STOLL

CMS Handling and Knitting Techniques

Training

271 680_03_EN

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1 CMS - Handling

These document refers to the **CMS 530 OKC** machine type if nothing else is specified.

	WARNING
	Dangerous operations! Handling the knitting machine requests to follow the safety precautions.

2 Overview of Patterns for the CMS Basic Training

Pat-tern	Pattern name	Machine	Comb Usage	Setup Type:	Task / Parameter
1	Full Cardigan, 2 Colors	CMS 530 HP CMS ADF 32 W	With Comb	Setup 2	RS, NP, WM, MSEC, YDI
2	Cable 4x4	CMS 530 HP CMS ADF 32 W			VCI, WM^, NP, RS
3	1X1 Technique	CMS 530 HP CMS ADF 32 W			YDopt, NP, RS
4	Fully Fashion	CMS 530 HP CMS ADF 32 W			NPJ, WMF, YDF, Sequence
5	Intarsia	CMS 530 HP CMS ADF 32 W			YCI, Setting the breaking values
6	Plating	CMS 530 HP CMS ADF 32 W			YPI, Y:Ua-Ub, Y:Ncc
7	multi gauge	CMS 530 HP CMS ADF 32 W			NP, RS, WM, MSEC
8	Splitting	CMS 530 HP CMS ADF 32 W			NP, RS, WM, MSEC
9	Fully Fashion	CMS 530 HP CMS ADF 32 W	without comb		NP,NPJ, RS, WMF, counter #90
10	Applications + gore	CMS 530 HP CMS ADF 32 W	without comb		NP, RS, WMF, counter #90
11	Structured Pattern + Applications	CMS 822 HP	With Comb without comb		Operating modes of the MC: Tandem mode with coupling width 44" NP, RS, WMF

3 CMS Documents

The following documents about operation and maintenance of the CMS are delivered on DVD together with the machine:

- Safety instructions
- Operating instructions
- Spare Parts Catalog
- Circuit diagram
- Pocket Card
- Brochure "Cleaning, maintenance, care"

These documents contribute to a safe and harmless operation.
The safety instructions and the brochure "Cleaning, maintenance, care" are delivered printed as well.

4 CMS Performer Machines

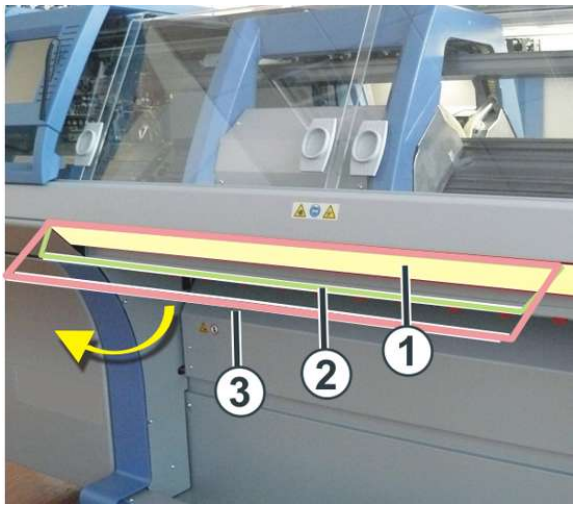
Operating and Signal Elements

	Designation	Explanation
1	Yarn control unit	Monitors the thread.
2	Bobbin board	The bobbins are placed on it.
3	Carriage	It moves over the needle beds and controls the work positions of the yarn carriers and of the needles in the needle bed.
4	Signal light	It displays the operating state of the knitting machine
5	Safety door (left, right)	The reversing position of the carriage is secured by the safety door.
6	Covers	The entire traversing path of the carriage is secured with covers. You have to forbid everyone from reaching out into the running machine.
7	Control Unit	◆ Controls the knitting process. ◆ It saves the data of the knitting program. ◆ It controls the needle selection and the motors in the carriage.
8	Main switch	Switching on and off of the machine. EMERGENCY-STOP switch

	Designation	Explanation
9	Engaging Rod	It activates and stops the carriage run.
10	Fabric take-down	**Main take-down:** Pulls the stitches away from the needle downwards to the fabric container. **Auxiliary take-down:** Grasps the fabric directly under the needle bed. **Comb take-down:** With the comb take-down fabric pieces are automatically started and press off after completion.
11	Fabric collection chamber	The fabric take-down guides the finished fabric into the fabric collection chamber. There the fabric is protected from soiling.
12	Touch screen	The touch screen enables communication with the machine control
13	USB port	Connection for a removable drive, containing knitting programs, operating systems and machine data. **Recommendations:** Use USB Memory Stick. **Further Possibilities:** ◆ External hard disk drive

Switching-on the machine at main switch

Engaging the machine with the engaging rod



Positions of engaging rod	
1	Carriage stopped
2	reduced speed
3	normal speed

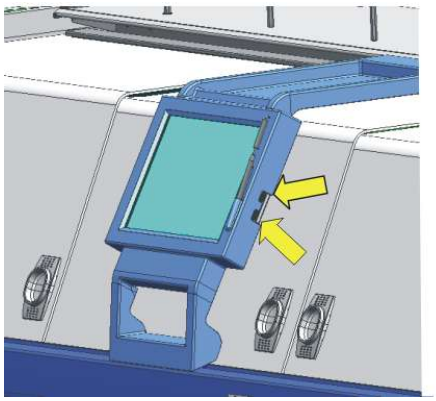
Signal light

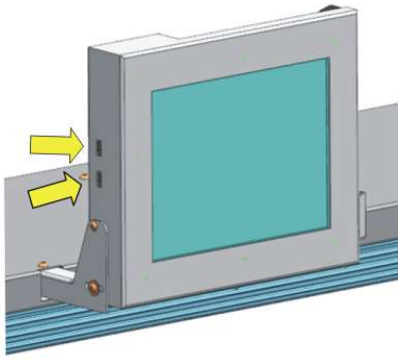
The signal light (1) displays the operating status of the knitting machine.

Color	State
green	Knitting machine is producing.
green (flashes)	Knitting machine is stopped with an engaging rod
yellow	The knitting machine is not producing, as an error has occurred during knitting.
green, yellow	Both lamps light up during the shutdown process.
off	Main switch is off.

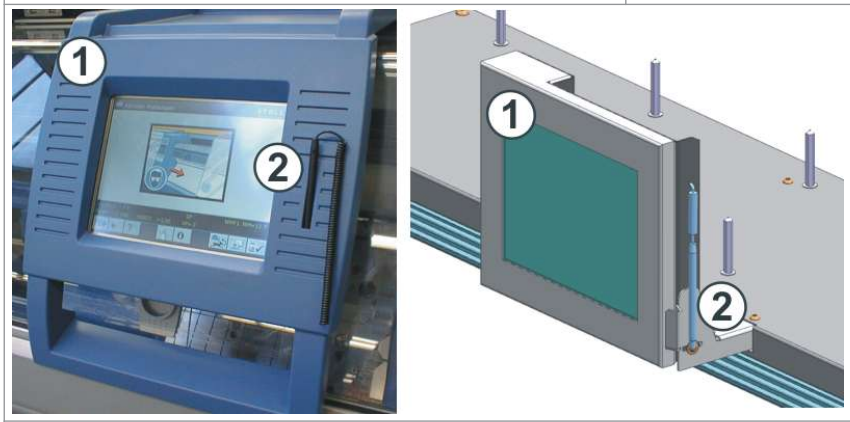
USB Memory Stick

All CMS machine types	CMS 502 HP / CMS 502 HP+





User Interface

	CMS 502 HP / CMS 502 HP+
	
1	The input unit enables communication with the machine control
2	Touch pen.

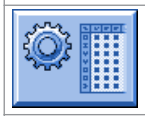
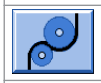
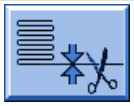
Functions at the touch screen (user interface):

- Display of operating data
- Changing machine settings and pattern data
- Input of commands
- Calling up help information

4.1 User interface

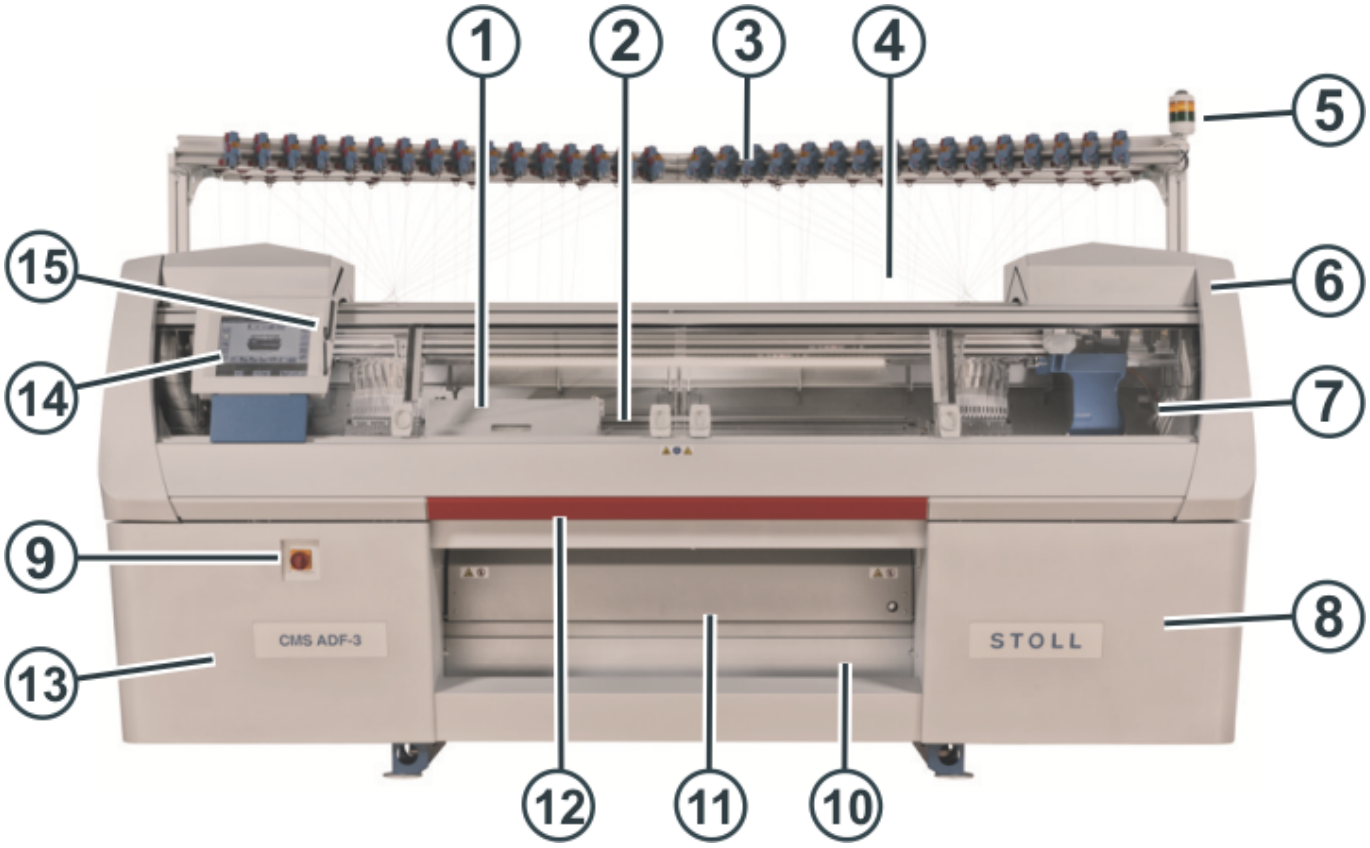
Areas	Display
Upper area (1)	◆ Input and output of information ◆ different input menus
Middle area (2)	◆ Status display ◆ Additional input elements ◆ Selection elements
Lower area (3)	Function keys

Description of the Function Keys:

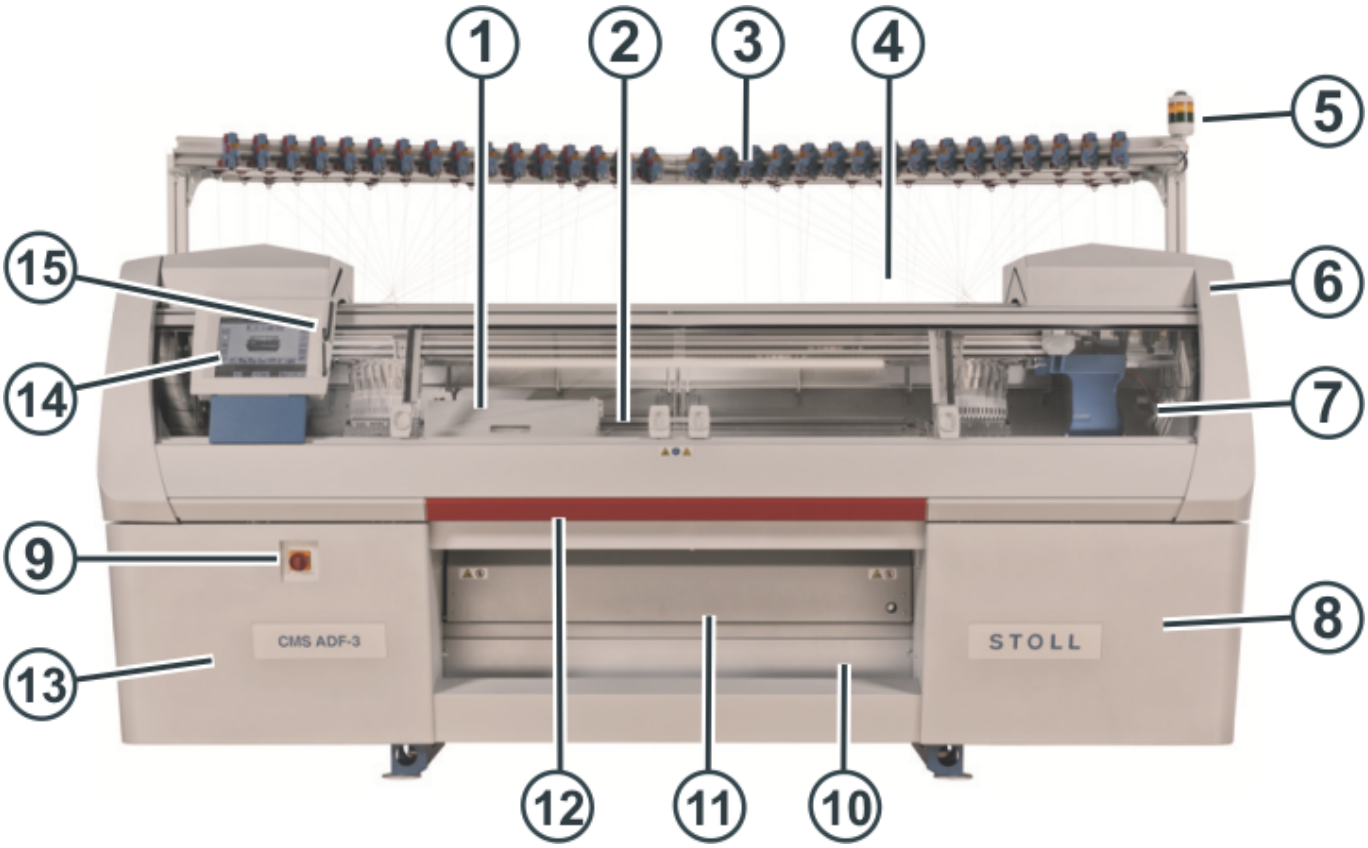
Key	Function	Key	Function
	Load/save data		Editing the knitting program
	Carriage Speed		Racking Correction
	Set-up Pattern		
	Call-up Setup2 ℹ: Appears with Setup2 patterns only		Machine start
	Machine Stop		Changeable monitoring
	cycle counters & counters		Manual interventions
	Take-down comb		
	Fabric Take-down		Multi-Piece Knitting
	Belt Take-Down		
	Stitch tension		Yarn Carriers
	Release clamps		
	Service		Machine settings
	Order menu		Sequence knitting
	Yarn Length Measuring		

5 CMS Knitting Machine - ADF Machines

Operating and Signal Elements

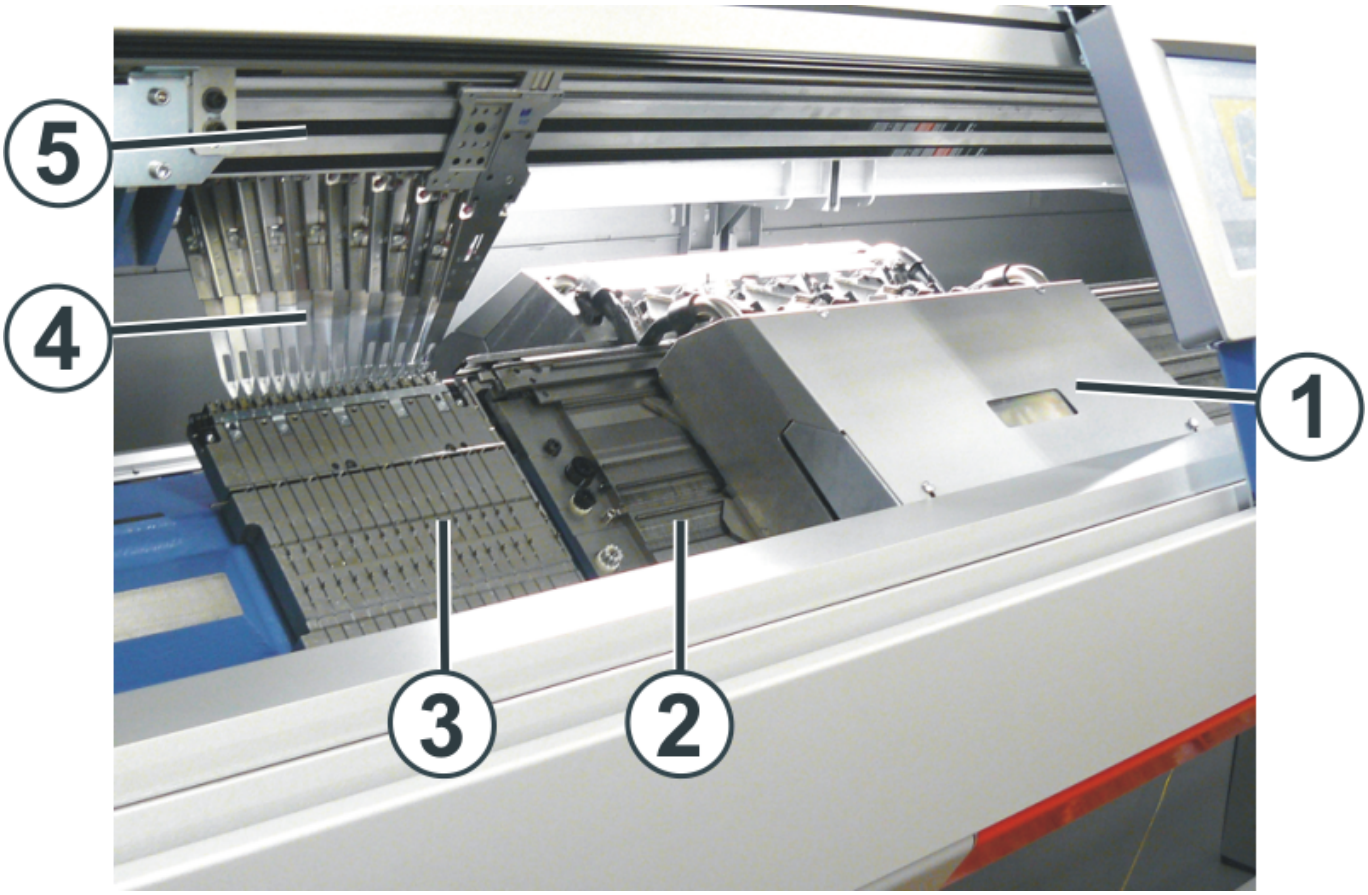


	Designation	Explanation
1	Carriage	It moves over the needle beds. It controls the work positions of each yarn carrier and each and every needle in the needle bed.
2	Needle bed	Every machine has a front and a rear needle bed. There are grooves in the needle bed which are run by needles.
3	Yarn control unit	Tensions and controls the thread.
4	Bobbin board	The bobbins are placed on it.
5	Signal light	It displays the operating state of the knitting machine
6	Safety door (left, right)	The reversing position of the carriage is secured by the safety door.
7	Covers	The entire traversing path of the carriage is secured with covers. You have to forbid everyone from reaching out into the running machine.
8	Control (right-hand side of the machine)	It controls the knitting process. It saves the data of the knitting program. It controls the needle selection and the motors in the carriage.
9	Main switch	Switching on and off of the machine. EMERGENCY-STOP switch.



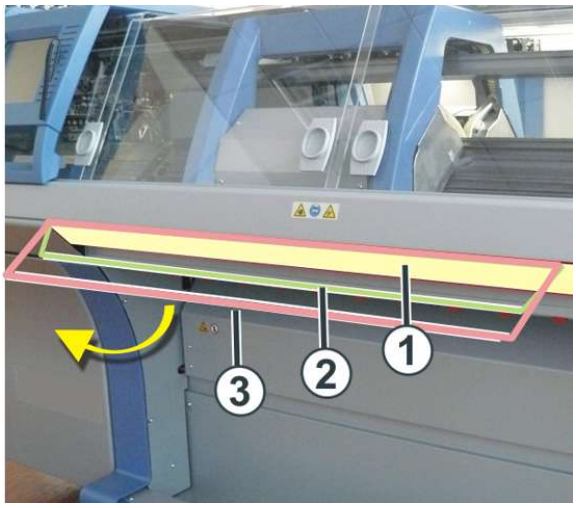
	Designation	Explanation
10	Fabric collection chamber	The fabric take-down guides the finished fabric into the fabric collection chamber. There the fabric is protected from soiling.
11	Fabric take-down (main take-down, auxiliary take-down, comb take-down, belt take-down)	Main Take-down: Pulls the stitches away from the needle downwards to the fabric container. Auxiliary take-down: Grasps the fabric directly under the needle bed. Comb take-down: With the comb take-down fabric pieces are automatically started and press off after completion. Belt take-down: Grasps the fabric directly under the needle bed.
12	Engaging Rod	It activates and stops the carriage run.
13	Control (left side of the machine)	It controls the autarkic yarn carriers.
14	Touch screen	The touch screen enables communication with the machine control
15	USB port	Connection for a removable drive, containing knitting programs, operating systems and machine data. Recommendations: Use USB Memory Stick. Also possible: Floppy disk drive, CD drive, DVD drive, external hard disk.

Inner view



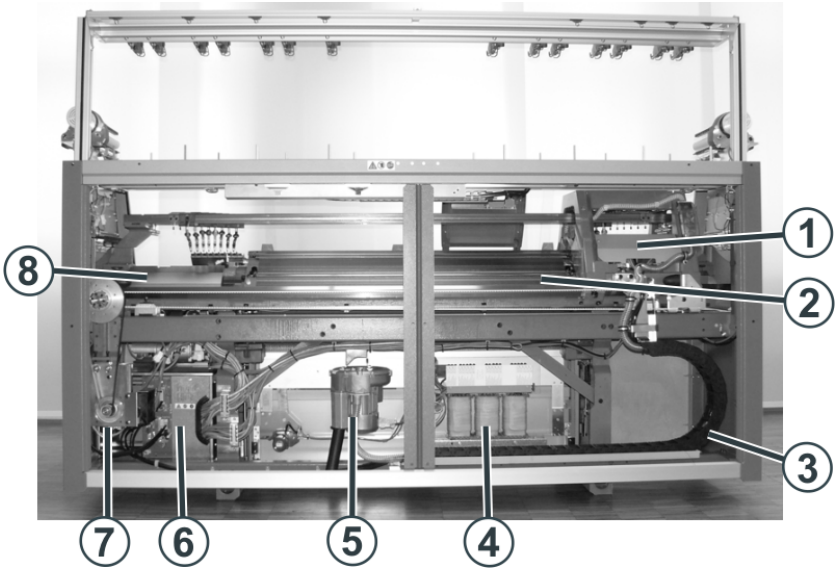
	Designation	Explanation
1	Carriage	It moves over the needle beds. It controls the work positions of each and every needle in the needle bed.
2	Needle bed	Every machine has a front and a rear needle bed. There are grooves in the needle bed which are run by needles.
3	Thread clamping and cutting device (left, right)	The thread clamping and cutting device holds the thread of a yarn carrier not used for knitting at the moment.
4	Yarn Carriers	It leads the thread into the needle. A toothed belt moves the yarn carrier synchronously with the carriage or freely, regardless of the carriage direction.
5	Yarn carrier rail	On each yarn carrier rail there are four yarn carriers - two on the front side and two at the rear.

Engaging the machine with the engaging rod



Positions of engaging rod	
1	Carriage stopped
2	reduced speed
3	normal speed

Rear of the machine



	Designation	Explanation
1	Carriage	It moves over the needle beds. It controls the work positions of each yarn carrier and each and every needle in the needle bed.
2	Rear needle bed	Every machine has a front and a rear needle bed. There are grooves in the needle bed which are run by needles.
3	Trailing cable (energy chain)	The cables for the carriage that travels hence and forth are fed along with in the energy chain.
4	Transformer (Fuses)	The knitting machine can be operated with various mains voltages.
5	Fluff absorption	The fluff absorption removes the yarn fluff from the upper area of the needle beds.
6	Control Unit	It controls the knitting process. It saves the data of the knitting program. It controls the needle selection and the motors in the carriage.
	Control (right-hand side of the machine)	It controls the carriage run and the racking of the needle bed.
7	Main Drive	The carriage is driven by the drive motor via a toothed belt.

	Designation	Explanation
8	Racking device	Racks the rear needle bed laterally.

5.1 User interface

User interface with function keys:

ADF - Machine specific data

Key	Function
	Autarkic yarn carrier

6 Safety Precautions for Production

Type of risks	Measures
Danger of injury	Close the covers. Close the rear panels (sliding boards) of the machine. Close the lateral covers. Keep eyes away from the lateral yarn tensioner. Objects such as tools, bobbins etc. to be removed from the inside of the machine. If the machine is in operation, under no circumstances should you reach into it. If the machine is in operation, do not reach into the area of the yarn carrier rails under any circumstances. Stop the machine if an intervention is necessary. Do not tear off the yarn by hand but use scissors.
Danger of winding and suction and danger of crushing.	Do not reach into the fabric take-down rollers. Do not touch the friction feed wheel while the machine is in operation and keep away loose garments and hair strands. Wait for the feed wheel to stop moving after stopping the machine.
Health hazard by fibers, dust and fumes.	Special caution is to be observed while knitting of yarns that cause health hazards or a damage to the machine: ◆ Yarns with heavy fiber fly ◆ dyestuffs causing health hazards ◆ Yarns made of glass fibers, metallic-annealed fibers, asbestos, carbon, PU or similar materials Employ suitable measures to avoid the hazard caused by fibre, dust and fumes. Observe the country-specific laws and regulations. Observe the manufacturer's specifications (safety data sheet). For any further queries please contact Stoll.
Fire hazard by fluff, dust and other impurities. Increased danger of short circuit during knitting of metallic or conductive materials by building up of conductive fluff and dust.	Fluff, dust and other impurities to be removed regularly from the entire machine depending upon the degree of dirt at least once in every shift. Take care of any additional suction. Wear Inhalation protection gear.

7 Additional Safety Instructions for the Operation with Open Covers

If the covers are open the engaging rod cannot be locked into it's highest position (production). The user must hold the engaging rod in this position so that the machine works at the set speed "MSECCO" (dead man's switch).

The maximum carriage speed with open cover can be set in the "Machine parameter" window. (Value range in input field "MSECCO": 0.00 to 0.20 m/s, standard: 0.05)

DANGER

The carriage moves at production speed!

Danger of crushing and cutting by the carriage.

▷ If the "MSECCO" check box is deactivated, the carriage moves at production speed.
After the reversal point, the carriage can move at higher speed, if it is set up that way in the knitting program.

➜ Close the covers.

➜ Do not deactivate the "MSECCO" check box.

Type of risks	Measures
Danger of crushing and cutting by the carriages, racking, the needle beds, the clamping and cutting devices and the additional needle beds.	Do not reach into the running machine. Move carriage step by step or at creep speed (see operating instructions).
Danger of injury by broken cam box and needle pieces.	Wear safety glasses.
Danger of crushing and suction by the fabric take-down, the auxiliary take down, the comb take-down and the additional beds.	Do not reach in the gap between the needle beds. Keep hands, face, loose clothing and other loose objects away: danger of crushing. Do not reach into the area between the fabric take-down roller and the comb take-down.

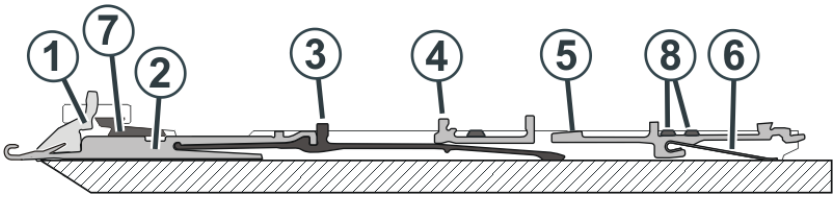
Type of risks	Measures
Danger of crushing and cutting by the carriage, the autarkic yarn carriers, the racking, the needle beds and the clamping and cutting devices.	Do not reach into the running machine. Move carriage step by step or at creep speed (see operating instructions).
Danger of injury by broken cam box and needle pieces.	Wear safety glasses.
Danger of crushing and suction: ◆ by the fabric take-down (main take-down, auxiliary take-down, comb take-down, belt take-down)	Do not reach in the gap between the needle beds. Keep hands, face, loose clothing and other loose objects away: danger of crushing. Do not reach into the area between the fabric take-down roller and the comb take-down.

Type of risks	Measures
Danger of crushing and cutting by the carriages, racking, the needle beds, the clamping and cutting devices and the additional needle beds.	Do not reach into the running machine. Move carriage step by step or at creep speed (see operating instructions).
Danger of injury by broken cam box and needle pieces.	Wear safety glasses.
Danger of crushing and suction: ◆ by the fabric take-down (main take-down, auxiliary take-down, comb take-down, belt take-down) ◆ by the additional needle beds	Do not reach in the gap between the needle beds. Keep hands, face, loose clothing and other loose objects away: danger of crushing. Do not reach into the area between the fabric take-down roller and the comb take-down.

8 Needle Beds and their Elements

Construction: Needle beds

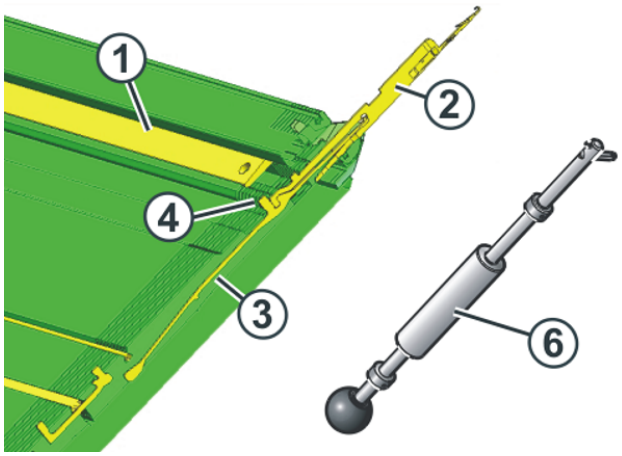
- The front needle bed is permanently screwed to the support of the needle beds.
- The rear needle bed can laterally be racked relative to the front needle bed by the racking device.



No.	Elements	No.	Elements
1	Holding-down jack	**5**	Selection jack
2	Needle	**6**	Selector spring
3	Coupling part	**7**	Needle bar
4	Intermediate slider	**8**	Cover rail

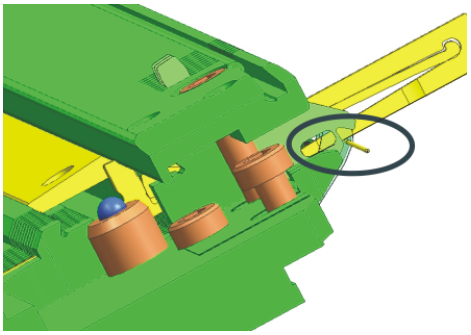
The moveable parts (2) till (6) are fixed by multiple cover rails (8) in the needle bed.

I. Replacing needle and coupling part



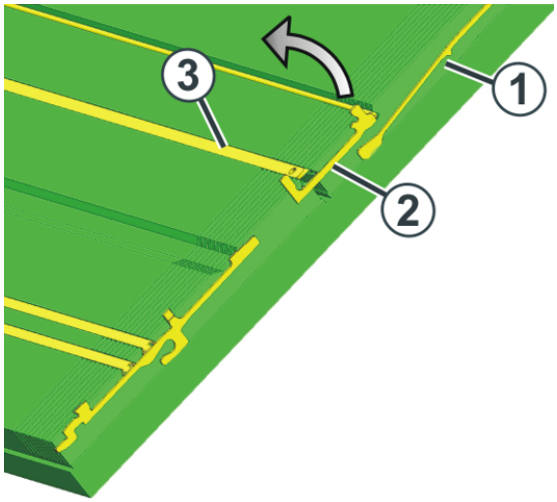
1. Open the needle rail (1) with pull-out hook (6).
2. Pull the needle (2) and coupling part (3) upward.
3. Press the coupling part downward, when the butt of the coupling parts (4) bumps into the holding-down jack bed.
4. Assemble the new needle and coupling part.
5. Push the butt of the coupling part into the needle bed under the jack bed.

While doing so, make sure that the needle is guided in above the knock-over wire.



II. Replacing intermediate slider

CMS machines with a cam box distance of 6"

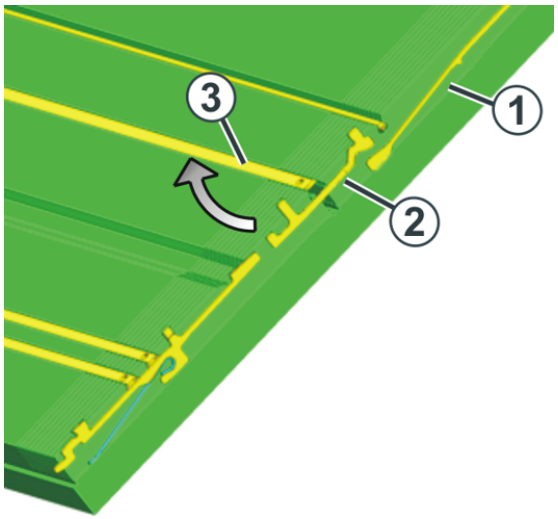


1. Push the needle and coupling part (1) upward.
2. Push the intermediate slider (2) until the lower butt bumps into the cover rail (3).
3. Pull the upper butt of the intermediate slider out of the needle bed while pressing the lower butt into the needle bed and under the cover rail.
4. Install the new intermediate slider in the reverse order.
5. Slide the needle and coupling parts into the home position.

CMS machines with a cam box distance of 5"

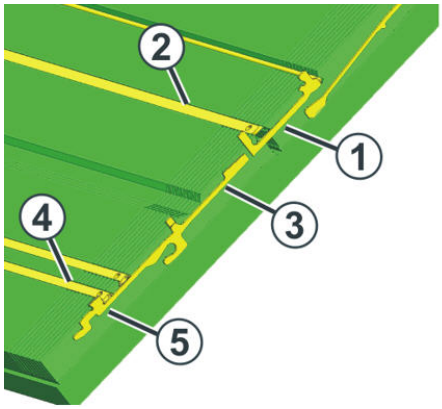
To replace the intermediate slider, you need

a pair of pliers.



1. Push the needle and coupling part (1) upward.
2. Using the pliers, pull the lower butt of the intermediate slider (2) downwards out of the needle bed while pressing the upper butt into the needle bed and pressing it under the cover rail.
3. Install the new intermediate slider in the reverse order.
4. Slide the needle and coupling parts into the home position.

III. Replacing selection jack

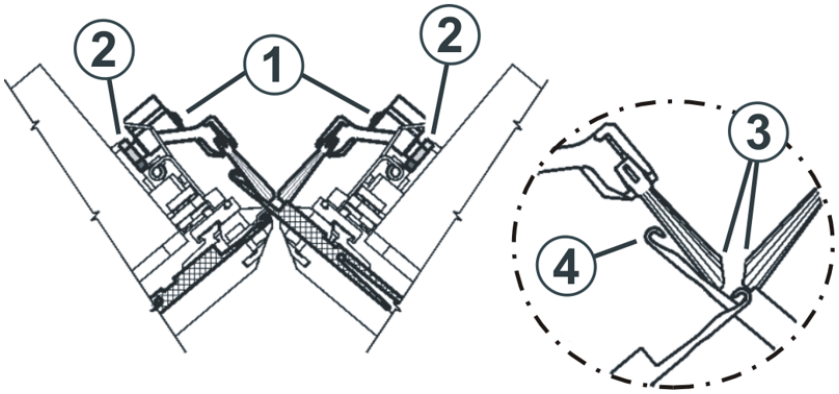


1. Push the needle upward with the coupling part.
2. Push the intermediate slider (1) until the lower butt bumps into the spring wedge (2).
3. Push the selection jack (3) upward until it bumps into the cover rail (4).
4. Press the butt (5) of the selection jack into the needle bed and at the same time slide the selection jack further upward.
5. Remove the selection jack.
6. Install the new selection jack in the reverse order.
7. Slide the intermediate slider in home position.
8. Slide the needle and the coupling part into the home position.

9 Adjusting needle brushes

The needle brushes must be adjusted when errors occur during stitch formation, e.g. drop stitches.

The needle brushes open the needle latches for inserting the thread. They are swivel-mounted so, that they are always inclined in the direction of travel of the carriage assembly.



The needle brushes are correctly adjusted when

- the brushes project an equal distance over both sides of the holder The markings on the brush are visible on both sides.
- the canted surfaces (3) opposite each other
- the brushes do not touch the needle hooks of the fully raised needles (RR). The distance (4) is to be 0.5 mm to 1 mm.

Adjusting needle brushes:

1. Release hexagon nut (2).
2. Adjust needle brush at screw (1).
3. Re-tighten hexagon nut (2).
4. Adjust needle brushes on all systems.
5. Call up "Manual interventions" window.

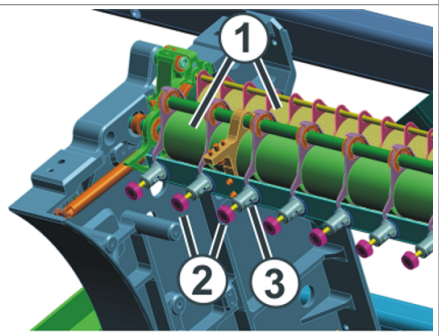
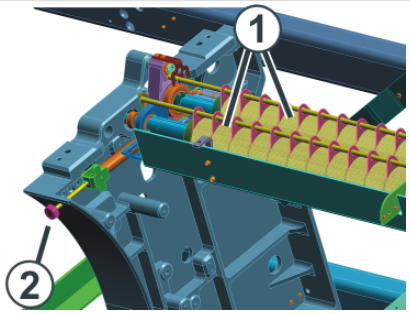
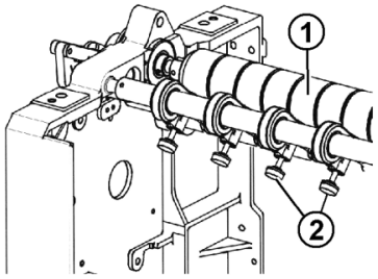
Key	Function
	Call up "Manual interventions" window

6. Move carriage assembly at low speed. To do this, press "Move stepwise" button and check the setting of the needle brushes.

10 Fabric take-down

10.1 Main Take-down

Types of Main Take-down

Compact class multi gauge class knit&wear class	CMS 502	Top class
		

No.	Elements
1	Take-down rollers
2	Knurled screws
3	Scale

- A motor drives the take-down rollers (1).
  These provide the take-down tension and guide the finished fabric into the fabric collection chamber.
- The contact pressure can individually be adjusted with knurled screws (2).
- The scale (3) simplifies the adjustment.

Take-down tension

The take-down tension consists of:

- Pretension at the carriage reversing point (**WMI**)
- Take-down tension during knitting (**WM**)

You can set both take down values independently of each other.

The optimum value for the take-down tension depends on:

- Working width
- Yarn
- Pattern

Premature wear of the take-down rollers

The roller rubber of the take-down roller (1) is prematurely worn by:

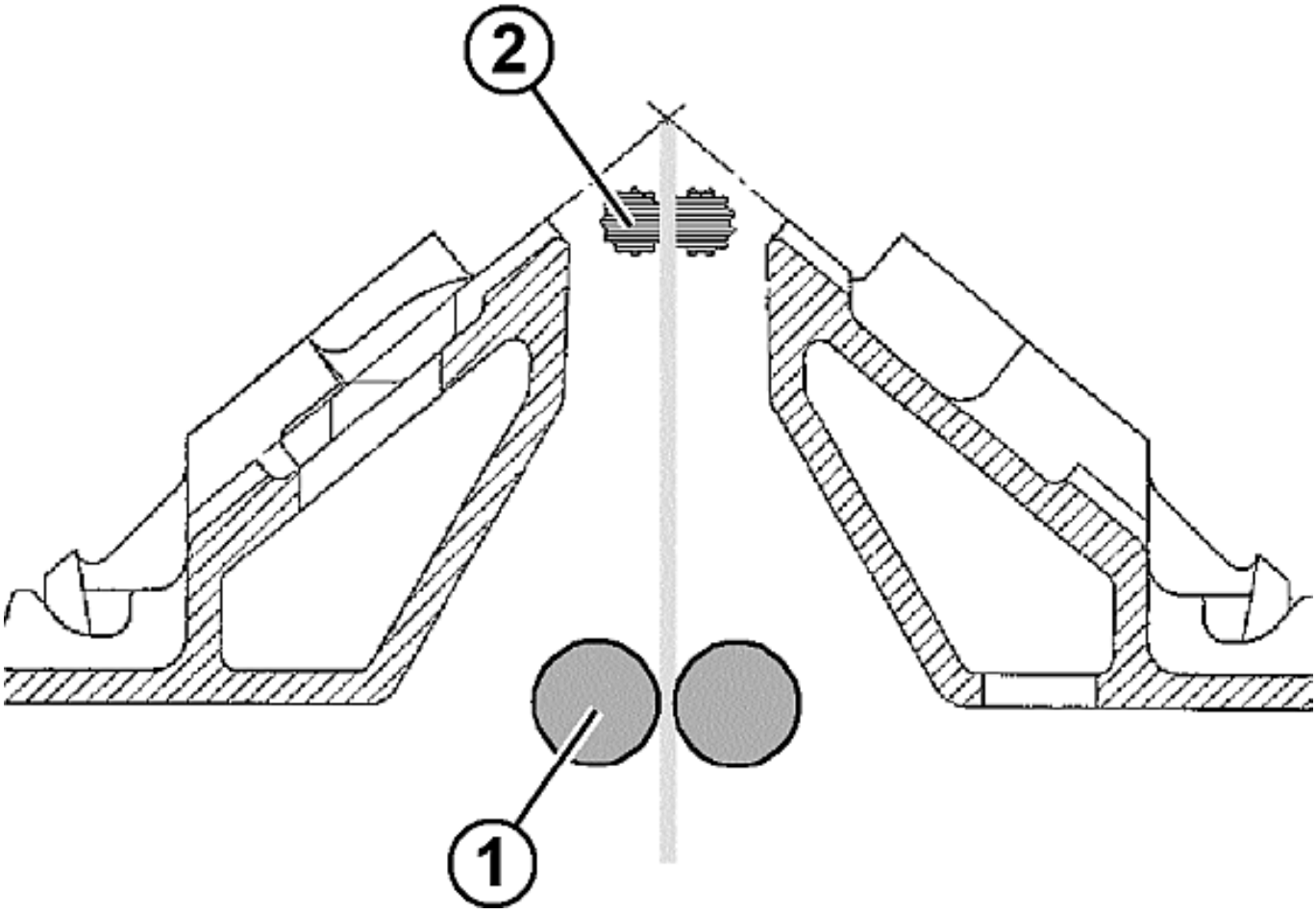
- Fabric take-down values too high (roller spins)
- Contact pressure too high
- abrasive, sanding yarns
- yarn finishes such as greases or oils
- UV radiation

- Cleaning agents harmful to rubber.

Use cleaning petrol!

10.2 Auxiliary Take-down

Position: Auxiliary Take-down



Position	Element
1	Main Take-down
2	Auxiliary Take-down

- The auxiliary take-down grasps the fabric directly under the needle bed.
- The take-down force and the take-down speed are programmable.
- The auxiliary take-down supports:
  - Stitch formation
  - Adjustment of the fabric take-down to requirements typical of the fabric
  - Narrowing or widening

If the fabric is only taken down with the main take-down, the rollers of the auxiliary take-down are pivoted apart.

Adjusting the Contact Pressure

- **For machines with a needle bed of 50 inches:**
  Adjust the contact pressure with the detent plate (1)

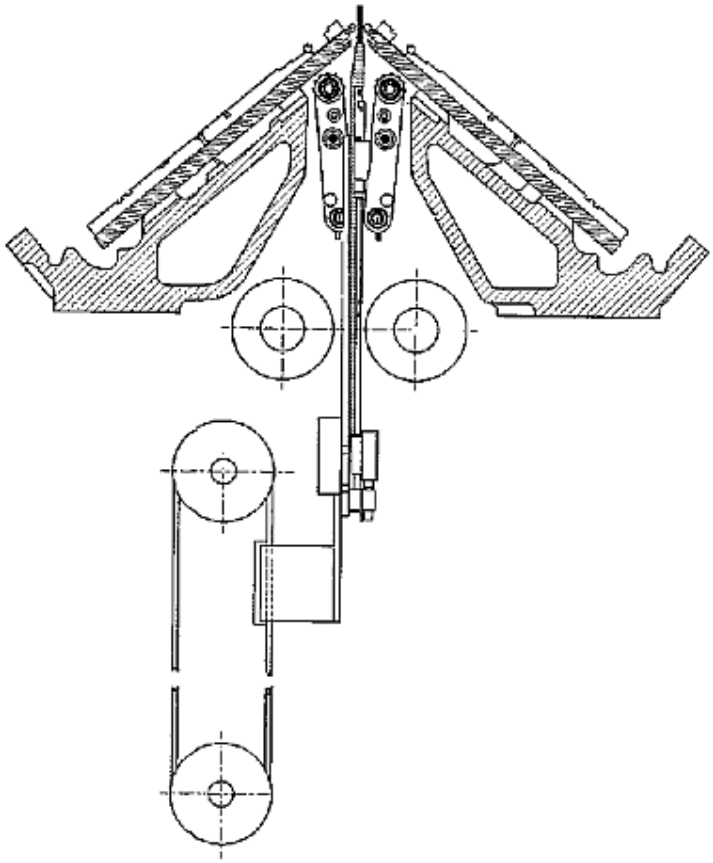
- **For machines with needle beds of 72, 84 or 96 inches:**

  Enter the contact pressure in the  window under "Contact pressure (W+P)".

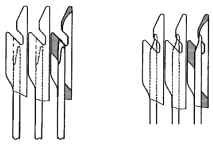
10.3 Comb Take-down

Function: Comb Take-down

With the comb take-down fabrics are started on empty needles.
The fabric will be thrown off then and a new fabric will be started on empty needles again.



Comb hooks with the sliders open or closed:



With the start of a new fabric on empty needles the comb take-down will provide the take-down function and pulls the fabric down till the fabric is taken down by the main take-down.

How the Comb Take-down Works

▷ The knitting program must be generated with **Comb start**.

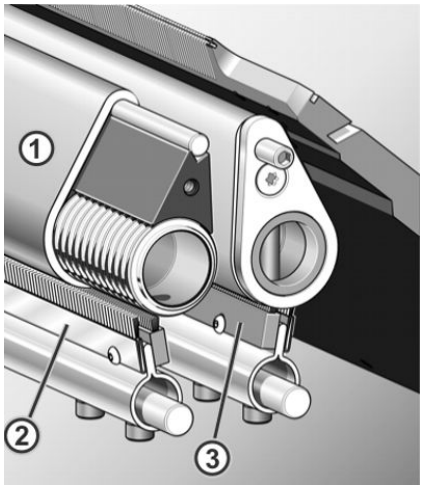
▷ The needle beds, comb hooks and fabric collection chamber must be empty.

▷ The comb take-down adopts the settings of the main take-down.

▷ The main take-down and the auxiliary take-down are open.

1. The knitting program is started.
2. The comb thread (elastic yarn) is inserted in the two rows.
3. The comb take-down moves upwards with opened comb hook and grasps the comb thread.
4. The comb hooks close and the comb pulls the comb thread under the comb level.
5. Now, the fabric can be started on the comb thread.
6. The comb take-down pulls the fabric below the main take-down.
7. The take-down rollers of the main take-down close and receive the fabric out of the comb.
8. The comb hooks open and release the fabric, simultaneously the comb moves to the home position.
9. The fabric is completed and gets cast-off at the end.
10. A new fabric may start.

10.4 Belt Take-Down



1 Belts

3 Linear stripping brush

How the belt take-down works

The belt take-down grasps the fabric directly under the needle bed.

A motor drives the drive shafts. The belts (1) are driven by the drive shaft and guided by the deflection rod. The finished fabric is guided into the fabric collection chamber by the belts.

The winding protection device with antistatic brushes (2) and linear stripping brushes (3) avoid the winding of the fabric and the threads around the take-down belts. If winding is detected nevertheless, the machine stops.

Functional states

- **Rotate**: Forward rotation with controlled speed by the motor
- **Stop**: After a short delay the forward movement is stopped.
- **Close**: Short, fast forward rotation, then rotate
- **Open**: Short, fast backward rotation

Premature wear of the take-down belts

The belt will be worn prematurely by:

- too high belt speed
- yarns that are harmful to rubber, e.g. abrasive, sanding yarns or yarn finishes such as greases or oils
- sharp tools that are used for example for pressing-down the stitches or the fabric
- UV radiation
- Cleaning agents harmful to rubber, e.g. ether or fuels. Recommendation: Use cleaning petrol for cleaning

11 Removing and mounting carriage part

Reasons why the carriage part must be removed:

- Cleaning
- blocked carriage part
- For changing cams
  - Assembling / disassembling split cams
  - wide or narrow coupling of tandem machines

11.1 Switching on/off the 40 Volt power supply.

I. Switching off the 40 V Power Supply

The power supply of the carriage part (step motors, selection systems, yarn carrier plunger) can be switched off for assembling works. This eliminates the switching off and on of the main machine switch and thereby the waiting time until the computer of the knitting machine has shut down and rebooted.

If the power supply is switched off, the machine **cannot be started with the engaging rod**.

1. Tap the "Service"  key in the Main menu.
2. In the service window tap on "Manual interventions service"  .
3. Set the switch for "Switch the 40 Volt power supply" to **OFF**.
4. Answer the message "Switch off" with "Yes".

II. Switch on 40 V power supply

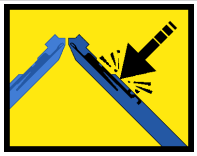
▷ All plug connections are plugged in.

1. Tap the "Service"  key in the Main menu.
2. In the "Manual interventions service" window tap on the  button.
3. Set the switch for "Switch the 40 Volt power supply" to **ON**.
4. Go back to the Main menu.

11.2 CMS Performer Machines

11.2.1 Remove the carriage part when the carriage assembly is blocked in the needle bed

In the case of a shock on the needle bed, e.g. in the case of needle breakage, the piezo-electric shock stop switches off the knitting machine.

Shock stop motion front needle bed	Shock stop motion rear needle bed
	

Possible causes:

- Working butts of the movable parts (needle, coupling part, intermediate slider, and selection jack) are broken. This may have damaged trick walls as well.

I. Remove the carriage part from the needle bed

On tandem machines both carriage parts in the same needle bed are raised, even if only one is blocked.

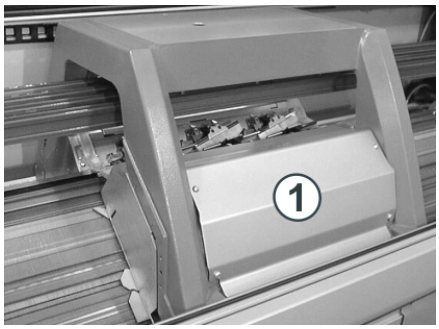
1. Call up the "Manual interventions"  window.
2. Switch off needle selection.

3. Tap the "YC bolt" "Up" key to switch off all yarn carriers.
4. Push all yarn carriers outward.

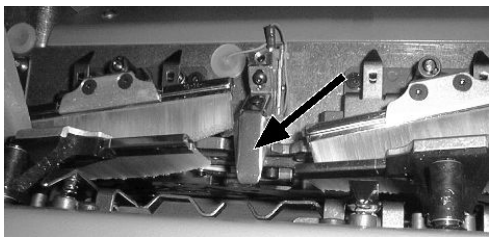
Central lubrication

If a central lubrication is present, swivel it into mounting position.

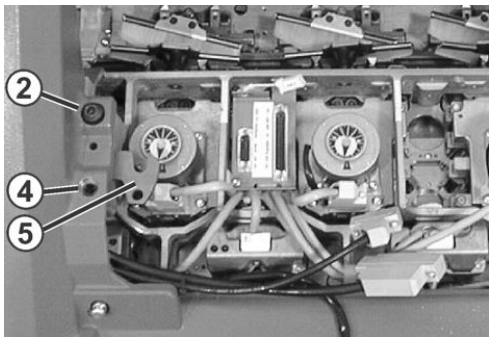
5. Switch off 40 V power supply.
6. Remove the carriage assembly panelling (1).



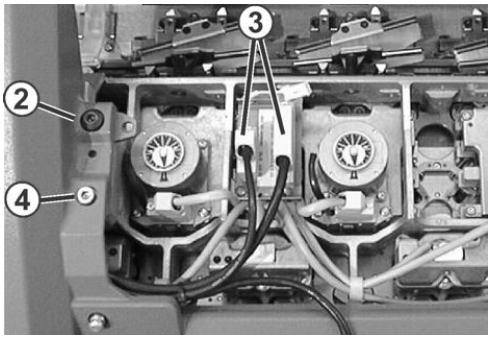
7. If the rear carriage part is removed, the needle detector is to be removed as well.



8. Mark the position of the needle detector so that it can be reassembled in the same position.
9. Remove the suction tube on the carriage assembly.
10. Loosen the shoulder screws (2) and screws (4) on the left and right sides.



11. Swivel left and right swiveling plates (5) inward.
12. Tighten shoulder screws (2) and screws (4) evenly; the carriage part is raised off the needle bed in the process.
13. Loosen the screws on the plugs (3) and pull out the plugs.



14. To lower the carriage part again, loosen the shoulder screws (2) and screws (4) on the left and right-hand sides.
15. Remove the shoulder screws (2) and screws (4).
16. In the "Manual interventions"  window tap the "Release drive brake" key.

	NOTICE
	Damage to needles and knitting system! There are still needles in the knitting system. When moving the carriage assembly in the other direction (opposed to the carriage stroke direction), the needles and knitting system can be damaged. **Do not change the pushing direction of the carriage assembly!!!**

17. Push away the carriage assembly.

If the carriage assembly is blocked:

The drive brake has automatically closed.

18. Lift carriage part from needle bed.
19. Check the carriage part and the needle bed.

II. Check and clean the carriage part and the needle bed

Do not remove metallic parts and fragments (e.g. broken needle latch or needle hook) with a magnetic tool. There is a danger that the needle bed or cams can be magnetized, leading to incorrect selection.

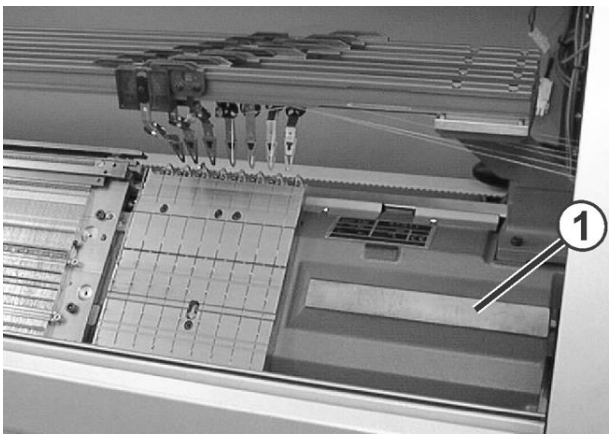
- Check the cams for damage.
  Remove broken working butts of the movable parts (needle, coupling part, intermediate slider, and selection jack).
- Check the needle bed for damage.
  Remove broken working butts of the movable parts (needle, coupling part, intermediate slider, and selection jack).
  If trick walls are damaged, they have to be repaired.

1. Clean the selection systems with a clean cloth.
2. Clean the cams with a cloth and check them for wear and damage.
3. Remove fragments if necessary
4. Apply oil onto the cams with a brush.

For further information about cleaning the knitting and selection systems refer to the operating instructions.

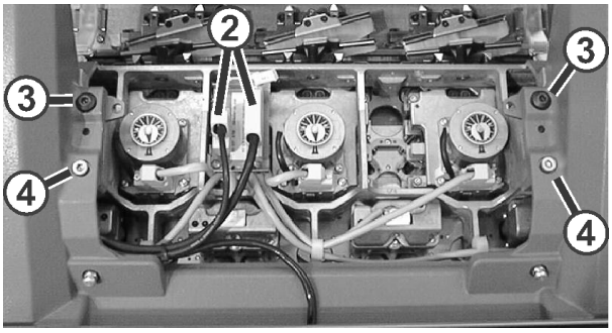
IV. Put the carriage part on:

1. Mount the carriage part on the left or right outside the needle bed in such a way that it contacts the support surface (1).



2. In the service window tap on "Manual interventions service"  .

3. Set the switch for "Switch the 40 Volt power supply" to **ON**.
4. Tap the "Release drive brake" key in the Manual interventions  window.
5. Push the carriage assembly right over the carriage part.
6. Set the switch for "Switch the 40 Volt power supply" to **OFF**.
7. Uniformly screw in the shoulder screws (3) until the carriage assembly is raised somewhat.



8. Swivel the left and right swiveling plates outward below the carriage assembly.
9. Tighten the screws (3) and (4) uniformly.
10. Insert the plug (2) and screw-in the safety screws on the plugs.
11. Mount the suction tubes on the carriage assembly.
12. Assemble the carriage assembly panelling.

V. Switch on 40 V power supply:

1. In the window tap on "Manual interventions service"  .
2. Set the switch for "Switch the 40 Volt power supply" to **ON**.

11.2.2 Remove the carriage part to replace cams

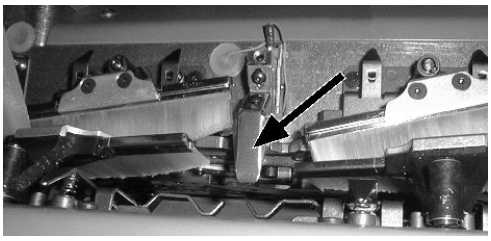
I. Remove the carriage part from the needle bed

Central lubrication

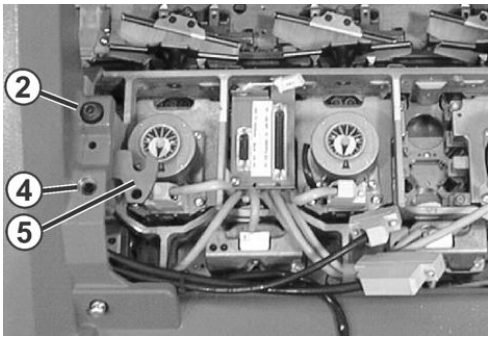
If a central lubrication is present, swivel it into mounting position.

1. Move the carriage assembly outward up to the support surface.
2. Switch off 40 V power supply.
3. Remove the carriage assembly panelling (1).

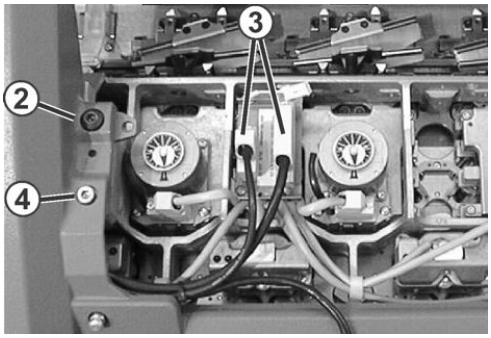
4. If the rear carriage part is removed, the needle detector is to be removed as well.



5. Mark the position of the needle detector so that it can be reassembled in the same position.
6. Remove the suction tube on the carriage assembly.
7. Remove the shoulder screws (2) and screws (4) on the left and right-hand sides.



8. Swivel left and right swiveling plates (5) inward.



9. Loosen the screws on the plugs (3) and pull out the plugs.
10. In the "Manual interventions"  window tap the "Release drive brake" key.
11. Push away the carriage assembly.

If the carriage assembly is blocked:

The drive brake has automatically closed.

---

12. Lift the carriage part off the support surface.

- or -

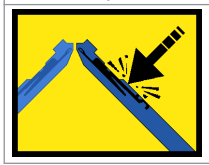
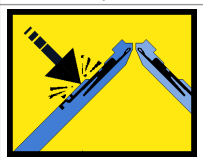
➜ Open the side safety door hood and lift out the carriage part to the side.

13. To replace the cams, turn the cam plate upward.

11.3 ADF machines

11.3.1 Remove the carriage part when the carriage assembly is blocked in the needle bed

In the case of a shock on the needle bed, e.g. in the case of needle breakage, the piezo-electric shock stop switches off the knitting machine.

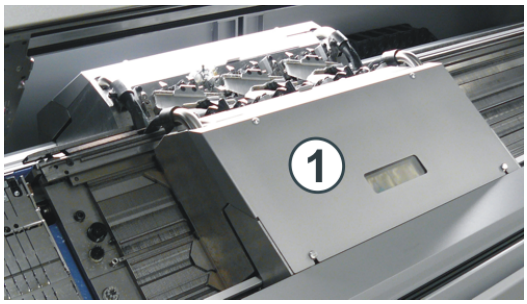
Shock stop motion front needle bed	Shock stop motion rear needle bed
	

Possible causes:

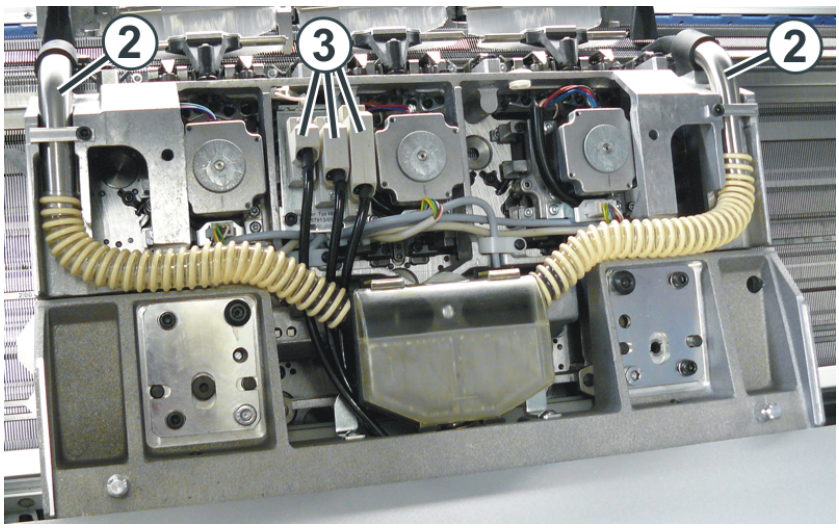
- Working butts of the movable parts (needle, coupling part, intermediate slider, and selection jack) are broken. This may have damaged trick walls as well.

I. Remove the carriage part from the needle bed

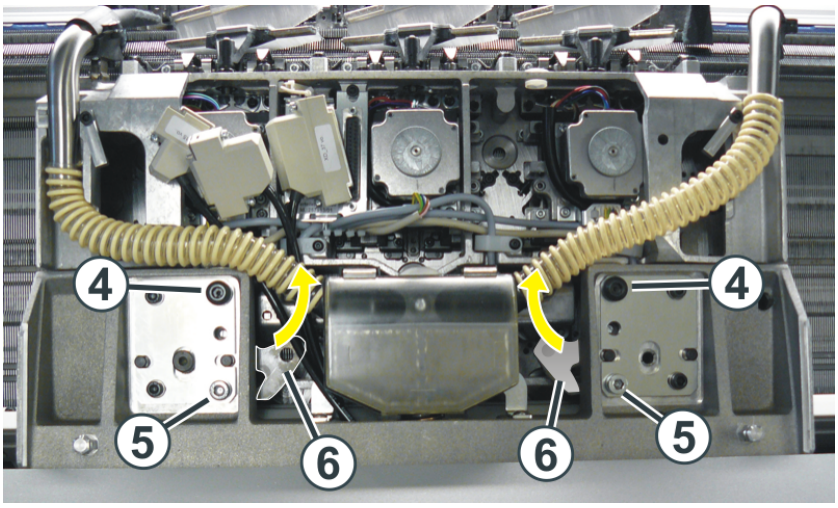
1. Call up the "Manual interventions"  window.
2. Switch off needle selection.
3. Open the covers.
4. Move all the yarn carriers away from the carriage area.
5. Switch off 40 V power supply.
6. Remove the carriage assembly panelling (1).



7. Take the suction tubes (2) out of the carriage part.



8. Loosen the screws on the plugs (3) and pull out the plugs.
9. Remove the shoulder screws (4) and screws (5) on the left and right-hand sides.



10. Swivel left and right swiveling plates (6) inward.

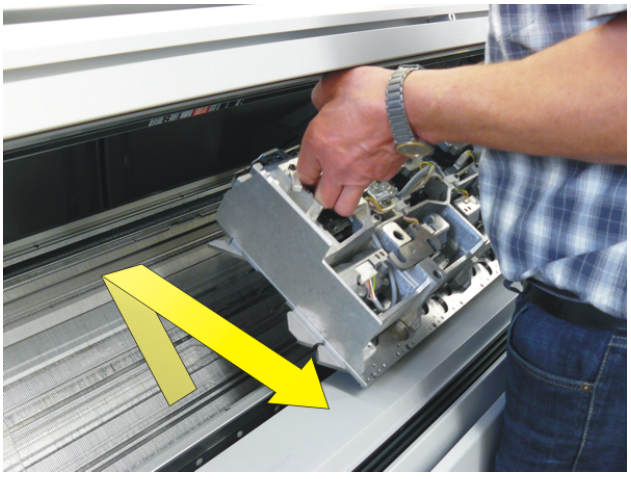
	NOTICE
	Damage to needles and knitting system! There are still needles in the knitting system. When moving the carriage assembly in the other direction (opposed to the carriage stroke direction), the needles and knitting system can be damaged. **Do not change the pushing direction of the carriage assembly!!!**

11. In the "Manual interventions"  window tap the "Release drive brake" key.
12. Move the carriage support away continuing in the original carriage direction.

If the carriage support blocks:

The drive brake has automatically closed.

13. Remove carriage part from machine.



With the front carriage part there is the risk of the cover being damaged if the carriage part is lifted off directly from the needle bed.

➜ "Yarn carrier rods"

14. Check the carriage part and the needle bed.

II. Check and clean the carriage part and the needle bed

Do not remove metallic parts and fragments (e.g. broken needle latch or needle hook) with a magnetic tool. There is a danger that the needle bed or cams can be magnetized, leading to incorrect selection.

- Check the cams for damage.
  Remove broken working butts of the movable parts (needle, coupling part, intermediate slider, and selection jack).
- Check the needle bed for damage.
  Remove broken working butts of the movable parts (needle, coupling part, intermediate slider, and selection jack).
  If trick walls are damaged, they have to be repaired.

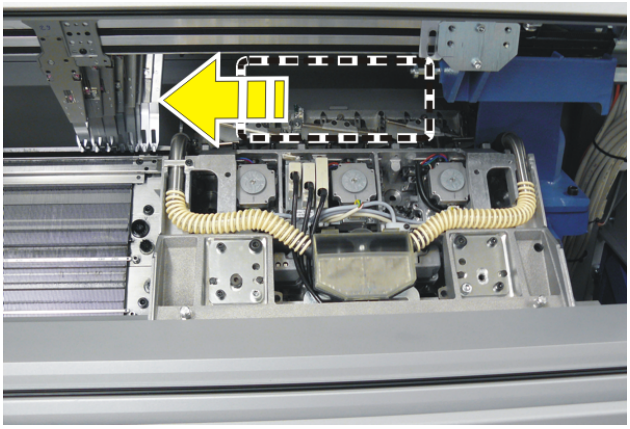
1. Clean the selection systems with a clean cloth.
2. Clean the cams with a cloth and check them for wear and damage.
3. Remove fragments if necessary
4. Apply oil onto the cams with a brush.

For further information about cleaning the knitting and selection systems refer to the operating instructions.

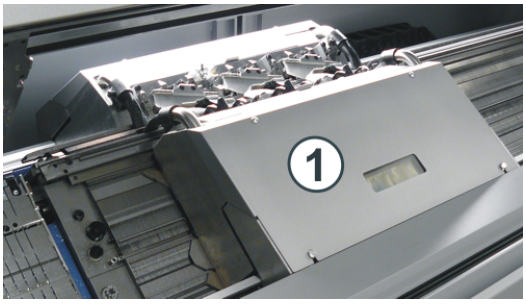
11.3.2 Remove the carriage part to replace the cams

I. Remove the carriage part from the needle bed

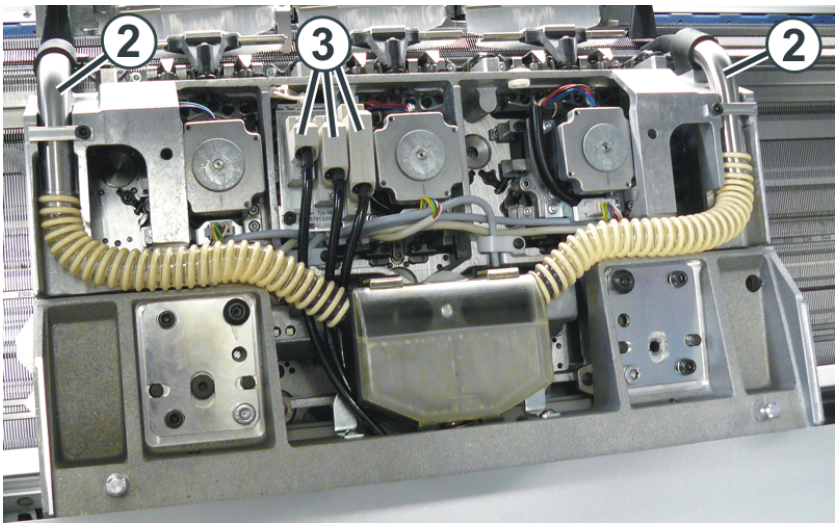
1. Move the carriage assembly outward up to the support surface.
2. Switch off 40 V power supply.
3. Open the covers.
4. Move the yarn carrier from the clamping and cutting area into the needle bed.
   Reason: When lifting the carriage part, the yarn carriers can be damaged.



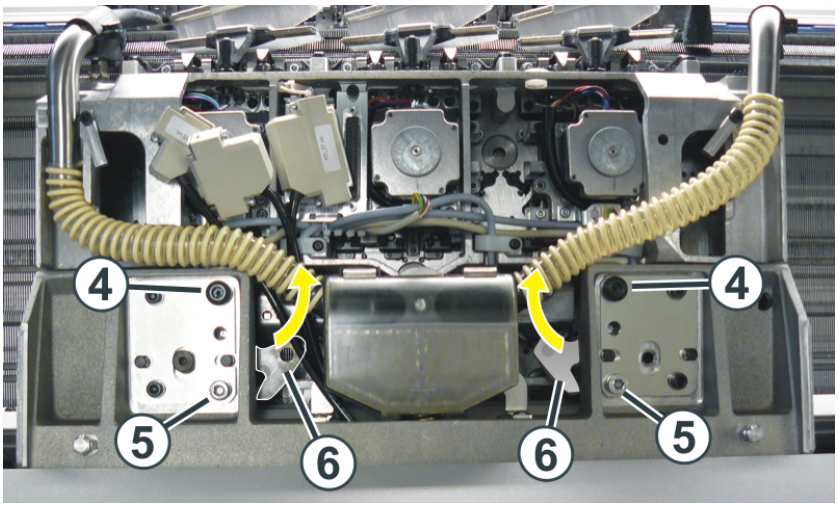
5. Remove the carriage assembly panelling (1).



6. Take the suction tubes (2) out of the carriage part.



7. Loosen the screws on the plugs (3) and pull out the plugs.
8. Remove the shoulder screws (4) and screws (5) on the left and right-hand sides.



9. Swivel left and right swiveling plates (6) inward.
10. In the "Manual interventions"  window tap the "Release drive brake" key.
11. Push away the carriage support to the machine center.

If the carriage support blocks:

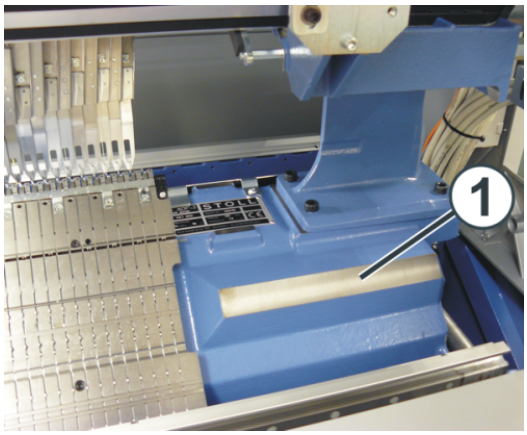
The drive brake has automatically closed.

12. Remove carriage part from machine.
13. To replace the cams, turn the cam plate upward.

11.3.3 Assembling carriage part and carriage support

Preparations

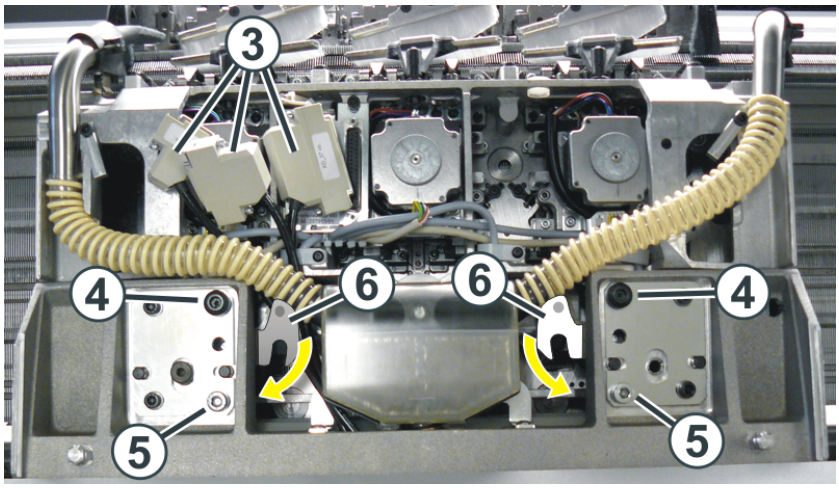
If the front carriage part is returned to the machine, it needs to be pushed from outside on to the support surface (1).
The reason for this: The movable parts in the clamping and cutting bed will be pushed into their correct position with the help of the cam curve.



Procedure:

	Procedure
Front needle bed	◆ Open the lateral safety door (on the right side). ◆ Push the carriage part from outside onto the support surface (1). ◆ Push the carriage part inward until it is located above the clamping and cutting bed.
Rear needle bed	◆ Push both sliding boards in the same direction. ◆ Position the carriage part on the support surface (1).

1. Switch off 40 V power supply.
2. In the "Manual interventions"  window tap the "Release drive brake" key.
3. Push the carriage support exactly over the carriage part.
4. Screw in the shoulder screws (4) until the carriage part lifts slightly.



5. Swivel the left and right swiveling plates (6) outward below the carriage support..
6. Tighten both shoulder screws (4) for fixing the carriage part.
   i Assembly of the rear carriage part: pull the upper area of the carriage part (needle brushes) away from the needle bed to ensure that the shoulder screw does not cant.
7. Tighten screws (5) evenly.
8. Plug in the plugs (3) while watching the plug coding.
9. Tighten the screws at the plugs (3).
10. Mount the suction tubes again.
11. Assemble the carriage assembly panelling.
12. Close the covers.
13. Switch on 40 V power supply.

14. Call up the Main menu with  .
15. Call up the  window.
16. Tap the "SPF line fixed" key.
17. Start the machine with the engaging rod.
    ⇨ The yarn carriers move automatically back into their knitting position, then the carriage starts moving.
18. Only if the carriage assembly was blocked: If the carriage stops after the left reversal, set the needle selection to "On" in the  window.
19. To start the production tap the "SP from line 1" button in the  window.

12 Positioning the Needle Bed Upright

With machines with auxiliary / belt take-down it can happen that yarns are winded around the take-down rollers. For removing the yarns the needle beds can be positioned upright.

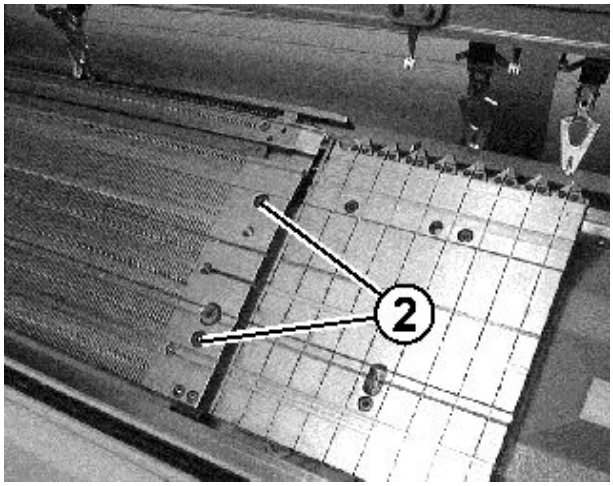
Prepare Machine

▷ Before positioning the needles beds upright, the fabric is to be removed from the needles.

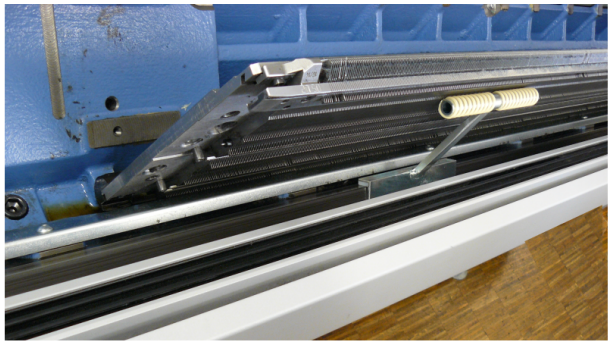
1. Stop the carriage assembly into the left reversing position.
2. Tap the "Release drive brake" key in the Manual interventions  window and slide the carriage assembly to the left up to the stop point.

Positioning the Needle Bed Upright

1. Remove two screws (2) on each side of the machine.

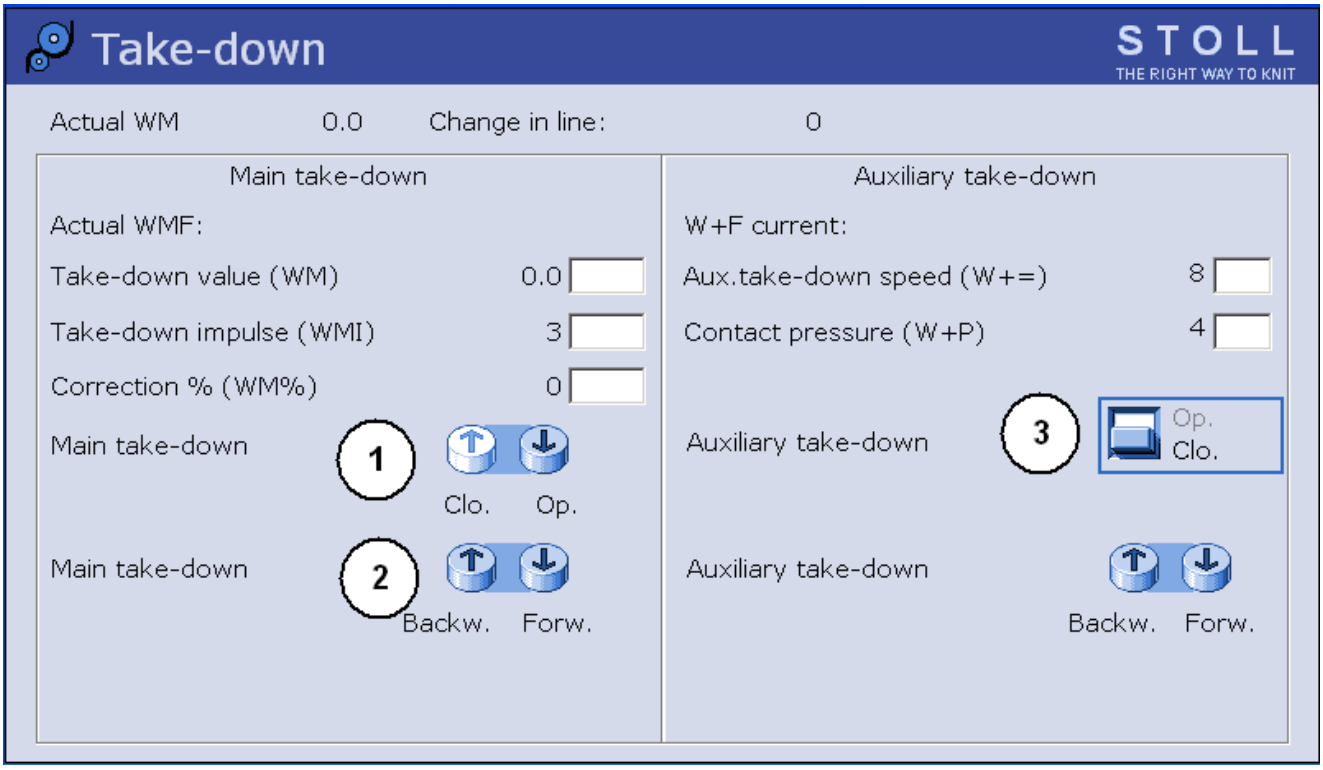


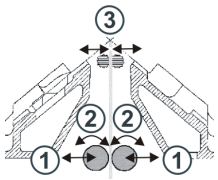
2. Lift the front needle bed carefully, tilt it to the front and lean it against the machine cover.



Cleaning the auxiliary take-down rollers

1. Call up the "Take-down" window with  key.





2. Tap the "Auxiliary take-down" "Op." key.
3. Press the "Auxiliary take-down" "Open" / "Close" key until the threads can be removed.

- or -

➜ Press the "Auxiliary take-down" "Back" key until the threads can be removed.

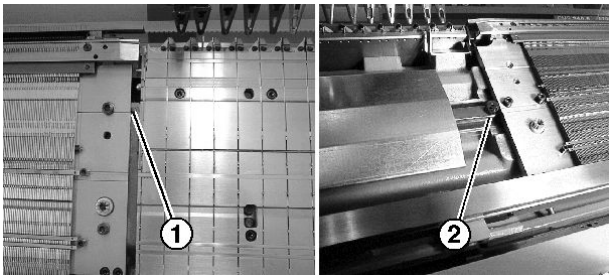
4. Free the take-down rollers from the threads.
5. Close the auxiliary take-down.
   Tap the "Auxiliary take-down" "Clo." key.

Danger: Damage of the take-down rollers.

Do not use pointed or sharp objects to remove the threads!

Returning the needle beds

1. Reassemble the needle bed in the reverse order. When doing so, make sure that the front needle bed contacts the pin (1) and the rear needle bed contacts the roller (2).



2. Screw the needle bed again onto each machine side.

13 Operating Modes of the Machine Types CMS with Comb and ADF machines

If necessary, the machine types of the **CMS 5xx** compact class can be operated with two different operating modes.

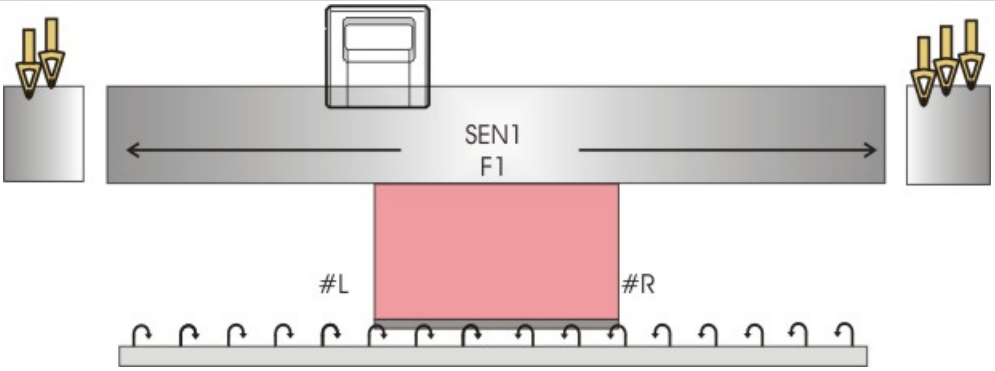
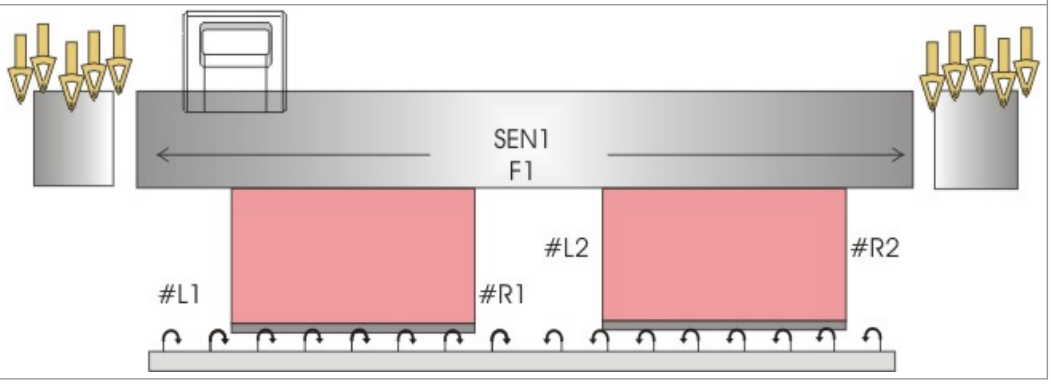
■ **Operating mode without using the comb:**
The knitting program (Sintral, Jacquard, Setup) is structured the way that the **comb function** is called-up at the start of the program and the **cast-off function** at the fabric end.
Result:
Each piece is started with the comb and casted-off at the end.
Single fabrics are produced.

i	There must **not** be a fabric in the needle bed or main take-down.

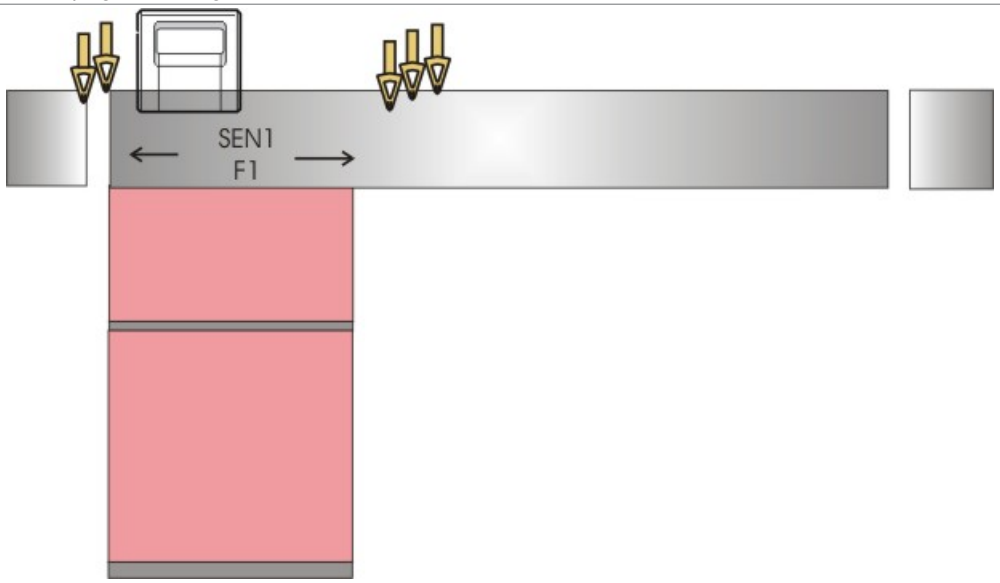
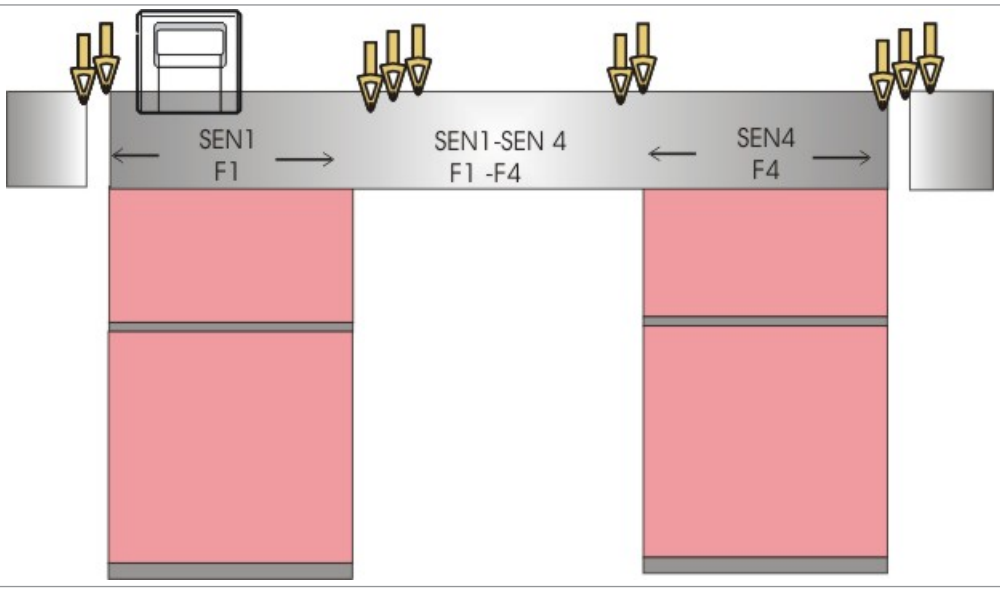
■ **Operating mode without using the comb:**
The knitting program (Sintral, Jacquard and Setup) comes with a draw thread at the start.
The draw thread enables to separate the pieces after knitting or ironing.
Result:
The individual pieces are knitted in a common panel following each other.

i	With this operating mode a fabric must always hang in the needles.

Operating modes for CMS machines with comb and ADF:

CMS machines with comb and ADF	
Operating mode with comb and clamping and cutting device	
1-piece	
	◆ Machine does **work in Fully-Fashion mode** (**PF0** command) ◆ The fabric is generally positioned in the machine center. ◆ **SEN** and **F1** define the entire needle bed width ◆ The **#L** and the **#R** counter define the actual knitting width ◆ Yarn carriers are positioned in the **Clamping and cutting device** ◆ **Comb is active**
2-pieces	

CMS machines with comb and ADF	
Operating mode with comb and clamping and cutting device	
	◆ Machine does **work in Fully-Fashion mode** (**PF0** command) ◆ Two pieces can be knitted ◆ **SEN1** and **F1** define the entire needle bed width ◆ The **#L1** and the **#R1** counter define the knitting width of the left piece ◆ The **#L2** and the **#R2** counter define the knitting width of the right piece ◆ Yarn carriers for the left piece in the left clamping and cutting device ◆ Yarn carriers for the right piece in the right clamping and cutting device ◆ **Comb is active**

CMS machines with comb and ADF	
Operating mode without comb and clamping and cutting device	
1-piece	
	◆ If there is no fabric in the fabric take-down, the picking-up after pressing-off must be activated before starting the pattern. ◆ For fully fashion, a special Sintral function is needed, which enables widening or cast-off to achieve the start width of the fabric. ◆ The yarn carriers are positioned at the left and right fabric selvedge ◆ **Comb and clamping and cutting device are deactivated**
Multi-piece	

CMS machines with comb and ADF	
Operating mode without comb and clamping and cutting device	
	◆ If there is no fabric in the fabric take-down, the picking-up after pressing-off must be activated before starting the pattern. ◆ For fully fashion, a special Sintral function is needed, which enables widening or cast-off to achieve the start width of the fabric. ◆ Up to 4 pieces (SEN1 to SEN4) can be knitted simultaneously. ◆ Home position of the yarn carriers (**YG1 - YG4**) ◆ The yarn carriers are positioned at the left and right fabric selvedge correspondingly ◆ **Comb and clamping and cutting device are deactivated**

14 Elements of a knitting program

Generally, a knitting program consists of the following three elements:

- **Sintral file** (***.sin**)
- **Jacquard file** (***.jac**)
- **Setup2 file** (***.setx**):
  Only for machine generation OKC starting with the **V 2.1.xxx** operating system version

The information from all of the three elements result in the knitting program.

