4.C

### 2.2.5 Product data (S3)

Pressing S3 results in the product data overview of page 1.2/2.2. On that page you can return to the drawing again via softkey S6.

### 2.2.6 Assignments (S4)

Pressing S4 on page 1.3/2.3 results in the parameter pages starting on page 1.5/2.5.

Automatic bend sequence computation works with several criteria in order to find an optimum between a minimum production time, handling possibilities without product/machine and product/tool collision.

In order to find one of the optimums you must program several computation parameters with which the bend sequence can be computed.

Some of these parameters are machine related, axis speeds a.o. and some are related to handling possibilities and turn times.

Page 1.5/2.5 gives the first page of these assignments.

BEND SEQUENCE COMPUTATION ASSIGNMENTS					
OPTIMALISATION DEGREE.....OB= 2					
range 1-5    1 lowest degree of optimisation,fastest computation 5 highest degree of optimisation,less fast computation					
X-AXIS SPEED.....XS= 200    mm/s					
R-AXIS SPEED.....RS= 50    mm/s					
FRONT EXTEND RATIO.....FR= .38					
minimum allowable ratio: length in front / total product length.					
FRONT EXTEND RATIO ACCEPT....FA= 0					
0: comply if possible 1: comply always					
OB=2					1.5
previous page	next page				draw

Fig. 2.2.6.a

parameter explication (page 1.5/2.5)

OPTIMALISATION DEGREE . . . . .OD=

Range 1-5

The number of alternative sequences to be computed for each bending must be entered here.

The higher this number the more alternatives are to be examined by the processor, so the longer the computing time will take.

X-AXIS SPEED. . . . .BS=

Speed of the backgauge of your press brake

R-AXIS SPEED. . . . .RS=

Speed of the R-axis fingers

FRONT EXTEND RATIO . . . .FR=

This is the ratio of the minimum allowable length of your product which extends in front of the press to the total blank length of the product. You must have a minimum length of your product in front of the press to be able to handle the product. Max. possible value = .49

FRONT EXTEND RATIO ACCEPT . . . .FA\*

- In case programmed 0 (comply if possible) :

This means that when possible the computer tries to comply to the front extend ratio and only when this will result in no solutions to be found it will accept that the length in front is smaller than the specified ratio.

- In case programmed 1 (comply always) :

The computer will always comply to the front extend ratio. This may result in no solutions to be found.

Softkey functions;

S1 = previous page

S2 = next page

S6 = draw, to go back to the drawing on page 1.3/2.3

Parameter explication (page 1.6/2.6)

Backgauge possibilities

BEND SEQUENCE COMPUTATION ASSIGNMENTS					
BACKGAUGE POSSIBILITIES					
BACKSTOP AGAINST SHARP ANGLE ALLOWED...SA= 1					
BACKSTOP-DIE, INTERMEDIATE BEND.....IB= 1					
0: permitted					
1: avoid					
2: if unavoidable permitted					
3: prohibited					
EDGE TOLERANCE.....ET= 3 °					
90 DEGREE TOLERANCE.....CT= 3 °					
LAY ON BACKSTOP LIMIT.....BL= 9999.8 mm					
SA=1					1.6
previous page	next page				draw

Fig. 2.2.6.b

BACKSTOP AGAINST SHARP ANGLE ALLOWED. . . . .SA=

- 0 if not allowed
- 1 if allowed

Specify if backstop may be placed against an angle smaller than 90\*.

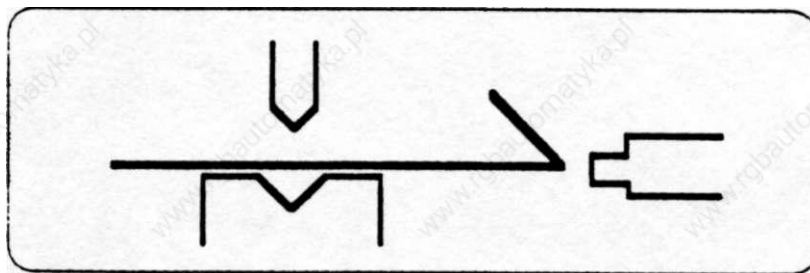


Fig. 2.2.6.C

BACKSTOP DIE. INTERMEDIATE BEND. . . . .IB=

Set to allow if there may be a bend between the die and backstop.

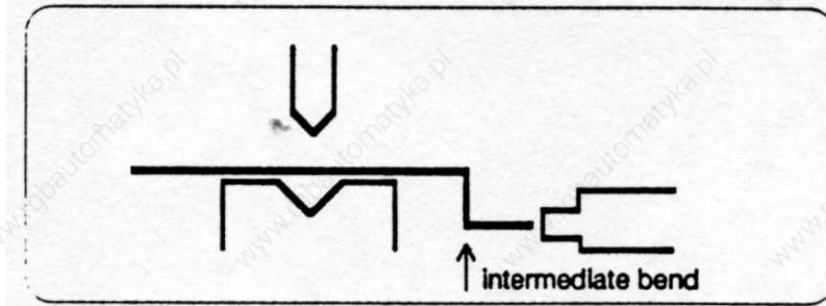


Fig. 2.2.6.d

Selection possibilities:

0 - permitted

1 = avoid

tries to avoid with low priority

2 = if not avoidable permitted

if it results that no solutions are to be found, than it is permitted

3 = prohibited

never allowable

EDGE TOLERANCE. . . . .ET=

In case backstop is against flat plate an angle tolerance is allowed (deviation from horizontal). To be programmed in degrees of tolerance (0 - 90\* input)

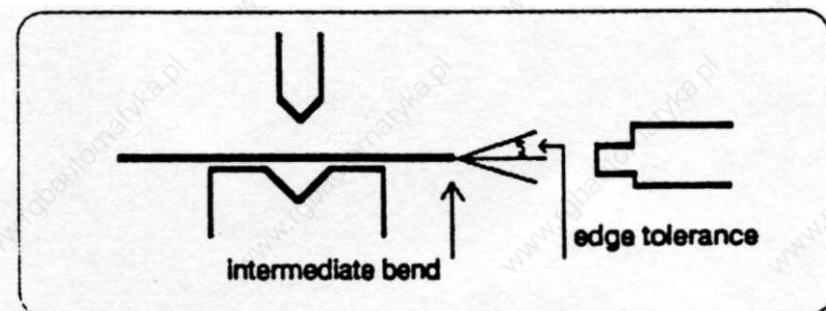


Fig. 2.2.6.e

90 DEGREE TOLERANCE . . . . .CT-

Backgauge against bended angle which is not 90 degrees  
max. allowance deviation from vertical. (0 - 90\* input)

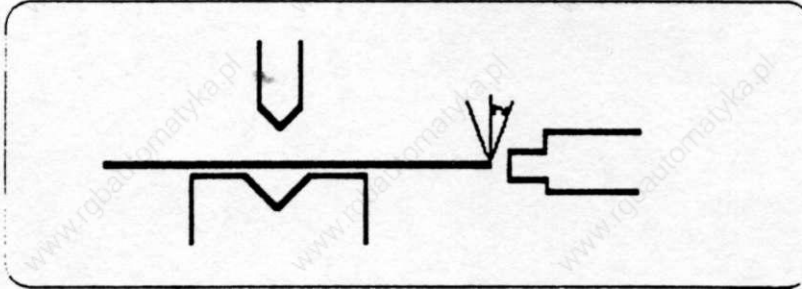


Fig. 2.2.6.f

LAY-ON BACKSTOP LIMIT . . . . .BL=

When the length of the plate at the backside of the machine is greater than this limit, the X-axis and R-axis positions will be corrected automatically so the plate will rest on the backgauge finger. (0 - 9999.9 mm)

This is only possible if an automatic R-axis is enabled.

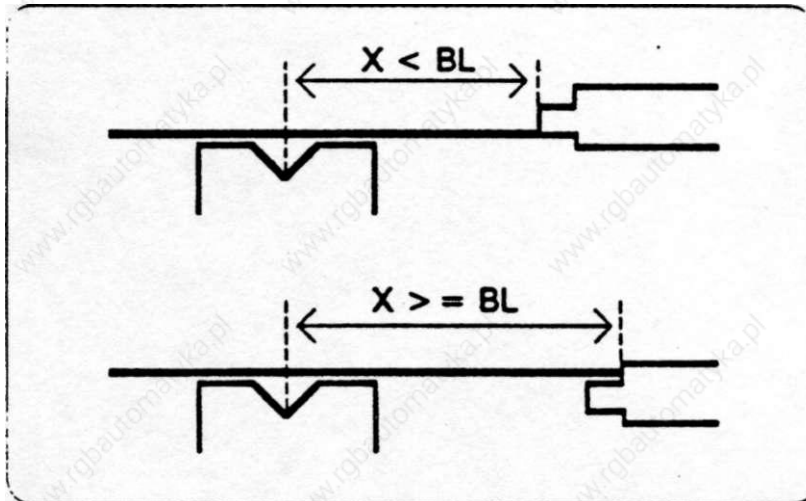


Fig. 2.2.6.g

Parameter explication (page 1.7/2.7)

BACKGAUGE DIMENSIONS

The backgauge finger will be drawn with certain standard dimensions of which 4 can be changed. With these finger dimensions the R-axis movement and work/backgauge collision can be computed.

