Chapter 8 "Darts and pleats"

Content

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Darts and pleats are an important styling element for garment construction. For construction of darts and pleats Grafis offers the following functions:
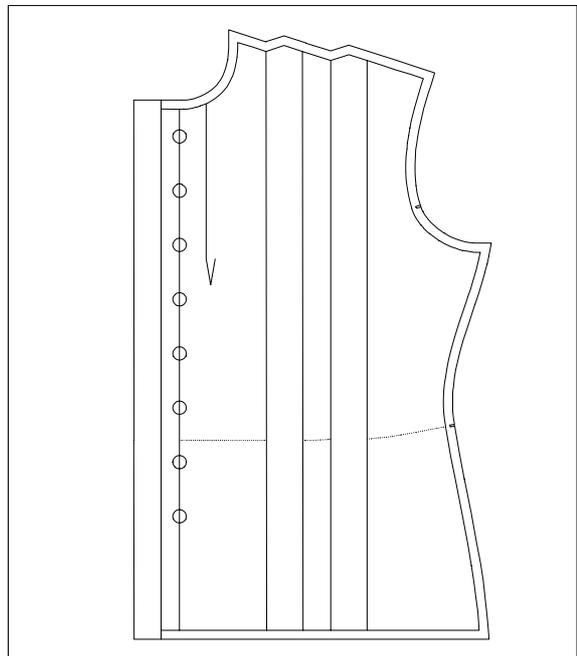
- automatic and interactive relocation of darts,
- shortening darts,
- construction of hoods for darts,
- construction of new darts and
- spreading in preparation for pleats..
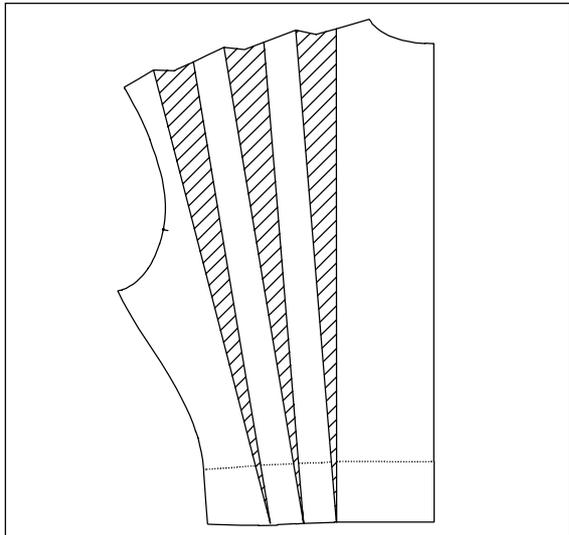
In this chapter you will learn about all construction options for pleats and darts. In the remaining chapters 9 and 10, working with curves and various transformation options follow.

In the well-known manner, each section of this chapter contains exercises for the consolidation of the new function. In the complex exercises at the end of the chapter all previously learned functions will find their applications, also.

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8.1 Relocate dart

modify
p adjust
vertical
horizontal
relocate dart
shortn dart lg=20.0
reset measure

The *modify* menu

This menu offers functions for adjustment of parts, relocation and shortening of darts.

The relocation of darts is the content of this section, shortening darts is content of the next section.

Prerequisites for relocation of darts

1. For the relocation of darts Grafis requires a closed perimeter - also across corners. Starting and final point of the lines are allowed a maximum of 0.5mm gap. The individual lines of the perimeter do not have to be linked.

2. The dart must not be closed, i.e. with a dart hood. If such a dart is to be relocated the hood is to be removed with *separate* und *cut* or *corners*, first.

3. The dart lines must be of the same length and share a apex.

Step-by-step guide

⇒ Check whether the conditions for dart relocation are met
⇒ *Basic menu --> modify*
⇒ Click *relocate dart*
⇒ Determine relocation direction by clicking both dart lines (succession!)
⇒ Adjust % of the dart to be relocated
⇒ Switch +*dart line* or -*dart line*
⇒ Click *automatic*
⇒ Determine insert position with the sub-menu point construction
⇒ Relocate additional objects; before clicking the objects the switch +/ -*copy* is to be adjusted and the object type *lines* or *points* is to be activated.
⇒ Possibly, reset single objects with *reset single* or reset all objects with *reset all*
⇒ Continue with 5. or terminate with ⬛

Pivot direction for *relocating darts*

When clicking *relocate darts* in the *modify* menu you will be asked which dart line is to be relocated towards the other. The succession of clicking the lines determines the pivot direction (see Pictures 8-1 and 8-2).

2nd click point *   *1st click point
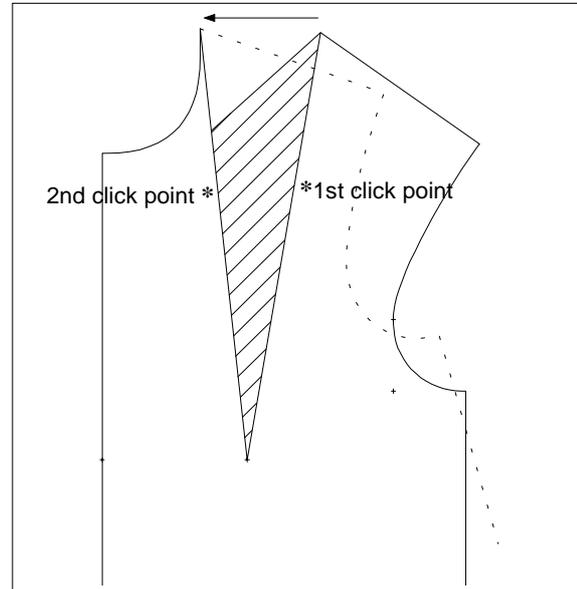
Picture 8-1

After having determined the pivot direction, the dart is hatched; the direction of the hatching indicates the pivot direction. The *relocate dart* menu opens, see next page.