14.1 Sintral

- Sintral is a machine language developed by Stoll.
- The text-based file contains the function structure of the knitting program and all the relevant knitting specifications.
- With the help of the Sintral, the machine converts the knitting program into a knitting pattern.

```
  1 C CMS530.Full_Cardigan_2_Colors_GG72 E7.2 /janke 03.12.2015 11:33:28 <M1> 6.4.012
 11 C NP1=9.0       Setup Row
 12 C NP2=10.0      Setup Tub
 13 C NP3=9.0       1x1-Cycle
 14 C NP4=11.0      Loose Row
 15 C NP5=11.5      stitch front
 16 C NP6=9.5       tuck rear
 17 C NP7=9.5       tuck front
 18 C NP8=11.5      stitch rear
 19 C NP9=12.0      Struc Single jersey front
 20 C NP11=7.9      Setup Row front
 21 C NP17=12.0     Safety rows
 22 C NP20=9.0      Start 1
 23 C NP21=10.0     Start 2
 24 C NP22=11.0     Start 3
 25 C NP24=12.0     Start 5
 26 C NP25=16.0     Comb Thread
 27 C MSECI=0.70
 39  IF #L=0 #L=1 IF #R=0 #R=699 #LM=0 #RM=0
 40 START
 41 C #98=0         C Cast-off On/Off (#98=0)
 42 C #69=0         C MS*#69 (1-4s) (#69=1..4)
 43 PF0
 44 Y-CR1
 50 YGC:1=A 2=B/4=C 5=D 8=E;
 51 YDF=2
 52 C-------------------------------------I-------------------------------------I
 53 C                LEFT                 I               RIGHT                 I
 54 C-------------------------------------I-------------------------------------I
 55 C                                     I 8=E Protection thread 1             I
 56 C                                     I 5=D color 2                         I
 57 C                                     I 4=C Rib thread 1   color 1          I
 58 C 2=B Comb thread1                    I                                     I
 59 C 1=A Draw thread1                    I                                     I
 60 C-------------------------------------I-------------------------------------I
 61 YD YC
 80 FBEG:M1-SIZES;
 81 F1=1-699
 82 PA:JA1; PAI:JA1; PANP<>:JA1;
 83 PM:1:F1; SEN=1-699 #51=1 #52=699
 84 FEND C M1-SIZES
 85 JA1=1276(1100-1100)
110 #99=0
111 IF RS17=0 S0Y    #99=1
112 IF RS17=1 S0YCR0 #99=1
113 IF #99=1 #99=0 MS PRINT/CHECK YARN CARRIER/
114 F:M1-SINTRAL;
115 END
```

I. Structure:

Program structure
1 C CMS530.Full_Cardigan_2_Colors_E8 ... <SETUP2>

```
11 C NP1=9.0 Net
12 C NP2=10.0 Tubular net
13 C NP3=9.5 1x1 Cycle
14 C NP4=12.0 Transition
15 C NP5=10.0 Front stitch Color1
16 C NP6=10.0 Rear tuck Color1
17 C NP7=8.8 Front tuck Color2
18 C NP8=9.6 Rear stitch Color2
19 C NP9=12.0 Front single jersey struc.
20 C NP11=7.9 Front net
21 C NP17=12.0 Protection rows
22 C NP20=9.0 Start1
23 C NP21=10.0 Start2
24 C NP22=11.0 Start3
25 C NP24=12.0 Start5
26 C NP25=16.0 Comb thread
27 C MSECI=0.70
```

40 START

```
41 C #98=0 C Cast-off On/Off (#98=0)
42 C #69=0 C MS*#69 (1-4s) (#69=1…4)
43 PF0
44 Y-CR1
50 YGC:1=A 2=B/ 4=C 5=D 8=E;

61 YD YC

80 FBEG: M1-SIZES;
81 F1=
82 PA: PAI:
83 PM:1:F1; SEN=…… #51=… #52=…
84 FEND C M1-Sizes
85 JA1= …(…-…)
110 #99=0
111 IF RS17=0 S0Y #99=1
112 IF RS17=1 S0YCR0 #99=1
113 IF #99=1 #99=0 MS PRINT / CHECK YARN CARRIER/

114 F:M1-SINTRAL;
```

xx END

```
xx FBEG:... (Beginning of the function)
xx FEND (end of function)
```

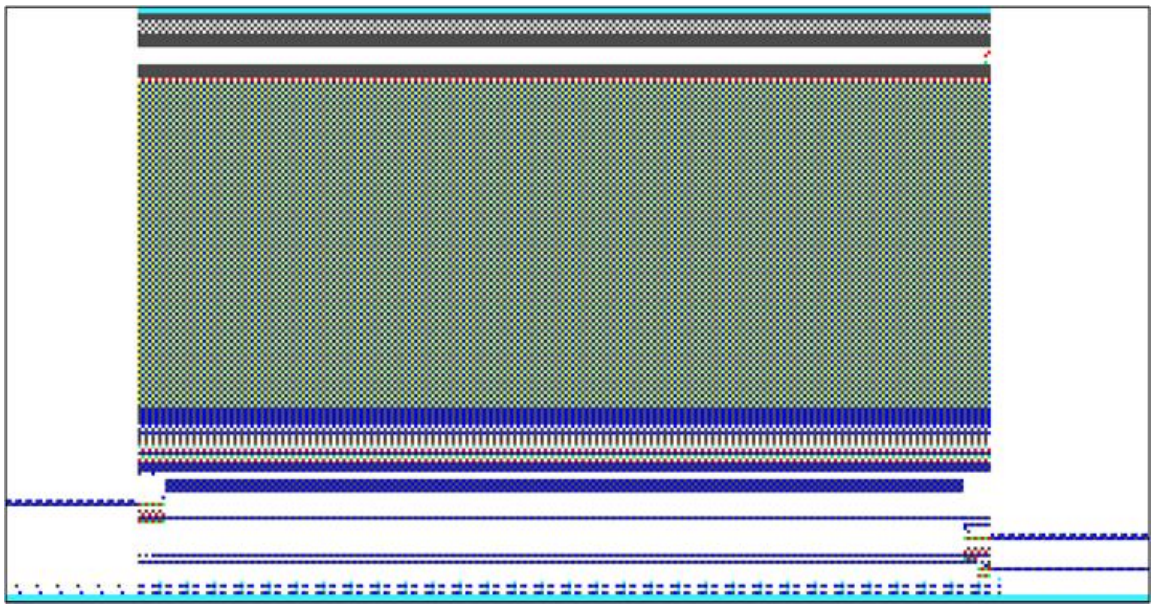
```
999 S0 W0
```

II. Knitting instructions:

Sintral command	Meaning
<<	Carriage direction to the left
>>	Carriage direction to the right
<>	any carriage direction
S: ...-...;	Knitting specification
***+.ABEGHIKLMOPQTWYZ abeghiklmopqtwxyz**	Jacquard symbols for single needle selection
N	Symbols written after N are not selected, but all other symbols Example: S: A - NA ;
%.	Symbols written after the % move needles to the tuck position, symbols written before % in the stitch position Example: S: A%Y – 0;
0	All needle do not knit
-	Break between front and rear system

Sintral command	Meaning
/	Break between the systems
;	End of a knitting specification
<1->	Decrease Jacquard
<A>	Releases the Jacquard selection in the color field A
Y:...;	Yarn Carriers
S1 .... S6	Knitting system 1 to knitting system 6
U^S	Transfer to rear
UVS	Transfer to Front
UXS	Transfer to the rear and to the front
$^S	Split to the rear
$VS	Split to the front
$XS	Split to the front and rear
RS	Cycle Counters
FBEG	Beginning of the function
FEND	Function end
SBEG	Start of stroke processing. The knitting specifications are determined using conditions.
SEND	End of stroke processing.
JA1 8	Jacquard1 8
#	Counters
IF	IF-decisions
IFN	If not...

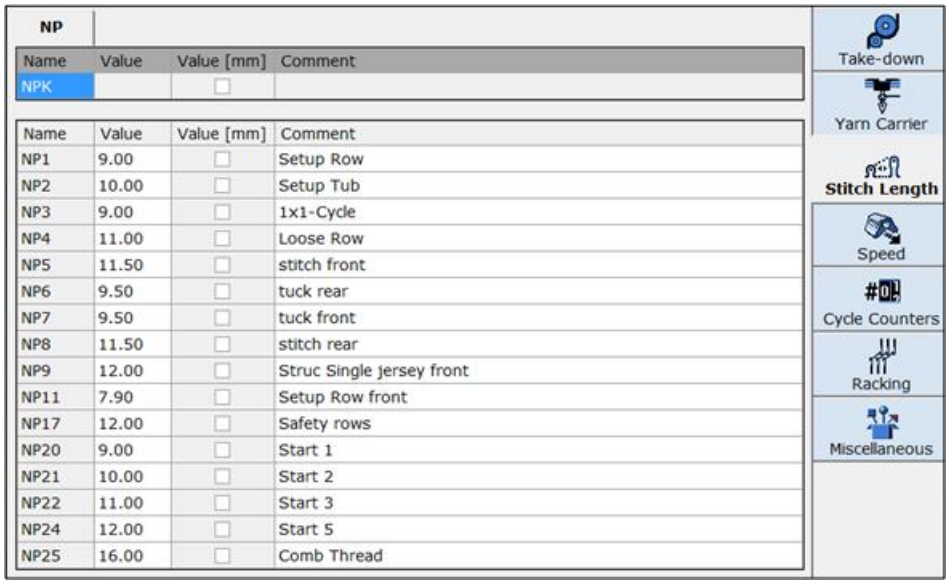
14.2 Jacquard



- The jacquard file is the graphic representation of the knitting program.
- Each symbol in the jacquard corresponds to a knitting specification in Sintral.
- The information of one Jacquard row corresponds to one knitting row.
- The Sintral file and the Jacquard file together result in the knitting program.

14.3 Setup2

Menu Setup2



- All pattern related machine parameters are defined in the Setup2.
- The setup data can be edited and saved on the running machine.
- The data within the setup file ensure the running properties of a pattern and allow for a convenient pattern setup at the machine.
- The edited values can be returned to the original pattern and are therefore repeatable.

Contents of the Setup2 menu	Tabs
Take-down	◆ **WMF** ◆ **W+F** ◆ **WM% / WMK%**
Yarn Carriers	◆ **YD / YDI**: Yarn Carrier Staggering ◆ **YC / YCI**: Corrections of yarn carriers ◆ **Y:Oa-b**: Correction value for right carriage ◆ **Y:Ua-b**: Engaging width of yarn carrier sliding block
Stitch Length	◆ **NPK**: Stitch cam correction for all stich cams ◆ **NPn**: used stitch cam position ◆ **NPR**: Correction for stitch cam position of the right carriage
Speed	◆ **MSEC0**: Standard S0 ◆ **MSECI**: with intarsia yarn carriers ◆ **MSECK**: Small knot ◆ **MSECC**: Take yarn carrier out of clamp / Bring yarn carrier into clamp ◆ **MSEC1**: with transfer rows ◆ **MSEC2-20**: with knitting rows
Cycle counters	◆ **List of the used cycle counters**: RSn (n=1 bis 39)
Yarn length (display only with connected ASCON)	◆ **Basic settings** ◆ **Correction Values** ◆ **Yarn data** ◆ **NP (Knitting Mode) / Wheel**

Contents of the Setup2 menu	Tabs
Racking	◆ **VCI**: Racking function ◆ **Direction**: Racking direction of the correction ◆ **VK**: Racking Correction ◆ **VV**: Racking speed ◆ **V+/-**: Overracking ◆ **Comment**
Miscellaneous	◆ Counter of the machine ◆ Machine Data ◆ Comment

15 Setting up CMS Performer Machine

Sequence: Setting up the machine

1. Check the state of the machine.
2. Finish or cancel the current knitting program.
3. Bring the carriage into parking position on the left after the reversal.
4. In case of changing the current knitting program, save the changes if applicable.
5. Load a new knitting program.
6. Preparation of the machine for the newly loaded program.
   - Thread up the yarn carriers
7. Start the machine.
8. Adapt pattern parameters.

For this, see also...

15.1 Loading Files, Library and Folders

Possibilities of reading-in the knitting program (zip file):

- Removable Disks
  - USB Memory Stick
  - External hard disk drive
- Hard disk of the computer in the knitting machine
- Ethernet

15.1.1 Loading Pattern

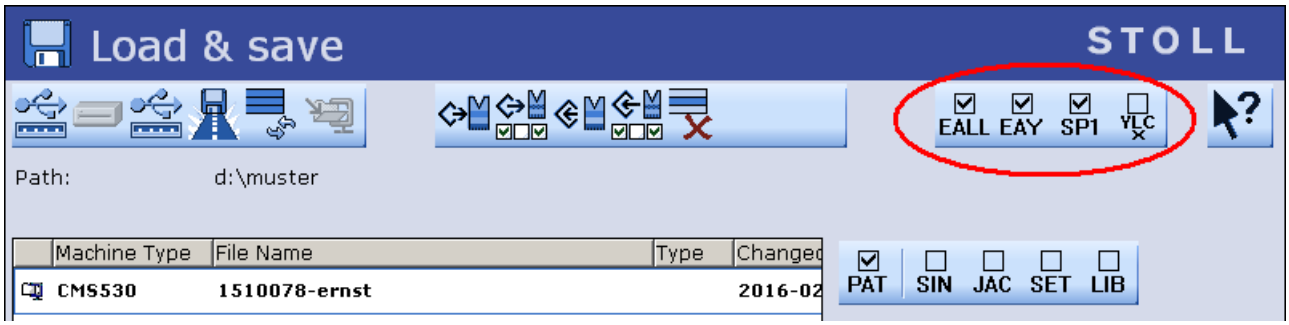
Load pattern into the machine:

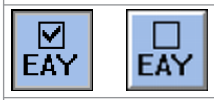
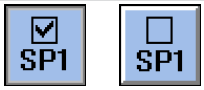
Before loading the pattern, the current machine state is to be checked:

- With Comb
  - No fabric in the needle bed or in the fabric take-down.
- Without Comb
  - Pay attention to the starting width of the new pattern.
  - Check and adjust the yarn carrier positions.
- Park the carriage assembly with the carriage direction to the right.

	CAUTION
	Computer viruses! Loss of data or production. Computer viruses can creep into the machine through unscanned data via USB sockets or network.

1. In the "Main Menu" press the  key.
   ⇨ The window "Load & save" is displayed.
2. Specify before reading in a pattern:



Key	Function
	Delete / Do not delete pattern (**sin**, **jac**, **setx**) from main memory **i**: Cycle counters, counters and NP values will be reset.
	Delete / Do not delete all yarn carrier positions
	Run / Do not run the "Start program from line 1" command automatically after loading the pattern. **i**: If SP1 is activated, there is no need of calling up the "Machine Start" window.
	Delete / Do not delete the ASCON correction values automatically with loading the pattern **i**: Key is only available if an **Ascon** device is mounted.

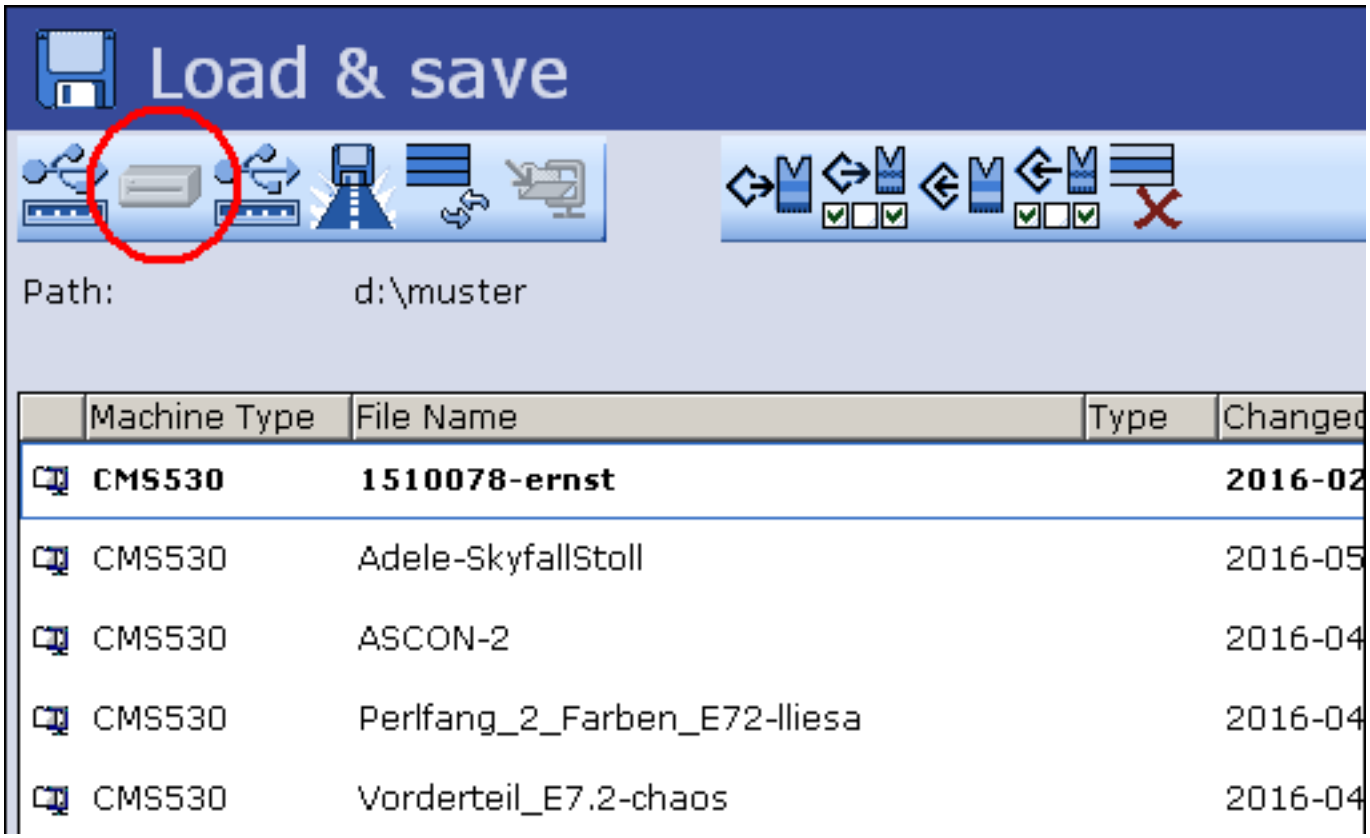
3. Select the desired folder (direct selection folder).

Key	Function
Keys for direct selection of a predefined folder	
	Loading data via network
	Loading data from hard disk
	Loading data from the USB memory stick
	Loading data from a shared folder (network folder) e.g. from the pattern workstation M1plus
	Definition (path) of a key for direct selection of a folder

4. Select the hard disc drive with the  key for example.

⇨ The content of the selected directory appears in the selection window.

Display of all programs of a selected folder:



Symbol	Meaning
	Program was generated with **Setup2**. The elements of the program (**sin** /**jac** / **setx**) will be saved as **zip** file. **i**: Only with **OKC** machines
No symbol	Program was generated with **Setup1** The elements of the program will be saved as **sin** / **jac** / **set**.

5. Select the PAT key.

⇨ All program elements belonging to a pattern will be selected.

Selecting the desired program / program elements (type of files):

Key	Function
PAT / PAT	Load / Do not load all program elements belonging to a pattern **i**: All program elements must have the same name.
SIN / SIN	Load / Do not load **Sintral** (**sin**)
JAC / JAC	Load / Do not load **JACQUARD** (**jac**)
SET / SET	Load / Do not load **SETUP** (**setx**) ◆ **setx**: File extension with **Setup2**
LIB / LIB	Library = protected memory area in the memory **i**: Load / Do not load program element e.g. **Auto-Sintral** **i**: The **Auto-Sintral** is necessary for patterns generated with the **JSA** program on the **SIRIX** pattern workstation.

i With the selection of "SIN" / "JAC" / "SET" only the selected file types will be displayed in the selection window.

6. Refresh the selection window by the  key if necessary.
7. Select the desired file (pattern) in the selection window.
8. Tap the key:

- 

  Load pattern with Setup data.

- 

  Load the pattern with selected Setup data.
  Select the desired data in the following window.

9. Confirm the selection with the  key.
   ⇨ The pattern memory will be cleared and the selected pattern will be loaded.

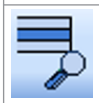
 The loaded program elements appear in the "Load & Save" window at the right-hand side.

---

10. Tap the  key.
    ⇨ The "Main menu" window appears.

Show the content of a compressed pattern (**zip** file):

1. Select the desired folder (direct selection folder).
2. Select the desired program elements with the "SIN" / "JAC" and "SET" keys.
3. Select a pattern with the  label in the selection window.
4. Tap the  key.
   ⇨ The compressed pattern will be opened and the desired program elements appear.
5. Select the desired program element (**sin** /**jac** / **setx**) in the selection window.
6. Call up the function desired next:

Key	Function
	Delete the selected file of the selected folder
	Show the selected file in the corresponding editor.
	Add selected file and accompanying pattern elements to the pattern already loaded

7. Close the compressed pattern with  again if desired.
   ⇨ The single program elements (**sin** / **jac** / **setx**) are displayed as **zip** file.

Call up Help in the Load & Save window:

Key	Functions
	Call up direct help for the key pressed next

1. Tap the  key.
2. Tap the desired key then for which you want help.
   ⇨ An information text appears.

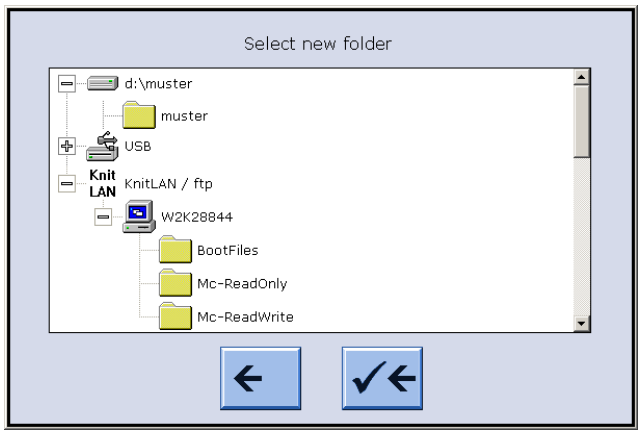
15.1.2 Changing the Path of a Drive or Folder

You can change the allocation of the keys as desired.

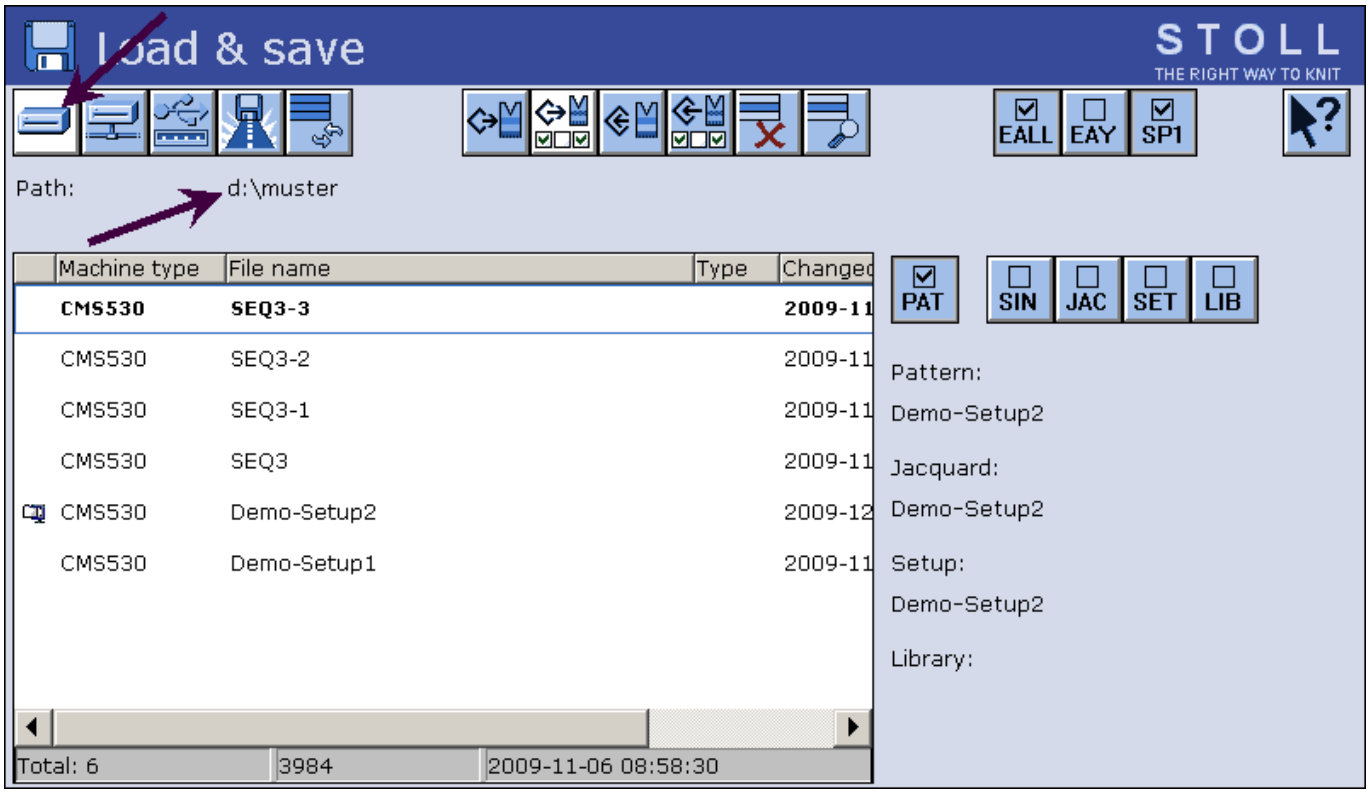
Default allocation (paths) of the keys

Key	Drive	Explanation
	**F:**	USB Memory Stick
	Name:\	Network drive
	**D:**	Hard disk
	**D:\Stoll\KnitLan**	Network folder (M1plus)

1. Tap the desired key.
2. Tap the  key.
   ⇨ The input window "Select new folder " appears.



3. Select the desired folder.
4. Confirm the entry and close the window with the  key.
   ⇨ In the "Load & Save" window, the display of the key is adapted to the new path.



The path will be displayed in the line below.

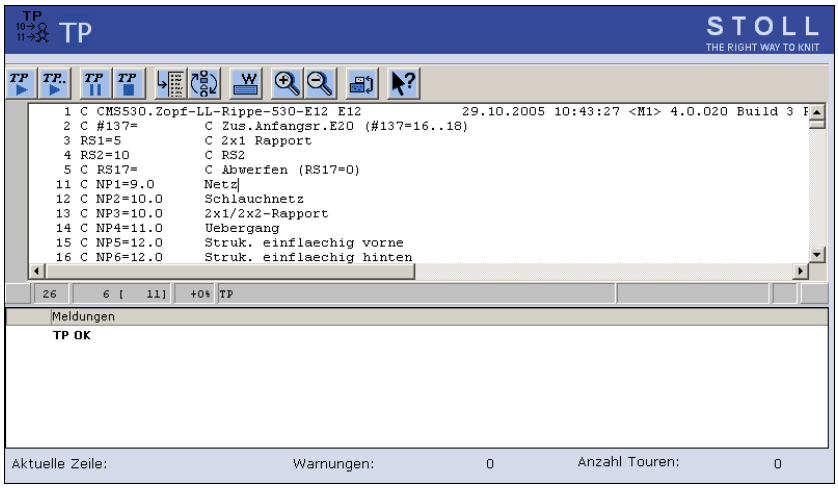
15.2 Carrying out a Program Check

A pattern newly loaded into the machine is to be tested for knitting ability.

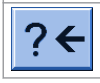
Test the knitting program:

▷ The "Load & save"  window is displayed.

1. Tap the  key.
2. Start the program test by  .
   ⇨ During the test the pattern is shown in the upper window and the **TP** messages in the lower window.



Function keys in the "TP" window:

Key	Designation	Function
	"Start program test"	Start program test from the first line.
	"Start program test from"	Start program test from a certain line on
	"Interrupt program test"	Interrupt program test and restart it
	"End program test"	End program test
	"Jump"	Go to a certain position
	"Go directly to"	Quick jump to the corresponding mark (e.g. from **FBEG** to **FEND**)
	"Display warning"	Activate/deactivate presentation of warnings during **TP**.
	"Enlarge"	Display text enlarged
	"Reduce"	Display the text decreased
	"Change size"	Change window size of pattern and error output
	"Direct Help"	Call up direct help for the key pressed next.

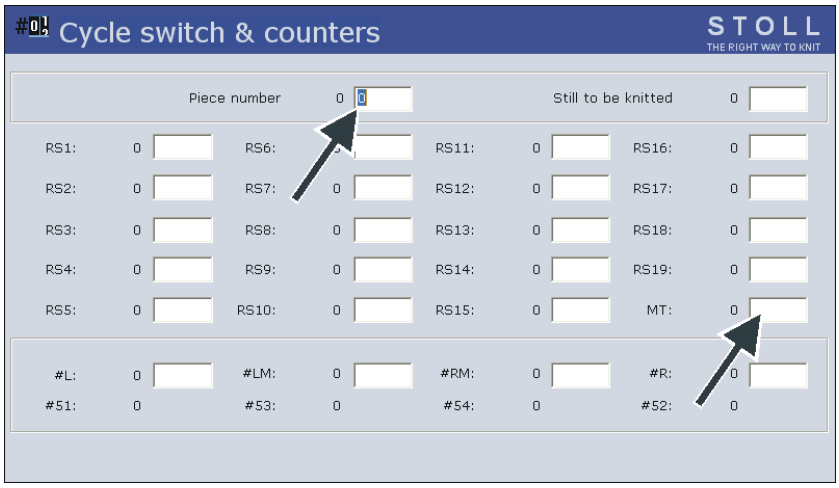
15.3 Setting the Quantity of Pieces

Set piece counters:

- "Piece number": Specified quantity of fabrics
- "Still to be knitted": the displayed number will be reduced by 1 when a fabric is completed.

➜ Tap the  key in the Main menu.

⇨ The "Cycle counters & counters" window is opened.



1. Enter the desired quantity of pieces at "Piece number" using the virtual keyboard  .

When producing cut goods, the length of the fabric is specified by the **MT** (maximum number of courses) counter.

2. Confirm the selection with the  key.

Cycle Counters

The cycle counters used in the knitting program are also displayed and can also be changed in this window. The values are entered in the Setup2 file as well.

3. Go back to the "Main menu".

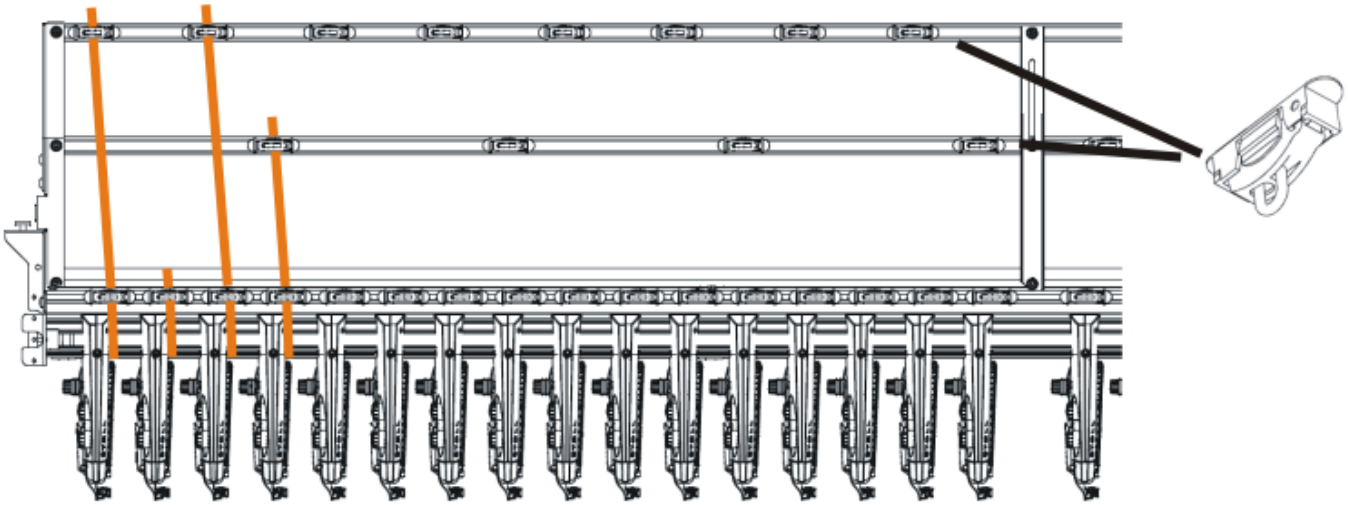
15.4 Threading up the Machine

Positioning the bobbins when using up to 16 yarn carriers:

You have different possibilities to position the bobbins depending on the machine type and the quantity of yarn carriers.

1. Place the bobbins from the outside toward the center of the machine.
2. Position the movable yarn guide brackets in order to get one yarn guide over each bobbin.

Top view:

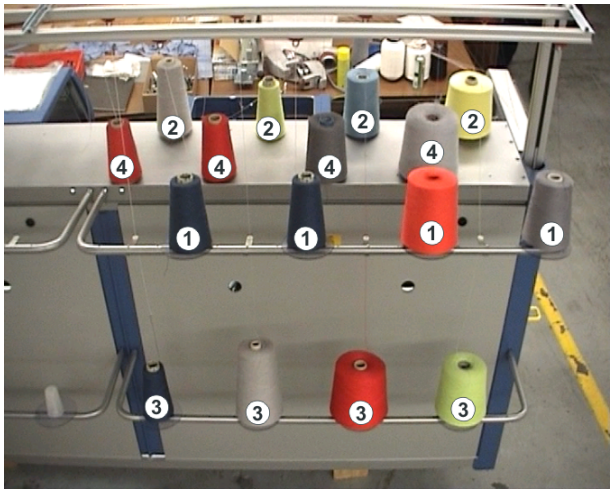


3. Thread each thread through a yarn guide bracket.
4. Thread in the yarn carriers:
   - Start with the yarn carriers of the highest track number, from the back to the front.
   - Lead the thread of the **inner yarn control device** via the **rear track of the roller deflector**.
   - Lead the thread of the **outer yarn control device** via the **front track of the roller deflector**.
5. Lead all threads for a yarn carrier on this side via the same track of the roller deflector.
6. Thread in the draw thread, the elastic thread and the comb thread into the corresponding yarn carriers.

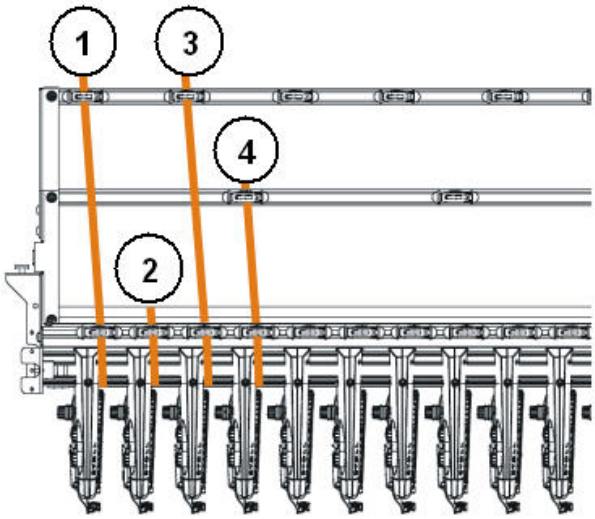
Positioning the bobbins when using more than 16 yarn carriers:

1. Position the bobbins on the bobbin board of the knitting machine and on the supplementary board starting from the outside to the center.

Arrangement of the bobbins using a supplementary bobbin board:



2. Feed the threads from the additional bobbin board (1) and (3) via the yarn guide bracket to the yarn control units (1) and (3).
3. Feed the threads from the additional bobbin board (2) and (4) via the yarn guide bracket to the yarn control units (2) and (4).
   i: Do not cross the threads.



4. Thread in the yarn carriers:

- Start with the yarn carriers of the highest track number, from the back to the front.
- Lead the thread of the **outer yarn control device** via the **rear track of the roller deflector**.
- Lead the thread of the **inner yarn control device** via the **front track of the roller deflector**.

5. Lead all threads for a yarn carrier on this side via the same track of the roller deflector.
6. Thread in the draw thread, the elastic thread and the comb thread into the corresponding yarn carriers.

15.4.1 Default Yarn Carrier Home Positions

Default allocations of yarn carrier rails for the different machine types:

Machine Type	Comb	Yarn type	left track	right track
CMS 5xx (not 502 HP / 502 HP+)	With Comb	Protection thread 1		8
		Rib thread		2
		Elastic Thread		1
		Comb Thread	2	
		Draw thread	1	
	Without Comb	Rib thread		2
		Elastic Thread		1
		Comb Thread		
		Draw thread	1	
CMS 822	With Comb narrow coupling	Protection thread 1		8
		Rib thread 1		2
		Elastic yarn 1		1
		Comb thread 1	2	
		Draw thread 1	1	
	With Comb wide coupled	Protection thread 2	8	
		Protection thread 1		8

Machine Type	Comb	Yarn type	left track	right track
		Elastic yarn 2	7	
		Draw thread 2		7
		Rib thread 1	3	3
		Comb thread 2		2
		Comb thread 1	2	
		Elastic yarn 1		1
		Draw thread 1	1	
CMS 822	Without Comb	Protection thread 1		8
		Rib thread 1		2
		Elastic yarn 1		1
		Draw thread 1	1	
CMS 9xx		Elastic yarn 1		8
		Draw thread 1	8	
		Rib thread 1		3
		Protection thread 1		2

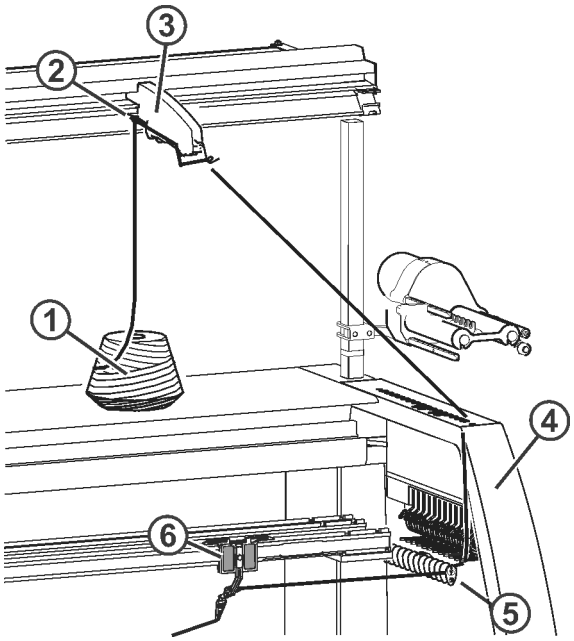
15.4.2 Threading up from the Bobbin Board to the Yarn Carrier

Various courses of yarn are provided for threading up the yarn on the knitting machine. The optimal course of yarn depends on the yarn and pattern.

Determining the course of yarn

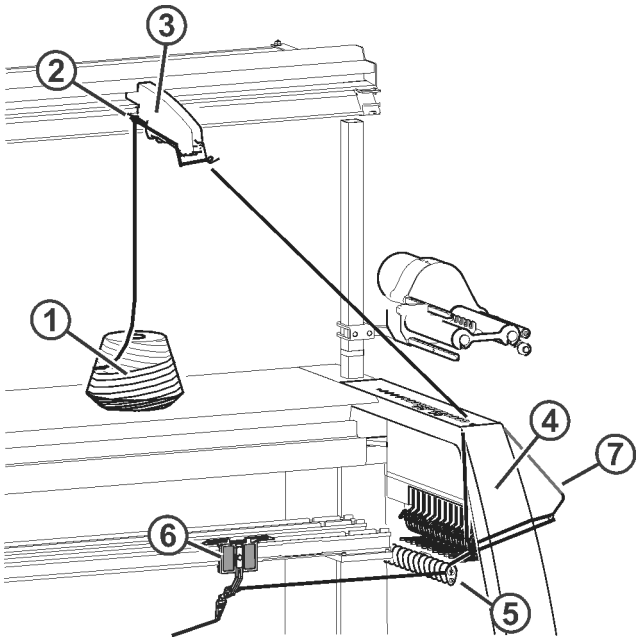
Courses of yarn	Yarn
Course of yarn 1	Seldom used threads, e.g. elastic yarns
Course of yarn 2	Seldom used threads, e.g. draw threads
Course of yarn 2:with simple patterns **Course of yarn 3:**with difficult patterns	Frequently used threads
Course of yarn 3	Difficult-to-process threads
Course of yarn 4	Equally long fabrics

Course of yarn 1:



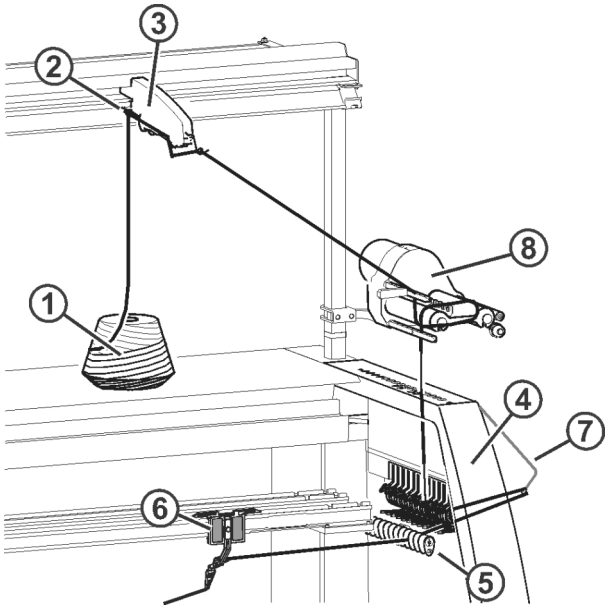
1	Bobbin	4	Safety door
2	Yarn guide bracket	5	Yarn deflector
3	Yarn control unit	6	Yarn Carriers

Course of yarn 2



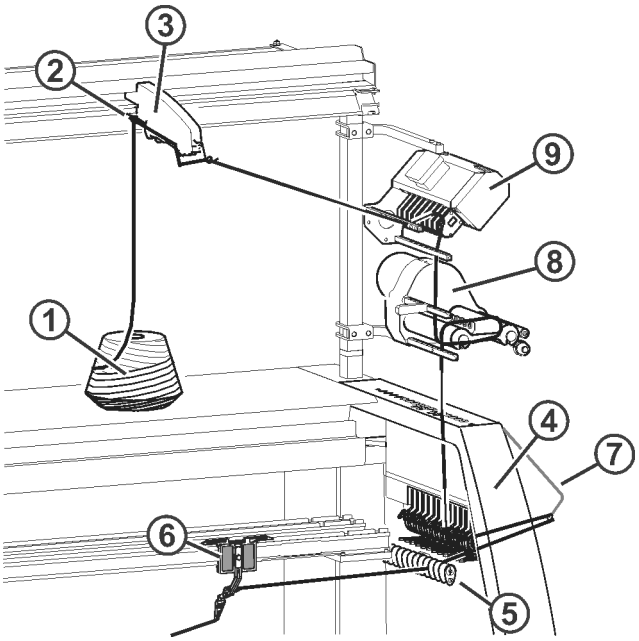
1	Bobbin	5	Yarn deflector
2	Yarn guide bracket	6	Yarn Carriers
3	Yarn control unit	7	Lateral yarn tensioner
4	Safety door		

Course of yarn 3



1	Bobbin	5	Yarn deflector
2	Yarn guide bracket	6	Yarn Carriers
3	Yarn control unit	7	Lateral yarn tensioner
4	Safety door	8	Friction feed wheel

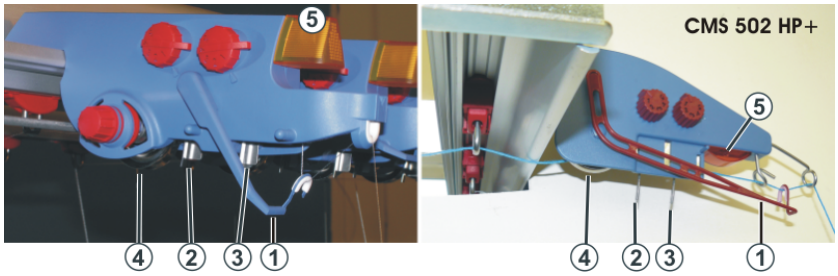
Course of yarn 4



1	Bobbin	6	Yarn Carriers
2	Yarn guide bracket	7	Lateral yarn tensioner
3	Yarn control unit	8	Friction feed wheel
4	Safety door	9	Yarn length measuring device (ASCON, STIXX)
5	Yarn deflector		

15.4.2.1 Threading up the yarn control unit

I. Yarn control unit (**FKE**):



1	Thread break control	**4**	Yarn brake disc
2	Knot detector for large knots	**5**	LED
3	Knot detector for small knots		

II. Tasks of the yarn control unit:

The elements of the yarn control device can individually be adjusted to the yarn being processed.

1. The yarn break control (1) monitors the yarn ends and switches off the machine in case of a yarn breakage or end.
2. In the case of large knots in the yarn, the knot detector switches off the knitting machine.

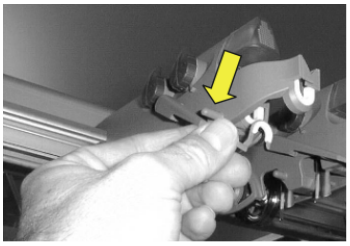
Error display

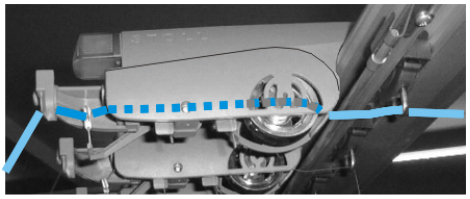
Errors are indicated by the LED (5), the signal light and at the display.

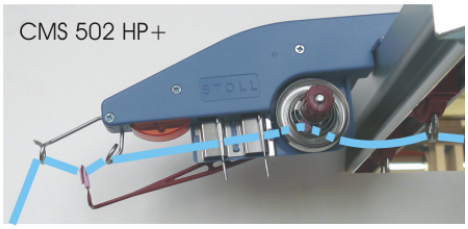
1. In the case of small knots in the yarn, the machine knits a programmed number of rows at reduced speed.
2. The yarn brake disc (4) regulates the yarn tension and prevents the thread from hanging through while knitting.

III. Threading up the **FKE**:

1. Bring thread break control in work position.
   Pull thread break control a little towards left till it is not held by the stopping cam anymore.





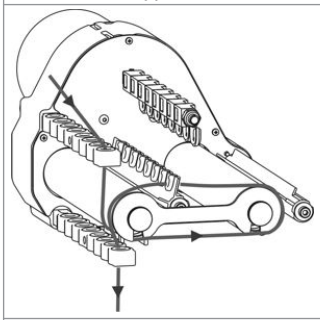
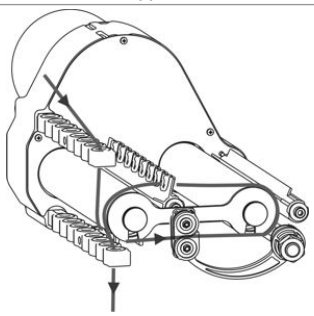
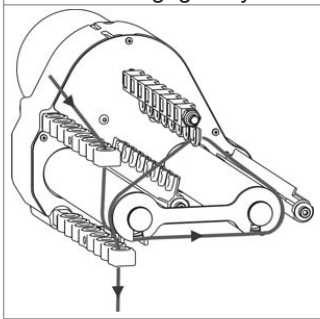
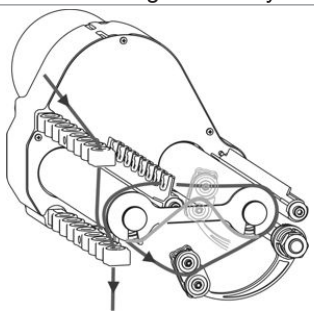


2. Thread each thread through a yarn control device as shown in the picture.

15.4.2.2 Threading up the Friction Feed Wheel

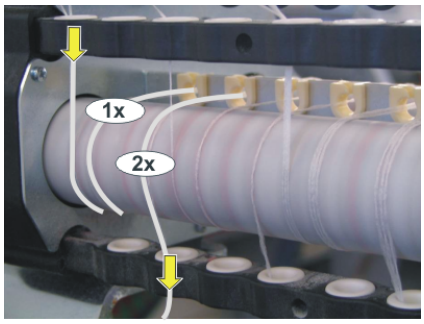
I. Different ways to thread up the friction feed wheel:

The different ways of threading up depend on the construction type of the feed wheel.

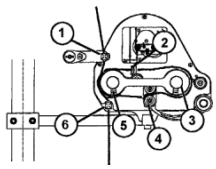
Construction type without swivel arm	Construction type with swivel arm
	
Default setting: great yarn delivery	Default setting: medium yarn delivery
	
Lower yarn delivery	Greater yarn delivery (grey) Lower yarn delivery (black)

i:

Lead the thread twice over the friction rollers if necessary. This reduces the yarn tension considerably.



II. Threading-up a feed wheel with swivel arm.

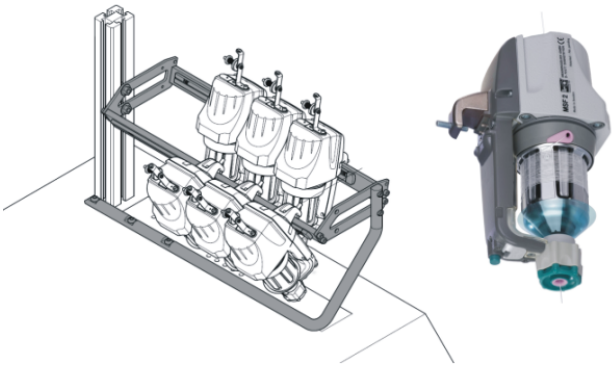


1. Lead the thread through the eyelet (1).
2. Lead the thread from the friction roller (5) through the swivel arm (4) around the friction roller (3).
3. Carry on the thread on the top side and thread it through the eyelet (2), lead it over the friction roller (5) to the eyelet (6).

15.4.2.2.1 Using the Storage Feed Wheel

Use storage feed wheels with fine and delicate yarns.

- Storage feed wheels are standard with the gauges **E14 - E18**
- You can use storage feed wheels with the gauges **E3.5 - E12** and **E7.2 - E9.2**.

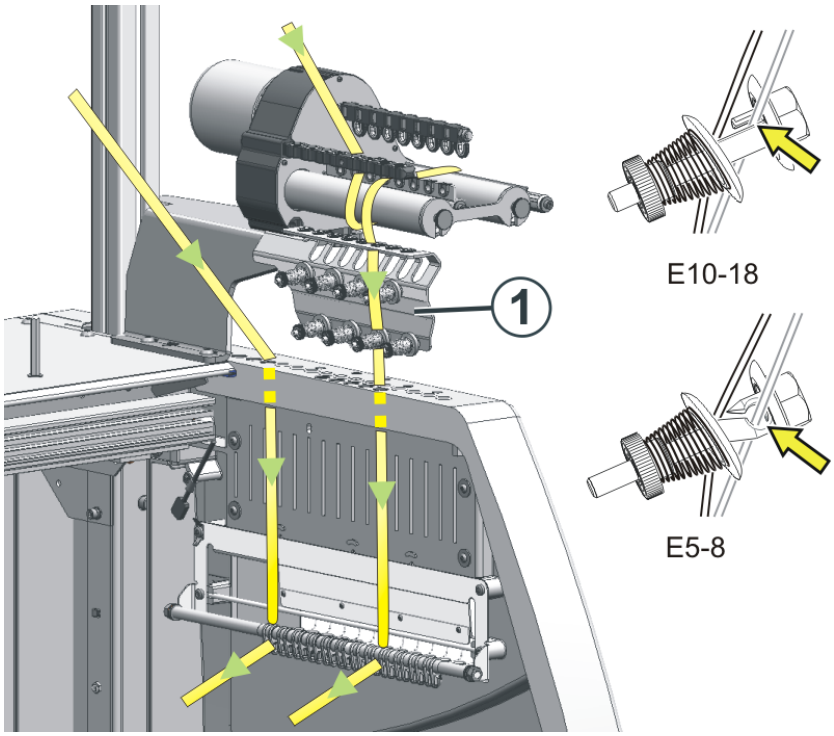
Designation	
Storage feed wheel **MSF 3**	

The storage feed wheel serves for temporary storage of the yarn. This way spikes will be caught and compensated when unwinding the yarn from the bobbin.

15.4.2.3 Threading-up the Permanent Brake

Thread-up into the permanent brake only the yarns that are processed with the friction feed wheel.

Make sure that you thread-up the yarn vertically downwards.

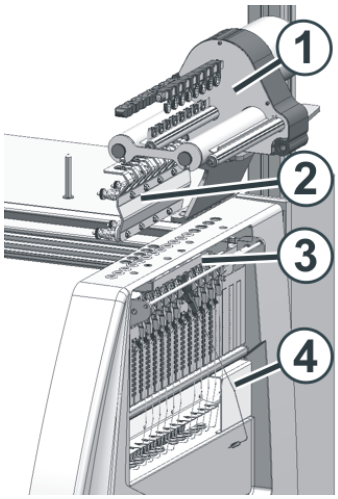


1. Guide the yarn downwards behind the brake discs.
2. Insert the yarn between the two brake discs.
3. Pull the yarn somewhat towards the machine center to open the brake discs.
4. Release the yarn tension again.
   ⇨ The brake discs close and the yarn glides into the open eyelet.

15.4.2.4 Threading-up the Lateral Yarn Guide

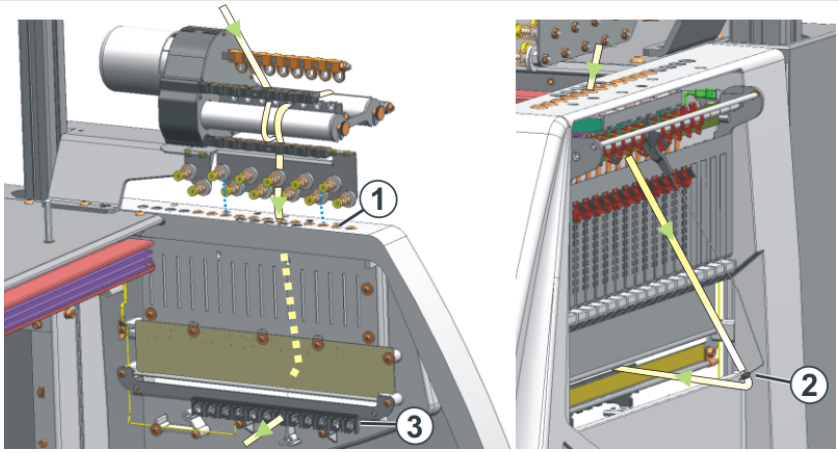
The friction feed wheel, the permanent brake, the active thread clamp and the lateral yarn tensioner work together.

I. Designations of the lateral yarn guide



	Designation
1	Friction feed wheel
2	Permanent brake
3	Active thread clamp
4	Lateral yarn tensioner

II. Threading-up the lateral yarn tensioner:



1	Eyelet
2	Lateral yarn tensioner
3	Yarn deflector

Make sure that you thread-up the thread vertically through the lateral safety door.

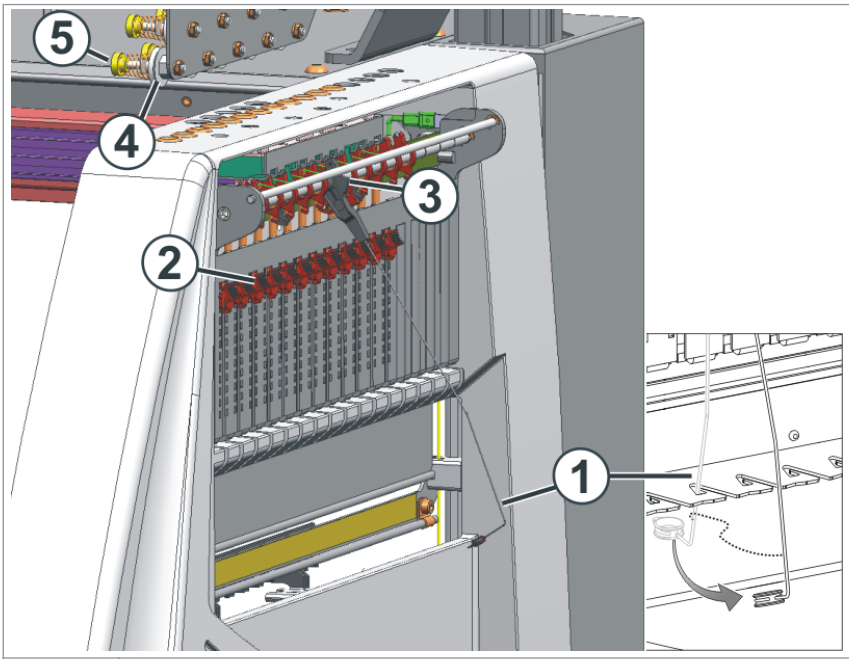
1. Bring the lateral yarn tensioner in still position (lock). This way the active thread clamp is opened.
2. Thread the thread through one of the eyelets (1) on the lateral safety door.

- **Eyelet 3 to 10:** for threads that are threaded-up via the feed wheel.
  The clamping positions of the active thread clamp are located in this area.
- **Eyelet 1 + 2 / 11 and following:** for threads that are processed without feed wheel.
  Example: Comb thread, draw thread

3. Thread-up the thread vertically downwards in the eyelet (2) of the lateral yarn tensioner.
4. Feed the thread through the yarn deflector (3) to the yarn carrier.
5. Bring lateral yarn tensioner in work position by unlocking.

15.4.2.5 Adjustment of the lateral yarn guide

I. Adjust the yarn tension:



1	Yarn tensioner locked / unlocked
2	Slider for the restoring force of the yarn tensioner
3	Notched plate
4	Brake disc of the permanent brake
5	Knurled screw for the contact pressure of the permanent brake

1. Lateral yarn tensioner: Adjusting the restoring force on the linear regulator (2).
2. Open permanent brakes (5).
3. Adjusting yarn control unit.
4. Adjusting permanent brakes (5).
5. Lateral yarn tensioner: Adjust the yarn tensioning path at the notched plate (3).

II. Adjusting restoring force of the yarn tensioner

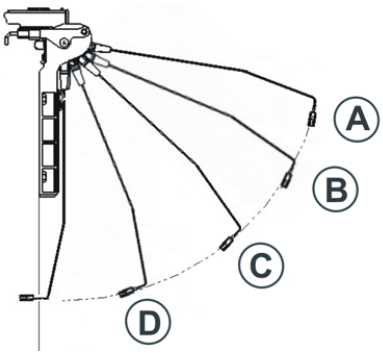
1. Remove lateral yarn tensioner (1) from the stay.
2. Linear regulator (2) is to be set in a manner that the lateral yarn tensioner has enough strength to hold the thread tensioned always.
3. Control the setting while the machine is knitting.
   In this case the thread must not sag rather it should always be tensioned by the yarn tensioner.

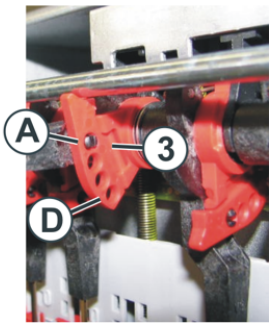
III. Adjusting permanent brake:

➔ Adjust the permanent brake in such a manner that the lateral yarn tensioner swivels only a bit (approx. 25 degrees)
If a thread loop is formed between the friction feed wheel and the permanent brake (on the inner side of the lateral safety door) then the yarn brake on the yarn control unit should be set a little stronger and the yarn brake should be set a little weaker.

IV. Set the yarn tensioning path of the yarn tensioner:

- The yarn tensioning path of the yarn tensioner can be set from 80 to 35 degrees.
- The yarn tensioning path is adjusted with the four lock positions of the notched plate (A-D).



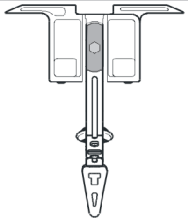
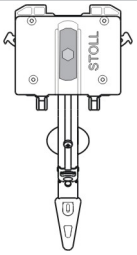


Position	max. angle	Function
A	80 °	Home position of the lock segment. Active thread clamp in action. Largest yarn tensioning path.
B	65 °	Active thread clamp in action.
C	50 °	Active thread clamp in action.
D	35 °	Active thread clamp out of action. Smallest yarn tensioning path.

15.4.2.6 Threading-up the normal yarn carrier

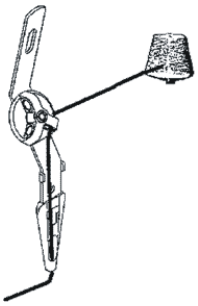
	DANGER
	Danger by moving carriage Danger of crushing and cutting by the carriage.

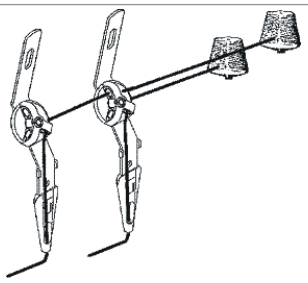
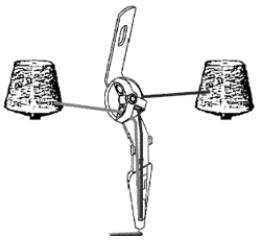
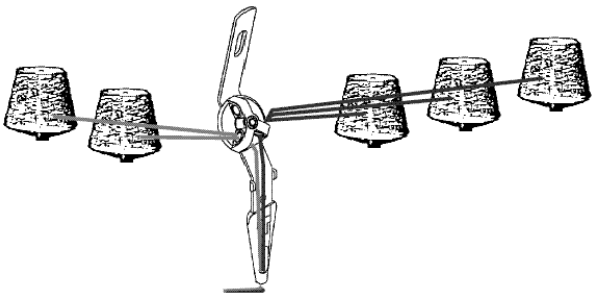
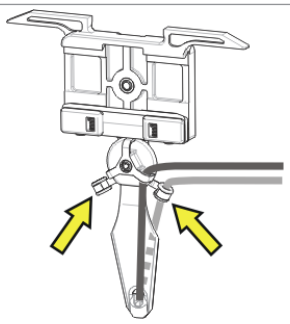
Normal yarn carrier types:

Normal yarn carrier type 1	Normal yarn carrier type 2 (optional)
 **Standard equipment**	

Different ways of threading-up the yarn carriers:

1. Open covers.
2. Thread up the yarn through the eyelets, the yarn guide star and yarn carrier head.

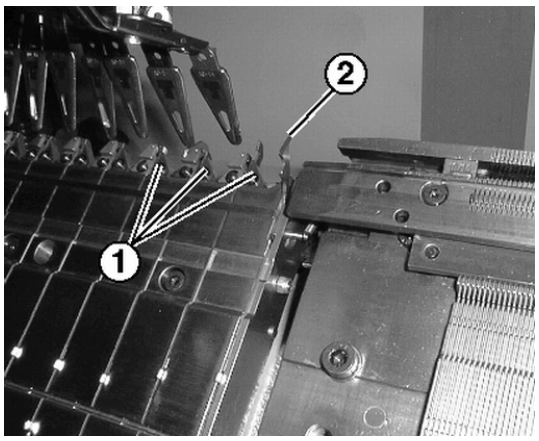
Thread up yarn carrier - Variants	
Thread-up the threads into the respective next eyelet on the yarn carrier.	

Thread up yarn carrier - Variants	
If several yarn carriers of one track are used and the threads are led to the yarn carriers from the same side.	
If several bobbins are used for one yarn carrier. ◆ Threading-up yarns from left and right. ◆ Make sure that almost the same number of threads are used from left and right.	
	
CMS 520 C, CMS 830 C The yarn carrier has two additional eyelets. Up to 5 thin yarns can be threaded into each eyelet.	

15.4.2.7 Locking yarn ends

I. Utilization of clamping and cutting device and of the comb:

1. Position the yarn carriers next to the corresponding clamping and cutting points on the right or on the left according to the yarn carrier home position.
2. Insert the yarn ends manually into the cutting needles of the clamping points.



No.	Element
1	Clamping point with cutting needle
2	Catch hook

II. Without utilization of clamping and cutting device and of the comb:

1. Position the yarn carriers at the fabric selvedge on the right or on the left according to the yarn carrier home position.
2. Manually push up some needles to the fabric selvedge.
3. Insert the yarn ends in the needles.
4. Pull down the needles manually.
5. Cut off the yarn end.
6. Close the covers.

15.4.2.8 Position the Yarn Carriers

I. Position the yarn carriers at the clamping point.

▷ The yarn carriers used in the pattern are threaded-up.

▷ With clamping and cutting device (**YGC**).

1. Position the yarn carriers at the **corresponding clamping points**.

Allocation of the yarn carriers to a clamping point by the YGC command.

The yarn carrier number corresponds to the clamping point number.

II. Position the yarn carriers at the fabric selvedge:

▷ The yarn carriers used in the pattern are threaded-up.

▷ Without clamping and cutting device (**YG**).

1. Position the yarn carriers staggered **at the fabric selvedge** according to the "Yarn carrier" (YP) dialog box.

15.4.3 Thread up the Yarn Carriers after Yarn Breakage

DANGER

Danger by moving carriage

Danger of crushing and cutting by the carriage.

With production: Thread up yarn carriers after yarn breakage.

1. Open covers.
2. Thread up the yarn through the yarn guide star and yarn carrier head.
3. Lay-in the thread in the needle head using a knitting hook.
4. Lead the yarn end opposed to the carriage direction.
5. Hold the yarn end outside the danger zone(carriage)
6. Pull the engaging rod to position 2 (reduced speed) keeping the carriage in view.
7. Release the engaging rod when the thread is fixed in the fabric and the position is accessible.
8. Cut-off the yarn end.
9. Close the covers and continue production.

For this, see also...

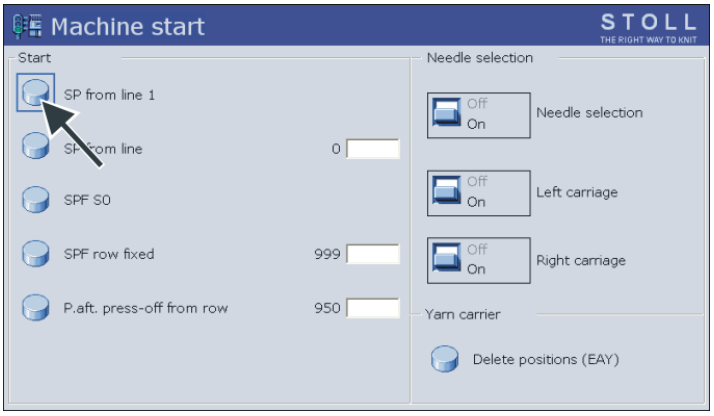
15.5 Starting Machine

I. Start the machine with a loaded pattern:

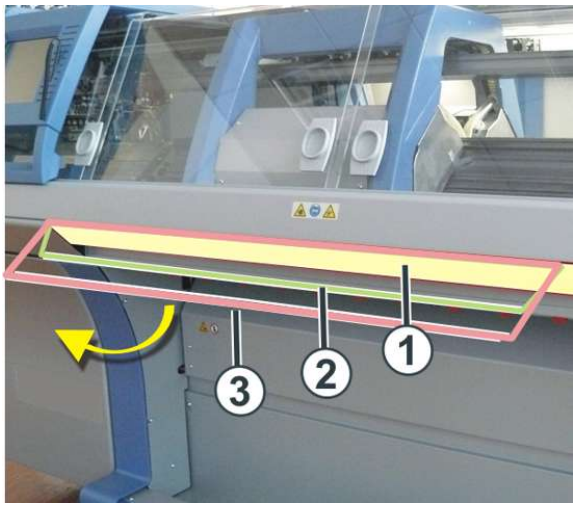
▷ Operative program is loaded

▷ The yarn carriers used in the knitting program are threaded in.

1. Call up the "Machine Start & Stop" menu with the  key of the "Main Menu".



2. Tap the "SP from line 1" key.
3. Start the machine with the engaging rod.



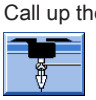
1	Carriage stopped
2	reduced speed
3	normal speed

The carriage is positioned at the left reversal point after the knitting.

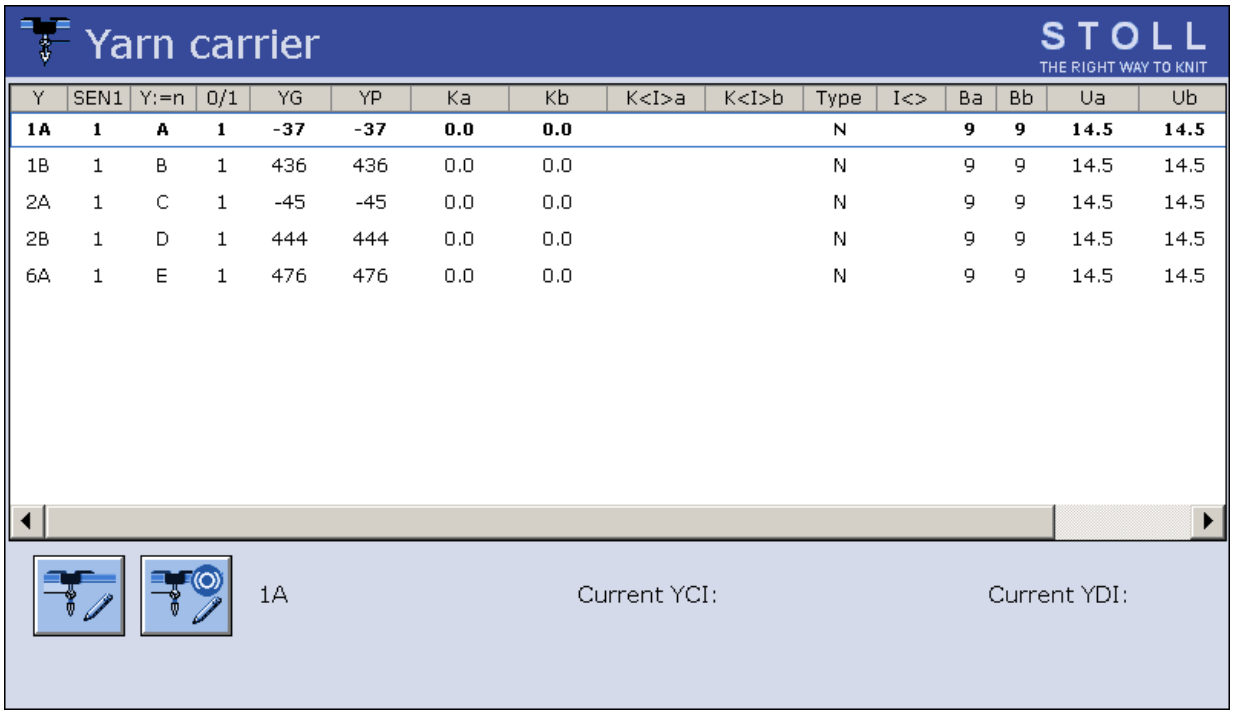
15.6 Check the yarn carriers

Display and check the yarn carrier positions.

1. Call up the Yarn carrier menu.



⇨ The yarn carriers used in the knitting program are displayed.



Column	Meaning
Y	Specification of yarn carrier
SEN 1	Specification of SEN area in which yarn carrier works
Y: =n	Specification of yarn type
0/1	Yarn type switched on or off
YG	Home position of the yarn carrier with needle xx
YP	Current yarn carrier position with needle xx
Ka	Yarn carrier correction value a (left) with selected knitting
Kb	Yarn carrier correction value b (right) with selected knitting
K<I>a	Correction value a (left) for swiveled intarsia yarn carrier
K<I>b	Correction value b (right) for swiveled intarsia yarn carrier
Type	Definition of the yarn carrier type: ◆ Normal yarn carrier (N) ◆ Intarsia yarn carrier (I)
I<>	Swiveling direction of intarsia yarn carrier
Ba	Yarn carrier braking value a (left)
Bb	Yarn carrier braking value b (right)
Ua	Engaging value of the yarn carrier when plating to the left
Ub	Engaging value of the yarn carrier when plating to the right
MSEC	Carriage speed related to yarn carrier (with technical fabrics)
V	Number of selvedge needles until first knitting needle (technical fabrics)

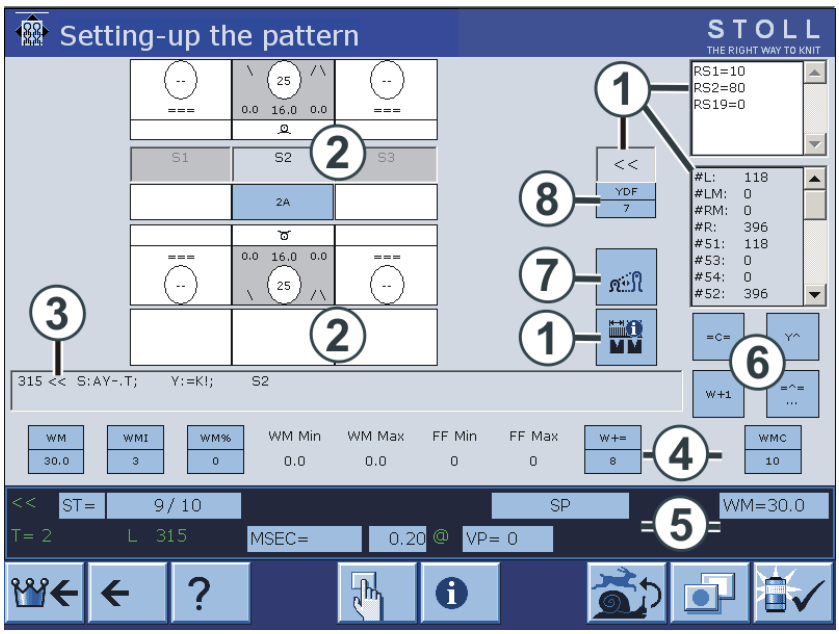
15.7 Mask: Set-up Pattern

You can check the pattern specific settings and correct them if necessary during production.

Call up the "Setting-up the pattern" menu

1. Tap the  key in the Main Menu.

   ⇨ The settings are displayed in the "Setting-up the pattern" menu.



1	Display of: ◆ Carriage Direction ◆ Cycle Counters ◆ SEN area ◆ Coupling width (for tandem machine) ◆ Counters The active cycle counter is highlighted. The values cannot be modified.
2	Setting up of the knitting systems: ◆ Needle action ◆ Stitch tension ◆ Yarn Carriers ◆ Jacquard line
3	Current Sintral line
4	◆ Fabric take-down values ◆ Fabric take-down function
5	Status line: Here the individual values can be changed or the corresponding setting menu called up.
6	Actions for yarn carrier plunger, fabric take-down, comb take-down and auxiliary take-down
7	Call up "Stitch length" window
8	Additional yarn carrier distance for fully fashion knitting

Editing Values

1. Tap the corresponding field.

   ⇨ Menu for input appears.

2. Activate the virtual keyboard by  .
3. Change the values by the virtual keyboard.

4. Confirm the changes.
5. Deactivate the virtual keyboard by  .

16 Setting up the ADF machine

Sequence: Setting up the machine

1. Check the state of the machine.
2. Finish or cancel the current knitting program.
3. Bring the carriage into parking position on the left after the reversal.
4. In case of changing the current knitting program, save the changes if applicable.
5. Load a new knitting program.
6. Preparation of the machine for the newly loaded program.
   - Thread up the yarn carriers
7. Start the machine.
8. Adapt pattern parameters.

For this, see also...

16.1 Loading Files, Library and Folders

Possibilities of reading-in the knitting program (zip file):

- Removable Disks
  - USB Memory Stick
  - External hard disk drive
- Hard disk of the computer in the knitting machine
- Ethernet

16.1.1 Loading Pattern

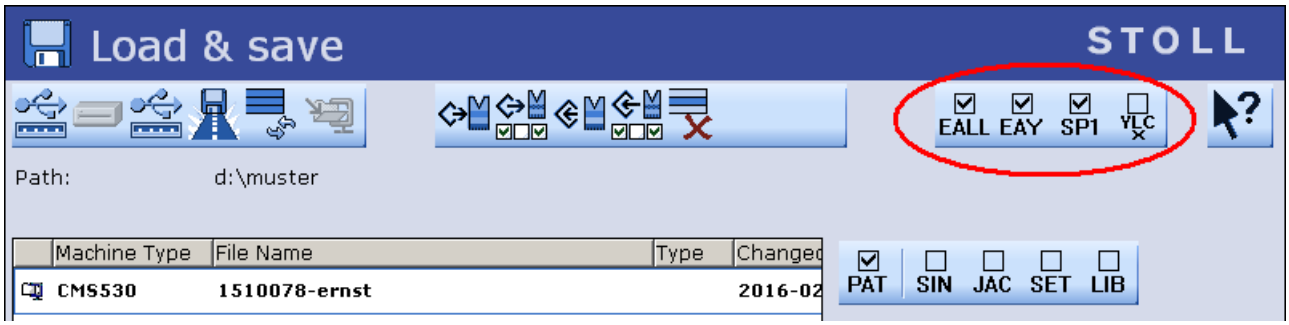
Load pattern into the machine:

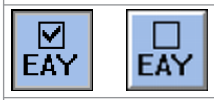
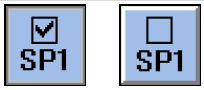
Before loading the pattern, the current machine state is to be checked:

- With Comb
  - No fabric in the needle bed or in the fabric take-down.
- Without Comb
  - Pay attention to the starting width of the new pattern.
  - Check and adjust the yarn carrier positions.
- Park the carriage assembly with the carriage direction to the right.

	CAUTION
	Computer viruses! Loss of data or production. Computer viruses can creep into the machine through unscanned data via USB sockets or network.

1. In the "Main Menu" press the  key.
   ⇨ The window "Load & save" is displayed.
2. Specify before reading in a pattern:



Key	Function
	Delete / Do not delete pattern (**sin**, **jac**, **setx**) from main memory **i**: Cycle counters, counters and NP values will be reset.
	Delete / Do not delete all yarn carrier positions
	Run / Do not run the "Start program from line 1" command automatically after loading the pattern. **i**: If SP1 is activated, there is no need of calling up the "Machine Start" window.
	Delete / Do not delete the ASCON correction values automatically with loading the pattern **i**: Key is only available if an **Ascon** device is mounted.

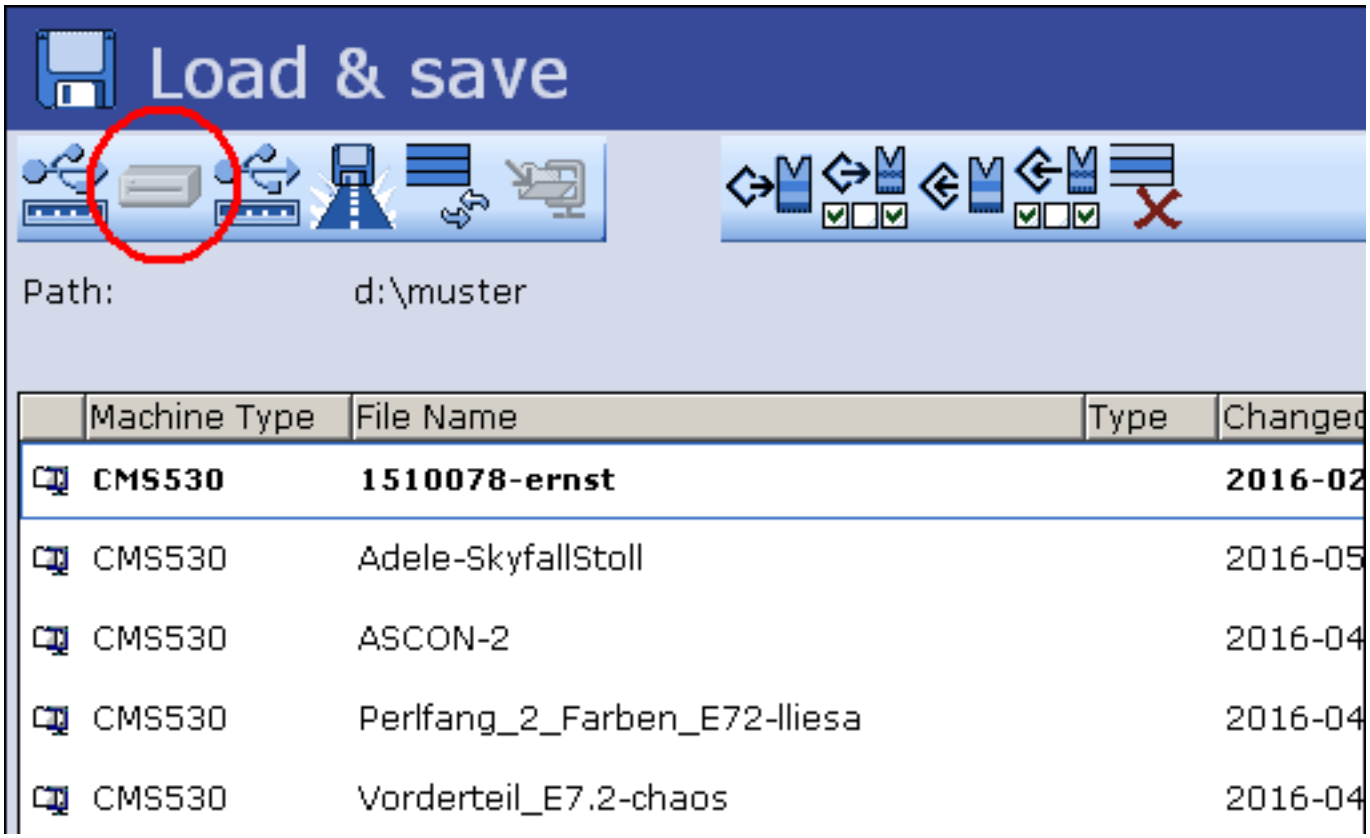
3. Select the desired folder (direct selection folder).

Key	Function
Keys for direct selection of a predefined folder	
	Loading data via network
	Loading data from hard disk
	Loading data from the USB memory stick
	Loading data from a shared folder (network folder) e.g. from the pattern workstation M1plus
	Definition (path) of a key for direct selection of a folder

4. Select the hard disc drive with the  key for example.

⇨ The content of the selected directory appears in the selection window.

Display of all programs of a selected folder:



Symbol	Meaning
	Program was generated with **Setup2**. The elements of the program (**sin** /**jac** / **setx**) will be saved as **zip** file. **i**: Only with **OKC** machines
No symbol	Program was generated with **Setup1** The elements of the program will be saved as **sin** / **jac** / **set**.

5. Select the PAT key.

⇨ All program elements belonging to a pattern will be selected.

Selecting the desired program / program elements (type of files):

Key	Function
PAT PAT	Load / Do not load all program elements belonging to a pattern **i**: All program elements must have the same name.
SIN SIN	Load / Do not load **Sintral** (**sin**)
JAC JAC	Load / Do not load **JACQUARD** (**jac**)
SET SET	Load / Do not load **SETUP** (**setx**) ◆ **setx**: File extension with **Setup2**
LIB LIB	Library = protected memory area in the memory **i**: Load / Do not load program element e.g. **Auto-Sintral** **i**: The **Auto-Sintral** is necessary for patterns generated with the **JSA** program on the **SIRIX** pattern workstation.

i With the selection of "SIN" / "JAC" / "SET" only the selected file types will be displayed in the selection window.

6. Refresh the selection window by the  key if necessary.
7. Select the desired file (pattern) in the selection window.
8. Tap the key:

■ 

Load pattern with Setup data.

■ 

Load the pattern with selected Setup data.
Select the desired data in the following window.

9. Confirm the selection with the  key.
   ⇨ The pattern memory will be cleared and the selected pattern will be loaded.

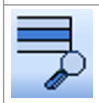
The loaded program elements appear in the "Load & Save" window at the right-hand side.

---

10. Tap the  key.
    ⇨ The "Main menu" window appears.

Show the content of a compressed pattern (**zip** file):

1. Select the desired folder (direct selection folder).
2. Select the desired program elements with the "SIN" / "JAC" and "SET" keys.
3. Select a pattern with the  label in the selection window.
4. Tap the  key.
   ⇨ The compressed pattern will be opened and the desired program elements appear.
5. Select the desired program element (**sin** /**jac** / **setx**) in the selection window.
6. Call up the function desired next:

Key	Function
	Delete the selected file of the selected folder
	Show the selected file in the corresponding editor.
	Add selected file and accompanying pattern elements to the pattern already loaded

7. Close the compressed pattern with  again if desired.
   ⇨ The single program elements (**sin** / **jac** / **setx**) are displayed as **zip** file.

Call up Help in the Load & Save window:

Key	Functions
	Call up direct help for the key pressed next

1. Tap the  key.
2. Tap the desired key then for which you want help.
   ⇨ An information text appears.

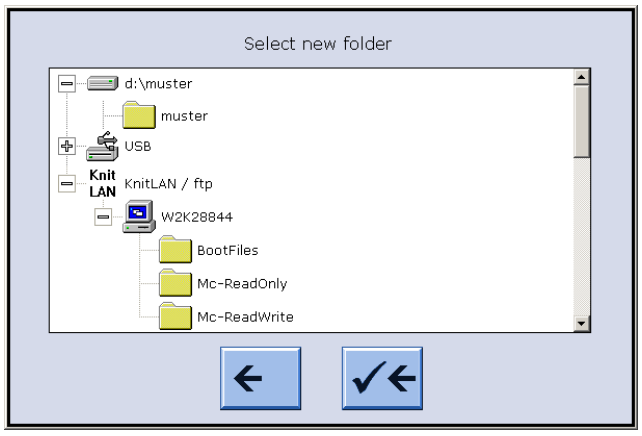
16.1.2 Changing the Path of a Drive or Folder

You can change the allocation of the keys as desired.

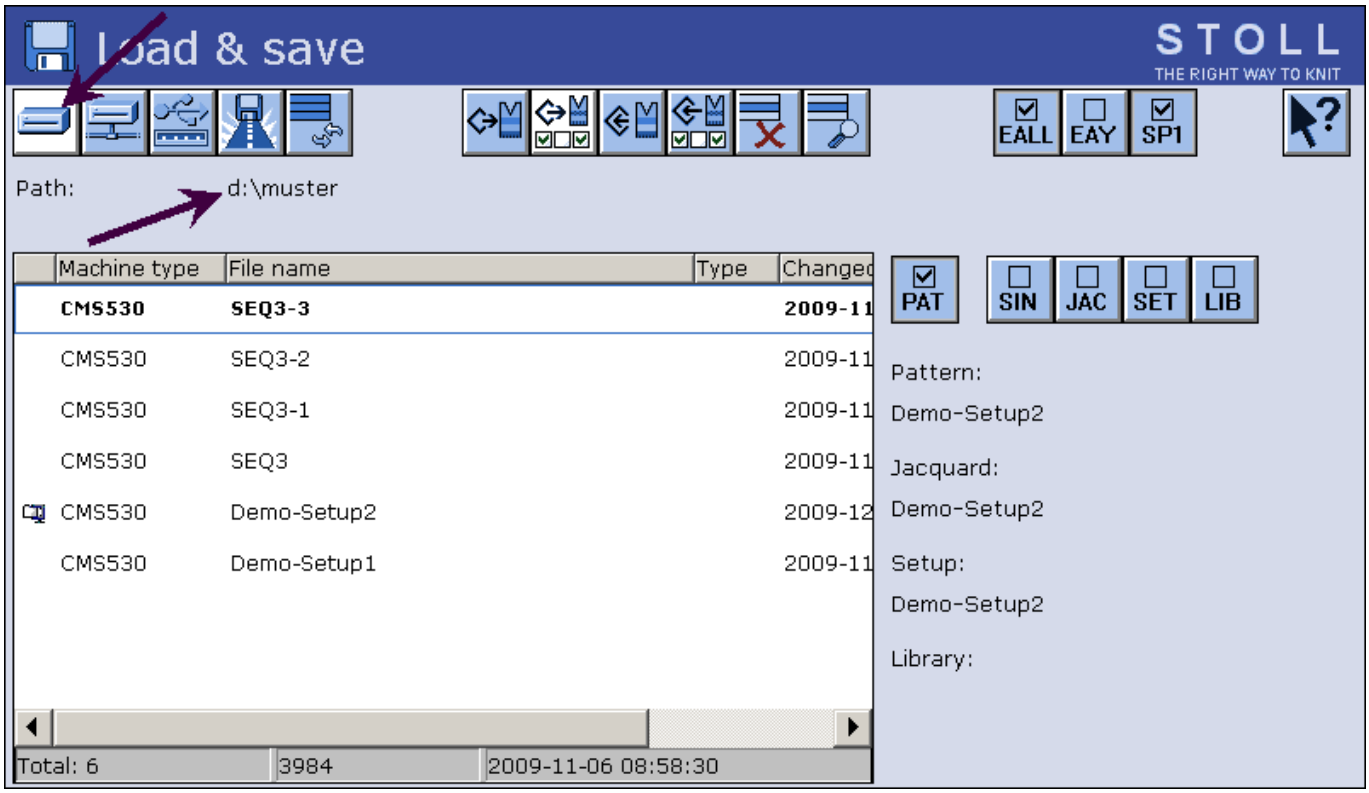
Default allocation (paths) of the keys

Key	Drive	Explanation
	**F:**	USB Memory Stick
	Name:\	Network drive
	**D:**	Hard disk
	**D:\Stoll\KnitLan**	Network folder (M1plus)

1. Tap the desired key.
2. Tap the  key.
   ⇨ The input window "Select new folder " appears.



3. Select the desired folder.
4. Confirm the entry and close the window with the  key.
   ⇨ In the "Load & Save" window, the display of the key is adapted to the new path.



The path will be displayed in the line below.

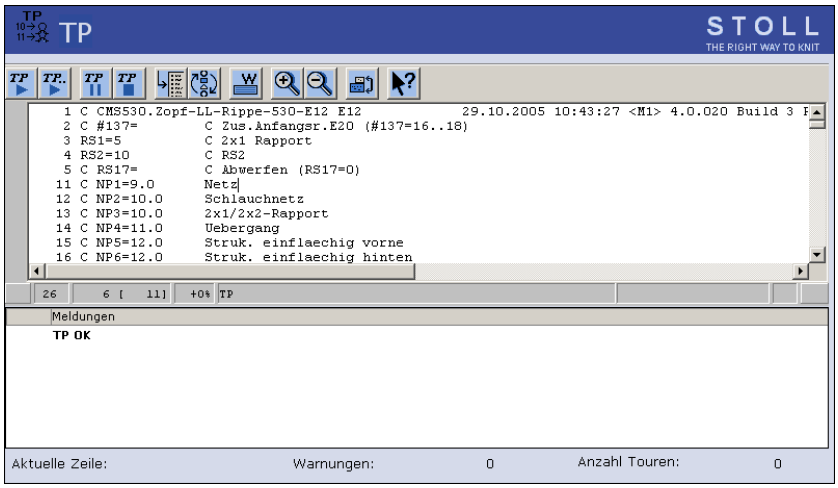
16.2 Carrying out a Program Check

A pattern newly loaded into the machine is to be tested for knitting ability.

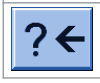
Test the knitting program:

▷ The "Load & save"  window is displayed.

1. Tap the  key.
2. Start the program test by  .
   ⇨ During the test the pattern is shown in the upper window and the **TP** messages in the lower window.



Function keys in the "TP" window:

Key	Designation	Function
	"Start program test"	Start program test from the first line.
	"Start program test from"	Start program test from a certain line on
	"Interrupt program test"	Interrupt program test and restart it
	"End program test"	End program test
	"Jump"	Go to a certain position
	"Go directly to"	Quick jump to the corresponding mark (e.g. from **FBEG** to **FEND**)
	"Display warning"	Activate/deactivate presentation of warnings during **TP**.
	"Enlarge"	Display text enlarged
	"Reduce"	Display the text decreased
	"Change size"	Change window size of pattern and error output
	"Direct Help"	Call up direct help for the key pressed next.

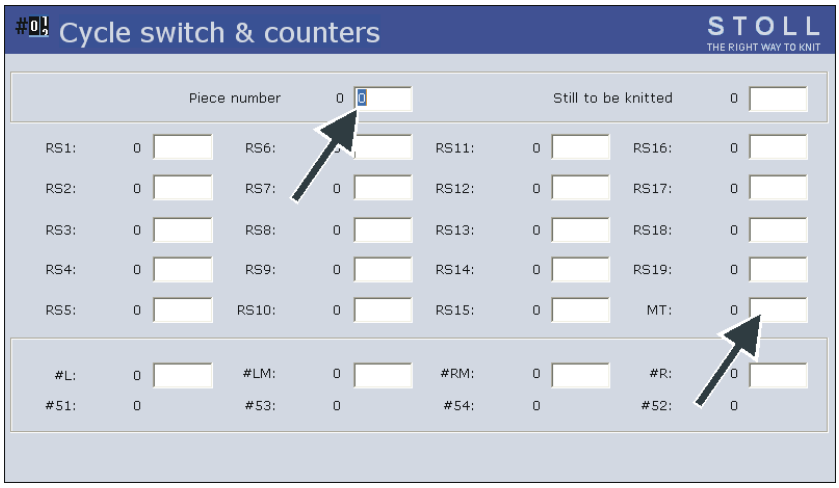
16.3 Setting the Quantity of Pieces

Set piece counters:

- "Piece number": Specified quantity of fabrics
- "Still to be knitted": the displayed number will be reduced by 1 when a fabric is completed.

➜ Tap the  key in the Main menu.

⇨ The "Cycle counters & counters" window is opened.



1. Enter the desired quantity of pieces at "Piece number" using the virtual keyboard  .

When producing cut goods, the length of the fabric is specified by the **MT** (maximum number of courses) counter.

2. Confirm the selection with the  key.

Cycle Counters

The cycle counters used in the knitting program are also displayed and can also be changed in this window. The values are entered in the Setup2 file as well.

3. Go back to the "Main menu".

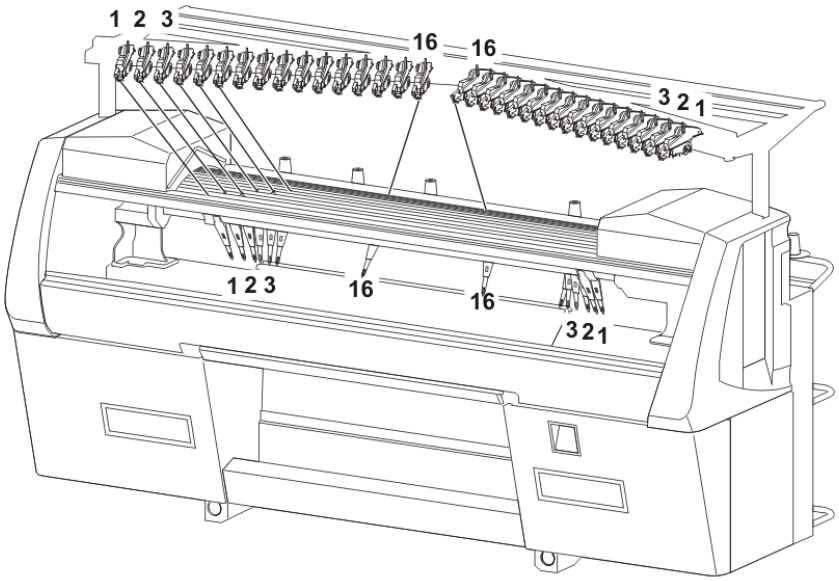
16.4 Threading up the Machine

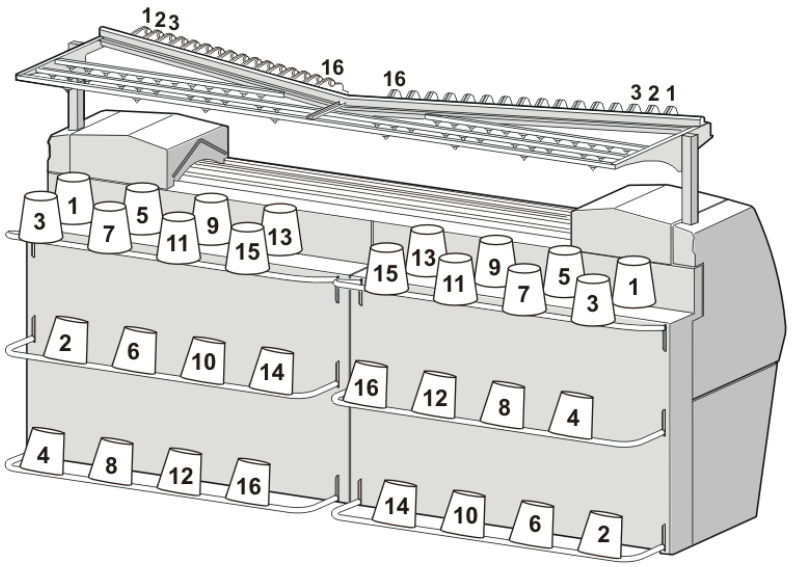
16.4.1 Threading up from the Bobbin Board to the Yarn Carrier

Course of yarn

The yarn feeding is carried out from the top - directly from the yarn control device to the yarn carrier.

To prevent the threads from touching each other, the yarn control devices are arranged in a V-shape.





Course of yarn

The course of yarn from the bobbin to the yarn carrier should run straight.

Definition of the allocation of bobbin - yarn control unit - yarn carrier:

- Bobbin 1 - Yarn control device 1 - Yarn carrier 1
- Bobbin 2 - Yarn control device 2 - Yarn carrier 2
- etc.

This yarn feeding causes:

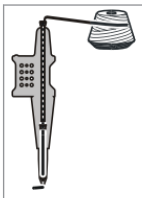
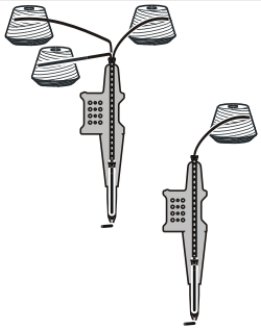
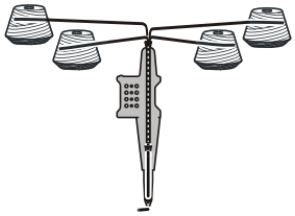
- the most reduced yarn tension possible
- that the threads do not touch each other

Example on equipment: of an ADF 32 W:

- Bobbin boards for a total of 32 yarn bobbins
- 32 Yarn control devices
- 32 yarn carriers (2 yarn carriers on 16 tracks)

This means: If several threads are combined in one yarn carrier it is no longer possible to use all of the 32 yarn carriers.

Threading options:

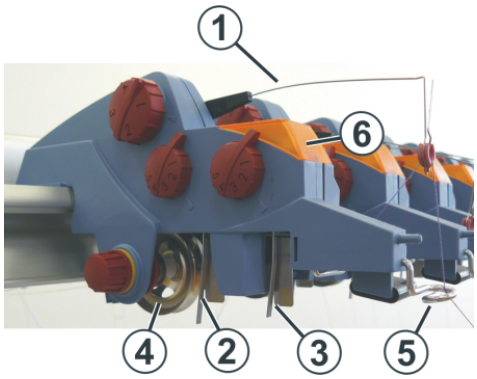
 Default allocation	Threads per yarn carrier	1
	Number of yarn carriers	32
	Number of bobbins	32
	i: Double allocation of all tracks	
	Two threads per yarn carrier ◆ One yarn carrier per track ◆ Two yarn carriers per track	
	Three yarns per yarn carrier + one yarn per yarn carrier ◆ One yarn carrier per track ◆ Two yarn carriers per track	
	Four threads per yarn carrier	

i In the operating instructions you will find the graphic presentation of the different threading possibilities.

16.4.1.1 Threading up the yarn control unit

I. Yarn control unit (**FKE**):

> The elements of the yarn control device can individually be adjusted to the yarn being processed.



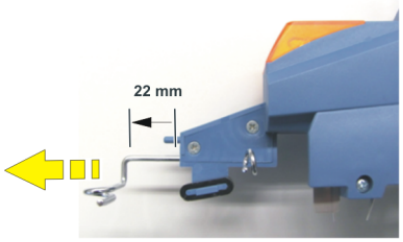
1	Tension arm	**4**	Yarn brake disc
2	Knot detector for large knots	**5**	Eyelet
3	Knot detector for small knots	**6**	LED

II. Tasks of the yarn control unit:

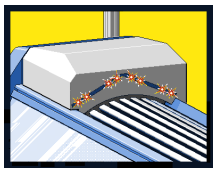
- Yarn brake disc (4):
  - controls the yarn tension and prevents threads from sagging via yarn tensioning.
- Tension arm (1:)
  - in case of yarn breakage or yarn end the tension arm switches off the knitting machine

> **Error display**
>
> Errors are indicated by the LED (6), the signal light and at the display.