BEND SEQUENCE COMPUTATION ASSIGNMENTS					
BACKGAUGE DIMENSIONS					
FINGER HEIGHT.....FH= 18.8 mm					
FINGER LENGTH.....FL= 48.8 mm					
GAUGE HEIGHT.....H1= 38.8 mm					
GAUGE HEIGHT.....H2= .8 mm					
FH=18.8					1.7
previous	next				draw
page	page				

Fig. 2.2.6.h

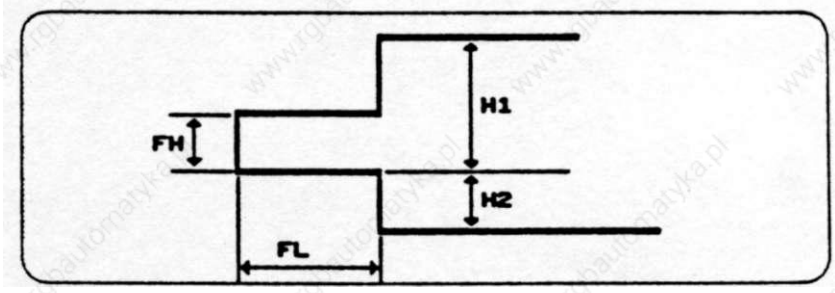


Fig. 2.2.6.i

Parameter explication (page 1.8/2.8)

CRITICAL DIMENSION BOUNDARIES

Turning of your product takes production time. This time depends upon the length and width of your product.

For a relative small product (in Z-direction) a top-bottom turn can be done quickly. But a relative small product which is long (in x-direction) needs some longer time to turn from front to back or in a combination turn.

The turn time can be set in a table in seconds. For this purpose there are 4 length intervals (3 boundaries) each with a specific turn time depending on the type of turn. Like the turn times you also can set the length limit boundaries.

The turn times must be entered for each of your specific products, because they also will change with the shape of the product.

BEND SEQUENCE COMPUTATION ASSIGNMENTS				
CRITICAL DIMENSION BOUNDARIES.				
BOUNDARY1.....B1= 100 mm				
BOUNDARY2.....B2= 500 mm				
BOUNDARY3.....B3= 1000 mm				
DELAY TIMES FOR PRODUCT TURNS (sec)				
critical dim. [mm]:	< 100	100 - 500	500 - 1000	>1000
TOP BOTTOM TURN critical dim. z	T1= 1	T2= 3	T3= 8	T4= 12
FRONT BACK TURN largest of x and z	F1= 1	F2= 3	F3= 8	F4= 12
COMBINATION TURN critical dim. x	C1= 1	C2= 3	C3= 8	C4= 12
B1= 100				1.0
previous page	next page			draw

Fig. 2.2.6.J

Parameter explication (page 1.9/2.9)

SPEED Y-AXIS

On page 1.9/2.9 the several Y-axis speeds must be programmed.  
The Y-axis speed values are important for production time calculations.

BEND SEQUENCE COMPUTATION ASSIGNMENTS					
Y SPEEDS					
CLOSING SPEED.....CS= 88 mm/s					
PRESSING SPEED.....PS= 8 mm/s					
OPENING SPEED.....OS= 50 mm/s					
BLANK LENGTH COMPUTATION					
RADIUS FACTOR BLANK LENGTH...RF= 1.00					
RADIUS FACTOR X-AXIS.....AF= 1.00					
CS= 88		1.9			
previous PAGE	next PAGE				draw

Fig. 2.2.6.k

BLANK LENGTH COMPUTATION

After postprocessing, the DA-58 calculates the developed length of your product and the bend allowance. Important for the developed length calculation and the bend allowance is the inner radius of the bends. For each of these computations a correction factor can be programmed (RF and AF).

- RADIUS FACTOR BLANK LENGTH . . . . .RF=

The computed inner radius is multiplied by this factor to correct the total developed length of the product. The initial value of RF is 1.

- RADIUS FACTOR X-AXIS POSITION . . . .AF=

The computed inner radius is multiplied by this factor to correct the X-axis position in order to have a correct product dimension after each specific bend (bend allowance). This factor can be checked by making a product with just one bend and a certain product dimension e.g. 100 mm (outer dimension). See figure 2.2.6.1.

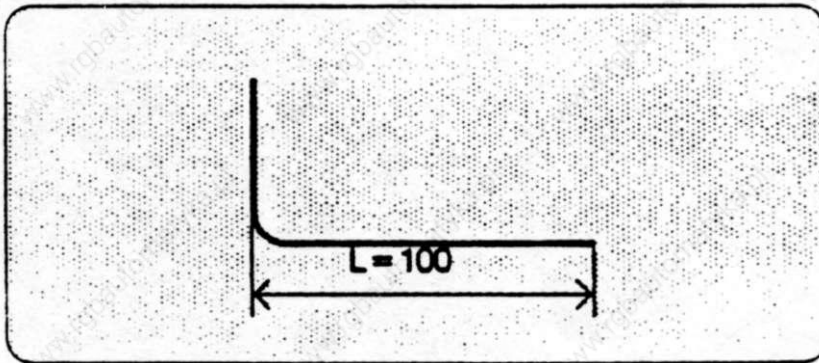


Fig. 2.2.6.1

Fig. 2.2.6.1

The DA-58 computes the X-axis position necessary to obtain L=100 as shown in fig. 2.2.6.1.

The accuracy of the length L is dependent on the material parameters like thickness, strength and kind of material. In order to have a correction possibility with the radius factor AF you can now optimise this computation.

RF and AF do not influence each other. It is recommended that first you optimise the AF factor for your product and thereafter find the correct value for the developed length correction RF.

### 2.2.7 Bend sequence (S5)

After completion of your drawing, with function key S5 you select the "bend sequence" mode.

This results in page 1.4/2.4 asking first to enter the number of machine underside, die, machine upperside and punch.

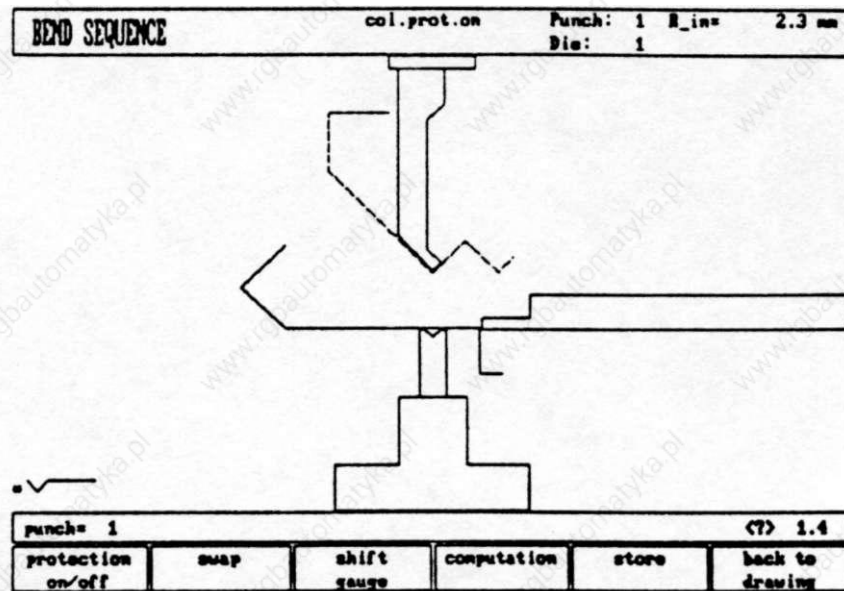


Fig. 2.2.7.a

If the number entered is not known, the DA-58 prompts the sign "not programmed".

You have to program the machine parts and tools before you can compute the bend sequence. Programming can be done via the respective selections in the program menu.

In your machine and tool library you can program 10 different machine upper sides (see paragraph 2.7), 10 different machine under sides (tables, see paragraph 2.7), 60 different dies (see paragraph 2.6) and 30 different punches (see paragraph 2.5). One of each must be selected, and can also be changed during the bending sequence determination. In the lower left corner of page 1.4/2.4 these selections are prompted on at the time.

After specifying machine part and tools the product and machine will be drawn on the screen (page 1.4/2.4)

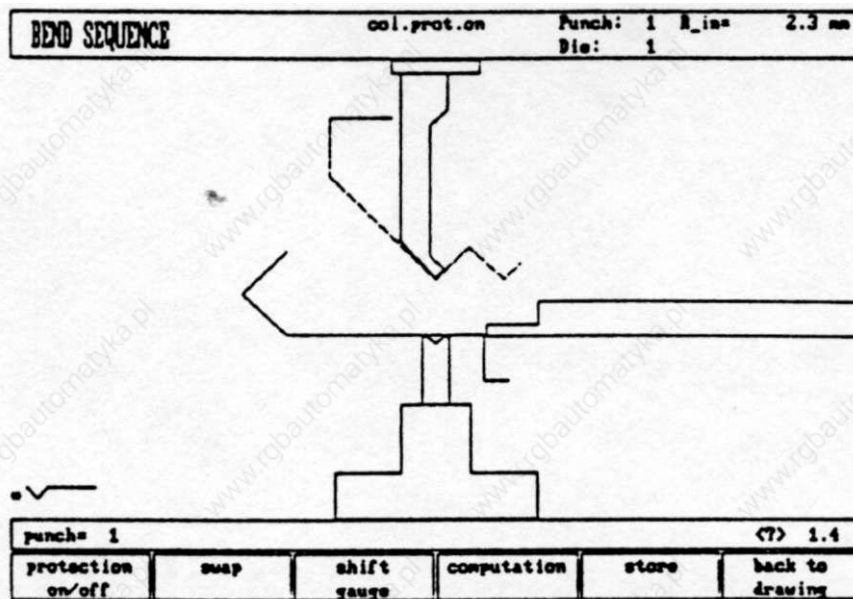


Fig. 2.2.7.b

The product, as you had it drawn, is placed directly under the punch, at one of the last bending positions possible. The shape of your product before this last bend is placed on top of the die.