1st click point *   *2nd click point
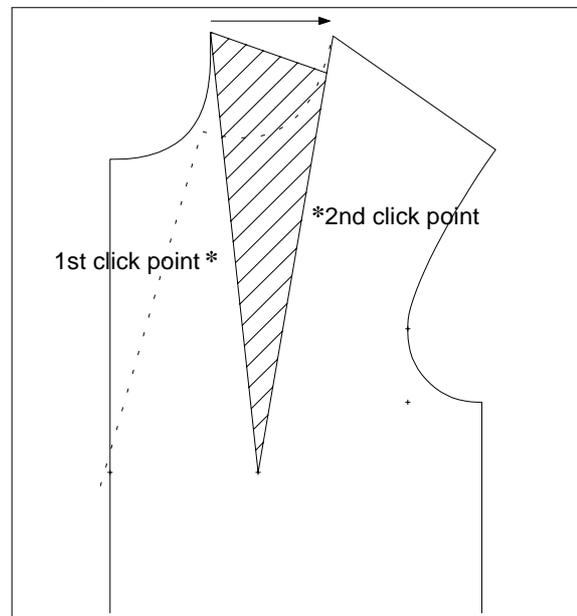
Picture 8-2

The dashed lines in pictures 8-1 and 8-2 show the shape of the bodice in case the full dart (100%) is relocated.

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The *relocate dart* menu

% of the dart to be relocated

In the first part of the menu you determine how many % of the dart is to be relocated in the next step. The line *"rest=0%"* shows the remainder of the dart which can still be relocated.

modify reloc. dart
100% dart to be relocated (rest=0%)
automatic +dart line
additional: points
lines
-copy
reset single all

automatic

Activating the function *automatic* starts the relocation. The *dart line* switch determines whether or not the dart lines are drawn at the new position:

   +dart line   draws the dart lines at the new position

   -dart line   does not draw the dart lines at the new position.

additional

After having relocated parts of the dart important construction points and lines are no longer positioned correctly in relation to the part. These *points* or *lines* must be relocated directly after relocating the dart. The type of object (*points* or *lines)* is to be selected and the *copy* switch is to be set:

   +copy   object is copied

   *-copy*   object is relocated only.

reset

Clicking *single* or *all* determines:

   single   additional relocated objects can be reset individually by clicking

   all   the last relocation step is reset completely.

Relocate 100% of the dart

Relocating 100% of the dart is explained using an example. Call the basic block „Grafis Bodice 10" and relocate 100% of the dart into the armhole notch (Picture 8-3):

   call

   modify

      relocate dart
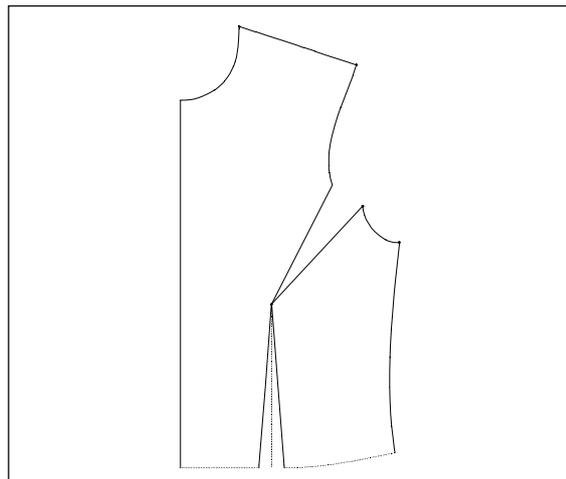
Picture 8-3

The right dart line is to be pivoted to the left. Click the right dart line first and then the left.

   100%   enter in the first line so it shows: *100% dart to be relocated (rest=100%)*.

   +dart line

   automatic

      click p   construct the sleeve notch as insert position

As two lines are assigned to the sleeve notch Grafis asks for the base line required. You can click one of the lines offered and the dart is relocated automatically.

Check whether further objects are to be relocated to be positioned correctly in your construction. In this example this is not necessary and the dart relocation can be terminated with ◱.

      reset all   the dart is replaced in its original position

Repeat relocation of the dart to a position on the side seam 30 mm from the armhole (not shown). Please note that the construction points of the armhole have to be relocated as well with:

   points

   -copy   click the points required

   ◱

   N*reset   reset construction record to 001

   test run

Repeat relocating the dart with the left dart line being pivoted towards the right. Click the left dart line first and then the right. As opposed to Picture 8-3 the centre front is now angled, the position of the armhole remains unchanged.