- Knot detector for large knots (2):
  - in case of large knots in the yarn, the knot detector switches off the knitting machine
- Knot detector for large knots (3):
  - in case of small knots in the yarn, the machine knits a programmed number of rows at reduced speed.
- Eyelet (5:)
  - guides the thread and prevents the threads from touching or crossing over each other.
  - adjustable: necessary when threading-up a yarn carrier with more yarns



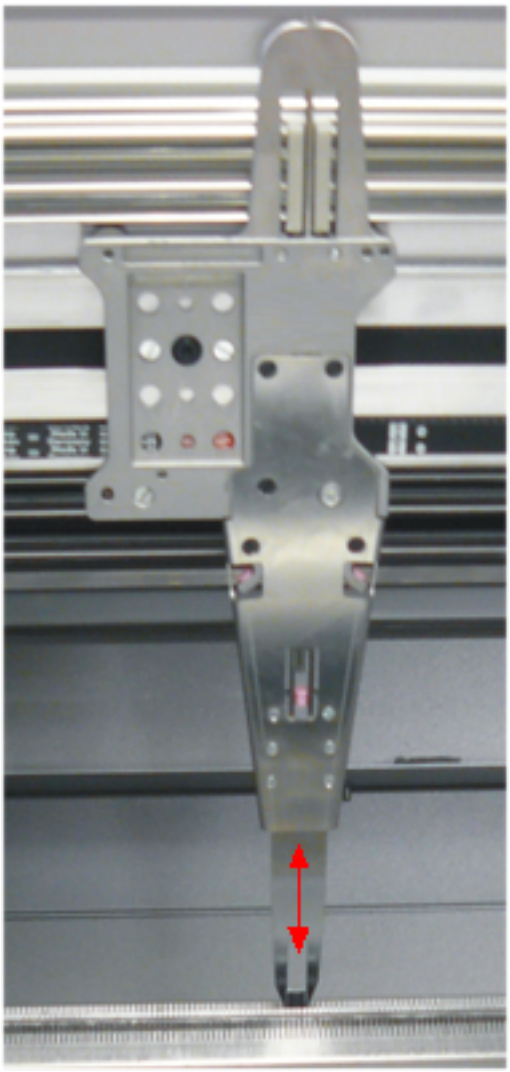
16.4.1.2 Light curtain



- The light curtain monitors the area above the yarn carrier rails.
- If this protective field is interrupted, the carriage and the autarkic yarn carriers are stopped immediately.

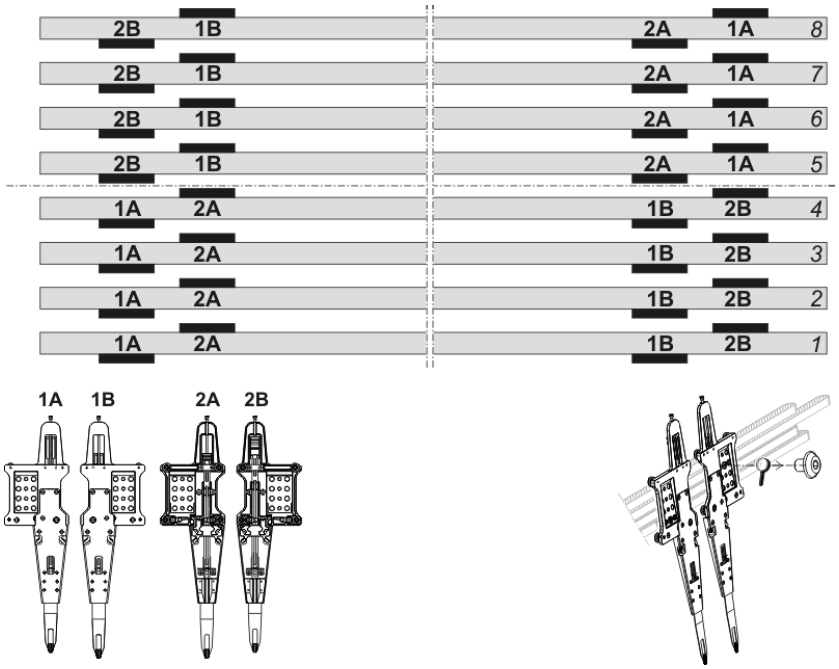
16.4.1.3 Threading-up the autarkic yarn carrier

Autarkic yarn carrier:

ADF - yarn carrier	Function
	Yarn carriers are moved autarkic in horizontal and vertical direction

Rail allocation with 32 autarkic yarn carriers:

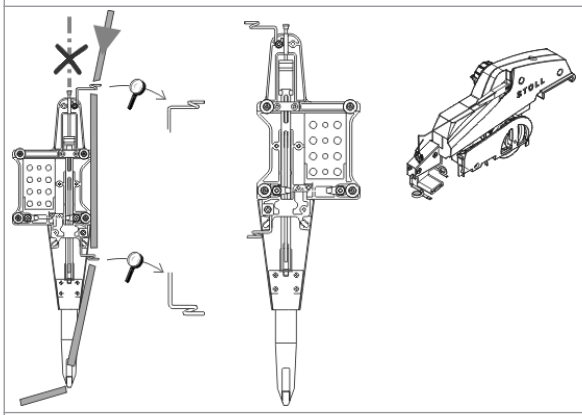
- At the yarn carriers of the rails 1-4, the yarn carrier tips are closed at the front - open at the rear for threading-up
- At the yarn carriers of the rails 5-8, the yarn carrier tips are open at the front for threading-up - closed at the rear



Two different construction types:

- Yarn carrier 1A corresponds to the yarn carrier 2B
- Yarn carrier 1B corresponds to the yarn carrier 2A

Special yarn carrier with ADF Weave-in machines:

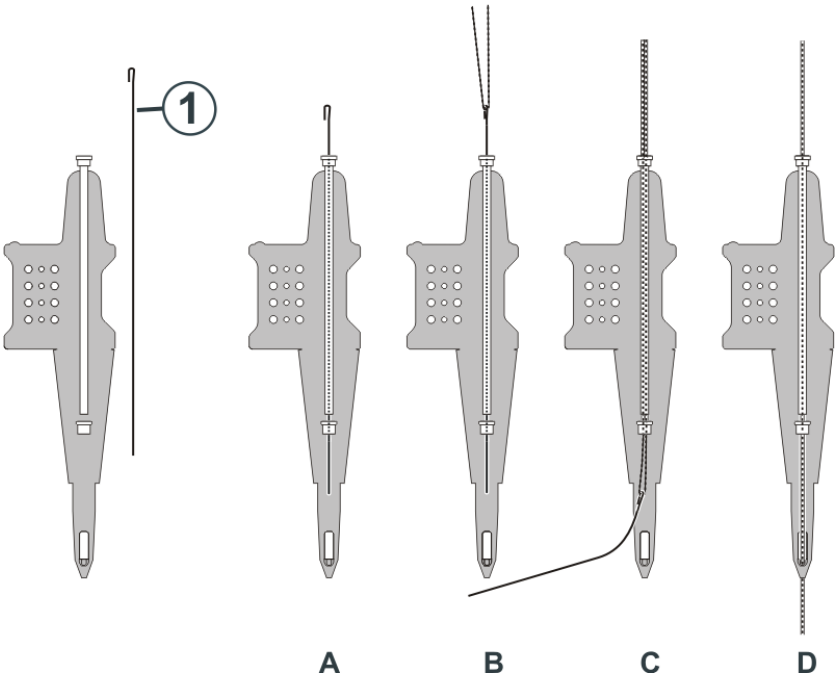
Yarn Carriers	Threading up
	Bypass: The yarn won't be threaded in the yarn tube but it will rather be led over two eyelets. 1. **Only Bypass required**: The yarn fits through the yarn carrier tip 2. **Coarse yarn carrier with bypass + coarse yarn control unit (stronger restoring force):** Yarn (thick) does not fit through the yarn carrier tip

Usage of the yarn carrier with bypass	**Explanation**
◆ with a very coarse, voluminous yarn	The yarn is too thick, and cannot be threaded in the yarn tube
◆ with a yarn, which "sticks" in the yarn tube	After the carriage reversal, the yarn is to be fetched back (tensioned) by the tension arm of the yarn control unit so that no yarn loop is formed. The increased friction results in a yarn loop, which leads to a fault in the fabric (yarn loop, hole, drop stitch, yarn breakage).

Procedure:

1. Open the covers.
2. Move the yarn carrier to a position where it can be threaded-up easier.

3. Thread-up yarn carrier.
   Use the threading aid (1) for it.



4. Push the threading aid downward through the little yarn tube (A).
5. Form a thread loop (B).
6. Pull the threading aid downward (C).
7. Unthread the thread loop and thread it manually into the yarn carrier tip (D).
8. Hold the yarn end.

	DANGER
	The yarn carrier moves back into its knitting position! Danger of crushing and cutting by the autarkic yarn carriers. ▷ The yarn carriers that were moved will automatically move back into their knitting position. ➜ ➜

9. Pull the engaging rod upward cautiously.
10. If the yarn carriers are in their knitting position, the carriage starts moving and inserts the thread in the needles.
11. When the thread is inserted securely in the needles, release the engaging rod.
12. Release the yarn end and close the covers.
13. Keep moving the carriage until the reversing position is reached and stop it.
14. Remove the yarn end.
15. Continue the production or begin a new fabric.

16.4.1.4 Moving yarn carriers and repositioning them

For threading up and for repair work it is necessary to move the yarn carrier out of the knitting area.

Our recommendation:
Move the yarn carrier to a position where it is as accessible as possible and where you can thread it up easier.

Moving yarn carriers manually

1. Open the covers.

⇨ All the yarn carriers are automatically disconnected from the power supply - they are manually movable.

2. Move the yarn carrier to a position where it is as accessible as possible and where it can be threaded it up easier.

Reposition the yarn carriers

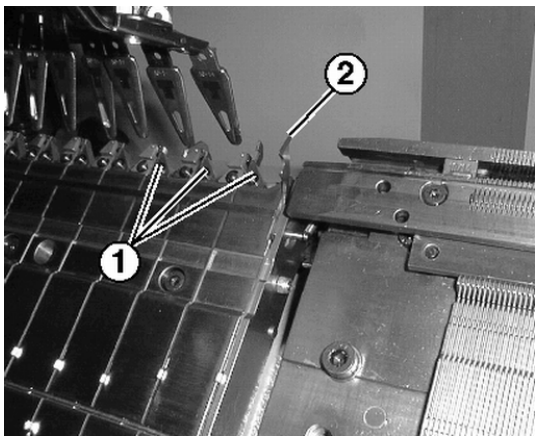
1. Insert the thread in the needles.
2. Close the covers.
3. Confirm the error message.
4. Pull up the engaging rod.

⇨ The yarn carriers move automatically back into their knitting position.

16.4.1.5 Locking yarn ends

I. Utilization of clamping and cutting device and of the comb:

1. Position the yarn carriers next to the corresponding clamping and cutting points on the right or on the left according to the yarn carrier home position.
2. Insert the yarn ends manually into the cutting needles of the clamping points.



No.	Element
1	Clamping point with cutting needle
2	Catch hook

II. Without utilization of clamping and cutting device and of the comb:

1. Position the yarn carriers at the fabric selvedge on the right or on the left according to the yarn carrier home position.
2. Manually push up some needles to the fabric selvedge.
3. Insert the yarn ends in the needles.
4. Pull down the needles manually.
5. Cut off the yarn end.
6. Close the covers.

16.4.1.6 Position the Yarn Carriers

I. Position the yarn carriers at the clamping point.

▷ The yarn carriers used in the pattern are threaded-up.

▷ With clamping and cutting device (**YGC**).

1. Position the yarn carriers at the **corresponding clamping points**.

Allocation of the yarn carriers to a clamping point by the YGC command.

The yarn carrier number corresponds to the clamping point number.

II. Position the yarn carriers at the fabric selvedge:

▷ The yarn carriers used in the pattern are threaded-up.

▷ Without clamping and cutting device (**YG**).

1. Position the yarn carriers staggered **at the fabric selvedge** according to the "Yarn carrier" (YP) dialog box.

16.4.2 Thread up the Yarn Carriers after Yarn Breakage

DANGER

Danger by moving carriage

Danger of crushing and cutting by the carriage.

With production: Thread up yarn carriers after yarn breakage.

1. Open covers.
2. Thread up the yarn through the yarn guide star and yarn carrier head.
3. Lay-in the thread in the needle head using a knitting hook.
4. Lead the yarn end opposed to the carriage direction.
5. Hold the yarn end outside the danger zone(carriage)
6. Pull the engaging rod to position 2 (reduced speed) keeping the carriage in view.
7. Release the engaging rod when the thread is fixed in the fabric and the position is accessible.
8. Cut-off the yarn end.
9. Close the covers and continue production.

For this, see also...

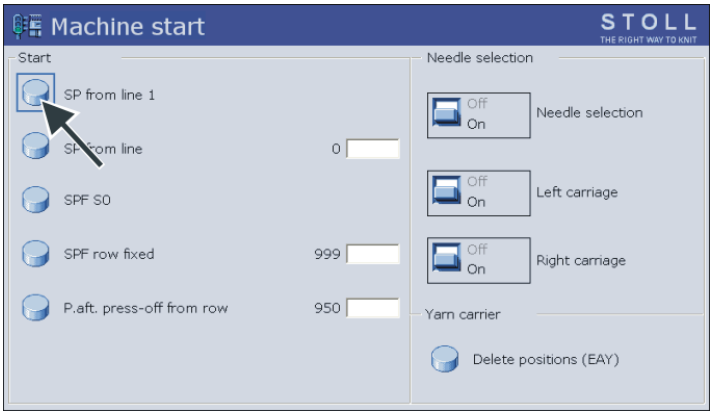
16.5 Starting Machine

I. Start the machine with a loaded pattern:

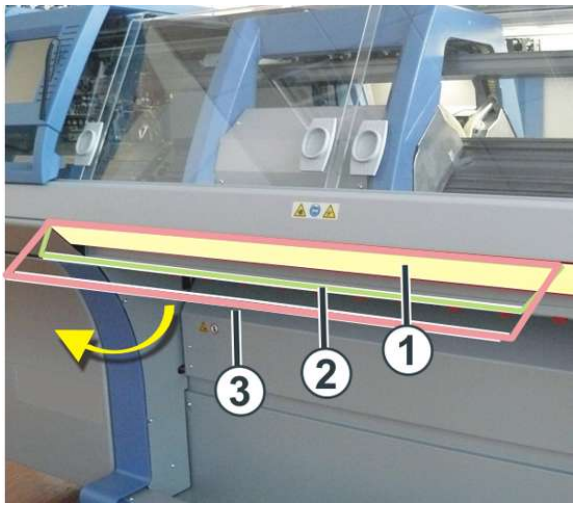
▷ Operative program is loaded

▷ The yarn carriers used in the knitting program are threaded in.

1. Call up the "Machine Start & Stop" menu with the  key of the "Main Menu".



2. Tap the "SP from line 1" key.
3. Start the machine with the engaging rod.



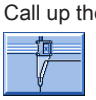
1	Carriage stopped
2	reduced speed
3	normal speed

The carriage is positioned at the left reversal point after the knitting.

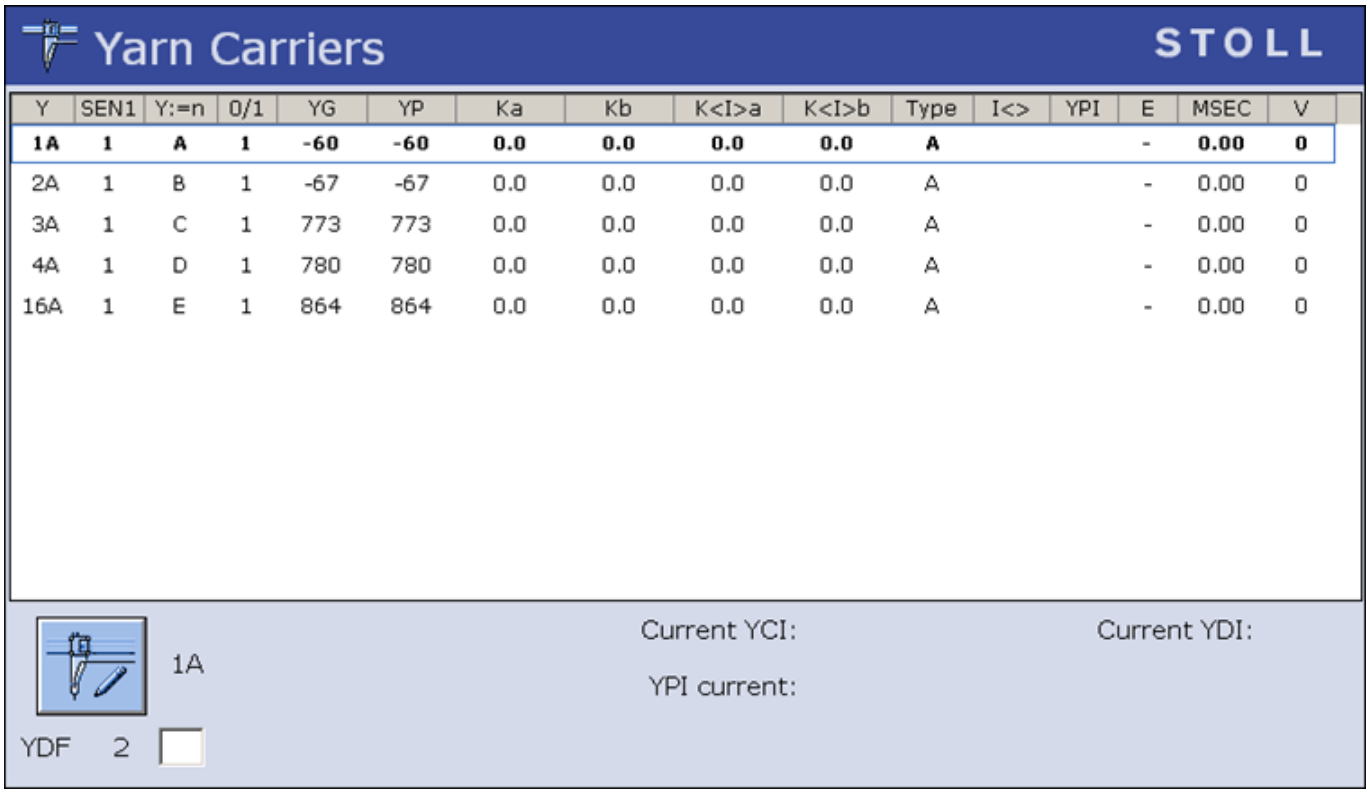
16.6 Check the yarn carriers

Display and check the yarn carrier positions.

1. Call up the "Yarn carrier" menu.

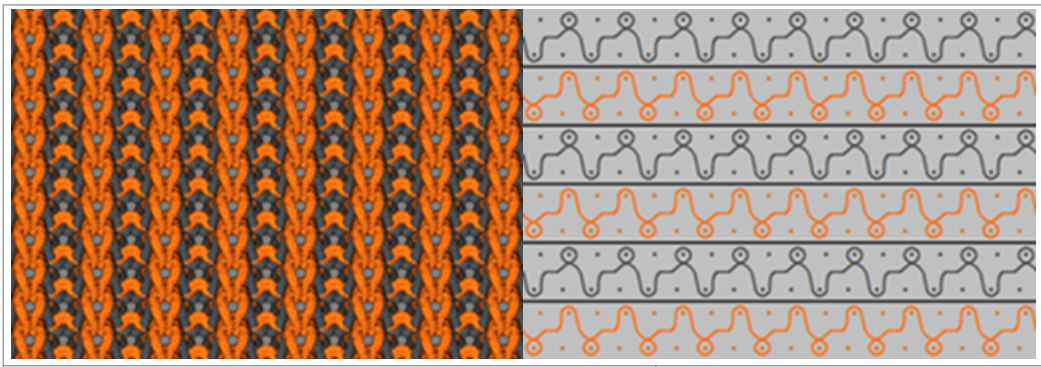


⇨ The yarn carriers used in the knitting program are displayed.



Column	Meaning
Y	Specification of yarn carrier
SEN 1	Specification of SEN area in which yarn carrier works
Y: =n	Specification of yarn type
0/1	Yarn type switched on or off
YG	Home position of the yarn carrier with needle xx
YP	Current yarn carrier position with needle xx
Ka	Yarn carrier correction value a (left) with selected knitting
Kb	Yarn carrier correction value b (right) with selected knitting
K<I>a	Correction value a (left) for swiveled intarsia yarn carrier
K<I>b	Correction value b (right) for swiveled intarsia yarn carrier
Type	Definition of the yarn carrier type: ◆ Autarkic yarn carrier (A)
I<>	Swiveling direction of intarsia yarn carrier
YPI	Display of the corresponding index numbers for the yarn carrier
E	Position of the yarn carrier ◆ **-** Insertion position (knitting position) ◆ **^** Yarn carrier in upper position ◆ **v** Yarn carrier in upper position
MSEC	Carriage speed related to yarn carrier (with technical fabrics)
V	Number of selvedge needles until first knitting needle (technical fabrics)

17 Pattern 1: Full Cardigan, 2 Colors / Tuck

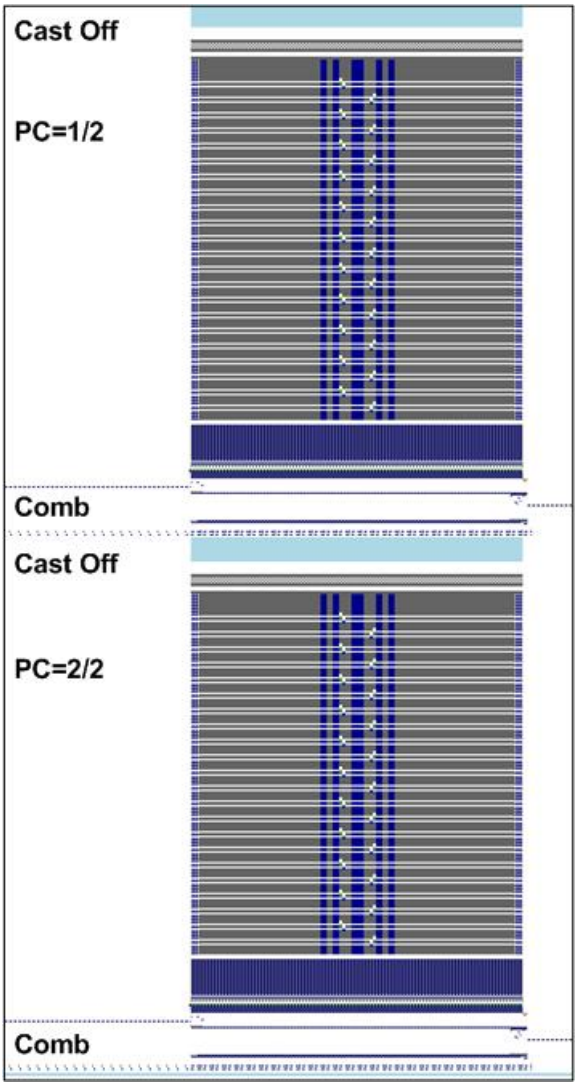


Pattern name	Full_Cardigan_2_Colors
Start	1X1 Rib
Machine Type	CMS 530 HP 5“ with E 7.2 CMS 530 HP 6“ with E 3,5.2 CMS ADF 32 W with E 7.2
Operating mode of the machine	◆ with comb function ◆ with clamping / cutting
Pattern description	◆ 1x1 Start ◆ Structure Full Cardigan (tuck) in 1x1 technique ◆ 2 colors
Pattern Parameters	◆ Cycle Counters **(RS)** ◆ Stitch Length **(NP)** ◆ Fabric Take-down **(WM)** ◆ Carriage Speed **(MSEC)** ◆ Staggering the yarn carriers at the fabric selvedge (**YDI**)

17.1 Operating Mode of the Machine and Knitting Program

Operating mode of the machine

- **Operating mode using the comb**
  The knitting program (Sintral, Jacquard, Setup2) is structured the way that the **comb function** is called-up at the start of the program and the **cast-off function** at the fabric end.
  Result:
  Each piece is started with the comb and cast-off at the end. This way single pieces are produced.



There must **not** be a fabric in the needle bed or main take-down.

Comb function at the start of a fabric piece

1. Clearing the needle beds (knitting without yarn carrier)
2. Inserting the comb thread (special elastic yarn)
3. Raising the comb to the top till the comb thread is caught by the comb hooks
4. Closing the comb hooks
5. Lowering the comb till the comb hooks are no longer between the needles

Casting-off function at the end of a fabric piece

The function is called-up at the end of the fabric to ensure an empty needle bed when starting the next fabric.

```
280 C ---------- Abwerfen ----------
281 FBEG:SCHALTER-9;
282 JA1=1103 #L=125 #LM=0 #RM=0 #R=275
283 << S:<1->H(8)-H(8)/<1->H-H;                    Y:0/0;          V0      S1 S2     WMF5  MSEC=0.70
284 #98=1
285 >> S:<1->H-H/<1->H-H;                          Y:0/0;                  S2 S3     WMF2  MS=2.5
286 IF #69=>1 IF #69<=4 F:SCHALTER-10; C MS*#69 (1-4s)
287 FEND C Abwerfen
288 C ---------- MS*#69 (1-4s) ----------
289 FBEG:SCHALTER-10;
290 JA1=1100 #L=125 #LM=0 #RM=0 #R=275
291 <<                                                          V0      S0        WMF2  MSEC=0.70
292 IF#69=1 MS=1
293 IF#69=2 MS=2
294 IF#69=3 MS=3
295 IF#69=4 MS=4
296 >>                                                                  S0
297 FEND C MS*#69 (1-4s)
```

You can define an **additional standstill time (MS)** in the reversal point of the carriage using the **counter #69** in the cast-off function.
This is necessary in certain cases to ensure the casting-off of the fabric.

17.2 Load and Set-up the Pattern

Procedure:

1. **Load pattern into the machine.**
2. **Set up the pattern:**
   - Threading up the Yarn Carriers
   - Position the yarn carriers at the clamping point
   - Check the knitting area and the fabric collection chamber
3. **Start the machine.**

Make the following changes:

- Cycle Counters **(RS)**
- Stitch Length **(NP)**
- Machine Speed **(MSEC)**
- Fabric take-down values **(WM, W+, WMK...)**

The changes are kept during working at the machine.
Save the changes in the Setup2 before deleting the memory.

17.3 Setting: Cycle Counters

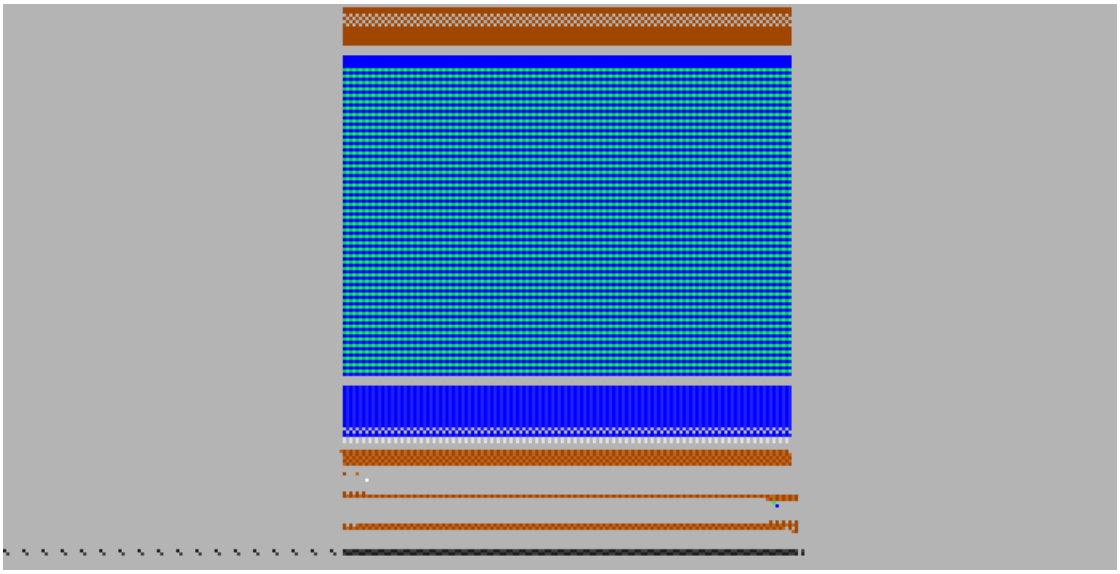
Use of cycle counters

- Cycle counters are used for the length control in a fabric piece
- Pattern areas are defined in the pattern and repeated by cycle counters (variables)

- The cycle counters are allocated to the corresponding pattern areas in the Sintral.
- Possible variables of cycle counters:
  - **Setup2**: **RS1**to**RS39**

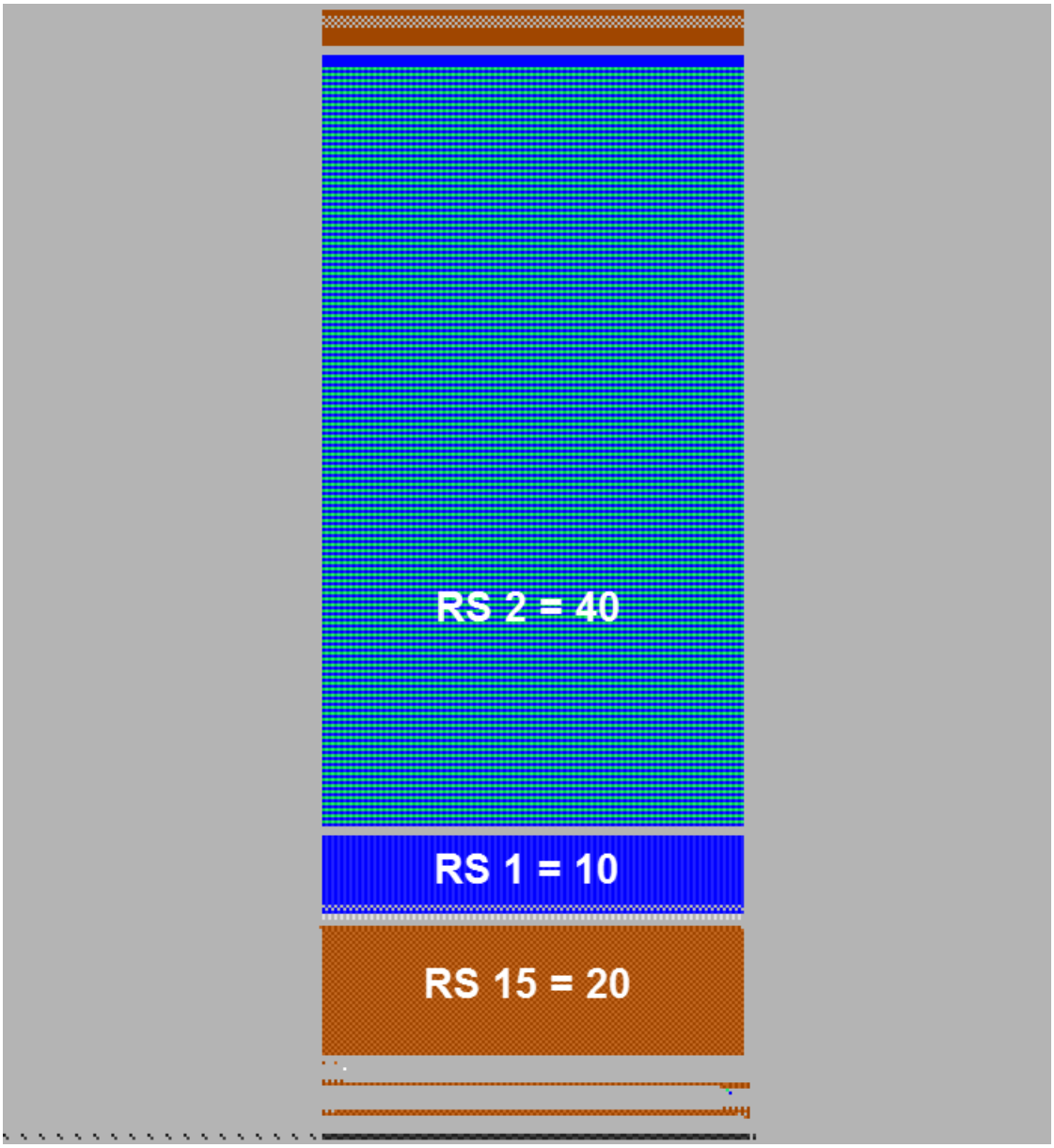
Behavior of cycle counters

- Pattern without cycle counters



Result: The pattern cannot be influenced regarding the length.

- Same pattern with cycle counters

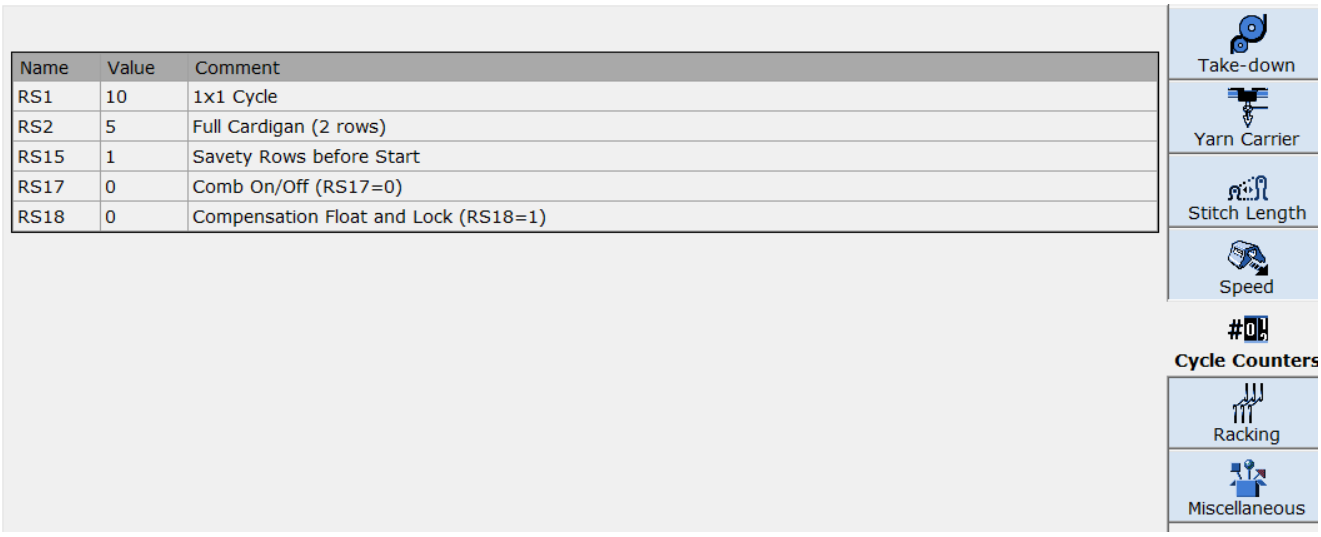


Result: The pattern can be changed regarding the length in the areas with defined cycle counters.

Call up and change used cycle counters in the SetupEditor

1. Open the "Setup2 Editor" with the  key.
2. Tap the "Cycle counters" key.

3. Change the values.



Name	Value	Comment
RS1	10	1x1 Cycle
RS2	5	Full Cardigan (2 rows)
RS15	1	Savety Rows before Start
RS17	0	Comb On/Off (RS17=0)
RS18	0	Compensation Float and Lock (RS18=1)

4. Close the "SetupEditor" with the key.
   ⇨ Modified values will be saved to the **setx**-file.

17.4 Setting: Stitch Length

The stitch length is essentially decisive for the stitch appearance of the knitwear.

- The longer the stitch is, the looser will be the fabric.
- The shorter the stitch is, the tighter will be the fabric.

The stitch length depends on:

- Yarn Quality
- Structure / Binding / Knitting technique

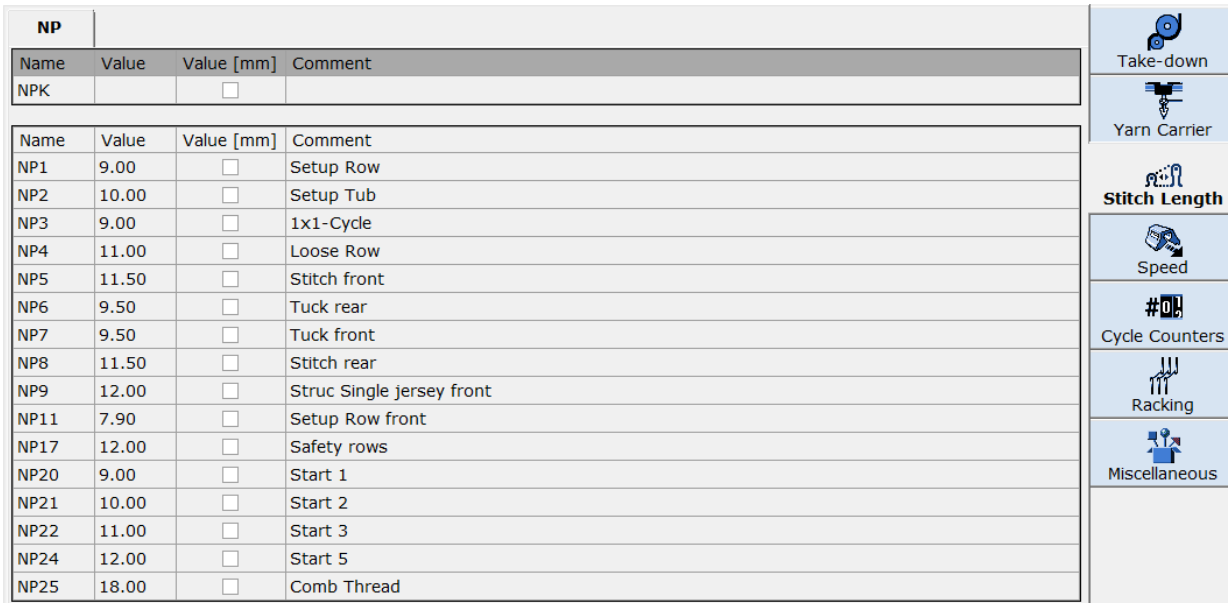
Call up the stitch length table and change the values

1. With the key
   - or -

➜ Call-up the "Setup2 Editor" with the key and tap the "Stitch length" key.

Result: The "NP" tab appears with all **NP**-values used in the pattern.

2. Tap the entry box and change values or the comment
3. Confirm entries with .



Name	Value	Value [mm]	Comment
NPK		☐	

Name	Value	Value [mm]	Comment
NP1	9.00	☐	Setup Row
NP2	10.00	☐	Setup Tub
NP3	9.00	☐	1x1-Cycle
NP4	11.00	☐	Loose Row
NP5	11.50	☐	Stitch front
NP6	9.50	☐	Tuck rear
NP7	9.50	☐	Tuck front
NP8	11.50	☐	Stitch rear
NP9	12.00	☐	Struc Single jersey front
NP11	7.90	☐	Setup Row front
NP17	12.00	☐	Safety rows
NP20	9.00	☐	Start 1
NP21	10.00	☐	Start 2
NP22	11.00	☐	Start 3
NP24	12.00	☐	Start 5
NP25	18.00	☐	Comb Thread

	Explanation	Value range
NPK	Correction for all stitch cams	Minimum value: -2 Maximum value: 2 Step width: 0.05
NP1 - NP100	Stitch cam position 1 to 100	
Value	Stitch length in **NP** values or **mm**	
Value [mm] ☐	Specification in **NP** values.	Minimum value: 6.5 Maximum value: 22.5 Step width: 0.05
Value [mm] ☑	Settings in millimeters. Setting the yarn length per stitch (Yarn Length Control).	Minimum value: 2.20 Maximum value: 33.00 Step width: 0.01
Comment	Comment	ASCII Characters

17.5 Setting: Carriage Speed

Within a knitting program there are different technical rows that carry out specific actions in the pattern. They determine, for example, the knitting, transferring, casting-off, yarn carrier clamping and much more. A speed value can be assigned to any desired row in the pattern, if necessary.

Adjusting carriage speed

Adjust the carriage speed (MSEC) in case of:

- Difficult program parts
- Tight transfer rows
- Delicate yarns (cashmere)

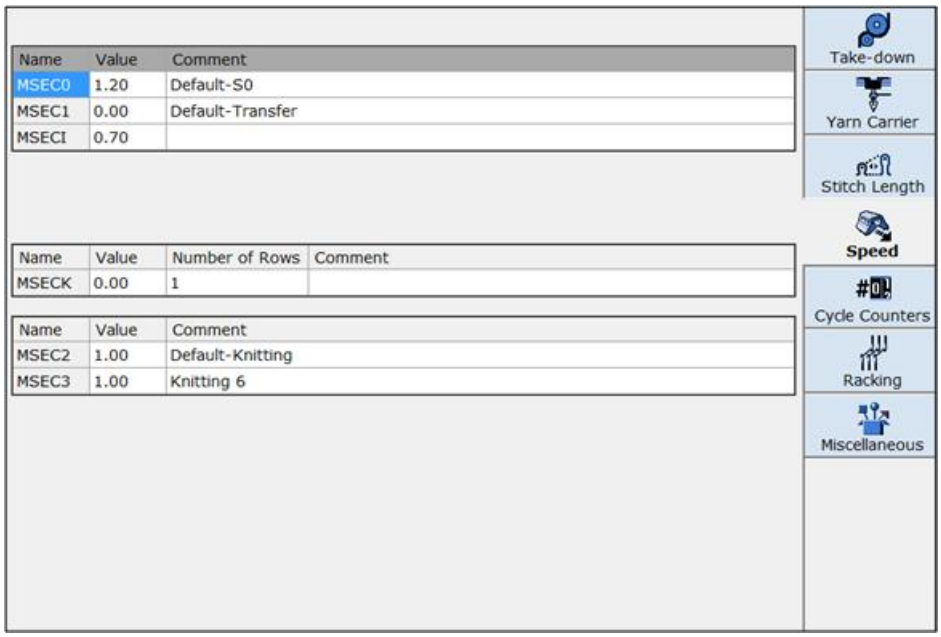
Carriage Speed Menu

1. Call up the "Carriage speed" menu with  in the Main menu.

- or -

➜ Call up the "Setup2 Editor" with the  key.

2. Tap an input field.
3. Enter values or a comment.



	Explanation	Value range (meters/second)
MSEC	Speed (normal speed)	Minimum value: 0.05 Maximum value: 1.20 Step width: 0.05
MSEC0	Speed for empty rows (**S0**)	Minimum value: 0.05 Maximum value: 1.40 Step width: 0.05
MSEC1	Speed for transfer rows	Minimum value: 0.05 Maximum value: 1.20 Step width: 0.05
MSECI	Speed with Intarsia Yarn Carrier (**CMS ADF-3**: Specification is not taken into account)	Minimum value: 0.05 Maximum value: 1.00 (**CMS-C: 0.7**) Step width: 0.05
MSECC	Speed outside the needle bed when the yarn carrier is brought in the clamp or taken out of the clamp.	Minimum value: 0.05 Maximum value: 0.50 Step width: 0.05
MSECK	Carriage speed for small knots over m rows, default: 1 row	Minimum value: 0.05 Maximum value: 1.20 Step width: 0.05
MSEC2-20	Speed for knitting rows	Minimum value: 0.05 Maximum value: 1.20 Step width: 0.05
Comment	Comment	**ASCII** characters

17.6 Setting: Fabric Take-down

The fabric take-down pulls the knitwear continuously towards the fabric container Through the take-down, the fabric gets stability. During the stitch formation process or transfer, the stitch loops are hold reliably in the needle hook.

Adjusting fabric take-down

The take-down value depends on:

- Fabric width
- the knitting mode
- the yarn in use

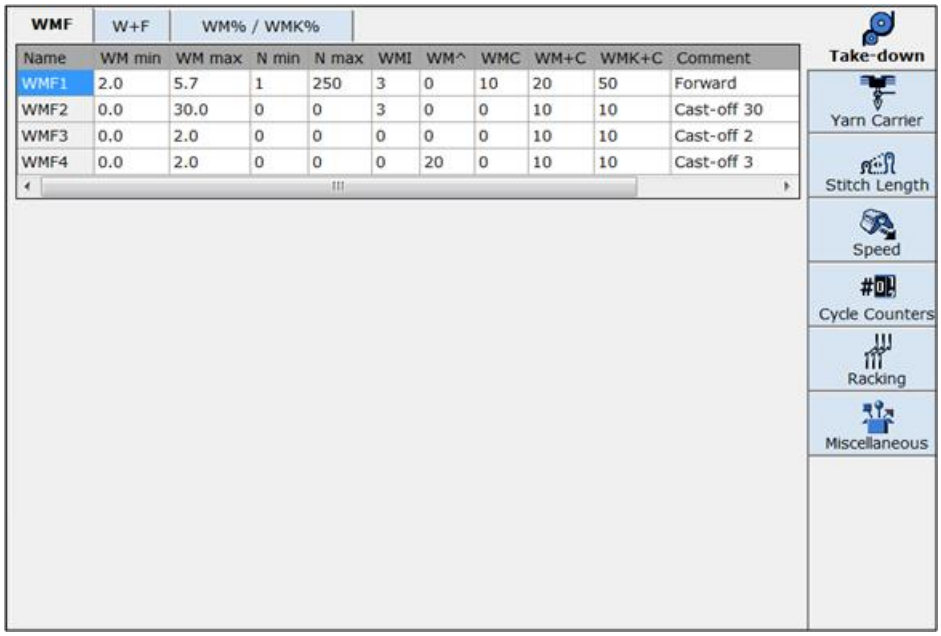
- the stitch length

Open the Fabric Take-down Table

Call up the "Setup2 Editor" with the  key.

1. Tap the "Take-down" key.
2. Tap an input field.
3. Enter values or a comment.
4. Confirm entries with  .

Tab: WMF



	Explanation	Value range
WMF…	Fabric take-down function	**WMF1**to**WMF50**
WM min	Minimum fabric take-down value (with Fully Fashion)	Minimum value: 0 Maximum value: 31.5 Step width: 0.1
WM max	Maximum fabric take-down value (value must always be specified)	Minimum value: 0 Maximum value: 31.5 Step width: 0.1
N min	Minimum quantity of needles (with Fully Fashion)	Minimum value: 0 Maximum value: Needle number of the CMS Step width: 1
N max	Maximum quantity of needles (with Fully Fashion)	Minimum value: 0 Maximum value: Needle number of the CMS Step width: 1
WMI	Fabric take-down impulse	Minimum value: 0 Maximum value: 15 Step width: 1

	Explanation	Value range
WM^	Open the brake of the active take-down system (main take-down or comb take-down) for a maximum of 2.5 seconds, take-down roller or comb take-down turn back by a maximum number of the indicated degrees (depending on the fabric tension and the fabric take-down value). CMS 5xx, 7xx, 8xx, CMS ADF-3: 9-60 degrees CMS 9xx: 9-120 degrees If either of both the conditions is fulfilled, then the brake is closed again. Fabric take-down value (n=0-31.5) becomes active again at the reversion.	No turning back: 0 Minimum value: 9 Maximum value: 120 Step width: 1
WMC	Set the speed control of the active take-down system (main take-down or comb take-down) to the value n (0-32). If the take-down system turns too quickly, the machine is stopped. 0= no stop motion, 1= insensitive, 32= very sensitive	Minimum value: 0 Maximum value: 32 Step width: 1
WM+C	Monitoring of main take-down. If the take-down has not been used after n (0-100) knitting rows, the machine will stop. (0 = no supervision)	Minimum value: 0 Maximum value: 100 Step width: 1
WMK+C	Monitoring of comb. If the comb has not moved after n (0-100) knitting rows, the machine will stop. (0 = no supervision)	Minimum value: 0 Maximum value: 100 Step width: 1
Comment	Comment	**ASCII** characters

Tab: W+F

		Explanation	Value range
W+F...		Auxiliary Take-down function	**W+F1** - **W+F50**
W+F On	☑	Switch on auxiliary take-down. The auxiliary take-down will be closed. The speed of the auxiliary take-down **W+=n** is active	
	☐	Switch off the auxiliary take-down. The auxiliary take-down will be opened.	
W+=		Input of the speed of the auxiliary take-down Turning value n (1-15)	Minimum value: 1 Maximum value: 15 Step width: 1
W+P		Contact pressure n (0-10), only for machines with 72 to 96 inch working width	Minimum value: 0 Maximum value: 10 Step width: 1
W+C		Monitoring of auxiliary take-down. If the auxiliary take-down has not been used after n (0-100) knitting rows, the machine will stop. (0 = no supervision)	Minimum value: 0 Maximum value: 100 Step width: 1
Comment		Comment	**ASCII** characters

Tab: WM% - WMK%

	Explanation	Value range	
WM%	Modify the fabric take-down value by **n** percent	-80 to 80	
WMK%	Changing the fabric take-down value by **n** percent while the comb take-down is working. The value is active till the fabric is taken down by the main take-down.	-80 to 80	
Comment	Comment		**ASCII** characters
			All characters and numbers (**UTF-8**)

17.6.1 Additional Setting: Main Take-down, Auxiliary Take-down and Comb

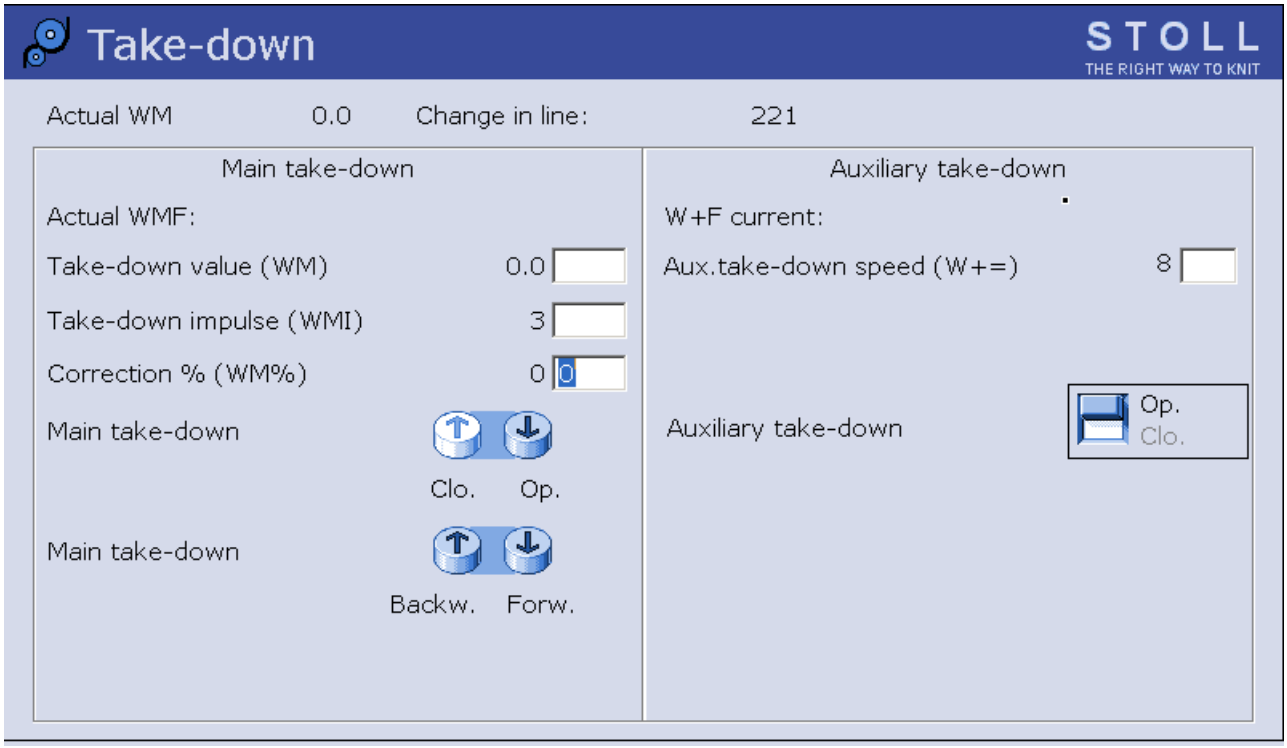
It may be necessary to do some of the following additional settings when setting up the knitting program or during production:

- Behavior of the main take-down or auxiliary take-down

- Control of the main take-down or of the auxiliary take-down
- Comb functions

Fabric Take-down menu

1. Call up the "Take-down" window via the  key in the Main menu.

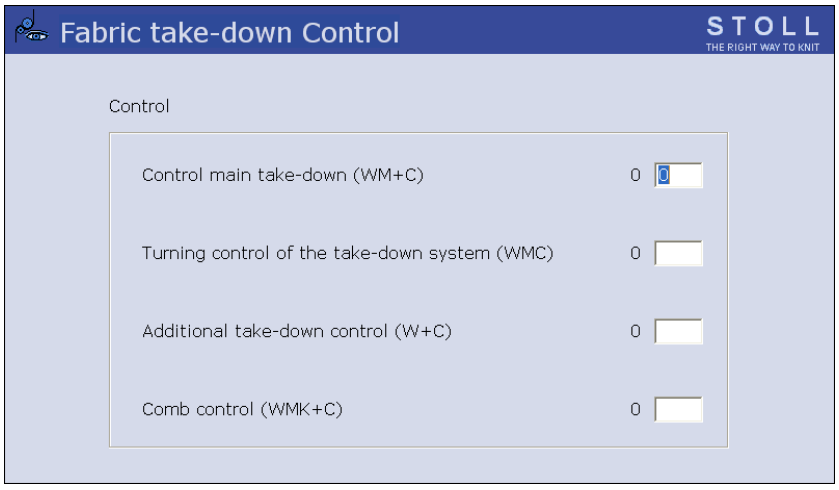


2. Tap the corresponding key in order to operate the main take-down or auxiliary take-down manually.

Fabric take-down Control

During production, the control of knitting machine compares the current values with threshold values. If a threshold value is exceeded, the knitting machine stops and displays an error message.

1. Tap the  key in the "Fabric take-down" menu.
2. Call up "Fabric take-down Control" menu with the  key.



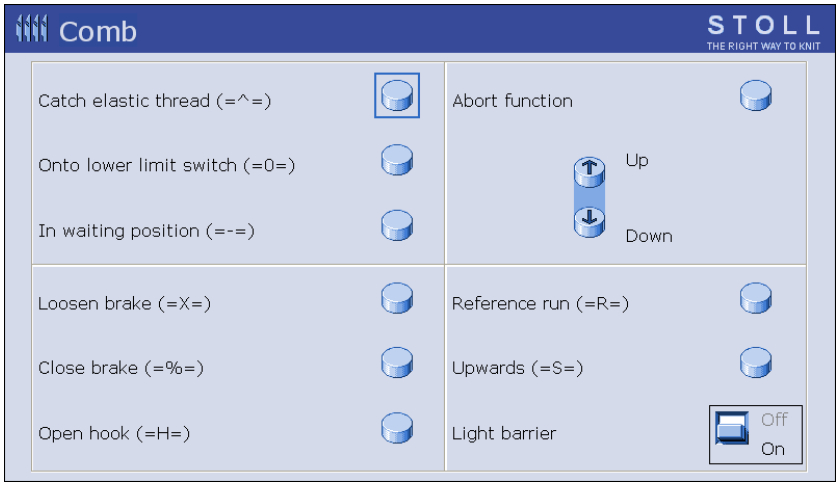
3. Enter a threshold value into the entry field.

4. Confirm input.

Comb menu

An interruption of production can require different comb functions.

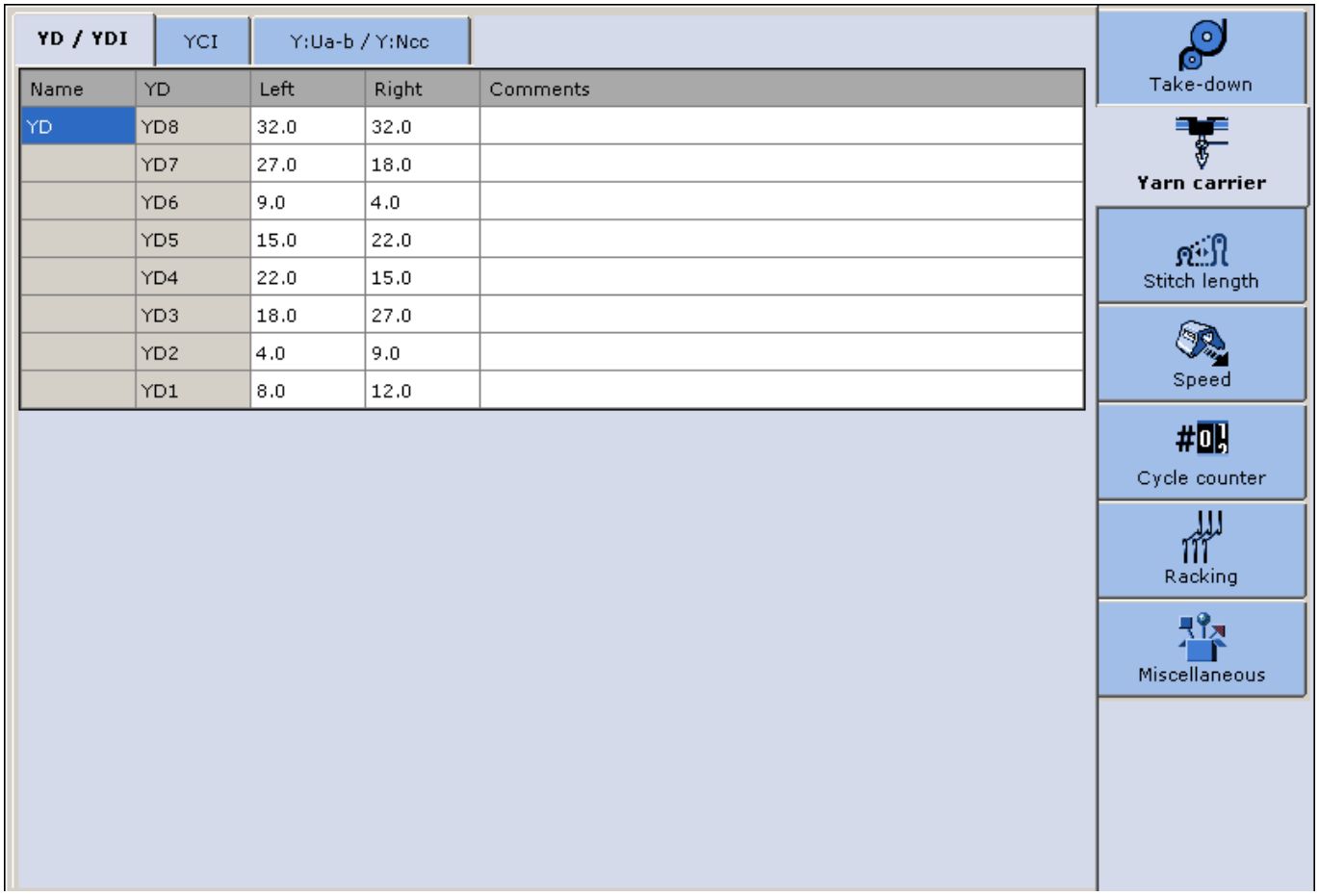
1. Call up the "Comb" menu with the  key of the Main menu.



2. Activate the desired function with the corresponding key.

17.7 Setting: Distance of the yarn carrier at the fabric selvedge

I. Modify the yarn carrier distance (YD):



	Explanation	Value range
YD	Distance between yarn carriers and fabric selvedge Collapse (reduced display) Expand (expanded display)	
YD1 : **YD8**	Distance of the yarn carriers on track 1 to 8 from the left and right fabric selvedge **CMS ADF: YD1…YD16**, track 1 to track 16	Minimum value: 0 Maximum value: 160 Step width: 0.5=1/32 inch=0.8 mm
YDI	Additional, indirect yarn carrier staggering (YDI1 to YDI20) Collapse (reduced display) Expand (expanded display)	Minimum value: 0 Maximum value: 160 Step width: 0.5=1/32 inch=0.8 mm
Comment	Comment	**ASCII** characters

1. Call up the "Setup2 Editor" with the  key.
2. Tap the "Yarn carrier" key.
   ⇨ The "Yarn carrier" appears with its three tabs.
3. Open the "YD / YDI" tab.
   ⇨ The yarn carrier staggering **YD** used in the pattern and all the additional yarn carrier staggerings **YDI** will be displayed.
4. Make changes in the **YD** table.
5. Quit the "Setup2 Editor" with the  key.

⇨ Modified values will be saved to the **setx**-file.

6. Start the machine with the engaging rod.

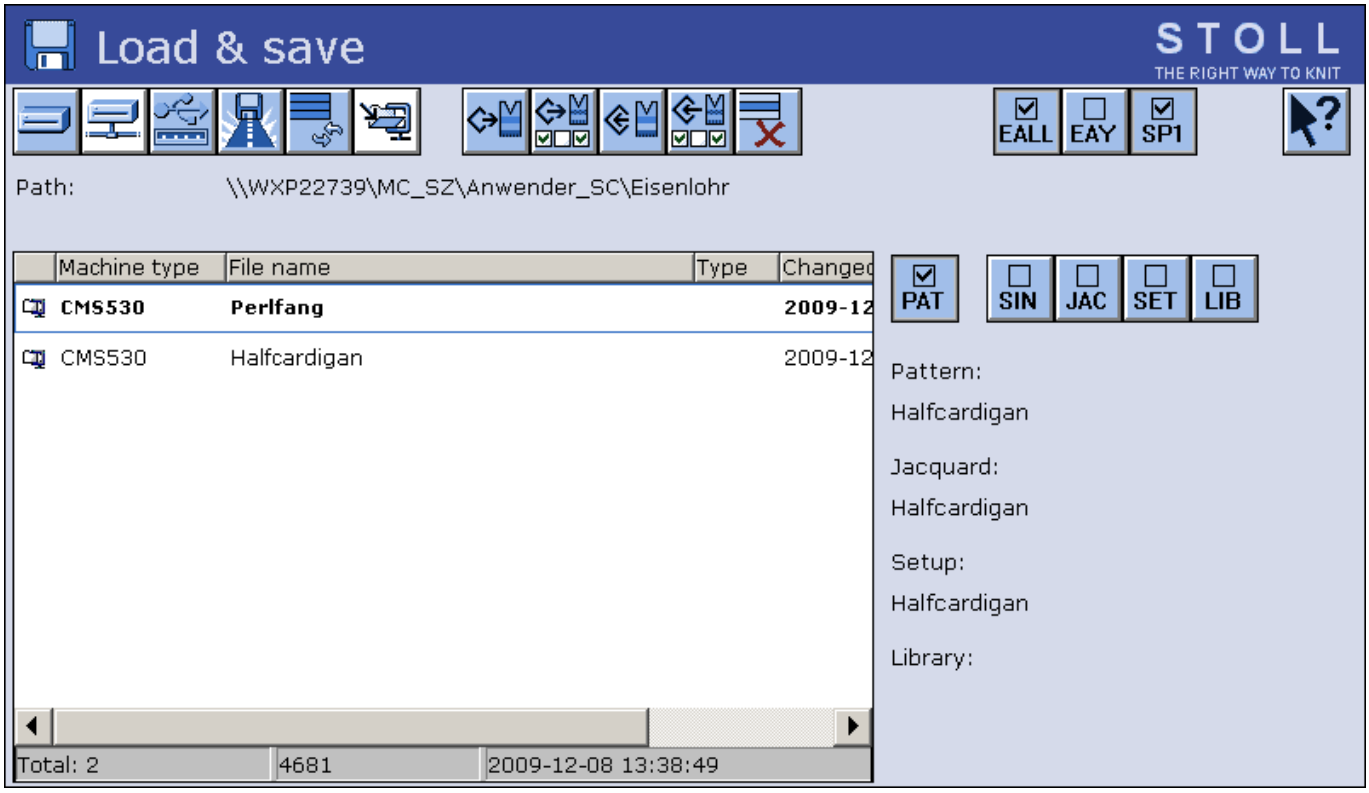
⇨ The changes will be carried out with the next use of the yarn carrier.

17.8 Save Pattern

Save

1. Tap the  key in the "Main Menu".

⇨ The window "Load & save" is displayed.



2. Select the desired folder (direct selection folder).
3. Select the  key for example.
4. Select the file to be saved:

- Entire pattern "PAT"
- Sintral file "SIN"
- Jacquard file "JAC"
- Setup file "SET"
- Library "LIB"

5. Tap the  key.
Pattern with Setup data
6. Rename the pattern if necessary
7. Confirm input with  .

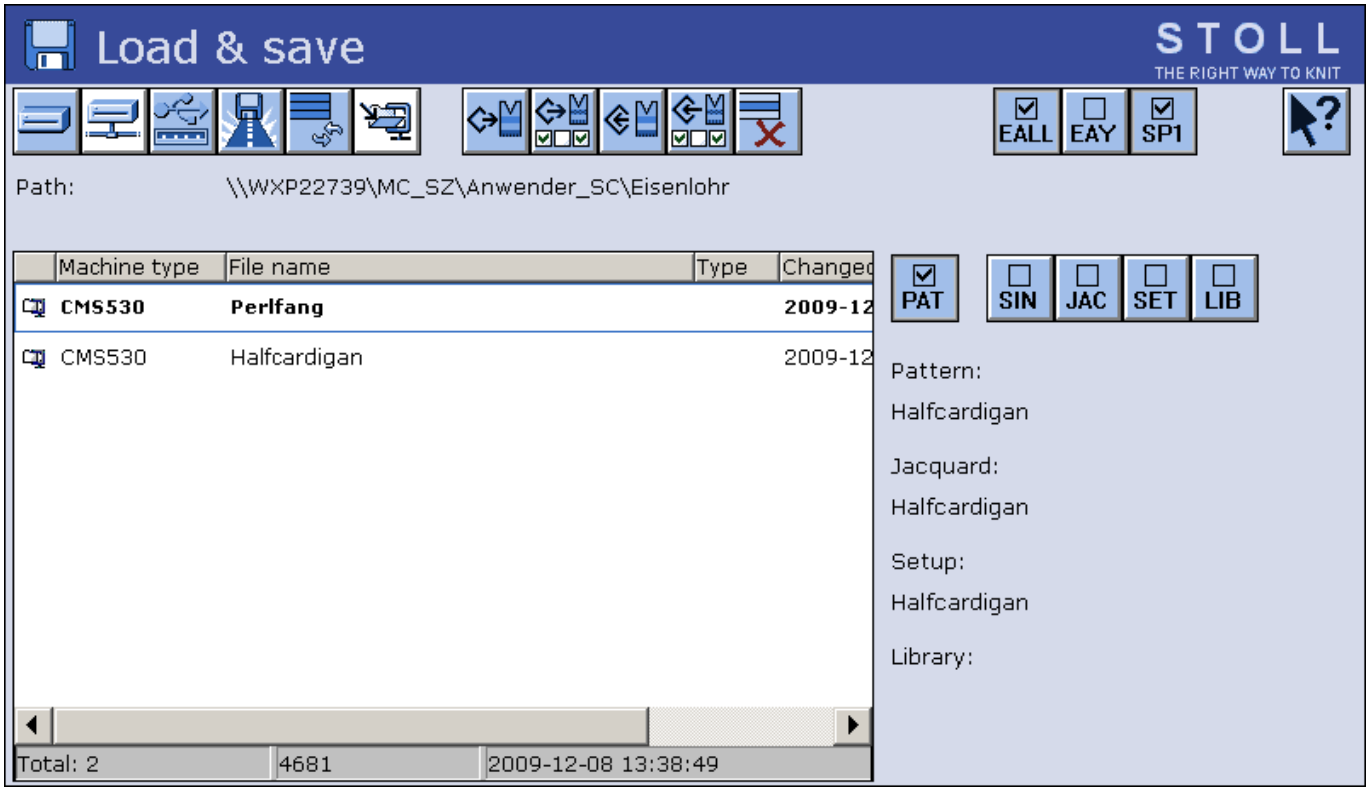
⇨ The pattern will be saved to the selected pattern folder.

You can save the pattern with the selected setup data (for Setup2 only) with  .
You can select the desired Setup data in the following window.

18 Clearing the Main Memory of the Machine

I. Clear the main memory completely:

1. Tap the  key in the "Main Menu".
   ⇨ The window "Load & save" is displayed.



2. Tap the  key.
   ⇨ The keys of the sub-menu appear.
3. Tap on the button  .
   ⇨ The main memory will be deleted.

II. Deleting individual files

- Sintral (**sin**)
- Jacquard (**jac**)
- Setup (**set** / **setx**)
- Library (**Autosintral**)

1. Tap the  key in the "Main Menu".
2. The window "Load & save" is displayed.
3. Select the file to be deleted:

- 

- 

- 

- 

4. Tap the  key.
   ⇨ The keys of the sub-menu appear.
5. Tap on the button  .
   ⇨ The selected program elements will be deleted from the main memory
6. Return to the Main menu.

19 Cycle counter RS17 with constant fabric width (without fully fashion)

With the help of the cycle counter **RS17** the work with the comb and the related clamping and cutting is controlled at the machine.

Working with RS17

RS17	Function
RS17 = 0	Comb and clamping / cutting activated
RS17 = 1	Comb and clamping / cutting deactivated

After loading a pattern in the machine memory, the cycle counter is set to **RS17=0**.

Production with RS17

- Via the Sintral command **RS17=1 IF #100=1 RS17=0**, the activation / deactivation of the comb function is coupled to the piece counter.
- The use of the comb and the clamping / cutting are therefore automatically regulated within the production.

Cancellation of the production with RS17

In case patterns need to be restarted based on machine problems (e.g. yarn breakage) or for other reasons it must be ensured that with SP the RS17 is set to RS17=0!!!

Behavior of the piece counter when using RS17

If piece counter: ST=1

1. For the one fabric piece, the comb and the clamping / cutting are active.
2. All yarn carriers are taken out of the clamp before the start and knitted-in.
3. The fabric is cast-off at the end via a cast-off function in the Sintral.

If piece counter: ST>1

I. First fabric:

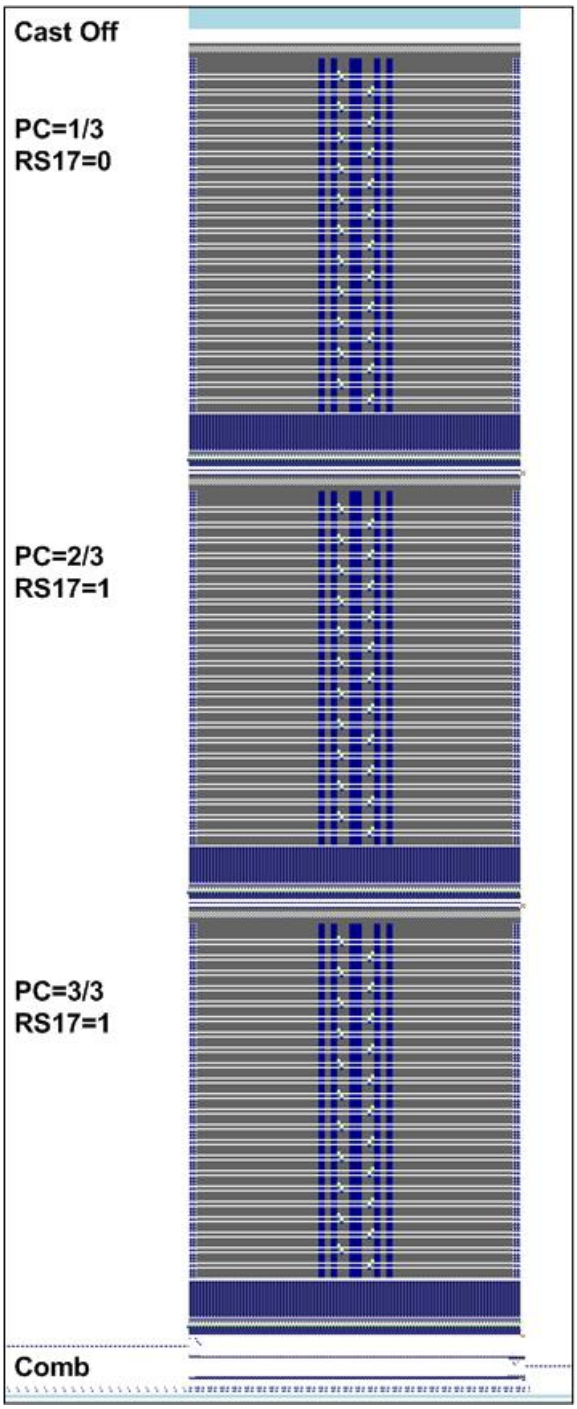
1. The first piece works with **Comb** since RS17=0 is set.
2. All yarn carriers are taken out of the clamp before the start and knitted-in.
3. The **Comb thread** is clamped after knitting, since it is **only** needed **for the first piece**.
4. All other yarn carriers are positioned at the fabric selvedge for the following pieces.
5. At the fabric end the RS17 is set to 1 with the Sintral command **RS17=1 IF #100=1 RS17=0**, as the piece counter is >1. This way **no cast-off is carried out at the fabric end**.

II. The following fabric pieces:

1. All the following fabrics are processed without comb and clamping / cutting.
2. No cast-off is carried out at the end of these fabrics.
3. The pieces are connected by knitting-in a draw thread. (Transition)

III. Last fabric piece of the piece counter:

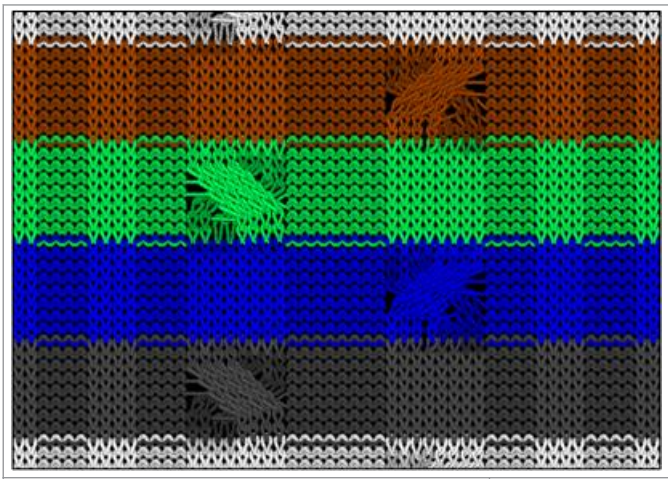
1. The last fabric piece is processed without comb and clamping / cutting.
2. At the end of the last piece, the piece counter is checked by the Sintral command **RS17=1 IF #100=1 RS17=0** and this way is set **RS17 = 0**.
3. With RS17 = 0 the yarn carriers are brought into the clamps and then the fabric piece is cast-off.



Result

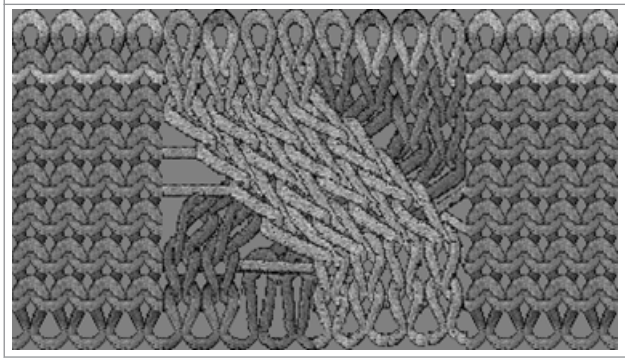
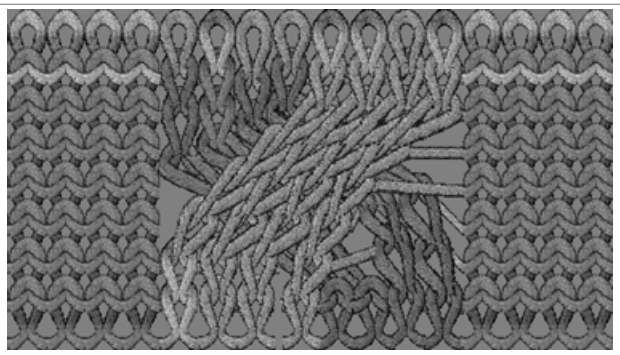
The fabric pieces are knitted together separated by the draw thread instead of casting-off after each single piece.
The working procedure is recommended for fabric pieces with reduced height, e.g. collars and other small pieces.

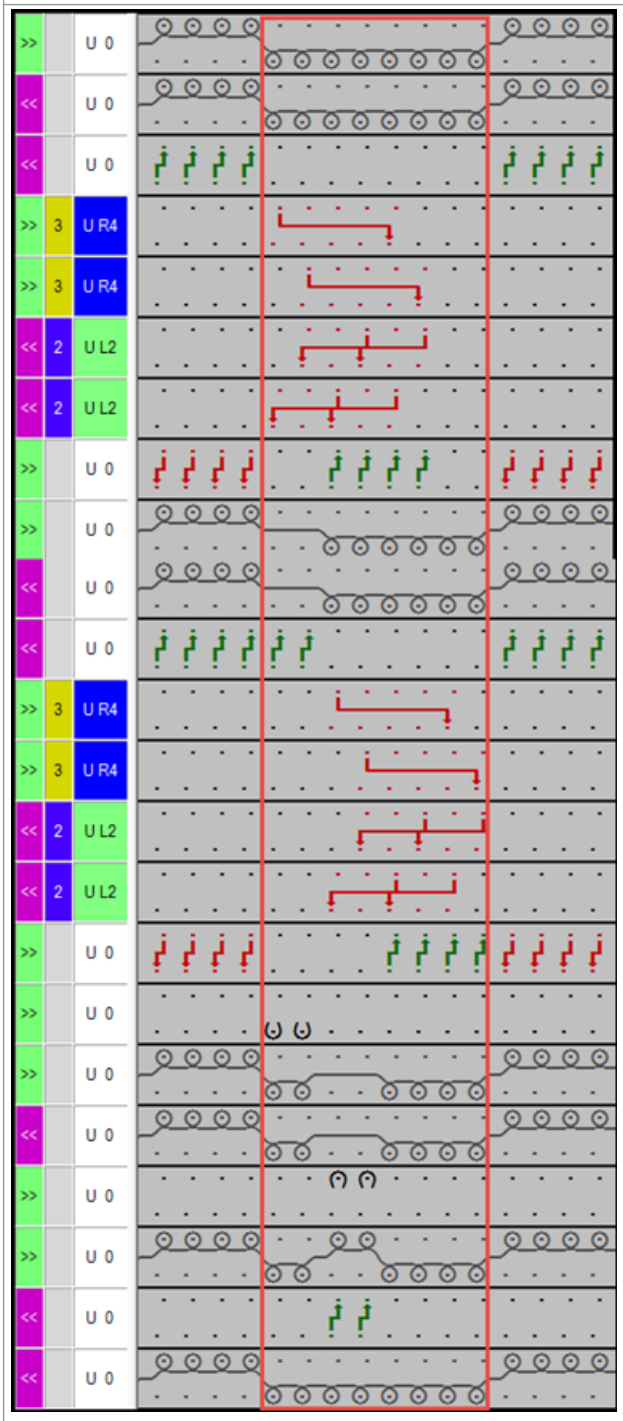
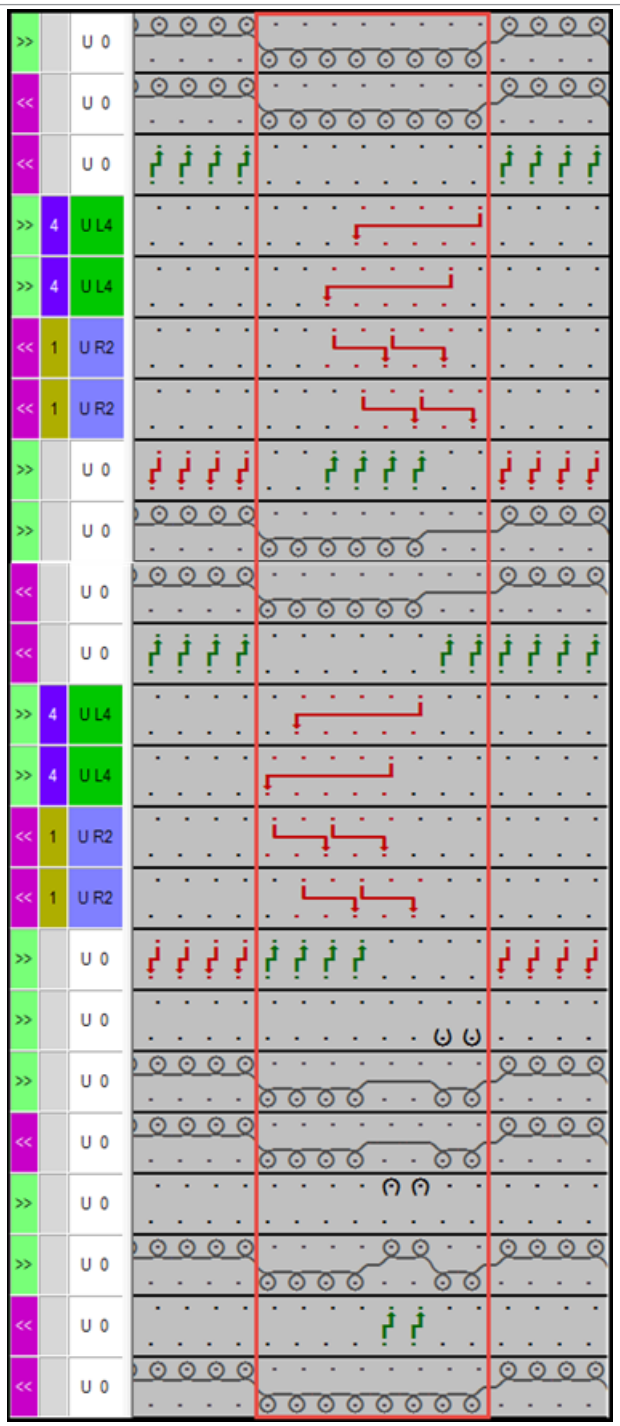
20 Pattern 2: Cable_4x4



Pattern name	Cable_4x4
Start	1X1 Rib
Machine Type	CMS 530 HP 5“ with E 7.2 CMS 530 HP 6“ with E 3,5.2 CMS ADF 32 W with E 7.2
Operating mode of the machine	◆ **Use of RS17** – First fabric piece with comb function and clamping / cutting – Following fabric pieces without comb function and clamping / cutting – Last fabric piece with piece counter =0 is cast-off ◆ With Sintral command **RS17=1 IF #100=1 RS17=0**
Pattern description	◆ 4x4_cable crossed over to the left and to the right ◆ with rib structure ◆ different colors as stripes
Pattern Parameters	◆ Stitch Length **(NP)** ◆ Cycle Counters **(RS)** ◆ Fabric Take-down **(WMF, WM^)** ◆ Yarn Carriers **(YDopt)** ◆ Racking Correction **(VCI)**

Fabric view and stitch line of the cable cross-over 4x4:

Cable cross-over 4x4 <	Cable cross-over 4x4 >
	

Cable cross-over 4x4 <	Cable cross-over 4x4 >
	

: The stitches on the left and on the right next to the cable are called 'environment'. If these stitches are on the rear needle bed (=reverse jersey stitches), they are transferred to the front before the cable cross-over (transfer environment).

Racking Correction

The racking specifications existing in the cable cross-overs have racking indices (VCI). In case of large racking courses this is necessary to increase the running reliability.

20.1 Operating Mode of the Machine and Knitting Program

Operating mode of the machine

- **Operating mode without using the comb and production with RS17:**
  The knitting program (Sintral, Jacquard, Setup2) is structured in such a way that the working mode of the machine can be influenced via the cycle counter RS17.
- Sintral command **RS17=1 IF #100=1 RS17=0** necessary in the Sintral program
- Value specification for the piece counter

There must **not** be a fabric in the needle bed or main take-down.
All fabric pieces are knitted consecutively, separated by a draw thread.

20.2 Load and Set-up the Pattern

Procedure:

1. **Load pattern into the machine.**
2. **Set up the pattern:**
   - Threading up the Yarn Carriers
   - Position the yarn carriers at the clamping point
   - Check the knitting area and the fabric collection chamber
3. **Start the machine.**

Make the following changes:

- Cycle Counters **(RS)**
- Stitch Length **(NP)**
- Fabric take-down values **(WMF,WM^)**
- Racking corrections **(VCI)**

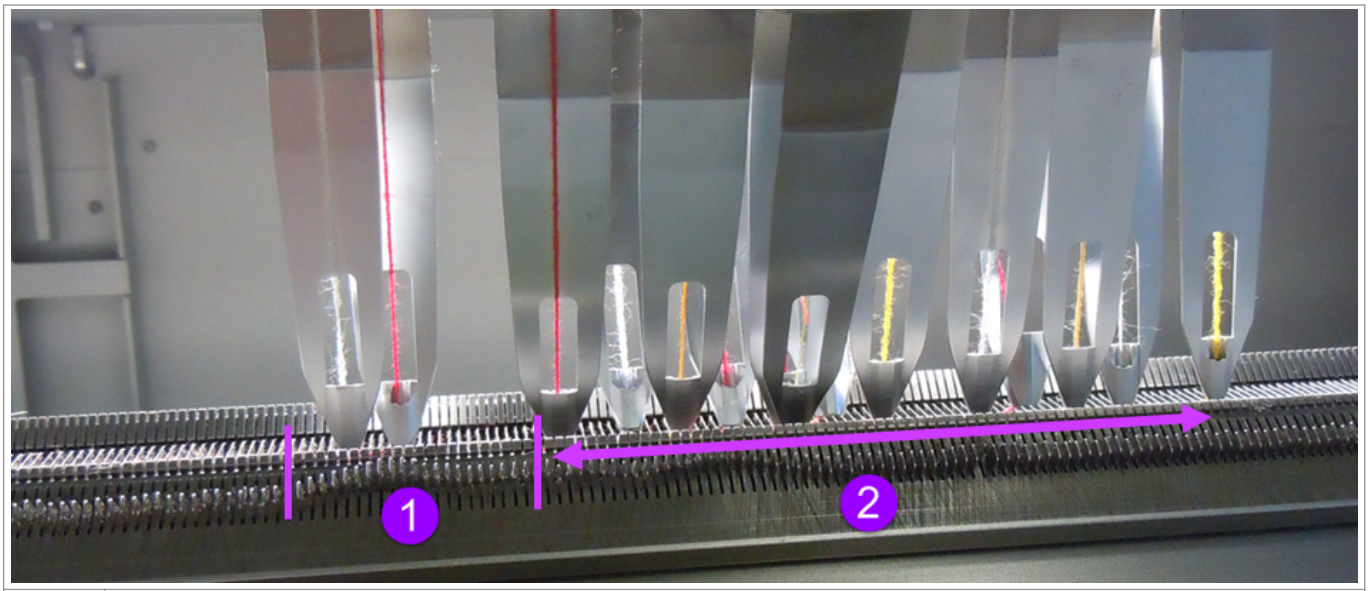
20.3 Optimized yarn carrier home position YDopt

YDopt:

Using **YDopt** when programming, the distances between the yarn carriers and the fabric selvedge are automatically optimized.

Especially appropriate for patterns with a high use of yarn carriers, for ex. stripe patterns.

Functioning principle:

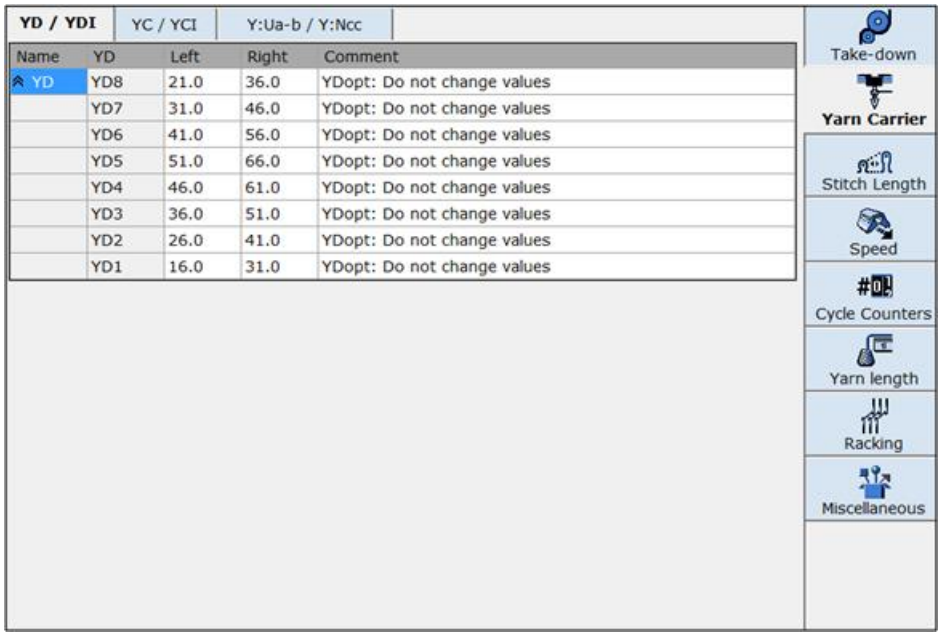


1	Parking area for the yarn carriers that are knitting in the pattern row i: The yarn carriers are positioned staggered
2	Parking position (waiting area) for the momentarily non knitting yarn carriers i: The yarn carriers are positioned staggered

1. The yarn carriers are positioned staggered with a **wide** distance (parking position) in relation to the fabric selvedge.
2. The required yarn carriers are taken out of the parking position and start knitting.
3. While knitting, the active yarn carrier receives a new parking position and will be positioned **much closer** to the fabric selvedge.
   The parking position is optimized **(YDopt).**
4. After the last knitting row, the active yarn carrier is returned to the parking position.
5. The following, knitting yarn carrier is taken out of the parking position and also positioned at the fabric selvedge with YDopt.

YDopt in Setup2

- The parking position YD of the yarn carriers is determined automatically.
  i: The specifications are in Sintral
- The values are predetermined and may not edited any longer at the machine.



With **YDopt**, the corresponding YD values of the yarn carriers may **not** be changed.

20.4 Racking Positions and Racking Commands

Racking Positions

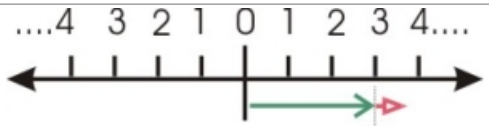
Designation	Symbol	Position of the needle bed
V0	Normal Racking	
V#	Half Racking	
VU	Transfer Racking	

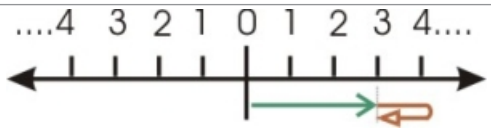
The maximum racking course of the rear needle bed covers 2 inch to left and 2 inch to the right starting from the home position 0.

Racking Functions

Command	Function
VCI n	n = 1 – 50 racking functions available. ◆ One function is used for each racking in use. ◆ The function has all commands to control the racking.

General Commands for Racking

Commands	Designation / Min./max. values	Movement of the needle bed:
Racking Correction ◆ **VKn > m** ◆ **VKn < m**	**n** = A – Z **<** = to the left **>** = to the right **m** = 1-10	
	m = 0	Racking correction is turned off
	m = ?	Machine stops at the given racking position in order to check the racking position and correct it if necessary.

Commands	Designation / Min./max. values	Movement of the needle bed:
Overracking ◆ V+ n ◆ V- n	n = 1 - 24	
Racking speed ◆ VV = n	n = 1-32	Default setting: VV=32 (highest speed)

Notice:

- The racking commands are maintained for one carriage stroke.
- Additional racking commands are used for machines with additional beds.

20.5 Settings for racking

The racking correction optimizes the transfer process and improves the running reliability with patterns with racking technique. A racking correction influences the position of the rear needle bed regarding the front needle bed during the transfer.

Possible corrections:

- Racking Correction (**VKn**)
- Racking Speed (**VV**)
- Overracking (**V+**)

Racking Functions VCI

All Sintral commands regarding the racking are managed by functions. For each racking position, a racking function **VCIn** is stored with index.

Input of changes for racking:

▷ Machine is running till the automatic stop (**?** Sintral command).

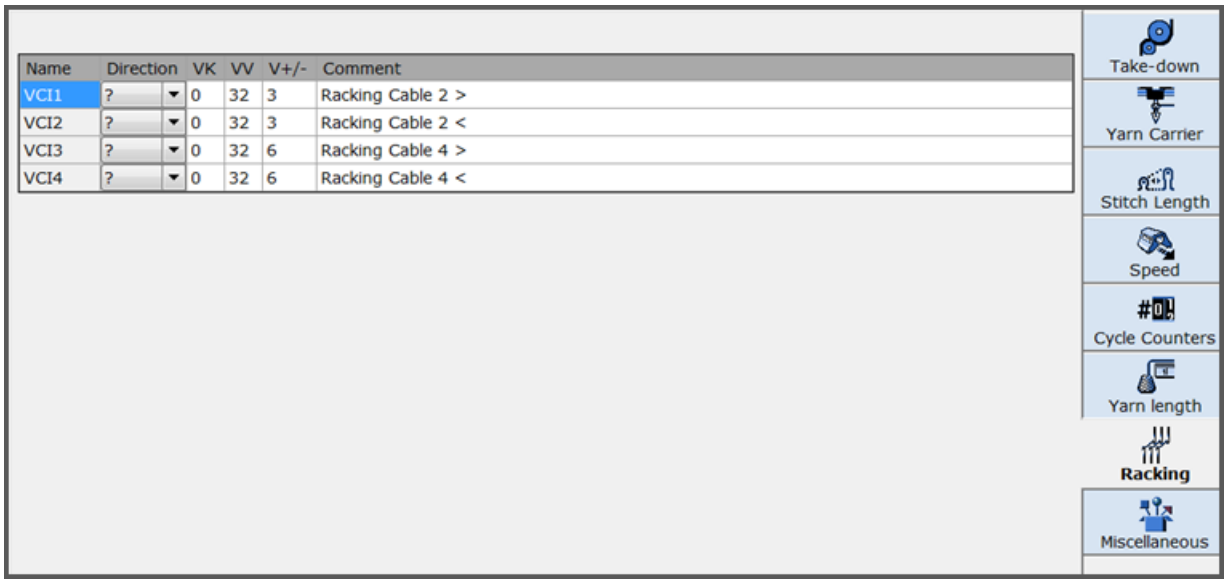
▷ Machine is manually stopped at the racking position you want to check.

1. Call up the "Racking correction" window from the Main menu with  .

- or -

→ Call up the "Setup2 Editor" with the  key.

2. Tap the "Racking" key.



3. Tap in the input field to be changed.
4. Enter values or a comment.

- Command **VKn<?** or **VKn>?**:
  - Change the **?** symbol regarding a carriage direction specification **<** or **>**.
  - Enter the necessary **VK** value.
- Command **VKn<0** or **VKn>0**:
  - Enter the necessary **VK** value.

Sintral command

A **VCIn** racking function is allocated to each racking direction existing in the cable cross-overs. With the help of the commands in the racking function, the corresponding racking position is influenced.

```
149 << S:<1-><A>A(5)-Y(6)/<1->U^ST;                Y:=C;          V0  Y-3A:F1A^0;  Y-3A:YD1.0-6.0;
150 >> S:<1-><A>A(5)-Y(6)/<1->0-%Z(9);                      Y:=C/0;        VU  Y-3A:YD1.0-1.0;
151 << S:<1-><A>A(5)-Y(6);                         Y:=C;          VU
152 >> S:<1-><A>A(5)-Y(6)/<1->%O(7)-0/<1->UXST-+;  Y:=C/0;
153 << S:<1->UVS+/<1->UVS+;                                       VR2 VCI1
154 >> S:<1->UVS+/<1->UVS+;                                       VL4 VCI4
155 << S:<1->U^ST/<1-><A>A(5)-Y(6);                 Y:=C;          V0
156 >> S:<1-><A>A(5)-Y(6)/<1->UXST-+;                     Y:=C;
157 << S:<1->UVS+/<1->UVS+;                                       VR2 VCI1
158 >> S:<1->UVS+/<1->UVS+;                                       VL4 VCI4
159 << S:<1->U^ST/<1-><A>A(5)-Y(6);                 Y:=C;          V0
160 >> S:<1-><A>A(5)-Y(6);                         Y:=C;          VU  Y-3A:YD1.0-46.0;
161 << S:<1-><E>A(5)-Y(6)/<1->U^ST;                 Y:=D;           Y-4A:F1E^0;  Y-4A:YD1.0-11.0;
162 >> S:<1-><E>A(5)-Y(6)/<1->0-%Z(9);                      Y:=D/0;        VU  Y-4A:YD1.0-1.0;
163 << S:<1-><E>A(5)-Y(6);                         Y:=D;          VU
164 >> S:<1-><E>A(5)-Y(6)/<1->%O(7)-0/<1->UXST-+;  Y:=D/0;
165 << S:<1->UVS+/<1->UVS+;                                       VL2 VCI2
166 >> S:<1->UVS+/<1->UVS+;                                       VR4 VCI3
167 << S:<1->U^ST/<1-><E>A(5)-Y(6);                 Y:=D;          V0
168 >> S:<1-><E>A(5)-Y(6)/<1->UXST-+;                     Y:=D;
169 << S:<1->UVS+/<1->UVS+;                                       VL2 VCI2
170 >> S:<1->UVS+/<1->UVS+;                                       VR4 VCI3
171 << S:<1->U^ST/<1-><E>A(5)-Y(6);                 Y:=D;          V0
172 REP*3
173 >> S:<1-><E>A(5)-Y(6);                         Y:=D;          VU
174 << S:<1-><E>A(5)-Y(6);                         Y:=D;          VU
175 REPEND
```

20.6 Save Pattern

Save the pattern from the machine:

1. Tap the  key in the "Main Menu".

⇨ The window "Load & save" is displayed.