With the cursor key's ( , ) and the "S2" function key you can select any of the other bendings which you prefer to be the last bending.

The bends possible are indicated with the round cursor.

If the product has collision with the tools or machine it will be indicated via a warning message on the screen. With function key "S1" you can switch the collision protection check on or off. This is indicated at the top of the screen. When you have selected collision "off" you can also select other bends which will give collision with the tools or machine parts. The inner radius resulting after this bend is displayed at the top of the screen.

In this drawing you can make use of the zoom-functions with help of the | and | keys.

After pressing "unbend" the position of the bending is indicated by a small circle, see figure 2.2.7.C  
A bigger circle on an angle indicates that this bending is also possible without collision.

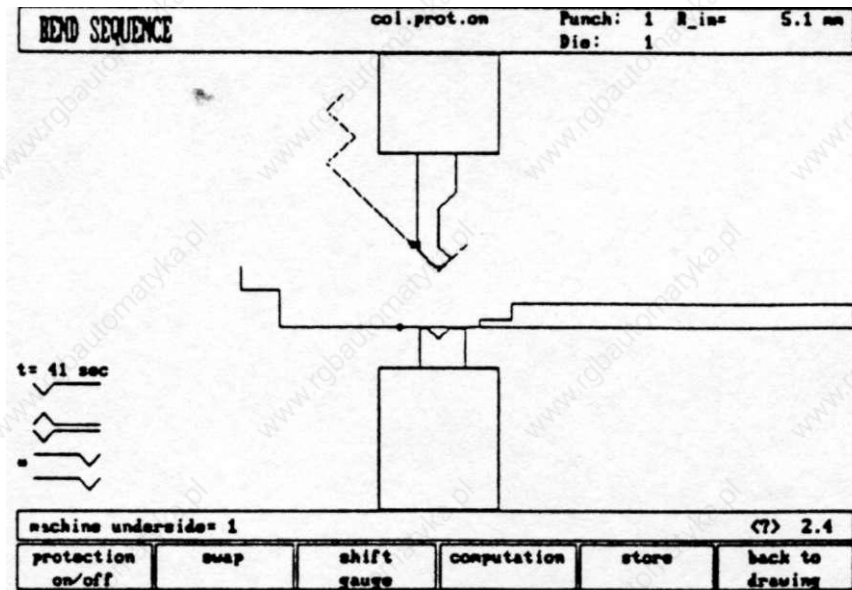


Fig. 2.2.7.C

Note:

A big radius (bumping) is shown during bend sequence computation but is treated as a single bending.  
The CNC-data of the bendings necessary to produce the radius are computed during postprocessing.

The bendsequence computation can be activated from the last bending upwards to the first, but it is also possible to activate for instance the last 2 bendings manually and to compute the optimal bendsequence for the rest of the bendings. This computation will start from the bending indicated with an asterix. With this possibility and with help of the swap function you can compute several possibilities. When the computation has been finished, you can compute the CNC program by pushing the S5 key. The CNC program is thereafter automatically stored in the memory.

### Restoring a bend sequence

A (partly) determined bend sequence is no longer automatically reset after leaving the bend sequence menu. After you re-enter the bend sequence menu it is possible to continue with the existing bend sequence.

If you re-enter the bend sequence menu you have the following options:

- S1= start new bend sequence,  
the existing bend sequence is reset
- S3= continue with current bend sequence  
the existing (partial) bend sequence is restored and shown on the screen

If you have loaded a drawing from which a postprocessed bending program already exists, there is a third option when you enter the bend sequence menu:

- S2= restore bend sequence from postprocessed program,  
the bend sequence is restored from this postprocessed bending program and shown on the screen

If you have drawn a new product in the menu "Product drawing" and you enter the bend sequence menu for the first time, there is no existing bend sequence and postprocessed program yet, these previously mentioned selections are not shown.

### Minimum X-axis dimension

The minimum possible bending length will be calculated from the V-opening parameter ( $1/2 V$ ), but also depends on the angle to bend and the thickness of the material to be bend, see figure 2.2.7.d. If the programmed value for the wanted product does not correspond with the minimum possible length, you will get a warning message on the screen.

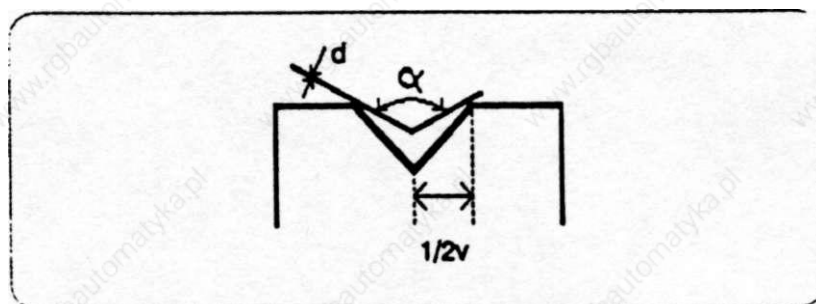


Fig. 2.2.7.d

### Machine/Tool selection

At each bend you can select one of the tools or machine shapes which are present in your library. In the lower left corner you can enter a number. The displayed number is the number of the tool and machine part which is presently selected. Entering a new number will select another tool or machine part which will be drawn directly on the screen.

With the "enter" key you can toggle between punch-, die-, machine upper- and lower partnumber.

It is also possible to turn the punch and die with respect to the machine shapes. To achieve this, the toolnumber must be programmed negative.

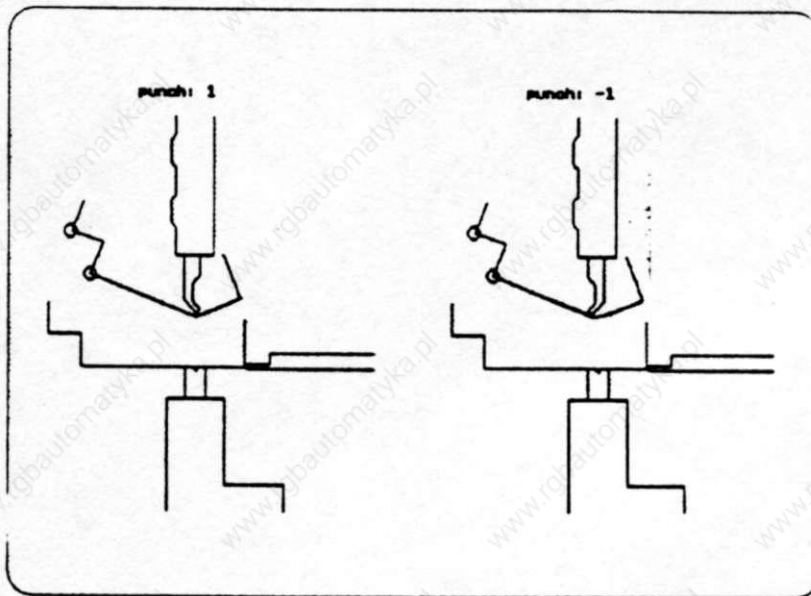


Fig. 2.2.7.e

### Turn indication

In the lower left corner a bend turn indication is displayed at each bend of bend sequence.

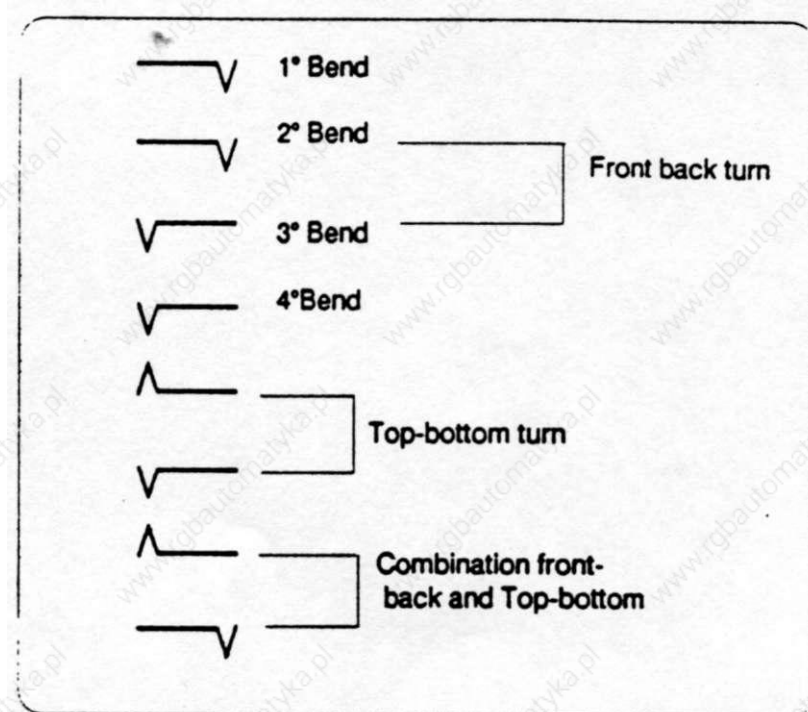


Fig. 2.2.7.f

The asterix indicates which bend is presently displayed.