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Relocate parts of a darts

Relocating a portion of a dart is explained with an example. Call the basic block „Grafis Bodice 10". Now, 25% of the bust dart is to be relocated to the sleeve notch and 50% into the hem (Picture 8-4).
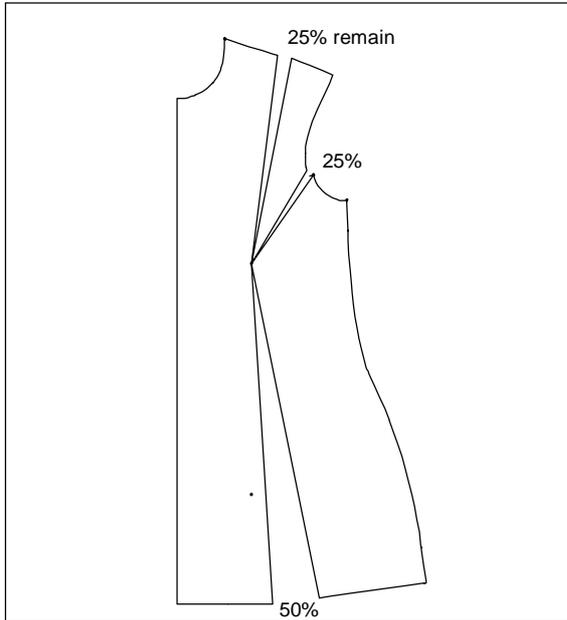
Picture 8-4

   call
   modify
      relocate dart
      The right dart line is to be pivoted towards the left. Click the right dart line first and then the left.
      25% enter in the first line so it shows: *25% dart to be relocated (rest=75%).*
      +dart line
      automatic
         click p   sleeve notch

Please note that the construction points of the armhole have to be relocated as well:
      -copy
      points   relocate construction points of the armhole
      50% enter in the first line so it shows: *50% dart to be relocated (rest=25%)*
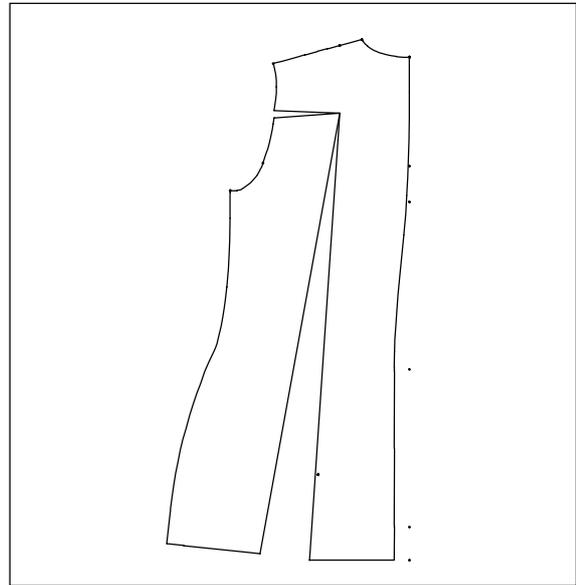   *+dart line*
      automatic
         click l   hem

Check whether any other objects must be relocated so that they are in the correct position in your construction. Terminate with 🗔.

Exercise

Relocate 50% of the dart in the back of basic block „Grafis Bodice 10" into the sleeve and the remaining 50% of the dart into the hem (Picture 8-5).

Picture 8-5

8.2 Shorten dart

Step-by-step guide
⇒ *Basic menu --> modify*
⇒ Adjust the length *lg=....*, by which the dart is to be shortened
⇒ Activate *shorten dart*
⇒ Click both dart lines

Calling the function *shorten dart*

This function is contained in the *modify* menu. An existing dart can be shortened by a specified amount *lg=...* with this function.
***Entering a negative value lengthens the dart.***
After having entered the amount and activated *shorten dart,* Grafis asks for the two dart lines. The shortened dart appears on screen; the distance between the original and the new apex is exactly the amount entered.

| modify |
| --- |
| p adjust vertical horizontal |
| relocate dart |
| |
| shortn dart |
| lg=20.0 |
| reset |
| measure |

Exercises

1st Exercise

Relocate the dart in the basic block „Grafis Bodice 10" into the armhole, the side seam and the hem. Shorten the side seam dart by 20mm, the dart in the armhole by 30mm and lengthen the dart in the hem by 20mm (*lg=-20.*) (Picture 8-6).
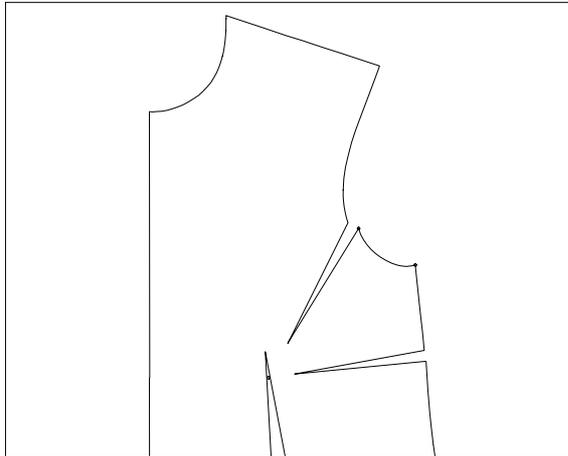
Picture 8-6