2. Select the files to be saved:
3. Tap the  key.
   Pattern with Setup data
4. Rename the pattern if necessary
5. Confirm input with  .

   ⇨ The pattern will be saved to the selected pattern folder.

You can save the pattern with the selected setup data (for Setup2 only) with  .
You can select the desired Setup data in the following window.

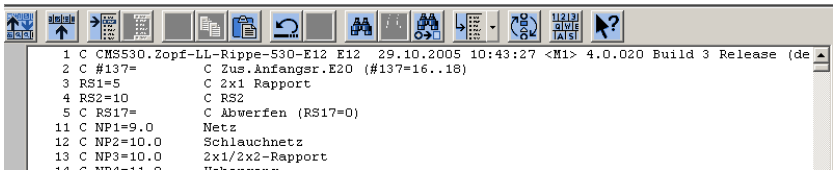
21 Working with the Sintral Editor

You can modify or complete the knitting program in the Sintral Editor.

Open the Sintral Editor:

1. Call up the "Sintral Editor" by  .

   ⇨ The "Sintral Editor" is displayed with its first level of keys.



During production you can view the knitting program only.

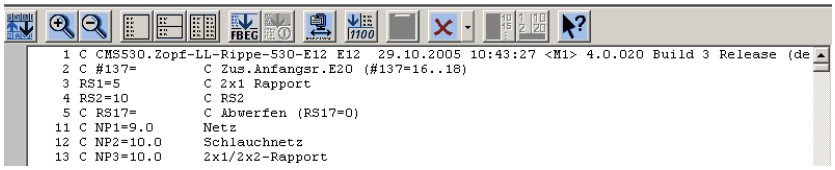
21.1 Keys of the First Level of the Sintral Editor

Keys of the first level of the Sintral Editor:

	Designation	Function
	"Switch toolbar"	Switch over toolbar to second level
	"Mask jump"	Toggle in the toolbar for Go to mask
	"Start of marking"	Start of selection: Set the beginning of a marking. Any existing selection will be deleted
	"End of marking"	End of selection: Set the end of a selection
	"Cut"	Cut selected area
	"Copy"	Copy selected area
	"Paste"	Paste copied or cut area
	"Undo"	Multi-level Undo
	"Redo"	Multi-level Redo
	"Search"	Search a certain term
	"Find next"	Continue to find a certain term
	"Replace"	Find a term and replace it with a new term
	"Jump"	Go to a certain position
	"Go to submenu"	Open the submenu for Go to
	"Go directly to"	Quick jump to the corresponding mark (e.g. from FBEG to FEND)
	"Keyboard"	Toggle off/on the keyboard
	"Direct Help"	Call up direct help for the key pressed next.

21.2 Keys of the Second Level of the Sintral Editor

The second level is called up by the  key.



Keys of the second level of the Sintral Editor:

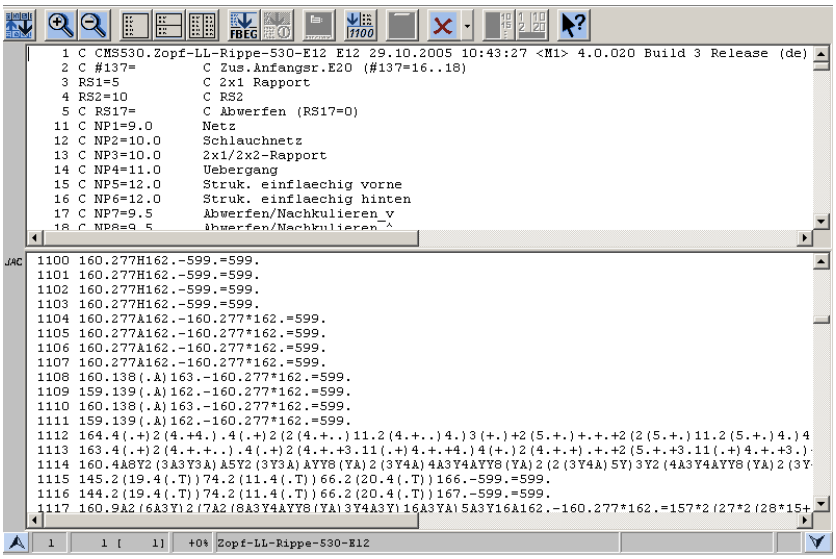
Key	Designation	Function
	"Switch toolbar"	Switch over toolbar to first level
	"Enlarge"	Display text enlarged
	"Reduce"	Display the text decreased
	"Remove window divisions"	Cancel tile (horizontal or vertical)
	"Tile window horizontally"	Split display horizontally
	"Tile window vertically"	Tile display vertical
	"Function list"	Toggle on/off the display of pattern functions.
	"Error messages on/off"	Toggle off/on the Sintral error messages
	"Pack and unpack jacquard"	Pack/unpack selected jacquard lines
	"Set start of jacquard"	Set start of jacquard on current line
	"Auto-Sintral"	Switch between current pattern and Auto-Sintral
	"Delete all"	delete the complete pattern
	"Submenu for Delete"	Open the submenu for Delete
	"Sort"	Sort the selected area ascending by line numbers
	"Renumber"	Reissue line numbers in the selected area
	"Direct Help"	Call up direct help for the key pressed next.

21.3 Changes within the Sintral:

Edit the Sintral:

▷ Machine is not running

1. Call up the "Sintral Editor" with the  key.



2. Tap the  key of the toolbar.

   ⇨ The virtual keyboard is displayed.

3. Make changes.

   ⇨ A prompt appears:
   "Memory protection: Should the pattern really be modified?"

4. Confirm the prompt with "Yes".

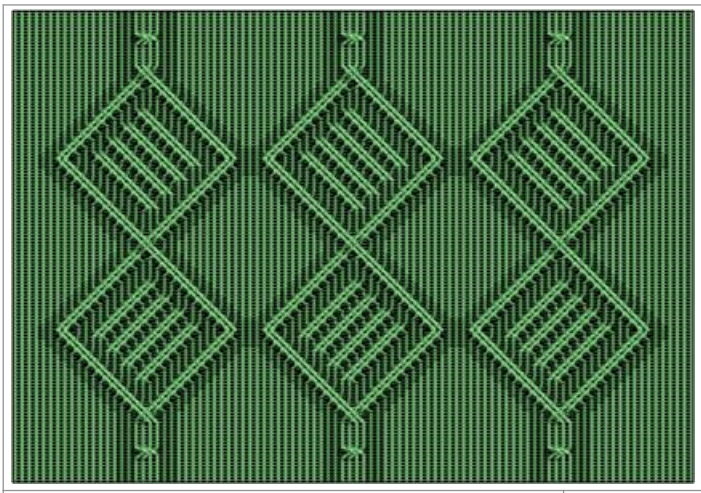
5. Confirm entry with  of the keyboard.

   ⇨ Modifications of the program will be saved to the pattern memory.

If you want to archive the modifications you have the save the them afterwards.

---

22 Pattern 3: 1x1 technique



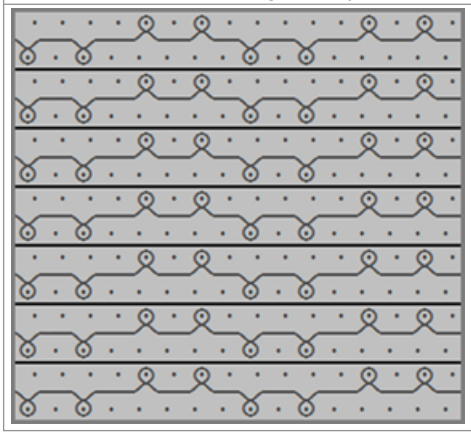
Pattern name	1x1-Technique
Start	MG-1x1-rib
Machine Type	CMS 530 HP 5“ with E 7.2 CMS 530 HP 6“ with E 3,5.2 CMS ADF 32 W with E 7.2
Operating mode of the machine	◆ with comb function ◆ with clamping / cutting
Pattern description	◆ Structure consisting of Front / rear stitch in 1x1 technique ◆ 1x1_Aran 2x1 ◆ 1x1_Cable 2x2
Pattern Parameters	◆ Stitch Length **(NP)** ◆ Cycle Counters **(RS)** ◆ Fabric Take-down **(WMF,WM^)** ◆ Racking Correction **(VCI)**

22.1 1x1 Knitting Technique

Stitch line with 1x1 knitting technique

- First needle knitted and the 2nd needle is a non-knitting needle (=floats).

Stitch line of the 1x1 knitting technique

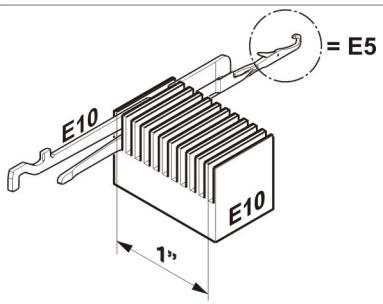


This knitting technique can be implemented on all machine types. Based on the quality (fabric appearance), however, we recommend using a machine with the **Multi Gauge** gauges.

Machine types with multi gauge

Gauge specification multi gauge

The gauges are specified with **E xx.2**.

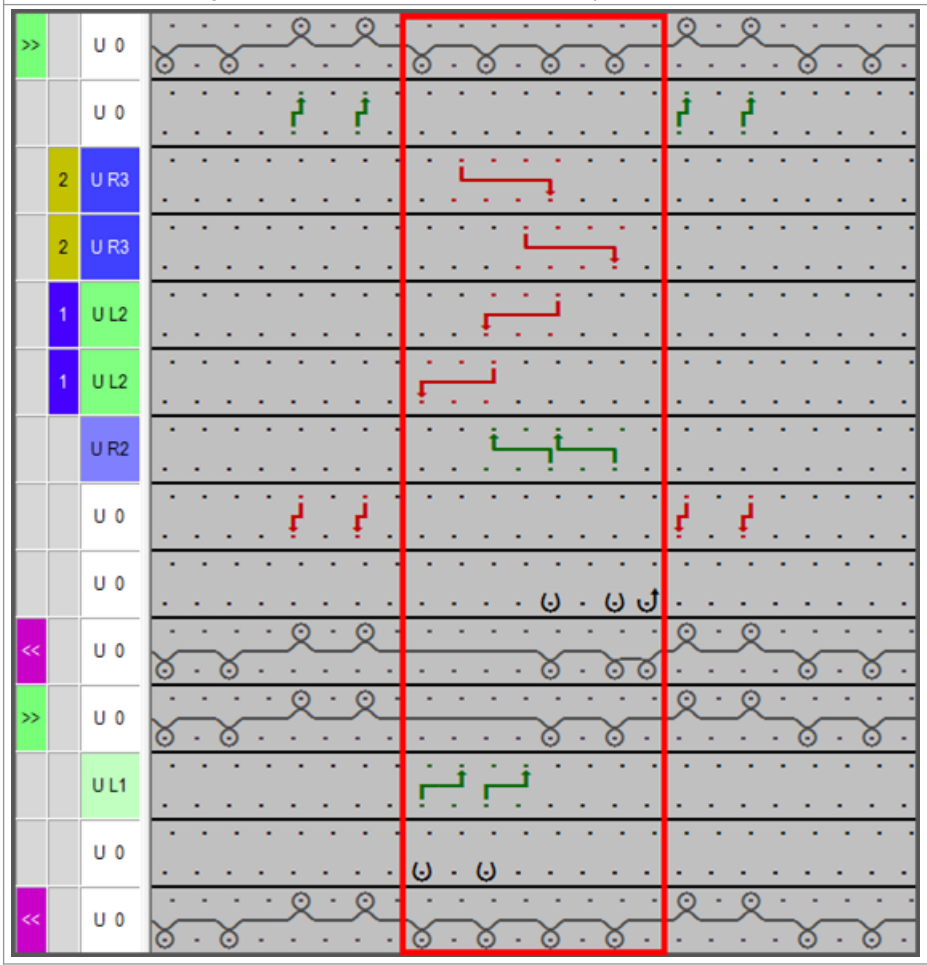
Multi gauge gauges	**Coarse gauges:** ◆ E 1,5.2 ◆ E 2,5.2 ◆ E 3,5.2 ◆ E 5.2	**Fine gauges:** ◆ E 6.2 ◆ E 7.2 ◆ E 8.2 ◆ E 9.2
Example E 5.2		Needle bed gauge = E 10 Needle hook gauge = about E 5

Advantages	◆ Flexible production ◆ Several gauges can be implemented on one machine  – Fine fabrics are knit with fine yarn on all needles – Coarse fabrics are knit with coarse yarn in 1x1 technique i: The yarn thickness can be adapted by the number of yarns.
Characteristics of the machine	◆ Larger needle bed gap between the needle beds ◆ Adapted, larger needle hook ◆ Adapted holding-down jack control

Racking with patterns in 1x1 technique

i	When knitting structures with racking in 1x1 technique, the racking courses are doubled. This requires changing the transfer sequences to improve the running reliability.

Stitch line and racking courses with a 2x2 cable in 1x1 technique



22.2 Load and Set-up the Pattern

Procedure:

1. **Load pattern into the machine.**
2. **Set up the pattern:**
   - Threading up the Yarn Carriers
   - Position the yarn carriers at the clamping point
   - Check the knitting area and the fabric collection chamber
3. **Start the machine.**

Make the following changes:

- Cycle Counters **(RS)**
- Stitch Length **(NP)**
- Fabric take-down values **(WMF,WM^)**
- Machine Speed **(MSEC)**

22.3 Save Pattern

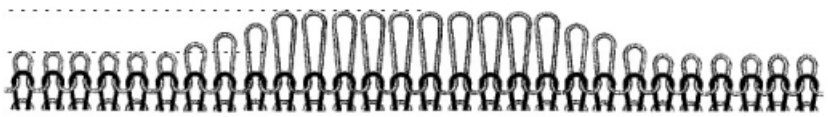
Save the pattern from the machine:

1. Tap the  key in the "Main Menu".
   ⇨ The window "Load & save" is displayed.
2. Select the files to be saved:
3. Tap the  key.
   Pattern with Setup data
4. Rename the pattern if necessary
5. Confirm input with  .
   ⇨ The pattern will be saved to the selected pattern folder.

You can save the pattern with the selected setup data (for Setup2 only) with  .
You can select the desired Setup data in the following window.

23 Power Tension Setting - PTS

Working with **PTS** enables different stitch lengths (**NP** stitch tensions) in one knitting row. The stitch tension change is continuous (not needle exact) and depends on the machine gauge.



I. Areas of application:

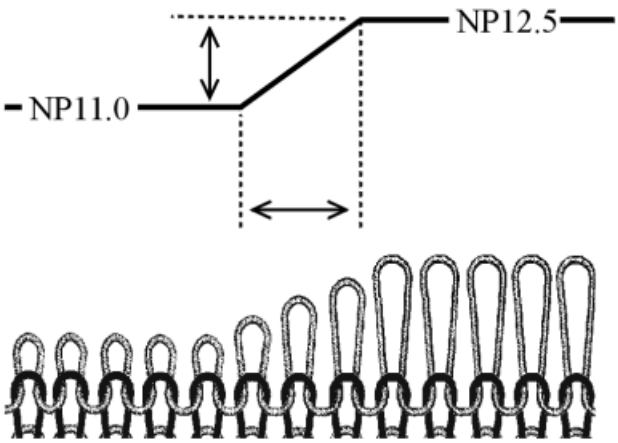
- Pattern with different knitting modes in one knitting row
- Fabric selvedge with fully fashion
- Intarsia pattern

II. Application of the NPJ command:

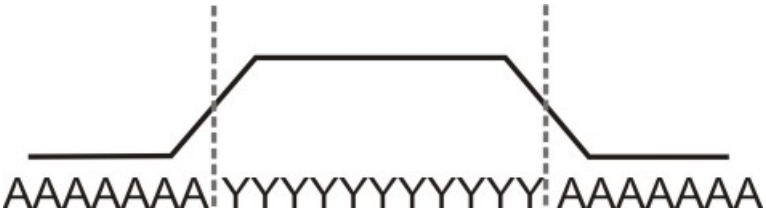
NPJ means **N**eedle sinker **P**osition **J**acquard

Command	Meaning
NPJ n	n = 1-8 Define up to 8 jacquards in order to control the stitch tension.
PANP	Pattern pack arrangement for the control of the stitch cams with **NPJ** Necessary if the jacquard for **NPJ** differs from the jacquard of the pattern.

You can influence the transition of the stitch tensions of neighboring knitting areas.



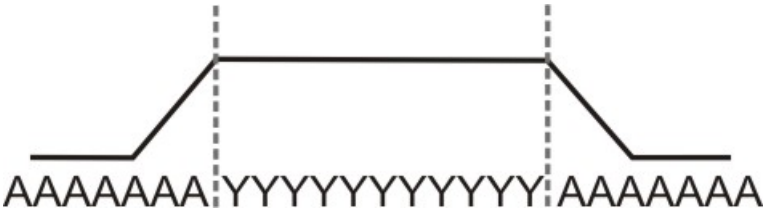
- **Stitch tension setting with symbol "="**
  The change of the stitch tension will be done in field **A** and field **Y** equally.



Example of a sintral command:
NPJ1: .=11.0 A=11.0 Y=12.0; C front needle bed
NPJ2: .=11.0 A=11.0 Y=12.0; C rear needle bed
<> S: <1-> A (J1) – Y (J2); SX

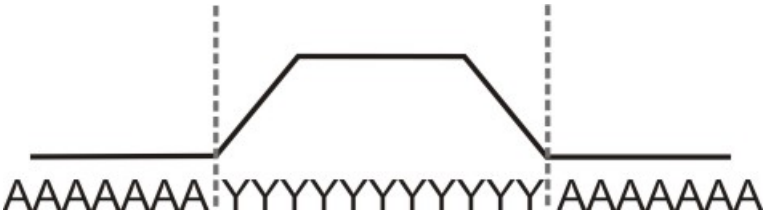
- **Stitch tension setting with symbol "!"**

– **Example 1:**
The change of stitch tension will be moved into field **A**.



Allocating the "!" symbol**:**
NPJ1: .=11.0 A=11.0 Y! 12.0; C front needle bed
NPJ2: .=11.0 A=11.0 Y! 12.0; C rear needle bed

– **Example 2:**
The change of stitch tension will be moved into field **Y**.



Allocating the "!" symbol**:**
NPJ1: .=11.0 A! 11.0 Y=12.0; C front needle bed
NPJ2: .=11.0 A! 11.0 Y=12.0; C rear needle bed

Specification in the Sintral program

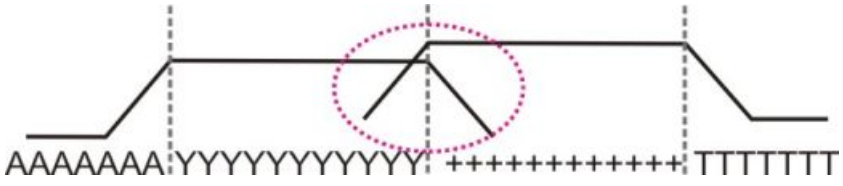
You change the indirect **NPJ** values in the "Setup2 Editor".

```
FBEG:M1-SIZES;
F1=1-399
PA:JA1; PAI:JA1; PANP<>:JA1;
PM:1:F1; SEN=1-399 #51=1 #52=399 #53=199 #54=200
FEND C M1-SIZES
JA1=2989(1100-1100)
C ---------- NPJ ----------
NPJ1:.=12.0 *=11 +=5; C vorne
NPJ2:.=12.0 *=11 +=6; C hinten
```

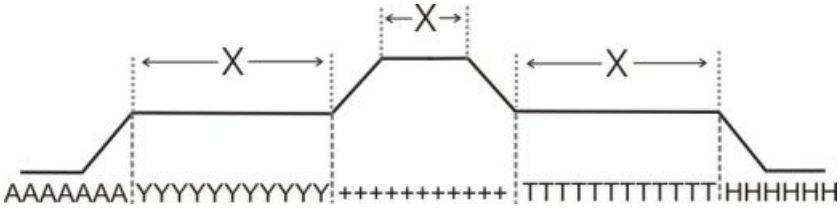
You can specify **NPJ** values directly in the Sintral as well.

III. Rules for NPJ:

- Watch out the distance between the areas (symbols).
- Symbol "." must always be specified.
- All other symbols will get the value of the symbol ".". Therefore do not a "!" to this symbol.
- "!" may not be applied to areas (symbols) lying next to each other.



- Watch-out the idle times with subsequent changes of the stitch tension (X).



23.1 Table for Modifying the Stitch Tensions

Distances and idle times for modifying the stitch tensions with **MSEC = 1.0**:

With the machine types ST 211 - ST 811

The change of the stitch tension is **independent** of the machine type.

Gauge	Quantity of needles for changing stitch tension by one value	Idle time
E 3	2.66	5
E 3,5	3.2	5
E 5 (2,5.2)	1.8	7
E 7 (3,5.2)	2.25	8
E 8	3	9
E 10 (5.2)	4.5	11
E 12 (6.2)	4.5	13
E 14 (7.2)	4.5	14
E 16 (8.2)	4.8	4
E 18 (9.2)	5.4	4.5
E 20	6	5

With the machine types ST 168 - ST 468 and OKC

These types of machines control the step motors faster.

- Reduced quantity of needles for changing the stitch length by one step
- Reduced idle time.

Stitch length change	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.5	2.0	2.5	3.0	X
E 3	0,1	0,3	0,4	0,5	0,7	0,8	0,9	1,1	1,2	1,3	2	2,7	3,4	4	1,2
E 3,5	0,2	0,3	0,5	0,6	0,8	0,9	1,1	1,3	1,4	1,6	2,4	3,2	3,9	4,7	1,3
E 5 (2,5.2)	0,2	0,3	0,5	0,6	0,8	0,9	1,1	1,2	1,4	1,5	2,3	3	3,8	4,5	1,7
E 7 (3,5.2)	0,2	0,4	0,6	0,8	1,0	1,3	1,5	1,7	1,9	2,1	3,2	4,2	5,3	6,3	2,1
E 8	0,2	0,5	0,7	1,0	1,2	1,4	1,7	1,9	2,2	2,4	3,6	4,8	6	7,2	2,3
E 10 (5.2)	0,3	0,6	0,9	1,2	1,5	1,8	2,1	2,4	2,7	3	4,5	6	7,5	9	2,8
E 12 (6.2)	0,4	0,7	1,1	1,4	1,8	2,2	2,5	2,9	3,2	3,6	5,4	7,2	9	10,8	3,3
E 14 (7.2)	0,4	0,8	1,3	1,7	2,1	2,5	2,9	3,4	3,8	4,2	6,3	8,4	10,5	12,6	3,7
E 16 (8.2)	0,5	1,0	1,4	1,9	2,4	2,9	3,4	3,8	4,3	4,8	7,2	9,6	12	14,4	4,2
E 18 (9.2)	0,5	1,1	1,6	2,2	2,7	3,2	3,8	4,3	4,9	5,4	8,1	10,8	13,5	16,2	4,6

X = Quantity of needles for the idle time

Power Tension Settings (**PTS**) depending on the machine speed:

Command	Meaning
MSECNPJ = n.nn	**n.nn** = 0.05 - 1.20 Speed setting with the work with the **NPJ** command Not specified: **MSEC = 1.0**

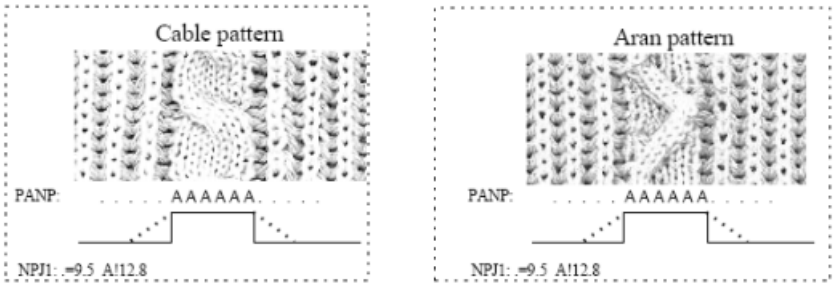
The table shows the required quantity of needles at different machine speeds for changing the stitch tension by one value.

MSECNPJ= off-duty period	1.0	X	0.9	X	0.8	X	0.7	X	0.6	X	0,5	X
E 3	1,3	1,2	1,2	1,1	1	1	0,9	0,8	0,8	0,7	0,7	0,6
E 3,5	1,6	1,3	1,4	1,2	1,3	1	1,1	0,9	1	0,8	0,8	0,7
E 5 (2,5.2)	1,5	1,7	1,4	1,5	1,2	1,4	1	1,2	0,9	1	0,8	0,9
E 7 (3,5.2)	2,1	2,1	1,9	1,9	1,7	1,7	1,5	1,5	1,3	1,3	1,1	1,1
E 8	2,4	2,3	2,2	2,1	1,9	1,8	1,7	1,6	1,4	1,4	1,2	1,2
E 10 (5.2)	3	2,8	2,7	2,5	2,4	2,2	2,1	2	1,8	1,7	1,5	1,4
E 12 (6.2)	3,6	3,3	3,2	3	2,9	2,6	2,5	2,3	2,2	2	1,8	1,7
E 14 (7.2)	4,2	3,7	3,8	3,3	3,4	3	2,9	2,6	2,5	2,2	2,1	1,9
E 16 (8.2)	4,8	4,2	4,3	3,8	3,8	3,4	3,4	2,9	2,9	2,5	2,4	2,1
E 18 (9.2)	5,4	4,6	4,9	4,1	4,3	3,7	3,8	3,2	3,2	2,8	2,7	2,3

X = Quantity of needles for the idle time

23.2 Applications of NPJ (PTS)

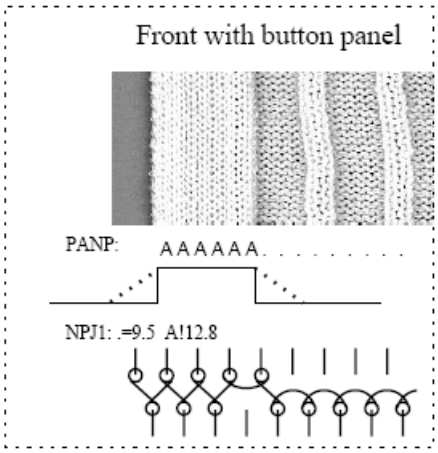
Use different knitting modes in one knitting row (= one knitting system):



Use different stitch tensions on the left and right fabric selvedge:

For fully fashion fabric with different knitting modes at the fabric selvedges.

> **i** In the fully fashion mode, the needle area outside the shape (fabric selvedge) is automatically filled with symbol e.g. "N" symbol.



Same symbols at the left and right edge:

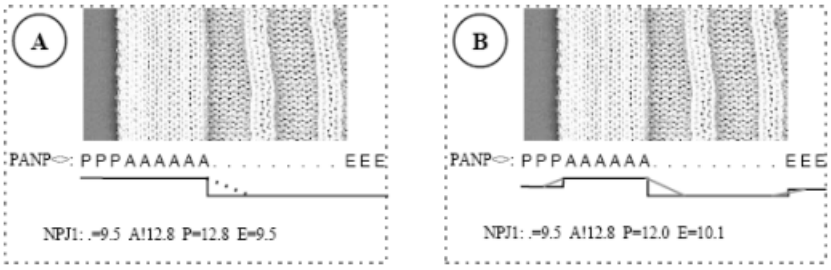
```
PANP      ******AAAAAAAA.............******
```

> **i** Different stitch tensions at the left and right selvedge are not possible.

Command	Meaning
PANP <>	Pattern pack arrangement for the control of the needle sinkers with NPJ. 1. Necessary if the jacquard for NPJ differs from the jacquard of the pattern. 2. Different stitch tensions at the left and right selvedge.

Different symbols at the left and right selvedge:

PANP <> **PPP**AAAAAAAA.....**EEE**



Example	Meaning	Effect
A	The same value for stitch tension will be applied to the "P" and "A" symbol	Same stitch tension of the selvedge stitches
B	Any value for stitch tension will be applied to the "P" symbol.	Different stitch tension of the selvedge stitches
	Any value for stitch tension will be applied to the "P" symbol.	Different stitch tensions at the left and right selvedge

Different symbols for the stitch tensions at the selvedge outside shape must be entered manually.

24 Pattern 4: Fully Fashion

Pattern name	Fully Fashion
Start	1X1 Rib
Machine Type	CMS 530 HP 5“ with E 7.2 CMS 530 HP 6“ with E 3,5.2 CMS ADF 32 W with E 7.2
Operating mode of the machine	◆ with comb function and clamping / cutting ◆ **Use of RS17** – First fabric piece with comb function and clamping / cutting – Following fabric pieces without comb function and clamping / cutting – Last fabric piece with piece counter =0 is cast-off ◆ With Sintral command **RS17=1 IF #100=1 RS17=0**
Pattern description	◆ Shape: Front with v-neck ◆ SJ fabric with stripe (3 colors)
Pattern Parameters	◆ Cycle Counters **(RS)** ◆ Stitch Length **(NP)** ◆ Power Tension Setting - PTS **(NPJ)** ◆ Fabric Take-down **(WMF)** ◆ Additional distance of the yarn carrier at the fabric selvedge **(YDF)**

24.1 Additional Information with Fully Fashion - with Comb

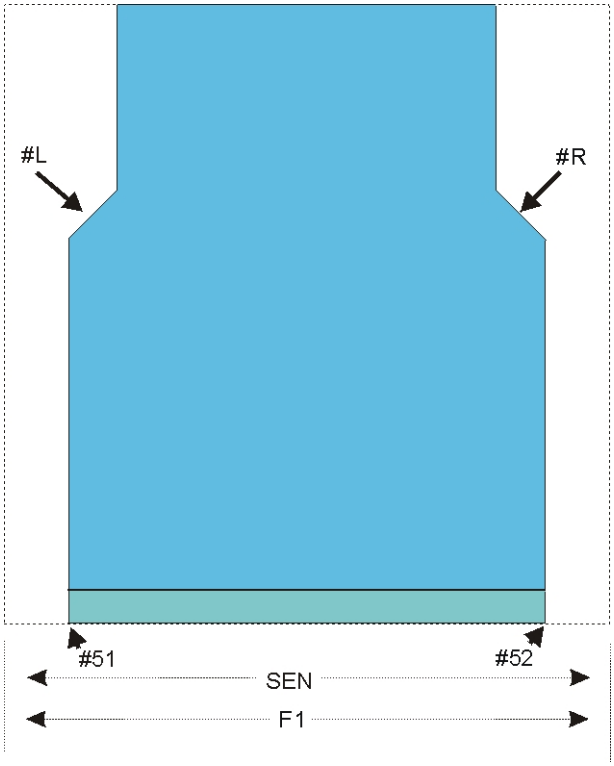
Additional commands are necessary in Sintral with **Fully Fashion with comb**!

Fully Fashion commands:

Command	Function
PFN	Machine is working as a normal machine (Needle selection over the total width of the **SEN**)
PF0	Machine is working as a fully fashion machine (Needle selection within **#L** - **#R**)
WMN	Value of the fabric take-down depending on the quantity of needles (changes with the knitting width)

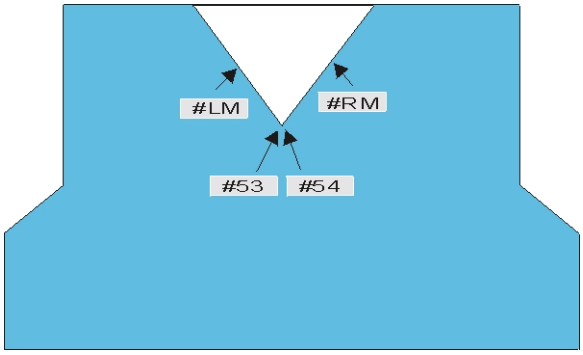
Command	Function
YDF	Additional distance of the yarn carriers at the fabric selvedge with fully fashion
# L / #R **#LM / #RM**	Shape counters for outer edges

II. Counter at the outer edge of the shape:



Counters	Function
#L	Selvedge counter for the left fabric selvedge
#R	Selvedge counter for the right fabric selvedge
#51	Auxiliary counter for start width at the left (Counter does not change)
#52	Auxiliary counter for start width at the right (Counter does not change)

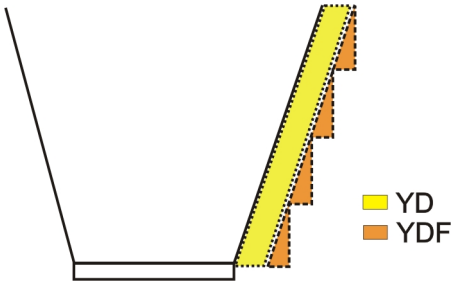
III. Counter at the outer edge of the v-neck:



Counters	Function
#LM	Selvedge counter for the fabric selvedge in the neckline middle left
#RM	Selvedge counter for the fabric selvedge in the neckline middle right
#53	Auxiliary counter for start width middle left (Counter does not change)
#54	Auxiliary counter for start width middle right (Counter does not change)

V. Distance of the yarn carrier from the fabric selvedge:

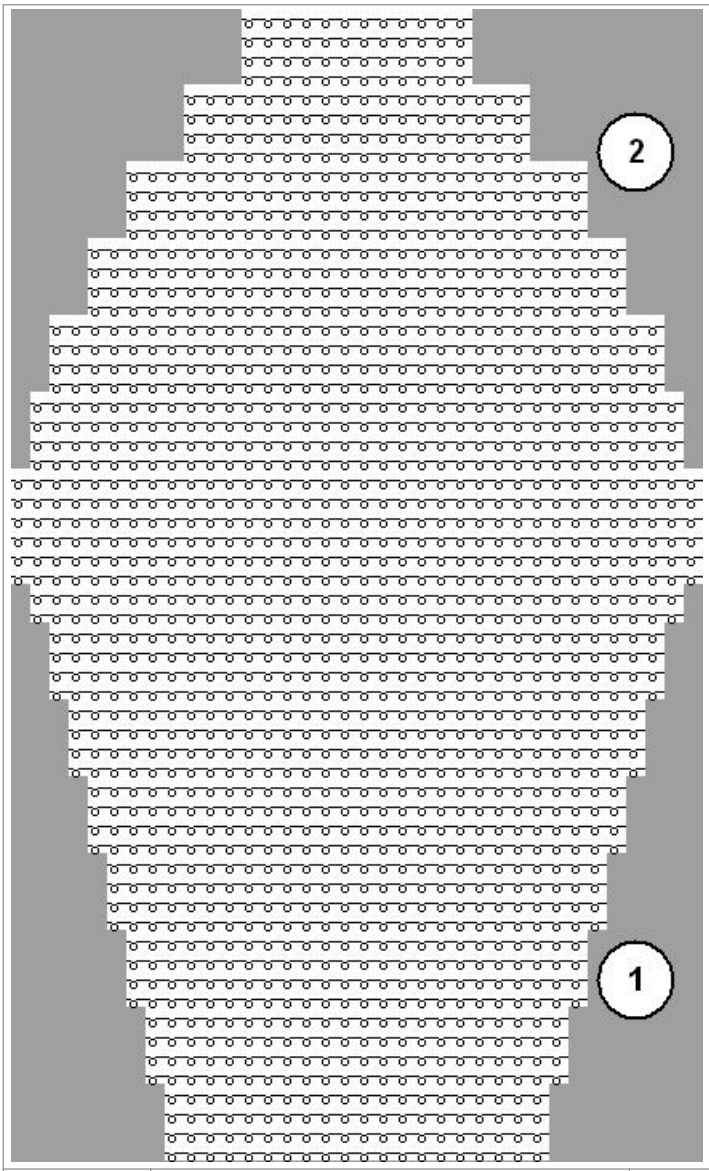
- **YD**: Manual staggering (yarn carrier distance) the yarn carriers at the fabric selvedge
- **YDopt:** Automatic staggering the yarn carriers at the fabric selvedge
- **YDF**: Additional yarn carrier distance for fully fashion knitting



Command:		
YDF = n	Additional yarn carrier distance for fully fashion knitting	**n = 1 – 20** (by needles)

24.2 Widening / Narrowing of Fully Fashion

Shaping by widening / narrowing

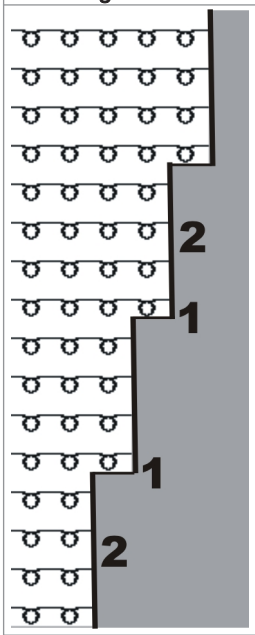


1	**Widening**	Enlarging the knitting width

2	**Narrowing**	Reducing the knitting width **i**: The transfer of stitches results in double stitches = Fully fashion marking (fashioning marks)

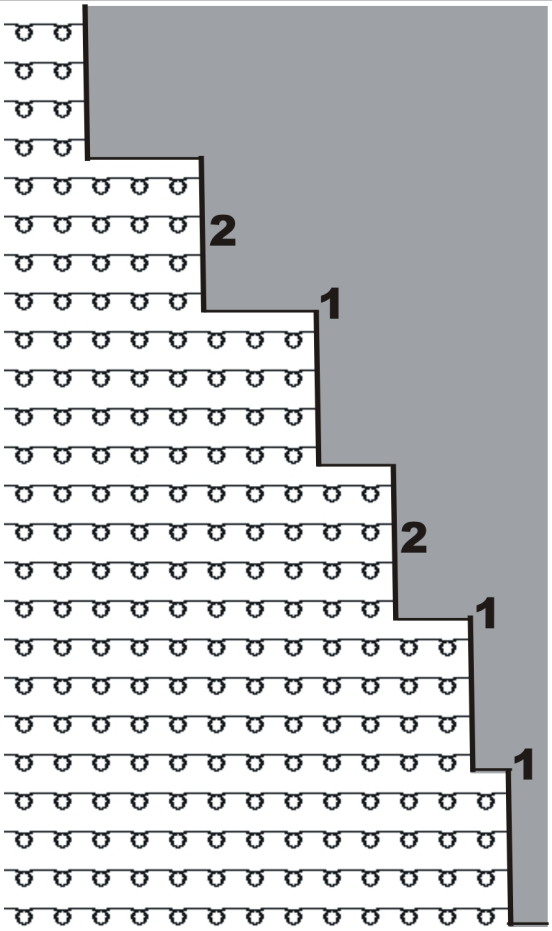
Step height and step width when widening / narrowing

Widening



1	**Step width** **i**: Widening always only 1 needle
2	**Step height** = Number of rows between two widenings **i**: Step height is as desired

Narrowing

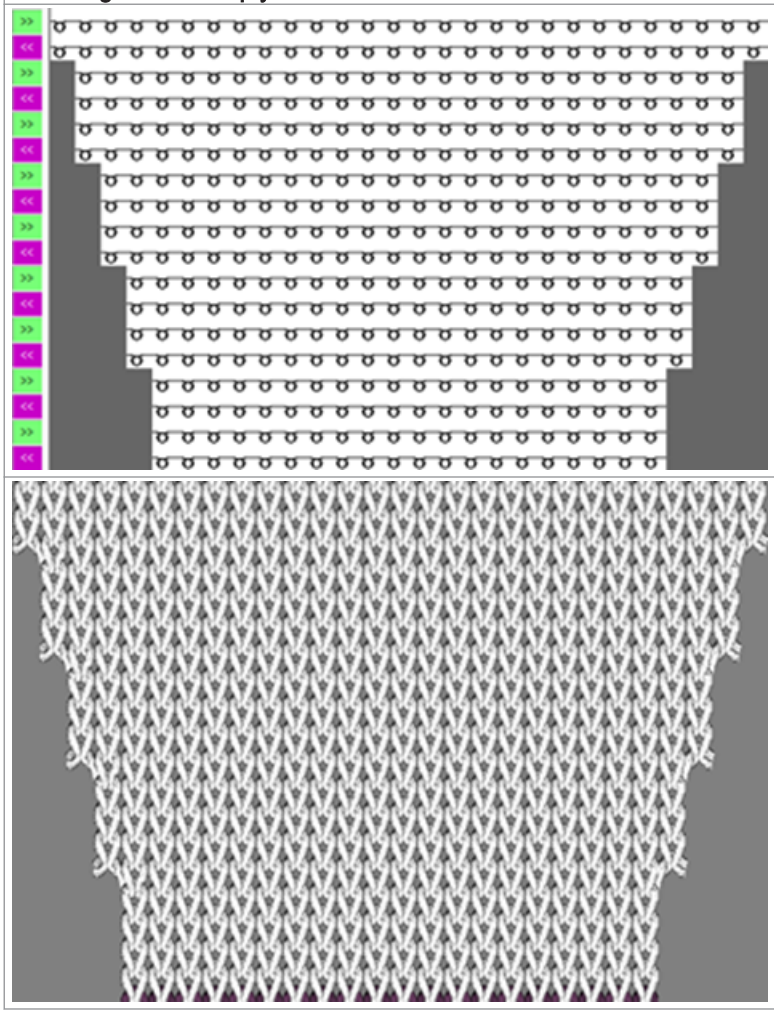


1	**Step width** ◆ 1 needle narrowing ◆ 2 needle narrowing ◆ 3 needle narrowing **i**: **Step widths of more than 3 stitches are bind-off.**
2	**Step height** = Number of rows between two narrowings **i**: Step height is as desired

24.2.1 Widening Procedure by the Example of Single Jersey fabric

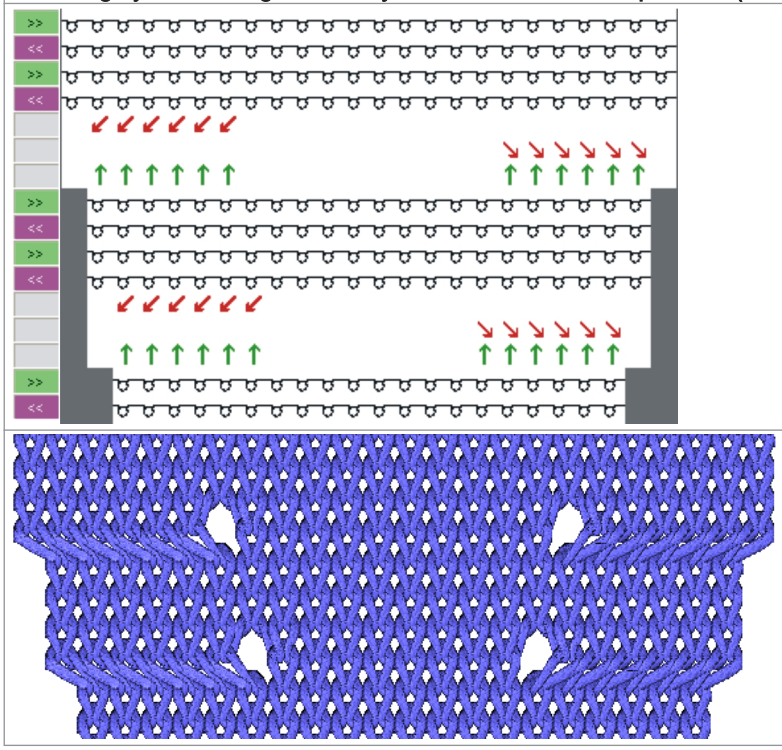
Widening

Widening onto an empty needle = tuck



i:
The widening by 1 needle can be executed at the left and right fabric selvedge in the same stitch row.

Widening by transferring stitches by one needle outward = pointelle (without closing)

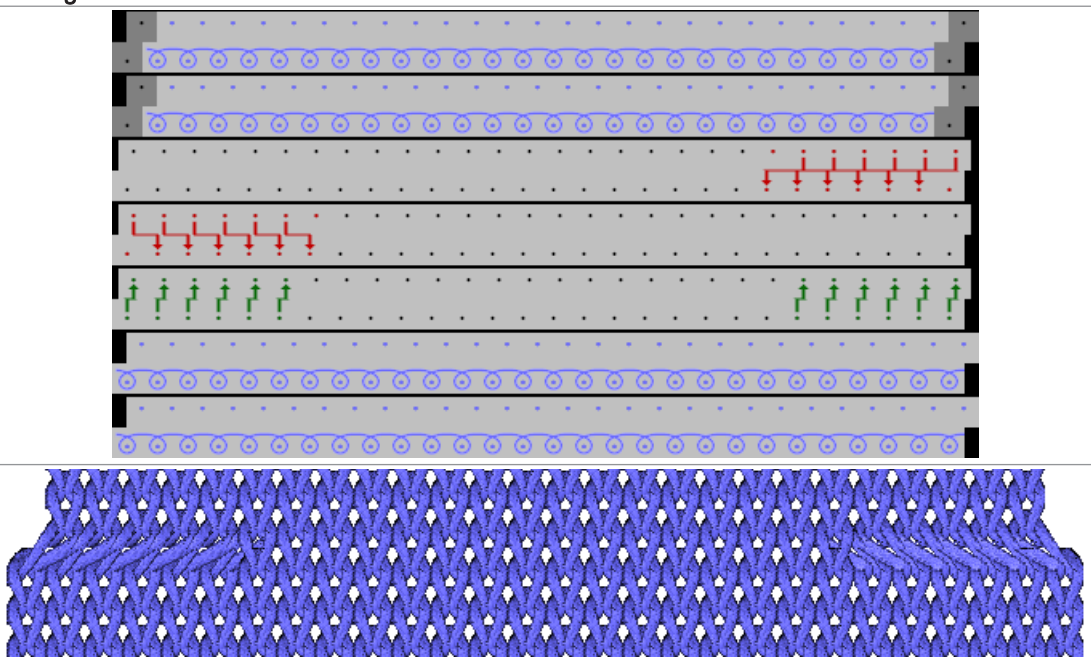


i:
The hole (=pointelle) that resulted from transferring stitches outward (stitch group = widening width) can also be closed by knitting + transferring a tuck. (= Widening with Closing-Stitch)

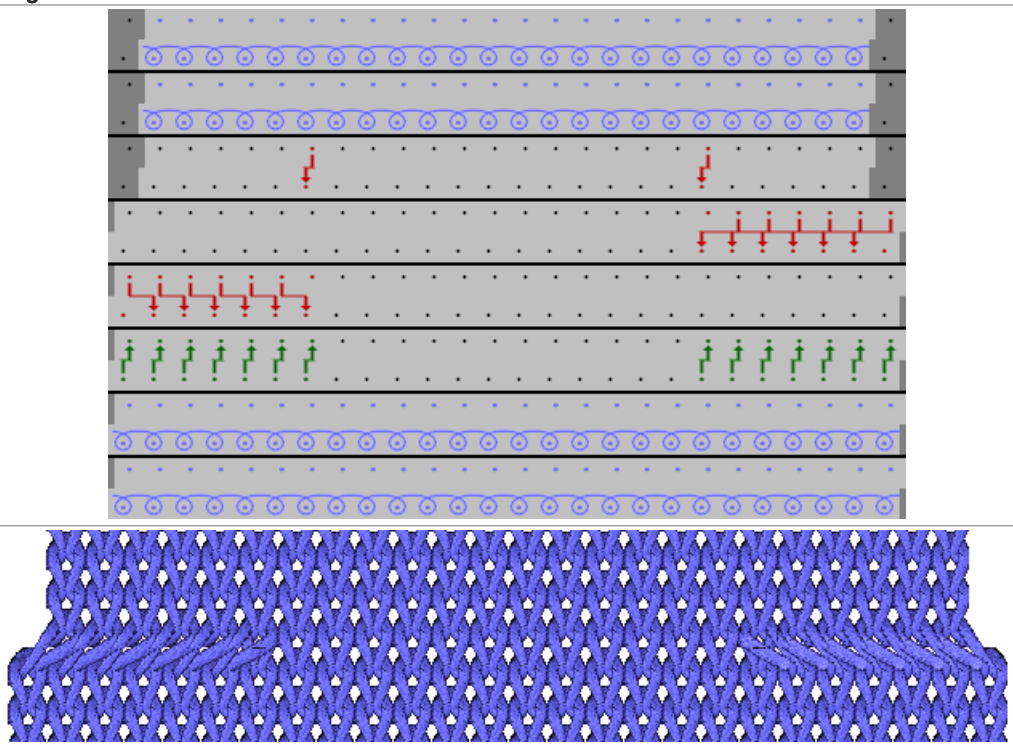
24.2.2 Narrowing Procedure by the Example of Single Jersey

Narrowing

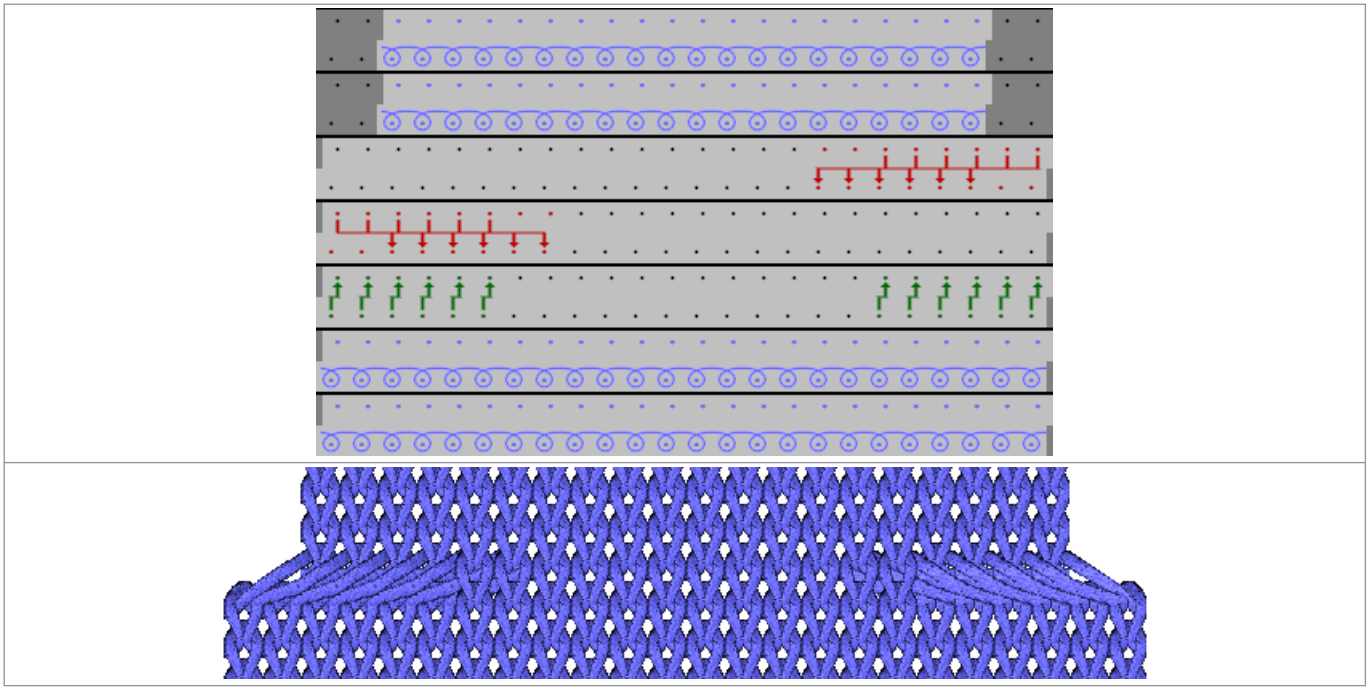
1 needle narrowing underneath



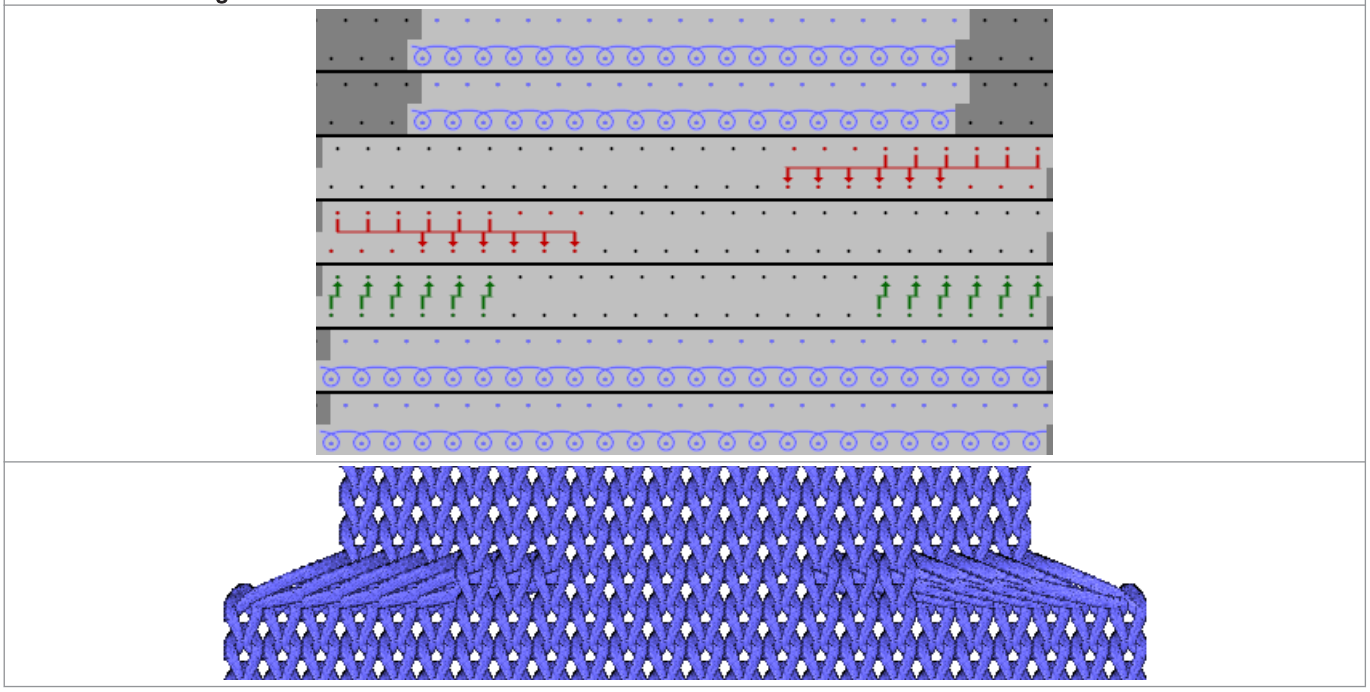
1 needle narrowing above



2 needles narrowing underneath

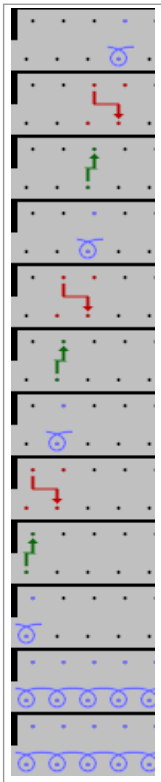


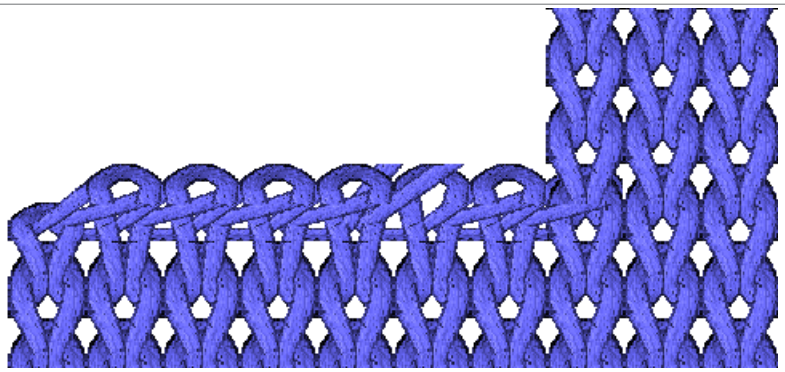
3 needles narrowing underneath

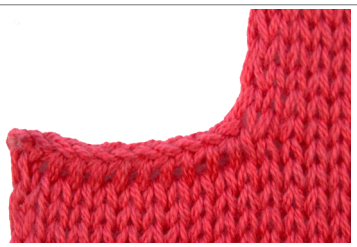


24.2.3 Binding-off Procedure by the Example of Single Jersey Fabric

Binding-off (to the right >>)







You can change the form of a fully fashion fabric by binding-off as well.
The binding-off sequence consists of knitting and transferring of individual stitches.
Different variants of binding-off are available.

24.3 Load and Set-up the Pattern

Procedure:

1. **Load pattern in machine.**
2. **Set up the pattern:**
   - Threading up the Yarn Carriers
   - Position the yarn carriers at the clamping point.
3. **Start the machine.**

Make the following changes:

- Cycle Counters **(RS)**
- Stitch Length **(NP)**
- Additional distance of the yarn carrier at the fabric selvedge **(YDF)**
- Fabric Take-down **(WMF)**
- Power Tension Setting - PTS **(NPJ)**

24.4 Cycle Counter RS17 with different Fabric Widths (with Fully Fashion)

Production with RS17 with fully fashion fabrics:

- Via the Sintral command **RS17=1 IF #100=1 RS17=0**, the activation / deactivation of the comb function is coupled to the piece counter.
- Additional **FF-TRANS** Sintral function required when using the cycle counter RS17 with fully fashion.
  This function regulates the transition between the single fabric pieces.
  - End width same as start-width: no special transition is necessary.
  - End width larger than start-width: excess needles up to the start-width are cast-off.
  - End width smaller than start-width: protection yarn is used to widen up to the needed start-width.

Behavior of the piece counter when using RS17:

If piece counter: ST=1

1. For the one fabric piece, the comb and the clamping / cutting are active.
2. All yarn carriers are taken out of the clamp before the start and knitted-in.
3. The fabric is cast-off at the end via a cast-off function in the Sintral.

If piece counter: ST>1

I. First fabric:

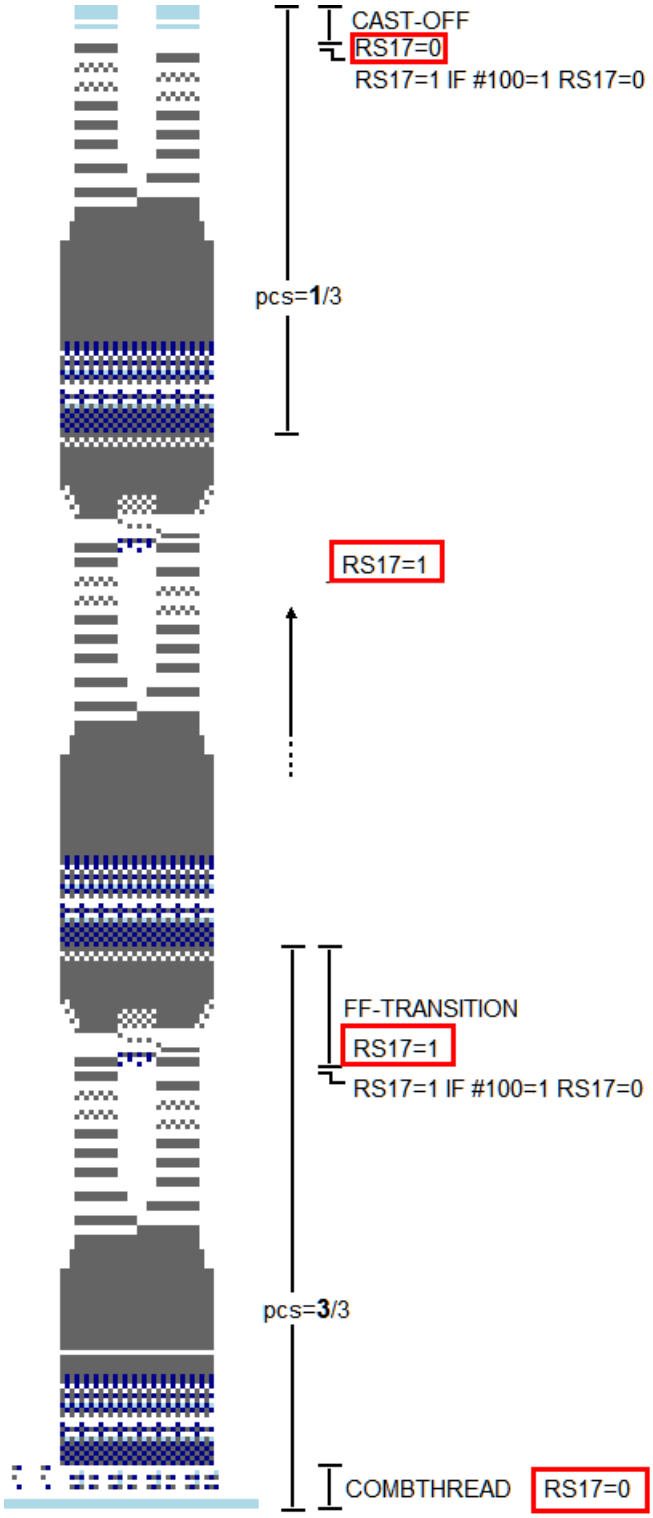
1. The first piece works with **Comb** since RS17=0 is set.
2. All yarn carriers are taken out of the clamp before the start and knitted-in.
3. The **Comb thread** is clamped after knitting, since it is **only** needed **for the first piece**.
4. All other yarn carriers are positioned at the fabric selvedge for the following pieces.
5. At the fabric end the RS17 is set to 1 with the Sintral command **RS17=1 IF #100=1 RS17=0**, as the **piece counter is >1**. This way **no cast-off is carried out at the fabric end**.
6. Afterwards, the Sintral function **FF-TRANS** is called-up for comparing the shape counters ant the required transition rows are processed.

II. The following fabric pieces:

1. All the following fabrics are processed without comb and clamping / cutting.
2. No cast-off is carried out at the end of these fabrics.
3. Execution of the Sintral function **FF-TRANS** for the transition to the next fabric piece.

III. Last fabric piece of the piece counter:

1. The last fabric piece is processed without comb and clamping / cutting.
2. At the end of the last piece, the piece counter is checked by the Sintral command **RS17=1 IF #100=1 RS17=0** and this way is set **RS17 = 0**.
3. With RS17 = 0 the yarn carriers are brought into the clamps and then the fabric piece is cast-off.



24.5 Setting: Fabric take-down with fully fashion knitting

With fully fashion knitting, **WMN** controls the take-down in the fabric. The take-down values within the fabric are automatically adapted to the corresponding fabric width.

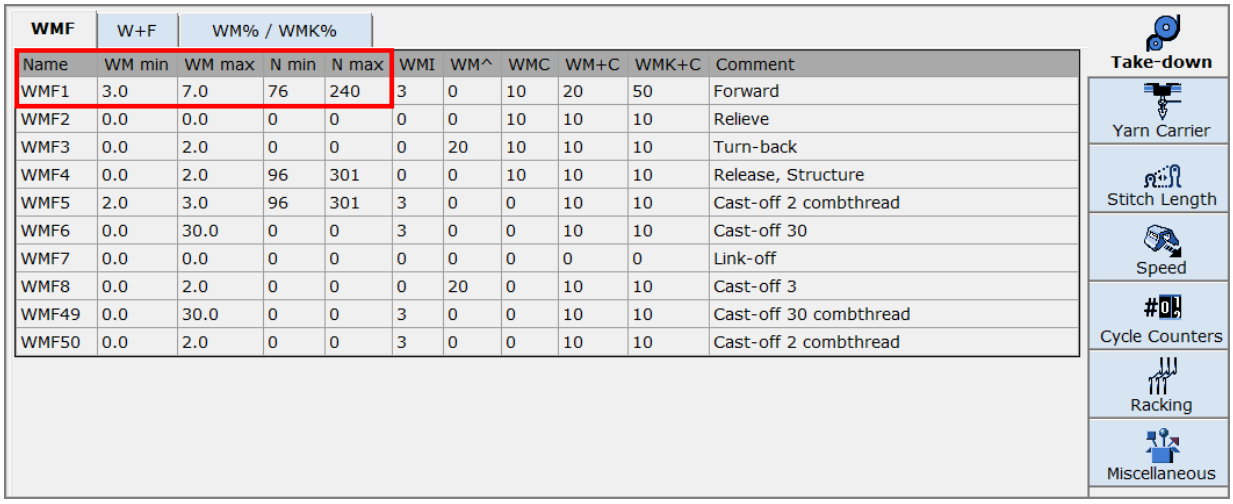
Open the Fabric Take-down Table

Call up the "Setup2 Editor" with the  key.

1. Tap the "Take-down" key.

2. Tap an input field.
3. Enter values or a comment.
4. Confirm entries with  .

Tab: WMF



Name	WM min	WM max	N min	N max	WMI	WM^	WMC	WM+C	WMK+C	Comment
WMF1	3.0	7.0	76	240	3	0	10	20	50	Forward
WMF2	0.0	0.0	0	0	0	0	10	10	10	Relieve
WMF3	0.0	2.0	0	0	0	20	10	10	10	Turn-back
WMF4	0.0	2.0	96	301	0	0	10	10	10	Release, Structure
WMF5	2.0	3.0	96	301	3	0	0	10	10	Cast-off 2 combthread
WMF6	0.0	30.0	0	0	3	0	0	10	10	Cast-off 30
WMF7	0.0	0.0	0	0	0	0	0	0	0	Link-off
WMF8	0.0	2.0	0	0	0	20	0	10	10	Cast-off 3
WMF49	0.0	30.0	0	0	3	0	0	10	10	Cast-off 30 combthread
WMF50	0.0	2.0	0	0	3	0	0	10	10	Cast-off 2 combthread

- For working with **WMN**, all values must be defined in the WMF menu:
  - **WM min** and **WM max**
  - **N min** and **N max**

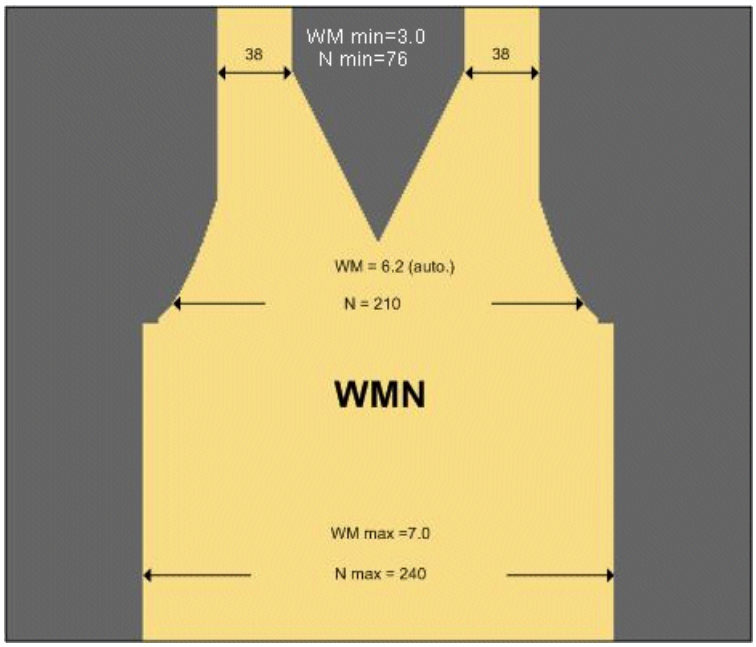
WMN command

In the **WMF1** menu are displayed the corresponding values for the fully fashion piece:

- **WM max** depends on **N max** (absolute value)
- **WM min** depends on **N min** (absolute value)

Automatic adjustment of the take-down value

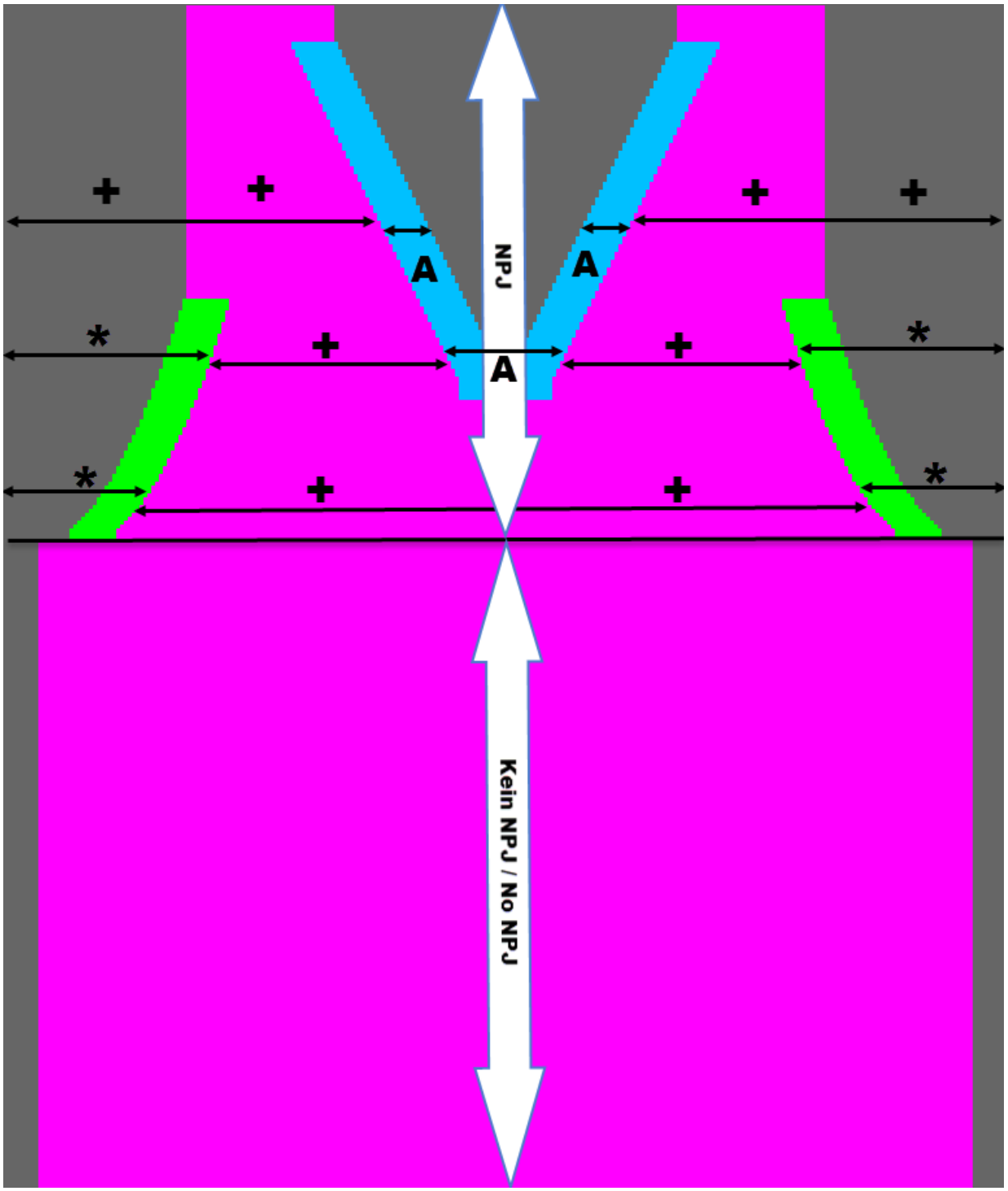
The WM values for all other needle widths within the fabric are automatically calculated at the machine.



24.6 Setting: NPJ with Fully Fashion

Working with NPJ:

Each stitch tension value is assigned to the pattern based on a jacquard symbol in the **(PANP)** jacquard. In the Sintral, a value is assigned to each jacquard symbol and displayed in a function.



Sintral specification: NPJ

```
C ---------- NPJ --------
NPJ1:.=12.0 *=7 +=5 A=8;
NPJ2:.=12.0 *=7 +=5 A=8;
C ----------------------
```

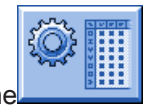
- **NPJ1:** Indirect stitch tension specifications for the front needle bed.
- **NPJ2:** Indirect stitch tension specifications for the rear needle bed.
- Specification for the Point jacquard symbol **.=12.0 :** Direct input of a stitch length for the **.** symbol (must be defined as safety information for possibly not defined symbols in jacquard).

■ Change of the stitch length values (stitch tensions) in **Setup 2**.

Call up the stitch length table in the Setup2

1. With the  key

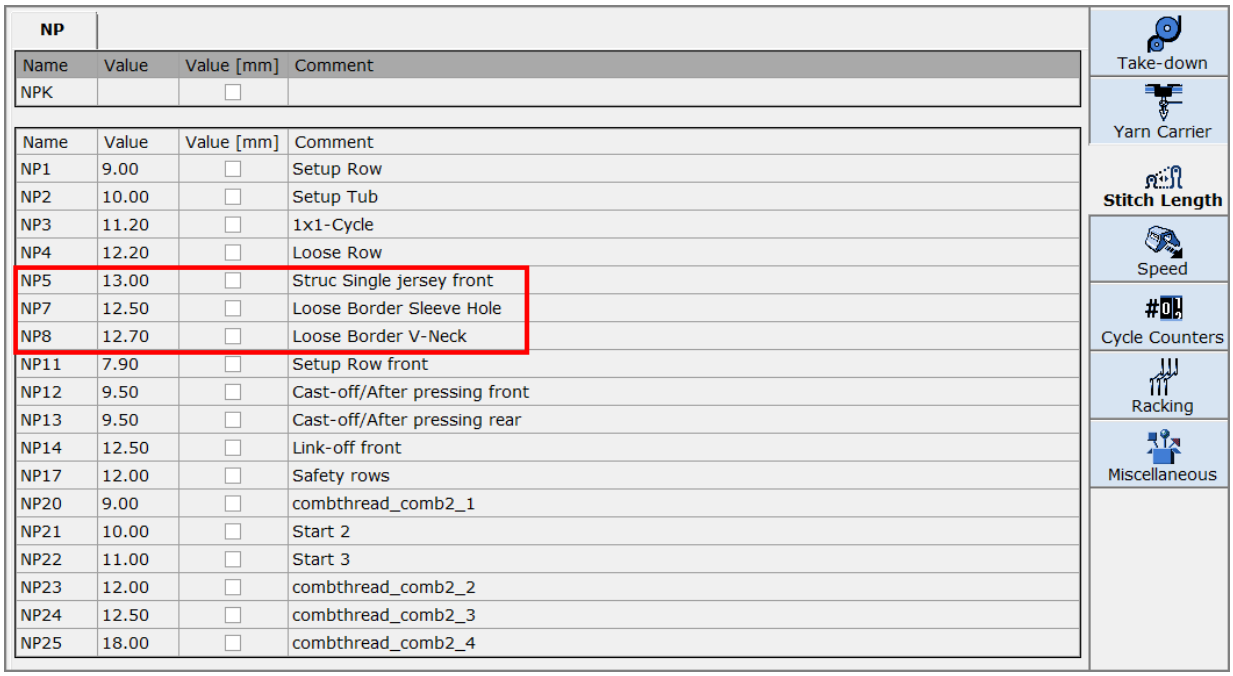
- or -

➜ Call-up the "Setup2 Editor" with the  key and tap the "Stitch length" key.

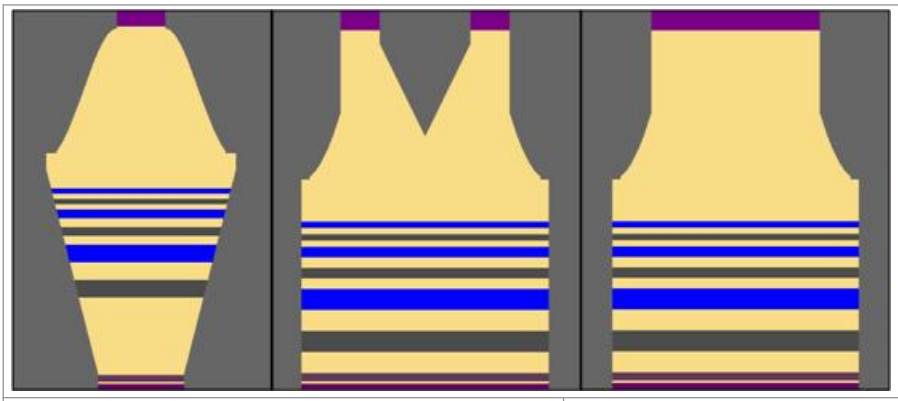
Result: The "NP" tab appears with all **NP**-values used in the pattern.

2. Tap the entry box and change values or the comment

3. Confirm entries with  .



25 Pattern 4.1: Fully Fashion - Sequence

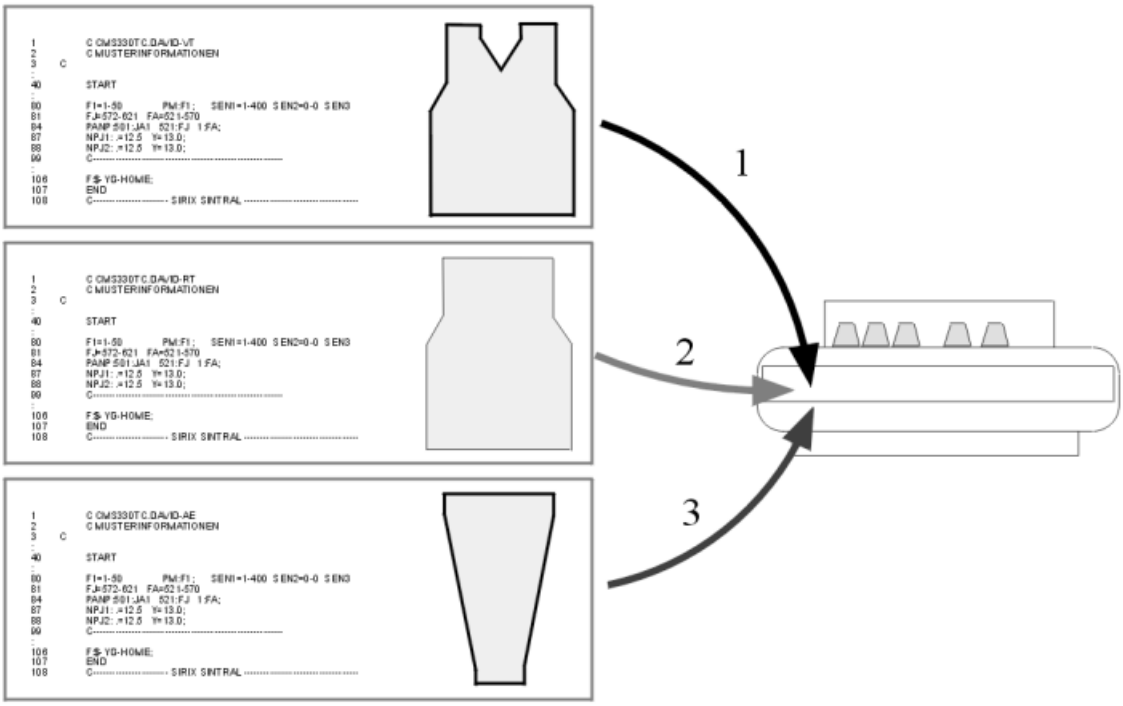


Pattern name	Sequence
Start	2x1 rib
Machine Type	CMS 530 HP 5“ with E 7.2 CMS 530 HP 6“ with E 3,5.2 CMS ADF 32 W with E 7.2
Operating mode of the machine	◆ With Comb ◆ with clamping / cutting
Pattern description	Fully fashion knit as **Sequence**: ◆ 1x front ◆ 1x back ◆ 2x sleeve
Pattern Parameters	◆ Stitch Length **(NP)** ◆ Cycle Counters **(RS)** ◆ Fabric Take-down **(WMF)**

25.1 Workflow and Usage of Sequences

Working procedure:

- Subsequent production of a certain number of knitting programs.
- The knitting programs are automatically loaded into the main memory of the machine.



Usage:

- **Fully fashion:**
  The knitting of parts in the sequence of front, back and sleeve.
- **Knitting sets of sizes:**
  The same pattern in different sizes.

Requirements:

All the knitting programs used in the sequence must have the following identical settings:

- Same type of the machine
- Home positions of the yarn carriers:
  i: **Note**
  1. Different yarn carrier home positions in the knitting programs are possible with **EAY SEQ**.
  2. All yarn carriers must be brought to their home position before **END**.
  Recommended for knitting programs with comb use.

25.2 Load sequence

Procedure:

1. **Save all the patterns for the sequence on the hard disc.**
   - All knitting programs of the sequence elements: Front, back and sleeve
2. **Start Sequence Editor.**
   - Putting together a sequence
3. **Load the first sequence element into the pattern memory.**
4. **Set up the pattern.**
   - Threading up the Yarn Carriers
   - Position the yarn carriers at the clamping point
   - Check the knitting area and the fabric collection chamber
5. **Start the machine.**

Make the following changes:

- Cycle Counters **(RS)**
- Stitch Length **(NP)**
- Fabric take-down values **(WMF)**

25.3 Create Sequence

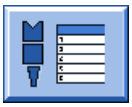
Condition:

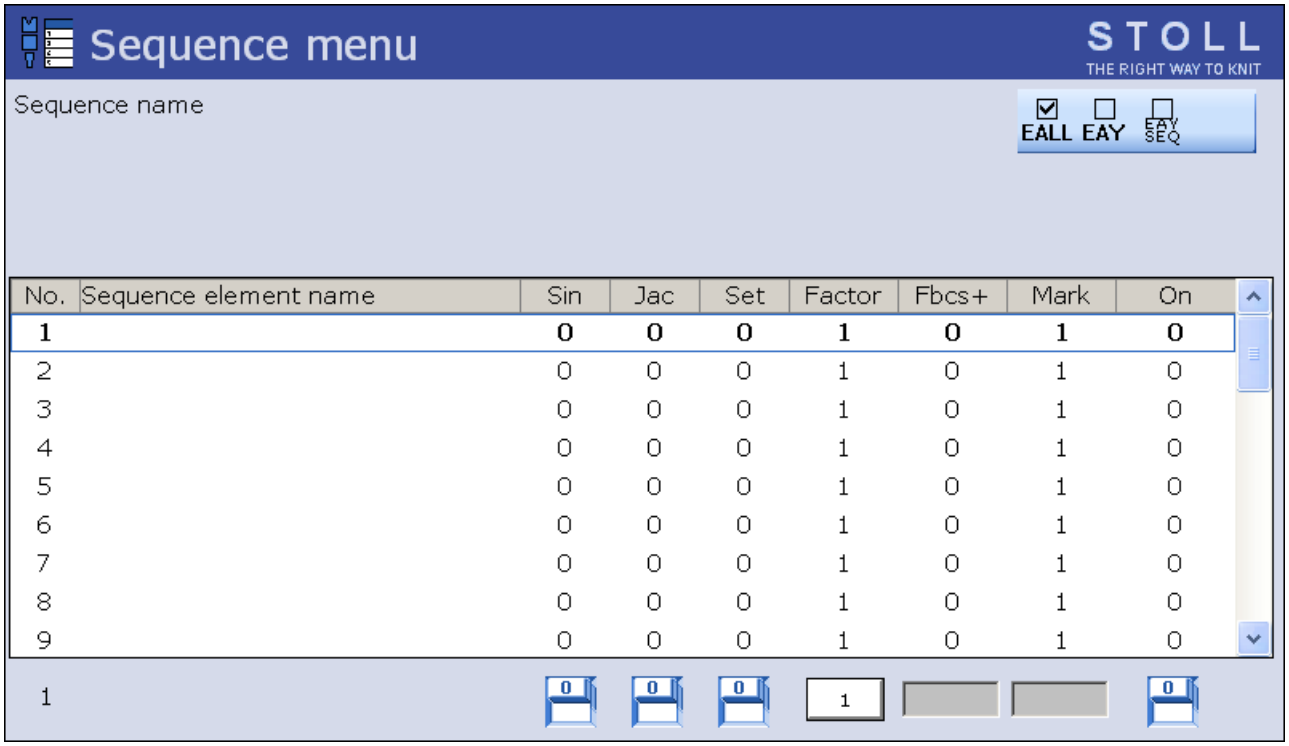
All the knitting programs for the sequence are to be located in the same storage medium:

- Hard disk
- USB stick
- Network

Putting together a sequence:

▷ All the knitting programs are stored on the hard disc.

1. Call up the "Sequence menu" with the  key of the Main menu.

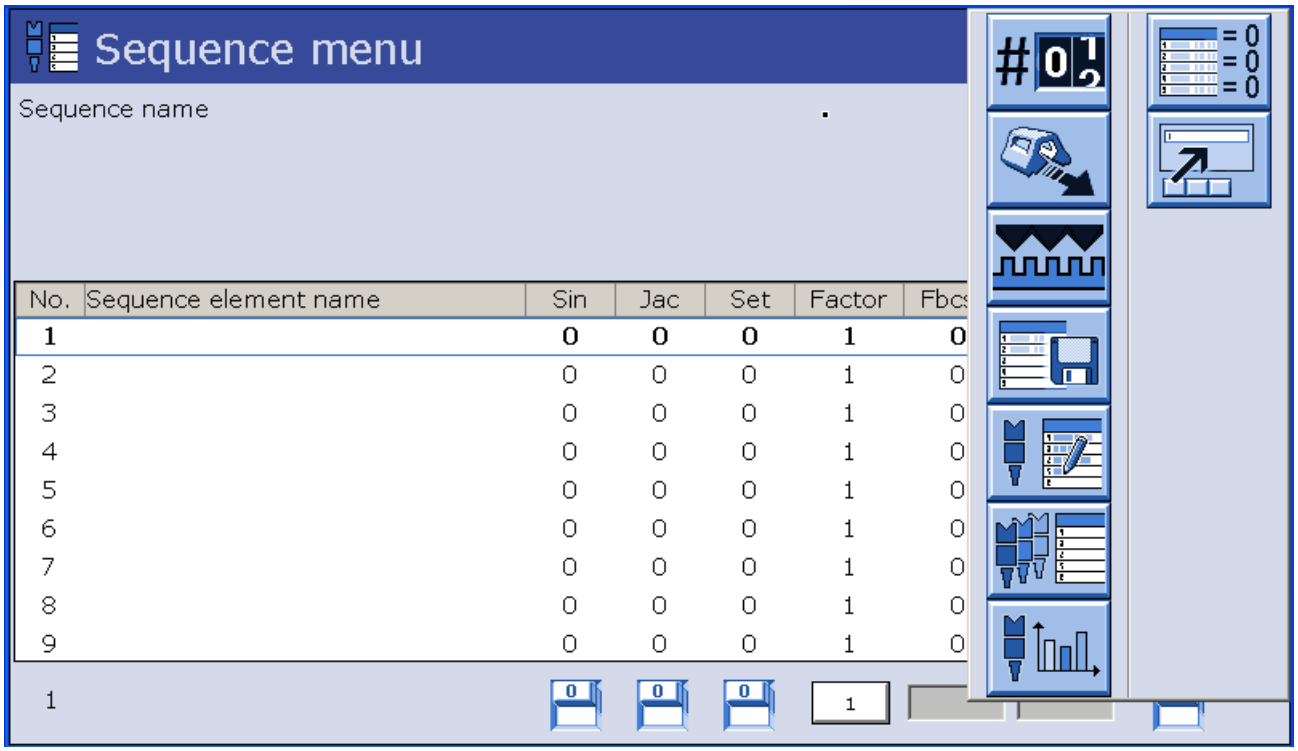


Key	Function
EALL	☑ When loading a sequence element the previous pattern in the pattern memory is deleted.
EAY	☑ When starting a sequence the previous yarn carrier home position is deleted.
EAY SEQ	☑ When loading the next sequence element the previous yarn carrier position is deleted.
	Watch the necessary specifications in Sintral!

Key	Function
YCLx	☑ The YLC correction values are deleted.
	ℹ: Only active with yarn length control

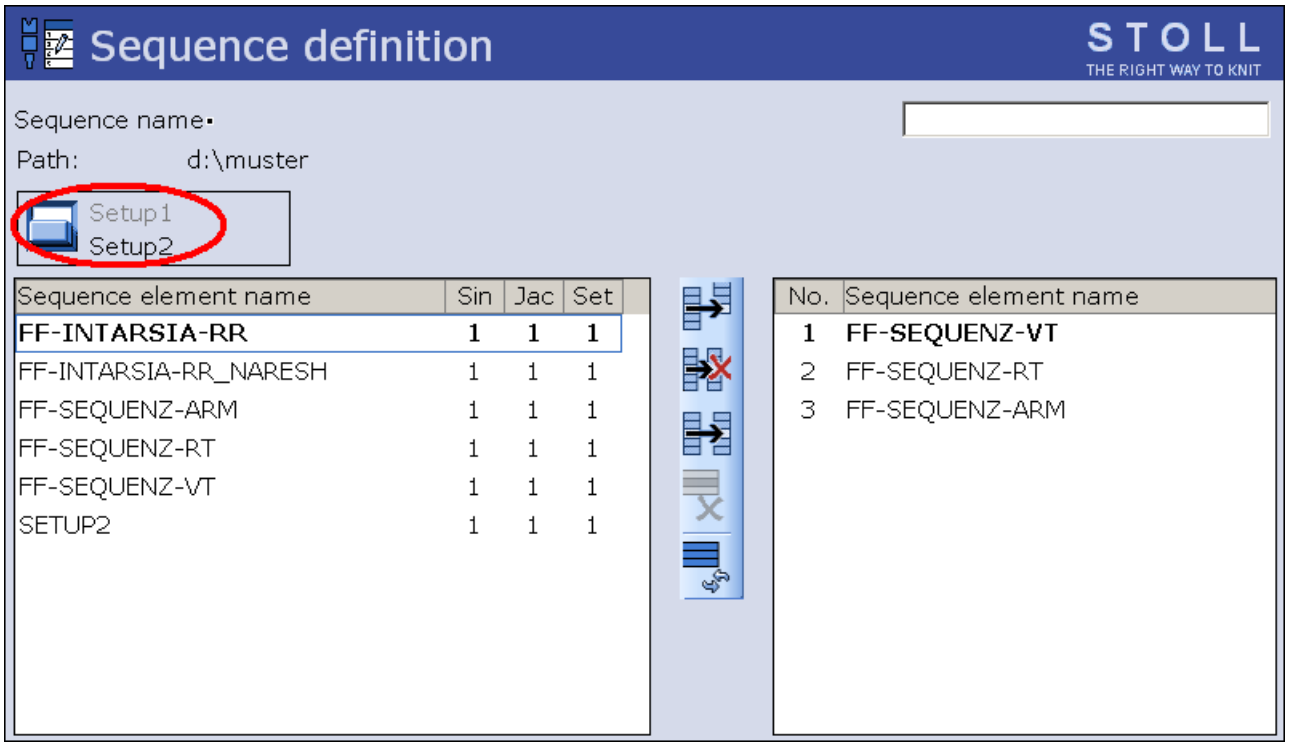
2. Tap the  key.

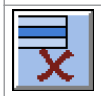
⇨ A list with the "additional function keys" is displayed.



3. Select the  key.

⇨ The "Sequence definition" window (Putting together a sequence) is opened.

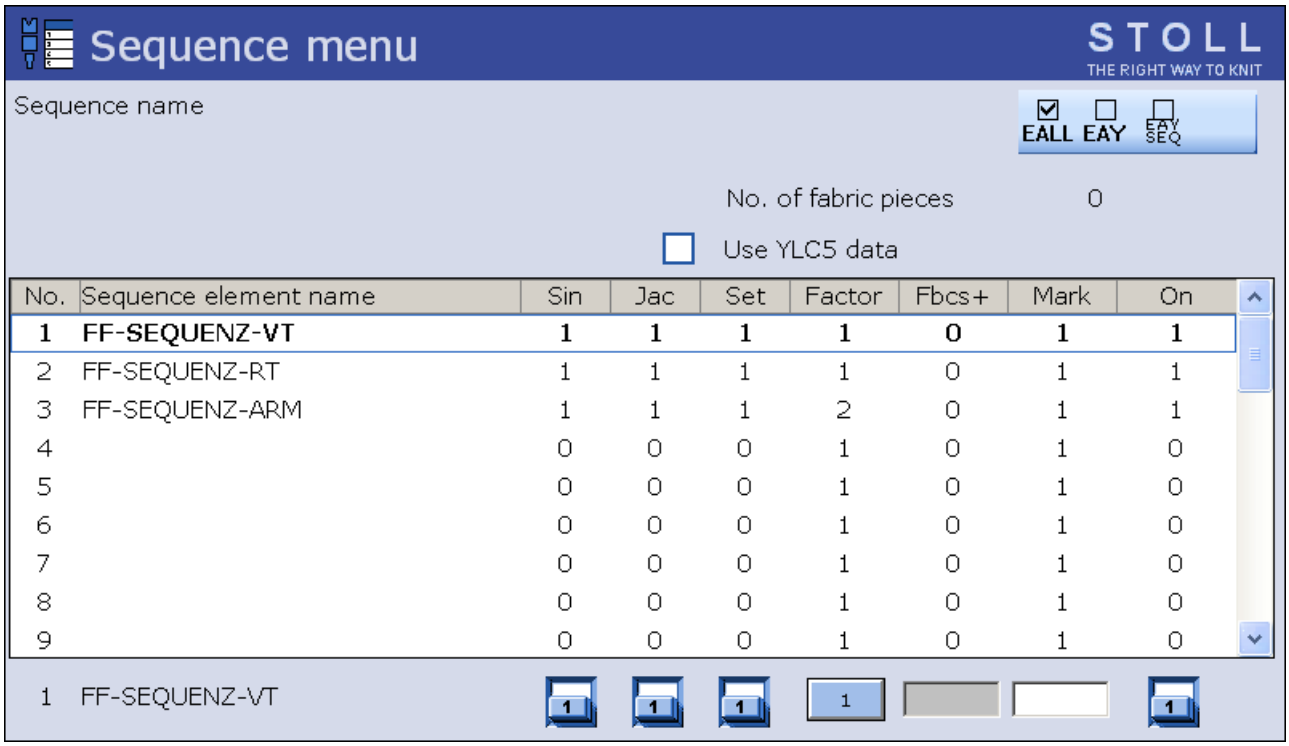


Key	Function	
	Setup1	Adjustment for pattern with **Setup1**
	Setup2	Adjustment for pattern with **Setup2**
	Add a selected element at the end	
	Replace the selected element	
	Insert the selected element	
	Delete selected element	
	Refresh the contents of the pattern folder	

4. In the table at the left **Sequence element name** select the first sequence element e.g. **FF-Sequenz-VT**.
5. Tap the  key.
   ⇨ The selected element is inserted in the table at the right.
6. Select and insert the next sequence element, e.g. **FF-Sequenz-RT**.
7. Select and insert as the last element e.g. **FF-Sequenz-Arm**.