### Production time

At the top of the turn information (before the first bend) the total production time is indicated.

This time is calculated from the following settings:

- X-axis speed
- Y-opening
- R-axis speed
- Turn time programmed in the turn time table of the assignment

With automatic bend sequence computation the DA-58 tries to find the minimum production time.

**Screen data**





On top of the screen some general important data are displayed.

Col.prot.on	Collision and backgauge checks on or off
Punch: 1	Punch number selected
Die: 1	Die number selected
R-in =1.3	Inner radius of the bend to be obtained with selected die

**Function- and control keys**

S1	Protection on/off	Collision protected on/off
S2	Swap	Front to back turn of product
S3	Shift gauge	Select backgauge position
S4	Computation	Computation of bend sequence The sequence calculation starts from of the bend number presently selected. This feature gives you the unique possibility to fix the bending sequence interactively, e.g. partly manual partly automatic.
S5	Store	Automatic computation of all axes positions (complete CNC program)
S6	Drawing	Back to drawing on page 2.2

**Control keys:**

	Zoom enlargement
	Zoom reducement
	Next bend
	Previous bend

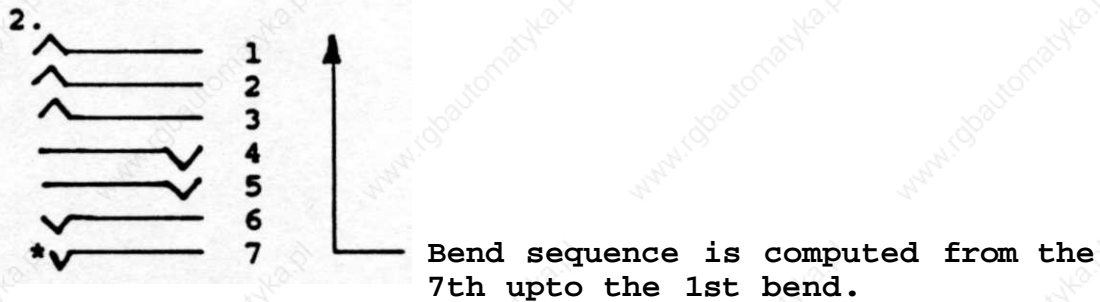
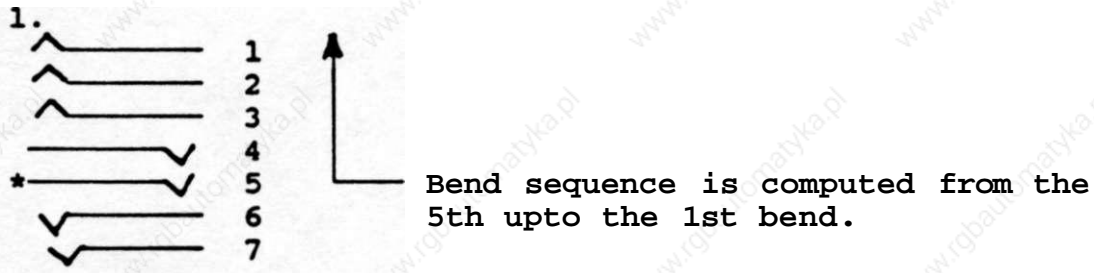
Bend sequence computation (S4)

With function key S4 on page 1.4/2.4 the bend sequence can be computed automatically.

The computation is done only with one set of tools. These are the tools selected at the last bend.

The computation of the bend sequence starts always at the bend which is indicated with the \* at the lower left corner of the screen. (Page 1.4/2.4)

Example: Product with 7 bends



In the first example the bend no. 7 and no. 6 are chosen manually, from 5 upto 1 thereafter are computed automatically,

In the second example the complete bend sequence is computed (7 upto 1).

During the computation all assignments are important so you must be sure before starting the bend order computation that all assignments are set correctly.

**Store (S5)**

**After you have completed the bend sequence a CNC-program can be generated.**

**In order to start the computation you must push S5 "store". This will generate the CNC-program. This generated program will be stored in the DA-58 program memory.**

Data preparation/Data, edit

After selecting number 3 in the program menu, page 3.1. is on the VDU-screen.

The Data edit mode is selected via number 4 in the program menu, resulting in page 4.1. on the VDU-screen.

In the data preparation mode you can program a new CNC program. In the date edit mode you can make corrections in an existing program. Programming and changing data is done in the same way for both modes.

For editing a certain program which is not actual, you must first select that program by selection 5 in the program menu. In the given list, you have to select the wanted programnumber.

<b>DATA EDITING</b>		product nr: 11
		drawing :
ANGLE SEL.....ng=	1	0= absolute 1= a
THICKNESS.....TH=	1.00 mm	
MATERIAL.....N =	1	1= steel 2= aluminium 3= zinc 4= stainless 5= material 5 6= material 6
BLANK LENGTH.....L =	310.0 mm	
CONNECT.....CN=	0	
ng=1		4.1
	first bend	menu

Fig. 2.3.a

This page gives all data which are the same for every bending of the program (main data of program).

With the I and | keys the cursor can be placed at one of the parameters.

The value entered for the selected parameter appears in the entering field, situated in the lower left corner.

The input can be cleared by pressing the clear button. New input data can be given now. Data has to be given to be able to continue programming.

After pressing the enter key this data will be placed at the corresponding parameter.

**Softkey functions:**

Pushing softkey S2 "(First bend) results in the page with the first bend information.

Pushing softkey S6 will result in finishing the data preparation and returning to the program menu.

2.3.1. Parameters explication (Page 3.1,/4.1.)

ANGLE SELECTION. . . . . ma = 0 = absolute  
1 = angle programming

Selection of the programming mode for the Y-axis.

0 = Y-axis bending position in absolute dimensions

1 = Y-axis in direct angle programming

THICKNESS. . . . . TH = mm

Thickness of the plate in millimeters.

MATERIAL. . . . . M =

Selection of one of the following preprogrammed materials, which are used to calculate the bending depths.

1 = Steel

2 = Aluminium

3 = Zinc

4 = Stainless steel

5/6 - Materials definable by the user, which tensile strength and e-module are programmed under the program constants.  
(Menu nr. 11)

BLANK LENGTH. . . . . L = mm

Developed length of the workpiece.

CONNECT. . . . . CN =

The parameter "connect" is to have a possibility to connect certain programs to one another. This option can be used to produce 3-dimensional products.

After pushing the enter key or key i when the cursor is at the connect parameter, the page will turn over to page 3.2/4.2 which gives the first bending of the program.

To determine the bend sequence of a 3D-product perform the following steps:

- Make a drawing of the product in one direction in the menu "product drawing".
- Determine the .bend sequence of this product and compute the bending program (postprocessing).
- Make a drawing of the other direction of the product. Determine the bend sequence and compute the bending program.

Now you have two bending programs, one for each direction. These two programs must be connected. In order to do this perform the following steps:

- The program which corresponds with the direction which must be bended first must be selected in the menu "Product Selection".
- Go to "Data Editing"  
There is the parameter:

CONNECT.....CN=

The value must be programmed with the program number of the other direction.

- Go to "Product Selection" and select the second program. Program the parameter CONNECT in "Data Editing". The value programmed must be the program number of the first direction.

To produce this product perform the following:

- Select the first program in "Program Selection"
- Select the operation mode "Automatic"
- Program a value for the stock count (if needed)

Now you can press the start button and start producing. After the first program is completed the second program will be loaded automatically. The stock count will be decreased after both programs are executed one time.

### 2.3.2. Bending programming

The parameters of one bending are divided over 2 VDU pages (Page 3.2/4.2 and page 3.3/4.3).

<b>DATA EDITING</b>		bending no: 1	product nr: 11
		drawing :	
punch.....	UP=	1	
die.....	UN=	1	
length.....	BL=	288	mm
<b>ANGLE.....<math>\alpha</math> = -98.88 °</b>			
opening.....	DY=	18.8	mm
<b>BACKGAUGE POSITION.....X = 56.2 mm</b>			
opening.....	DX=	.8	mm
code.....	CX=	8	
$\alpha$ = -98.88		(<?) 4.2	
previous bend	next bend		all bends
			end

Fig. 2.3.2.a

The bending number, product number and drawing number are displayed in the top row on the screen, the function of the "softkeys" in the bottom row.

Softkey functions:

S1 = select previous bend

S2 = select next bend

S5 = to the listing of all bends of this program (page 3.6)

S6 = to end data preparation by giving at page 3.5/4.5 the program a program number and drawing number

Parameter explication (page 3.2./4.2.1)

Punch	UP = Number of punch in library
Die	UN - Number of die in library
Length	BL = Length of plate between tools
Angles	a = Angle to bend
Opening	DY = The opening distance above the mute point, resulting in a certain gap opening between punch and die after this bending.
Gauge position	X - Backgauge position When a negative sign is programmed this backgauge dimension is an incremental dimension. The incremental dimension is subtracted from the actual X-axis position.
Gauge opening	DX = Opening position of backgauge during the bending. The "backgauge retract" is started at the pinching point of the plate.
Gauge code	CX = 0 = Bending number change at bending position of punch (next bend parameters active) 1 = Bending number change at muting position movement during opening 2 = Bending number change at upper dead point 3 = Bending number change at upper dead point with dwell time of 3 seconds 4 through 9 = dwell time 4 through 9 seconds 10 = waiting of punch at pinching point until backgauge is in-position after retract (DX). This code can be combined with codes 1 - 9 !