2nd Exercise

Shorten the dart in the back skirt of the style „Straight skirt" from Section 2.4 by 20mm and lengthen the dart in the front skirt by 20mm (Picture 8-7).
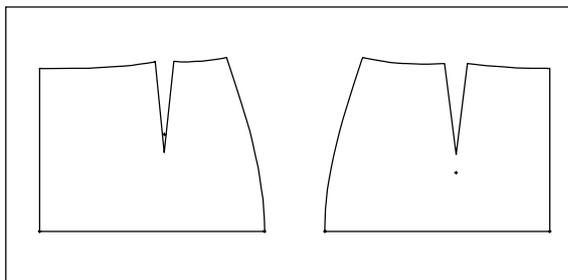
Picture 8-7

8.3 Hoods on darts and pleats

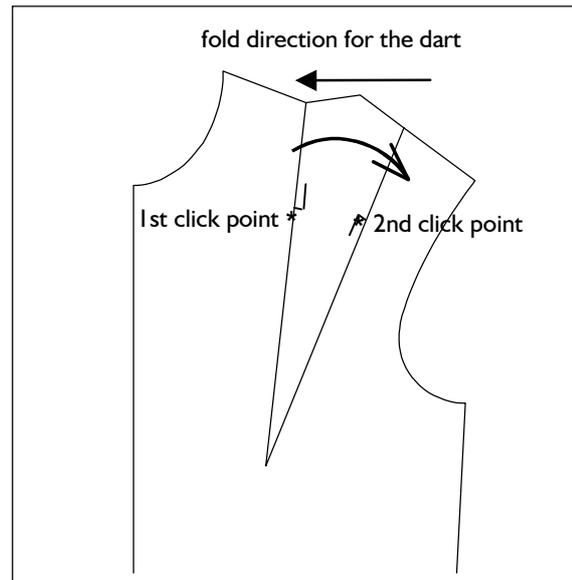**The *pleats* menu**

The functions in this menu allow for
- generation of hoods for darts and pleats
- dart construction and
- preparation of pleat construction with spreading.

Contents of this section is the dart hood generation with its options *single* and *double*.
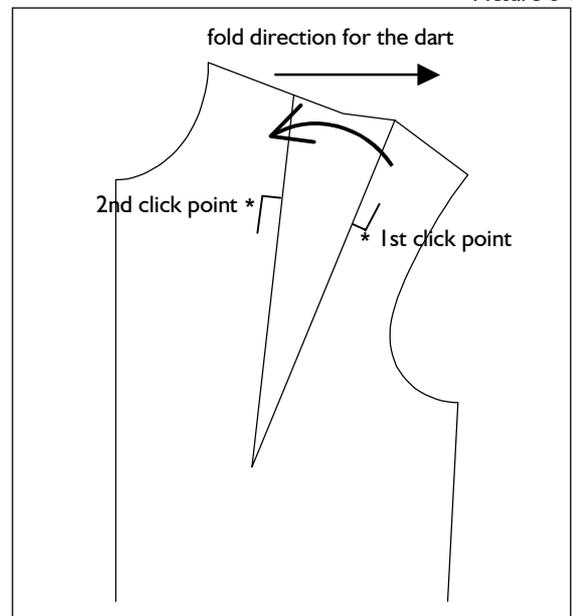
The construction of darts with *dart s+dir* and *dart s+apex* is content of section 8.4.

With *reset* the last dart hood generation or dart construction, respectively can be undone.
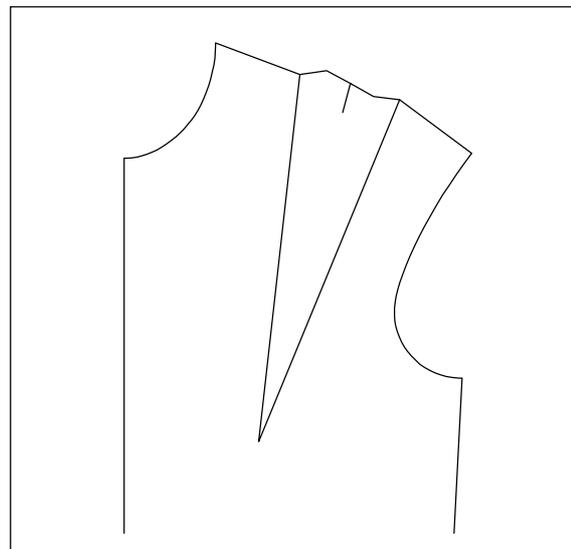
Activating *spread with click 1* or *spread with click p=>p* calls the *spread* menu which is introduced in section 8.5.

fold direction for the dart

1st click point *   * 2nd click point

Picture 8-8

fold direction for the dart

2nd click point *   * 1st click point

Picture 8-9

Picture 8-10

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Step-by-step guide for hood generation on darts or pleats

⇒ *Basic menu --> pleats*
⇒ Activate *single* or *double*
⇒ Click the dart lines (with *single* consider the direction in which the dart / pleat is folded)

pleats
dart hood
single
double
dart s+dir
dw= 20.0
dl= 80.0
dart s+apex
dw= 20.0
reset
spread with
click l
click p=>p
measure

single hood on darts or pleats

After having activated *single,* Grafis asks for the first dart line / pleat fold. The inside is folded toward this line, i.e. it determines the folding direction of the pleat / dart. Then, the second dart line / pleat fold is to be clicked (Pictures 8-8 and 8-9).

double hood on darts or pleats

The function *double* allows for construction of a box pleat or inverted pleat. The hood generation is symmetrical, so that the succession in which the pleat folds are clicked is of no consequence.

After having activated *double* both dart lines / pleat folds are to be clicked (Picture 8-10).