The order in the table at the right corresponds to the order of processing.
You can add further elements to the list if necessary

8. Return to the "Sequence menu" by the  key.

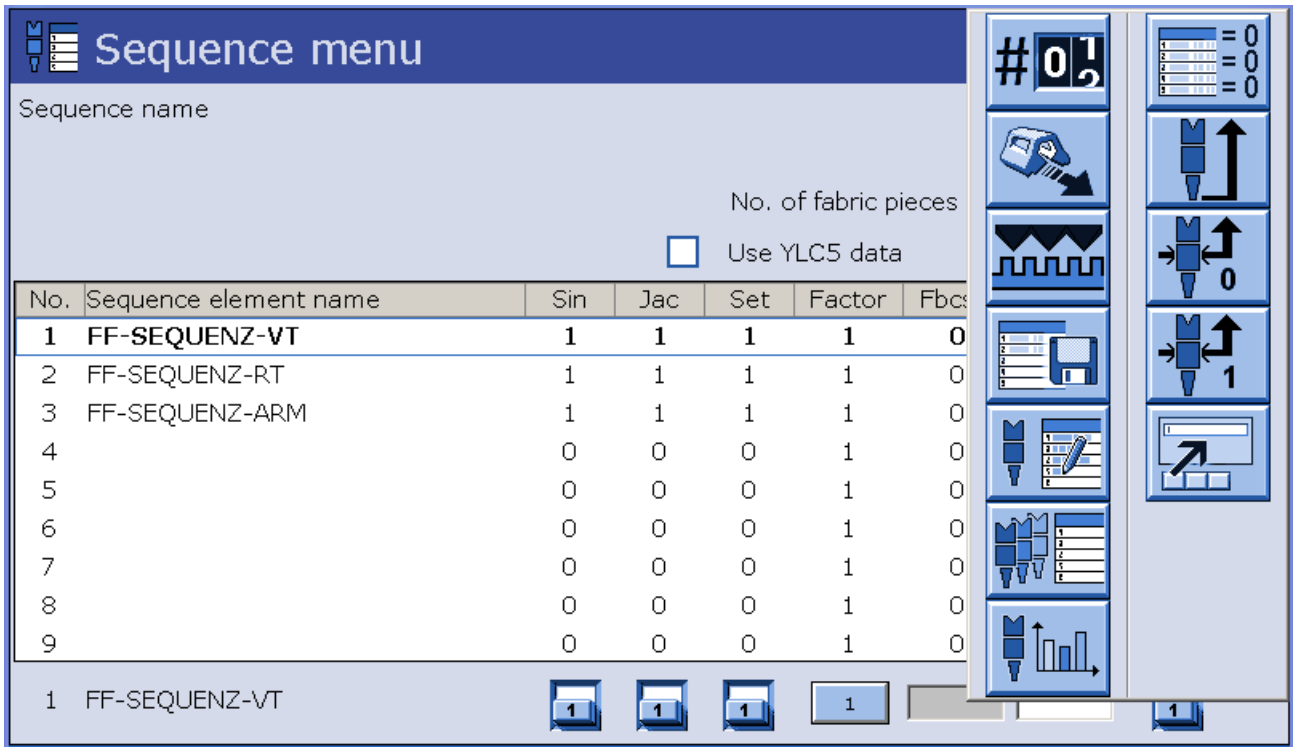


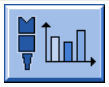
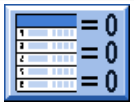
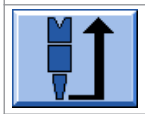
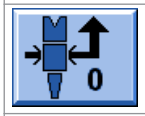
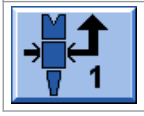
Designation	Meaning
No.	Consecutive number of the sequence elements
Sequence element name	Name of the sequence element
Sin / Jac / Set (Setx)	**1** = the program element is loaded **0** = the program element is **not** loaded
Factor	Repetition of the sequence element
Pces+	Repeat knitting of the sequence element
Mark	Delete the previous sequence element starting with line **n**. **n = 1**: Deleting starting with program line 1
On	**1** = Sequence element activated **0** = Sequence element deactivated

9. Select the sequence element and carry out the adjustment:

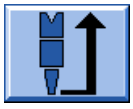
- Under **Sin / Jac / Set** set the values 1 or 0.
- Under **Factor** establish the repetition of the sequence element.
- Under **On** activate or deactivate the sequence element.

10. Switch over to more function keys with  .



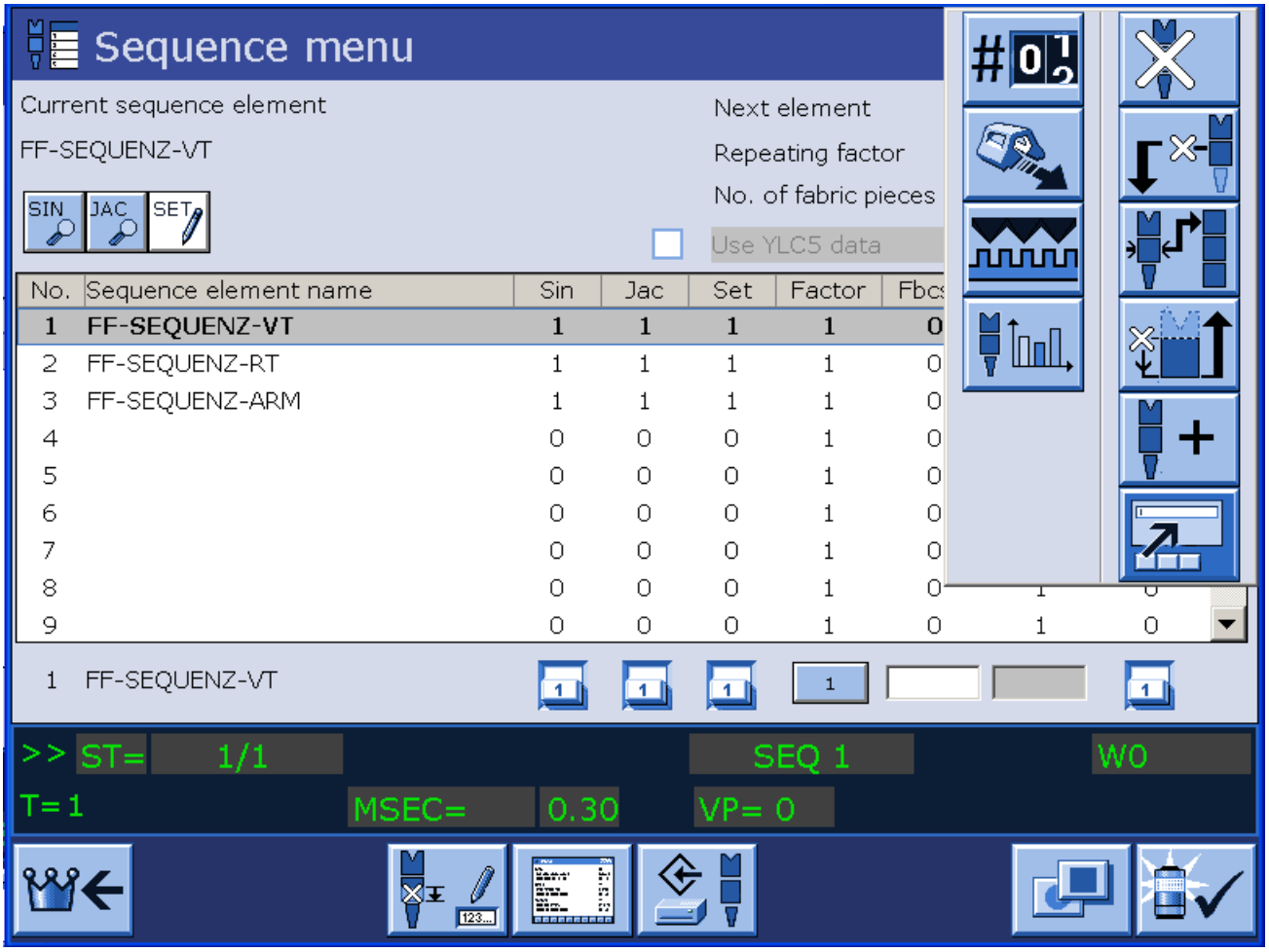
Key	Function
	◆ **Saving** a sequence (sequence definition) under a name (does **not** correspond to the **sequence name**) File: ◆ **Loading** a sequence
	**Open the sequence definition window:** Put together the programs to a sequence
	**Assembling a sequence list** from several saved sequences (sequence definitions) **i**: Not possible with **Setup2**
	Call up Running time control
	Deleting the displayed list ◆ in the sequence menu window ◆ in the sequence list window
	Starting the sequence **i**: Here, a check is carried out to ascertain whether all sequence elements exist and the first sequence element is loaded.
	**Deactivate** all **sequence elements** above the activated element. **Example:** When repeating knitting it is possible to deactivate a larger number of sequence elements at once.
	Switch on sequence elements

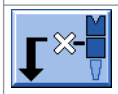
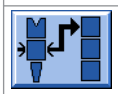
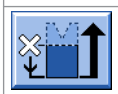
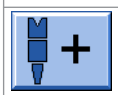
11.

Start the sequence by pressing the  key.

More additional function keys in the sequence menu:

1. Switch over to more function keys with  .



Key	Function
	Ending the sequence knitting i: Once knitting of sequence has been completed, this key must be pressed before reading in a new pattern.
	Restarts a sequence i: The sequence is terminated as quickly as possible, the active sequence element. Then the first sequence element will be restarted.
	"Clamp sequence - on" key. i: The currently active sequence element with its repeat factor continues to be knitted until the piece counter is on "0" or the button "Clamp sequence - off" is actuated.
	Restart of the current sequence element i: The sequence element currently being knitted is terminated as quickly as possible. The sequence element is restarted.
	Re-knitting of fabrics missing by faults
	Export whole sequence i: After selecting memory target, all loaded sequence elements are saved, carried out modifications included.

Key	Function
	Jacquard start in sequence menu **i:** The default value of the jacquard start is adjustable in the sequence menu (value in column "Mark"). Default setting: 1100

2. If necessary, save the sequence definition (sequence) under a **sequence file name** with the  key.
   ⇨ The sequence is saved as **.seqx** file with **Setup2**.

i	A sequence file name is not the same as a sequence name! **No sequence name** was used in this example.

25.4 Save and Load the Sequence

I. Save the sequence definition under sequence file name (**seqx**):

▷ The sequence menu is open.

1. Call up further functions with the  key.
2. Call up the "Catalog Sequence Data" menu with the  key.
3. Save the sequence definition (sequence) with the  key.
   ⇨ The entry window appears.
4. Enter a sequence file name and confirm.

II. Load a sequence (**seqx**):

1. Open "Sequence menu" dialog box:
2. Call up the "Catalog Sequence Data" menu with the  key.
3. Select the sequence file name (sequence) and load it with the  key.
   ⇨ The sequence elements named in the sequence are loaded.

25.5 Creating a Sequence List

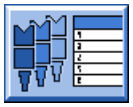
Function of sequence lists:

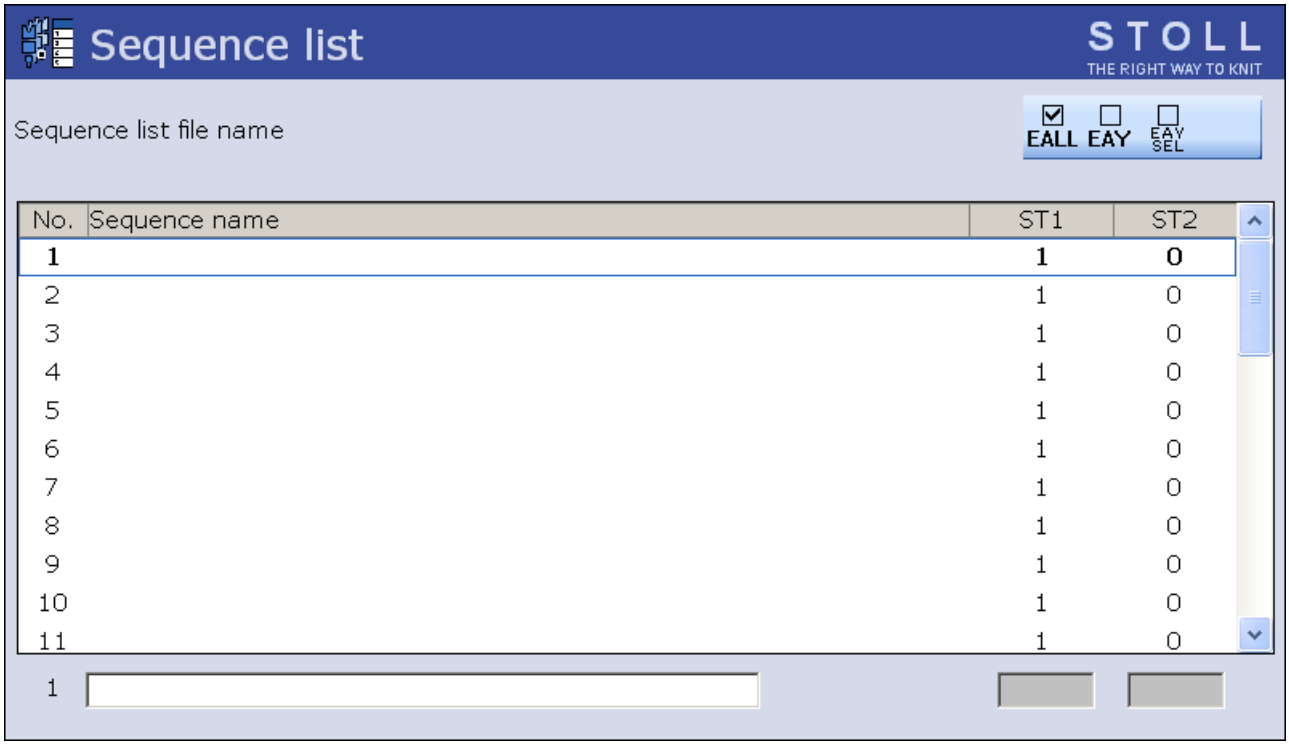
The sequence lists contain several sequence file names (sequences), which are to be produced in sequence.
Recommendation: Sequence lists are suitable for the production of different sizes.

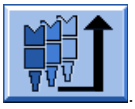
I. Putting together a sequence list:

▷ There are several sequence definitions (sequences) saved under one sequence file name.
(e. g. hard disc)

1. Call up further functions in the "Sequence menu" with the  key.

2. Call up the "Sequence List" via the  key.



3. Call up further functions in the Sequence List menu with the  key.
4. Tap the  key.
   ⇨ The sequence list definition is displayed.
5. Select the desired sequence file name and add it to the list with  .
6. Following the same procedure add more sequences to the list.
7. With the  key return to the "Sequence list" menu.
8. In the list with the sequences under **ST1** enter the desired **piece number**.
9. Tap the  key and start the sequence list with  .
   ⇨ The sequence list is initialized and the data of the first sequence list is loaded.

---

i An already started sequence list can be stopped via the  key under "additional function" keys.

II. Save sequence list:

▷ The sequence list menu is open.

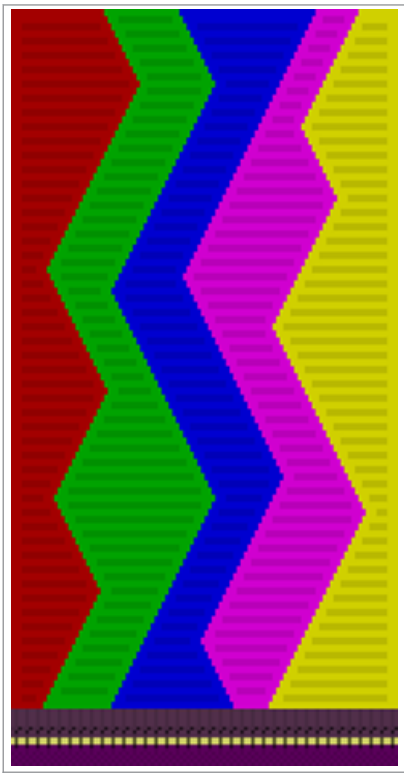
1. Tap the  key.
   ⇨ The "additional function keys" are displayed.
2. Call up the "Catalog Data of Sequence List" via the  key.
3. Select with the  key.
   ⇨ The entry window appears.
4. Enter the sequence list file name and confirm it.
5. With the  key return to the "Sequence list menu."

III. Load a sequence list:

▷ The sequence list menu is open.

1. Call up further functions with the  key in the "Sequence List" menu.
2. Call up the "Catalog Data of Sequence List" via the  key.
3. Select the desired Sequence list file name.
4. Load the sequence list with the  key.
   ⇨ The sequence names contained in the sequence list will be loaded.

26 Pattern 5: Intarsia technique



Pattern name	Intarsia_Technique
Start	2x1 Rib
Machine Type	CMS 530 HP 5“ with E 7.2 CMS 530 HP 6“ with E 3,5.2 CMS ADF 32 W with E 7.2
Operating mode of the machine	◆ with comb function ◆ with clamping / cutting
Pattern description	◆ Intarsia knitting technique: – With CMS 530 HP with 7 intarsia yarn carriers – With ADF no special yarn carriers ◆ Intarsia with SJ structure
Machine Parameters	**CMS 530 HP (Performer Machines)** ◆ Braking value setting **(Y:Ba-Bb)** – Manual input – Adjustment program **CMS ADF 32 W** ◆ No braking values adjustable / necessary
Pattern Parameters	◆ Yarn Carrier Correction **(YCI)**

26.1 Load and Set-up the Pattern

Procedure:

1. **Load pattern in machine.**
2. **Set up the pattern:**

■ **with Performer Machines:**

– Exchange Yarn Carriers (normal yarn carriers against Intarsia yarn carriers)

– Thread-up the Intarsia yarn carriers

– Adjust the Intarsia Yarn Carriers

- Position the Intarsia yarn carriers

■ **With ADF machines:**

- Threading up the Yarn Carriers
- Adjust the yarn carriers

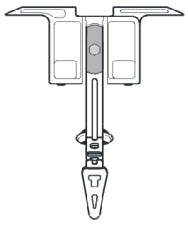
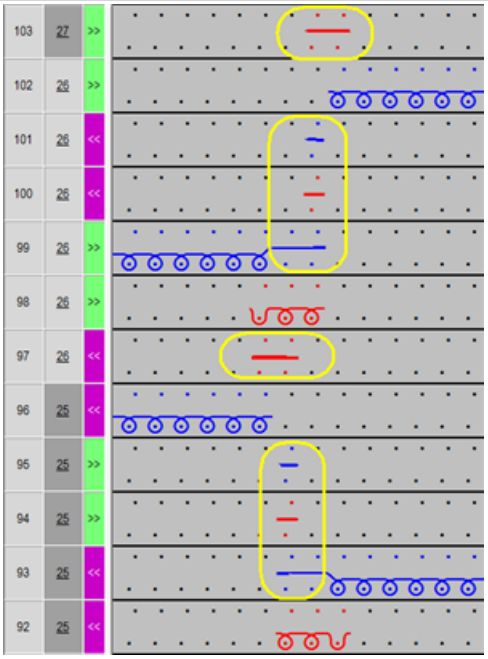
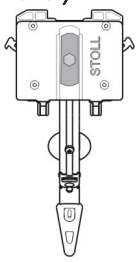
3. **Start the machine.**

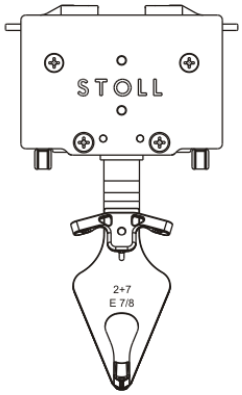
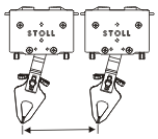
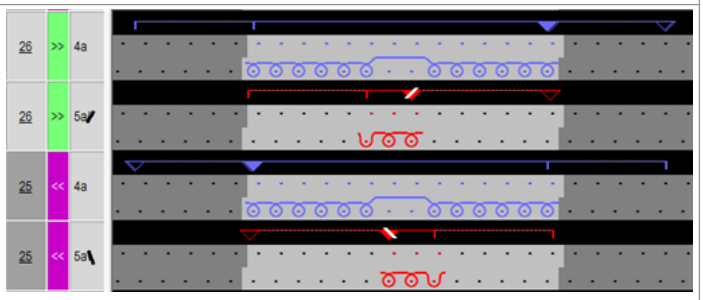
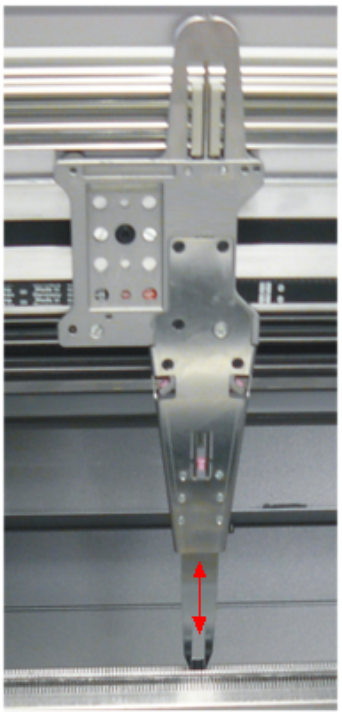
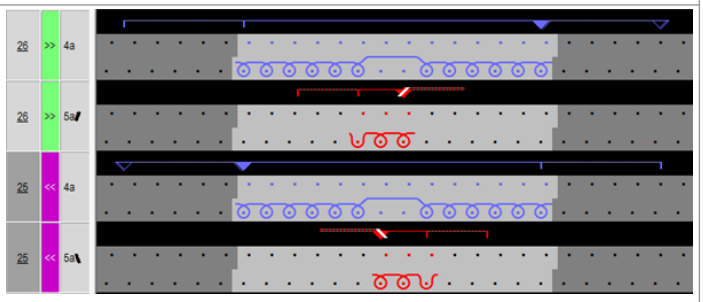
Make the following changes:

- Cycle counters (**RS**)
- Stitch Length (**NP**)
- Fabric take-down values (**WM, W+, WMK, ...**)
- Braking value of the yarn carriers (only necessary with Performer Machines)
- Corrections of yarn carriers (**YC / YCI**)

26.2 Yarn carrier types for the intarsia knitting technique

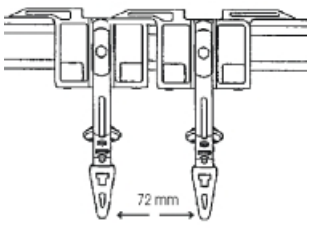
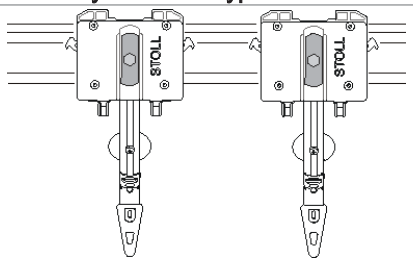
With the intarsia knitting technique, the yarn carriers are stopped in the fabric. This parking position leads to problems with the parked yarn carrier during the needle selection in the neighboring color field, i.e. the needles selected for knitting collide with the yarn carrier.
To avoid this collision, the yarn carriers are moved (kicked) out of the color field or parked in its own color field by swiveling the yarn carrier tip.

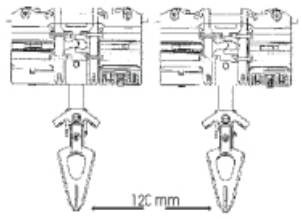
Yarn Carrier Type	Functioning principle	
Normal yarn carrier type 1 	Yarn carriers cannot swivel	 **i**: When using for the intarsia knitting technique, the yarn carriers are moved (kicked). This increases the production time.
Normal yarn carrier type 2 (optional) 		

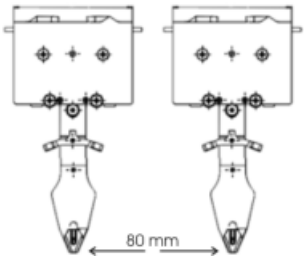
Yarn Carrier Type	Functioning principle	
Intarsia yarn carrier type 2 	Yarn carriers can swivel 	 **i**: At the end of the knitting row, the yarn carriers swivel into their own color field. The yarn carrier does not swivel at the fabric selvedge.
ADF yarn carrier 	Yarn carriers are moved autarkic in horizontal and vertical direction	 **i**: The yarn carrier is moved upward at the end of the color field and moved back to its color field in an autarkic way.

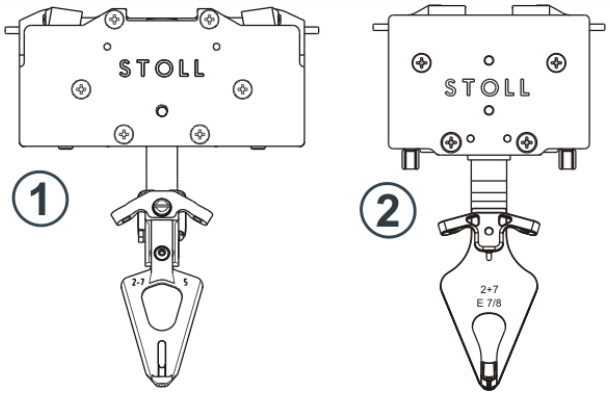
26.2.1 Intarsia Yarn Carriers with CMS Performer Machines and their way of working

Yarn carrier types:

Normal yarn carrier type 1	**Normal yarn carrier type 2**
	
Intarsia yarn carrier type **1**	**Intarsia yarn carrier Type 2**



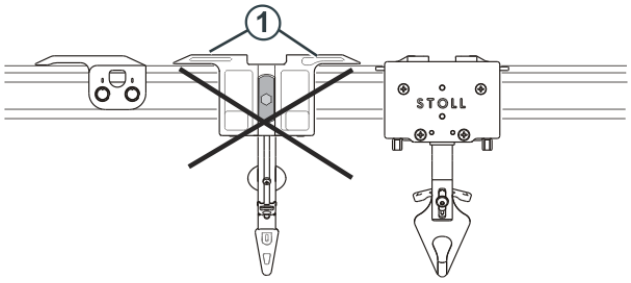


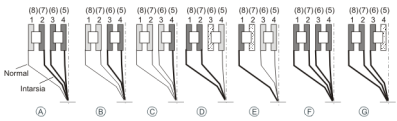


1	Intarsia yarn carrier type1	Use with Performer-Machines CMS 530 C and CMs 830 C with the old yarn carrier drive
2	Intarsia yarn carrier type2	Use with Performer-Machines starting with OKC 3.0 control with new yarn carrier drive

Combination of normal yarn carriers type 1 and intarsia yarn carriers type 2:

A normal yarn carrier type1 and an intarsia yarn carrier cannot work on the same yarn carrier rail.

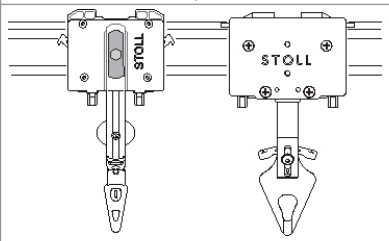
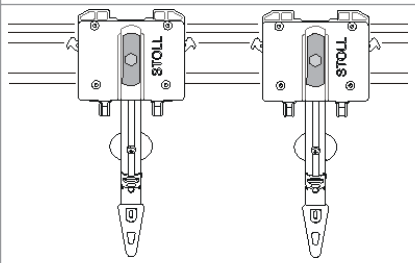
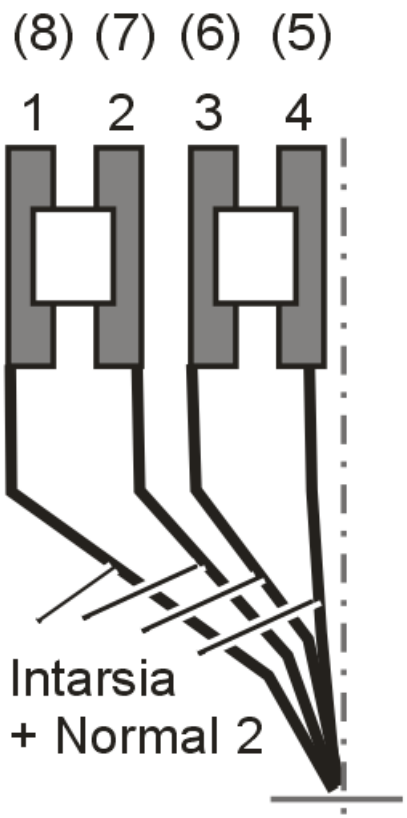
Yarn carrier types	Combination of the yarn carriers on one rail
Normal yarn carrier type 1 **Intarsia yarn carrier type 2**	 The disengaging arms (1) at the normal yarn carrier type 1 collide with the intarsia yarn carrier or the yarn carrier limiter.



Tip:
Equip the yarn carrier rails from inward to outward.

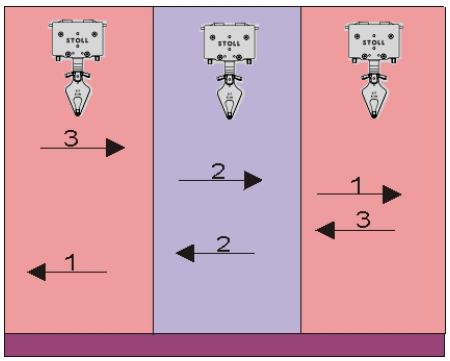
Benefit:
With the allocation from inward to outward no track must be kept empty when using intarsia and normal yarn carriers.

Combination of normal yarn carrier type 2 and intarsia yarn carrier type 2

Yarn carrier types	Combination of the yarn carriers on one rail
Normal yarn carrier type 2 **Intarsia yarn carrier type 2**	
Normal yarn carrier type 2 **Normal yarn carrier type 2**	
Advantage	◆ You can equip all yarn carrier rails as desired. 

Sequence of the knitting technique with intarsia:

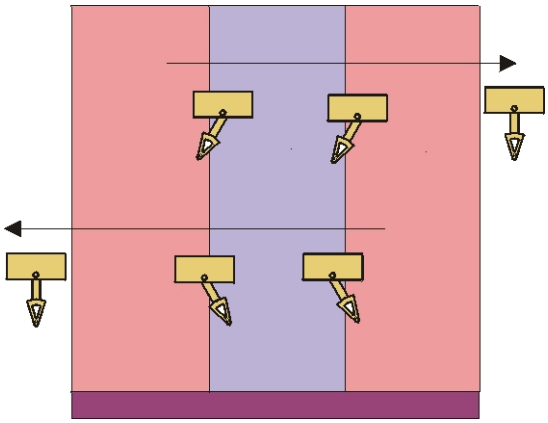
Consecutively, uniformly knitting intarsia yarn carriers:



The result is a nice, uniform binding at the color field edge = high quality.
With a high quantity of colors per knitting row this sequence leads to a high production time.

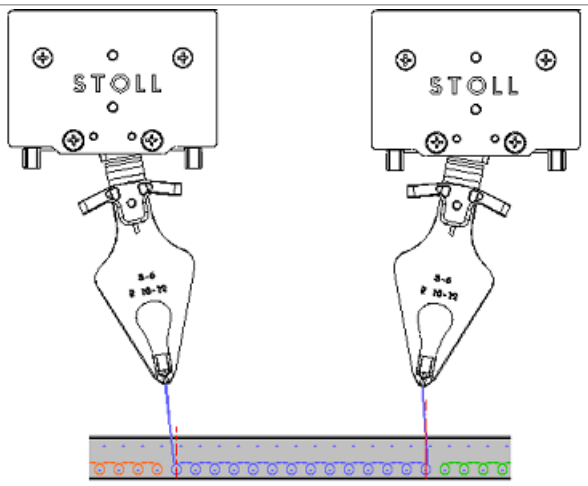
Way of working of an intarsia yarn carrier type 2 with Performer Machines:

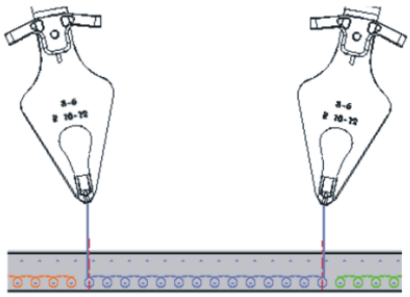
1. An intarsia yarn carrier is set upright from its swiveled position before knitting.
2. Knitting of the yarn carrier in its color field.
3. The brake is actuated and the yarn carrier is stopped at the end of the color field.
4. Swiveling the yarn carrier in its color field i.e. opposite to the carriage direction.



The yarn carriers stopped in the fabric are swiveled.
The yarn carriers stopped at the fabric selvedge are not swiveled.

Parking position of a swivelled intarsia yarn carrier:

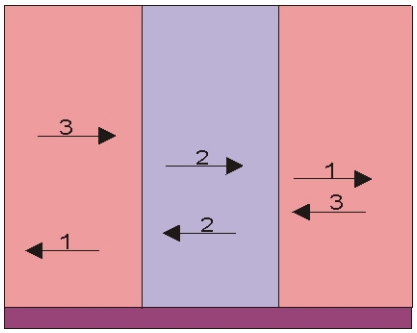
Parking position	
Not correct The yarn carrier is in the neighboring field, what can lead to a binding of the thread in the wrong color field.	
	i: Yarn carrier positions must be corrected.

Parking position	
Correct parking position	

26.2.2 Yarn Carriers with CMS ADF Machines and their way of working

Sequence of the knitting technique with intarsia with autarkic yarn carriers:

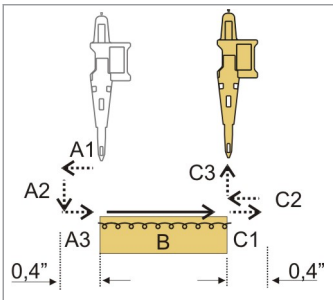
Consecutively, uniformly knitting ADF yarn carriers:



The result is a nice, uniform binding at the color field edge = high quality.
With a high quantity of colors per knitting row this sequence leads to a high production time.

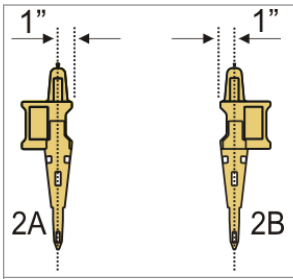
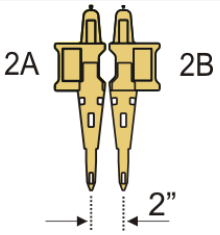
How a yarn carrier works with CMS ADF machines:

These autarkic yarn carriers doe not perform any swiveling movement.



A1	Overrun path: 0.4 inch (6 nic) Yarn carrier moves in upper position out of its color field by the overrun path.
A2	Yarn carrier moves in lower position.
A3	Yarn carrier moves to the beginning of its color field.
B	The yarn carrier works in its color field.
C1	Overrun path: 0.4 inch (6 nic) Yarn carrier moves further at the end of the color field by the overrun path
C2	Yarn carrier in lower position moves back to its color field.
C3	Yarn carrier moves to upper position.

Mechanical-induced distances:

	The width of the ADF-yarn carrier from the yarn carrier tip to the short side is **1 inch**.
	Two yarn carriers on the same track: The minimum distance is **2 inches**.

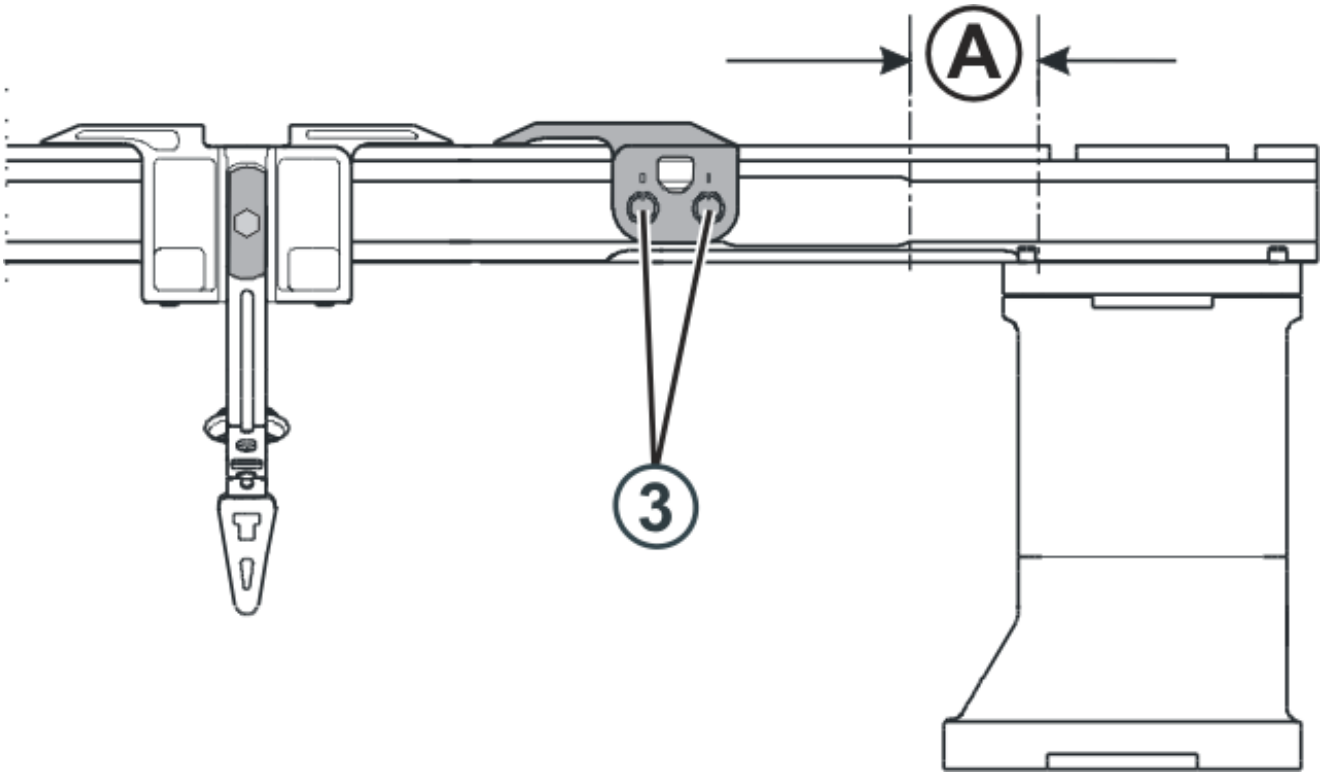
26.3 Exchange yarn carriers on Performer Machines

Based on the production time it is best to use intarsia yarn carriers for intarsia patterns.

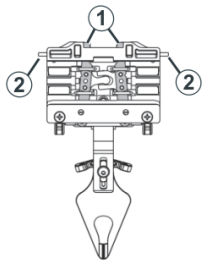
I. Procedure for exchanging a yarn carrier:

1. Stop the carriage assembly into the left reversing position.
2. Loosen the screws (3) of the yarn carrier limiter.
3. Remove yarn carrier limiter.

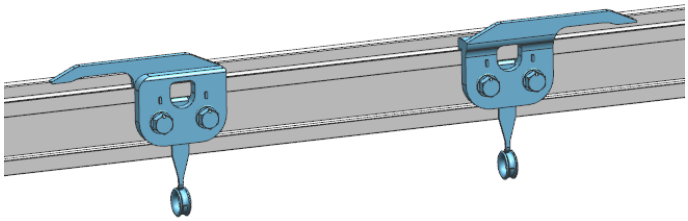
Yarn carrier limiters can be removed or mounted in any position.



4. Push the normal yarn carriers to position (A) at the right and remove them.
5. Mount the intarsia yarn carriers at position (A) on the track and push them into their starting positions.
   To do this, press the clamp (1) outward or the lifter (2) inward.



6. Mount the yarn carrier limiters with disengaging arms on the tracks!



7. Stag the yarn carrier limiters and lock them.

26.4 Adjustment of the yarn carriers on the machine

With Performer Machines:

- Guidance of the yarn carriers on the rails
- Vertical position (height)
- Horizontal position

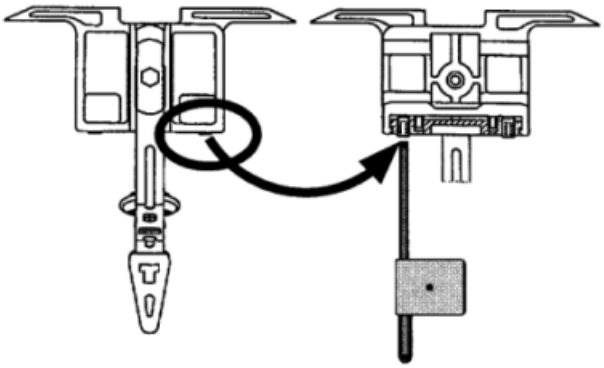
With ADF machines:

- Vertical position (height)
- Horizontal position

26.4.1 Adjustment of the Intarsia Yarn Carriers with Performer Machines

I. Adjust the guidance of yarn carriers:

1. To check whether the yarn carrier can be lifted from the yarn carrier rail, take the left and right sides of the yarn carrier housing in both hands and move the yarn carrier housing upward and downward.



2. If necessary push the setting key inwards with the adjusting key till the yarn carrier cannot be raised any more.
3. Turn the setting key back by one-eighth of a turn.

Same procedure with normal and intarsia yarn carriers.

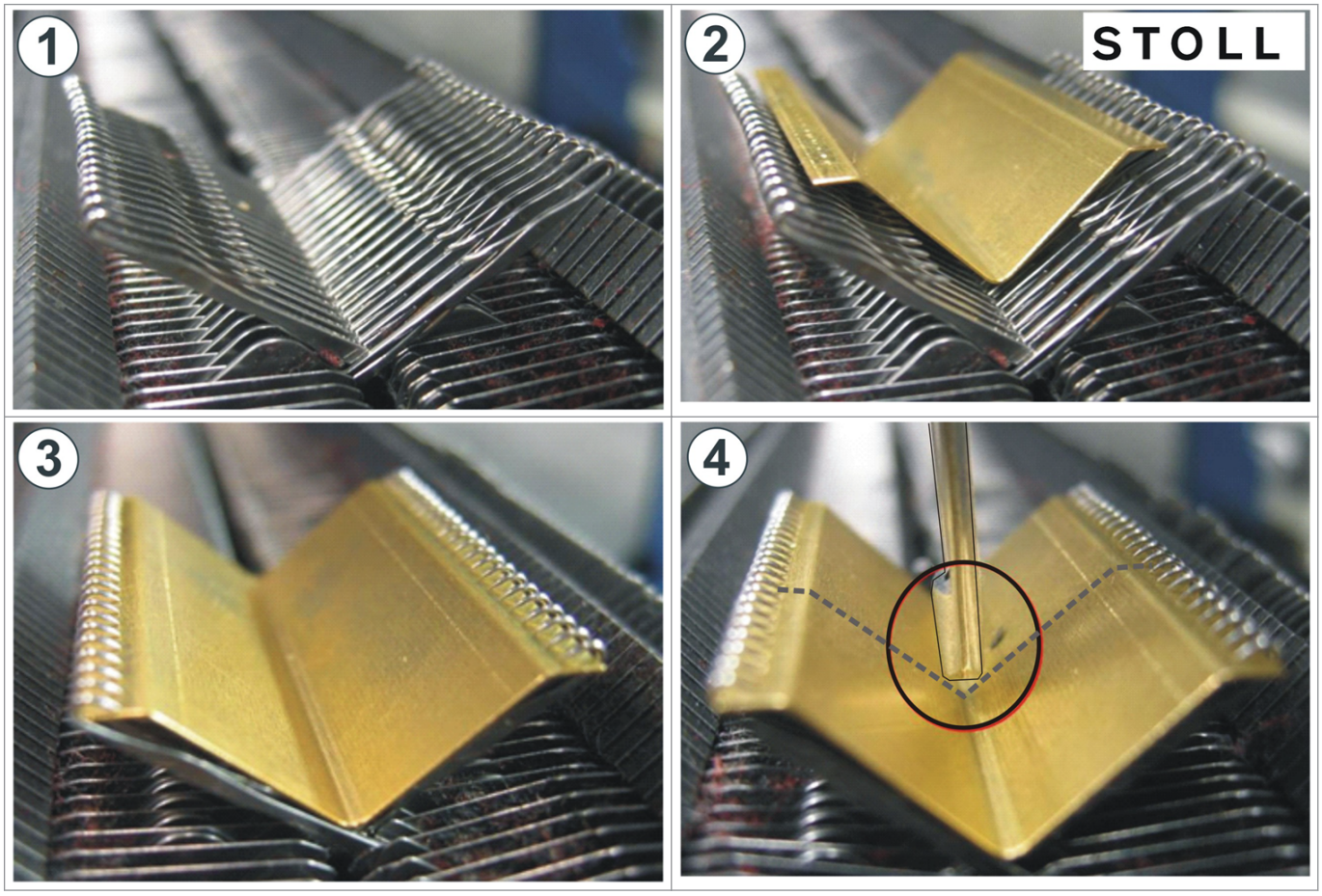
II. Adjustment of intarsia yarn carriers type 2:

The yarn carriers are correctly adjusted when:

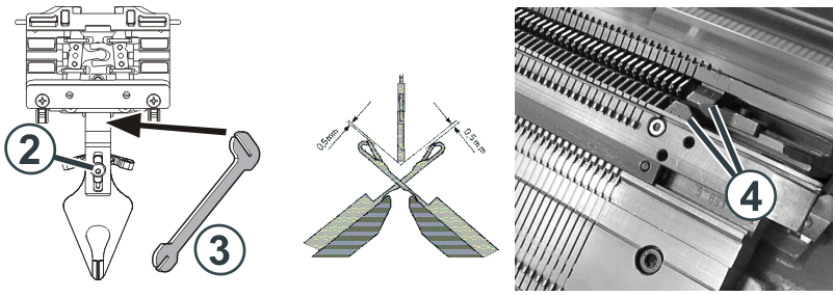
- an unswiveled yarn carrier passes by a swiveled yarn carrier.
- the yarn carrier tips move exactly between the needle beds in the needle cross and the distance between yarn carrier tips and the closed needle latch is 0.5 mm to 1 mm
- The yarn carriers of the track 1 and 8 are also set 0.5 higher so that they do not touch the lateral limiters (4) of the needle bed.

Procedure for adjusting an intarsia yarn carrier type 2:

1. Stop carriage assembly in needle area.
2. Insert yarn carrier shims in needles:



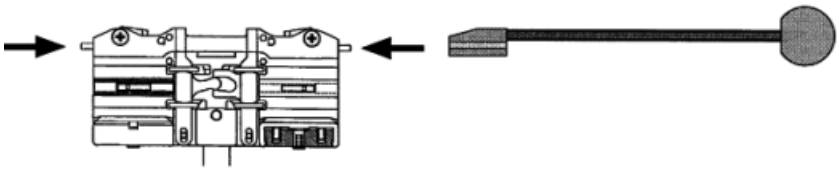
3. Loosen the screw (2) to adjust the height of the yarn carrier.



4. Adjust the height of the yarn carrier and re-tighten the screw (2).
5. In order to adjust the position of the yarn carrier tip laterally, bend the yarn carrier bow carefully (without using force) by means of the adjusting part (3).

III. Move the intarsia yarn carrier in the area of the carriage:

Intarsia yarn carriers located in the area of the carriage cannot be shifted by hand. Use the shifting device.



1. Press the lifters inward with the shifting device and shift the yarn carrier out of the area of the carriage.

IV. Check and correct the parking position of an intarsia yarn carrier:

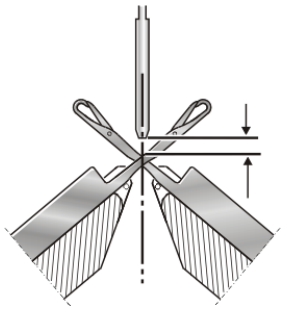
As soon as an intarsia yarn carrier reaches the end of its working area, the driver is lifted out of the yarn carrier. The yarn carrier is braked and swivels back into its color field.

Cause of wrong parking position	Remedy
Inner surface of the yarn carrier rail is oily or greasy	Clean the oily or greasy braking surface of the yarn carrier rail.
Stopping time of the yarn carrier is not set correctly	Adjust the braking value of the yarn carriers directly on the machine.
Pressure plates are worn	Turn over or replace the pressure plates (see operating instructions of the machine)

26.4.2 Adjustment of the Intarsia Yarn Carriers with ADF Machines

Optimized adjustment of the yarn carrier depends:

- on the centering of the yarn carrier tip.
  It is correctly adjusted if it is located exactly between both needle beds.

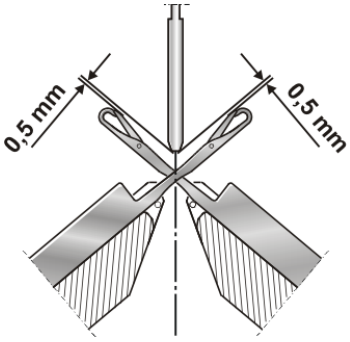


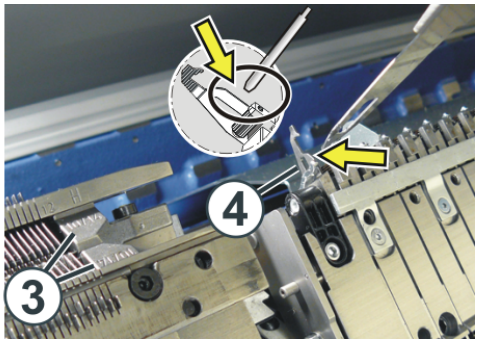
- on the height of the yarn carrier

If one of both settings are incorrect, there will be errors in the fabric or the needles will be damaged.

The yarn carriers are correctly adjusted if

- the thread is laid on the open latch at exactly the same point by each yarn carrier for both selvedge needles
- the yarn carrier tips move exactly between the needle beds in the needle cross and the distance between yarn carrier tips and the closed needle latch is 0.5 mm to 1 mm





- the yarn carriers of the track 1 and 16 are set 0.5 mm higher additionally so that they do not touch the limiters 3

- the yarn carrier in the clamping and cutting area does not press the cutting needle 4 located in the working position

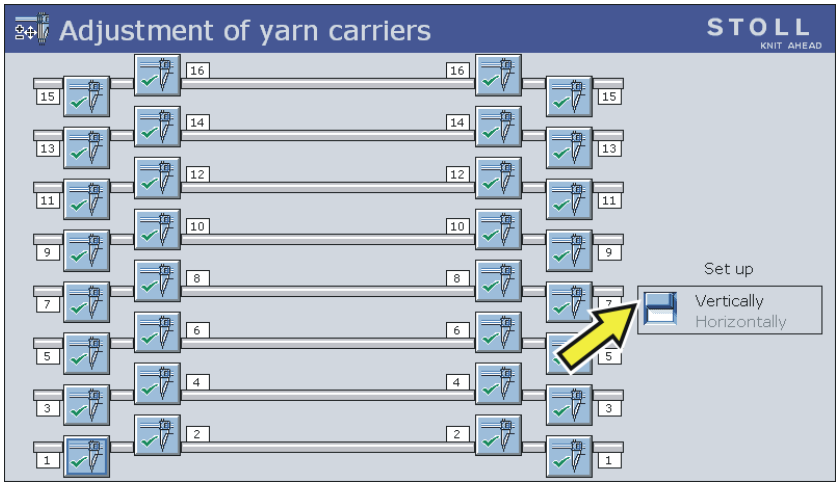
The yarn carrier must be adjusted on the software and on the hardware side.

26.4.2.1 Vertical adjustments of a yarn carrier

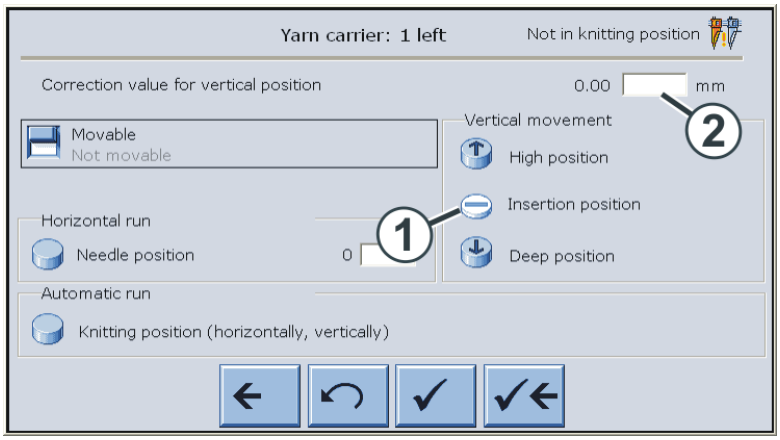
26.4.2.1.1 Centering a yarn carrier

I. Checking the centering:

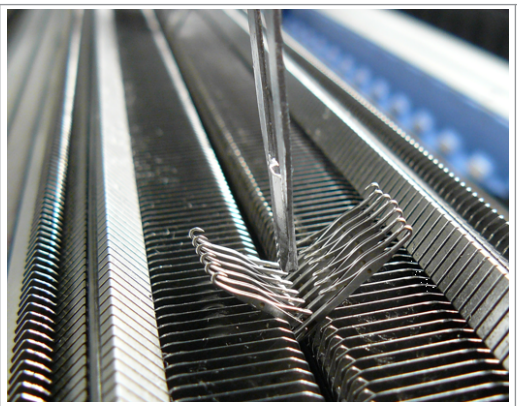
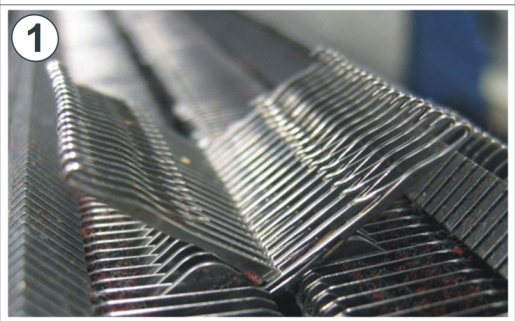
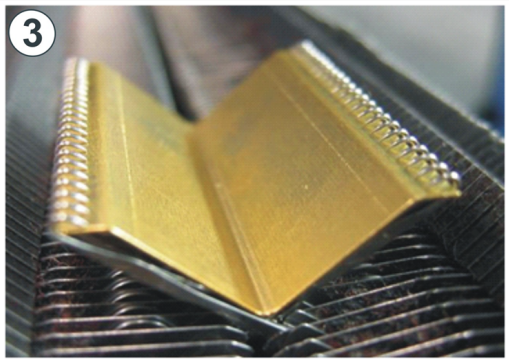
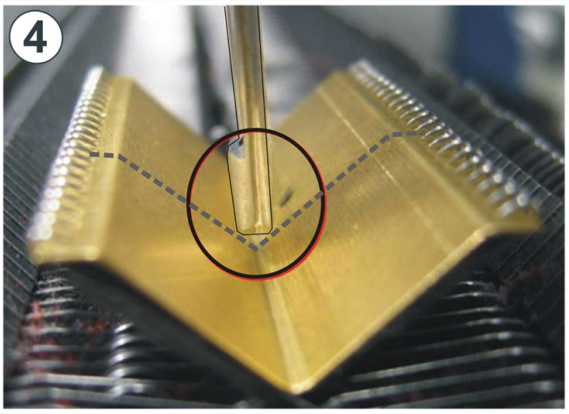
1. Call up the "Service"  window in the "Main menu".
2. Tap the "Adjustment of yarn carriers"  key.
   ⇨ The "Adjustment of yarn carriers" window appears.



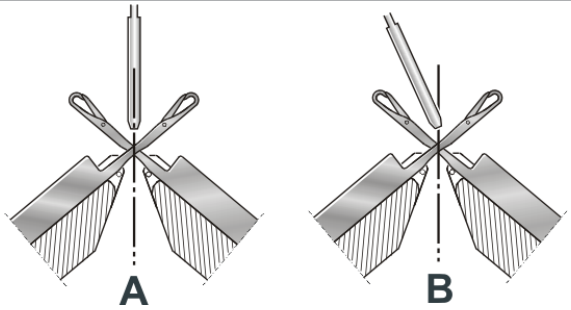
3. For "Adjustment" set the switch to "Vertically".
4. Tap on the yarn carrier to be centered.
   ⇨ The setting window appears.



5. Open the covers and move the yarn carrier to a position where the yarn carrier can be controlled.
6. Form a "needle cross":

Possibilities of forming a needle cross		
Manually		For that purpose, manually slide upward several needles of the front needle bed and the the opposite needles of the rear needle bed.
With shims		
		

7. Check the position of the yarn carrier tip.
   For that purpose move the yarn carrier manually into the "needle cross" and check the adjustment.

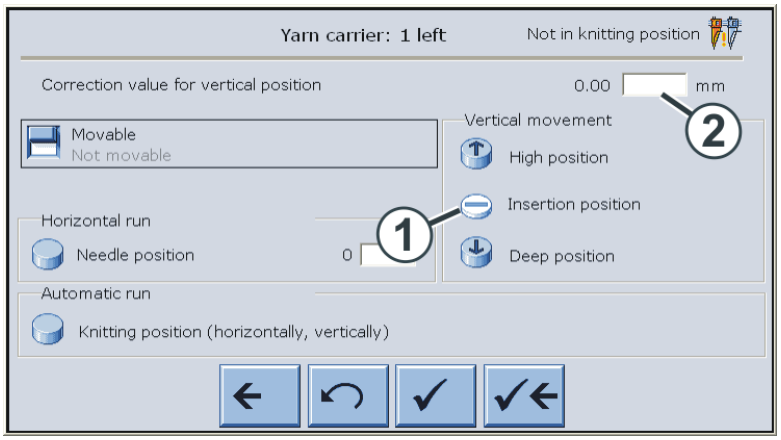
Position of the yarn carrier tip	
	
A	Inner yarn carrier (track 7, 8 or 9)
B	Outer yarn carrier (track 1, 2, 15 or 16)

i The adjustment is correct if the yarn carrier tip is located exactly vertically above the crossing point of the front and rear needles.

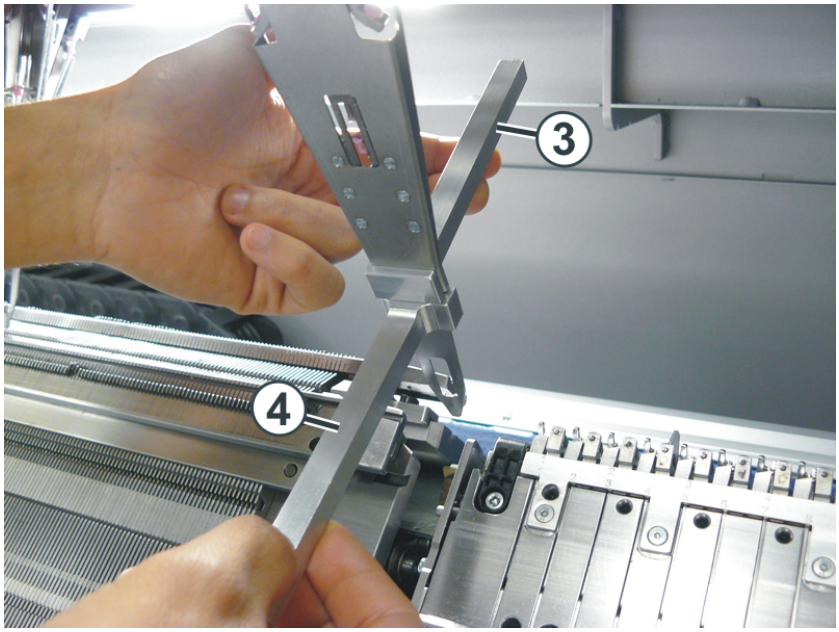
II. Centering the yarn carrier:

▷ The covers must be closed.

1. The yarn carrier must be brought into the insertion position (knitting) with the (1) key.
   ⇨ If the yarn carrier is located in the insert position, the (1) key is greyed out.



2. Open the covers.
3. Move the yarn carrier between needle bed and clamping and cutting bed.
4. With the help of the two adjusting levers (3) and (4) center the yarn carrier tip (.)



Procedure:

5. Position the adjusting lever (3) at the connecting point "yarn carrier sliding block tip" in the upper part of the yarn carrier.
   ⇨ It serves as protection for the upper area of the yarn carrier. If this area is distorted, the yarn carrier can no longer be moved upward.
6. With the lower adjusting lever (4) bend carefully (without using force) the yarn carrier tip to the front or to the rear.
7. Check the adjustment:

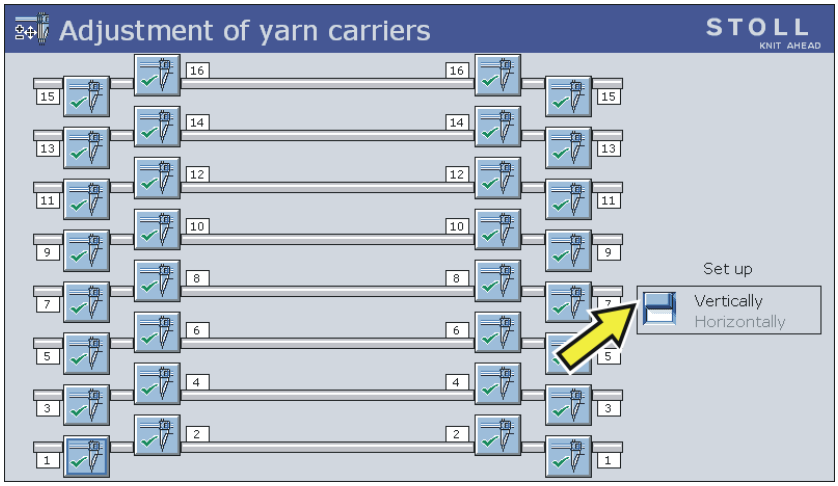
■ For that purpose move the yarn carrier over the needle cross.

■ The adjustment is correct, if the lower end of the yarn carrier tip is located exactly in the center of the needle cross.

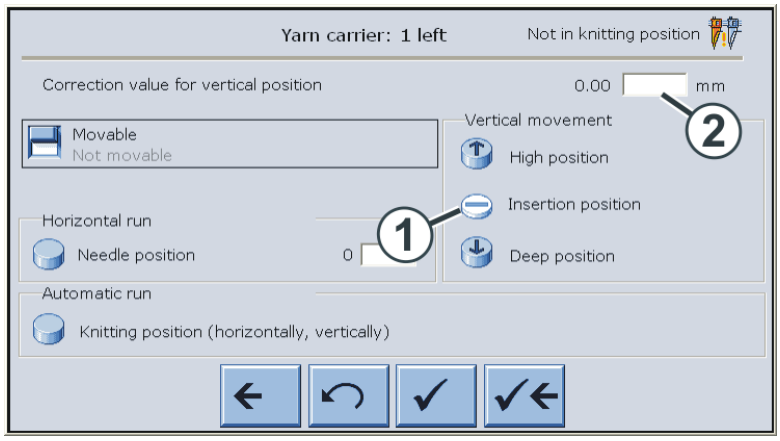
26.4.2.1.2 Adjusting the height of the yarn carrier

This adjustment of the yarn carrier is machine related!!
Additional pattern related adjustments may be required.

1. Call up the "Service"  window in the "Main menu".
2. Tap the "Adjustment of yarn carriers"  key.
   ⇨ The "Adjustment of yarn carriers" window appears.



3. For "Adjustment" set the switch to "Vertically".
4. Tap on the yarn carrier to be centered.
   ⇨ The setting window appears.



5. In the field (2) enter enter the desired correction value for the height.

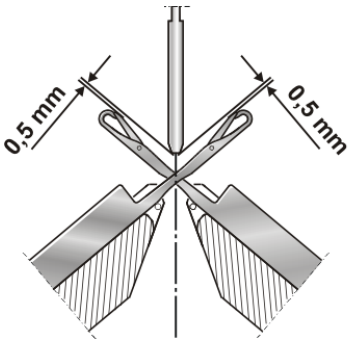
	Value range	
2	-2.5 ... 0 ... 2.5 Step width: 0.05 mm	Default =0

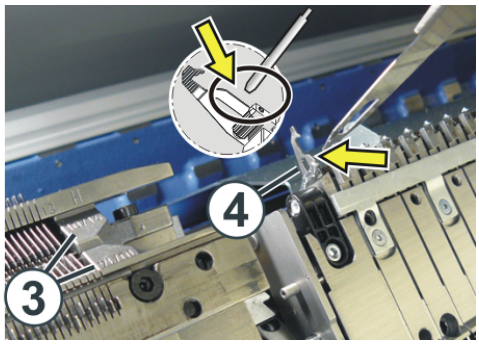
6. Check the height:

- Manually in the needle cross
- With the help of the shim

The yarn carriers are correctly adjusted if

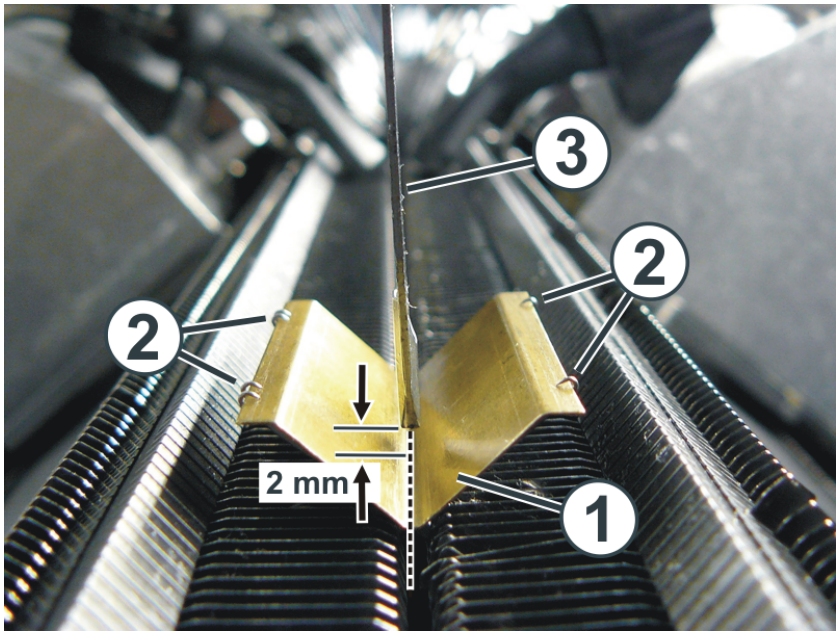
- the thread is laid on the open latch at exactly the same point by each yarn carrier for both selvedge needles
- the yarn carrier tips move exactly between the needle beds in the needle cross and the distance between yarn carrier tips and the closed needle latch is 0.5 mm to 1 mm





- the yarn carriers of the track 1 and 16 are set additionally 0.5 mm higher so that they do not touch the limiters (3)
- the yarn carrier in the clamping and cutting area does not touch the cutting needle (4) located in the working position

Adjust the Yarn Carriers With the Adjustment Gauge



1. Position the adjustment gauge (1) between the needle beds.
2. Fix the adjustment gauge.
   Therefore push one needle (2) on the left and right of the gauge each upward, open the needle latches and pull them back then. Do this on both needle beds.
3. Push the yarn carrier (3) over the adjustment gauge.
4. The adjustment is correct if:

- the distance from the yarn carrier tip to the gauge is about 2 mm.
- the end of the yarn carrier tip is exactly in the center of the gauge.

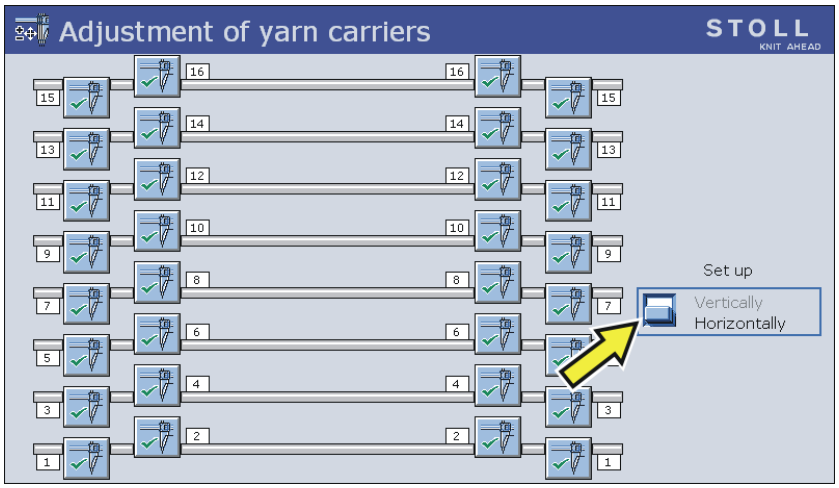
26.4.2.2 Horizontal adjustment of a yarn carrier

26.4.2.2.1 Adjust yarn carrier horizontally

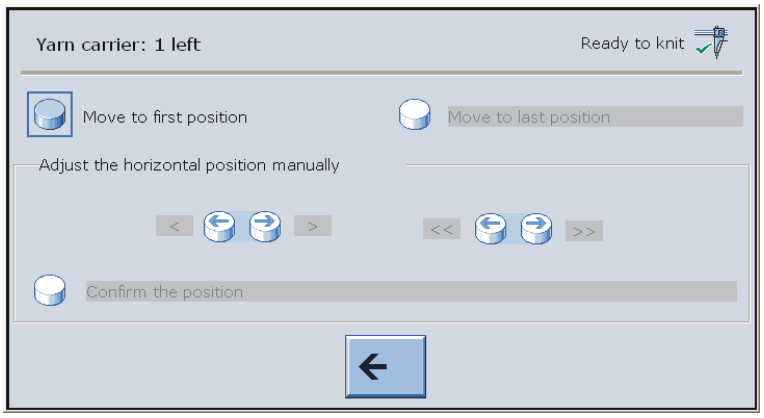
This adjustment of the yarn carrier is machine related!!
Additional pattern related adjustments may be required.

Key	Function
	Call up the "Service" menu
	Call up the "Adjustment of yarn carriers" window

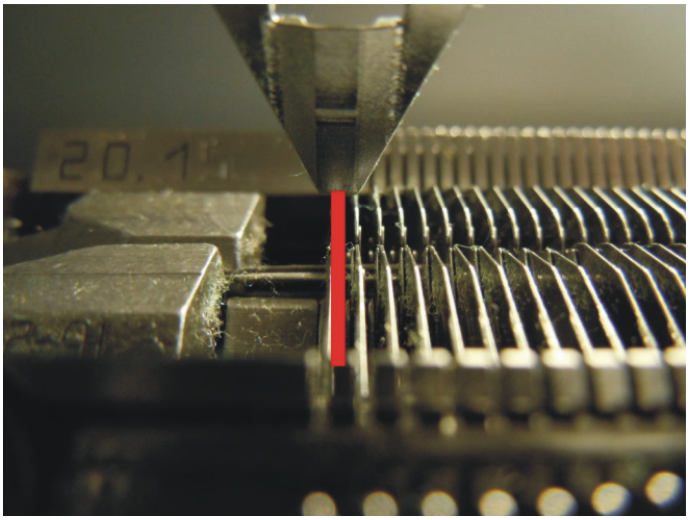
1. Call up the "Service"  window in the "Main menu".
2. Tap the "Adjustment of yarn carriers"  key.
   ⇨ The "Adjustment of yarn carriers" window appears.



3. For the "Adjustment" set the switch to "Horizontally".
4. Tap on the yarn carrier to be centered.
   ⇨ The setting window appears.



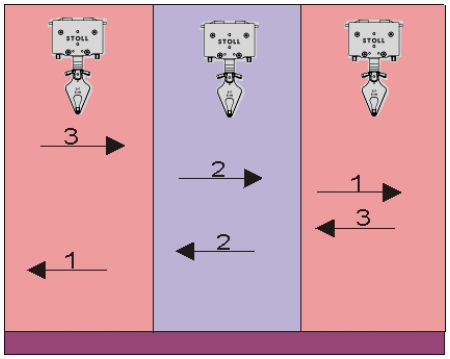
5. Tap on the "Move to first position" key.
6. With the help of the arrow keys in the "Manually adjust the horizontal position" field, move the yarn carriers until the yarn carrier tip is centered to the first needle.



7. Tap on the "Confirm position" key to confirm the adjustment.
   ⇨ The yarn carrier is adjusted.
   The yarn carrier automatically runs into its starting position.

26.5 Intarsia Knitting Technique and Programming

I. Knitting sequence for intarsia knitting technique on Performer Machines:

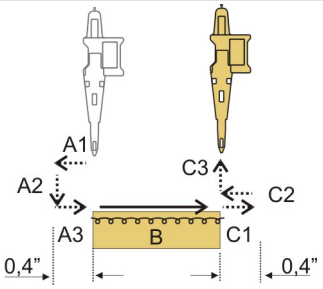


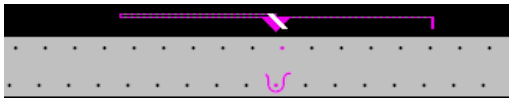
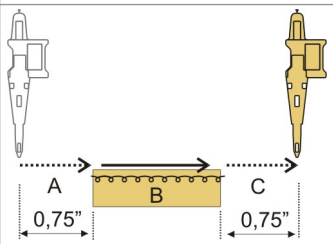
- The color fields are individually knitted one after the other
- At the end of the color field, the yarn carrier is swiveled into its own color field

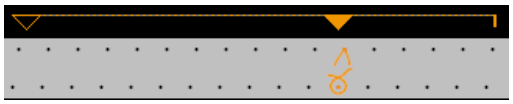
i	The result is a nice, uniform binding at the color field edge = high quality. With a high quantity of colors per knitting row this sequence leads to a high production time.

II. Knitting sequence for intarsia knitting technique on ADF machines:

i	The **autarkic yarn carrier** does not perform **any swiveling movement**. This yarn carrier performs an upward / downward movement, which equals the swiveling of an intarsia yarn carrier. For the knitting process the yarn carrier is positioned low and moved horizontally.

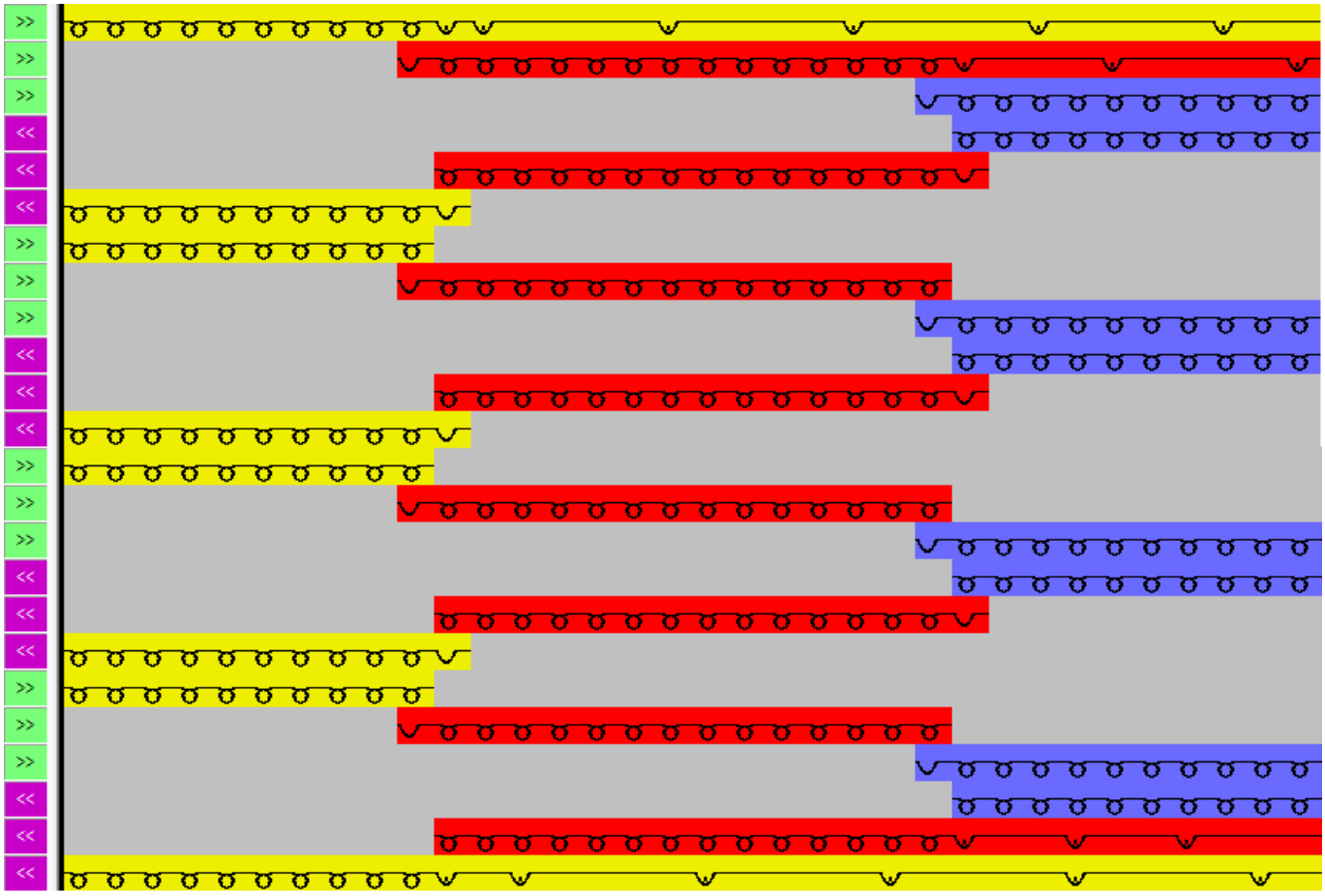
<table>
<tr><th>Conventional
Intarsia yarn carrier</th><th>Autarkic yarn carrier</th><th>Presentation of autarkic yarn carriers movement</th></tr>
<tr><td>Yarn carrier swiveled</td><td>The yarn carrier is positioned in its color field.
i: The overrun path is 0.4" (6 nic). This ensures a secure yarn insertion during the following knitting.</td><td> 

Graphic presentation in the technical view:
  </td></tr>
<tr><td rowspan="2">Yarn carrier not swiveled</td><td>The yarn carrier is positioned in the neighboring color field.
i: The behavior is similar to a normal yarn carrier, i.e. the overrun path is 0.75" (12 nic).</td><td> 

Graphic presentation in the technical view:
  </td></tr>
<tr><td colspan="2">i: The specification nic means: 1 nic = 1/16 inch = 1.5875 millimeters.</td></tr>
</table>

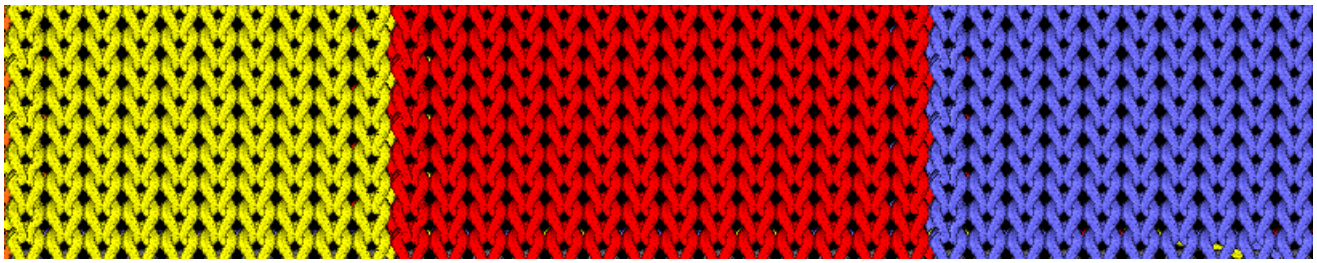
III. Fabric View

Stitch line:

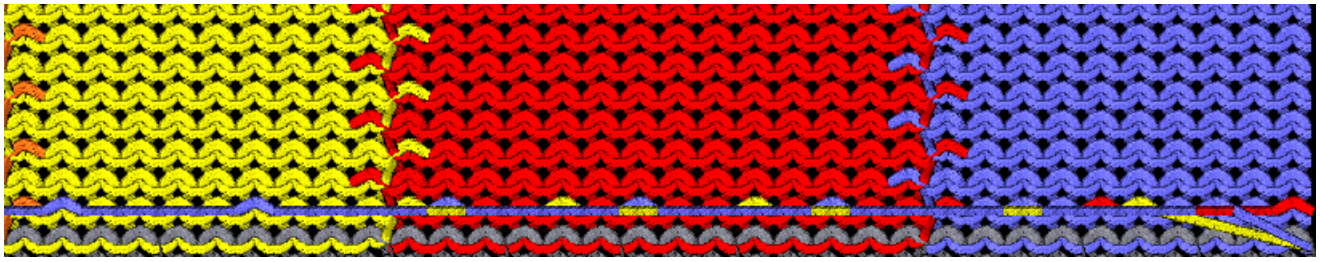


- **Knitting-in / knitting-out the yarn carriers** for ex. with the tuck binding / float needle actions
- **Binding at the color field edge** with tuck

Fabric front:



Fabric back:



26.5.1 Distances of intarsia yarn carriers with double assignment on Performer Machines

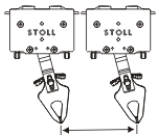
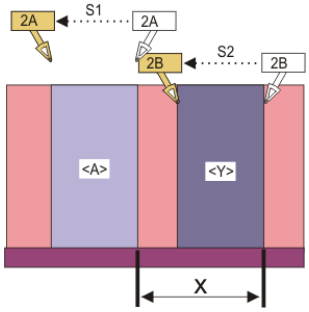
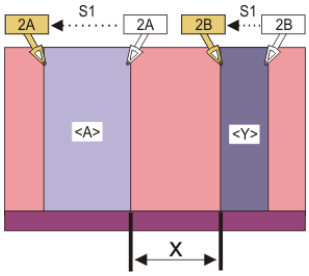
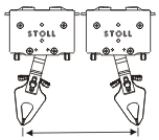
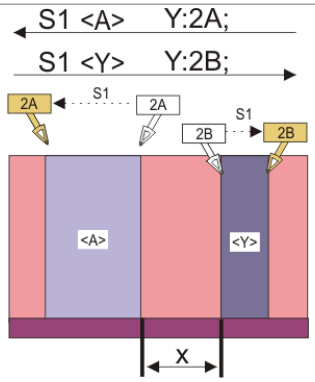
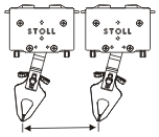
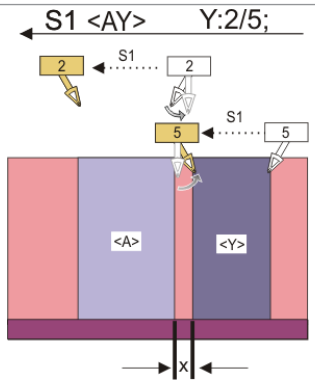
The distances depend on:

- on the intarsia binding between the color fields.

■ The parking position of the yarn carrier in the preceding row.

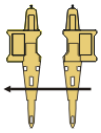
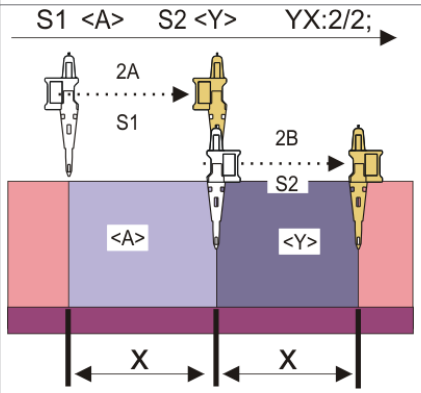
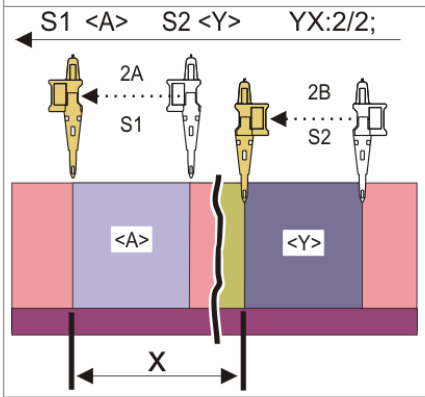
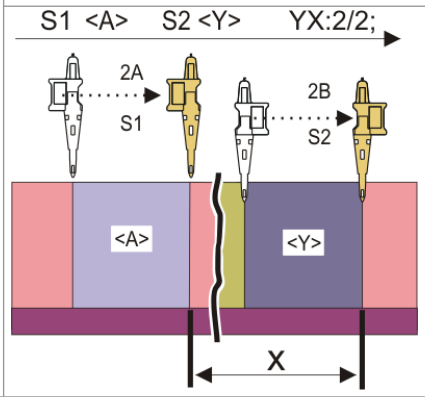
i	In case of color fields that have an angular course the distance can be greater.

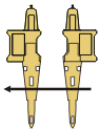
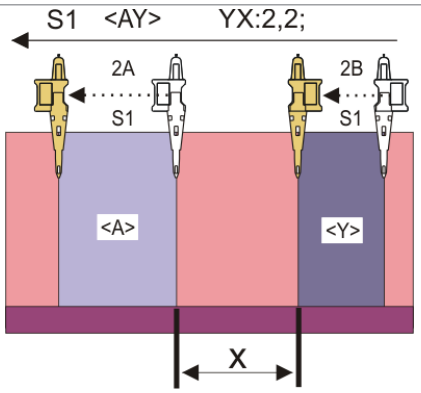
■ Pattern-dependent yarn carrier correction values **K<I>**

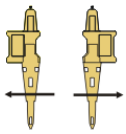
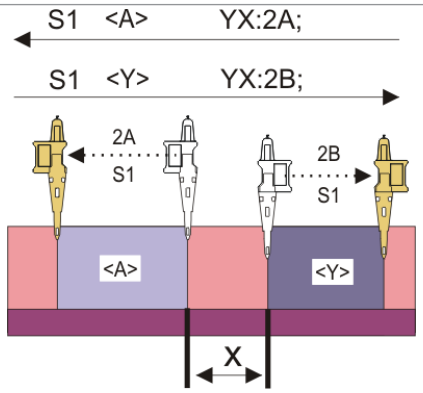
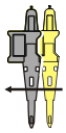
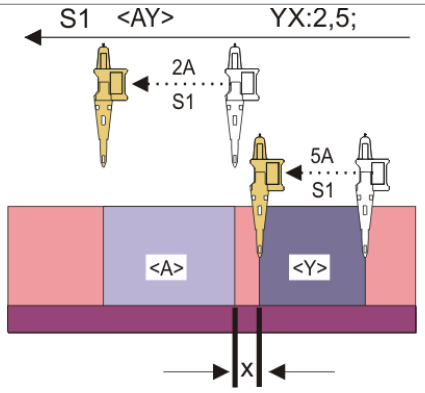
			Intarsia yarn carrier type	Distance (x) by inches
Intarsia yarn carriers knitting in the same carriage direction 	with two systems	S1 <A> S2 <Y> Y:2/2; 	Intarsia yarn carrier **Type 2**	**4**
			Intarsia yarn carrier **Type 1** () Intarsia yarn carrier Type 1 (**CMS 520 C**)	**6**
			Intarsia yarn carrier **Type 1** () Intarsia yarn carrier Type 1 (**CMS 830 C**)	**6**
	with one system	S1 <AY> Y:2 2; 	Intarsia yarn carrier **Type 2**	**6**
			Intarsia yarn carrier **Type 1** () Intarsia yarn carrier Type 1 (**CMS 520 C**)	**9,7**
			Intarsia yarn carrier **Type 1** () Intarsia yarn carrier Type 1 (**CMS 830 C**)	**9,6**
Intarsia yarn carriers work in the opposite carriage directions 		S1 <A> Y:2A; S1 <Y> Y:2B; 	Intarsia yarn carrier **Type 2**	**6**
			Intarsia yarn carrier **Type 1** () Intarsia yarn carrier Type 1 (**CMS 520 C**)	**9,7**
			Intarsia yarn carrier **Type 1** () Intarsia yarn carrier Type 1 (**CMS 830 C**)	**9,6**
Distance of colors that work in the same system.  i: The yarn carrier may not swivel into the color field knitted by the same system.		S1 <AY> Y:2/5; 	Intarsia yarn carrier **Type 2**	**1**
			Intarsia yarn carrier **Type 1** () Intarsia yarn carrier Type 1 (**CMS 520 C**)	**2,7**
			Intarsia yarn carrier **Type 1** () Intarsia yarn carrier Type 1 (**CMS 830 C**)	**2,0**

i	The table shows minimum distances of two intarsia yarn carriers on the same yarn carrier rail.

26.5.2 Distances of yarn carriers with double assignment on CMS ADF Machines

Function	Systems		Distance (x) by inches
Two yarn carriers on the **same track** work in the **same carriage direction** 	with 2 systems		**2,4“ (1"+1"+0,4")**
			**2,4“ (1"+1"+0,4")**
			**2,4 (1"+1"+0,4")**

Function	Systems		Distance (x) by inches
Two yarn carriers on the **same track** work in the **same carriage direction** 	with one system		**2,8“ (1"+0,4"+1"+0,4")**

Function	Systems		Distance (x) by inches
Two yarn carriers on the **same track** work in the **different carriage direction** 	with one system		**2,4“ (1"+1"+0,4")**
Two yarn carriers on the **different tracks** work in the **same carriage direction** 	with one system		**0,6“**

26.6 Pattern specific concepts of the intarsia knitting technique

Pattern example

Presentation of the fabric front	Presentation of the fabric back
	

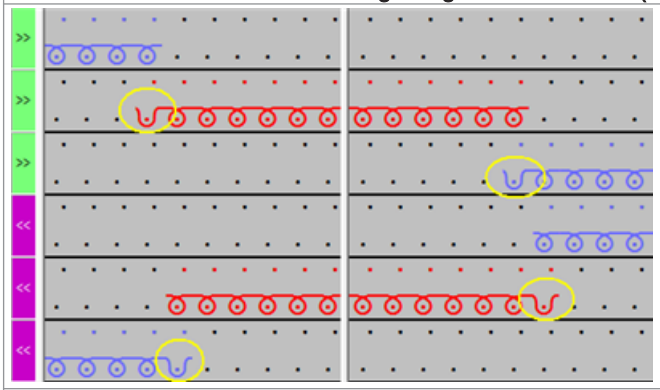
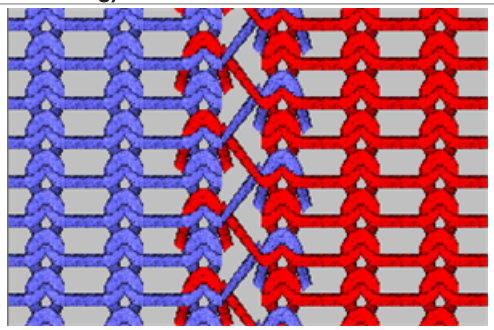
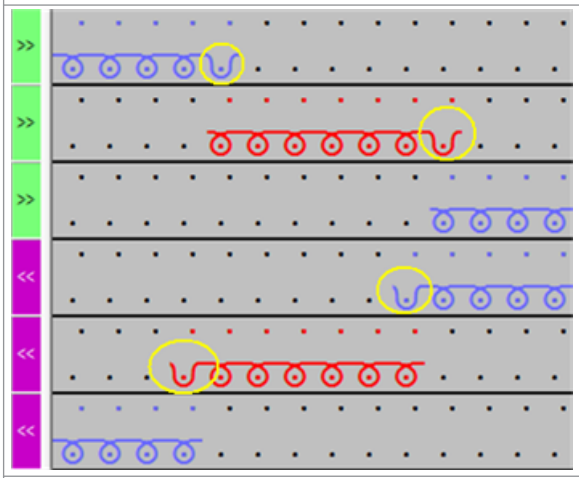
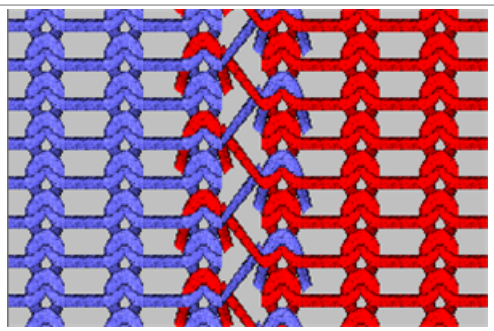
- Intarsia binding / Gore binding at the color field selvedges
- Border processing of the color field selvedges
  - Feed
  - Reduce
  - Allowed Stepping
- Knitting-in / knitting-out the yarn carriers

26.6.1 Intarsia binding / Gore binding

Intarsia binding / Gore binding

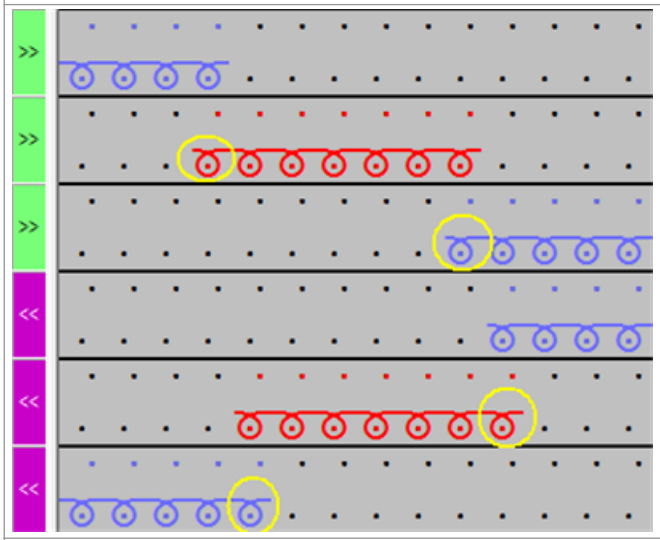
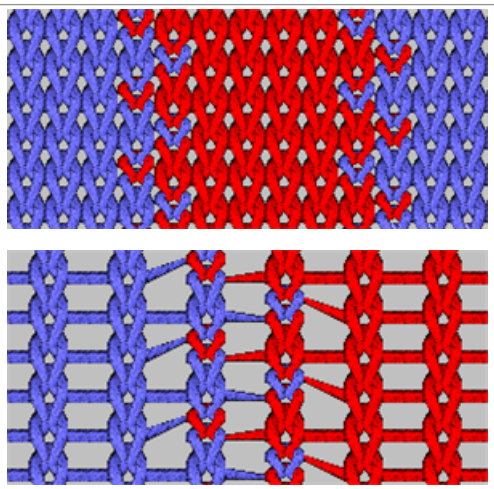
Under binding is meant the way of interconnecting two neighboring knitting areas (color fields).
The binding can be carried out at the beginning of the color field or at the end of the color field, i.e. the binding is carriage stroke dependent.

Binding with the binding element tuck (default)

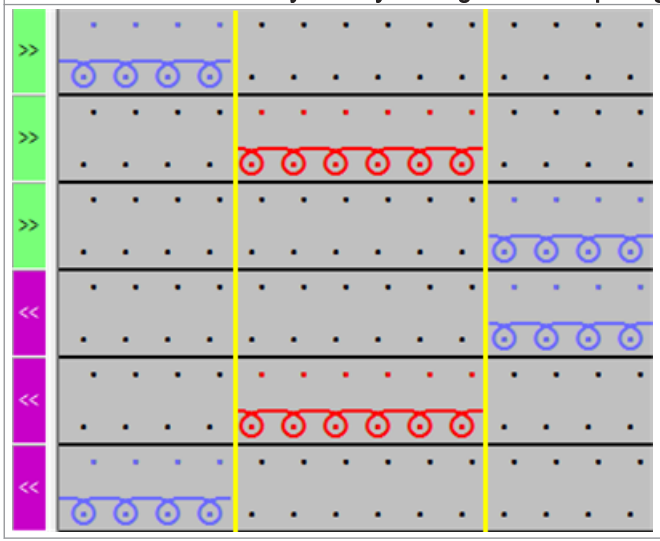
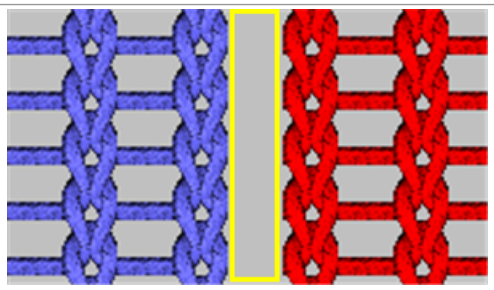
Technical view	Fabric View
Both color fields knit tuck at the beginning of the color field (default setting)	
	
The binding is knitted at the beginning of the color field i: The binding is secure as the following yarn carrier binds the tuck.	Closed color field selvedge i: Binding at the fabric back
Both color fields knit tuck at the end of the color field	
	
The binding is knitted at the end of the color field i: Binding not so secure!!	Closed color field selvedge i: Binding at the fabric back

Binding with Binding Element Stitch

Technical view	Fabric view fabric front
Both color fields knit stitch	

Technical view	Fabric view fabric front
	
The binding is knitted at the beginning of the color field.	Closed color field selvedge through stitch i: Binding on the fabric front as patterning effect.

No binding at both color field selvedges

Technical view	Fabric view fabric front
Both color fields don't carry out any binding = vertical opening	
	

Combination possibilities of the different bindings

You have many options of combining the types of bindings at the color field selvedges, where the right and left color field selvedge may also differ from each other.

26.6.2 Intarsia border processing

Intarsia border processing

With the concept **Border processing** is meant the processing of the steps at a color field selvedge (edge) depending on the carriage direction.