**Example :** Code = 11 is bending number change at muting point and waiting of the punch at pinching until gauge is at retract position (DX).

Parameter explication (page 3.3.74,3.)

Auxiliary functions of the bending can be programmed on this page.

DATA EDITING		bending no: 5	product nr: 11
		drawing :	
repetition.....CY=	1	angle number.....AM=	5.1
bottoming...BS=	0	backgauge number..XN=	6
	0 = air bend	machine upperside.M1=	1
	1 = bottoming	machine underside.M2=	1
speed.....U =	20.8 mm/s		
force.....F =	1 ton		
dwel time...T =	.1 sec		
decompres...DC=	.00 mm		
paralell....PA=	.00 mm		

CY= 1		C? 4.3	
previous bend	next bend	all bends	end

Fig. 2.3.2.b

- Repetition            CY =  
                           0 = bending is skipped  
                           1 through 99 is the number of times this bending will be repeated
- Bottoming            BS =  
                           0 = normal airbend  
                           1 = bottoming operation of the bend  
 Note: When bottoming operation is selected, the end of bend position of the Y-axis beam is depending on the working tonnage. If however the force is sufficient for the beam to go to the calculated Y-axis end of bend position, the beam stroke will be limited by the position value.
- Speed                V - Working speed (pressing speed)
- Force                P = Max. adjusted tonnage during pressing (auto calculated)
- Dwell time            T = Holding time of punch at bending point
- Decompress          DC = Decompression stroke after bending to release the working pressure
- Parallel              PA - Difference of left- and right hand side cylinder (Y1 and Y2).  
                           When positive right hand side lower.  
                           When negative right hand side higher.  
                           The programmed value is active below the clamping point.

**Note:** After selecting a new bend this will be a copy of the preceding one; You only have to programm those parameters which are different from the preceding bend.

Rang order number of bend counted from left to right (fig. 4.7)

Backgauge number...XN = Rang order number of backgauge stop position. Counted from left to right starting with 0 (fig. 4.7).  
If the plate must rest on the backgauge finger, add 100 to the XN value.

Machine upperside M1 -

Machine underside M2 = The machine number part which is used to make this product and has been drawn in the machine part library.

When the last 4 parameters are programmed it is possible to simulate the product bend in automatic mode by means of grafical simulation facility.

**Example:**

Product to make

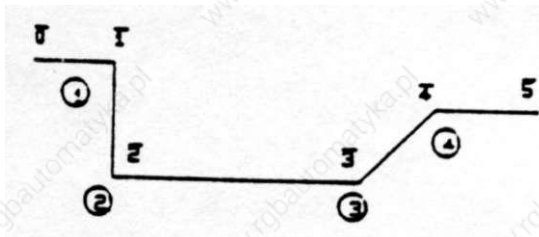


Fig. 2.3.2.c

0 to 5 are possible backgauge positions.

1 to 4 are angle numbers.

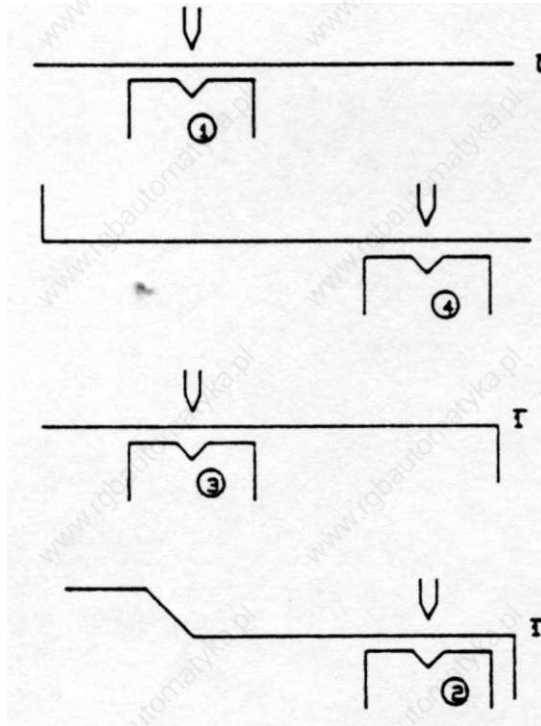


Fig. 2.3.2.d

Bend	Angle (AN)	Backgauge (XN)
1	1	0
2	4	5
3	3	1
4	2	1

When in, for example, the 1st bend the plate must rest on the backgauge finger, see table below for programming values.

Bend	Angle (AN)	Backgauge (XN)
1	1	100
2	4	5
3	3	1
4	2	1

List of bendings of the prepared program (Page 3.6./4.6)

DATA EDITING		bending no: 4		product nr: 11	
		drawing :			
material:STEEL		thickness: 1.00			
Nr	CY	tools	length	-Y-	-X-
1	1	1/ 1	200	-90.00 *	56.2
2	1	1/ 1	200	90.00 *	48.7
3	1	1/ 1	200	135.00 *	49.7
4	1	1/ 1	200	90.00 *	38.7
5	1	1/ 1	200	90.00 *	18.7

					4.6
insert bend	delete bend				back to bend

Fig. 2.3.2.e

Pressing S5 in the data preparation mode will result in a complete overview of the bendings programmed. After pushing S6 the page will be restored from which this page was selected, with the cursor on the parameter selected before. A specific bend can be selected on the screen by putting the highlighted bar on that bend, then pressing S6.

Softkey functions:

S1 = Insert bend. To insert a new bend between one of the bends, select with the cursor keys first the bend after which a bend must be inserted. Then push S1 for inserting, results in a new bend which is a copy of the previous one.

S2 = Delete bend. To delete a bend of the program first select this bend with the cursor (highlighted bar). Then push S2 for deleting.

In the overview you get information, from left to right, about:

- The bendnumber (N\*)
- Repetition of that bend (CY)
- Selected tools (punch/die)
- Length of the plate
- Angle to bend (Y) with an indication for Airbend (•) or bottoming (^)
- Backgauge position (X)

Ending data preparation/data editing (Page 3.5/4.5)

After pushing the S6 key on page 3.2/4.2 or 3.3/4.3, page 3.5/4.5 appears. At this page the program number and the drawing number must be given to the new prepared program, or can be changed in the edit mode.

After giving the drawing number, data preparation is ended and by pressing the enter key, page 0.1 will be on the VDU screen again. (Program Menu)

<b>DATA EDITING</b>						<b>product nr: 11</b>
						<b>drawing :    </b>
<b>PRODUCT NUMBER: 11</b>						
<b>DRAWING NUMBER:</b>						
<b>PRODUCT NUMBER: 11</b>						<b>4.5</b>

Fig. 2.3.2.f

### Special edit function

When a new program has been made and several tests are required, the operator can switch from "editing"-mode directly to the "auto"-mode and vice versa by pressing the particular mode buttons.

When in "data editing" a specific bending is selected, the operator can now select the "automatic mode" or "step by step mode".

In case one wants to edit the program, the edit mode can be selected directly with the programming key. In this way many key operations are saved in order to make program changes quickly.

### Edit notes

After changing program data the DA-58 will not calculate automatically:

1. Force
2. Decompression
3. Bend allowance
4. Z-axis position offset

Also you may find that the simulation will not go properly when you have changed tools and/or X-axis dimensions.

## 2.4. PRODUCT SELECTION

With number 5 on the program menu, product selection is selected.

PRODUCT SELECTION		bindings: 5	product nr: 11
product	drawing number	bindings	connect
11		5	

1.4% memory used

select product: 0				5.1	
select product	select drawing	delete product	delete all		end

Fig. 2.4.a

In the "product selection" overview, a listing of all the programs which are present in the main memory is given (page 5.1). The highlighted bar indicates which program is actually active.

In the enter field a new product number or drawing number can be entered to select a new program.

Softkey functions:

S1 = product selection with product number

S2 = product selection with drawing number

S3 = delete product, to delete a selected product

S4 = delete all products

S6 = End

Once entered a new number and pressing the "enter key" the selected program will be selected from the main-memory, and a listing is given of all bends in this program at page 5.2. Also information is given about the material and the thickness, see picture at page 5.2.

PRODUCT SELECTION				bendings: 5	product nr: 11
material: STEEL				thickness: 1.00 mm	
№	CY	tools	length	-Y-	-X-
1	1	✓ 1	200	-90.00 °	56.2
2	1	✓ 1	200	90.00 °	48.7
3	1	✓ 1	200	135.00 °	49.7
4	1	✓ 1	200	90.00 °	38.7
5	1	✓ 1	200	90.00 °	18.7

					5.2
directory					name

Fig. 2.4.b

### 2.5. Programming of Punches

The programming of punches is selected with number 7 in the program menu. The punch profile can be created with help of the drawing facilities of the DA-58.

PUNCHES			
NO	ANGLE [degr]	HEIGHT [mm]	CODE
1	86.8	166.88	
2	---	---	
3	---	---	
4	---	---	
5	---	---	
6	---	---	
7	---	---	
8	---	---	
9	---	---	
10	---	---	
11	---	---	
12	---	---	
13	---	---	
14	---	---	
15	---	---	

7.1

edit					RETURN
drawing					

Fig. 2.5.a

A listing of punches programmed into the memory is given at page 7.1. Select a new tool with **↑** and **→** keys.