Exercise

Call the basic block „Grafis Bodice 10" and generate a single dart hood with fold direction neck, a single dart hood with fold direction armhole and a double dart hood. End with *reset* each time. As a result your screen will show Pictures 8-8, 8-9 and 8-10.

Repeat the dart hood generation with a different fold direction and a double hood. Relocate the dart into the sleeve notch and construct the three different hood types here, also.

8.4 Construct new darts

The *pleats* menu

Hood generation for darts and pleats, construction of darts and preparation for pleat construction with spreading are the contents of the *pleats* menu.

This section deals with the creation of new darts with *dart s+dir* (dart out of symmetry point and direction) and *dart s+apex* (dart out of symmetry point and apex).

pleats
dart hood
single
double
dart s+dir
dw= 20.0
dl= 80.0
dart s+apex
dw= 20.0
reset
spread with
click l
click p=>p
measure

Step-by-step guide

⇒ *Basic menu --> pleats*
⇒ Adjust the respective parameters *dw=...* and *dl=....*
⇒ Activate *dart s+dir* or *dart s+apex*
⇒ Click the line into which the dart is to be inserted
⇒ Construct the symmetry point
⇒ only with *dart s+apex:* construct the apex

dart s+dir - dart out of symmetry point and direction

For this construction with symmetry point and direction the dart width *dw* by which the original line is to be shortened and the dart length *dl* is to be entered (Picture 8-11).

symmetry point

dl
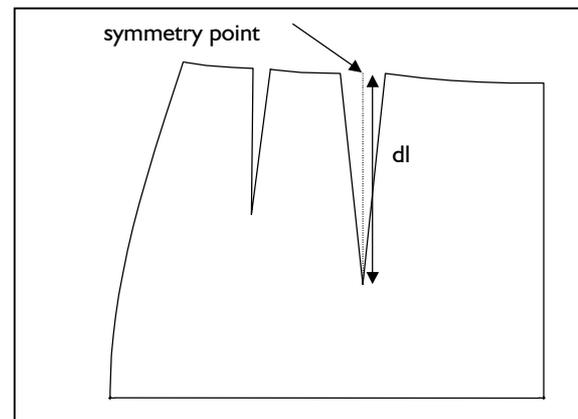
Picture 8-11

The values are to be entered into the menu lines below *dart s+dir*. Activating *s+dir* starts the construction. First, the line into which the dart is to be inserted must be clicked. Then, the symmetry point and the direction for the dart are to be determined. The direction of the dart could be set as an angle to the insert line, for example.
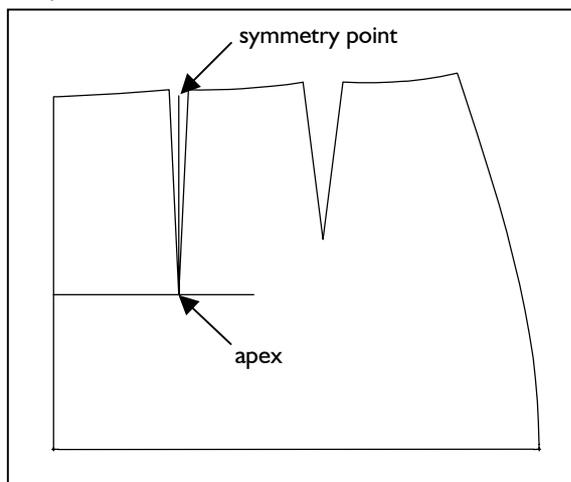
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Exercise on dart s+dir

In the style „Straight skirt" from Section 2.4 construct a dart in the back skirt from a symmetry point and a direction with a dart width of 20mm, dart length of 80mm with a right angle to the waist curve in the symmetry point (see Picture 8-11).

dart s+apex - dart out of symmetry point and apex

For this construction with symmetry point and apex (Picture 8-12) only the dart width *dw* by which the insert line will be shortened is to be entered. This value must be entered into the line below *dart s+apex*.

symmetry point

apex

Picture 8-12

Clicking on *dart s+apex* starts the dart construction. After having clicked the line in which the dart is to be inserted the construction of symmetry point and apex ensues.

Exercise on _dart s+apex_

In the style „Straight skirt" from Section 2.4 construct an auxiliary line beginning 100mm below the waist on the centre front running horizontally. Drop a perpendicular from the centre (50%) of the front waist onto the auxiliary line. Construct a dart with a dart width of 10mm. The symmetry point and the apex are the beginning and end point of the perpendicular respectively (Picture 8-12).

8.5 Spread for pleats, pivot open and close

The _pleats_ menu

The functions in the menu for generating hoods on darts and pleats and construction of new darts were introduced in the previous sections. The *spread* function for preparation of pleat construction is the contents of this section.

pleats
dart hood
single
double
dart s+dir
dw= 20.0
dl= 80.0
dart s+apex
dw= 20.0
reset
spread with
click l
click p=>p
measure

Step-by-step guide for spreading

⇒ Construct the spread line or starting and final point of the spread line with the functions of the *p+l+c+r* menu

⇒ *Basic menu --> pleats*

⇒ Click the lines below *spread* with
    click l   if a spread line is available and
    click p=>p   if the spread line is to be defined by its starting and final point.