- Concept Feed with Allowed Stepping [▷ 210]
- Concept Reduce with Allowed Stepping [▷ 212]

26.6.2.1 Concept Feed with Allowed Stepping

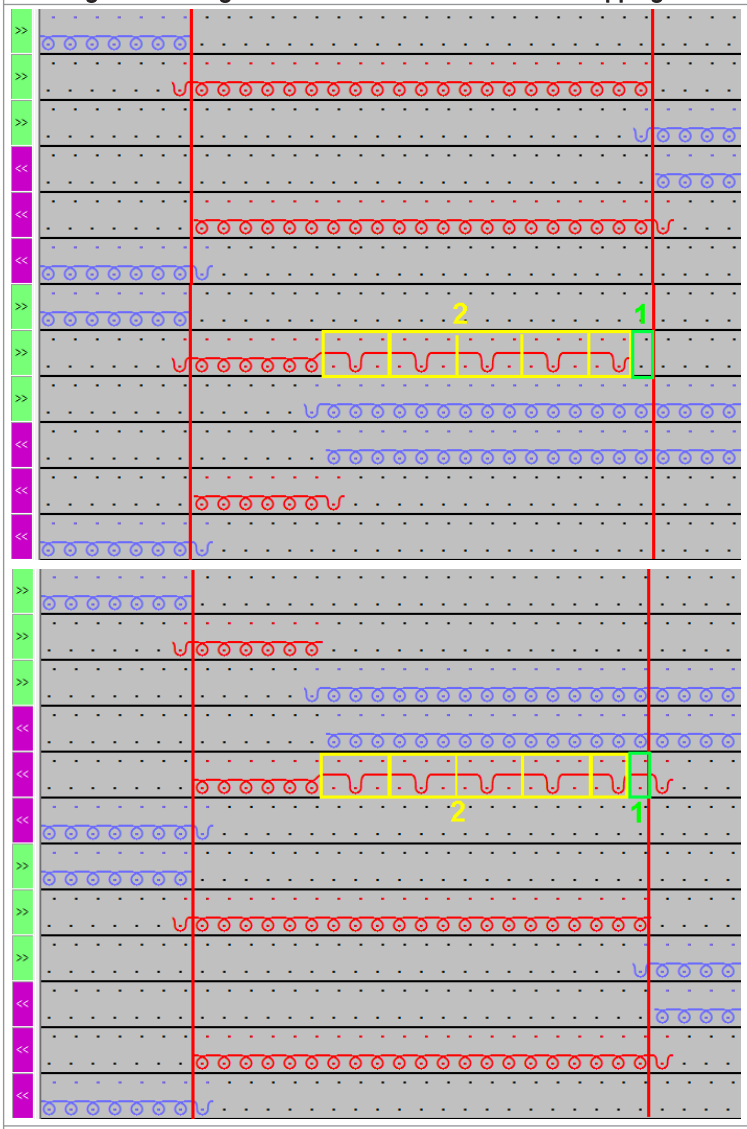
Feed

With the concept **Feed** is meant the positioning of a yarn carrier regarding the following knitting row of its own color field.
For this, there are many different options regarding the knitting technique.

Feed with Allowed Stepping: 1 needle

Examples for Feeding with different bindings and with allowed stepping 1 needle

Feeding with binding: Float - tuck - float and allowed stepping of 1 needle



1	Allowed stepping of 1 needle (default)
2	Binding for feeding with **Tuck + Float** i: Pay attention to the floating length!!!

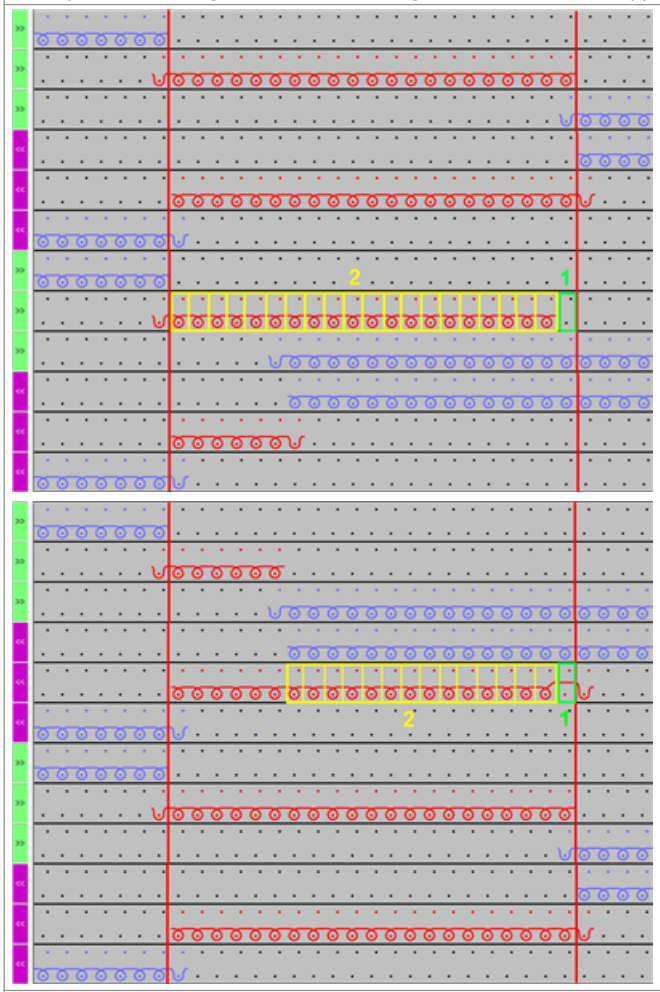
Result:

The feeding with tuck is not visible on the fabric font.

i: Through the input of allowed stepping, a float is knitted at this needle.

Feeding with binding: Stitch and allowed stepping of 1 needle

Examples for Feeding with different bindings and with allowed stepping 1 needle

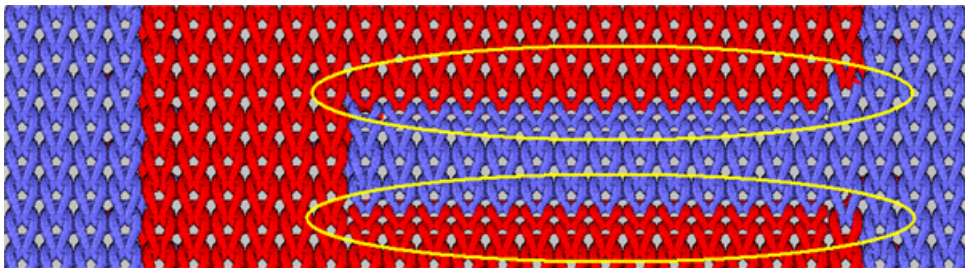


1	Allowed stepping of 1 needle
2	Binding for feeding **Stitch**

Result:

In the row of the feeding, an additional stitch row is knitted.

: At straight color field selvedges, there results an unattractive step through the 'allowed stepping' of one needle.



Numerical input under Allowed stepping

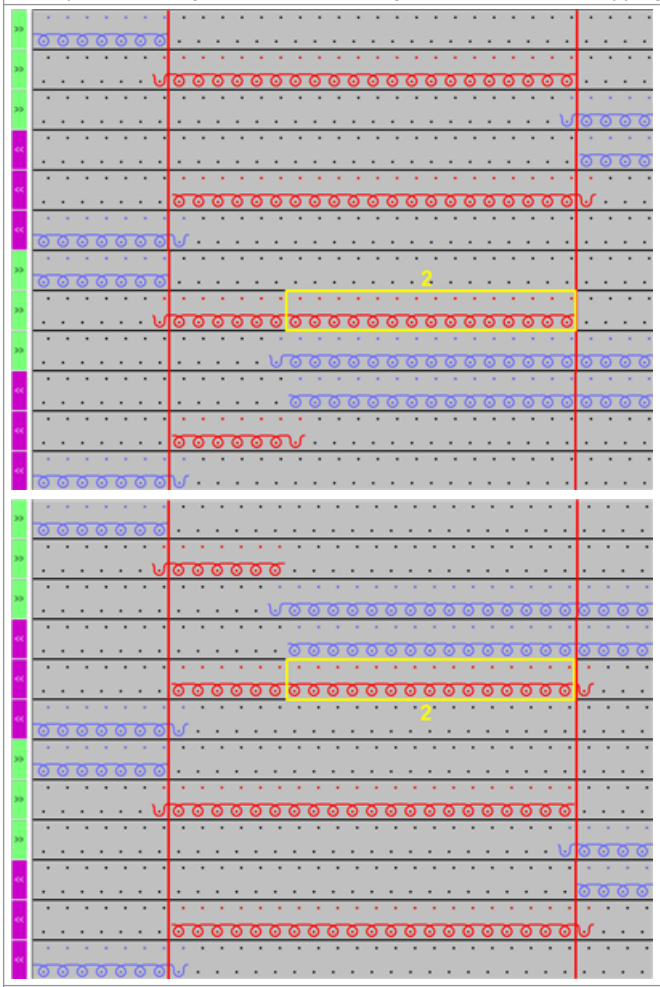
The number defines the quantity of needles at the color field selvedge, which is **not** knitted with the selected binding for feeding. At this position always results a float.

Feed with Allowed Stepping: None

Example for feeding with different bindings and with allowed stepping: 0 needles

Feeding with binding: Stitch and allowed stepping of 0 needle

Example for feeding with different bindings and with allowed stepping: 0 needles



2	Binding for feeding **Stitch**

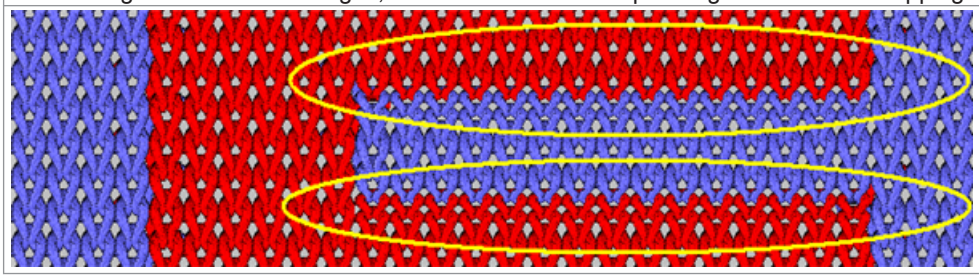
i:

Input at 'Allowed stepping': 0 (needle), i.e. the selected binding for feeding is entered over the entire color field step.

Result:

In the row of the feeding, an additional stitch row is knitted.

i: At straight color field selvedges, there results a nice step through the 'allowed stepping' of 0 needle.



26.6.2.2 Concept Reduce with Allowed Stepping

Reduce

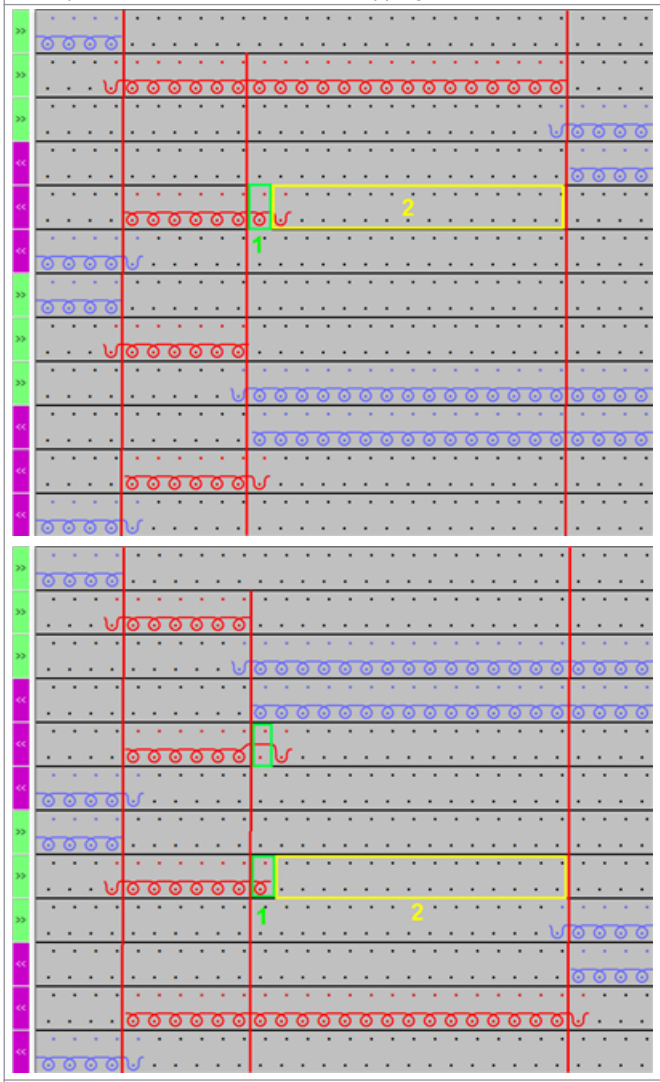
With the border processing 'Reduce', the color field selvedges of a color field are adapted (=reduced) through the knitting technique according to the carriage direction.
This means that the color field selvedges will no longer correspond visually to the original drawing due to the modification.
Caution: in case of round color field selvedges the result is not nice.

Reduce with setting under Allowed Stepping

Examples for Reduce with allowed stepping

Reducing with allowed stepping of 1 needle

Examples for Reduce with allowed stepping



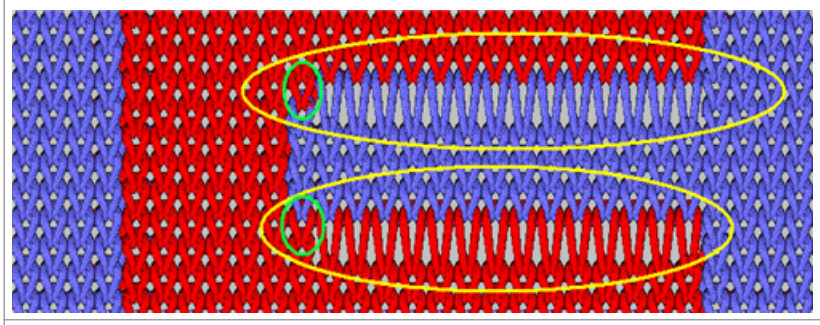
1	Allowed stepping of 1 needle (default) ℹ: The color field to be reduced is reduced by 1 needle less.
2	Reducing the color field according to the carriage direction. ℹ: Tuck is the binding at the color field selvedge.

Result:

In the rows where the reduction takes place, two stitch rows less will be knitted in the red color field.

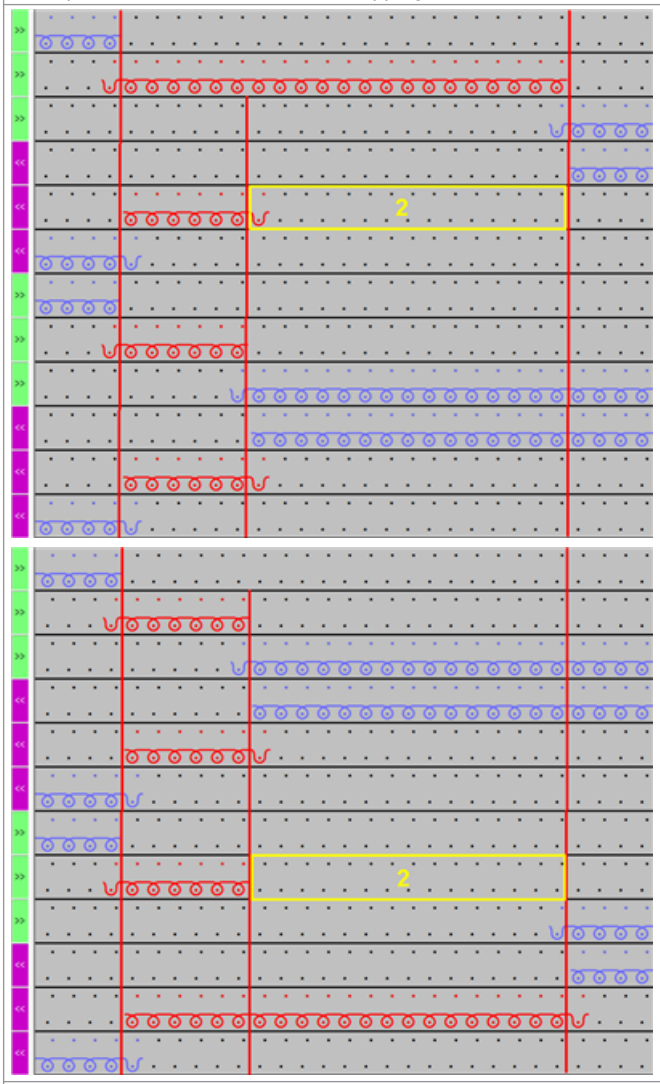
ℹ: At straight color field selvedges, there results an unattractive step through the 'allowed stepping' of one needle.

The result at round color fields is not nice either, as the shape of the original color field is changed due to the adaptation (Reduce).



Reducing with allowed stepping of 0 needle

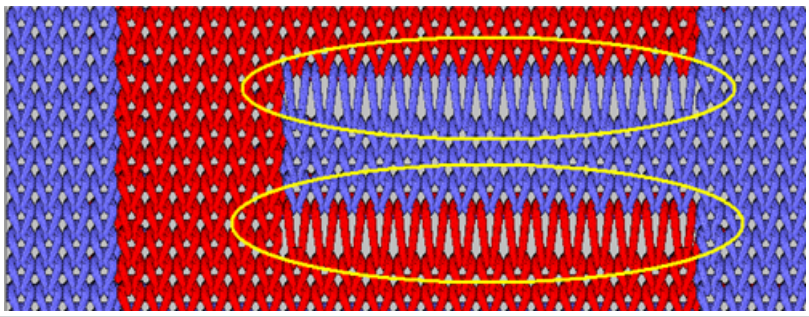
Examples for Reduce with allowed stepping



1	Allowed stepping of 0 needle
2	Reducing the color field according to the carriage direction. i: Tuck is the binding at the color field selvedge.

Result:

In the rows where the reduction takes place, two stitch rows less will be knitted in the red color field.



26.6.3 Knitting-in / knitting-out the yarn carriers

Knitting-in / Knitting out of yarn carriers

Knitting-in: The yarn carrier is at the fabric selvedge and must be positioned at the beginning of its color field for knitting at the color field selvedge.
Knitting-out: The yarn carrier is at the end of its color field after knitting, at the color field selvedge and must be brought to the fabric selvedge.

- Knitting-in of yarn carriers
  - Example 1: Knitting-in with tuck and float [▶ 215]
  - Example 2: Knitting-in with stitch and float [▶ 216]

- Example 3: Knitting-in with Knot1 and Tuck+Float [▶ 217]
- Example 4: Knitting-in with Knot, Split and Float [▶ 218]

■ Knitting-out of yarn carriers

- Example 1: Knitting-out with tuck and float [▶ 220]

Specifications for the knitting mode for the knit-in / knit-out row

A knit-in / knit-out row can be knitted identically or differently regarding the binding technique.
Generally, the type of bindings depends on the pattern and can vary from case to case.

26.6.3.1 Knitting-in of yarn carriers

■ Yarn carriers are in the clamp

- Take yarn carriers out of the clamp and starting from the fabric selvedge position the yarn carrier at the beginning of its color field (knitting-in)

■ The yarn carrier is at the fabric selvedge

- starting from the fabric selvedge position the yarn carrier at the beginning of its color field (knitting-in)

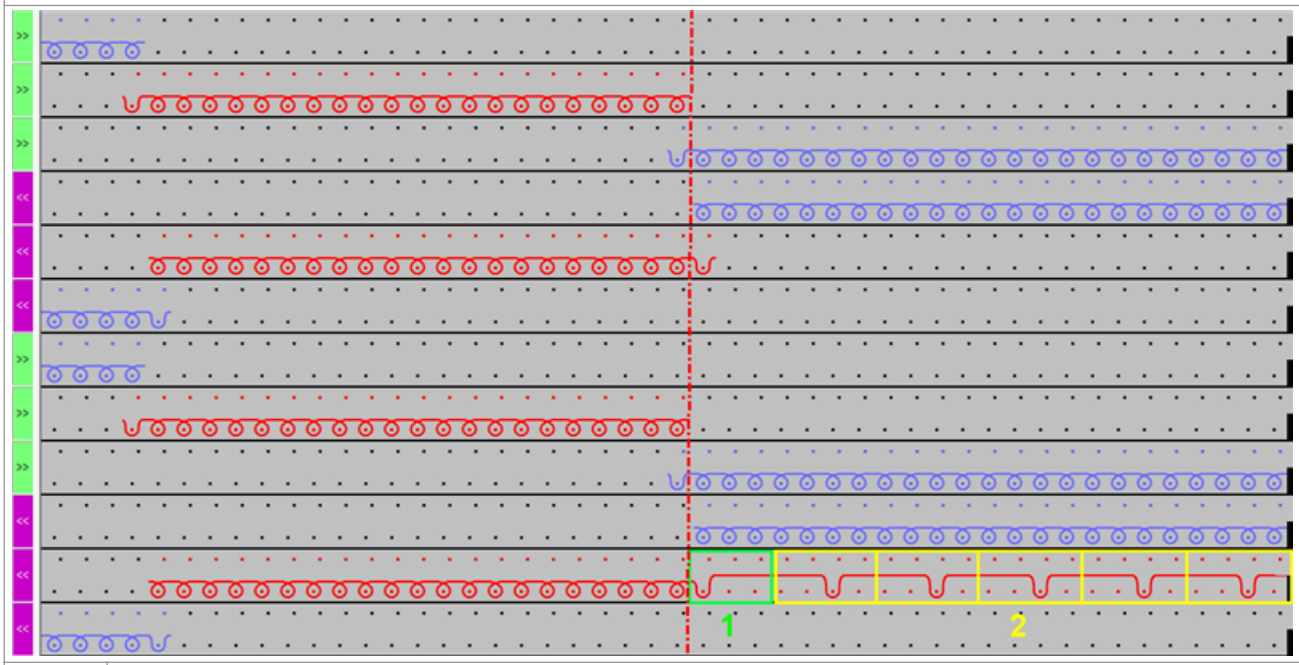
Structure of a knit-in row

When knitting-in the yarn carriers, two modules are used.
For knitting-in the yarn carriers from the fabric selvedge, the shortest distance (way) to the color field is always used by default.
Regarding the knitting technique, many options are available.

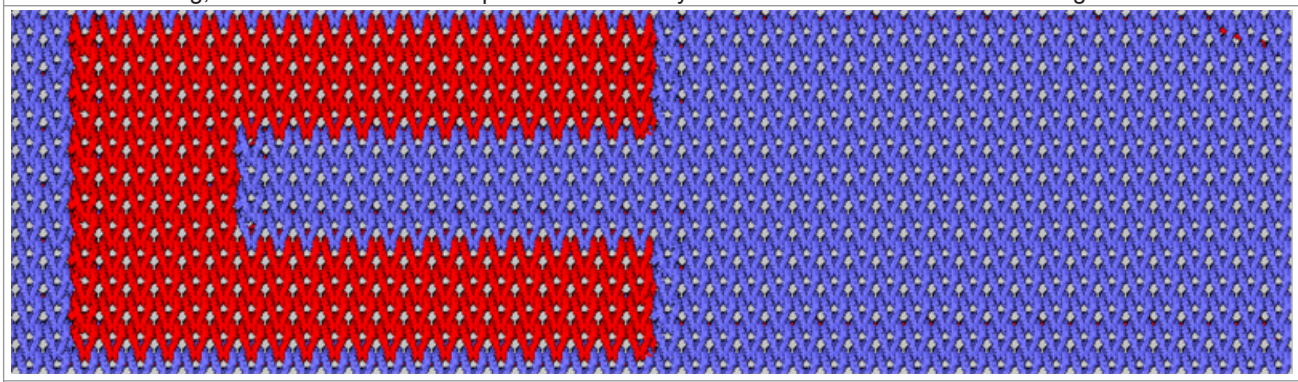
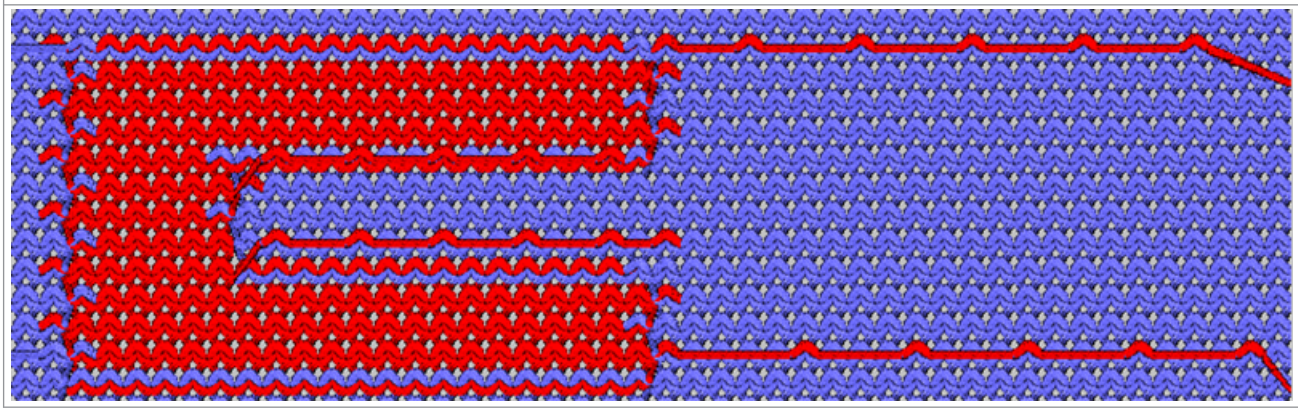
26.6.3.1.1 Example 1: Knitting-in with tuck and float

Example 1:

◆ **Module Binding / knot:** Tuck – Float – Float (**v - -**)
◆ **Module for knitting-in:** Float – Float – Tuck – Float (**- - v -**)



1	Module Binding / Knot at the beginning of the color field : Module is inserted only 1x at the color field selvedge.

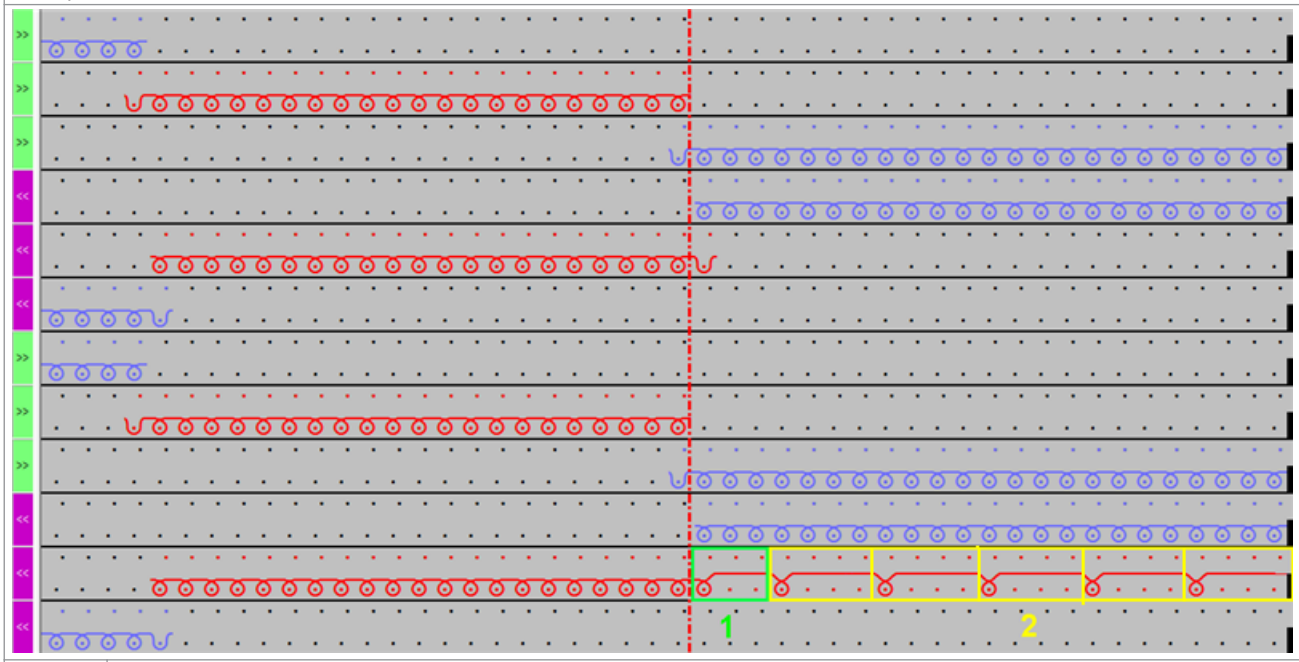
Example 1:	
2	Module for knitting-in (positioning) the yarn carrier at the color field selvedge i: The module is inserted several times, i.e. the distance between the color field and the fabric selvedge must be filled with the module. i: The maximum floating length corresponds to the machine gauge.
Result: Knitting-in with tuck and float is only visible on the fabric back. i: When finishing, the thread ends must be pulled out manually and knotted at the color field selvedge.	
	
	

i Knitting-in and knitting-out never is knitted on the same needle!

26.6.3.1.2 Example 2: Knitting-in with stitch and float

Example 2
◆ **Module Binding / knot:** Stitch – Float – Float (**o - -**) ◆ **Module for knitting-in:** Float – Float – Stitch – Float (**- - o -**)

Example 2

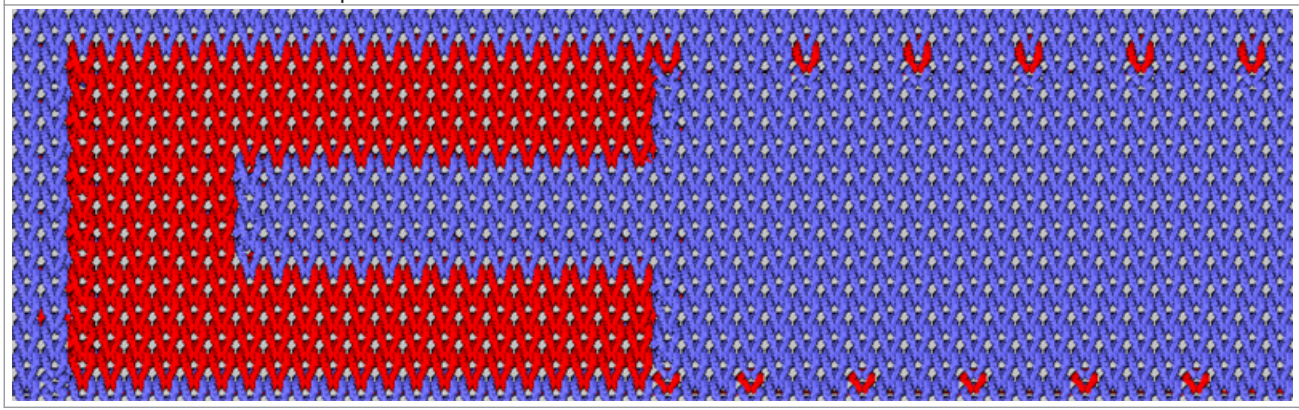


1	Module Binding / Knot at the beginning of the color field
2	Module for knitting-in (positioning) the yarn carrier at the color field selvedge ℹ: The maximum floating length corresponds to the machine gauge.

Result:

The binding of knitting-in is visible on the fabric front as stitch. A 'pattern effect' is the result.

ℹ: The thread ends cannot be pulled out and the don't need to be knotted therefore.



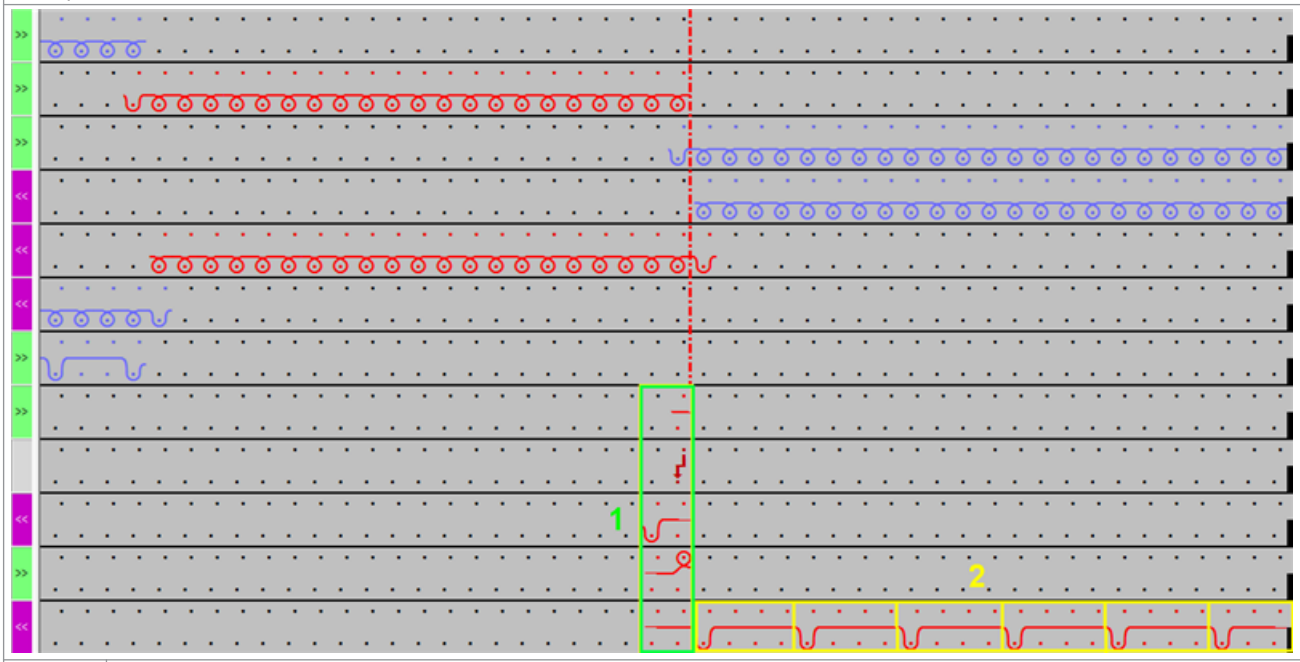
ℹ Knitting-in and knitting-out never is knitted on the same needle!

26.6.3.1.3 Example 3: Knitting-in with Knot1 and Tuck+Float

Example 3

- **Module Binding / knot:** Knot 1
- **Module for knitting-in:** Float – Float – Tuck – Float (**- - v -**)

Example 3

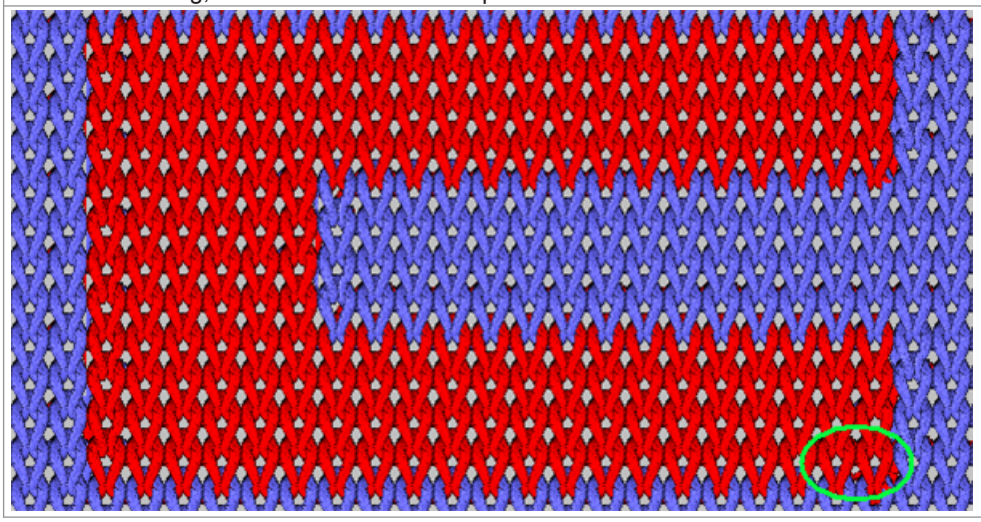


1	Module Binding / Knot at the beginning of the color field
2	Module for knitting-in (positioning) the yarn carrier at the color field selvedge i: The maximum floating length corresponds to the machine gauge.

Result:

Knitting-in with tuck and float is only visible on the fabric back.
The knot1 knots the thread in its own color field, resulting in a slight thickening. This increases the production time as well.

i: When finishing, the thread ends must be pulled out but **not** knotted at the color field selvedge.



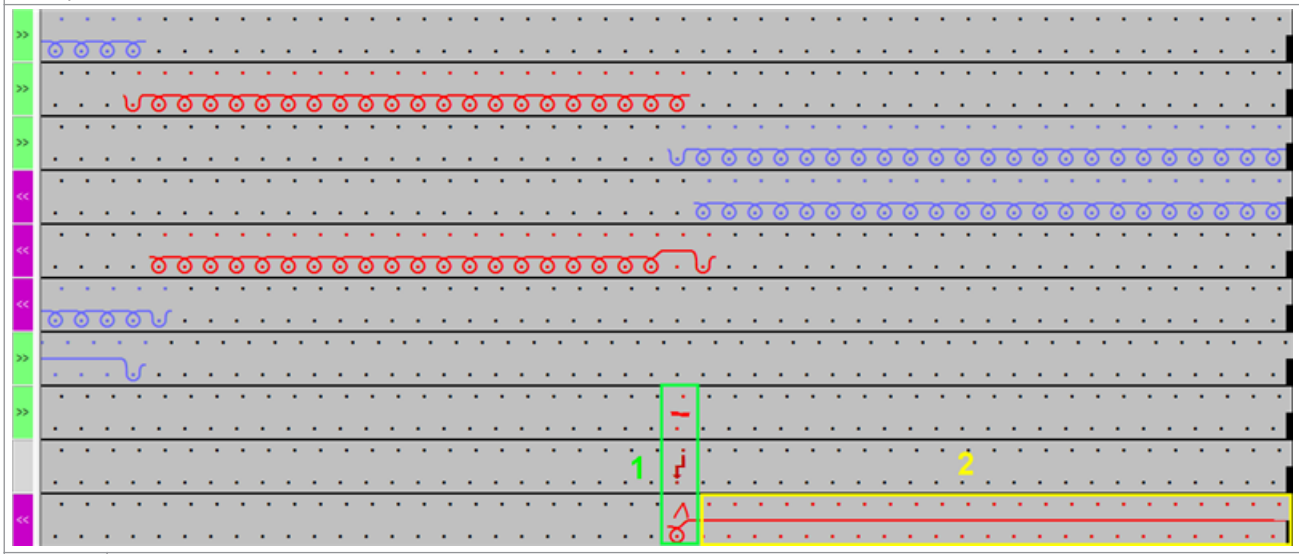
i Knitting-in and knitting-out never is knitted on the same needle!

26.6.3.1.4 Example 4: Knitting-in with Knot, Split and Float

Example 3

- **Module Binding / knot:** Knot Split
- **Module for knitting-in:** Float (—)

Example 3



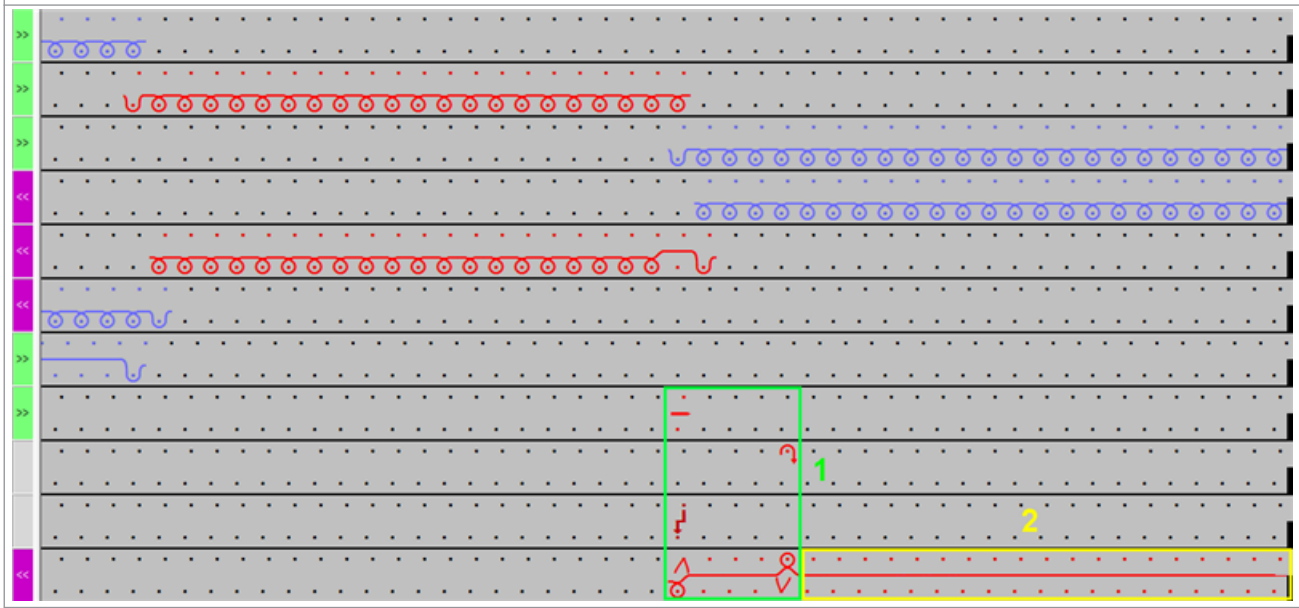
1	Module Binding / Knot at the beginning of the color field
2	Module for knitting-in (positioning) the yarn carrier at the color field selvedge ℹ: In case of problems with long floats

Result:

The float is visible on the fabric back.
The Split knot knots the thread in its own color field, resulting in a nice, invisible knot.
The production time is not increased.

ℹ: When finishing, the thread ends don't need to be pulled out manually nor knotted at the color field selvedge.

- **Module Binding / knot:** Knot Split with fixing (3)
  ℹ: Fixing enables a better yarn insertion with knot split.
- **Module for knitting-in:** Float (**----**)



ℹ Knitting-in and knitting-out never is knitted on the same needle!

26.6.3.2 Knitting-out of yarn carriers

■ The yarn carrier is at the end of its color field

– Position the yarn carrier at the fabric selvedge (knitting-out)

– Position the yarn carrier at the fabric selvedge (knitting-out) and bring directly into the clamp

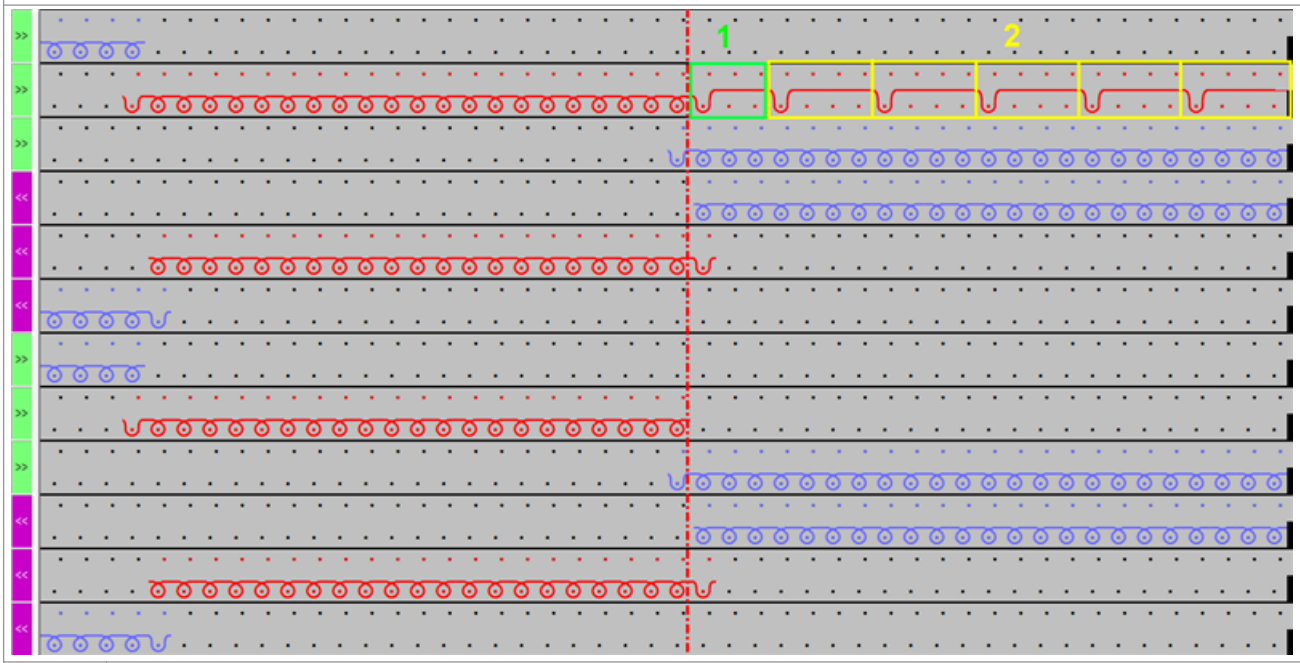
Structure of a knit-out row

When knitting-out the yarn carriers, two modules are used.
The yarn carriers are always knitted-out the shortest distance (way) from the fabric selvedge.
Regarding the knitting technique, many options are available.

26.6.3.2.1 Example 1: Knitting-out with tuck and float

Example 1:

- **Module Binding / knot:** Tuck – Float – Float (**v - -**)
- **Knitting-out module:** Float – Float – Tuck – Float (**- - v -**)

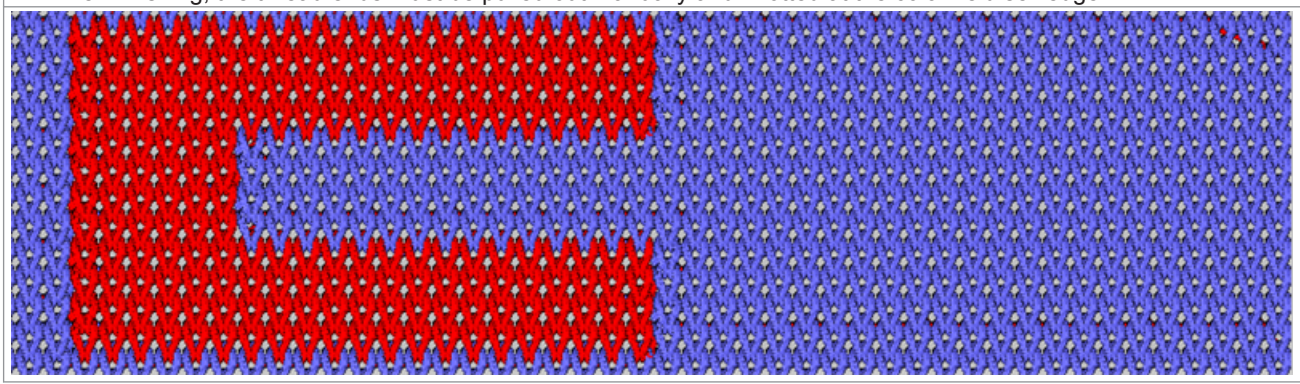


1	Module Binding / Knot at the beginning of the color field i: Module is inserted only 1x at the color field selvedge.
2	Module for knitting-out (positioning) the yarn carrier at the color field selvedge i: The module is inserted several times, i.e. the distance between the color field and the fabric selvedge must be filled with the module. i: The maximum floating length corresponds to the machine gauge.

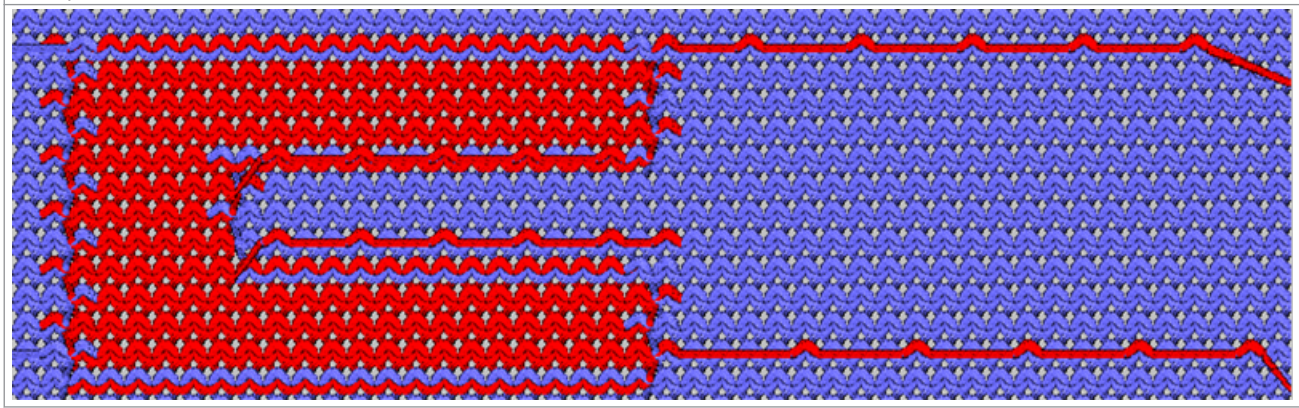
Result:

Knitting-out with tuck and float is only visible on the fabric back.

i: When finishing, the thread ends must be pulled out manually and knotted at the color field selvedge.



Example 1:



Knitting-in and knitting-out never is knitted on the same needle!

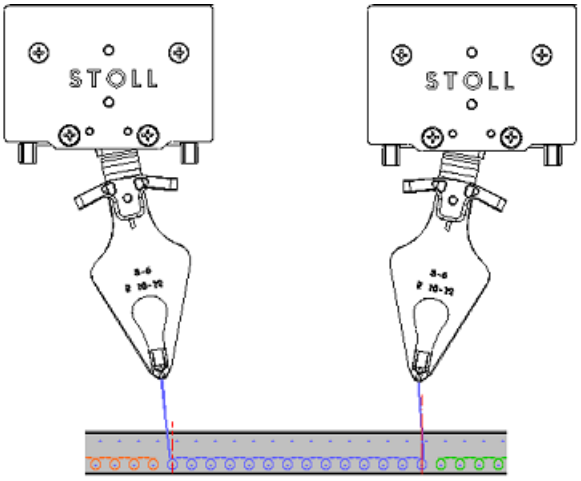
26.7 Braking Value with Intarsia Yarn Carriers with Performer Machines

Braking values are changed in order to compensate **mechanical variances** of the yarn carriers on the machine.

Command	Function	Value range
Y-1A:Bn-m;	Braking value for yarn carrier **1A** **n** = value for the left edge **m** = value for the right edge	-9 ..**0**.. 9

Example:

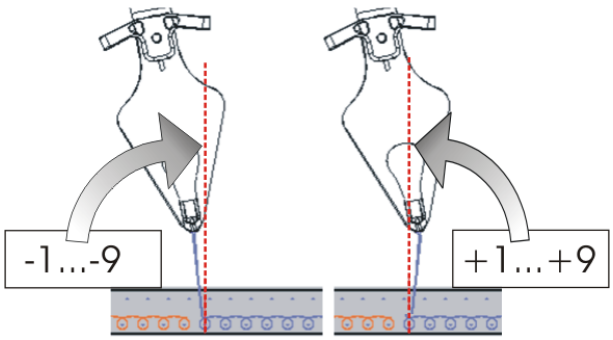
yarn carriers are not properly positioned at the edge of their color field



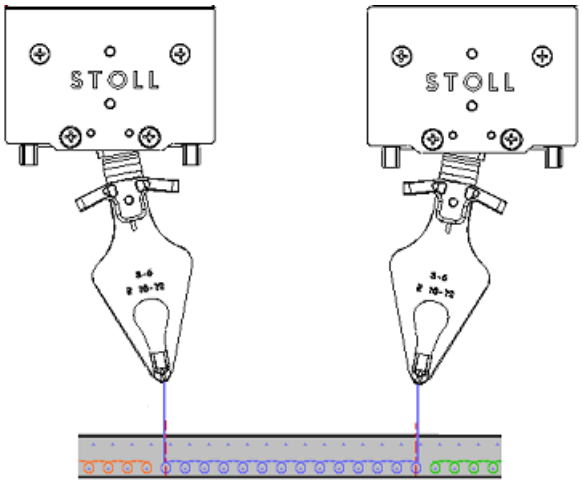
- The yarn carrier at the left edge must be corrected towards its own color field: **0**… **-9**
- The yarn carrier at the right edge must be corrected away from its color field: **0**… **9**

Behavior of the correction of braking values:

- Negative values move the yarn carrier nearer to the knitting area
- Positive values move the yarn carriers away from the knitting area



Result:



- The yarn carrier at the left edge is located at the left of the needle center:
- The yarn carrier at the right edge is located at the right of the needle center:

i	Loading a new pattern with **EALL** will **not delete** the existing braking values. Therefore check the braking values or set them to the default values always after loading.

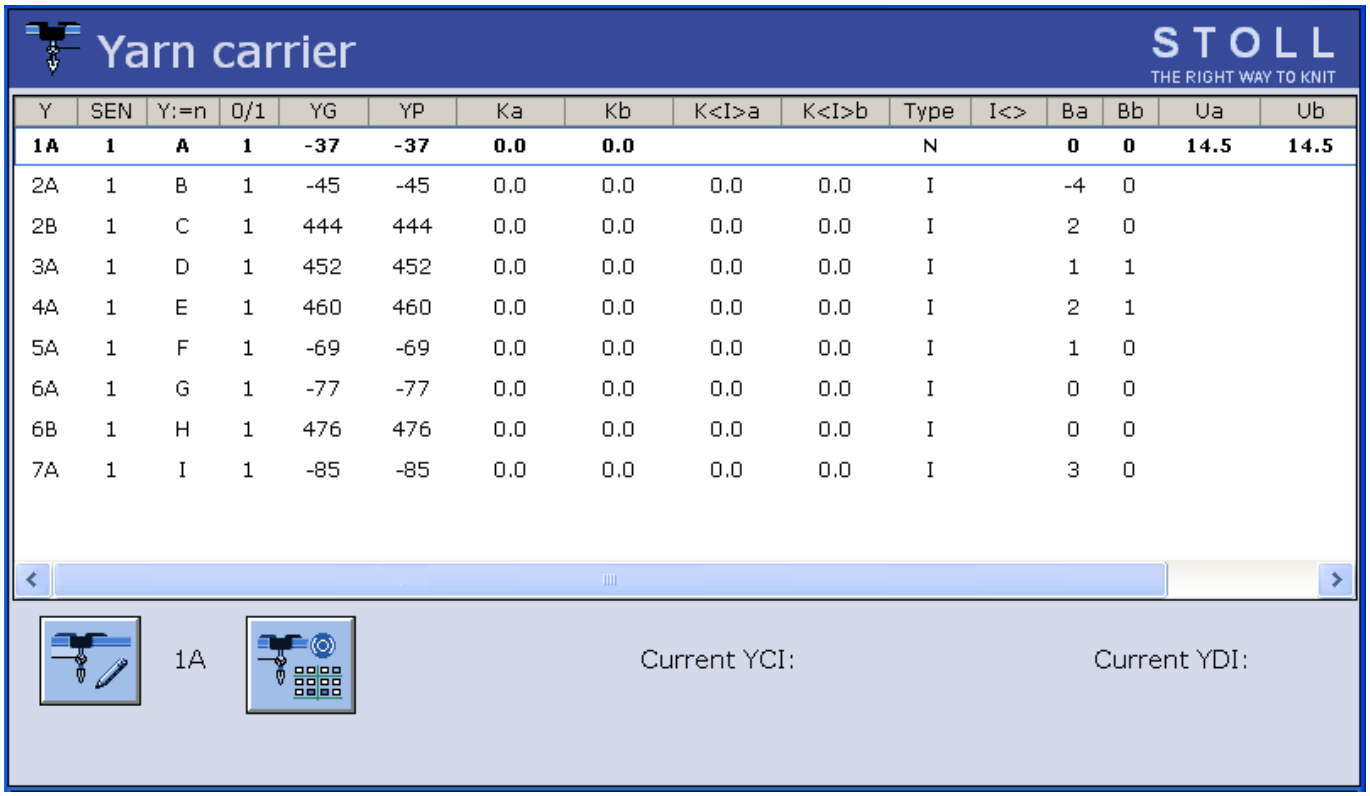
26.7.1 Handling the Braking Values

i	Adjust the intarsia yarn carriers mechanically correct on the machine at first.

Valuate braking values:

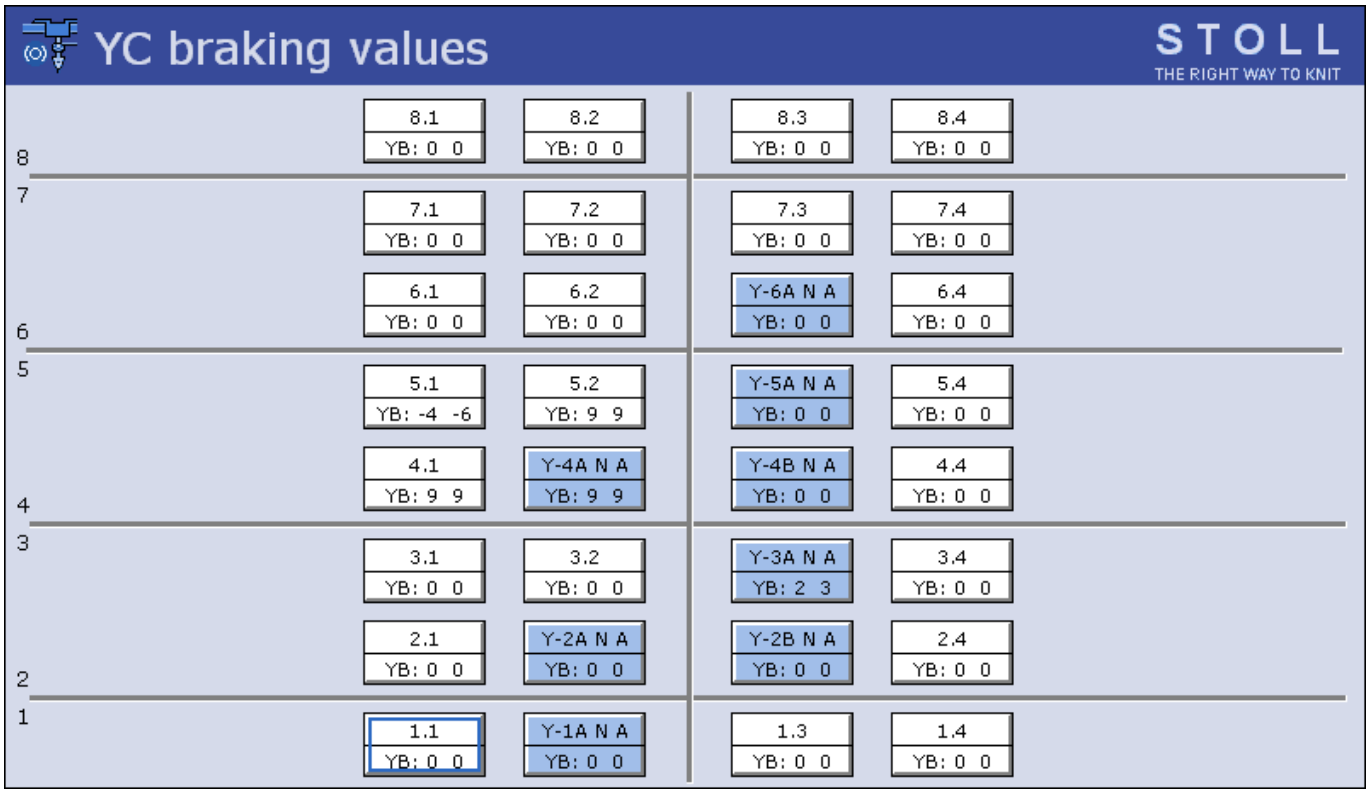
▷ The yarn carriers are adjusted mechanically correct.

1. Start the program.
2. Start knitting until the Intarsia yarn carriers are in use.
3. Check the position.
4. Call up the Main menu with  .
5. Call up the Yarn carrier menu  .
   ⇨ The yarn carrier allocation will be displayed.



Y	SEN	Y:=n	0/1	YG	YP	Ka	Kb	K<I>a	K<I>b	Type	I<>	Ba	Bb	Ua	Ub
1A	**1**	**A**	**1**	**-37**	**-37**	**0.0**	**0.0**			N		**0**	**0**	**14.5**	**14.5**
2A	1	B	1	-45	-45	0.0	0.0	0.0	0.0	I		-4	0		
2B	1	C	1	444	444	0.0	0.0	0.0	0.0	I		2	0		
3A	1	D	1	452	452	0.0	0.0	0.0	0.0	I		1	1		
4A	1	E	1	460	460	0.0	0.0	0.0	0.0	I		2	1		
5A	1	F	1	-69	-69	0.0	0.0	0.0	0.0	I		1	0		
6A	1	G	1	-77	-77	0.0	0.0	0.0	0.0	I		0	0		
6B	1	H	1	476	476	0.0	0.0	0.0	0.0	I		0	0		
7A	1	I	1	-85	-85	0.0	0.0	0.0	0.0	I		3	0		

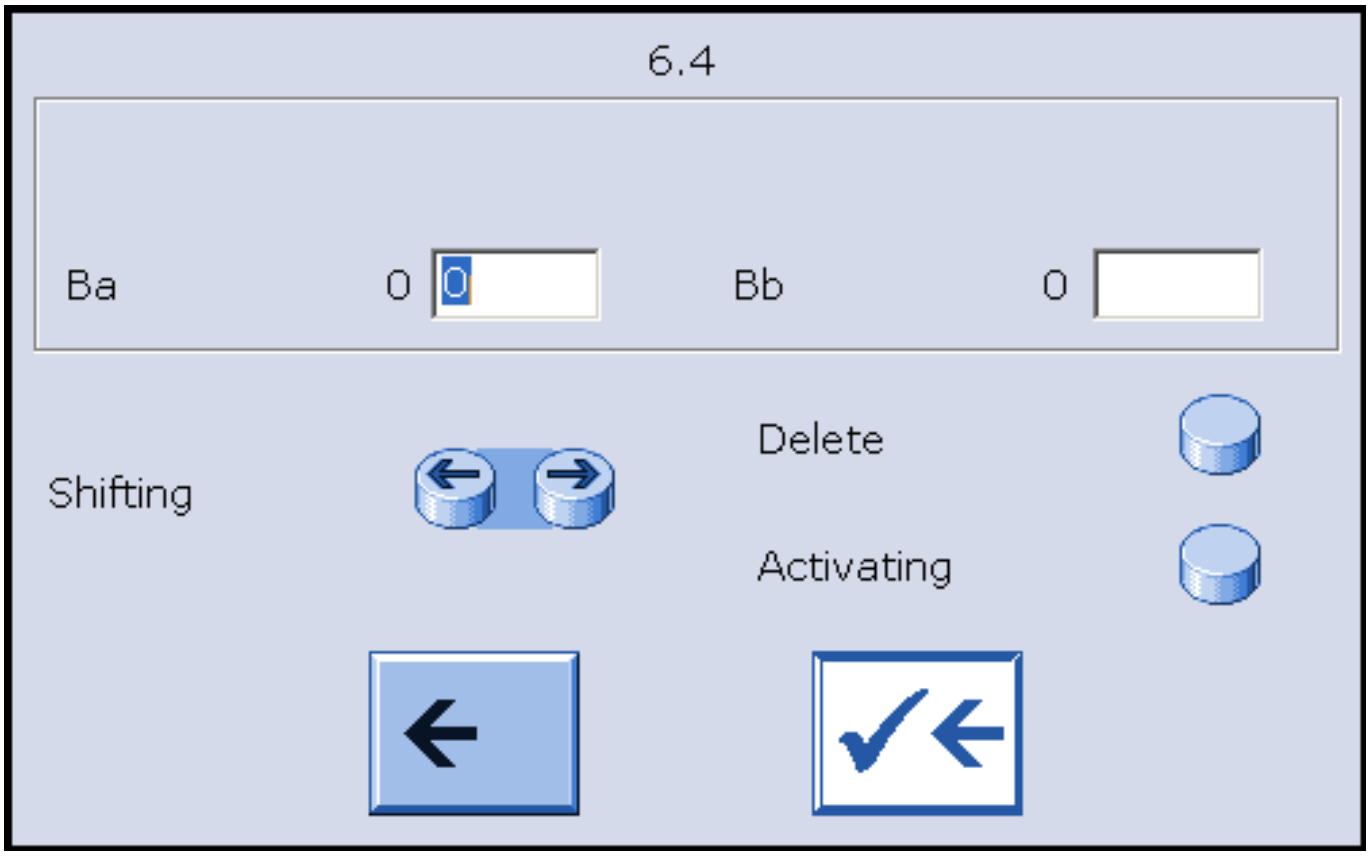
6. Tap the  key.



⇨ The entry field appears.

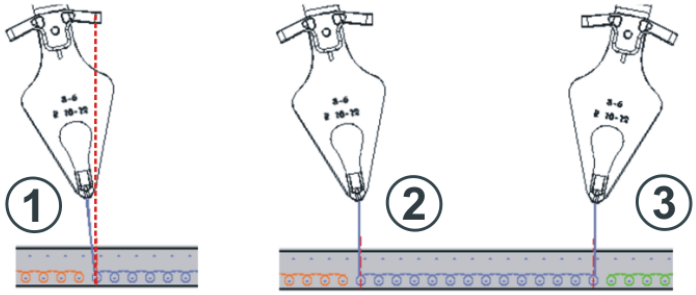
Open the input window with the 

key if necessary.



7. Check the parking positions of every yarn carrier with both the knitting directions to the left and right.
8. Enter values and confirm entries.

Correction values „**Ba**“ for parking positions on the left and „**Bb**“ for the right.



Pos	Situation
1	Yarn carrier at the left color field not corrected
2	Yarn carrier at the left color field corrected
3	Yarn carrier at the right color field corrected

i The changes in the table for braking values are not reset with **EALL** / **EAY**

9. Check the position again when this yarn carrier is knitting the next time

26.7.2 Handling the Adjusting Program

i You can determine the braking values by an adjusting program.

The adjusting program:

The adjusting program is a procedure inserted in the Intarsia knitting program which brings to use all yarn carriers before the start. The yarn carriers work on the same needle in order to get a vertical color stripe. With it you can determine the optimal parking position of the yarn carriers at the left and right.

I. Activate the adjusting program:

▷ The loaded knitting program contains the adjusting program.

1. Tap the  key in the "Main Menu".
2. Set the cycle counter to activate the adjusting program.
   Used with Setup2:

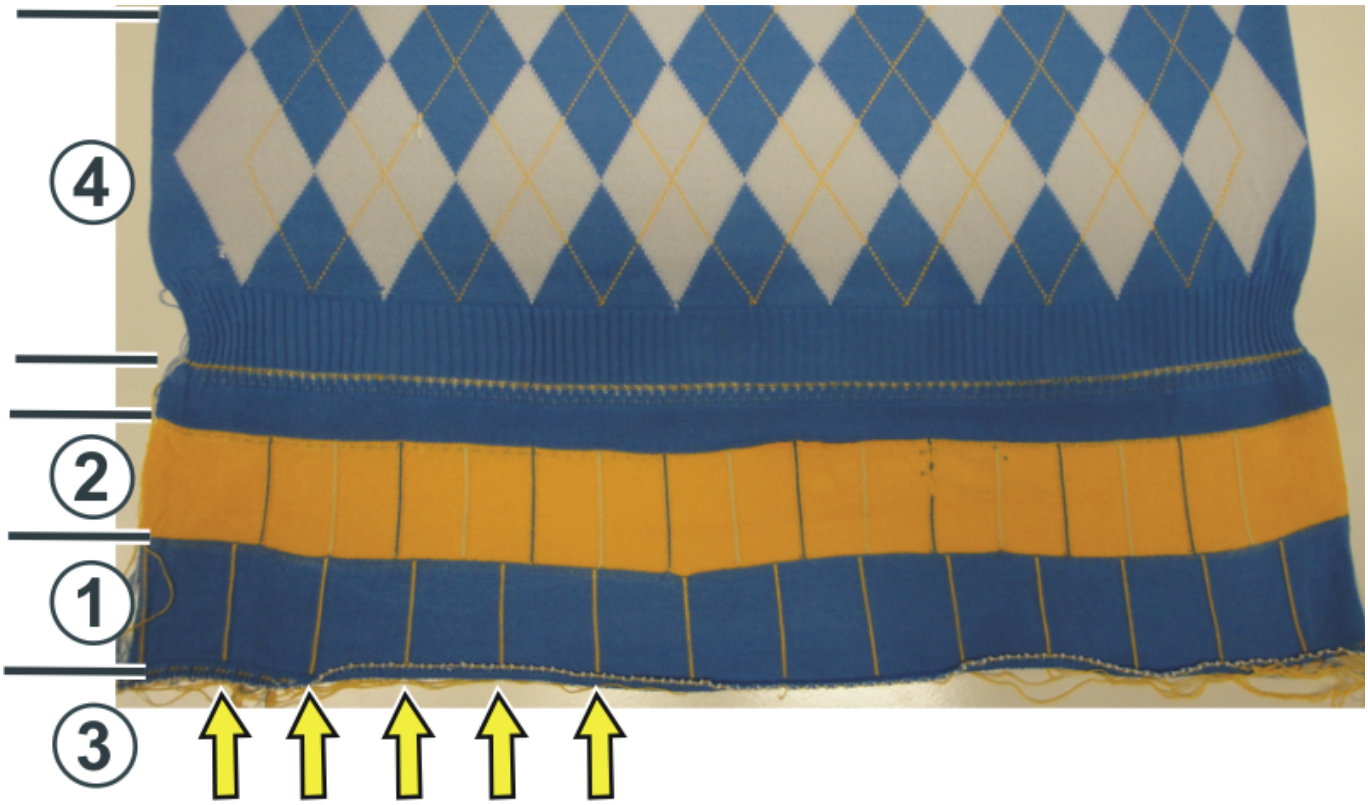
■ **Setup2: RS39 =1**

3. Call up the "Machine Start & Stop" menu with the  key of the "Main Menu".
4. Start the machine.
5. Open the entry window for braking values by the  and  key.
6. Check the parking positions of every yarn carrier with both the knitting directions to the left and right.
7. Enter correction values **Ba** for parking position on the left and **Bb** for the right.
8. Confirm the settings.
9. Exit the adjusting program after validating all Intarsia yarn carriers in use by the ctrl W key and start the knitting program.

II. Second part of the adjusting program:

A second procedure (Part 2) will be necessary for not yet validated yarn carriers if more than 16 yarn carriers are used in the knitting program.

1. Activate the second part of the adjusting program by the ctrl W key.
2. Check the parking positions of the further yarn carriers and enter a correction value if necessary.
3. Exit the adjusting program by the ctrl W key and start the knitting program.



Pos	Program
1	First part of the adjusting program
2	Second part of the adjusting program:
3	Embroidery stitch lines of the intarsia yarn carriers (vertical line, one needle wide)
4	Pattern

The cycle counters **RS18 / RS39** will automatically be set to "zero".

The braking values will be kept even if the knitting program is deleted from the main memory of the machine.

III. Reset braking values:

1. Reset single braking values to **"0"** manually.
2. Reset all braking values by the  and  key.

26.8 Automatic Staggering of Yarn Carriers in the Fabric

This automatic staggering of yarn carriers is carried out within the fabric. In this case it is **not about the automatic yarn carrier staggering at the fabric edge (YDopt).**

How to position the yarn carriers:

- The yarn carriers are positioned staggered at the fabric selvedge with **YD** / **YDopt**.
- The yarn carriers are staggered automatically within the fabric (auto-staggering)
  Example:
  - The yarn carrier follows a selection
  - Positioning of the yarn carriers within the v-neck

When to use the auto-staggering:

- For all yarn carriers that are 'upright':
  - Normal yarn carrier
  - Not swiveled Intarsia yarn carriers and ADF yarn carriers
- **Not** with swiveled intarsia yarn carriers and ADF yarn carriers (swiveled)

> For corrected yarn carriers (**YC**) the auto-staggering is deactivated.
> The remaining yarn carriers will be parked using auto-staggering.

26.9 Yarn Carrier Correction

> After a correct mechanical positioning of the yarn carriers with Performer Machines with help of the braking value and the adjustment of the yarn carriers with ADF machines, the **yarn carrier corrections** can be used for a **pattern technical positioning** with Performer Machines and also with ADF Machines.

Command	Meaning	Value range
YC	Table with direct yarn carrier corrections for the yarn carriers in use **i: YC** table is always displayed	
YCI n	Further tables with indirect yarn carrier corrections for the different pattern areas **i:** Display depending on the pattern creation	**n** = 1 -20
Y-1A :Kn-m	Correction for yarn carrier **1A** with selected knitting **n** = value for the left edge **m** = value for the right edge	Min. value: -120 Max. value: 120 Steps: **alt**: 1 = 1/16 inch = 1,6 mm **OKC:** 0.50 = 1/32 inch = 0.8 mm
Y-1A :KI n-m	Correction of not swiveled Intarsia yarn carriers	
Y-1A :K<I >n-m	Correction of swiveled Intarsia yarn carriers	

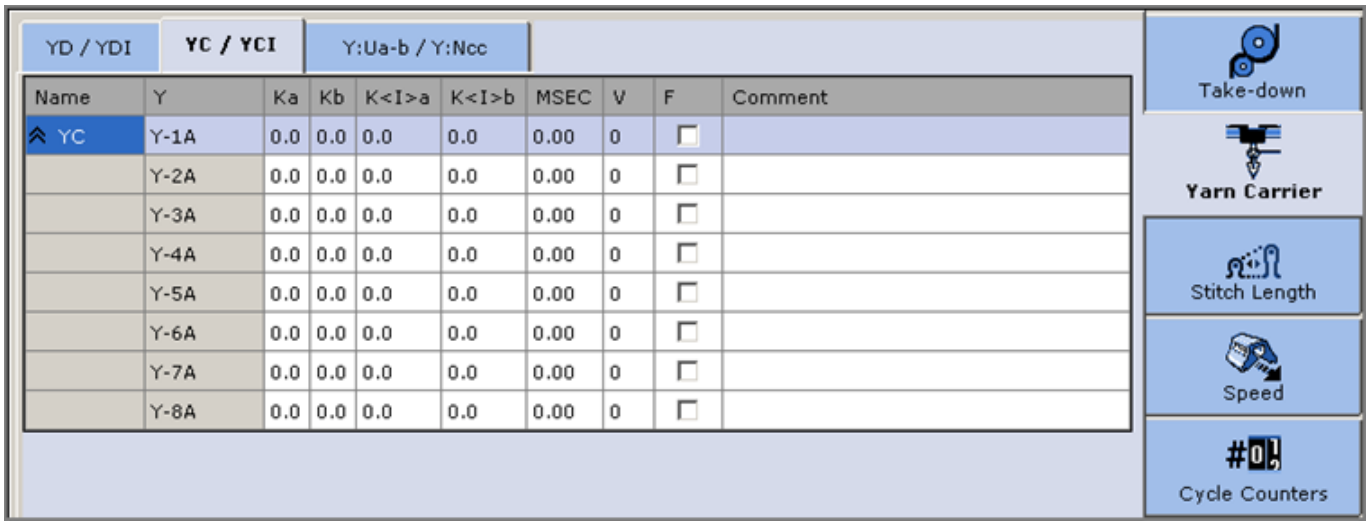
Default values for the correction of normal / intarsia yarn carrier and ADF yarn carrier:

Command	Normal yarn carrier Intarsia yarn carrier (not swiveled) ADF yarn carrier (not swiveled)	Intarsia yarn carrier (swiveled) ADF yarn carrier (swiveled)
Y-1A: K0-0;	12 -12	
Y-1A: K I 0-0;	12 -12	
Y-1A: K <I> 0-0;		0 -0

26.9.1 Handling of the Yarn Carrier Corrections with Performer Machines

Entering and changing yarn carrier corrections:

1. Call up the dialog of the "SETUP2 editor" with the  key.
2. Tap the "Yarn carrier" key in the dialog.
   ⇨ The dialog is displayed with three tabs.
3. Open the **YC / YCI** tab.
   ⇨ The **YC** used in the pattern with the used yarn carriers and all the additionally used yarn carrier corrections **YCIn** are displayed.
4. Make changes in the **YC** table or in one of the **YCIn** tables.



Column	Meaning
Name	**YC / YCI** ◆ **YC**: Default table ◆ **YCIn**: Further tables for yarn carrier corrections
Y	Display of the yarn carriers used in the pattern
Ka / Kb	Correction left (a) / right (b) for all yarn carriers ◆ Normal yarn carrier ◆ Intarsia yarn carrier (not swiveled)
K<I>a / K<I>b	Correction left (a) / right (b) only for Intarsia yarn carrier swiveled
MSEC	Defined carriage speed when knitting with selected yarn carrier
F	☐ The yarn carrier follows the shape / counter (Default) ☑ The yarn carrier **does not** follow the shape / counter (yarn carrier stops)
Vn	Reduce carriage speed for the selected yarn carrier. I.e. the speed is reduced to 75% after the carriage reversal point until reaching the knitting area of the selected yarn carrier. You can chosen between three options n (0..3) then: ◆ **n = 1**: Acceleration up to 100% ◆ **n = 2**: Reduce to 50% - Retain speed for 2 inch fabric width - Accelerate to 100% ◆ **n = 3**: Reduce to 50% - Retain speed for 5 inch fabric width - Accelerate to 100% ◆ **n = 0**: Deletion of the defined carriage speed

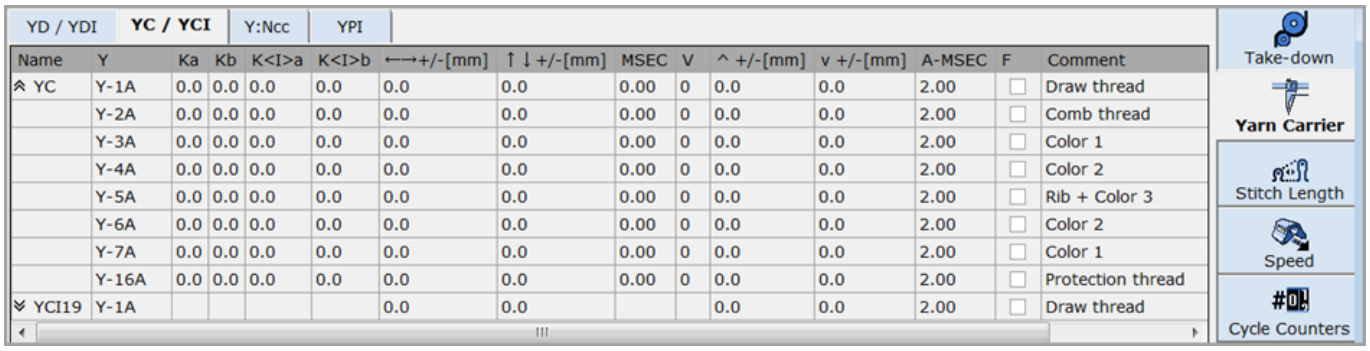
5. Quit the "Setup2 Editor" with the ← key.
   ⇨ Changed values are saved in **.setx**.
6. Start the machine with the engaging rod.
   ⇨ The changes will be carried out with the next use of the yarn carrier.

26.9.2 Handling of the Yarn Carrier Corrections with ADF Machines

Entering and changing yarn carrier corrections:

1. Call up the dialog of the "SETUP2 editor" with the key.
2. Tap the "Yarn carrier" key in the dialog.
   ⇨ The dialog is displayed with three tabs.

3. Open the **YC / YCI** tab.
   ⇨ The **YC** used in the pattern with the used yarn carriers and all the additionally used yarn carrier corrections **YCIn** are displayed.
4. Make changes in the **YC** table or in one of the **YCIn** tables.



Name	Y	Ka	Kb	K<I>a	K<I>b	←→+/-[mm]	↑↓+/-[mm]	MSEC	V	^ +/-[mm]	v +/-[mm]	A-MSEC	F	Comment
YC	Y-1A	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.0	2.00	☐	Draw thread
	Y-2A	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.0	2.00	☐	Comb thread
	Y-3A	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.0	2.00	☐	Color 1
	Y-4A	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.0	2.00	☐	Color 2
	Y-5A	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.0	2.00	☐	Rib + Color 3
	Y-6A	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.0	2.00	☐	Color 2
	Y-7A	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.0	2.00	☐	Color 1
	Y-16A	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.0	2.00	☐	Protection thread
YCI19	Y-1A					0.0	0.0			0.0	0.0	2.00	☐	Draw thread

Column	Meaning	
Name	**YC / YCIn** ◆ **YC**: Default table ◆ **YCIn**: Further tables for yarn carrier corrections	
Y	Display of the autarkic yarn carriers used in the pattern	
Ka / Kb	Correction left (a) / right (b) only for autarkic yarn carrier (not swiveled)	
K<I>a / K<I>b	Correction left (a) / right (b) only for autarkic yarn carrier (swiveled)	
←→+/-[mm]	Horizontal correction of the insertion position (knitting position): ◆ For knitting ◆ For weft yarn (yarn carrier defined as **Q**) Positive value: Correction of the home position to the right (following) Negative value: Correction of the home position to the left (in advance) **i**: Caution: The entered value is added to the values of the **YPI** tab.	Minimum value: - 100 Maximum value: 100 Step width: 0.1 mm
↑↓+/-[mm]	Vertical correction of the insertion position (knitting position): ◆ For knitting ◆ For weft yarn (yarn carrier defined as **Q**) Positive value: Correction of the home position upward (steep yarn angle) Negative value: Correction of the home position downward (flat yarn angle) **i**: Attention: The entered value is added to the values of the **YPI** tab.	Minimum value: - 2.0 Maximum value: 5.0 Step width: 0.1 mm
MSEC	Defined carriage speed when knitting with selected yarn carrier	
V	Reduce carriage speed for the selected yarn carrier. I.e. the speed is reduced to 75% after the carriage reversal point until reaching the knitting area of the selected yarn carrier. You can chosen between three options **n** (0..3) then: ◆ **n = 1**: Acceleration up to 100% ◆ **n = 2**: Reduce to 50% - Retain speed for 2 inch fabric width - Accelerate to 100% ◆ **n = 3**: Reduce to 50% - Retain speed for 5 inch fabric width - Accelerate to 100% ◆ **n = 0**: Deletion of the defined carriage speed	
^ +/-[mm]	Correction of the yarn carrier in the 'High position'	Minimum value: - 2.0 Maximum value: 5.0 Step width: 0.1 mm Default. 0
v +/-[mm]	Correction of the yarn carrier in the 'Deep position'	

Column	Meaning	
A-MSEC	Speeds for a yarn carrier with a system independent, autarkic yarn carrier run (miss-knit).	Minimum value: 0.05 Maximum value: 2.0 Step width: 0.05
F		Automatic tracking active: The yarn carrier follows the shape / counter (Default)
		Automatic tracking not active: The yarn carrier **does not** follow the shape / counter (yarn carrier stops)

5. Quit the "Setup2 Editor" with the  key.
   ⇨ Changed values are saved in **.setx** when saving.
6. Start the machine with the engaging rod.
   ⇨ The changes will be carried out with the next use of the yarn carrier.

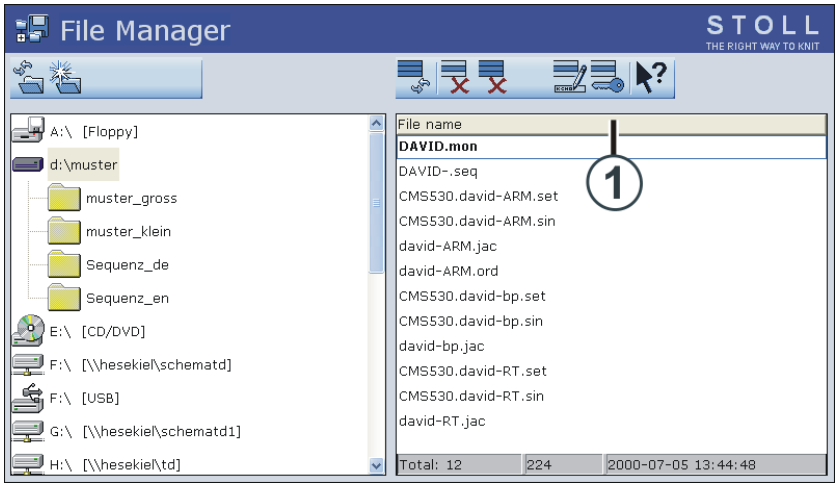
27 File manager: Manage pattern

Manage files and folders with the "File manager"

I. Opening the File Manager:

1. Call up the  window in the "Main menu".
2. Tap the  key.
3. Open the window with the  key.

   ⇨ File Manager window appears.



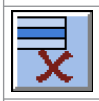
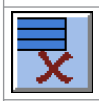
Left side of the table	Right side of the table
Execute different actions on folders **Example:** create a new folder	Files of the selected folder are displayed. **i**: The list appears in alphabetical order (default)

You can access the following data carriers:

- USB Memory Stick
- Hard disk drive of the the knitting machine
- Online
- Network drive

II. Functions of the File Manager

Key	Designation	Function
	"Update"	Refresh the contents of all the folders
	"Create folder"	Create folder in the selected directory **i**: You have to select a drive or folder
	"Copy folder"	Copy the selected folder including contents to a target folder
	"Delete folder"	Delete the selected folder including contents

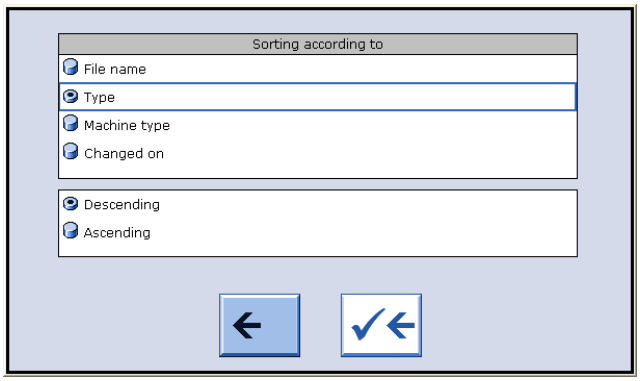
Key	Designation	Function
	"Rename folder"	Change the name of the selected folder
	"Update"	Update the contents of the folder
	"Deleting file"	Delete selected file
	"Delete all"	Delete all files in the selected folder
	"Display file"	Display selected file
	"Rename file"	Change name of selected file
	"Set Write Protection"	Set write protection of the selected file
	"Deactivate Write Protection"	Deactivate write protection of the selected file
	"Direct Help"	Call up direct help for the key pressed next.

III. Specify the sorting order

1. Click the header of the list (1).

   ⇨ The "Sort by" window appears.

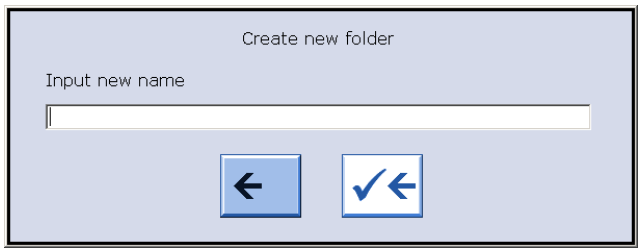
2. Select the type of sorting and confirm it.



IV. Create new folder:

1. Call up the input window with the  key.

   ⇨ The window "Create new folder" appears



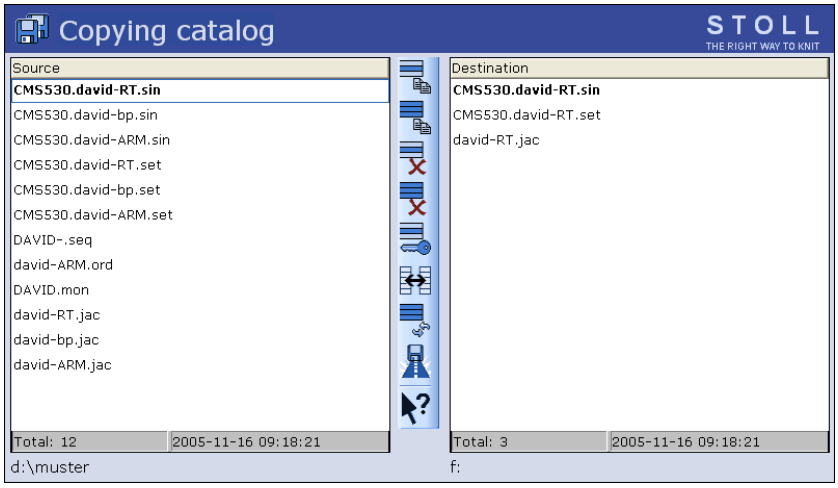
2. Enter the name of the new folder with the virtual keyboard.
3. Confirm input with  .
   ⇨ The new folder will be created with the desired name.

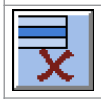
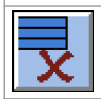
You can cancel the entry with  .

28 Copying Files

I. Copy files from the hard disk to the USB memory stick:

1. Insert the USB memory stick into the USB socket.
2. Call up the "Load & Save" window in the "Main Menu" with  .
3. Tap the  key.
4. Open the copying catalog with the  button.
   ⇨ The "Copying catalog" window is displayed.



Key	Designation	Function
	**Copy file**	Copy file selected in Source to Target
	**Copy all**	Copy all files from Source to Target
	**Deleting file**	"Delete selected file"
	**Delete all**	Delete all files of the selected pattern folder
	**Set Write Protection**	Set write protection of the selected file
	**Deactivate Write Protection**	Deactivate write protection of the selected file
	**Select current pattern folder**	Open the dialog box for definition of the current pattern folder
	**Direct Help**	Call up "Direct Help" for the key pressed next
	**Exchange contents**	Exchange contents of Source and Target; Source is always on the left, Target on the right
	**Update**	Refresh the contents of the pattern folder

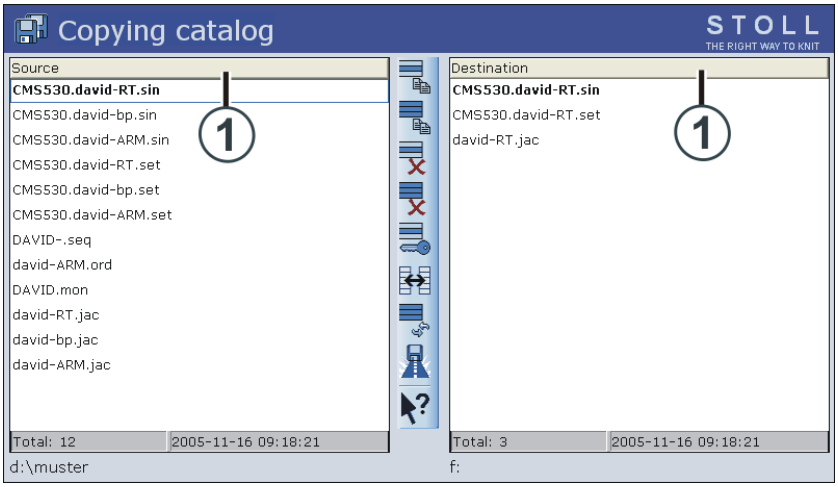
5. Specify the path for the **Source** and **Target** list.

> The path will be displayed below the respective list.

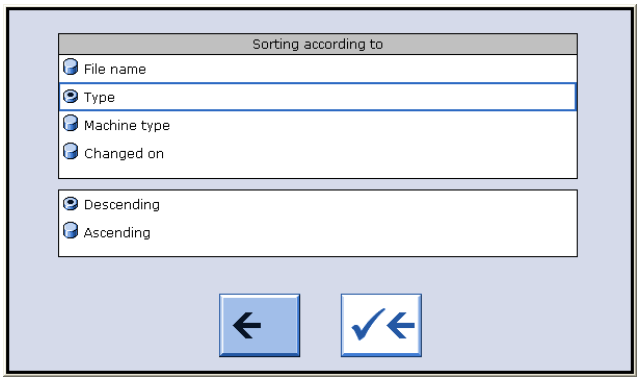
6. Select the desired file in the left list (Source).
7. Tap the "Copy file" key.
   ⇨ The file is copied and displayed in the list at the right (target).
8. Repeat the last two steps to copy other files.

II. Individually set the sequencing of the lists:

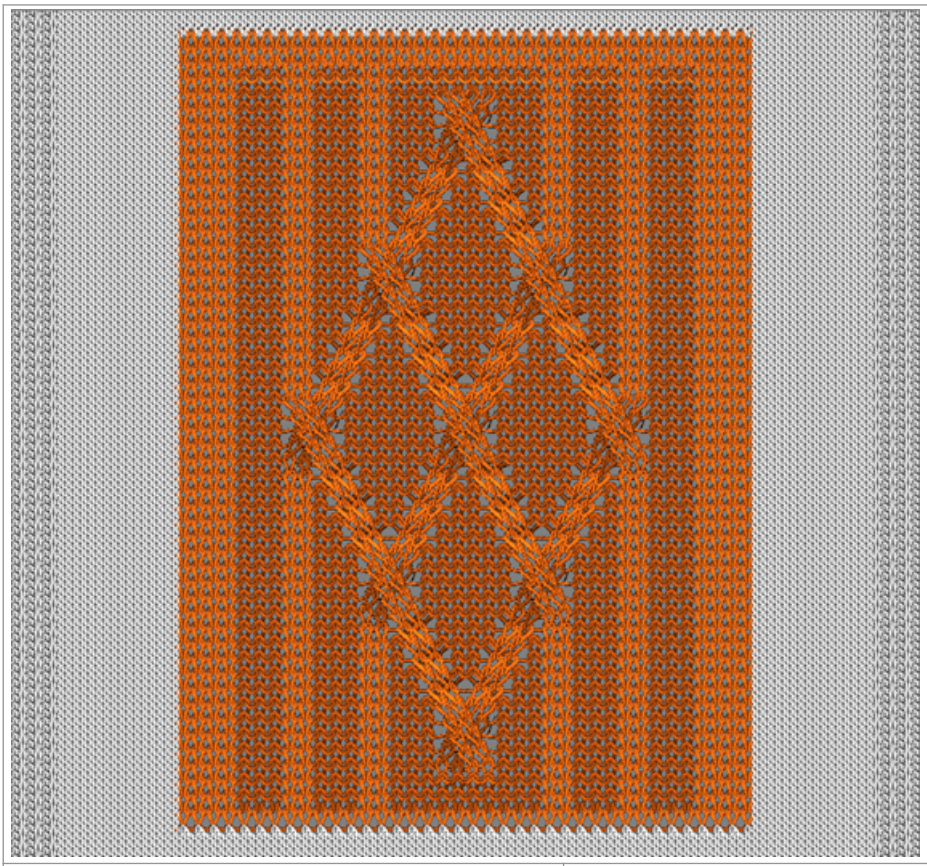
1. Click on the header (1) of the list to be changed.



2. Select and confirm the sort sequence in the "Sort by" window.



29 Pattern 7: Multi Gauge



Pattern name	Multi Gauge
Start	2x2 Rib
Machine Type	CMS 530 HP 5“ with E 7.2 CMS 530 HP 6“ with E 3,5.2 CMS ADF 32 W with E 7.2
Operating mode of the machine	◆ with comb function ◆ With clamping / cutting
Pattern description	◆ Multi gauge knitting technique – SJ area: all needles knit (fine area) – Multi gauge area with Aran: only every 2nd needle knits - 1x1 technique (coarse area)
Pattern Parameters	◆ Cycle Counters **(RS)** ◆ Stitch Length **(NP)** ◆ Fabric Take-down **(WMF)**

29.1 Load and Set-up the Pattern in the Machine

Procedure:

1. **Load pattern in machine.**
2. **Set up the pattern:**

■ Threading up the Yarn Carriers

■ Position the yarn carriers at the clamping point.