The punch program is selected with **S1** at page 7.1 resulting in the drawing of the uppertool at page 7.2.

The display starts prompting the initial dimensions of your punch:

- \* Toolheight = . . . . .
- \* Toolangle = . . . . .

Hereafter you can enter angle and length dimensions as in the product drawing facilities.

When, after having drawn the most important shapes, you can directly finish the tool shape to the top of the punch with function key **S1** (auto finish).

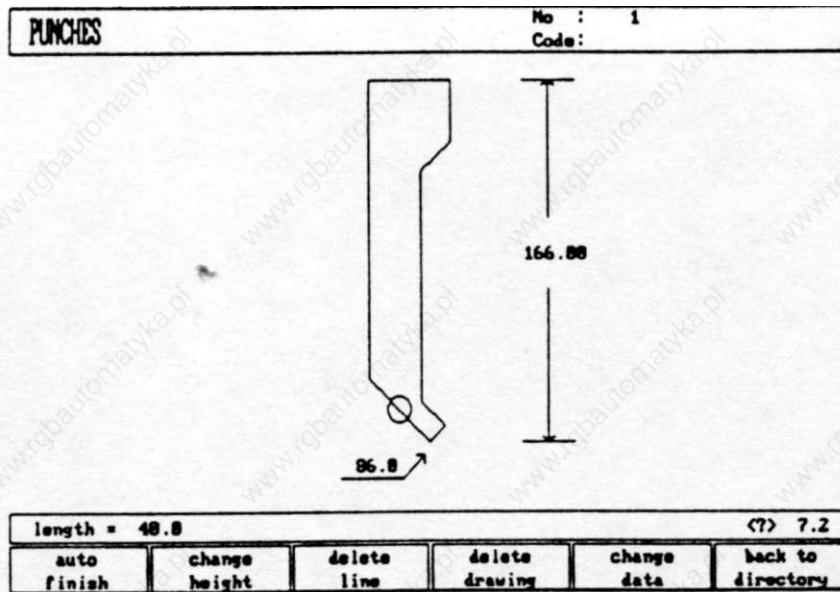


Fig. 2.5.b.

Softkey functions:

- |                        |   |
|------------------------|---|
| S1 = Auto finish       | Finishing the tool outline to the top of the tool automatically |
| S2 = Change height     | To change the height dimension of the tool                      |
| S3 = Delete line       | To delete a line segment  |
| S4 = Delete drawing    | To delete the tool from the library                             |
| S5 = Change data       | To change specific tool data and code                           |
| S6 - Back to directory | To return to the directory overview                             |

### 2.5.1. Specific Punch Data

With S5 on page 7.2, page 7.3 will be on the screen.

<b>PUNCHES</b>		No : 1
		Code:
CODE.....:		
RESISTANCE.....	R=	50.0 ton/m
LENGTH.....	L=	0 mm
Z POSITION.....	Z=	0 mm
enter code :		7.3
	alphanumeric	alphanumeric
		back to tool

Fig. 2.5.C

on this page specific punch data can be entered.  
These are:

1. : Alphanumeric tool name with a maximum of 20 characters
2. : Maximum allowable force on punch in ton/m
3. : Length of the punch to be used
4. : Offset position of the middle position of the punch in relation to the middle of the pressbrake.  
(Default value is 00 mm)  
In case automatic Z-axis are used the Z-axis value is computed from the: plate length, Z-distance (menu nr. 11) and Z-position.

TOP view

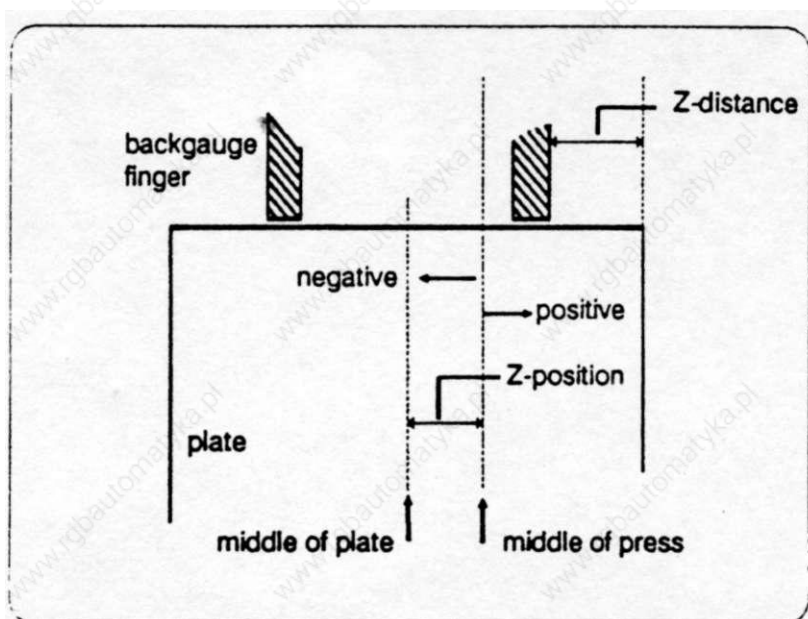


Fig. 2.5.d

Drawing orientation on the VDU-screen

The right hand side of the tool is the backgauge side.  
The bottom point of the punch will be placed on the center line  
of the press brake shape.



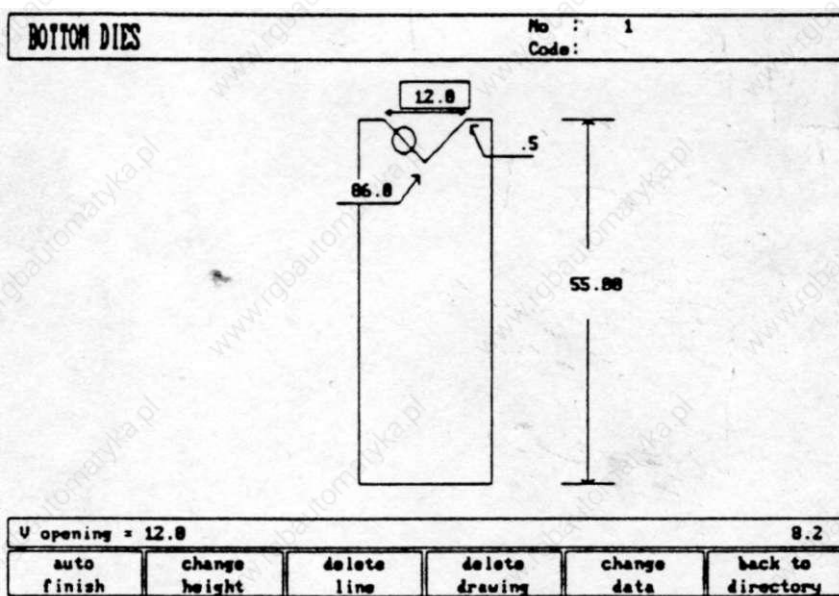


Fig. 2.6.b

The length of the flat section on the right hand side of the V-groove will be used in position for the R-axis collision detection with die (X -safe).

Softkey functions;

The softkey functions are exactly the same as for punch programming.

2.6.1. Specific die data

After pressing S5 on page 8.2., specific data of the die can be programmed at page 8.3.

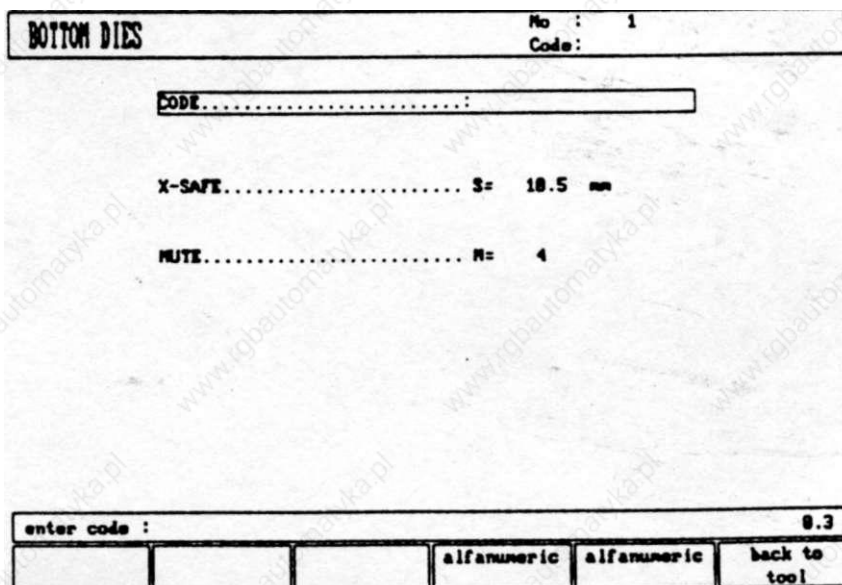


Fig. 2.6.c

**Data to program:**

**Code** = Alphanumeric tool name with a maximum 20 characters

**X-safe** = Calculated safety zone (minimum X-axis value), which will be used in the case a R-axis is mounted. This to prevent finger to die collision. The indicated minimum value is computed automatically from the die dimensions as follows:

$X - SAFE = FS + 1/2 V$  in which:

FS = flat section on the right hand side of the V - groove

V = opening value

In this formular also an extra small safety value has been added.