⇒ Construct the spread line, then the sub-menu *spread* opens (see below)

⇒ possibly, construct the spread line again after having clicked *spread line*

⇒ Enter the distances *s1=..., s2=...* and adjust +/- *dir shift*

⇒ Activate *single p, single l* or *all* (directly below *spread:*) and click the respective objects

⇒ possibly, reset by activating *single p, single l* or *all* (directly below *reset:*) and clicking the respective objects

⇒ Switch +*spread l.* or -*spread l.*

⇒ Terminate by clicking *deposit*

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Spread with click l or click p=>p

After having clicked *click l* or *click p=>p* in the *pleats* menu the *spread* menu opens. The spread line appears as a white line (blue - if a line of the construction underlies) and a red line as target line. **All required Grafis objects will be spread according to spread line ➔ target line.** Correction of the spread line is possible by clicking *spread line*.

Distances between spread line and target line

The position of the target line is to be adjusted. The following options are available:

- alter the spacing between the starting points of spread and target line s1,
- alter the spacing between the final points of spread and target line s2,
- alter the spread direction by clicking the switch *dir shift*

Spreading objects

As soon as the target line is in the required position spreading of the individual objects ensues. The option *spread: all* spreads the complete part from the spread line onwards. Then, individual lines or individual points can be spread, additionally by activating *single l* or *single p* and clicking the objects. If too many objects were spread with *spread: all,* individual points or lines can be reset with *reset: single p* or *reset: single l*.

Reset spread steps

Single lines or points can be reset by the spread amount with *reset: single p* or *single l*. With *reset: all* all spread objects are reset.

deposit

After having spread all required objects the switch *spread l.* is to be adjusted:

  +*spread l.*   the spread line is drawn,
  -*spread l.*   the spread line is not drawn.

To terminate spreading click *deposit*.

pleats
spread
spread line
spacing: s1 = 20.0 s2 = 0.0 -dir shift
spread: single p
single l
all
reset: single p single l all
deposit +spread l.

Exercises on spread

1st Exercise

Construct three pleats in the basic block „Grafis Bodice 20" (back) according to Picture 8-13.
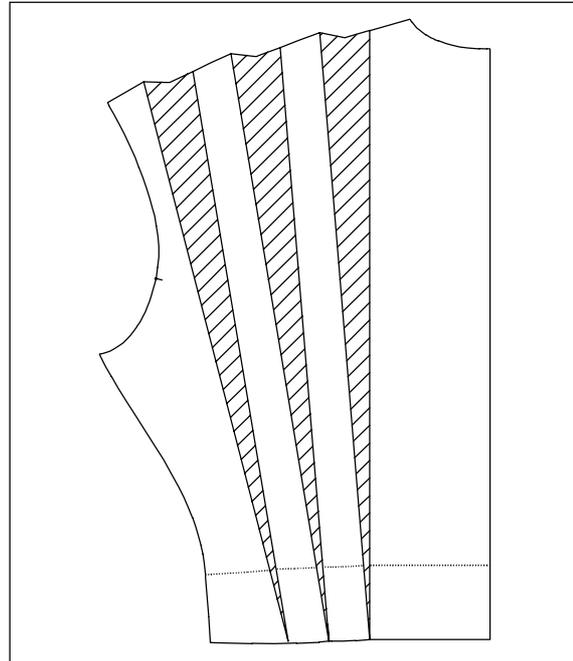
Picture 8-13

First, raster the shoulder and then, construct three lines from these points to the auxiliary line 6cm below waist, parallel to the centre back. Then, activate *pleats* and *spread with click l* and click the first spread line.

When clicking the spread line the right principle is to be followed. The starting point of the spread line is spread by the value s1, the final point by s2!

Enter the spread amount, here *s1=0.0* and *s2=40.0* and select the correct spread direction from centre back to the side seam by clicking on *dir shift*. Click on *spread: all* to spread. Set the switch to +*spread l.* and deposit with *deposit*.

Before depositing, test also the following:

reset: single l	click lines, with
spread: single l	back
reset: single p	click points, with
spread: single p	back
spread: all	
reset: all	
spread: single l	click lines
spread: single p	click points and restore the shape shown.

Click the next spread line. Grafis transfers the spread direction and spacing so you can continue with *spread: all* and *deposit*. Construct folds (dart hoods) for the pleats and hatch the pleats.