3. **Start the machine.**

Make the following changes:

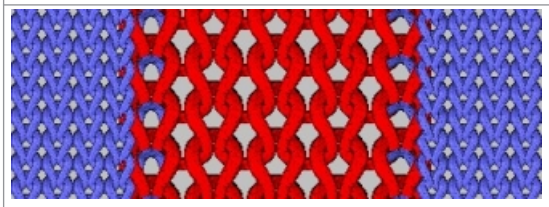
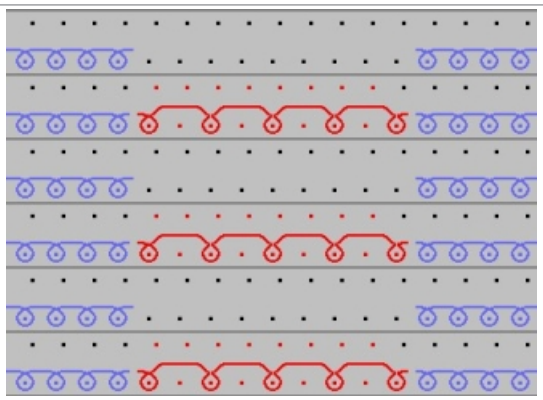
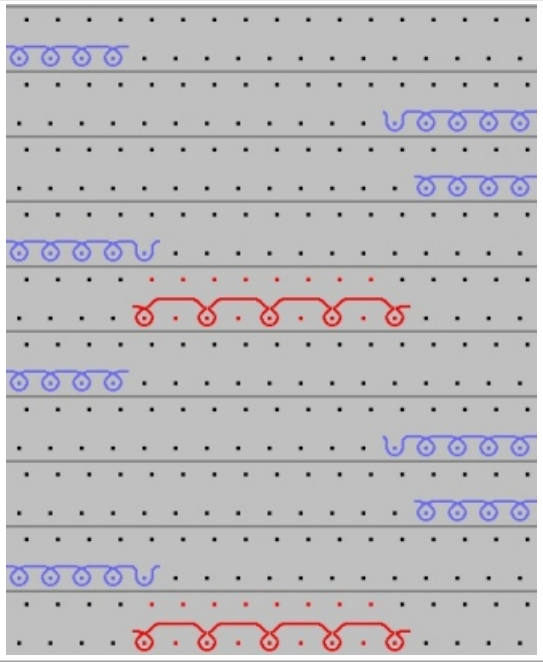
- Cycle counters (**RS)**
- Stitch Length (**NP**)
- Fabric take-down values (**WM, W+, WMK, ...**)

29.2 Multi gauge knitting technique

Multi gauge knitting technique

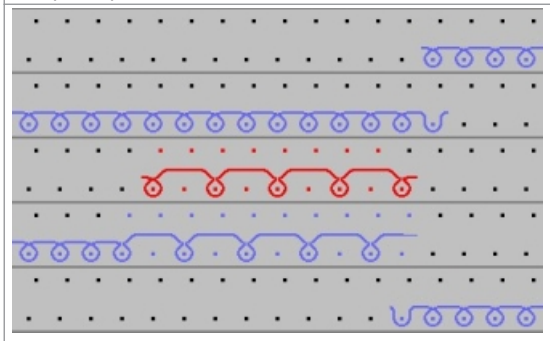
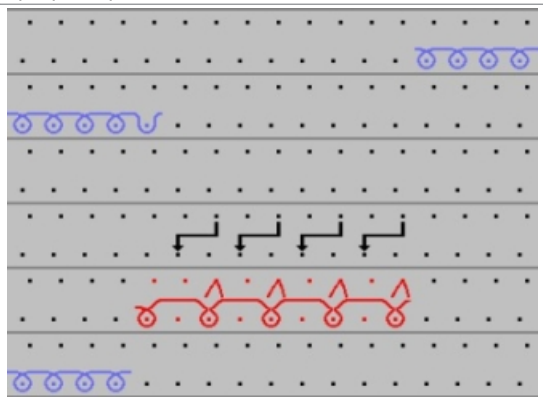
This knitting technique is based on the intarsia knitting technique as the neighboring areas (coarse - fine) in one knitting row are knitted with different yarn carriers.
The multi gauge gauges are recommended (e.g. E2,5.2, 3,5.2, 5.2 etc.).

Simplified presentation of fabric and stitch line:

Stitch Presentation	Stitch line
	
Coarse and fine color fields side by side	In the coarse area only every second stitch row will be knit in 1x1. In the fine area every stitch row will be knit with all needles. **Result:** Stitch ratio coarse: fine is 1: 2.
	Stitch line with binding at the edge of the color field
	

Only the fine areas (fine yarn) are linked into the coarse field by tuck.

Different bindings at the transitions from coarse area to fine area

fine pick-up of stitches	split pick-up of stitches
	

30 Pattern 6: Plating

Pattern name	**CMS 530 HP** ◆ Plating_with_2_YC ◆ Double bow plating YC **CMS ADF 32 W** ◆ Plating_2_YC
Start	1x1 rib plated with doubling in the transition
Machine Type	CMS 530 HP 5“ with E 7.2 CMS 530 HP 6“ with E 3,5.2 CMS ADF 32 W with E 7.2
Operating mode of the machine	◆ with comb function ◆ with clamping / cutting
Pattern description	◆ SJ structure pattern ◆ **Plating on Performer Machines** – Pattern 1: with double bow plating yarn carrier – Pattern 2: with 2 yarn carriers ◆ **Plating with ADF machines** – Patterns with 2 autarkic yarn carriers
Pattern Parameters	◆ **With Performer Machines** – **(Y:Ua-Ub)** engaging width when plating with 2 yarn carriers – Loop sinking depth **(Y:Ncc)** ◆ **With ADF machines** – **YDI**: Plating index – Loop sinking depth **Y: Ncc**

30.1 Types of plating

Plating types

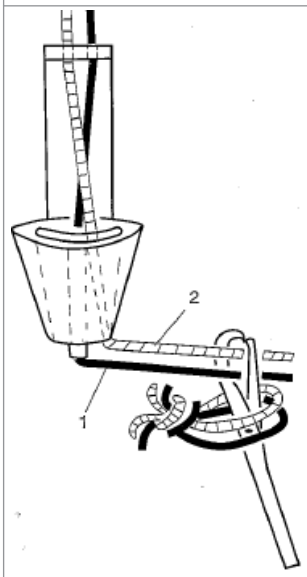
■ **Color plating:**
Patterning effect through different colors with structures with single jersey and reverse jersey stitches.

■ **Plating of different materials:**
Manufacturing elastic fabrics. For the basic yarn, an elastic Lycra thread is used.

- Usage in the cuff to achieve a more elastic rib
- Usage for a complete article to obtain a fashionable tight-fitting fabric.

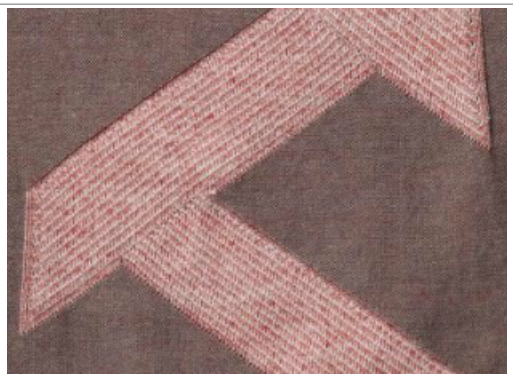
Plating technique

Two threads are inserted at exact position in the needle hook with plating. The leading yarn (plating yarn) lies on the front in case of a single jersey stitch. The following yarn (basic yarn) lies on the rear side (on the background) in case of a jersey stitch.



1	Plating Yarn
2	Basic Yarn

Color Plating



Plating of different materials

Knitting technique possibilities for plating:

■ Plating with one yarn carrier

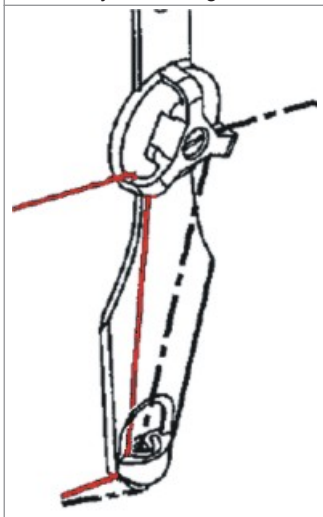
- Yarn carrier with double eyelet
- Double Bow Plating Yarn Carrier

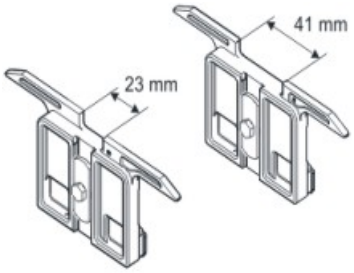
■ Plating with two yarn carriers

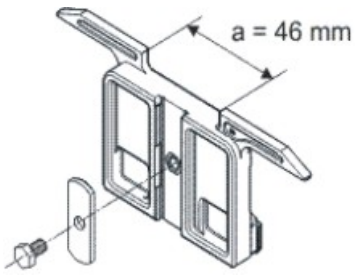
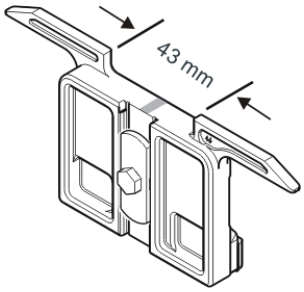
– The two yarn carriers must have different engaging widths.

30.2 Types of plating yarn carriers

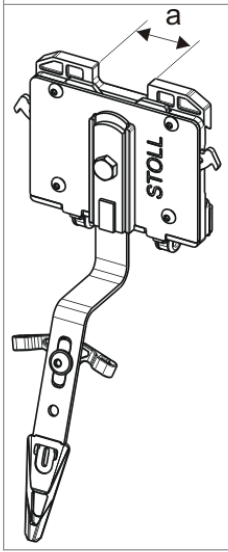
I. Machine type-depending options of plating:

Double Eyelet-Plating Yarn Carrier	Using machine type	Special feature
	**ST 211**to**OKC**	**Threading-up for color plating:** Thread the plating yarn through the central eyelet and the basic yarn through the oblong hole.
		Threading-up with Elastane plating: Thread the basic yarn through the central eyelet and the Elastane yarn through the oblong hole or through the following yarn carrier.

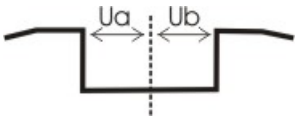
Two special yarn carrier carriages	Using machine type	Special feature
Combination for coarse gauges E 2,5 - 5 	**ST 711**, **ST 811**, **ST 168**, **ST 268**, **ST 468**, **OKC**	**Threading-up for color plating:** Thread the plating yarn in the yarn carrier with the shortened engaging width and the basic yarn in the yarn carrier with the enlarged engaging width.

One special and one normal yarn carrier carriage (29 mm)	Using machine type	Special feature
With 6‘‘ machines:  **With 5‘‘ machines:** 	**ST 711**, **ST 811**, **ST 168**, **ST 268**, **ST 468**, **OKC**	**Threading-up for color plating:** Thread the plating yarn in the normal yarn carrier with the shorter engaging width and the basic yarn in the yarn carrier with the larger engaging width.

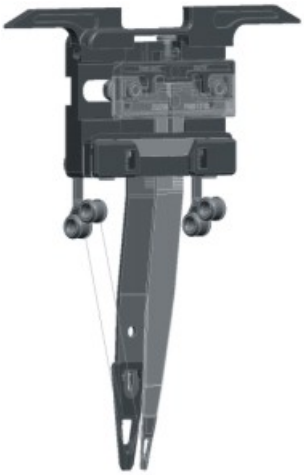
Adjustable yarn carrier carriage	Using machine type	Special feature
	**OKC**	**Threading-up for color plating:** Thread the plating yarn in the yarn carrier with the shorter engaging width and the basic yarn in the yarn carrier with the larger engaging width.

Normal yarn carrier type 2	Yarn carrier engaging widths	Special features and usage
	**43 mm**	**CMS 933, CMS 822, CMS 530, CMS 520** ◆ **E10|E12|E14|E16|E18|E6.2|E7.2|E8.2|E9.2**
	46 mm	**CMS 933, CMS 822, CMS 530, CMS 520** ◆ **E5|E7|E8|E2,5.2|E3,5.2|E5.2**
		CMS 740, CMS 730 T, CMS 530 T ◆ all gauges
	29 mm	Standard yarn carrier ("normal" knitting)
	23 mm	◆ **i**: only usable under certain conditions. Depending on the machine gauge (≥ E10) and the machine speed, the needle latches can be damaged. Remedy: Increase the engaging width.

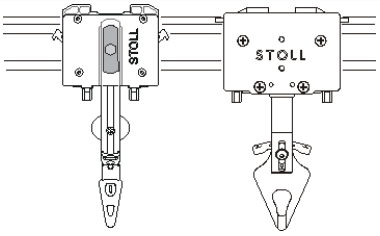
The different engaging widths of the yarn carrier carriages are defined by the **Ua/b** value in the MC program.



This way the correct parking position of the machine can be calculated.
If a yarn carrier is used with other engaging widths, it is necessary to take account of this in the MC program.

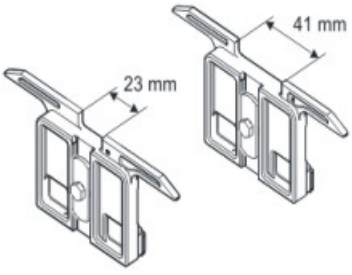
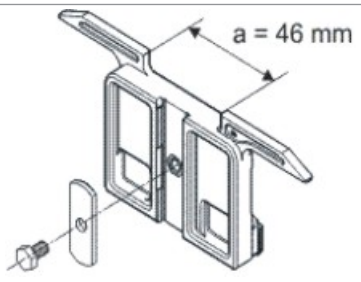
Double Bow Plating Yarn Carrier	Using machine type	Special feature
	**OKC** starting with component type 002	**Threading-up for color plating:** Thread the plating yarn in the fix yarn carrier bow and the basic yarn in the moving bow. **i**: Only possible with tandem machines with: ◆ 8 clamping and cutting points ◆ 16/8 clamping and cutting points ◆ without clamping and cutting points

II. Plating in combination with intarsia yarn carriers

Combination of yarn carriers with plating		
Normal yarn carrier type 2	**Intarsia yarn carrier Type 2**	
i: Combination of intarsia yarn carrier is only possible with normal yarn carrier type2!!		

30.3 Engaging Width and Rail Allocation

I. Different engaging width of the yarn carrier carriages:

Different engaging widths		
		

The different engaging widths of the yarn carrier carriages are defined by the **Ua/b** value in the MC program. This way the correct parking position of the machine can be calculated.
If a yarn carrier is used with other engaging widths, it is necessary to take account of this in the MC program.

II. Recommended yarn carrier rail allocation:

- Rails 4 + 5
- Rails 3 + 6

An optimum yarn insertion is achieved via allocation of the central yarn carrier rails.

30.4 Load and Set-up the Pattern

Procedure:

1. **Load pattern in machine:**

- Prepare plating yarn carrier
- Threading up the Yarn Carriers

2. **Start the machine.**

Threading-up the different plating yarn carriers:

Technique of Plating	Used plating yarn carrier type	Threading-up the plating yarn	Thread-up the basic yarn
Color plating	Double Eyelet	Central Eyelet	Oblong Hole
	Special yarn carrier carriages	Yarn carrier with short engaging width	Yarn carrier with large engaging width
	Double Arm	Fix Central Bow	Moving Bow
Elastane plating	Double Eyelet	Oblong Hole	Central Eyelet
	Special yarn carrier carriages	Yarn carrier with large engaging width	Yarn carrier with short engaging width
	Double Arm	Moving Bow	Fix Central Bow
	i: The elastic yarn is the invisible (at the start inner) yarn of single jersey stitches.		

Make changes if necessary:

- Stitch Length (**NP**)
- Fabric take-down values (**WM, W+, WMK, …**)
- With Performer Machines
  - Engaging Width **Y: U a-b**
  - Loop sinking depth **Y: Ncc**
- With ADF machines
  - Plating index **YPIn**
  - Loop sinking depth **Y: Ncc**

30.4.1 Definition for Plating Yarn Carrier

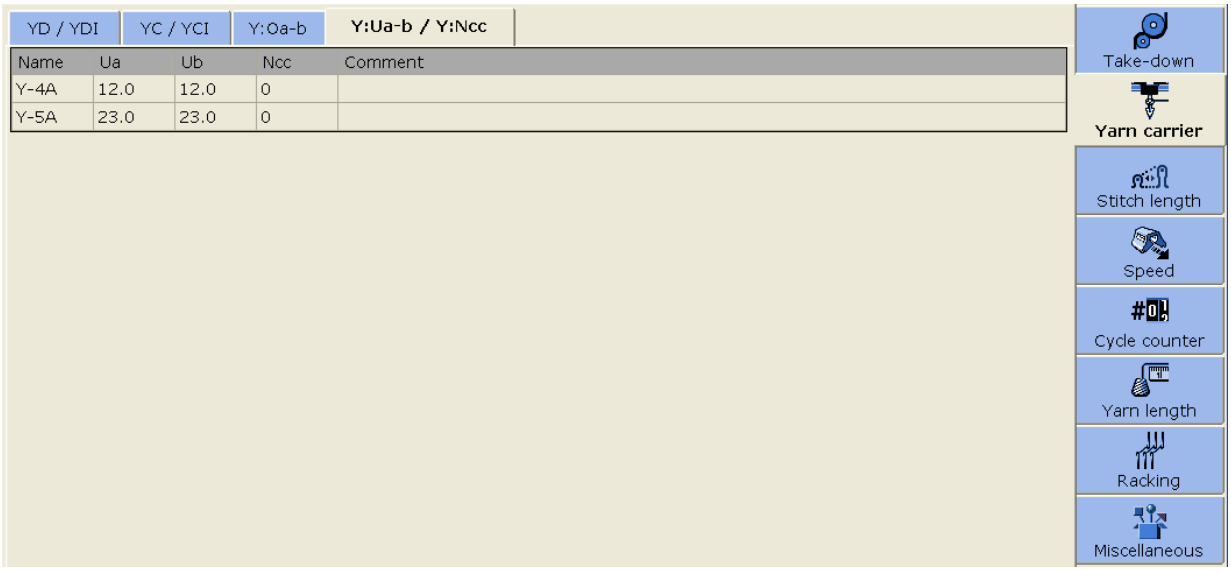
Sintral commands for the different yarn carriers:

For different yarn carrier types the corresponding designations are used in the MC program:

Command	Explanation
Y-5A:PA;	Double Bow Plating Yarn Carrier
Y-5A:P;	Double eyelet yarn carrier
Y-5A:Ua-b	Yarn carrier with variable engaging width **a** = Engaging value at the left **b** = Engaging value at the right

Definition for different engaging widths in the Setup2 Editor:

For selecting correctly the yarn carriers with different engaging width the following commands in Setup2 are necessary:

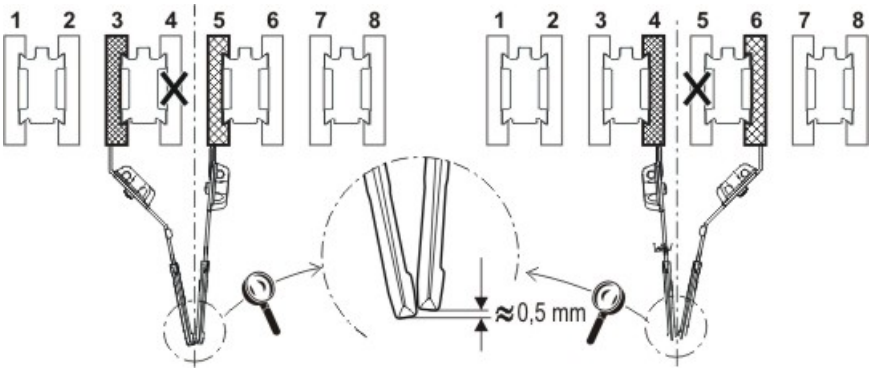


30.5 Plating with Performer Machines

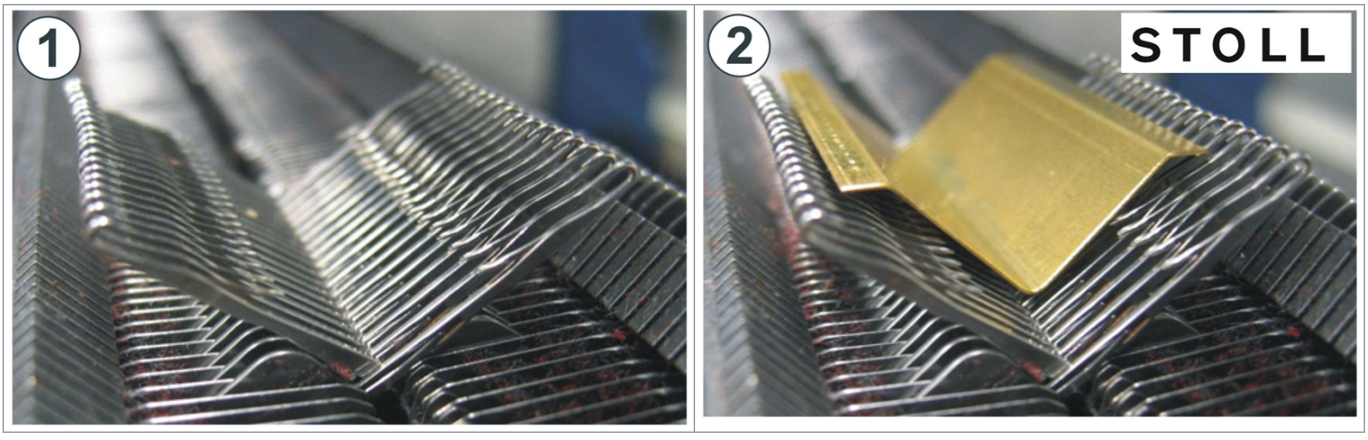
30.5.1 Settings during Production

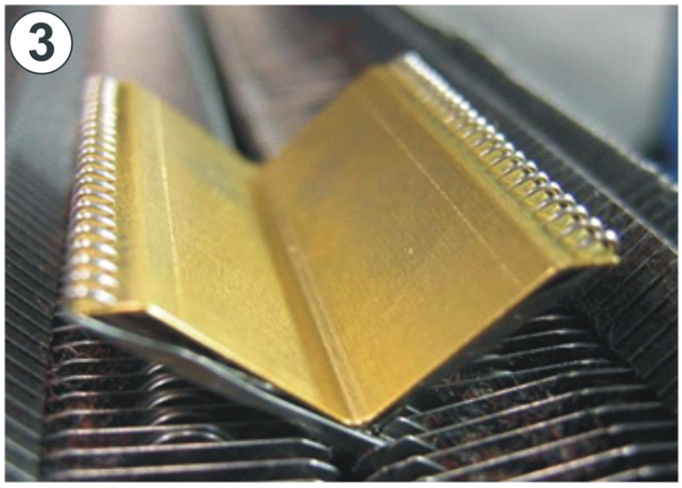
I. Influences on the quality of plating with SJ:

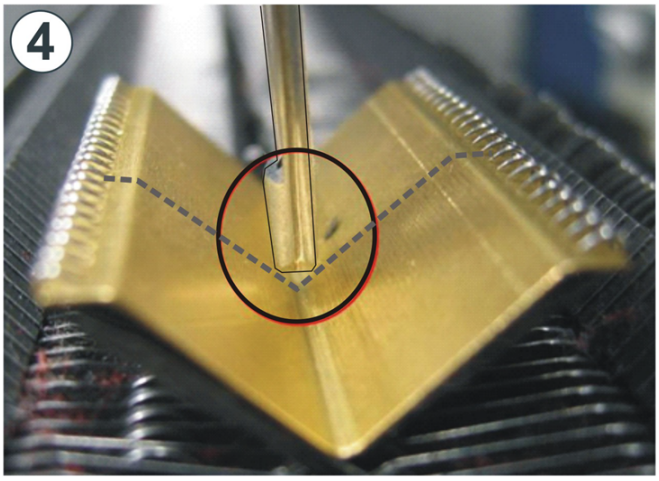
- Adjustment of the plating yarn carriers (two yarn carriers):
  - The two yarn carriers must be positioned exactly in the centre of the needle cross.
  - Adjust the eyelet of the following thread about 0.5 mm higher.
  - The basic yarn lying above has to cover the plating yarn lying underneath of it optimally.
  - Recommendable: Leave one yarn carrier rail unutilized to prevent the yarn carriers from displacing each other.

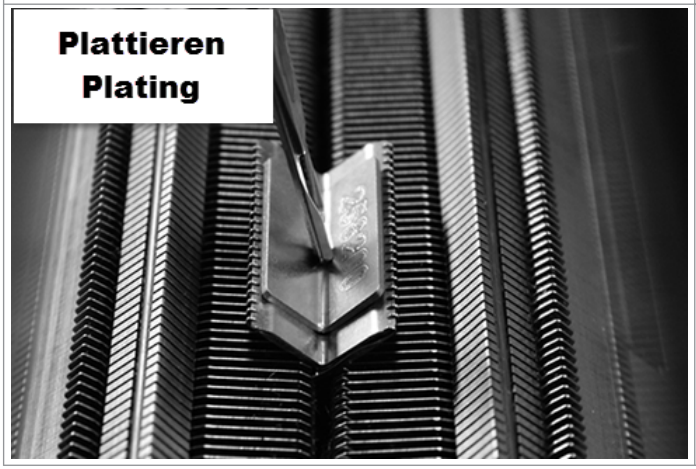


Adjusting the two yarn carriers when plating:







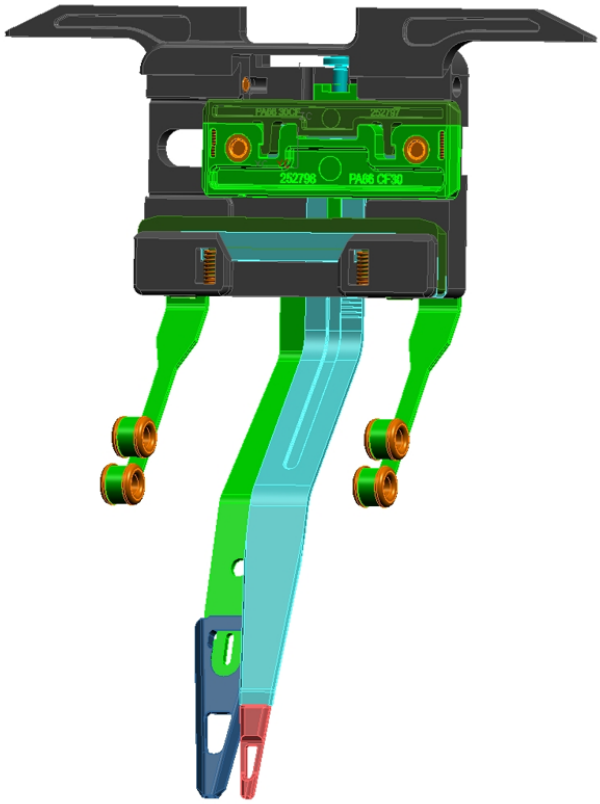


For adjusting the plating yarn carriers in height, there are additional 'shims' with different heights, which are positioned on the already inserted shim.

II. Influences on the quality of plating with DJ:

- Setting the plating yarn carrier (double bow):
- Adjust the eyelet of the following thread about 3 to 3.5 mm higher.
- **Yarn tension:**
  Adjust a higher yarn tension for the following basic yarn as for the leading plating yarn.
  i: Double the yarn tension nearly.
- **Fabric take-down:**
  Work with a reduced fabric take-down.
  i: Halve the fabric take-down value nearly.
- **NP value:**
  Produce a test fabric with different NP-values.
  i: Miss-knit to tight.

30.5.2 Double Bow Plating Yarn Carrier



With the double bow yarn carrier it is possible to carry out color and quality platings (elastane).

Possible uses of the double bow yarn carrier

Use for gauges E 5 to E 18 only:	
OKC (component type 002) **CMS 822** (component type 003) **CMS 420 E** (type 579, component type 000)	
Required operating system	**V_OKC_001.006.000_STOLL** (or higher)

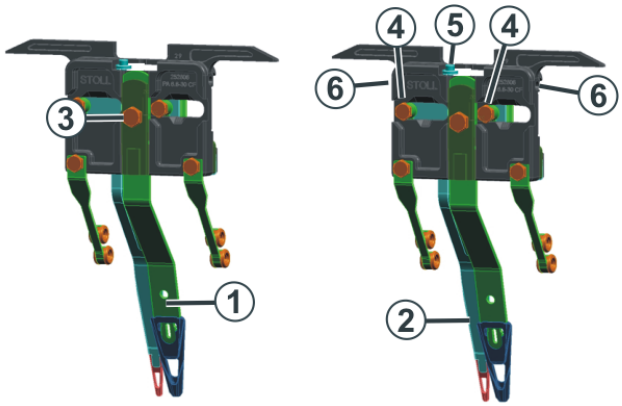
With older OKC machines (component type 000 and 001) the yarn carrier can also be used:			
Machines without thread clamping and cutting device or Clamping / cutting deactivated	**CMS 933**	**CMS 711**	**CMS 503**
	CMS 922		**CMS 502**
Machines with thread clamping and cutting device *		**CMS 730 T**	**CMS 530 T**
		CMS 730 S	
Required operating system	**V_OKC_001.005.000_STOLL** (or higher)		

Clamping and cutting of the double bow yarn carrier

When using 16 times clamping / cutting, every other clamping / cutting point has to be deactivated to ensure that both threads are reliably clamped and cut.

Machine	Clamping / cutting
OKC (component type 002) **CMS 822** (component type 003) **CMS 420 E** (type 579, component type 000)	Setting: 2x8
	Setting: 2x16/8 Carry out the settings in the "Machine Configuration 2" window. (**BootOkc** --> **Restart and Configuration** --> Machine configuration 2)

30.5.2.1 Adjust the Double Bow Plating Yarn Carrier

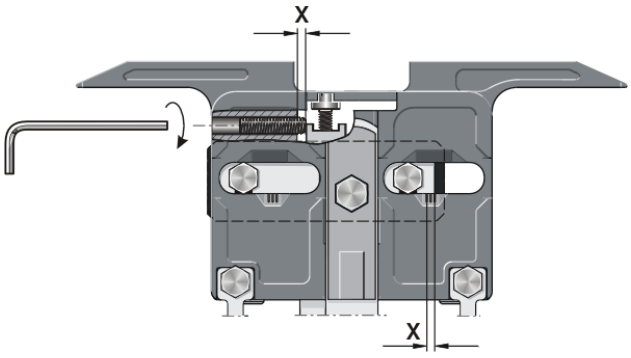


1	Central bow (fixed)	Plating Yarn
2	Follower bow (movable, following the central bow)	Basic Yarn

1. Loosen the screw (3) (turn by 90 degrees).
2. Adjust the central bow the same way as the normal yarn carrier.
3. Retighten the screw.

1. Loosen both screws (4) (turn by 90 degrees).
2. Adjust the height turning the screw (5).
   Standard setting: 2 mm higher than the central bow.
3. Retighten both screws (4).
4. Turn the screw (5) enough to prevent it from touching the upper or lower edge. If the screw is making contact, then the yarn carrier does not move smoothly and will be damaged.

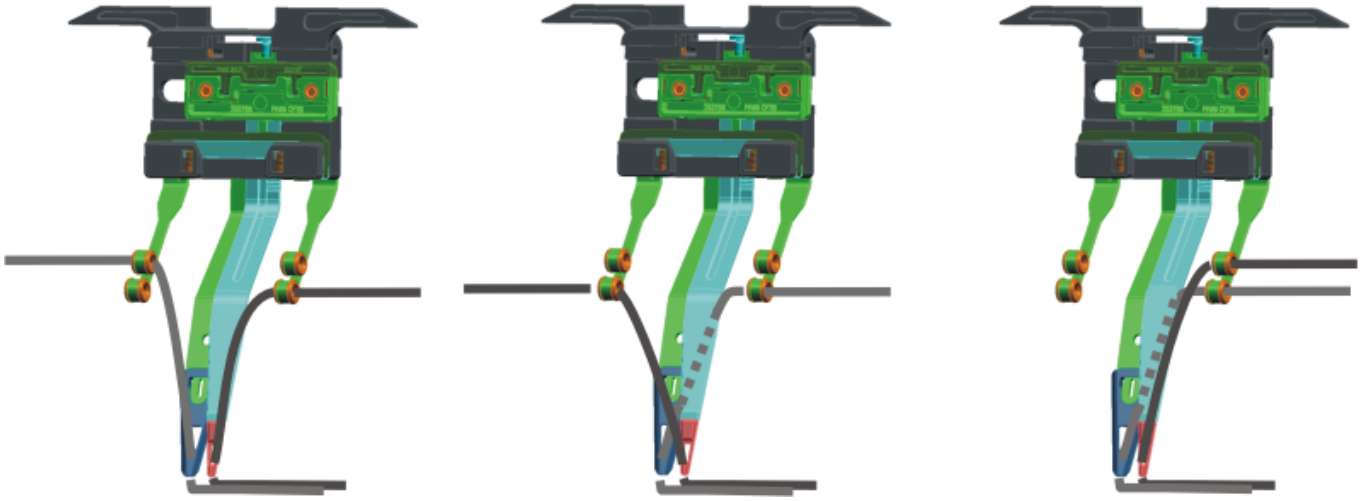
1. A screw is located in the boring (6). Adjust it with an Allen key (2 mm) (Setting range: 0 - 2 mm).
2. The distance from the bow (2) to the bow (1) can be set individually on each side. A scale simplifies the setting of the distance.



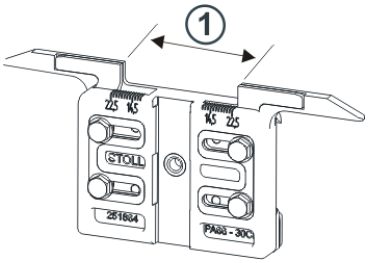
30.5.2.2 Threading up the Double Bow Plating Yarn Carrier

The follower and the central bow of the double bow yarn carrier can be threaded up from the left and from the right or from the same side.

Threading options:



30.5.3 Adjustable Plating Yarn Carrier Carriage



For plating with normal yarn carriers are required two yarn carriers that differs by the engaging width (1) at the yarn carrier carriage.
On the plating yarn carrier carriage the engaging width is individually adjustable (23-46 mm).

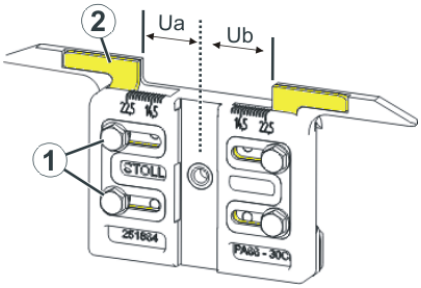
Applications when plating with two yarn carriers:

- 2 adjustable plating yarn carrier carriages
- 1 Standard normal yarn carrier and 1 adjustable plating yarn carrier carriage

Possible uses:

- With all **OKC** machines of the **E5 – E18** gauge
- Only starting with operating system **V_OKC_001.005.000_STOLL**

30.5.3.1 Adjusting the Engaging Width



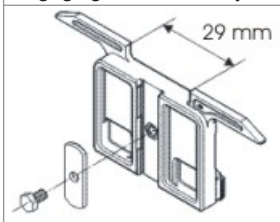
1. Loosen both screws (1).
2. Push insert (2) into the desired position.
   A scale simplifies the adjustment.
3. Re-tighten both screws (1).
4. Repeat the setting process for the other side.

The entire engaging width consists of the value for the left (**Ua**) and the right (**Ub**) side.
Both values may be equal (symmetrical setting) or may differ.

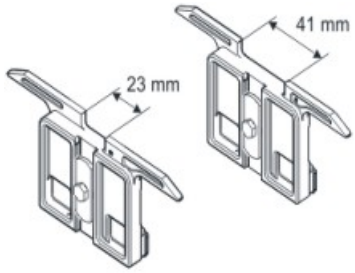
30.5.4 Changing Engaging Width and Loop Sinking Depth

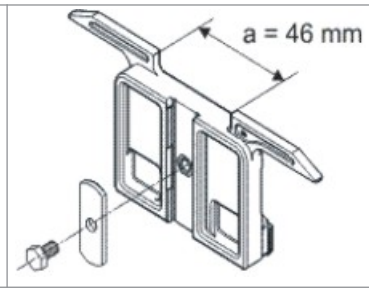
Different engaging width of the yarn carrier carriages:

Engaging width normal yarn carrier

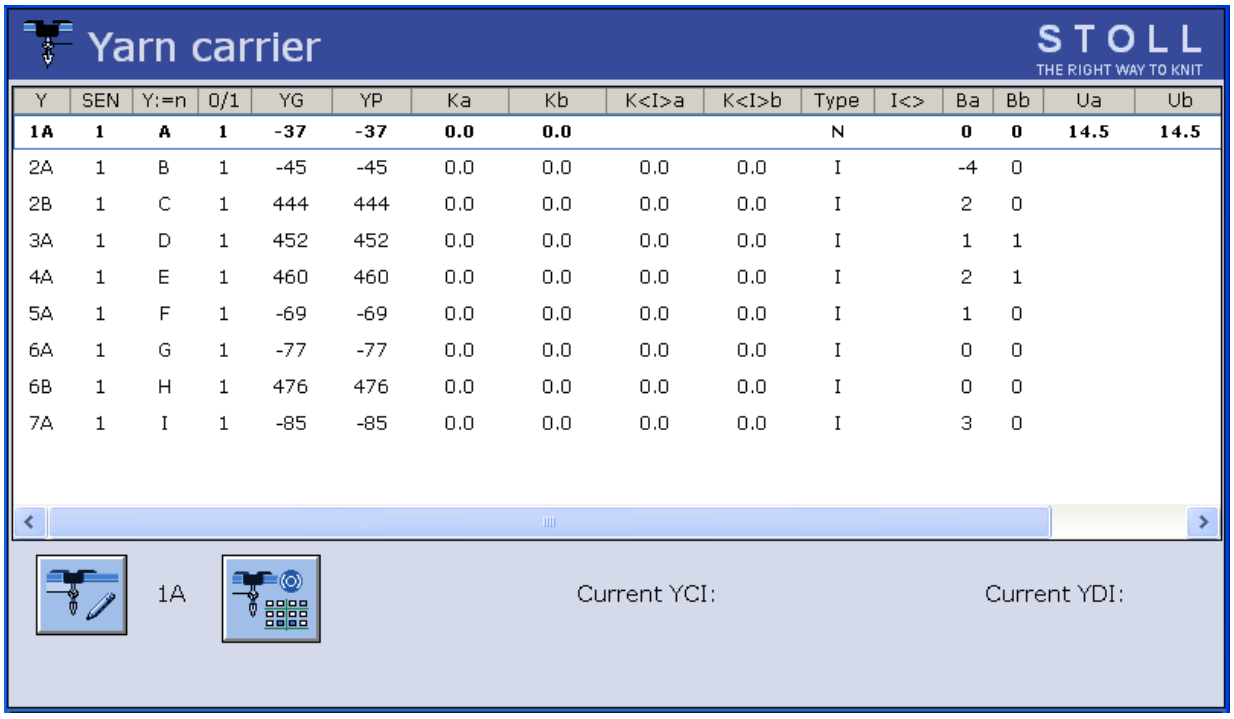


Engaging widths of the plating yarn carriers





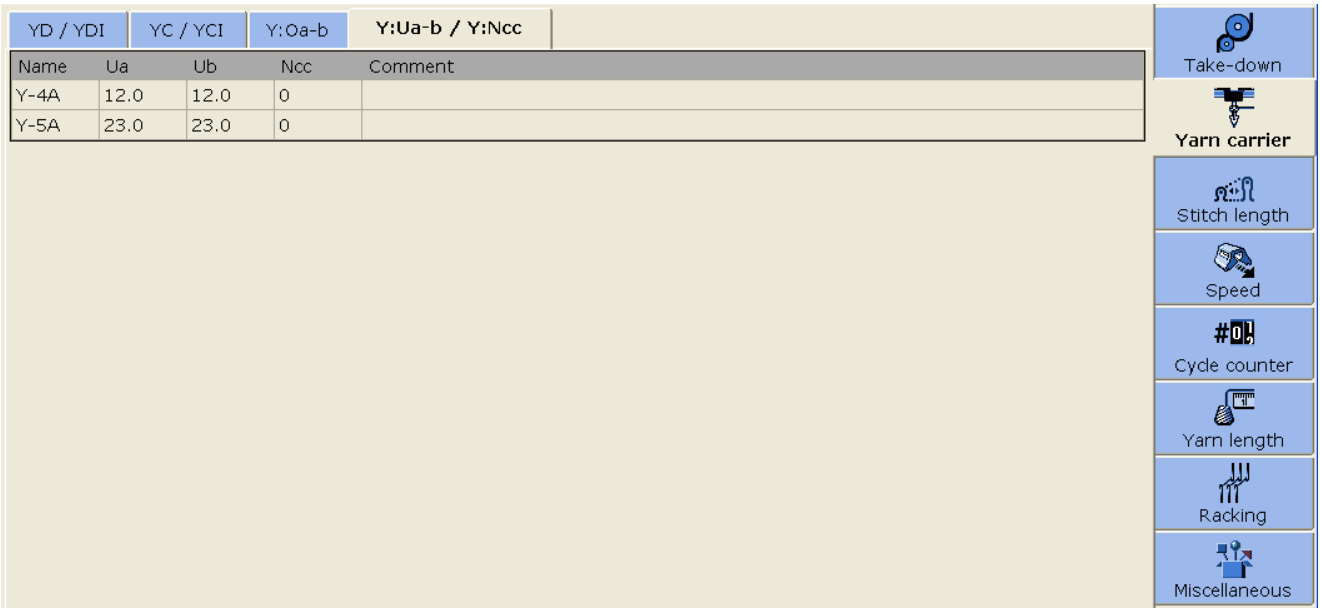
The different engaging widths of the yarn carrier carriages are defined by the **Ua/b** value . This way the correct parking position of the machine can be calculated.



Y	SEN	Y:=n	O/1	YG	YP	Ka	Kb	K<I>a	K<I>b	Type	I<>	Ba	Bb	Ua	Ub
1A	**1**	**A**	**1**	**-37**	**-37**	**0.0**	**0.0**			N		**0**	**0**	**14.5**	**14.5**
2A	1	B	1	-45	-45	0.0	0.0	0.0	0.0	I		-4	0		
2B	1	C	1	444	444	0.0	0.0	0.0	0.0	I		2	0		
3A	1	D	1	452	452	0.0	0.0	0.0	0.0	I		1	1		
4A	1	E	1	460	460	0.0	0.0	0.0	0.0	I		2	1		
5A	1	F	1	-69	-69	0.0	0.0	0.0	0.0	I		1	0		
6A	1	G	1	-77	-77	0.0	0.0	0.0	0.0	I		0	0		
6B	1	H	1	476	476	0.0	0.0	0.0	0.0	I		0	0		
7A	1	I	1	-85	-85	0.0	0.0	0.0	0.0	I		3	0		

Change engaging width:

1. Call up in the main menu "Setup". 
2. Tap the "Yarn carrier" key.
3. Open the "Y:Ua-b / Y:Ncc" tab



4. Enter new values into the **Ua** / **Ub** fields.

Recommended engaging width according to the machine gauge:

Gauge	leading	Trailing
E 5 **E2,5.2** **E 3,5.2**	**23 mm** **Ua: 11,5** **Ub: 11,5**	**41 mm** **Ua: 20,5** **Ub: 20,5**
E 7-18 **E 7.2- 9.2**	**29 mm** **Ua: 14,5** **Ub: 14,5**	**46 mm** **Ua: 23,0** **Ub: 23,0**

II. Loop sinking depth of the clamping and cutting device

- In case of very fine or smooth yarn it can be beneficial to change the loop sinking depth of the clamping and cutting needle.
- By the **Ncc** command the clamping depth can be influenced.

	Explanation	Value range
Ncc=n	Control of the loop sinking depth **n** of the clamping and cutting needles. Default setting: n=0 e.g.: sink the cutting needles by 5 steps deeper: **NCC=5**	Min. value: -10 Max. value: 10 Step width: 1

30.6 Plating with ADF machines

Adjustment of the yarn carriers

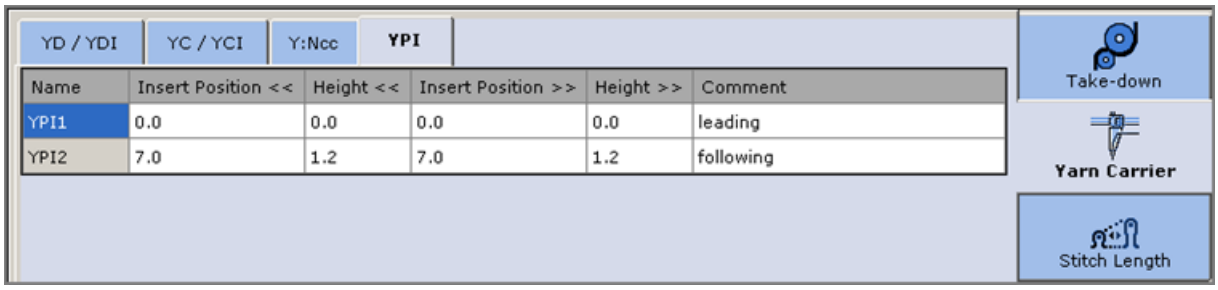
It is a requirement that the ADF yarn carriers are correctly adjusted vertically and horizontally.

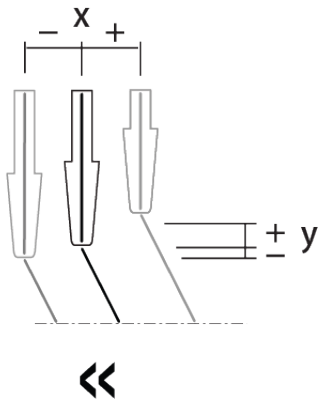
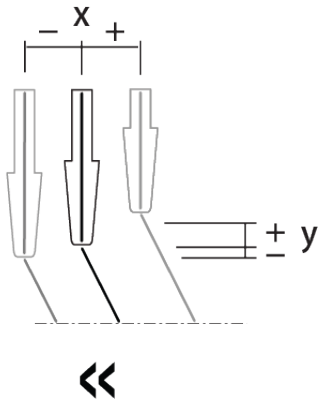
Changing specifications in assigned plating indices:

With the help of the specifications in the **YPI** menu it is possible to 'correct' the yarn carriers when plating.

1. In the "Setup2 Editor" main menu call up  .

2. Tap the "Yarn carrier" key.
3. Open the **YPI** tab.
   ⇨ The yarn carriers used for plating in the pattern are displayed with the used plating indices.
4. Make necessary changes in the table.



	Meaning	Value range
YPI	Plating index Defines the distance between the yarn carrier and the normal yarn insertion position in the needles and the insertion angel.	
Insert Position <<	Horizontal shifting of the insertion position **(x)** in the carriage direction from right to left  ◆ Positive value: Following basic yarn. The thread is inserted in the needles later on. Standard: 7.0 mm ◆ Negative value: Leading plating yarn Standard: 0 mm	Minimum value: -100 mm Maximum value: 100 mm Step width: 0.1 mm
Height <<	Vertical shifting **(y)** in the carriage direction from right to left Corrects the insertion angle  ◆ Positive value: Steeper yarn angle Standard: 1.2 mm for the following basic yarn ◆ Negative value: Flatter yarn angle	Minimum value: -2 mm Maximum value: 5 mm Step width: 0.1 mm
Insert Position >>	Horizontal shifting of the insertion position (x) in the carriage direction from left to right	
Height >>	Vertical shifting (y) in the carriage direction from left to right	

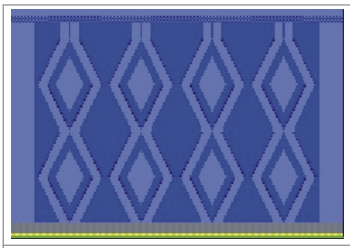
5. Quit the "Setup2 Editor" with the  key.
   ⇨ Changed values are saved in **.setx**.
6. Start the machine with the engaging rod.
   ⇨ The changes will be carried out with the next use of the yarn carrier.

II. Loop sinking depth of the clamping and cutting device

- In case of very fine or smooth yarn it can be beneficial to change the loop sinking depth of the clamping and cutting needle.
- By the **Ncc** command the clamping depth can be influenced.

	Explanation	Value range
Ncc=n	Control of the loop sinking depth **n** of the clamping and cutting needles. Default setting: n=0 e.g.: sink the cutting needles by 5 steps deeper: **NCC=5**	Min. value: -10 Max. value: 10 Step width: 1

31 Pattern 8: Split pattern

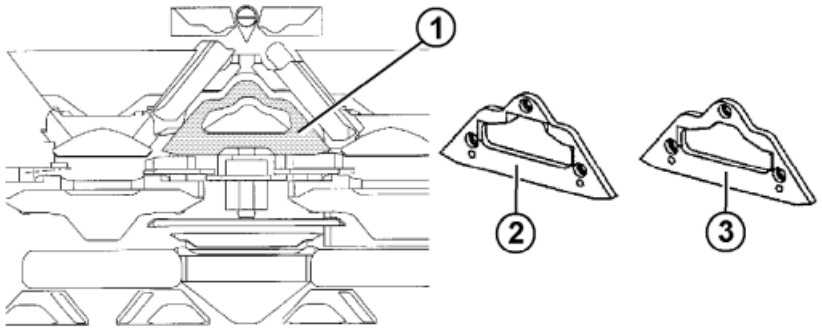


Pattern name	Split-stitch technique
Start	2x2 Rib
Machine Type	CMS 530 HP 5“ with E 7.2 CMS 530 HP 6“ with E 3,5.2 CMS ADF 32 W with E 7.2
Operating mode of the machine	◆ with comb function ◆ With clamping / cutting
Pattern description	◆ Structure with split and pointelle
Pattern Parameters	◆ Cycle Counters **(RS)** ◆ Stitch Length **(NP)** ◆ Fabric Take-down **(WMF)**

31.1 Install Raising Cam for Split-stitch

Exchange raising cam:

When the knitting machine is shipped, the raising cams for transfer (2) are mounted.
Split cams (3) must be mounted into the machine in order to knit with split-stitch technique.



1. Exchange cam (2) with cam (3). Therefore remove the carriage parts.
2. The installation of split cams is possible in every knitting system.

Recommendation: The following system allocation is recommended due to production related reasons:

- With **CMS 530**:

- With **CMS 822**:

The raising cam for split-stitch (3) can also be used for normal transfer patterns. In case of particularly delicate yarns, however, the raising cam for transfer (2) should be used so that the yarn does not tear when transferring the stitches.

31.2 Load and Set-up the Pattern in the Machine

Procedure:

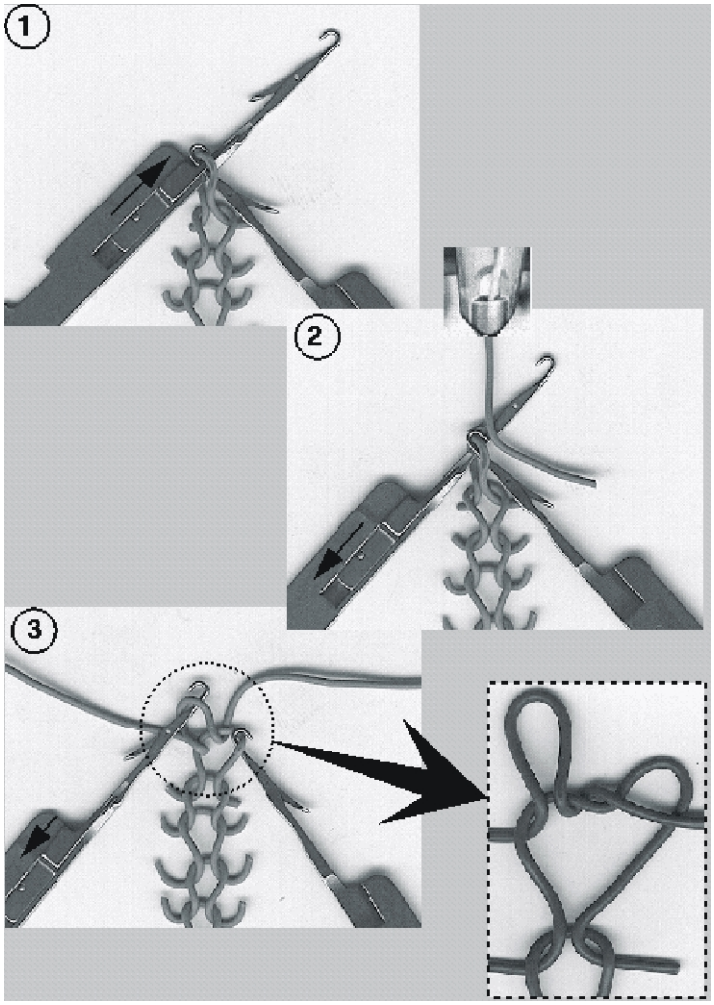
1. **Install split cams**
2. **Load pattern in machine.**
3. **Set up the pattern:**
   - Threading up the Yarn Carriers
   - Position the yarn carriers at the clamping point.
4. **Start the machine.**

Make the following changes:

- Cycle counters (**RS)**
- Stitch Length (**NP**)
- Fabric take-down values (**WM, W+, WMK, …**)

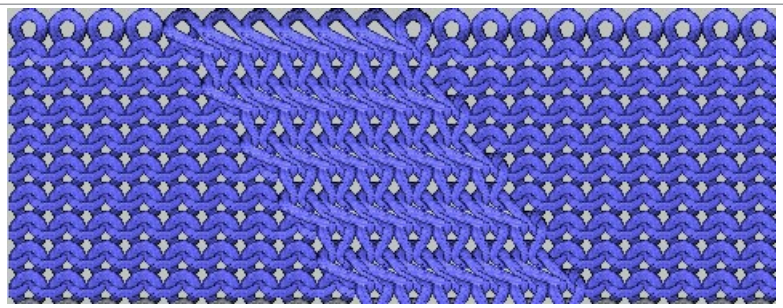
31.3 Split-stitch technique

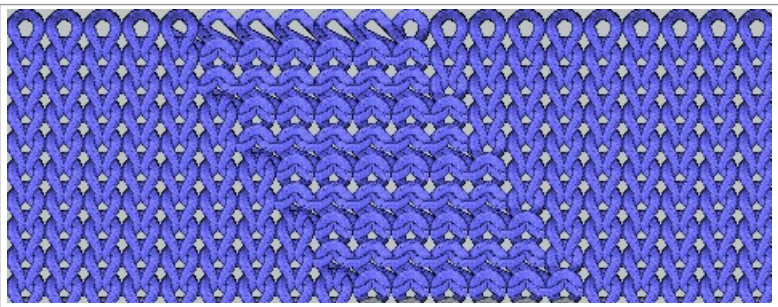
Knitting sequence for split:

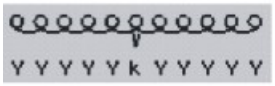
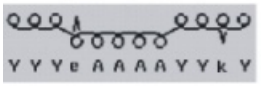


1 Needle raising
- All needles in transfer position (stitch)
- Selection of the receiving needles only for splitting

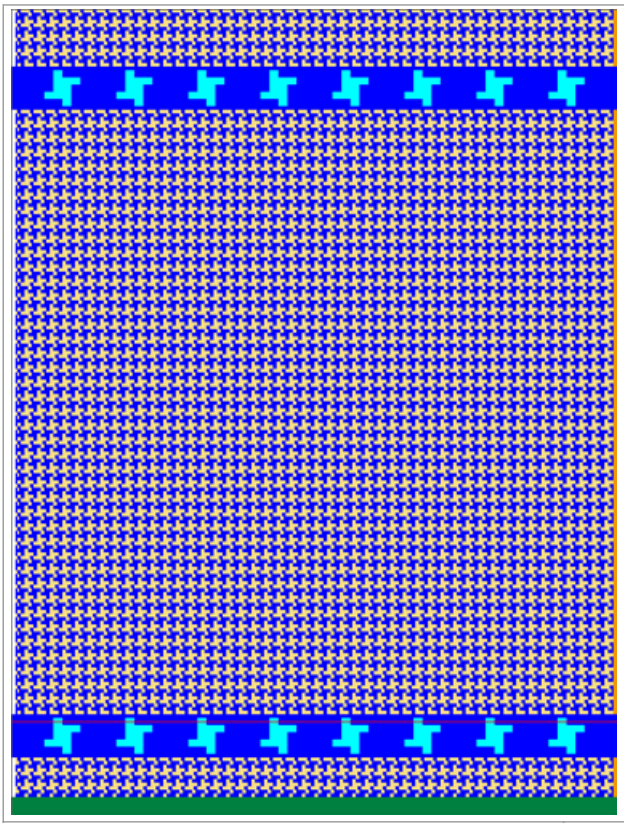
3
- Split-stitch on receiving needle
- new stitch on transfer needle

Fabric View	
Front side	

Fabric View	
Rear side	

Knitting specifications for split		
Split from the front to the rear		S:$^S e%A; Split to the rear front stitch
Split from the rear to the front		S:$VS k%Y; Split to the front back stitch
Split from the front to the rear and from the rear to the front		Split to the front back stitch S:$XS e%A-k%Y; Split to the rear front stitch

32 Pattern 9: CMS ADF 32 W weft yarn and inverse plating



Pattern name	Weft yarn_inverse plating
Start	Tubular
Machine Type	CMS ADF 32 W with E 7.2
Operating mode of the machine	◆ with comb function ◆ With clamping / cutting
Pattern description	◆ Tubular start plated ◆ Areas with weft yarn insertion ◆ Areas with inverse plating
Pattern Parameters	◆ Cycle Counters **(RS)** ◆ Stitch Length **(NP)** ◆ Fabric Take-down **(WMF)** ◆ Weft yarn carrier **Q** ◆ **YCI**

32.1 Load and Set-up the Pattern in the Machine

Procedure:

1. **Load pattern in machine.**
2. **Set up the pattern:**

■ Thread in yarn carrier:

  – Weft yarn in special weft yarn carrier with bypass

■ Position the yarn carriers at the clamping point.

3. **Start the machine.**

Make the following changes:

■ Cycle counters (**RS)**

- Stitch Length (**NP**)
- Fabric take-down values (**WM, W+, WMK, ...**)
- Yarn carrier correction for weft yarn carrier **Q**

32.2 Special features of the CMS ADF 32 W

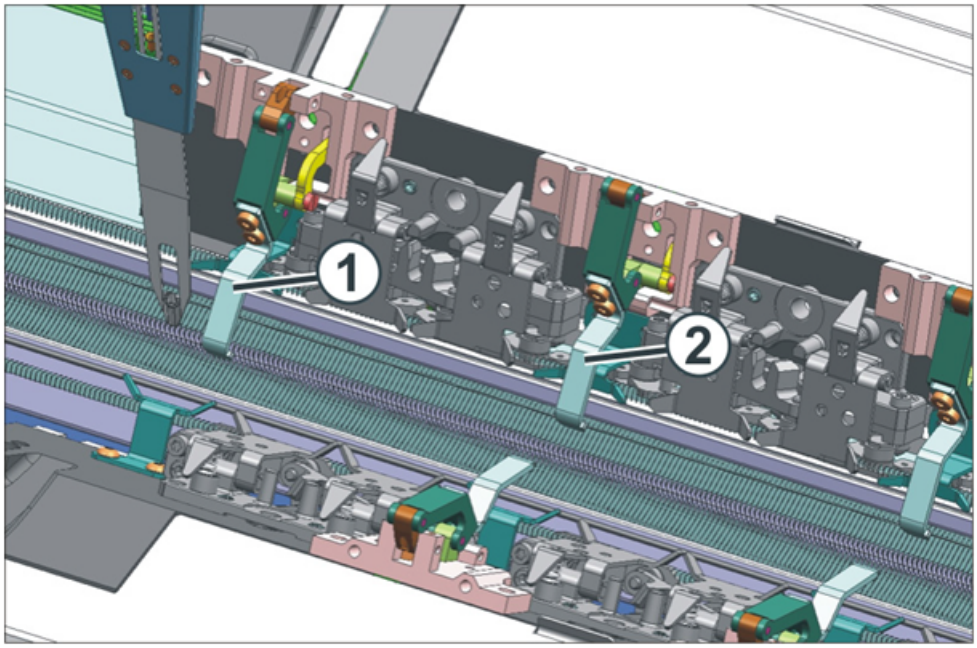
I. Special features of the machine:

1. Each system has a **weave-in device**

Weave-in device

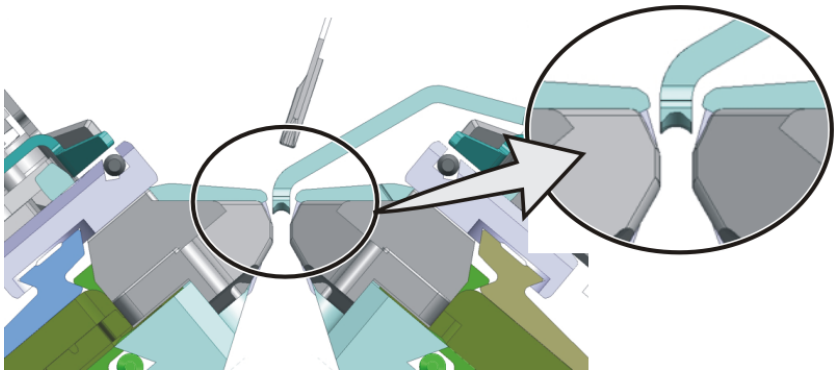
The weave-in device improves the weft insertion significantly and can also be used partly (with limitation) as fabric presser foot.

2. The jack openers are not spring-loaded.



1	Weave-in device in operation
2	Weave-in device out of operation

II. Position of the weave-in device:

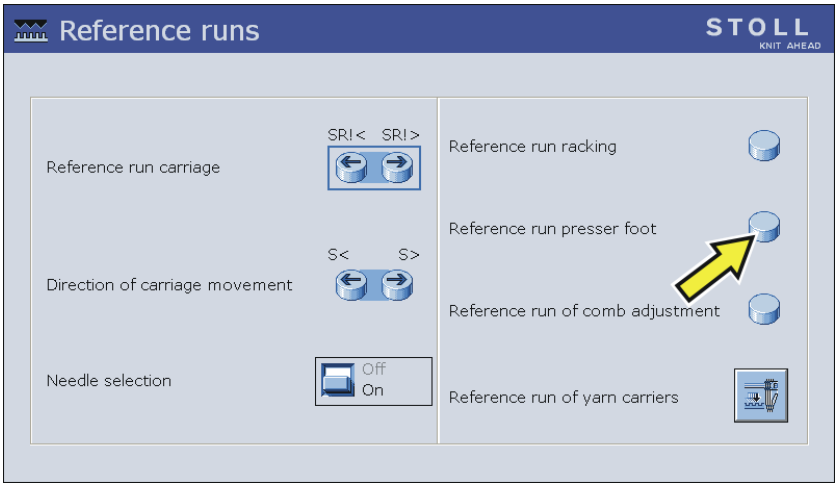


Jack opener

Between the opened jack and the jack opener, there should be a small gap to prevent the jack butt from wearing.

III. Reference run of the weave-in device at the machine:

- Reference run of the presser foot

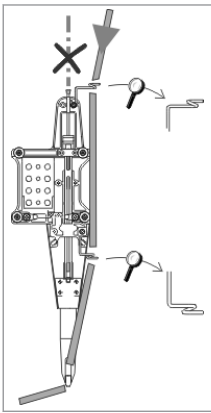


Reference run presser foot

This reference run may be carried out only in the needle bed area. **No yarn carrier** may be located in the carriage as well.
Never carry out a reference run in the area of the clamping and cutting bed.

32.3 ADF yarn carrier with bypass equipment

I. Yarn carrier with bypass:

	**Bypass:** The yarn won't be threaded in the yarn tube but it will rather be led over two eyelets.

When will the bypass be used?

	Explanation
◆ with a very coarse, voluminous yarn	The yarn is too thick, and cannot be threaded in the yarn tube.
◆ with a yarn, which "sticks" in the yarn tube	After the carriage reversal, the yarn is to be fetched back (tensioned) by the tension arm of the yarn control unit so that no yarn loop is formed. The increased friction results in a yarn loop, which leads to a fault in the fabric (yarn loop, hole, drop stitch, yarn breakage).

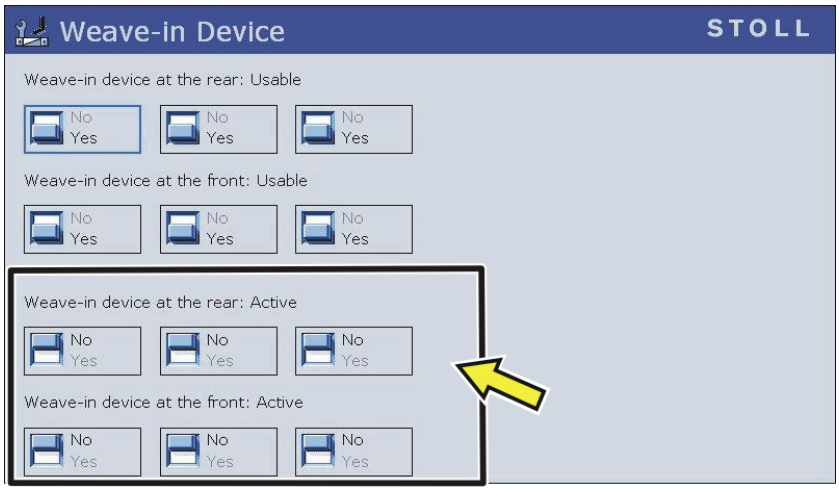
32.4 Setting / Adjustment of the weave-in device

I. Setting / Adjustment of the weave-in device

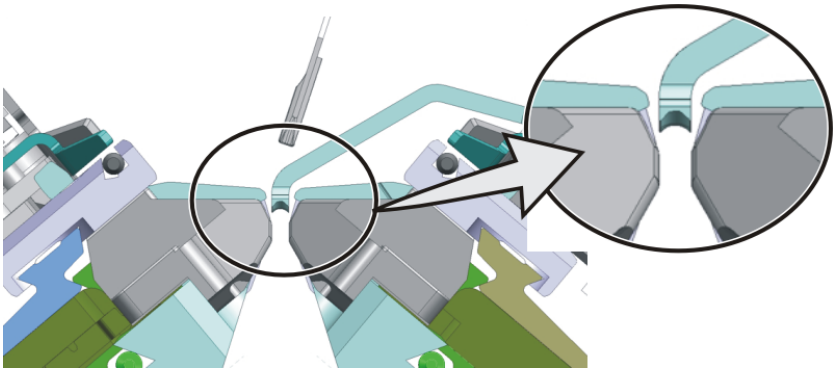
1. With the  key call up the dialog of the "Service".
2. Tap the  key in the dialog.
   ⇨ The "Weave-in device" dialog is displayed.

Sensor in the upper area of the window

With these sensors, the corresponding weave-in devices can be deactivated (not usable).
If a weave-in device is deactivated, it will automatically be inactive.



3. With the help of the switch "Yes / No" check the weave-in device in the selected area.



Incorrect position of the weave-in device

See operating instructions for horizontal and vertical adjustment of the presser foot.

4. With the  key return to the main menu.

32.5 Yarn carrier correction for the weft yarn carrier

Definition of the weft yarn carrier

The **weft yarn carrier** is defined as a **Q yarn carrier**. This means that this yarn carrier works in vertical and horizontal direction with specified values.

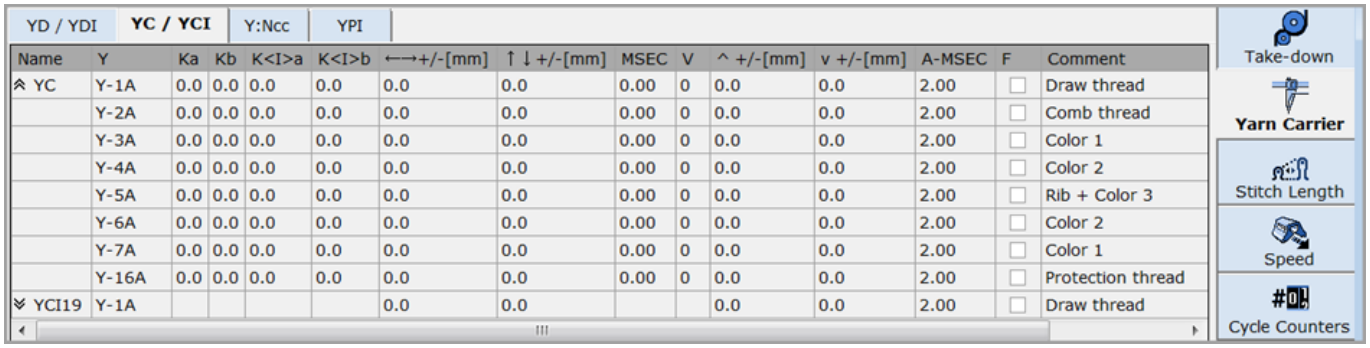
Correcting the weft yarn carrier:

Recommendation for using the weft yarn carrier

For the optimal insertion of the weft yarn, the use of the weave-in device is recommended!
Due to this, the weft yarn is generally inserted with the System 1 (S1) as a yarn carrier correction may be necessary for optimization.

1. Call up the dialog of the "SETUP2 editor" with the  key.
2. Tap the "Yarn carrier" key in the dialog.
   ⇨ The dialog is displayed with three tabs.
3. Open the **YC / YCI** tab.
4. Make changes in the following columns for the weft yarn carrier.

- Horizontal value change in the ⟷+/-[mm] column
- Vertical value change in the ↑ ↓ +/-[mm] column

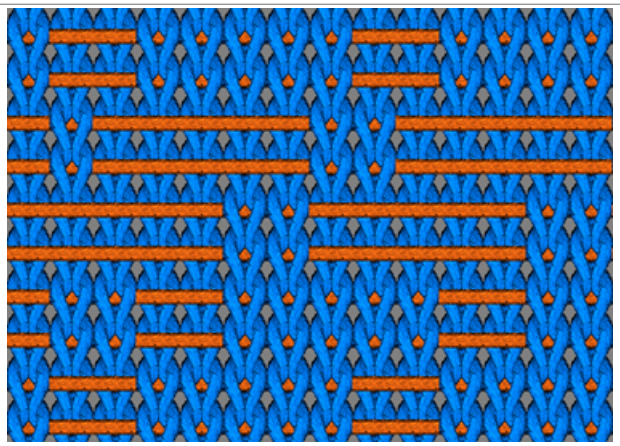
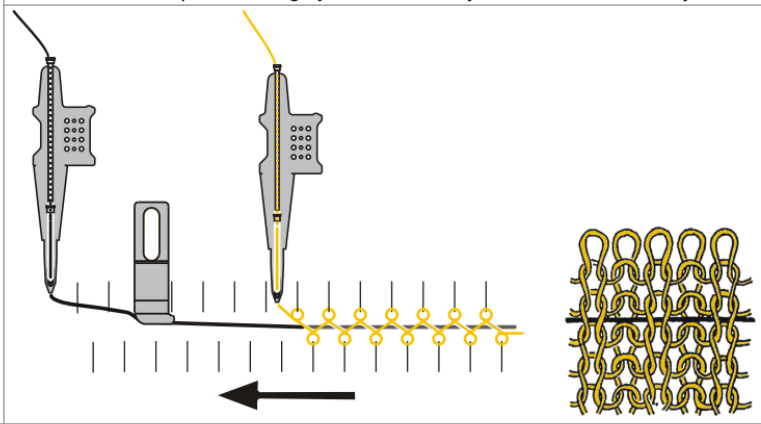


Name	Y	Ka	Kb	K<I>a	K<I>b	⟷+/-[mm]	↑ ↓ +/-[mm]	MSEC	V	^ +/-[mm]	v +/-[mm]	A-MSEC	F	Comment
YC	Y-1A	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.0	2.00	☐	Draw thread
	Y-2A	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.0	2.00	☐	Comb thread
	Y-3A	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.0	2.00	☐	Color 1
	Y-4A	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.0	2.00	☐	Color 2
	Y-5A	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.0	2.00	☐	Rib + Color 3
	Y-6A	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.0	2.00	☐	Color 2
	Y-7A	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.0	2.00	☐	Color 1
	Y-16A	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0.0	0.0	2.00	☐	Protection thread
YCI19	Y-1A					0.0	0.0			0.0	0.0	2.00	☐	Draw thread

Column	Meaning	
⟷+/-[mm]	Horizontal correction of the insertion position (knitting position): ◆ For knitting ◆ For weft yarn (yarn carrier defined as **Q**) Positive value: Correction of the home position to the right (following) Negative value: Correction of the home position to the left (in advance) i: Attention: The entered value is added to the values of the **YPI** tab.	Minimum value: - 100 Maximum value: 100 Step width: 0.1 mm
↑ ↓ +/-[mm]	Vertical correction of the insertion position (knitting position): ◆ For knitting ◆ For weft yarn (yarn carrier defined as **Q**) Positive value: Correction of the home position upward (steep yarn angle) Negative value: Correction of the home position downward (flat yarn angle) i: Attention: The entered value is added to the values of the **YPI** tab.	Minimum value: - 2.0 Maximum value: 5.0 Step width: 0.1 mm

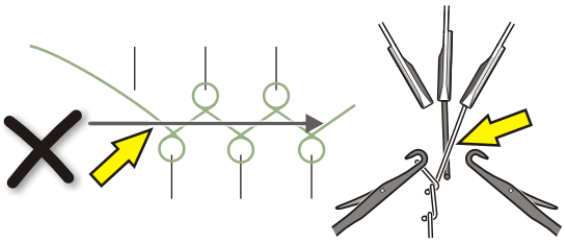
5. Quit the "Setup2 Editor" with the  key.
   ⇨ Changed values are saved in **.setx** when saving.
6. Start the machine with the engaging rod.
   ⇨ The changes will be carried out with the next use of the yarn carrier.

32.6 Knitting Technique: Weave-in on the CMS ADF 32 W

Fabric View (Neckline)	
Properties	A weft yarn (float thread) is laid-in covering the entire pattern width or a selection. ◆ No or minor crossways elasticity. With elastic threads a defined elasticity can be achieved (example: compression stocking) ◆ New fabric looks (woven-like) are feasible
How the weave-in device works	◆ The weave-in device holds the floats deep so that they don't obstruct the knitting process. ◆ The weave-in device holds the weft yarn deep enough so that it does not knit any stitch or tuck in the following knitting system.
	1. A weft yarn is inserted in knitting direction of the stitch rows but not enclosed by stitch or tuck. 2. The insertion of the weft yarn is carried out by the weft yarn carrier. This yarn carrier runs thus so far ahead before the knitting system that the yarn is only inserted but does not knit any stitch or tuck. 3. The weave-in device pressed the thread downwards between the needle beds. 4. In the subsequent knitting system, the weft yarn will be enclosed by the stitches.
	

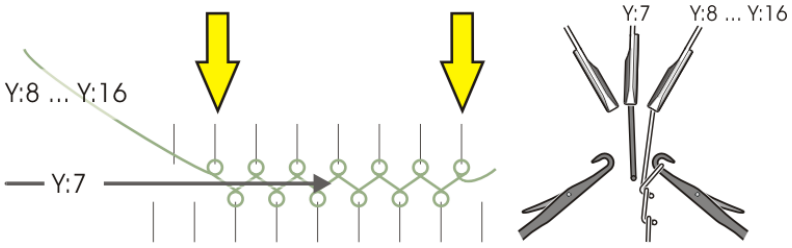
32.6.1 Secure insertion of the weft yarn

- Weft yarn carrier with bypass
- The weft yarn is enclosed in the fabric by the subsequent basic yarn.
- To ensure a secure insertion of the weft yarn, the basic yarn may not cross the weft yarn. If the course of the weft yarn is obstructed by the basic yarn, there is the danger of the weft yarn not being inserted in the weave-in device.



Rules for a secure weft yarn insertion:

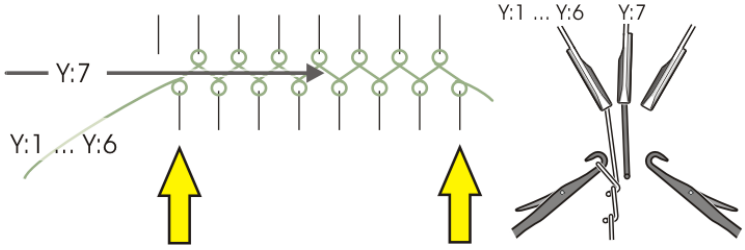
- The yarn carrier with a higher number than the weft yarn carrier knits the last stitch on the rear needle bed.



Y:7 Weft yarn carrier

Y:8 ... Y16 The subsequent knitting yarn carrier is on the track 8 up to track 16

- The yarn carrier with a lower number than the weft yarn carrier knits the last stitch on the front needle bed.



Y:7 Weft yarn carrier

Y:1 ... Y6 The subsequent knitting yarn carrier is on the track 1 up to track 6

32.7 Knitting Technique: Plating with the ADF machines

The ADF machines don't need any special yarn carriers for plating.

Conventional plating types:

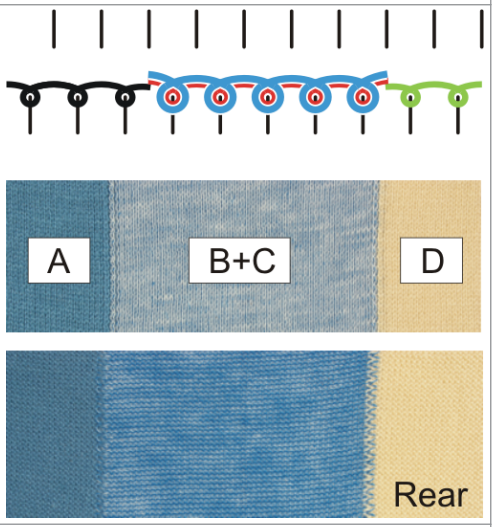
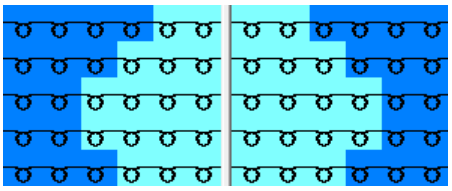
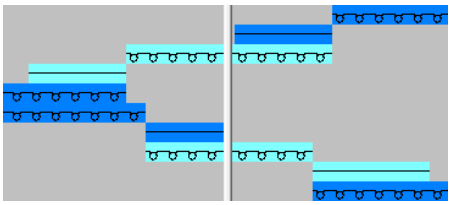
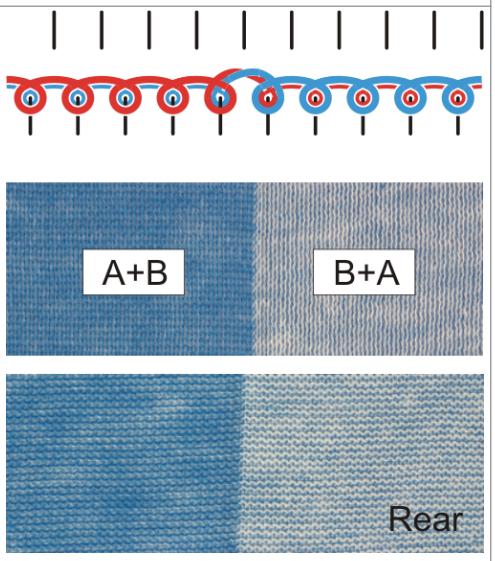
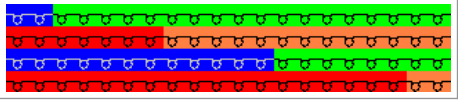
- Color Plating
- Plating of different materials

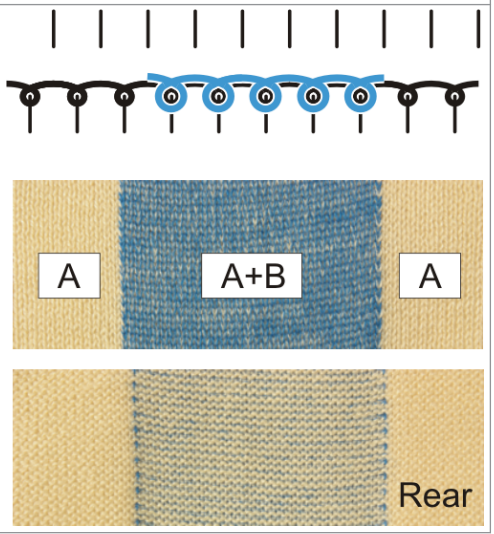
Plating over the entire fabric width with two yarn carriers in one knitting system (the same as on Performer Machines)

Special plating types of the ADF machines:

- Intarsia plating
- Inverse plating
- Stoll-ikat-plating ®

■ Selective Plating

Designation of the knitting techniques	Definition	Stitch notation
Intarsia Plated	Two (or more) yarns work together in one intarsia area. The yarns are not used in neighboring areas.	
Inverse Plating	Two (or more) yarns work together in one area and change their position (home position, plating position) with system change. **Result:** One pattern row  is divided in 2 technical rows. 	
Stoll-ikat plating ®	Two yarns work together in one area and change their position (home position, plating position) without system change. **Result:** One pattern row corresponds to one technical row. In each pattern row, two yarns work, which knit in one system and change their position as well. 	

Designation of the knitting techniques	Definition	Stitch notation
Selective Plating	Two (or more) yarns work together only in one selected area. In the same knitting row at least one yarn is also used outside the selected area.	

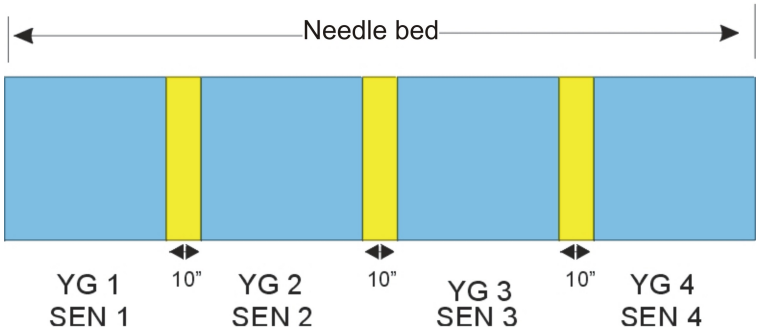
33 Multi-piece Knitting without Using the Comb

Working with several SEN areas:

- Machines without comb
- Machines with comb: Comb and clamping / cutting deactivated

Sintral commands	
Yarn carrier home position:	YG1: YG2: YG3: YG4:
Pattern fields	F1: - or - F1: / F2: / F3: / F4:
Pattern pack machine	PM: F1 xx: F1 xx: F1 xx: F1; - or - PM: F1 xx: F2 xx: F3 xx: F4;
Selected needle area	SEN1= SEN2= SEN3= SEN4=

Several SEN areas with the corresponding intermediate spacing for yarn carriers:



The distance between the single SEN areas depends on the number of yarn carriers in use per SEN.

34 Pattern 10: For fully fashion without comb

Pattern name	FF_without_comb
Start	1X1 Rib
Machine Type	CMS 530 HP 5“ with E 7.2 CMS 530 HP 6“ with E 3,5.2 CMS ADF 32 W with E 7.2
Operating mode of the machine	◆ without comb function ◆ without clamping / cutting
Pattern description	◆ Shape: Front with v-neck ◆ SJ fabric with stripe (3 colors)
Pattern Parameters	◆ Picking-up after pressing-off (counter **#90**) ◆ Cycle Counters **(RS)** ◆ Stitch Length **(NP + NPJ)** ◆ Fabric Take-down **(WMF)** ◆ Yarn Carriers **(YDF)**

34.1 Load and Set-up the Pattern

Procedure:

1. **Load pattern into the machine**
2. **Set up the pattern:**

- Threading up the Yarn Carriers
- Position the yarn carriers manually
- Check the knitting area and the fabric collection chamber

3. **Activate the Picking-up after Pressing-off function**

- Set counter **#90**

4. **Start the machine.**

- Start the program with **SP1**

Make the following changes:

- Picking-up after pressing-off (counter **#90**)
- Cycle Counters **(RS)**
- Stitch Length **(NP+NPJ)**
- Yarn Carriers **(YDF)**
- Fabric take-down values **(WMF)**

34.2 Additional Information with Fully Fashion - without Comb

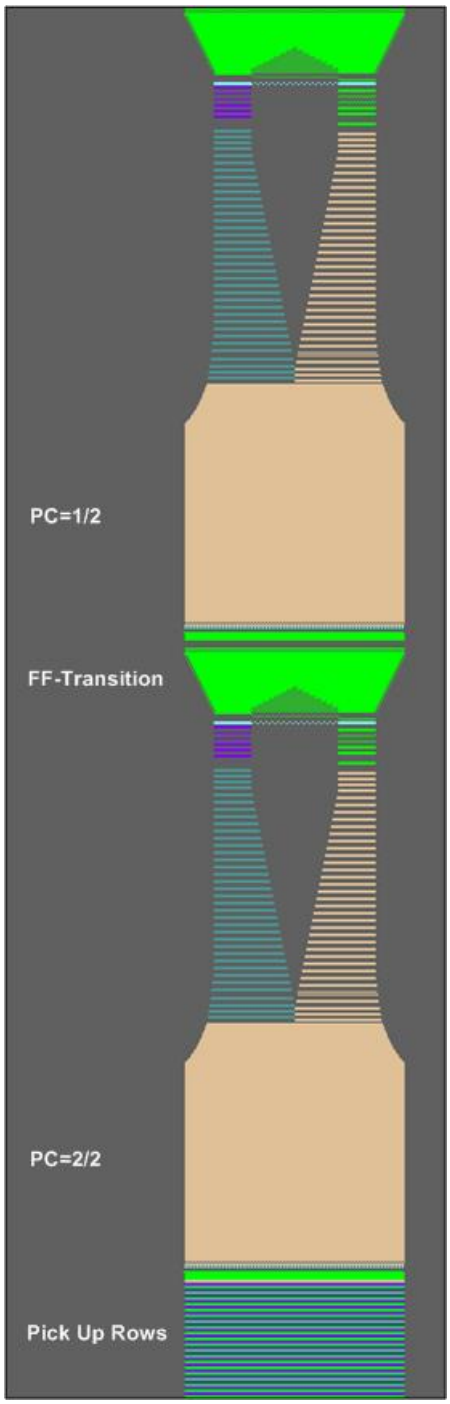
Additional commands and functions are necessary with **Fully Fashion without comb**:

- Picking-up after pressing-off
- Transition rows (FF-trans)
- Yarn carrier home position

I. Transition rows:

Transition rows (FF-trans) are used when **Knitting without comb**.

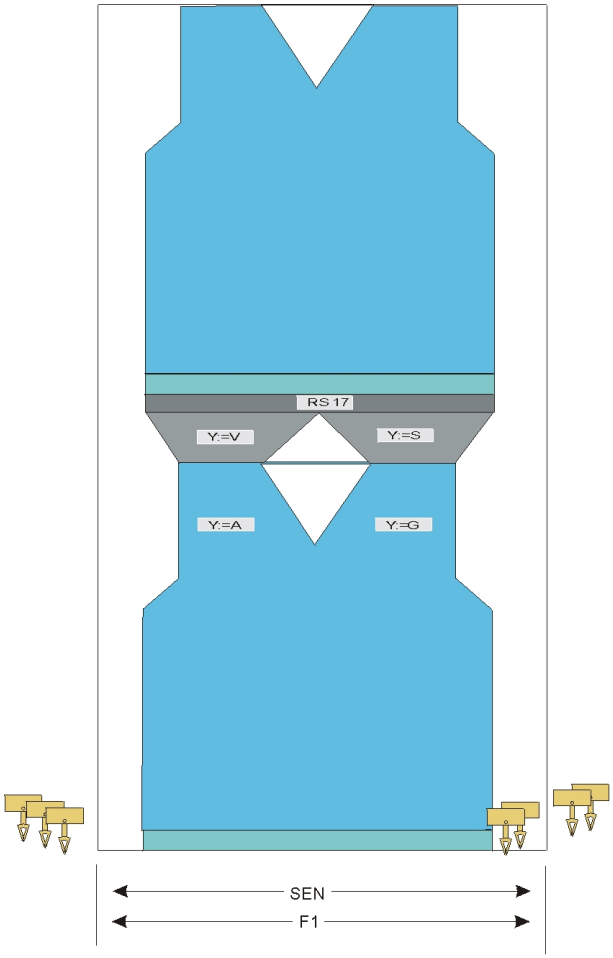
- The transition rows form the transition from the end width of the previous fabric piece to the starting width of the following fabric piece.
- The **FF-TRANSITION** function contains functions for widening and/or casting-off.
- With the help of **RS17**, the knitting rows in the transition can be controlled until the entire fabric width is located in the main take-down.
- Separate yarn carriers allow to use residual yarn.



Sintral function:

```
C---------------------------- FF-TRANSITION ---------------
FBEG:FF-TRANS;
IF #LM<#54   IF #RM>#53   IF #RM-#LM>2            F:!-WIDENING-V;
IF #L=#51    IF #R=#52                       #L=#51 #R=#52 #LM=0 #RM=0 GOTO FEND
IF #L<=#51   IF #R>=#52   F:!-PRESS-OFF;     #L=#51 #R=#52 #LM=0 #RM=0 GOTO FEND
IF #L>=#51   IF #R<=#52   F:!-WIDENING;      #L=#51 #R=#52 #LM=0 #RM=0 GOTO FEND
IF #L<>#51   IF #R<>#52   F:!-PRESS-OFF;     F:!-WIDENING;  #L=#51 #R=#52 #LM=0 #RM=0
FEND
```

II. Yarn carrier home position - YG



- Due to **F**, the yarn carriers **without S0Y** are positioned at the **SEN**.
- Due to **F**, the yarn carriers **with S0Y** are positioned at the fabric selvedge.

34.3 Picking-up after Pressing-off Function

- The **Picking-up after Pressing-off** function is used for:
  - Knitting programs for machines without comb
  - Knitting programs for machines with comb **but without using it**
- The **Picking-up after Pressing-off** function can be activated or deactivated.
- The knitting width and the knitting length for Picking-up after Pressing-off can be determined

Setting	Function
#90=0	Switch-off the Picking-up after Pressing-off function
#90=1	Activate the picking-up after pressing-off function (Automatic calculation of the length - depending on the gauge)
#90=2	The picking-up after pressing-off knitting process will be done twice
#90=3	The picking-up after pressing-off knitting process will be done three times

Setting	Function
#90=xx	The picking-up after pressing-off knitting process will be done XX times
#51 / #52	Specify the knitting width for Picking-up after Pressing-off **Example:** Fabric is started with the comb and the comb will be switched off by RS17.

Start picking-up after pressing-off

- In order to activate the Picking-up after Pressing-off function the counter **#90** must be defined before starting the program **(SP1)** .
- After processing the function picking-up after pressing-off with the help of #90, the knitting pattern starts automatically.
- The counter **#90** is set to **=0**.

The function picking-up after pressing-off will no longer be called-up during the production.
Usage only at knitting start on the empty needle bed, in case of yarn breakage or other occurring situations, where the entire fabric is no longer in the main take-down.

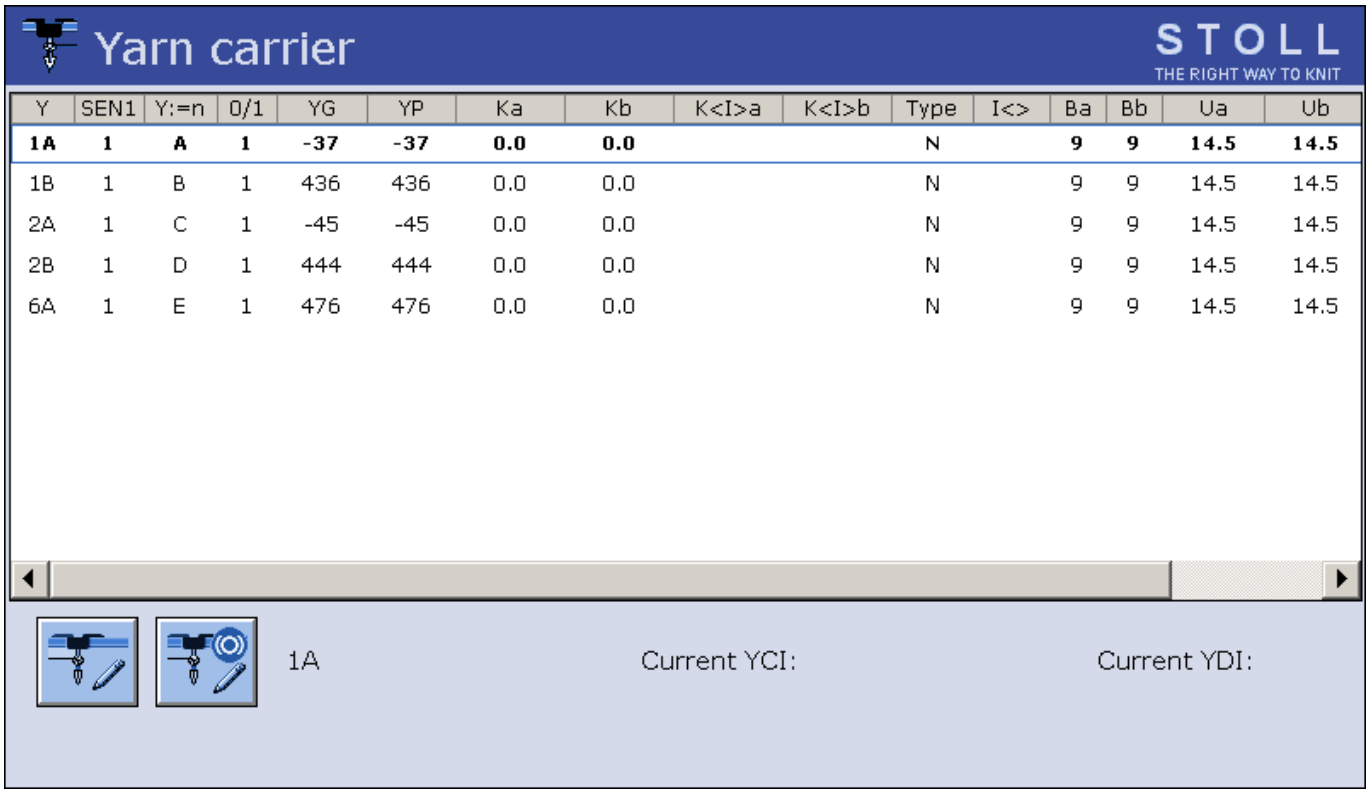
Cancel picking-up after pressing-off

- Wit the "Ctrl W" key you can cancel the function picking-up after pressing-off. The knitting program is started automatically.
- Wit the "Ctrl Z" key you can cancel the function picking-up after pressing-off and the knitting program must be started manually with "SP1".

34.4 Threading-up and Positioning Yarn Carriers with patterns without comb

Calling up the assignment and allocation of the yarn carriers:

1. Call up the "Machine Start" menu with the  key of the Main Menu.
2. Tap the "SP from Line 1" key.
3. Move the carriage from the left to the reverse at the right.
4. Call up the Main menu with  .
5. Call up the Yarn carrier menu  .
   ⇨ The yarn carrier allocation will be displayed.



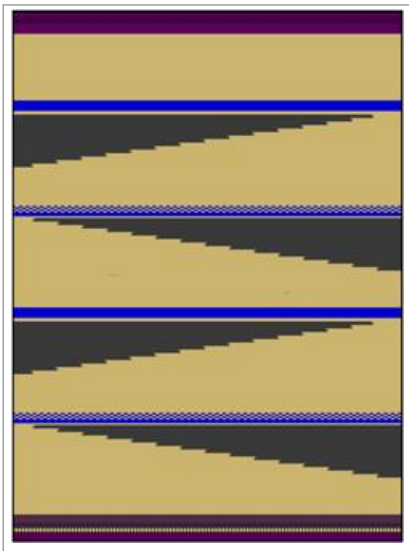
Y	SEN1	Y:=n	0/1	YG	YP	Ka	Kb	K<I>a	K<I>b	Type	I<>	Ba	Bb	Ua	Ub
1A	**1**	**A**	**1**	**-37**	**-37**	**0.0**	**0.0**			N		**9**	**9**	**14.5**	**14.5**
1B	1	B	1	436	436	0.0	0.0			N		9	9	14.5	14.5
2A	1	C	1	-45	-45	0.0	0.0			N		9	9	14.5	14.5
2B	1	D	1	444	444	0.0	0.0			N		9	9	14.5	14.5
6A	1	E	1	476	476	0.0	0.0			N		9	9	14.5	14.5

Column	Meaning
Y	Specification of yarn carrier
SEN 1	Specification of SEN area in which yarn carrier works
Y: =n	Specification of yarn type
0/1	Yarn type switched on or off
YG	Home position of the yarn carrier with needle xx
YP	Current yarn carrier position with needle xx
Ka	Yarn carrier correction value a (left) with selected knitting
Kb	Yarn carrier correction value b (right) with selected knitting
K<I>a	Correction value a (left) for swiveled intarsia yarn carrier
K<I>b	Correction value b (right) for swiveled intarsia yarn carrier
Type	Definition of the yarn carrier type: ◆ Normal yarn carrier (N) ◆ Intarsia yarn carrier (I)
I<>	Swiveling direction of intarsia yarn carrier
Ba	Yarn carrier braking value a (left)
Bb	Yarn carrier braking value b (right)
Ua	Engaging value of the yarn carrier when plating to the left
Ub	Engaging value of the yarn carrier when plating to the right
MSEC	Carriage speed related to yarn carrier (with technical fabrics)
V	Number of selvedge needles until first knitting needle (technical fabrics)

6.

Go back to the main menu with  .