**Mute** Muting distance.  
Distance above the plate at which the speed change takes place.

## 27. Machine upside and underside

The shapes of your machine are drawn in the same way as for the punches and dies. Like with the tools the right hand side of the drawing is the backgauge position of the machine.

Before starting drawing the machine shape upper or lower side you must enter the press-beam height of the upper part when the moving part of the upside is in its mechanical top dead centre.

For the underside of the machine the height is defined from the table surface to the floorlevel.

MACHINE UPSIDE					
NO	HEIGHT [mm]	CODE			
1	1155				
2	---				
3	---				
4	---				
5	---				
6	---				
7	---				
8	---				
9	---				
10	---				

					9.1
edit drawing					name

Fig. 2.7.a

The length prompted in pages 9.2 and 10.2 (table surface) is from the center line to the edge.

MACHINE UPSIDE					
					No : 1
					Code :
length = 35.0					
(7) 9.2					
auto finish	change height	delete line	delete drawing	code	back to directory

Fig. 2.7.b

## 2.8. Product and Tool Back-up

Page 6.1 is selected with number 6 in the program menu (product back-up).

Page 12.1 is selected with number 12 in the program menu (tool back-up).

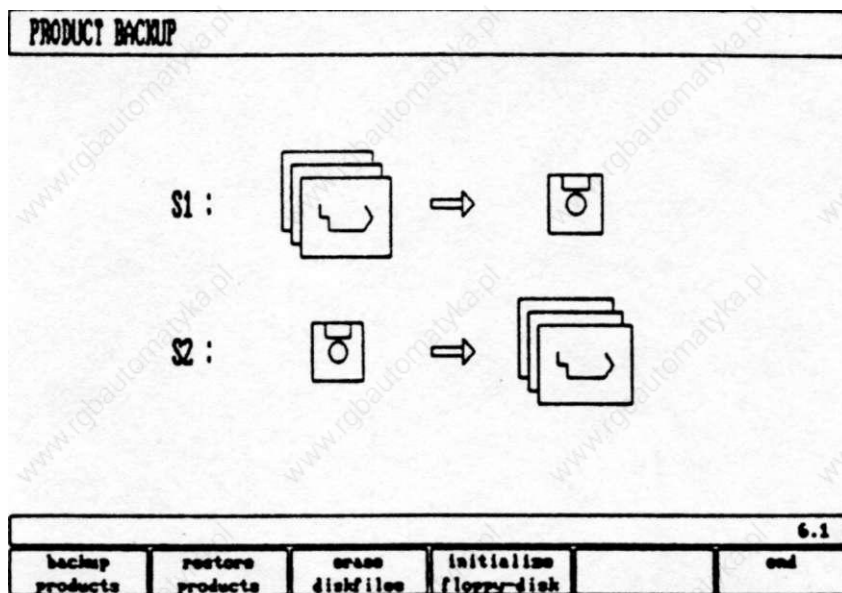


Fig. 2.8.a

Writing and reading programs to and from the floppy-disk is completely handled with the softkeys.

It is recommended to use separate product - and tool back-up floppy-disks. Specially because the DA-58 saves the program-and machine parameters together with the tool data automatically.

Products or tools can be written to the floppy by pressing S1 on page 6.1 or 12.1 (back-up products/tools).

The complete memory contents will be saved on the floppy disk.

Reading products or tools from the floppy-disk will be realised by pressing S2 on page 6.1 or 12.1 (restore products/tools).

In the case of reading tools from the floppy-disk the tools which were in the DA-58 memory before, will be overwritten if they have the same tool number.

This is not the case for products with the same number. The products or tools which have a different number in the DA-58 will remain in the memory.



### 2.9. Program Constants

Page 11.1 is selected with number 11 in the program menu.

PROGRAM CONSTANTS					
INCH-SELECT 1/0..... 1= 0					
1=0					11.1
previous page	next page				HOME

Fig. 2.9.a

The specific data of the user can be programmed at pages 11.1, 11.2 and 11.3.

Inch-select 1/0 1 =

1 = dimensions in inches  
0 = dimensions in millimeters

PROGRAM CONSTANTS					
TENSILE STRENGTH 5.....	2=	40	kg/mm2		
E MODULE 5.....	3=	21000	kg/mm2		
TENSILE STRENGTH 6.....	4=	40	kg/mm2		
E MODULE 6.....	5=	21000	kg/mm2		
FORCE FACTOR.....	6=	120	x		
TURN PAGE DELAY.....	7=	.3	sec		
END-ALLOWANCE 1/0.....	8=	0			
Z-DISTANCE.....	9=	10	mm		
BOTTOMING FORCE PAK.....	10=	3			
CLAMPING CORRECTION.....	11=	.00	mm		
2= 40					11.2
previous page	next page				HOME

Fig. 2.9.b

With the enter key or the " \ " key the next page of the system parameters can be selected (11.2). It is also possible to continue on the next-or previous page by using softkeys S2 c.q. S1.

Tensile strength 5 2 - kg/mm<sup>2</sup>  
E-module 5 3 - kg/mm<sup>2</sup>

Tensile strength 6 4 = kg/mm<sup>2</sup>  
E-module 6 5 = kg/mm<sup>2</sup>

Tensile strength and E-module of the materials 5 and 6 can be selected in data preparation.

Force factor 6 = Percentage of calculated tonnages which actually controls the pressure valve.

Turn page delay 7 = Delay after last entry at a page of the VDU before the page turns over to the next page.

Bend allowance 1/0 8 =  
1 = correction on  
0 = correction off  
Correction of the X-axis due to plate shortening after bending.  
[calculated only in data preparation]

Z-distance 9 = When automatic Z-axes are installed, the distance of the fingers on the backgauge are automatically calculated with respect to the end of the plate.

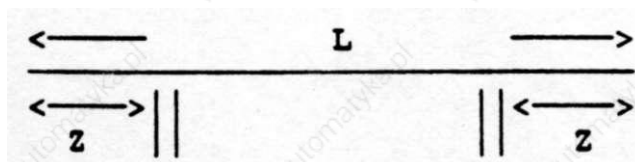


Fig. 2.c

L is plate length  
Z is Z-offset programmed

Bottoming Force Factor 10 -

The pressure needed for an airbend multiplied by this factor in order to obtain the coining pressure.

Clamping correction 11 =

The position of the beam at which the plate is clamped, is calculated. In order to have a firm clamped plate it is possible to offset the calculated pinch point with the value here programmed.

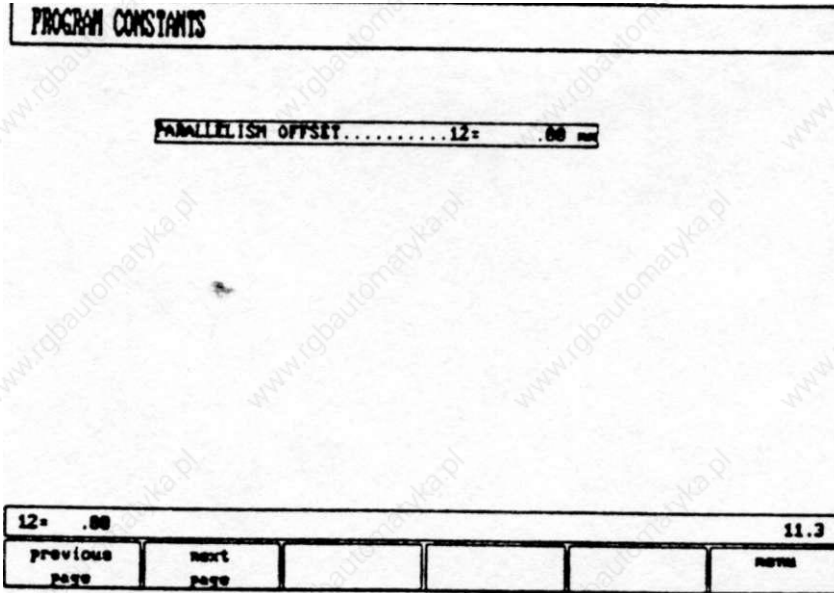


Fig. 2.9.d

Parallelism offset...12 =

An overall parallelism, valid for the complete Y-axis stroke, can be programmed with this parameter. The programmed value will be checked against the maximum allowed value during production. The parallelism which can be programmed for each bending (PA) is only active below the clamping point. The parallelism below the clamping point is the sum of the two parameters (PA + Par. offset).

### 2.9.1. Serial Interface Specifications

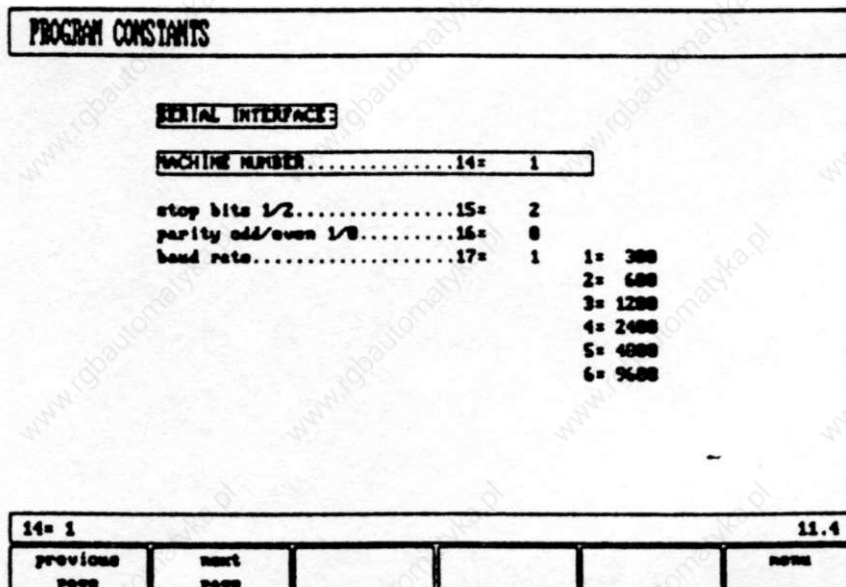


Fig. 2.9.e

For programming the DA-58 from a host-computer through its serial interface (DNC-operation), the interface specification can be programmed at page 11.4.