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2nd Exercise

Design two pleats in the front of „Grafis Bodice 20".First, link the shoulder and generate a point sequence of 5 points on the shoulder. Drop perpendiculars from the front two points onto the hem. Spread the perpendiculars with a spread amount of 40mm at the hem. The pleats are not opened at the shoulder. Link the hem lines.
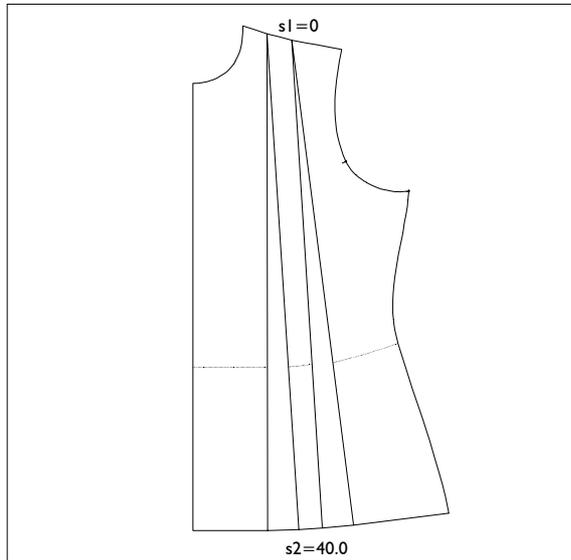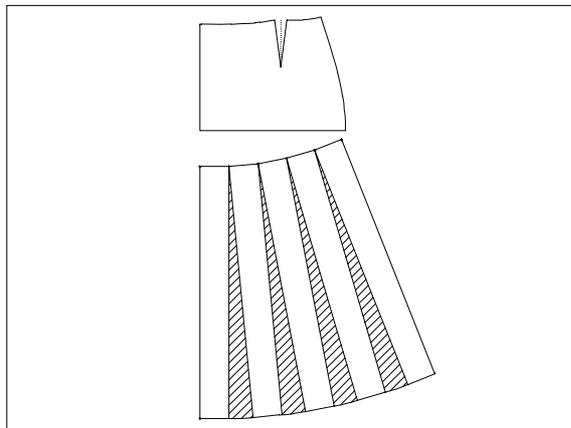

Picture 8-14

When clicking the spread line the right principle is to be followed. The starting point of the spread line is spread by the value s1, the final point by s2!

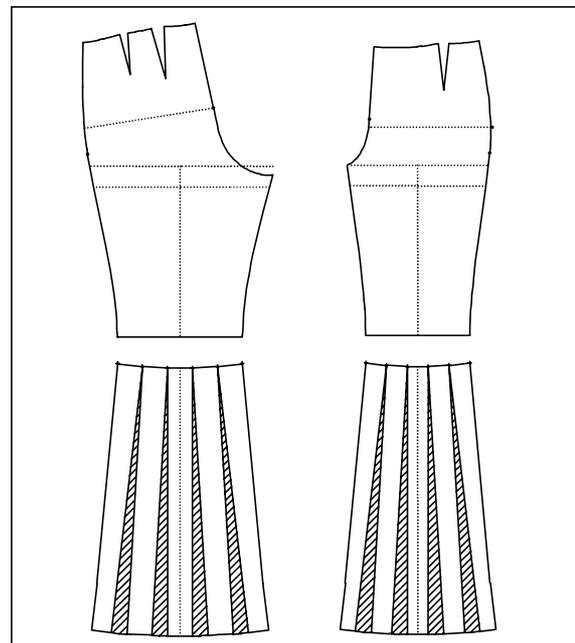## 8.6 Exercises

1st Exercise

Design four pleats from the hip line in the front skirt of the style „Straight skirt" from Section 2.4. The spread amount at the hip is 0 and the pleats are spread by 40mm at the hem.
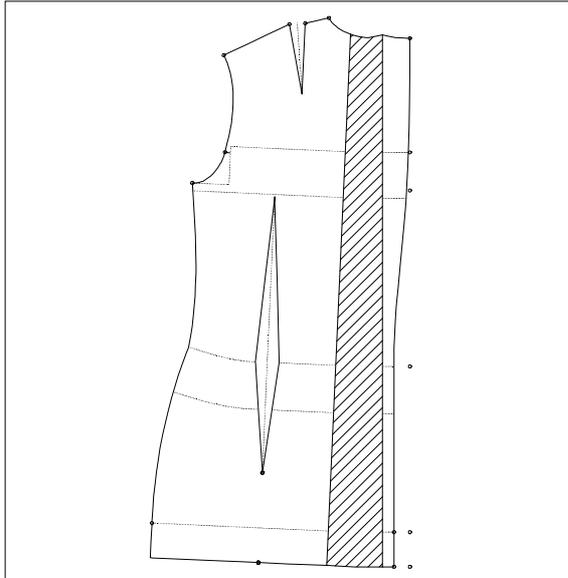

2nd Exercise

Design four pleats from the hip line in the front skirt of the style „Straight skirt" from Section 2.4. The pleats are spread by 60mm at the hip and hem respectively. Create inverted pleats at hip and hem.
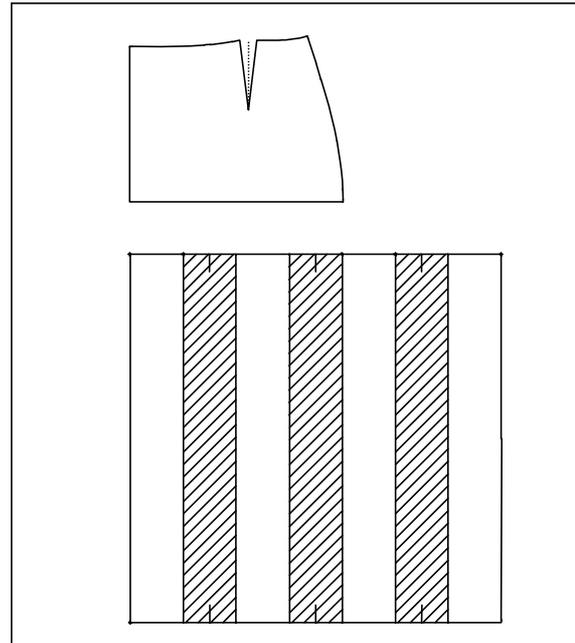
3rd Exercise