Machine number

14 =

Because it is possible to have 2-way communication with the Profile package with version V4 onwards in the PC, you must program a machinenumber. This must be the same as in the Profile program.

Stop bits 1/2

15 • Number of stop bits (1 or 2)

Parity odd/even

16 = Parity check with odd or even

1 - odd

0 = even

Baud rate

17 =

1 \* 300 Baud

2 = 600 Baud

3 - 1200 Baud

4 - 2400 Baud

5 - 4800 Baud

6 = 9600 Baud

## 3. MANUAL MODE

By pushing the



key the CNC is in manual mode.

MANUAL					
Y = ___	X = ___				
punch.....UP= 1	X-AXIS.....X = 100.0				
die.....UN= 1					
mat.....MA= 1					
thick.....TH= 1.00					
length.....BL= 200					
corr.a.....Ca= .00					
ANGLE.....a = 90.00					
Y-AXIS.....Y = 102.77					
mate.....M = 94.00					
backpr.....BP= .00	open.....BY= 20.0				
force.....P = 1	speed.....S = 10.0				
	d-time.....T = .1				
	paral.....Pa= .00				
UP= 1	20.1				
bottoming	ALX select	zoomed values			

Fig. 3.a

All the parameters can be programmed independently of the programs in memory.

Parameter explication, page 20.1

Punch	UP = Number of selected punch in the library
Die	UN - Number of selected die in the library
Mat	MA - Selection of one of the following preprogrammed materials, which are used to calculate the bending depths. 1 = Steel 2 = Alumunium 3 = Zinc 4 = Stainless steel 5/6 = Materials definable by the user, which tensile strength and E-module are program constants, (menu nr. 11).
Thick	TH = Thickness of the plate in millimeters
Length	BL = Length of the plate between the tools in millimeters
Corr. a	Ca = Correction on angle to bend

Angle	a = Angle to bend
Mute	M = Sequence point from fast closing to pressing speed. The value between upper beam and the plate to bend on top of the bottom die in mm.
Back pr.	BP = Decompression stroke after the bending to release the working pressure. The same parameter as DC in the data preparation mode.
Force	P = Max. adjusted tonnage during pressing
Open	DY = The opening distance above the mute point, resulting in a certain gap opening between punch and die after the bending
Speed	S = Pressing speed
D-time	T = Dwell time of punch at the bending point
Paral	PA = Difference of left- and right hand side cylinder (Y1 and Y2). When positive right hand side lower. When negative right hand side higher. The programmed value is active below the clamping point.
Y-Axis	Y =
X-Axis	X =
	The start value in X- and Y-direction to create the wanted bending

**Softkey functions:**

S1 = Bottoming with Y-axis  
If selected, then " f " symbol is behind the Y-axis value.  
With S1 the bottoming can also be switched off again.

S2 = Aux. select.  
If extra axes are used, you will get information at page 20.1 concerning these axes (e.g. R-axis or crowning). With S2 you can select the auxiliary axis to be moved manually.

S3 = Zoom page 20.3

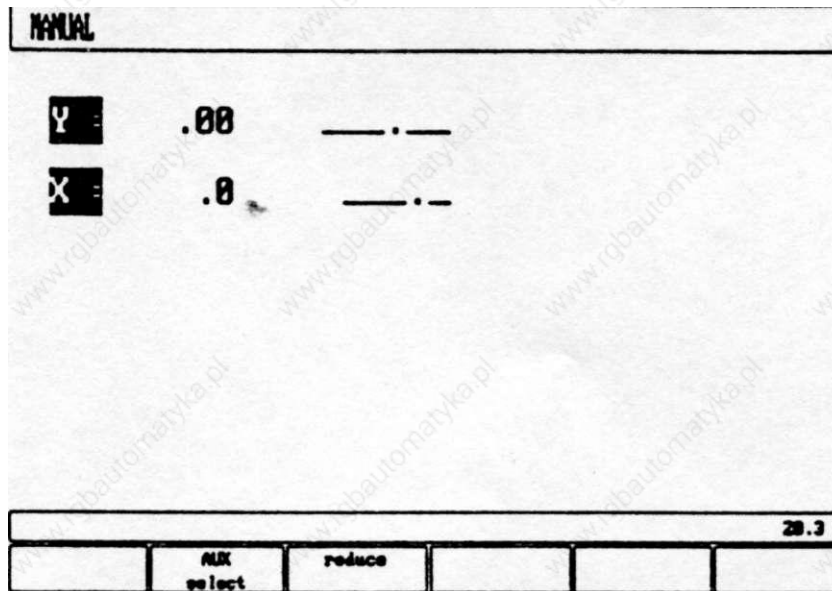


Fig. 3.b

After pushing the startbutton all the programmed parameters are active.

### 3.1. Manual operation of the axes

#### - Auxiliary axes:

With the + , AUX and - pushbuttons the backgauge can be positioned manually. This operation is only possible in "Stop" + "Manual Mode".

The movement can be realised by pressing AUX and + at the same time for moving fast forward or AUX and - at the same time for moving fast backwards.


Pressing only the + or - button the movement of the auxiliary axis will be slow.

#### - Y-axis:

With the + , Y and - pushbuttons the punch can be positioned manually in the same way as for the auxiliary axes. This operation is only possible in "Start" + "Manual Mode".

Another condition is now that the pressbrake must be in the manual mode, indicated on the screen by "Adjust" in the lower righthand corner and a pressing command must be given to the CNC.

### 3.2. Teach In

With the  Key an actual position of the Y-axis or X-axis can be programmed directly into the parameter field on which the cursor points.

After pushing the teach-in key the actual axis value will appear in the entering field (lower left corner of the screen). On pressing the "enter"-key this value will be programmed. After entering a new value by using the numerical keys and pressing the enter key this value will be programmed.

4. AUTOMATIC / STEP BY STEP MODE

AUTO		bend 4 of 5	product nr: 11
		rept 1	drawing :
Y : ____		X : ____	
ANGLE.....:	90.00	X-AXIS.....:	38.7
opening.....:	53.3	opening.....:	35.1
		code.....:	12
tools.....:	1 / 1		
length.....:	200		

---

BEND no.....BN=	4	STOCK.....ST=	____
corr.a.....Ca=	.00	G-corr. ....Ca=	.00
corr.X.....Cx=	.0	G-corr. ....Cx=	.0

---

BN= 4					21.1
previous bend	next bend	functions	graphical visualisation	zoomed values	

Fig. 4.a

In the upper information bar you get some information about your product and the bends of that product.

In auto, and step-by-step mode you get always information of the actual positions of Y-and X-axes. Page 21.1 gives information above the horizontal line about Y-and X-axis according to the program. You can also see which tools have been selected and the length of your product. On page 21.2, to be selected via softkey S3, you get data-information of your Y-axis.

Under the horizontal line at page 21.1 the operator can program one of the displayed parameters.

- BEND no.                      BN = Selection of a bend of the program displayed on the VDU-screen
- Corr a                        Co -
- Corr x                        Cx = Correction on angle and X-axis position in this bending. In case the bend allowance is selected (see PROGRAM CONSTANTS) in data preparation (menu 3) the bend allowance is calculated and given in Corr x at page 21.1. The corrections will be saved in the selected bending program.
- STOCK                         ST - Stockcount decremented after end of each program cycle.



## 5. EPROM CHANGE

When the EPROMS of the DA-controller have to be exchanged, due to program modifications, the program memory of the DA-controller must be initialised. As a consequence all program and tool data will be lost. This is indicated on the VDU-screen after the EPROMS are exchanged and the DA-controller is powered up.

The following message appears on the VDU-screen after exchanging the EPROMS and powering up the DA-controller:

```
PRESS S1 FOR INITIALISATION
(THIS WILL DESTROY YOUR PROGRAMS AND TOOLS,
REINSTALL OLD EPROMS TO SAVE THEM !!)
```

After pressing S1 the complete memory is erased and initialised. In case the contents is not yet saved externally, it is necessary to switch off the DA-controller and reinstall the old EPROMS, in order to save program data and tooling data.

### 5.1 Software versions

The version of the software in your DA-58 is displayed at the upper side of the menu screen in the programming mode.

The version information is also written on the stickers of the EPROMS. The language code is written on EPROM 1 and also displayed on the menu screen.

Example of version number:

```
VA 2.1 GB
VA stands for version
2 is version number
1 is level number
```

The version number is increased when new features are added to the software, the level number is increased when minor corrections are needed in the existing version number.

Possible language codes are:

```
GB = English
D = German
F = French
NL = Dutch
I = Italian
S = Swedish
DK = Danish
```