Construct four pleats from the knee in „Grafis Trouser 10". The spread amount at the knee is zero and 30mm at the hem. To the left of the crease line the pleats are to be spread towards the side seam, to the right of the crease line spread towards the inside leg. Link the hem lines.
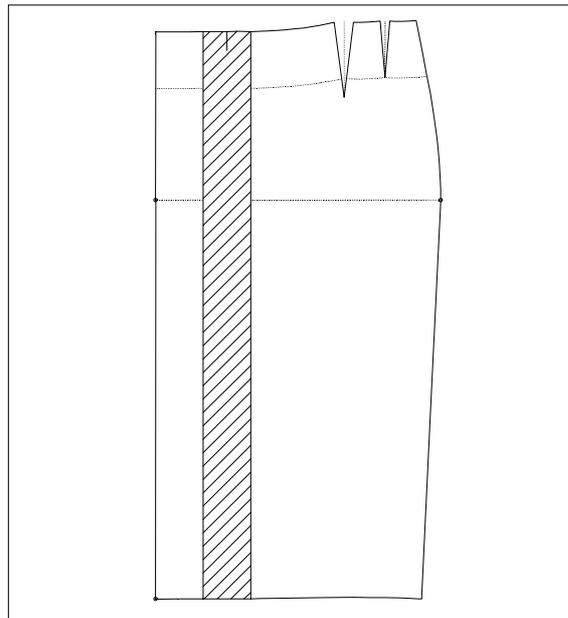

4th Exercise

Construct an asymmetrical pleat in the back of construction „Grafis Bodice 10", beginning at 50% of the neckline and running vertically down. Construct the spread line with either *p+digi* or with *p+dir+lg*, not with *perp.p=>l* as otherwise the spread line would change when interactively altering the hem curve. Spread with a pleat content of 40mm at the neck and 70mm at the hem. Construct a single dart hood at the neck and link the hem curve.

<u>5th Exercise</u>

In the front of „Grafis Skirt 20" construct a pleat at a distance of 50mm from the centre front. The pleat content is to be 50mm. First, construct a parallel of 50mm to the centre front and then spread the front skirt at the parallel.


<u>6th Exercise *„Blouse with pin-tucks"*</u>

Open the style *„Blouse with pin-tucks"* from Section 5.5 and continue designing.

Construct a point on the back armhole, 100mm from the end of the shoulder. From this point, drop a perpendicular onto the centre back. Construct a point sequence of 4 points on the perpendicular and construct two spread lines from these points. The spread lines are to be aligned parallel to the centre back. Extend the spread lines to the hem with *separate*.
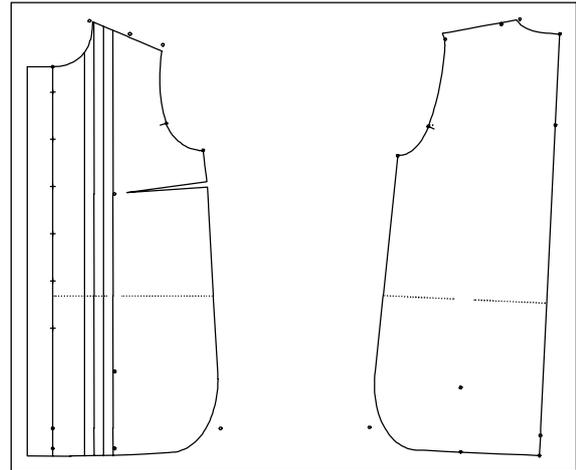
Construct a single dart hood for the bust dart in the side seam.
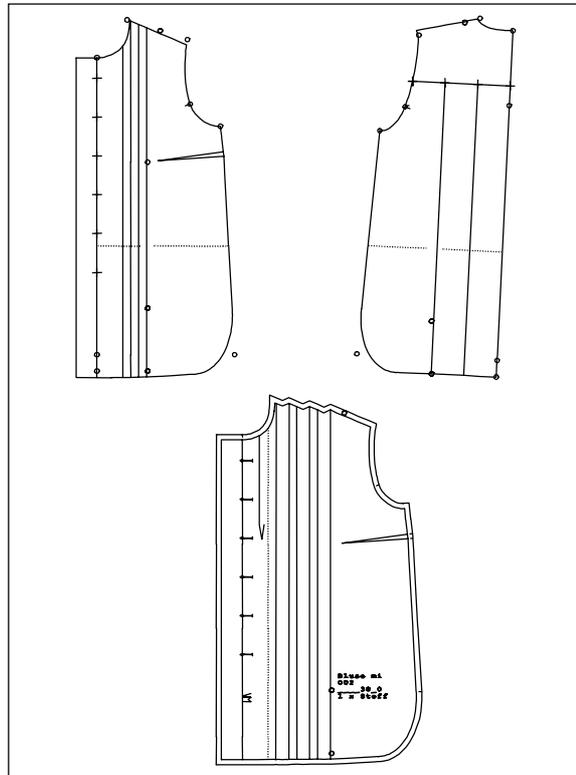
Open another part 002 in the part organisation and insert all lines and points of the front from part 001 into part 002. Hide part 001 and continue designing with part 002.

In part 002 spread the pleats in the front with a pleat content of 25mm at the shoulder and the hem respectively. Construct single dart hoods at the shoulder and close the hem with *link single*. Construct a seam allowance of 10mm with chain and set the symbols and the text.

Save the style again as „Blouse with pin-tucks"!