35 Pattern 11: Applications+Gore without Comb

	
Pattern name	Applications_without_comb
Start	1X1 Rib
Machine Type	CMS 530 HP 5“ with E 7.2 CMS 530 HP 6“ with E 3,5.2 CMS ADF 32 W with E 7.2
Operating mode of the machine	◆ without comb function ◆ without clamping / cutting
Pattern description	◆ SJ structure ◆ Gore Technique ◆ Waves – with SJ – with jacquard float ◆ Applications
Pattern Parameters	◆ Picking-up after pressing-off (counter **#90)** ◆ Cycle Counters **(RS)** ◆ Stitch Length **(NP)** ◆ Fabric Take-down **(WMF)**

35.1 Load and Set-up the Pattern

Procedure:

1. **Load pattern into the machine**
2. **Set up the pattern:**

- Threading up the Yarn Carriers
- Position the yarn carriers manually
- Check the knitting area and the fabric collection chamber

3. **Activate the Picking-up after Pressing-off function**

- Set counter **#90**

4. **Start the machine.**

- Start the program with **SP1**

Make the following changes:

- Picking-up after pressing-off (counter **#90**)
- Fabric take-down values **(WMF)**
- Stitch Length **(NP)**
- Cycle Counters **(RS)**

36 Operating modes of the CMS 822 HP

Possibilities of the operating mode with a CMS 822

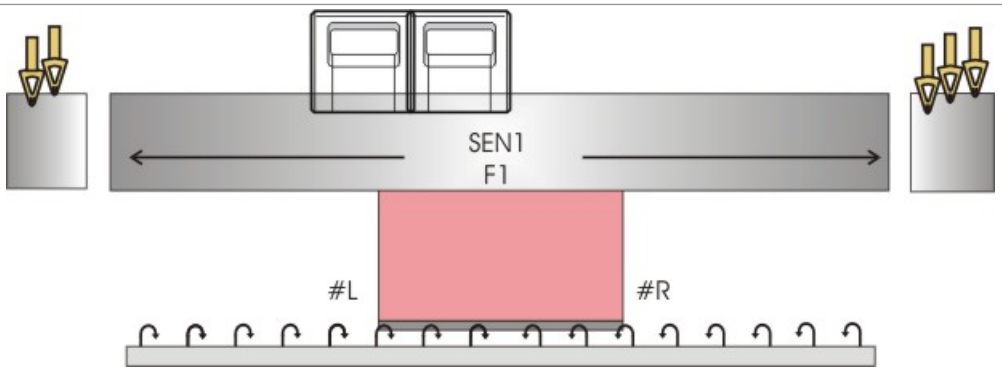
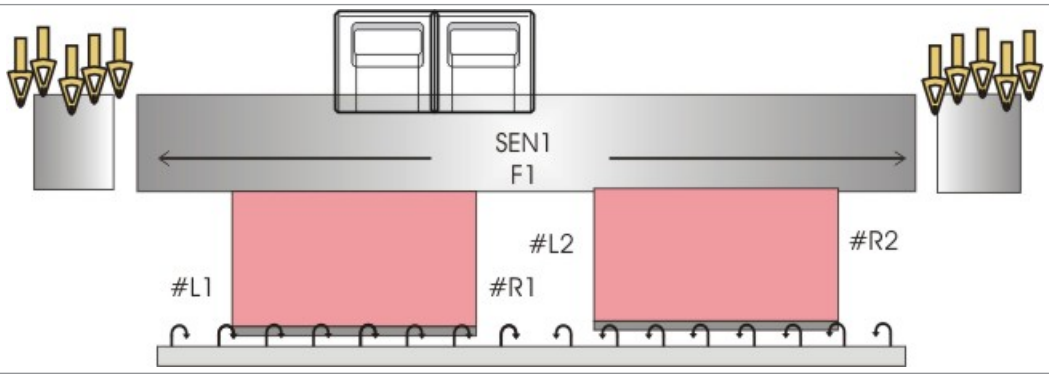
- **Operating mode without using the comb:**
  The knitting program (Sintral, Jacquard, Setup) is structured the way that the **comb function** is called-up at the start of the program and the **cast-off function** at the fabric end.
  Result:
  Each piece is started with the comb and casted-off at the end.
  Single fabrics are produced.

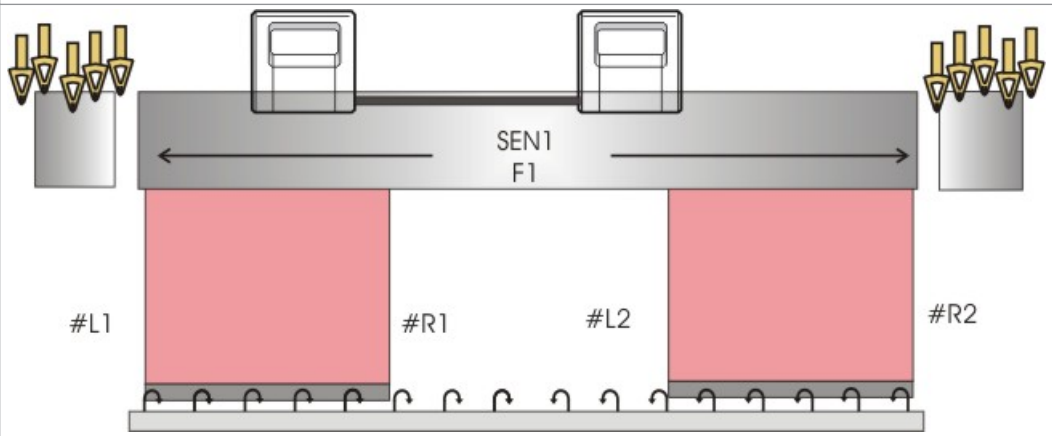
i	There must **not** be a fabric in the needle bed or main take-down.

- **Operating mode without using the comb:**
  The knitting program (Sintral, Jacquard and Setup) comes with a draw thread at the start.
  The draw thread enables to separate the pieces after knitting or ironing.
  Result:
  The individual pieces are knitted in a common panel following each other.

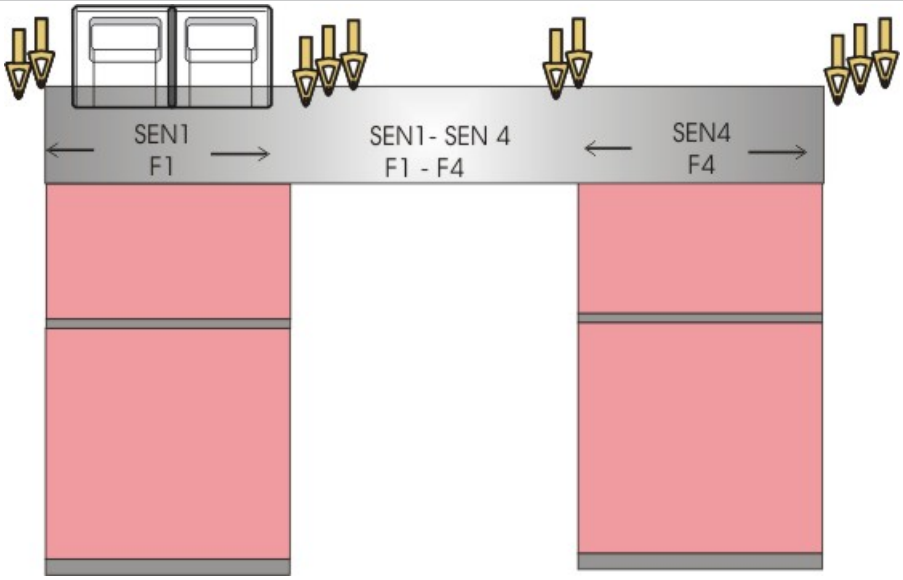
i	With this operating mode a fabric must always hang in the needles.

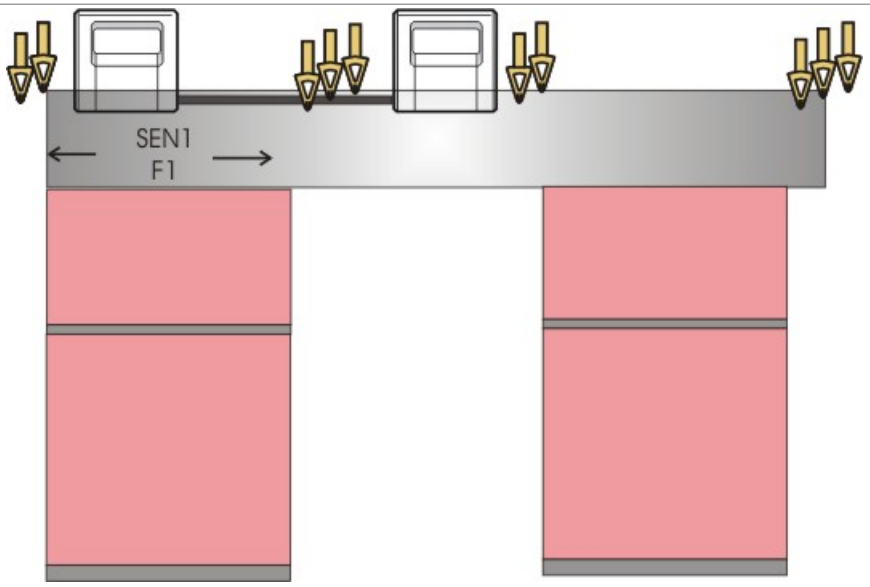
Operating mode with comb and clamping / cutting

Narrow coupling 1-piece	
	◆ Machine does **work in Fully-Fashion mode** (**PF0** command) ◆ The fabric is generally positioned in the machine center. ◆ **SEN** and **F1** define the entire needle bed width ◆ The **#L** and the **#R** counter define the actual knitting width ◆ Yarn carriers are positioned in the **Clamping and cutting device** ◆ **Comb is active**
Narrow coupling 2-pieces	

	◆ Machine does **work in Fully-Fashion mode** (**PF0** command) ◆ Two pieces can be knitted ◆ **SEN** and **F1** define the entire needle bed width ◆ The **#L1** and the **#R1** counter define the knitting width of the left piece ◆ The **#L2** and the **#R2** counter define the knitting width of the right piece ◆ Yarn carriers for the left fabric in the left clamping and cutting device ◆ Yarn carriers for the right fabric in the right clamping and cutting device ◆ **Comb is active**
Wide coupled **2-pieces**	
	◆ Machine does **work in Fully-Fashion mode** (**PF0** command) ◆ Two pieces can be knitted ◆ **SEN** and **F1** define the entire needle bed width ◆ The **#L1** and the **#R1** counter define the knitting width of the left piece ◆ The **#L2** and the **#R2** counter define the knitting width of the right piece ◆ Yarn carriers for the left fabric in the left clamping and cutting device ◆ Yarn carriers for the right fabric in the right clamping and cutting device ◆ **Comb is active**

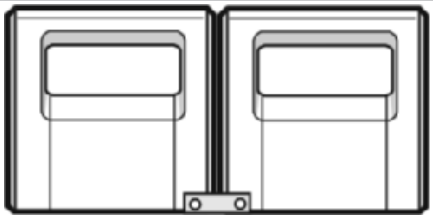
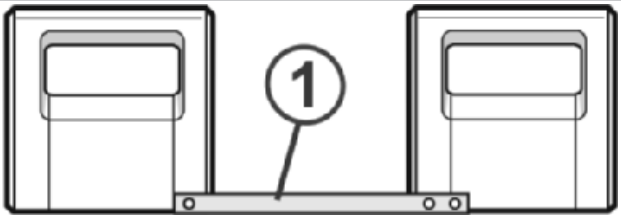
Operating mode without comb and clamping / cutting

Narrow coupled: **Multi-piece**	
	◆ Machine does **not work in Fully-Fashion mode** (**PFN** command) ◆ A maximum of 4 fabrics (**SEN1-SEN4**) can be positioned ◆ **SEN1-4** and **F1-4** define the respective knitting widths ◆ Home position of the yarn carriers (**YG1 - YG4**) ◆ The yarn carriers are positioned at the left and right fabric selvedge correspondingly ◆ **Comb and clamping and cutting device are deactivated**

Wide coupling (tandem)	
	◆ Machine does **not work in Fully-Fashion mode** (**PFN** command) ◆ Up to 4 fabric pieces per carriage ◆ SINTRAL contains **only the information for the left fabric** **Result:** The machine control copies the information of the left fabric for the right fabric. ◆ The selected coupling width defines the distance between the fabrics ◆ The yarn carriers are positioned at the left and right fabric selvedge correspondingly ◆ **Comb and clamping and cutting device are deactivated**

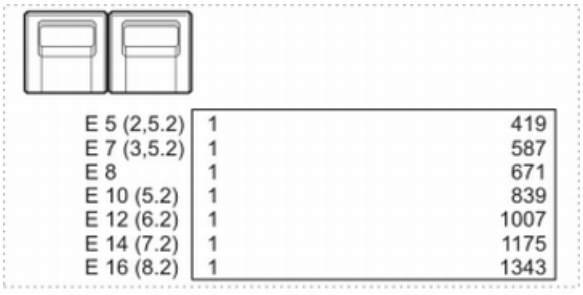
36.1 Coupling widths of the CMS 822 HP

Coupling with **CMS 822 HP**

Coupling possibilities	
	
Narrow coupling	**Wide coupling with connecting rod** (1) The different coupling widths result in different intermediate spacings for parking the yarn carriers of the individual fabrics.

The needle area of the **CMS 822 HP** is **84"**.

Operating mode: Narrow coupling for 4-system knitting



E 5 (2,5.2)	1	419
E 7 (3,5.2)	1	587
E 8	1	671
E 10 (5.2)	1	839
E 12 (6.2)	1	1007
E 14 (7.2)	1	1175
E 16 (8.2)	1	1343

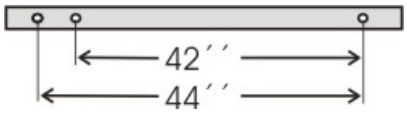
■ **Operating mode: Narrow coupling with comb**

– All four systems working in **one SEN** area.

■ **Operating mode: Narrow coupling without comb**

– All 4 systems work in **more than one SEN** areas (a maximum of 4 knitting areas).

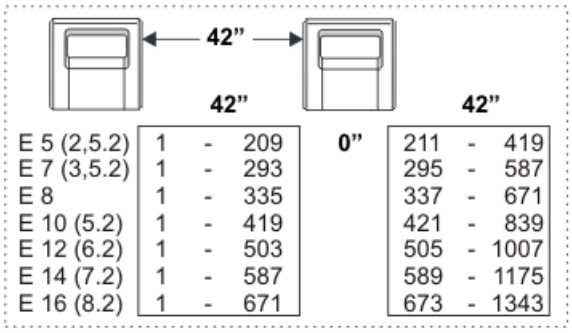
Coupling widths of the **CMS 822**



Operating mode: Wide coupling (tandem) without comb

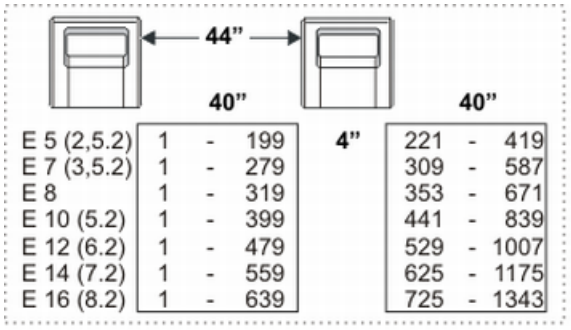
■ Two systems working in **one SEN** area.

Coupling width 42"



E 5 (2,5.2)	1	-	209	0”	211	-	419
E 7 (3,5.2)	1	-	293		295	-	587
E 8	1	-	335		337	-	671
E 10 (5.2)	1	-	419		421	-	839
E 12 (6.2)	1	-	503		505	-	1007
E 14 (7.2)	1	-	587		589	-	1175
E 16 (8.2)	1	-	671		673	-	1343

Coupling width 44"

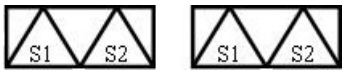


E 5 (2,5.2)	1	-	199	4”	221	-	419
E 7 (3,5.2)	1	-	279		309	-	587
E 8	1	-	319		353	-	671
E 10 (5.2)	1	-	399		441	-	839
E 12 (6.2)	1	-	479		529	-	1007
E 14 (7.2)	1	-	559		625	-	1175
E 16 (8.2)	1	-	639		725	-	1343

■ Two fabrics will be produced side by side.

■ Possible up to 4 fabric pieces per carriage

■ The knitting program is generated for the left carriage with knitting systems **S1** and **S2**. Needle selection is calculated internally for the left fabric piece and transferred to the right carriage, which produces the right fabric piece.

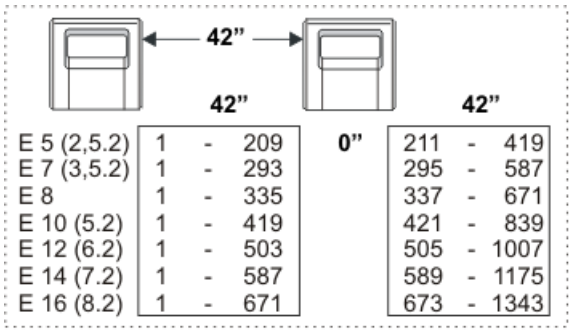


The workflow of the **CMS 822 HP** corresponds to the workflow of **CMS 4xx TC** / **CMS 9xx**.

Operating mode: Wide coupling (tandem) with comb

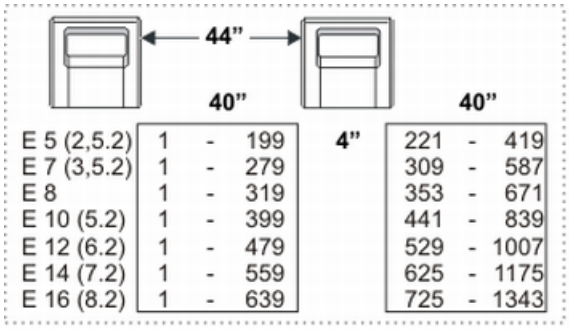
■ Two systems working in **one SEN** area.

Coupling width 42":



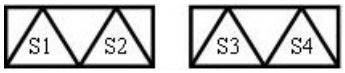
E 5 (2,5.2)	1	-	209		211	-	419
E 7 (3,5.2)	1	-	293		295	-	587
E 8	1	-	335		337	-	671
E 10 (5.2)	1	-	419		421	-	839
E 12 (6.2)	1	-	503		505	-	1007
E 14 (7.2)	1	-	587		589	-	1175
E 16 (8.2)	1	-	671		673	-	1343

Coupling width 44":



E 5 (2,5.2)	1	-	199		221	-	419
E 7 (3,5.2)	1	-	279		309	-	587
E 8	1	-	319		353	-	671
E 10 (5.2)	1	-	399		441	-	839
E 12 (6.2)	1	-	479		529	-	1007
E 14 (7.2)	1	-	559		625	-	1175
E 16 (8.2)	1	-	639		725	-	1343

- Two fabrics will be produced side by side.
- Both carriages function as one carriage with a wide space and with the system sequence:

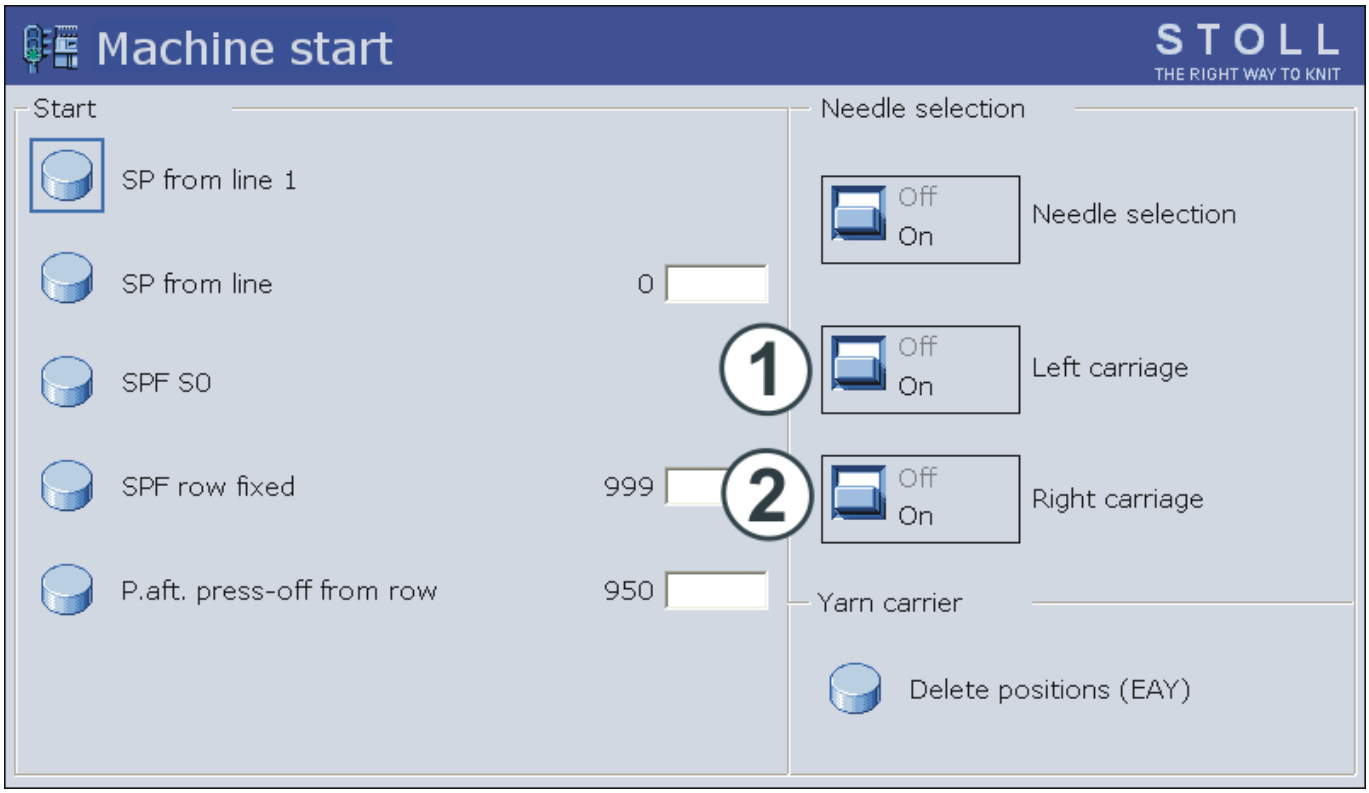


- The yarn carriers for the left fabric piece are positioned in the left clamping and cutting device.
- The yarn carriers for the right fabric piece are positioned in the right clamping and cutting device.
- One yarn carrier knits-in the comb thread (elastic thread) over both fabric pieces.

Special features with the operating mode tandem with comb (CCC):

Switch the needle selection on or off:

1. Press the  key.
   ⇨ The "Machine Start" menu is displayed.



Needle Selection				
"Needle selection"		"Off"	Needle selection deactivated	
		"On"	Needle selection activated	
"Left carriage"	(1)	"Off"	Needle selection deactivated in left carriage	i: For tandem machines with wide coupled carriages only.
		"On"	Needle selection activated in left carriage	
"Right carriage"	(2)	"Off"	Needle selection deactivated in right carriage	
		"On"	Needle selection activated in right carriage	

36.1.1 Couple Carriage Assembly Wide

1. Program an empty row and fix the knitting specification.

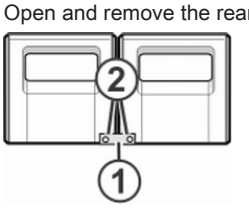
   - or -

➜ Call up the "Machine Start" menu and tap the "SPF S0" key.

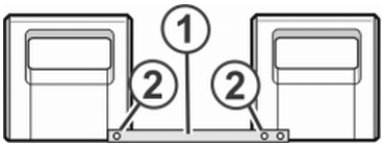
2. Start the machine with the engaging rod and stop it again when the carriage is located shortly after the left reversing position.

Switch off the 40 Volt power supply:

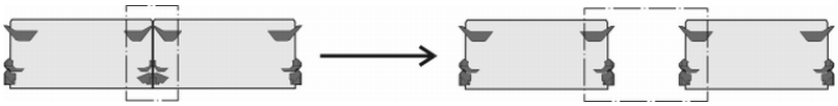
3. Press the  key in the Main Menu.
4. Tap the  key.
5. Switch off the "40 Volt power supply".
6. Open and remove the rear panel segments.



7. Loosen screws (2) and remove coupling rod (1).

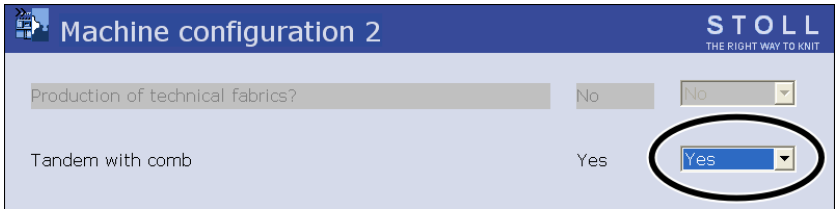


8. For wide coupling (tandem machine), push the right carriage to the right until the coupling rod (1) can be mounted.
9. Insert the screws (2) and tighten.
10. Remove the carriage part in order to replace the cams.



With the wide coupling you have to exchange the cam parts for reasons of safety.

11. Place carriage part on contact surface and assembly with carriage assembly.
12. Close the rear panel.
13. Switch on the 40 Volt power supply.
14. Call up the "Main menu".
15. Call up the "Service" menu.
16. Call up the "Basic settings" menu.
17. Call up the "Machine configuration 2" menu.



18. Check the setting in the "Tandem with comb" field.
    "Yes": Machine is working with comb take-down
    "No": Machine works without comb take-down
    ⇨ The carriage assembly runs in the creep speed until it automatically stops and the message "Reconfiguration" appears on the display.
    The control adjusts to the new coupling width.
    After a short time the message disappears again.
19. Move the carriage to the left.
    Thereby in the window "Reference runs" tap on the key "S<" and start machine with the engaging rod.
20. Stop the machine when the left carriage is outside the needle bed.
21. In the window "Reference runs" tap on the key "S>".
22. Pull up the engaging rod for short.
    The carriages may move to the left some inch (2") only.
    ⇨ The reference run is completed.
23. Load the knitting program.

If the carriage assembly operate coupled wide, the needles between and at the right and left of the fabric pieces must be free of fabric.
All yarn carriers must be positioned.

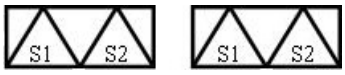
24. Calling up yarn carrier assignment.
25. Load the new knitting program.
26. Start the program.

36.1.2 Wide coupling without comb

Tandem without Comb

The knitting program (**Sintral, Jacquard, Setup**) is structured as follows:

- The knitting program is generated for the left carriage with knitting systems **S1** and **S2**. Needle selection is calculated internally for the left fabric piece and transferred to the right carriage, which produces the right fabric piece.



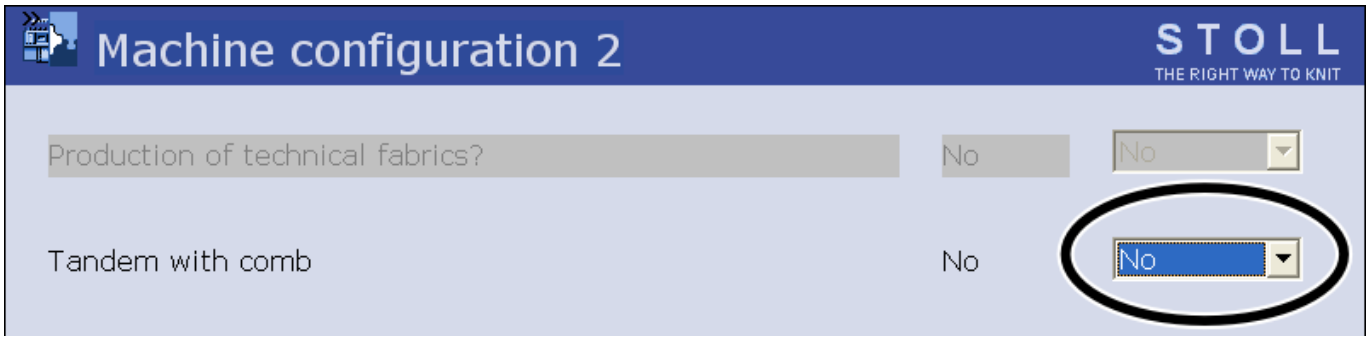
- A draw thread is knitted at the start of the program.
  The draw thread enables to separate the pieces after knitting or ironing.

Result:
The fabrics are knitted as one piece, connected by the draw thread.

With this operating mode, a fabric must always be in the main take-down.

Important settings for this operating mode:

1. Call up the main menu  .
2. Call up the "Service" menu with the  key.
3. Call up the Basic settings window with  .
4. Tap the  key.
   ⇨ The "Machine configuration 2" window is displayed.



5. Set **No** at "Tandem with comb" for this operating mode.
   ⇨ Clamping / cutting deactivated.
6. Go back to the "Main menu" with  .
7. Start the reference run.
   ⇨ The **Tandem without Comb** mode is active after the reference run.

36.1.3 Couple Carriage Assembly Narrow

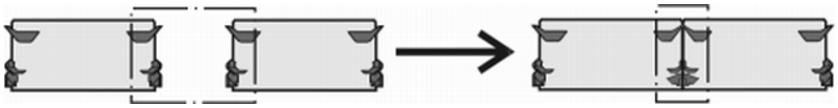
1. Program an empty row and fix the knitting specification.

   - or -

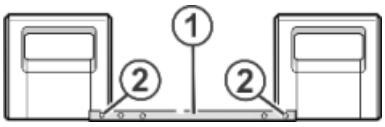
➜ Call up the "Machine Start" menu and tap the "SPF S0" key.

2. Start the machine with the engaging rod and stop it again when the carriage is located shortly after the left reversing position.
3. Switch off the 40 Volt power supply.

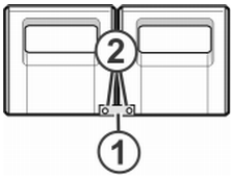
4. Remove the carriage part in order to replace the cams.



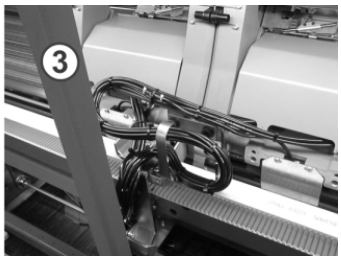
5. Place carriage part on contact surface and assembly with carriage assembly.
6. Open and remove the rear panel segments.



7. Remove the screws (2).



8. Take off the coupling rod (1).
9. For narrow coupling (tandem machine), push the left carriage assembly to the right and hook in the coupling rod (1)
10. Insert the screws (2) and tighten.
11. Lay the cable harness into the retainer.
    This prevents the cables at the support (3) from rubbing and being damaged.



12. Close the rear panel.
13. Switch on the 40 Volt power supply.
14. Call up the "Service" menu.
15. Call up the "Reference runs" window.
16. Start reference runs.
    ⇨ The reference run is completed.
17. Load the new knitting program.

- or -

➜ Start the loaded program.

36.2 Counters with CMS 822 HP

I. Operating mode: Narrow coupling (4 systems)

- **Without comb and clamping / cutting**
  - Single Piece: Working with all 4 systems in one **SEN** area
  - Multi-piece: Working with all four systems in several **SEN** areas (1-4).
- **With comb and clamping / cutting**
  - Single Piece: Working with all 4 systems in one **SEN** area.
  - double-piece: Processing 2 pieces with all 4 systems in one **SEN** area.

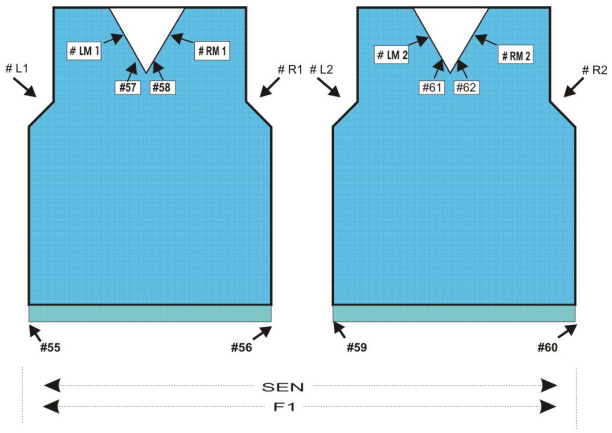
If the the fabric is worked as fully fashion with narrow coupling, counters will be used as well.

II. Operating mode: Tandem machine without comb and clamping / cutting:

- Processing one piece per carriage
- Processing up to a maximum of 4 pieces per carriage

The information of the knitting program will be transferred from the left carriage to the right carriage.

III. Operating mode: Tandem machine with comb and clamping / cutting:



	Counters	Function
Left fabric	**# L1**	Selvedge counter for the left fabric selvedge
	# R1	Selvedge counter for the left fabric selvedge
	# LM1	Selvedge counter for the left side in the center
	# RM1	Selvedge counter for the right-hand side in the center
	# 55	Start-width at the left
	# 56	Start-width at the right
	# 57	Start-width middle-left
	# 58	Start-width middle-right
Right piece	**# L2**	Selvedge counter for the left fabric selvedge
	# R2	Selvedge counter for the left fabric selvedge
	# LM2	Selvedge counter for the left side in the center
	# RM2	Selvedge counter for the right-hand side in the center
	# 59	Start-width at the left
	# 60	Start-width at the right
	# 61	Start-width middle-left
	# 62	Start-width middle-right

		Left fabric	
		Right piece	

36.2.1 Apply shape counter

Pattern changes - Apply shape counters

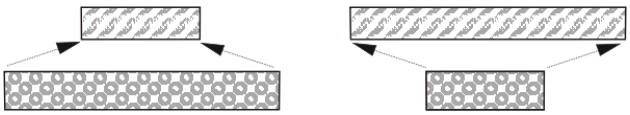
- Load pattern in machine
- Setting up the machine

Use this function only for the following machines:

→ Machine without comb take-down

→ Machine with comb take-down but without use of comb

The machine compares automatically the shape counters (old-new) in order to e able to adjust the new knitting width (widening or narrowing) with the pattern change. The values of the shape counters of the previous pattern are necessary for this.



You can enter the values of the previous pattern manually or simply apply them ("Apply shape counter" key).

The condition is that the pattern was created as Fully Fashion knitting program on the **M1plus**.

You can use this helpful function with basic patterns (without shape) as well.

Key	Function
	Call up "Machine start" window
	Call up "Additional function keys"
	"Apply shape counter" key

Keys to apply the shape counters

Apply shape counter:

1. Call up the window "Machine start" from the "Main menu".
2. Tap on "Additional function keys".
3. Tap the "Apply shape counter" key.
   Confirm the prompt that follows with "YES".
4. Tap the "SP from line 1" key.

36.3 Yarn Carrier Corrections with Tandem Machines

I. Yarn carrier corrections for the right carriage:

- **CMS 822 HP**: Tandem mode without comb and clamping / cutting

Possible reasons for a correction:

- different wear of the yarn carriers used in the left and right carriages

- different directions of the yarn feed in the left and right carriages
- different lubrication

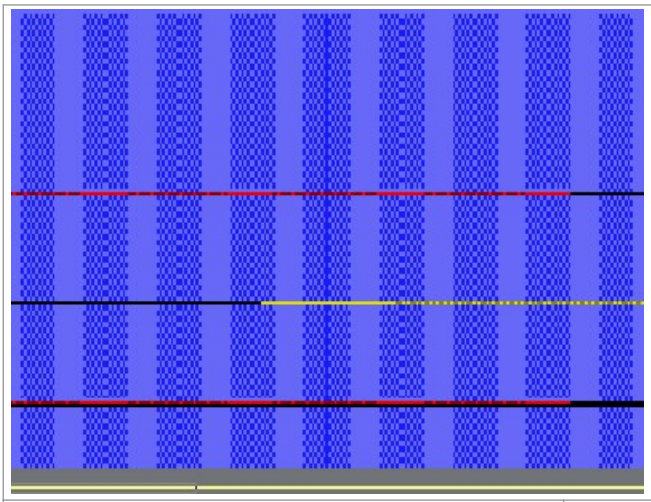
II. Enter the yarn carrier correction:

1. Call up the dialog of the "SETUP2 editor" with the  key.
2. Tap the "Yarn carrier" key in the dialog.
   ⇨ The dialog is displayed with three tabs.
3. Open the **Y:Oa-b** tab.
   ⇨ No offset values are displayed.
4. Activate the table tools with the  key.
5. Tap the  key.
   ⇨ A window for the yarn carrier selection appears.
6. Select yarn carrier
   ⇨ The new line with the selected yarn carrier is displayed.
7. Enter the offset values in the table.

	Explanation	Value range
Y-3A:Oa-b	**O**ffset specification for the yarn carrier **3A** to be corrected, which works in the right carriage	
	Correction for the right carriage with tandem mode: **a** = **O**ffset for the left parking position **b** = **O**ffset for the right stopping position **i**: The correction value refers to the stop value of the yarn carrier in the left carriage.	Min. value: -8 Max. value: 8 Step width: 0.5 = 1/32 “ = 0,8 mm

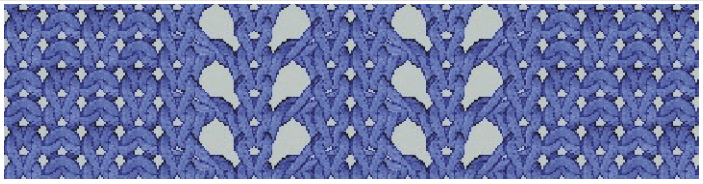
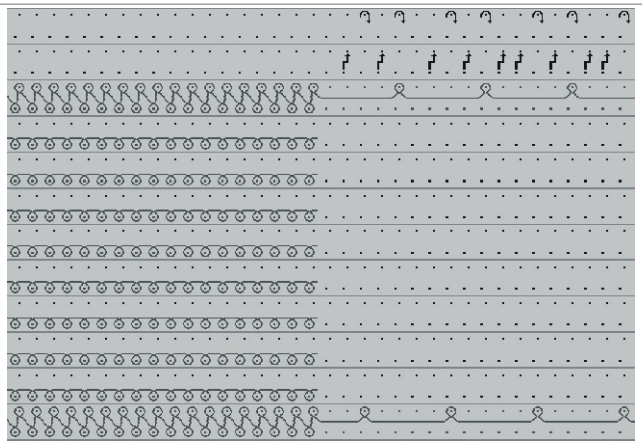
i These correction values are machine-dependent!
The values are **not deleted** with **EALL** and when reading-in a new operating system.
The correction values must be deleted manually.

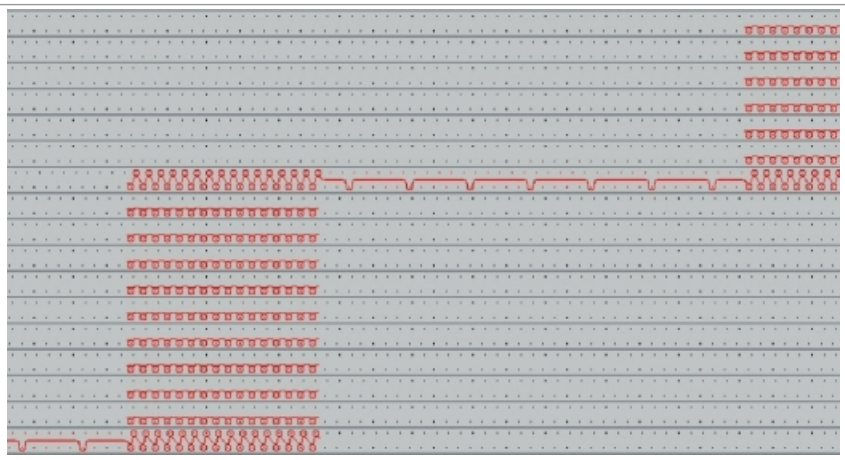
37 Pattern 12: CMS 822 HP Structure Pattern with Applications



Pattern name	◆ **Operating mode tandem without comb** **Struktur+Appli-Tandem** ◆ **Operating mode tandem with comb** **Struktur+Appli-Tandem+Kamm**
Start	Tubular
Operating mode of the machine	**CMS 822** ◆ Operating mode tandem without comb ◆ Operating mode tandem with comb
Pattern description	◆ Structures with single jersey and reverse jersey ◆ Open work ◆ Applications with different colors – Individual or neighboring

Fabric view and stitch line

	Presentation
Basic Pattern	
Application	

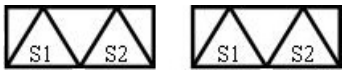
	Presentation
Neighboring applications	

37.1 Operating Mode of the Machine: Tandem without Comb

Tandem without Comb

The knitting program (**Sintral, Jacquard, Setup**) is structured as follows:

- The knitting program is generated for the left carriage with knitting systems **S1** and **S2**. Needle selection is calculated internally for the left fabric piece and transferred to the right carriage, which produces the right fabric piece.



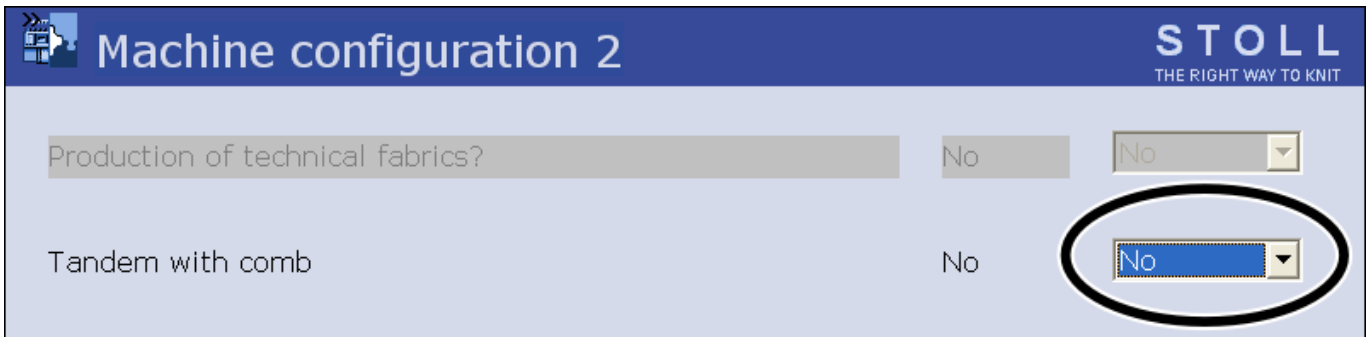
- A draw thread is knitted at the start of the program.
  The draw thread enables to separate the pieces after knitting or ironing.

Result:
The fabrics are knitted as one piece, connected by the draw thread.

With this operating mode, a fabric must always be in the main take-down.

Important settings for this operating mode:

1. Call up the main menu  .
2. Call up the "Service" menu with the  key.
3. Call up the Basic settings window with  .
4. Tap the  key.
   ⇨ The "Machine configuration 2" window is displayed.



5. Set **No** at "Tandem with comb" for this operating mode.

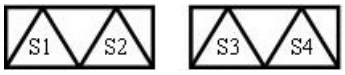
⇨ Clamping / cutting deactivated.

6. Go back to the "Main menu" with  .
7. Start the reference run.
   ⇨ The **Tandem without Comb** mode is active after the reference run.

37.2 Operating Mode of the Machine: Tandem with comb

Tandem with comb (**CCC**):

The knitting program (**Sintral, Jacquard, Setup**) is structured as follows:

- Both carriages function as one carriage with a wide space and with the system sequence:
  

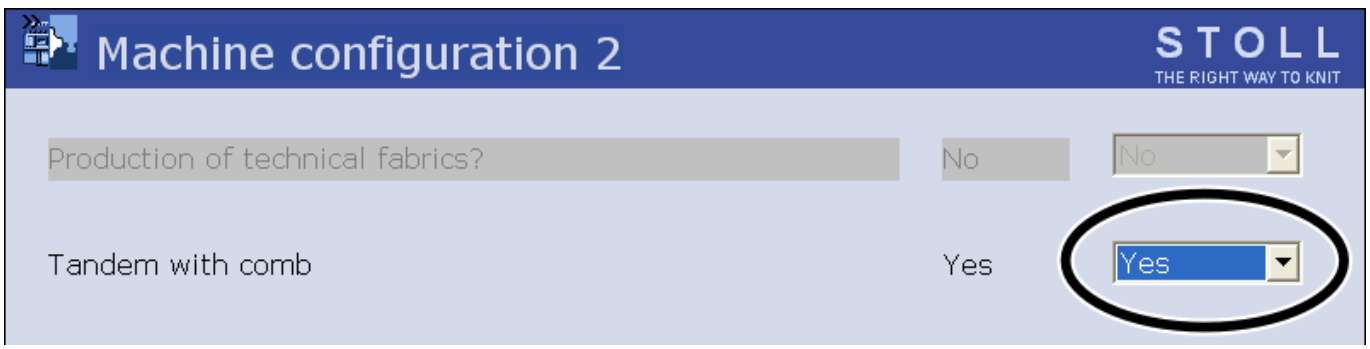
- The yarn carriers for the left fabric piece are positioned in the left clamping and cutting device.
- The yarn carriers for the right fabric piece are positioned in the right clamping and cutting device.
- One yarn carrier knits-in the comb thread (elastic thread) over both fabric pieces due to the **comb function** at the start of the program.
- A **Cast-off function** is called-up at the fabric end.

Result:
Each piece is started with the comb and casted-off at the end.
Single fabrics are produced.

With this operating mode **no** fabric must be in the main take-down.

Make important settings for this operating mode:

1. Call up the main menu  .
2. Call up the "Service" menu with the  key.
3. Call up the Basic settings window with  .
4. Tap the  key.
   ⇨ The "Machine configuration 2" window is displayed.



5. Set **Yes** at "Tandem with comb" for this operating mode.
   ⇨ Clamping / cutting gets active with this setting.
6. Go back to the "Main menu" with  .

7. Start the reference run.
   ⇨ The **Tandem with Comb** mode is active after the reference run.

37.3 Couple the Machine Wide, Load and Set-up the Pattern in the Machine

Set up the pattern:

1. Load pattern in machine
2. Couple the carriage wide: **44”**
3. Carry out the reference run
4. Check the settings in the "Machine Configuration 2" window:

- Tandem - with comb: **no**
  Result: Machine works in tandem mode without comb.
- Tandem - with comb: **yes**
  Result: Machine works without comb, but **not** in tandem mode
  Two fabrics will be produced side by side.

5. Threading up the Yarn Carriers
6. Position the Yarn Carriers
7. Check the needle bed: no fabric in the needles?
8. Starting Machine

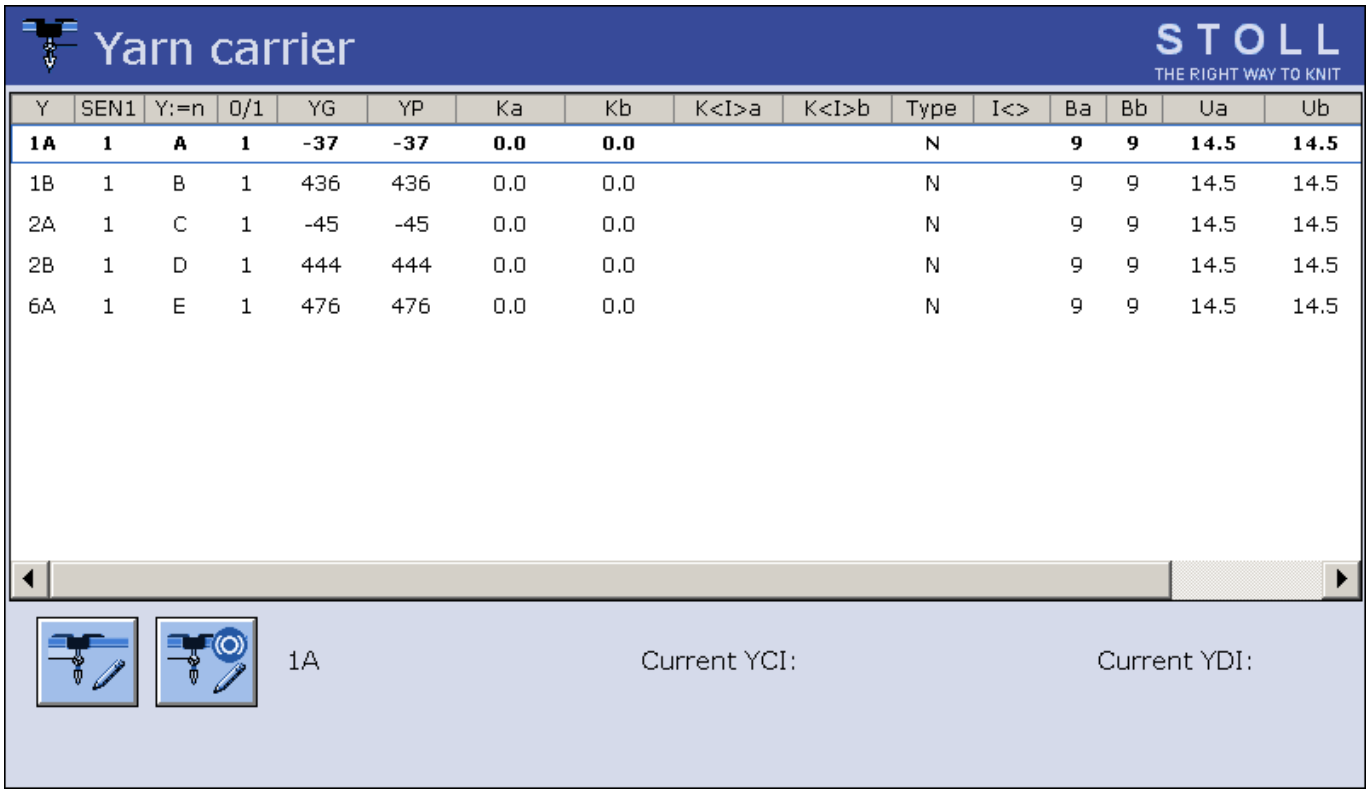
Make the following changes:

1. Cycle counters (**RS**)
2. Stitch Length (**NP**)
3. Fabric take-down values (**WM, W+, WMK, ...**)
4. Staggering the yarn carriers at the fabric selvedge (**YD**)

37.4 Tandem without Comb: Thread up Yarn Carriers and Position them

Calling up the assignment and allocation of the yarn carriers:

1. Call up the "Machine Start" menu with the  key of the Main Menu.
2. Tap the "SP from Line 1" key.
3. Move the carriage from the left to the reverse at the right.
4. Call up the Main menu with  .
5. Call up the Yarn carrier menu  .
   ⇨ The yarn carrier allocation will be displayed.

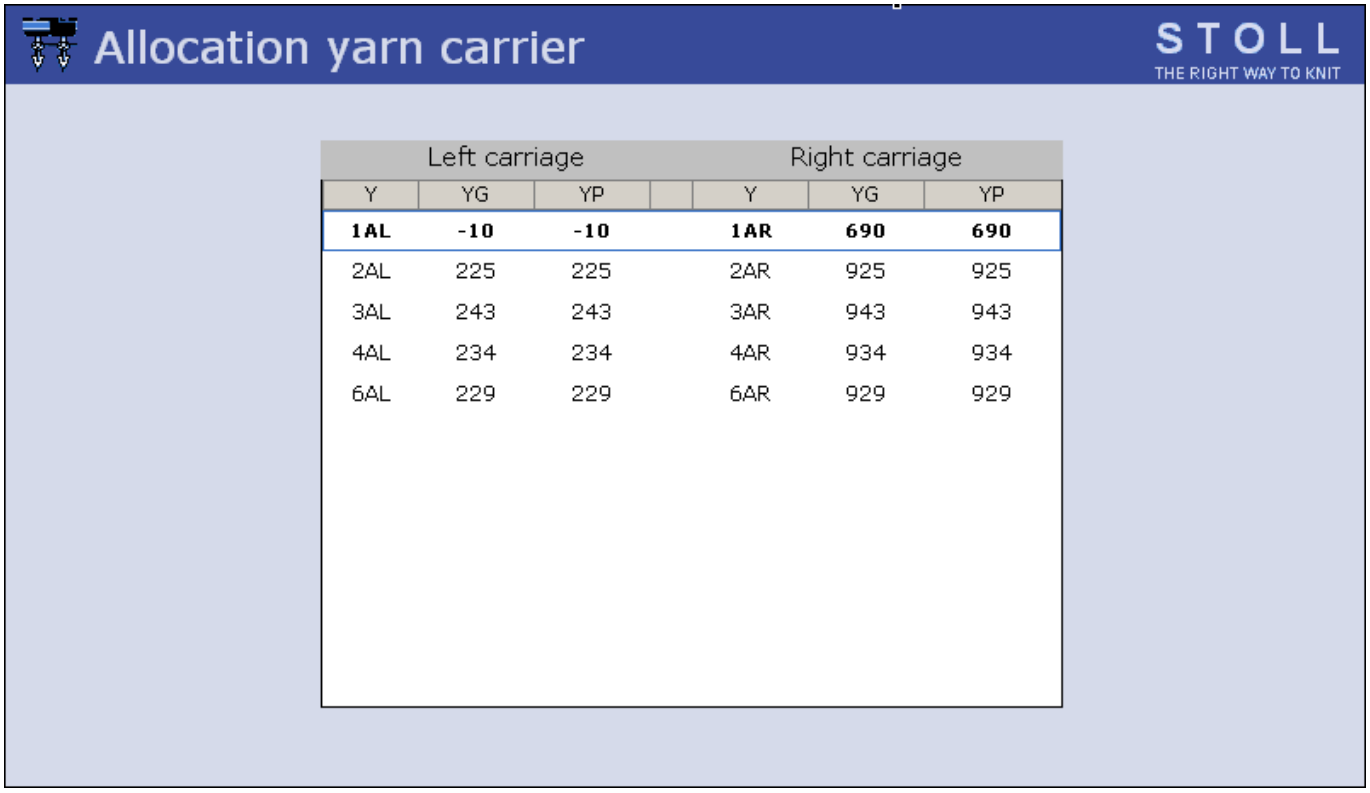


Y	SEN1	Y:=n	0/1	YG	YP	Ka	Kb	K<I>a	K<I>b	Type	I<>	Ba	Bb	Ua	Ub
1A	**1**	**A**	**1**	**-37**	**-37**	**0.0**	**0.0**			N		**9**	**9**	**14.5**	**14.5**
1B	1	B	1	436	436	0.0	0.0			N		9	9	14.5	14.5
2A	1	C	1	-45	-45	0.0	0.0			N		9	9	14.5	14.5
2B	1	D	1	444	444	0.0	0.0			N		9	9	14.5	14.5
6A	1	E	1	476	476	0.0	0.0			N		9	9	14.5	14.5

6. Tap the  key.

7. Call up the "Allocation yarn carrier" window with the  key.

   ⇨ The "Allocation yarn carrier" window appears.



Left carriage			Right carriage		
Y	YG	YP	Y	YG	YP
1AL	**-10**	**-10**	**1AR**	**690**	**690**
2AL	225	225	2AR	925	925
3AL	243	243	3AR	943	943
4AL	234	234	4AR	934	934
6AL	229	229	6AR	929	929

8. Position the yarn carriers as specified at the fabric selvedge and thread them up.

If the yarn carrier specifications in the Sintral differs from the yarn carriers really present on the machine, you can shift yarn carriers from the left to the right carriage.

37.4.1 Additional Stitch Length Correction for the Right Fabric

Correct the stitch length at the right carriage:

It may be necessary to change the stitch length of the right carriage if knitting different yarns.

1. Call up the "SETUP2 Editor" with the  key.

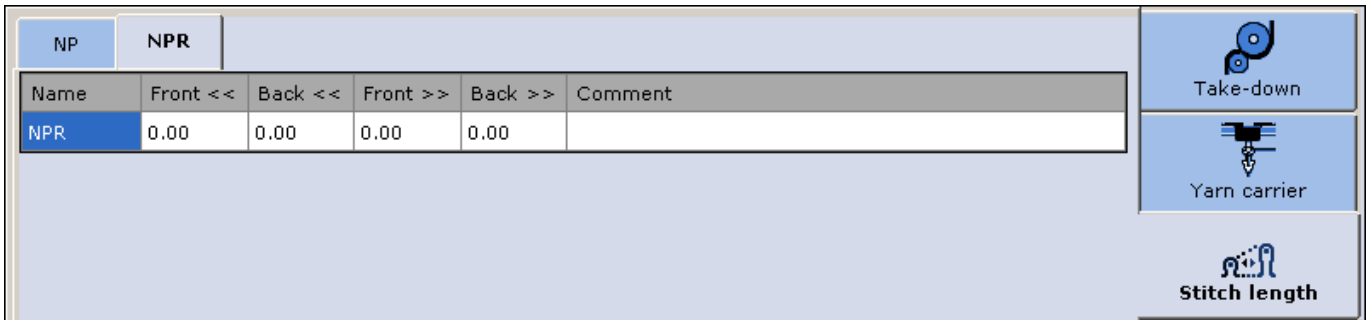
- or -

➜ Call up the "SETUP2 Editor" with the  key.

➜ Tap the "Stitch length" key.

Result: The **NP** tab appears with all **NP**-values used in the pattern.

2. Open the "NPR" tab.



Input fields	Meaning
NPR:<<k-l>>m-n	Correction of the stitch cam positions of the right carriage depending on the carriage direction **<< / >>** = Carriage direction **k, m** = Stitch length for the front needle bed **l, n** = Stitch length for the rear needle bed

3. Tap the entry field and enter values and a comment.

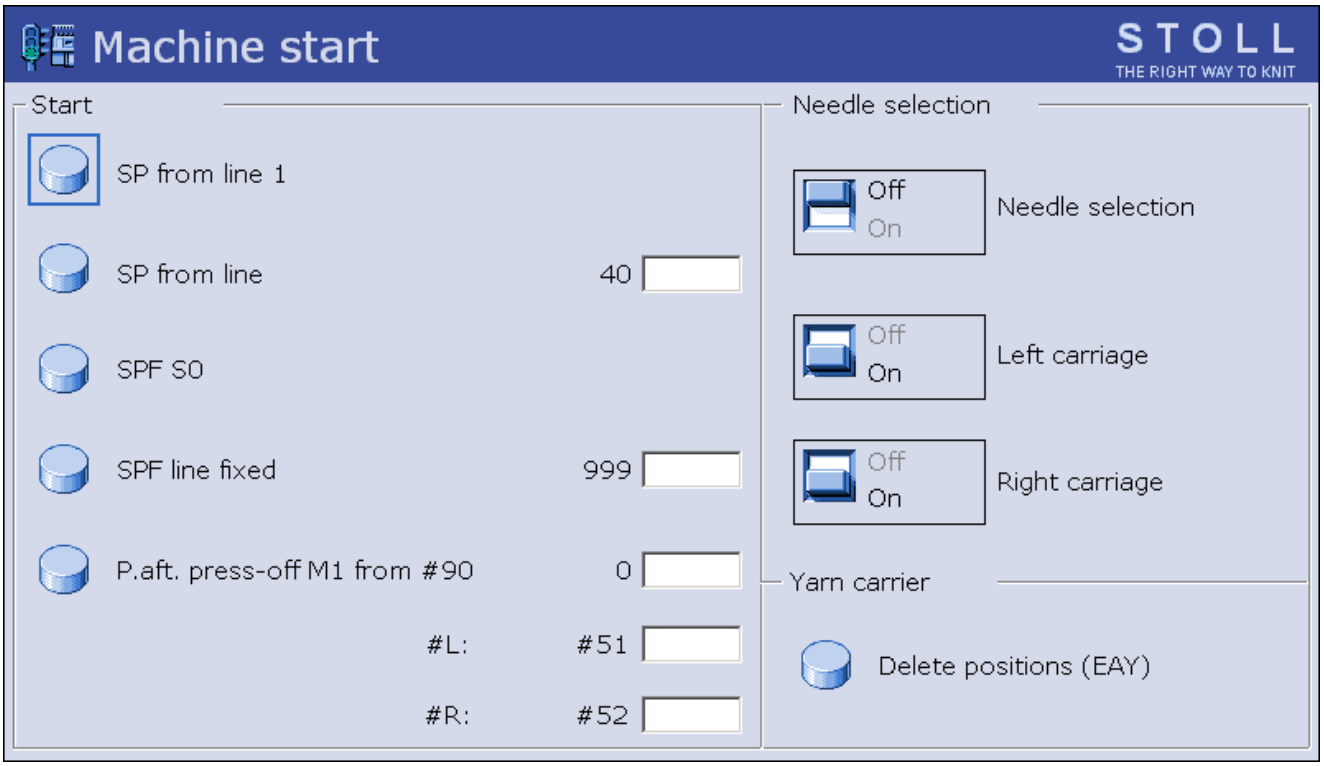
4. Confirm entries with  .

37.4.2 Switch-off the Needle Selection

Switch the needle selection on or off:

The needle selection can be switched on or off individually for one carriage with faulty fabric pieces.

1. Call up the "Machine Start" menu with the  key of the Main Menu.



2. Make the desired settings at "Needle selection":

Setting		Function
"Needle selection"	"Off"	Switch off needle selection
	"On"	Switch needle selection on
	i: This setting does not affect the settings at left or right carriage. Meaning the corresponding setting will be kept when switching off the needle selection. **Result:** Simplified handling when knitting in tandem mode.	
Only with tandem machines		
"Left carriage"	"Off"	Switch off the needle selection of the left carriage
	"On"	Switch on the needle selection of the left carriage
"Right carriage"	"Off"	Switch off the needle selection of the right carriage
	"On"	Switch on the needle selection of the right carriage

i All needle selection settings are switched on by default.

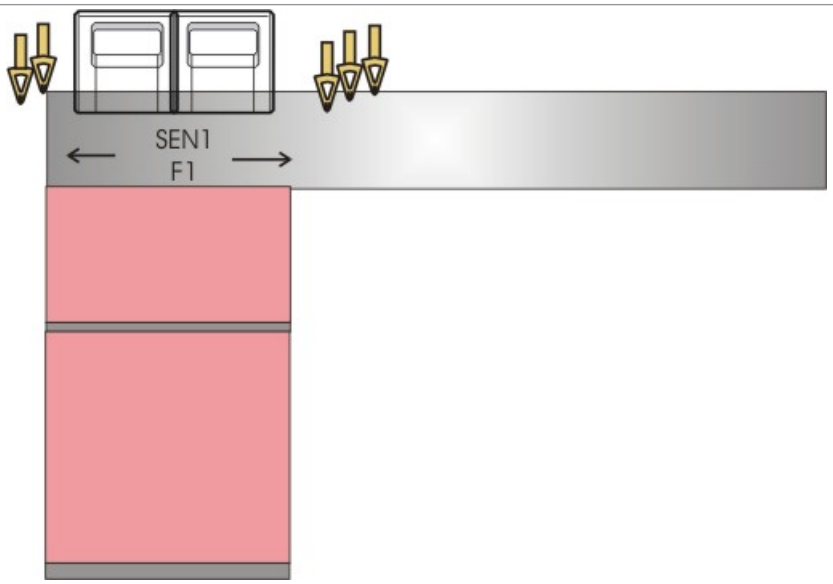
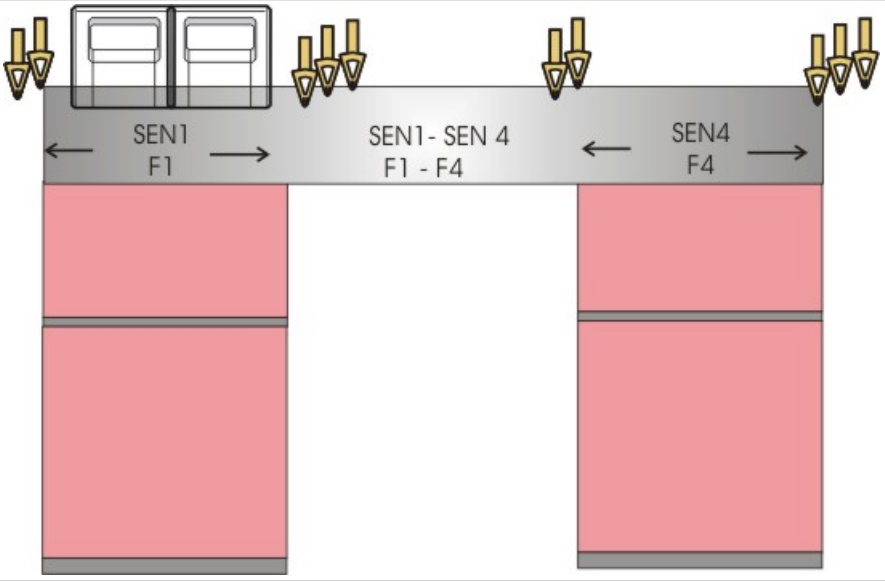
38 Operating Mode CMS 9xx HP

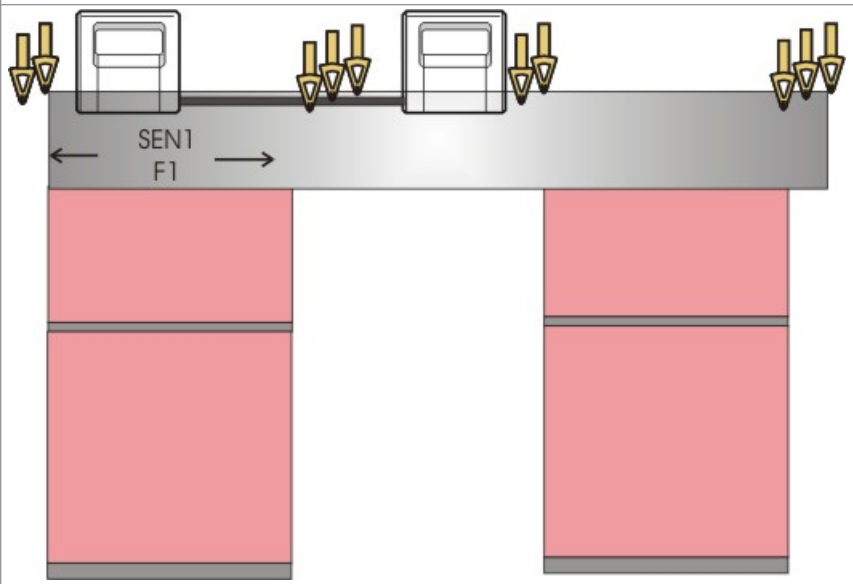
The **CMS 9xx** machine type works without comb and clamping and cutting device.

■ **Operating mode without using the comb:**
The knitting program (Sintral, Jacquard and Setup) comes with a draw thread at the start.
The draw thread enables to separate the pieces after knitting or ironing.
Result:
The individual pieces are knitted in a common panel following each other.

With this operating mode a fabric must always hang in the needles.

Operating modes of CMS 9xx HP

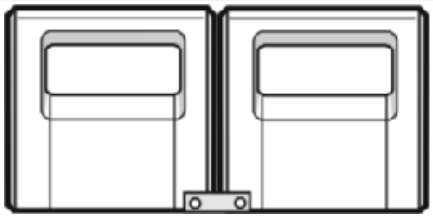
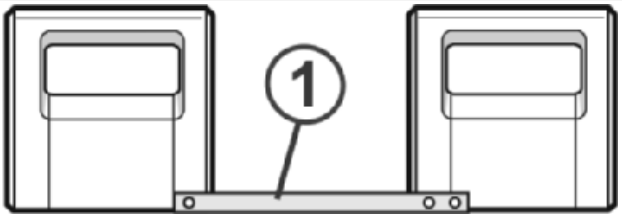
CMS 9xx	
Narrow coupled: 1-piece	
	◆ Machine does **not work in Fully-Fashion mode** (**PFN** command) ◆ **SEN** and fabric start generally on the first needle at the left needle bed border ◆ The yarn carriers are positioned at the left and right fabric selvedge correspondingly
Narrow coupled: multi-piece	

CMS 9xx	
	◆ Machine does **not work in Fully-Fashion mode** (**PFN** command) ◆ A maximum of 4 fabrics (**SEN1-SEN4**) can be positioned ◆ **SEN1-4** and **F1-4** define the respective knitting widths ◆ Home position of the yarn carriers (**YG1 - YG4**) ◆ The yarn carriers are positioned at the left and right fabric selvedge correspondingly
Wide coupling (tandem)	
	◆ Machine does **not work in Fully-Fashion mode** (**PFN** command) ◆ **SINTRAL** contains **only the information for the left fabric** **Result:** The machine control copies the information of the left fabric for the right fabric. ◆ The selected coupling width defines the distance between the fabrics ◆ The yarn carriers are positioned at the left and right fabric selvedge correspondingly ◆ A maximum of four fabrics per carriage can be positioned

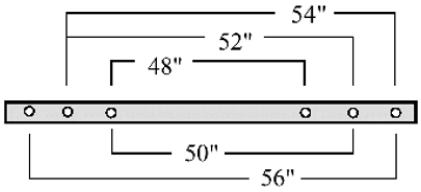
38.1 Coupling widths of Tandem Machines: CMS 9xx HP

Operating Modes:

- Wide coupled in tandem mode
- Narrow coupling as 4 system machine.

Operating Modes	
	
Narrow coupling	**Wide coupling with connecting rod** (1) The different coupling widths result in different intermediate spacings for parking the yarn carriers of the individual fabrics.

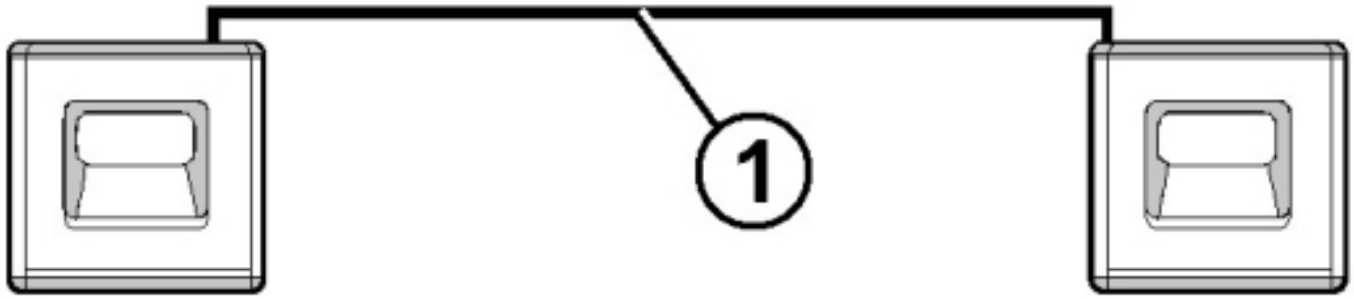
Coupling widths for **CMS 933 HP**:



Needle area with 96 inch needle bed width - narrow coupling:

Gauge	Needle rage
E5	**1 - 479**
E7	**1 - 671**
E8	**1 - 767**
E10	**1 - 959**
E12	**1 - 1151**
E14	**1 - 1343**

Coupling widths and distances between the fabrics:



Coupling width 56":

Gauge	Knitting width 40"	Empty Space	Knitting width 40"
E5 (2,5.2)	**1 - 199**	**16"**	**281 - 479**
E7 (3,5.2)	**1 - 279**		**393 - 671**
E8	**1 - 319**		**449 - 767**
E10 (5.2)	**1 - 399**		**561 - 959**
E12 (6.2)	**1 - 479**		**673 - 1151**
E14 (7.2)	**1 - 559**		**785 - 1343**

Coupling width 54":

Gauge	Knitting width 42"	Empty Space	Knitting width 42"
E5 (2,5.2)	**1 - 209**	**12"**	**271 - 479**
E7 (3,5.2)	**1 - 293**		**379 - 671**
E8	**1 - 335**		**433 - 767**
E10 (5.2)	**1 - 419**		**541 - 959**
E12 (6.2)	**1 - 503**		**649 - 1151**
E14 (7.2)	**1 - 587**		**757 - 1343**

Coupling width 52":

Gauge	Knitting width 44"	Empty Space	Knitting width 44"
E5 (2,5.2)	**1 - 219**	**8"**	**261 - 479**
E7 (3,5.2)	**1 - 307**		**365 - 671**
E8	**1 - 351**		**471 - 767**
E10 (5.2)	**1 - 439**		**521 - 959**
E12 (6.2)	**1 - 527**		**625 - 1151**
E14 (7.2)	**1 - 615**		**729 - 1343**

Coupling width 50":

Gauge	Knitting width 46"	Empty Space	Knitting width 46"
E5 (2,5.2)	**1 - 229**	**4"**	**251 - 479**
E7 (3,5.2)	**1 - 321**		**351 - 671**
E8	**1 - 367**		**401 - 764**
E10 (5.2)	**1 - 459**		**501 - 959**
E12 (6.2)	**1 - 551**		**601 - 1151**
E14 (7.2)	**1 - 643**		**701 - 1343**

Coupling width 48":

Gauge	Knitting width 48"	Empty Space	Knitting width 48"
E5 (2,5.2)	**1 - 239**	**0"**	**240 - 479**
E7 (3,5.2)	**1 - 335**		**336 - 671**
E8	**1 - 383**		**384 - 764**
E10 (5.2)	**1 - 479**		**480 - 959**
E12 (6.2)	**1 - 575**		**576 - 1151**
E14 (7.2)	**1 - 671**		**672 - 1343**

You can not use the maximum knitting width with a coupling width of 48 inches.

38.1.1 Couple Carriage Assembly Wide

1. Program an empty row and fix the knitting specification.

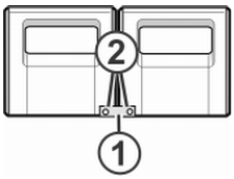
- or -

➜ Call up the "Machine Start" menu and tap the "SPF S0" key.

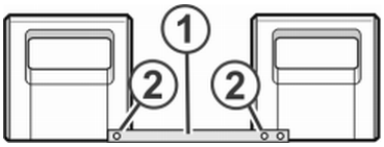
2. Start the machine with the engaging rod and stop it again when the carriage is located shortly after the left reversing position.

Switch off the 40 Volt power supply:

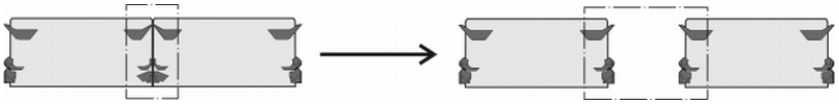
3. Press the  key in the Main Menu.
4. Tap the  key.
5. Switch off the "40 Volt power supply".
6. Open and remove the rear panel segments.



7. Loosen screws (2) and remove coupling rod (1).



8. For wide coupling (tandem machine), push the right carriage to the right until the coupling rod (1) can be mounted.
9. Insert the screws (2) and tighten.
10. Remove the carriage part in order to replace the cams.



With the wide coupling you have to exchange the cam parts for reasons of safety.

11. Place carriage part on contact surface and assembly with carriage assembly.
12. Close the rear panel.
13. Switch on the 40 Volt power supply.
14. Start the "Reference runs".
    ⇨ The carriage assembly runs in the creep speed until it automatically stops and the message "Reconfiguration" appears on the display.
    The control adjusts to the new coupling width.
    After a short time the message disappears again.
15. Move the carriage to the left.
    Thereby in the window "Reference runs" tap on the key "S<" and start machine with the engaging rod.
16. Stop the machine when the left carriage is outside the needle bed.
17. In the window "Reference runs" tap on the key "S>".
18. Pull up the engaging rod for short.
    The carriages may move to the left some inch (2") only.
    ⇨ The reference run is completed.
19. Load the knitting program.

---

i If the carriage assembly operate coupled wide, the needles between and at the right and left of the fabric pieces must be free of fabric.
All yarn carriers must be positioned.

---

20. Calling up yarn carrier assignment.
21. Load the new knitting program.
22. Start the program.

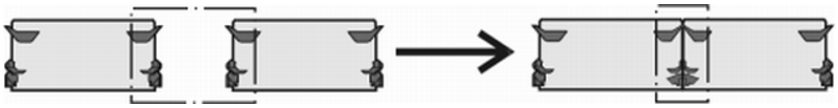
38.1.2 Couple Carriage Assembly Narrow

1. Program an empty row and fix the knitting specification.

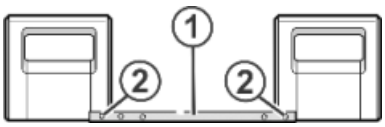
- or -

➜ Call up the "Machine Start" menu and tap the "SPF S0" key.

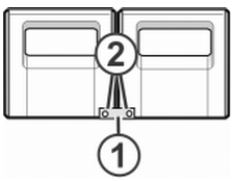
2. Start the machine with the engaging rod and stop it again when the carriage is located shortly after the left reversing position.
3. Switch off the 40 Volt power supply.
4. Remove the carriage part in order to replace the cams.



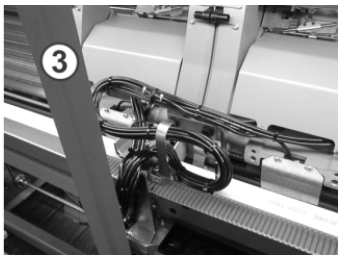
5. Place carriage part on contact surface and assembly with carriage assembly.
6. Open and remove the rear panel segments.



7. Remove the screws (2).



8. Take off the coupling rod (1).
9. For narrow coupling (tandem machine), push the left carriage assembly to the right and hook in the coupling rod (1)
10. Insert the screws (2) and tighten.
11. Lay the cable harness into the retainer.
    This prevents the cables at the support (3) from rubbing and being damaged.



12. Close the rear panel.
13. Switch on the 40 Volt power supply.
14. Call up the "Service" menu.
15. Call up the "Reference runs" window.
16. Start reference runs.
    ⇨ The reference run is completed.
17. Load the new knitting program.

    - or -

➜ Start the loaded program.

39 Service

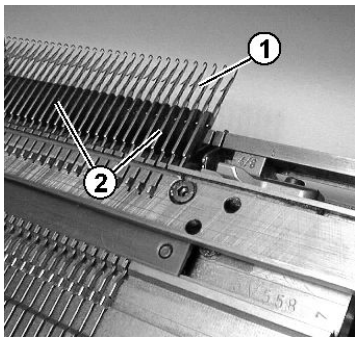
39.1 Cleaning the Knitting Machine

To ensure the operability of the knitting machine and ensure the quality of the fabric, the knitting machine must be cleaned regularly.

Cleaning interval	Cleaning work
if necessary	Cleaning the touch screen
6-24 operating hours	Cleaning suction and lint container
daily	Vacuuming off knitting machine Cleaning needle bed Cleaning the active thread clamp Cleaning the permanent brakes Cleaning the friction feed wheel
100 operating hours	Cleaning main drive fan
once a month	Cleaning fan and radiators in right control unit Cleaning filter mat of power supply unit
2 months	Quick cleaning of the clamping and cutting device
3 to 6 months	Thoroughly cleaning needle bed
6 months	Clean the knitting systems Thoroughly cleaning the clamping and cutting device

I. Clean needle beds:

1. Stop the knitting machine.
2. Push up all needles completely.



3. Vacuum off dirt in the area of the needle hook/pelerine spring (1) and in the area of the needle bed (2).

In order to avoid any dust being deposited on the inaccessible points of the machine, we recommend that the dust should be vacuum cleaned and the machine not to be cleaned by compressed air.

CAUTION

Damage of needles!

The spring-mounted needle latches will be damaged if the needles are blown out with compressed air.

➜ Always vacuum fluff and dust off the needles, never blow them out.

II. Cleaning with cleaning apparatus:

The cleaning apparatus is used to clean the needle hooks and the holding-down jacks.
The cleaning apparatus is machine and gauge dependent. The cleaning apparatus can be adapted to the gauge of the needle bed by replacing the cam.

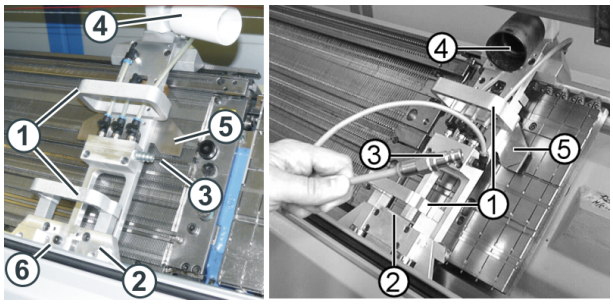


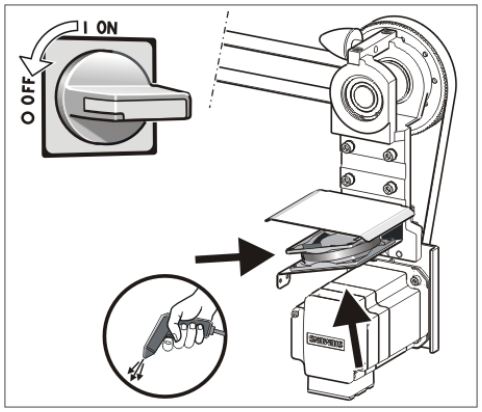
Fig. 1: Cleaning apparatus (left: OKC machine, right: TC machine)

	Function
1	Handles
2	Guide assembly
3	Connection for compressed-air
4	Connection for suction
5	gauge dependent cam

The cleaning apparatus is mounted on the right or left of the front needle bed and then pushed over the needle bed by hand.
If a thread clamping and cutting device is installed on the needle bed, the cleaning apparatus is mounted over the thread clamping and cutting device.

	WARNING
	Dangerous operation! Operation requires the observance of security measures ➜ Observe the operating instructions of the cleaning apparatus by all means.

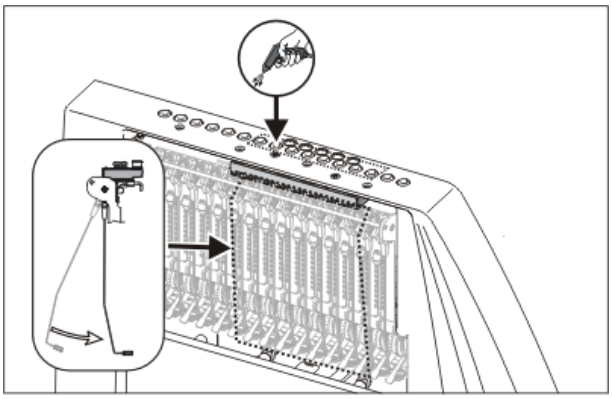
III. Clean the main drive fan:



1. Set the main switch to "0" and wait until the touch screen is dark and an alarm signal sounds.
2. Swing open the cover on the right-hand control unit.
3. Clean fan (1).
4. Close the cover on the right control unit.

IV. Cleaning the active thread clamp:

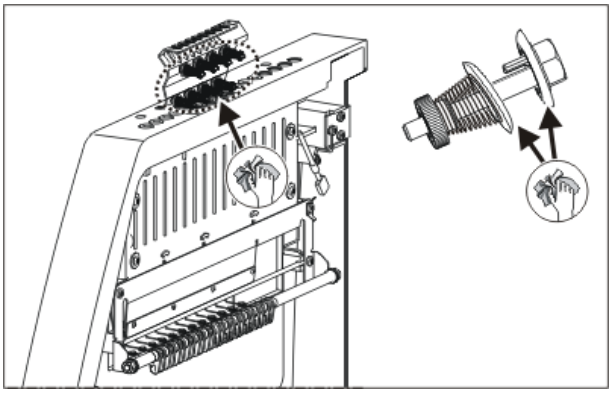
1. Bring the lateral yarn tensioner in still position.



2. Blow the eyelets in the lateral safety door by compressed air.

V. Cleaning the permanent brakes:

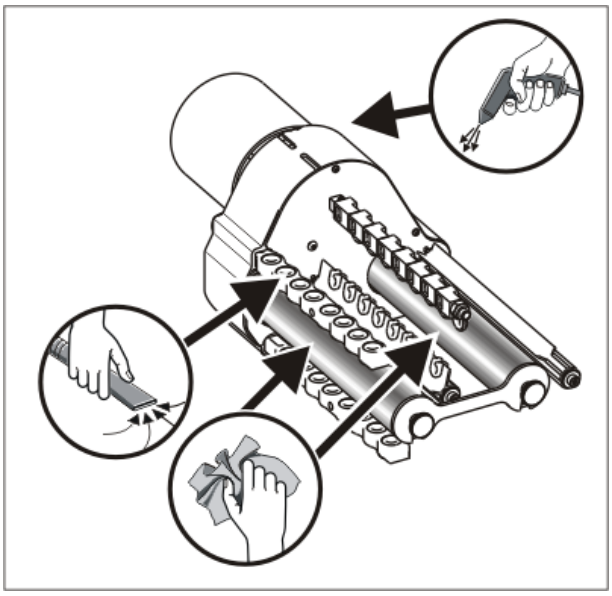
1. Clean both the brake settings of each permanent brake with a cloth.



2. The permanent brake can be dismantled and blown out with compressed air if it is very dirty.
3. For this purpose, pull the adjusting lever of the permanent brake outwards and simultaneously press the lug of the permanent brake on the inner side of the safety door.
4. Blow out the permanent brake with the compressed air.

VI. Cleaning the friction feed wheel:

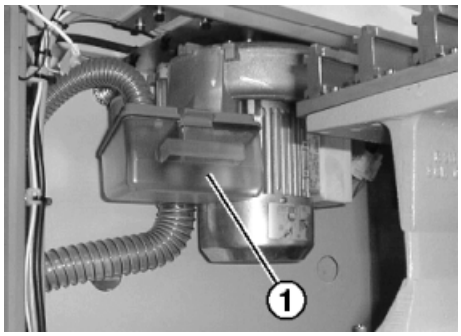
1. Vacuum off the fluff and dust from the friction feed wheel.



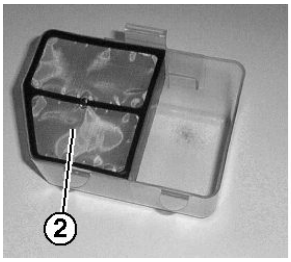
2. Remove dirt (e. g. paraffin) from the friction rollers.

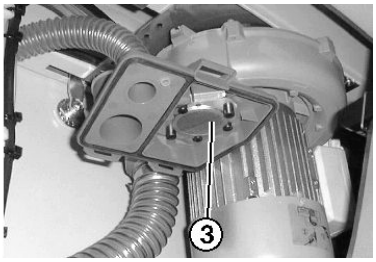
39.1.1 Clean the Suction and Control Unit (component type 00)

I. Clean the lint container and the suction turbine:

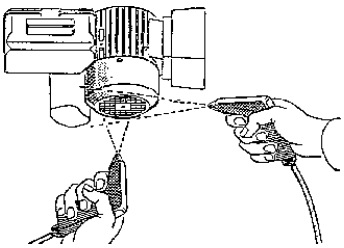


1. Slide on cover over needle bed.
2. Push the lock of the lint container (1) toward the rear and pull away the container downward.
3. Empty the lint container.





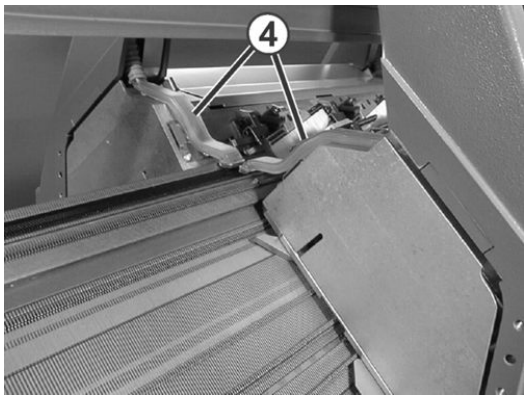
4. Clean the filter (2) in the lint container and the filter (3) at the vacuum device.
5. Reinstate the lint container.
6. Remove left rear panel segment.



7. Clean motor cover.

II. Clean the suction tube:

1. Remove the suction tube (4) from the carriage and blow it out with compressed air.



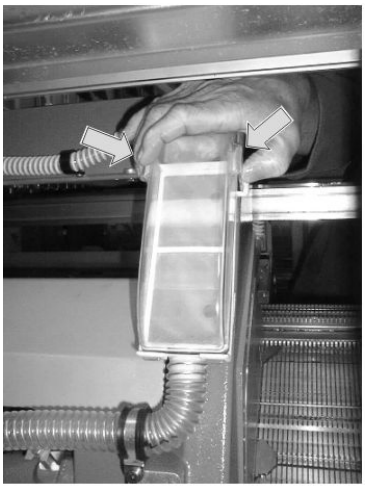
II. Cleaning at the left and right control unit:

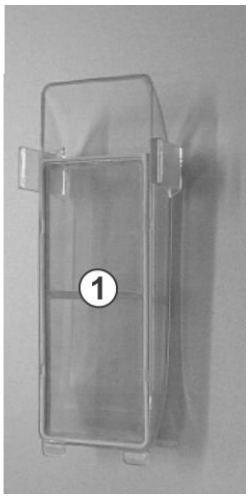
1. Switch off machine.
   Set the main switch to "0" and wait until the touch screen is switched off.
2. Remove the covers of the left and right control unit.
3. Control unit on the left:
   Vacuum off both filter mats, remove them and blow them out.
   Reassemble them.
4. Control unit on the right:
   Vacuum off and blow out the fan and radiator.
5. Fix the covers of both control units.

39.1.2 Clean the Suction and the Control Unit (starting with component type 01)

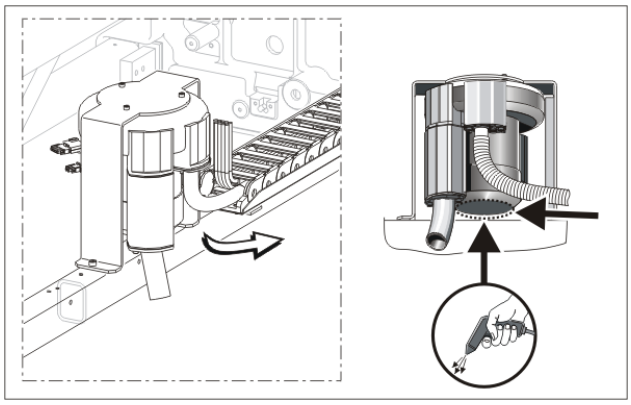
I. Clean the lint container and the suction turbine:

1. Stop knitting machine when carriage is located on right half of needle bed.
2. Slide on cover over needle bed.
3. Push locking of lint container inwards and pull away container upwards.





4. Empty the lint container.
5. Clean filter (1) of lint container.
6. Reinstate the lint container.
7. Remove left rear panel segment.
8. Clean motor cover.

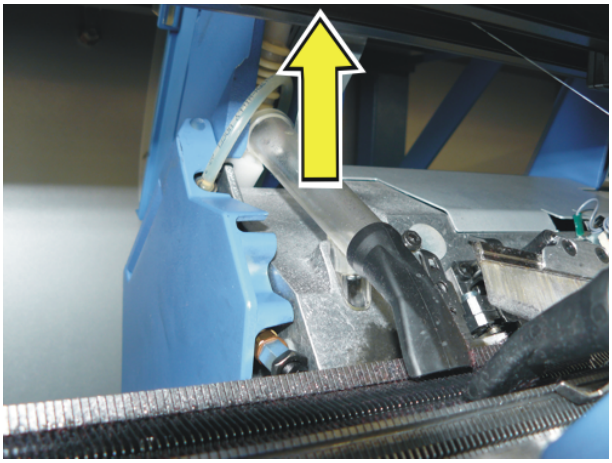


II. Clean the suction tube:

Damage to the suction tube!
The suction tube will be damaged at the coupling point suction tube-hose if you lift it by the suction nozzle.

➜ Lift the suction tube always in the middle so that the coupling point of suction tube and hose is separated

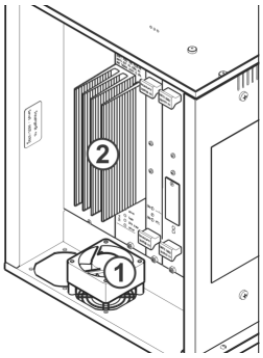
1. Lift the suction tube in the middle until the fixing clip is pulled out of the carriage.



2. Blow out the suction tube with compressed air.

III. Cleaning at the right control unit:

1. Switch off machine.
   Set the main switch to "0" and wait until the touch screen is switched off.
2. Swing open the cover on the right control unit.

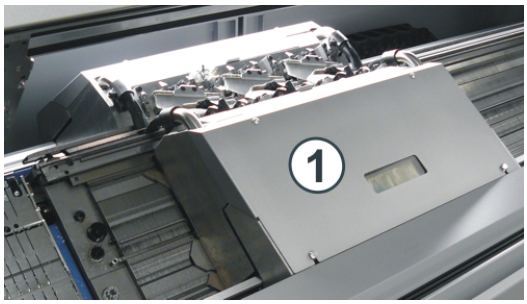


3. Vacuum-off and blow-out the fan (1) and heat sink (2).
4. Close the cover on the right control unit.

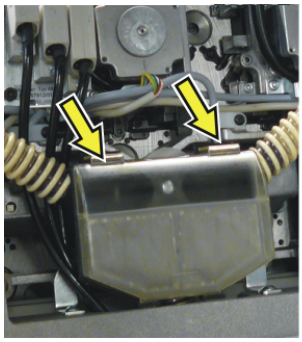
39.1.3 Cleaning the Suction and Control Unit (ADF)

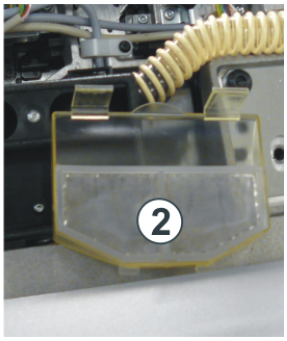
I. Clean the lint container and the suction turbine:

1. Stop the knitting machine when the carriage is located in the center of the needle bed.
2. Open the covers.
3. Remove the carriage assembly panelling (1).

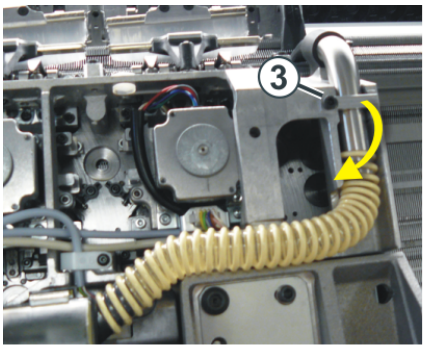


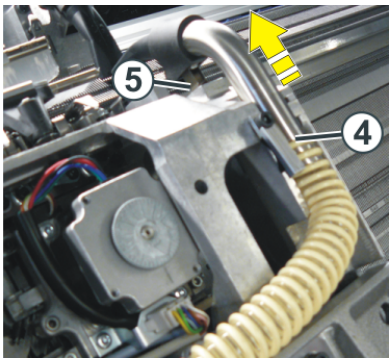
4. Push the locking of the fluff container downwards and pull away container upwards.



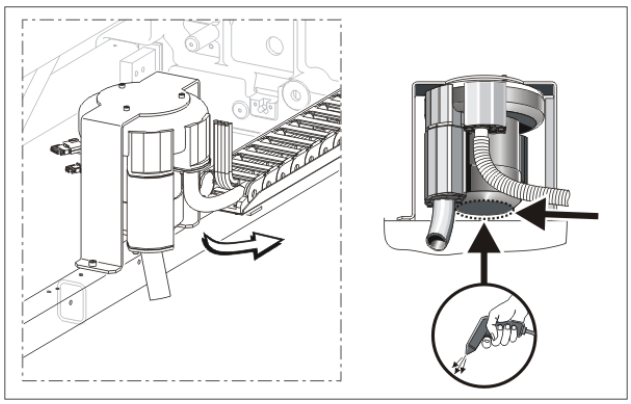


5. Empty the lint container.
6. Clean filter (2) of lint container.
7. Reinstate the lint container.
8. Loosen the screw (3) and swivel the retainer downwards.
9. Lift the suction tube somewhat at the lower end (4). Push the suction tube upwards until the fixing clip (5) is pulled out of the carriage.



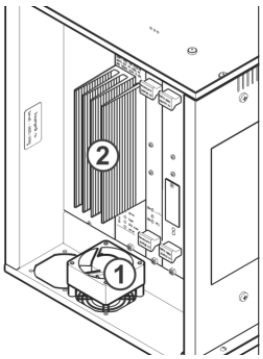


10. Separate the suction tube and the suction hose. Blow out the suction tube with compressed air.
11. On assembly please ensure that the suction hose is pushed about 2 cm over the suction tube.
12. Repeat this procedure on the rear carriage.
13. Clean motor cover.



II. Cleaning at the right control unit:

1. Switch off the machine and wait until the machine is currentless.
2. Swing open the cover on the right-hand control unit.



3. Vacuum-off and blow-out the fan (1) and heat sink (2).
4. Close the cover on the right control unit.
5. Switch on machine.

The fan is temperature-controlled.

39.2 Lubricate the Knitting Machine

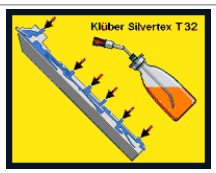
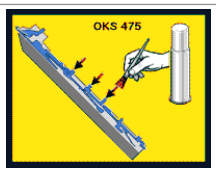
Maintain parts of the machine:

You have to clean and lubricate the knitting machine regularly in order to maintain the operability of the knitting machine.

When the lubricating interval for the needle bed expires, a message appears:

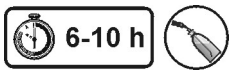
Oil needle bed

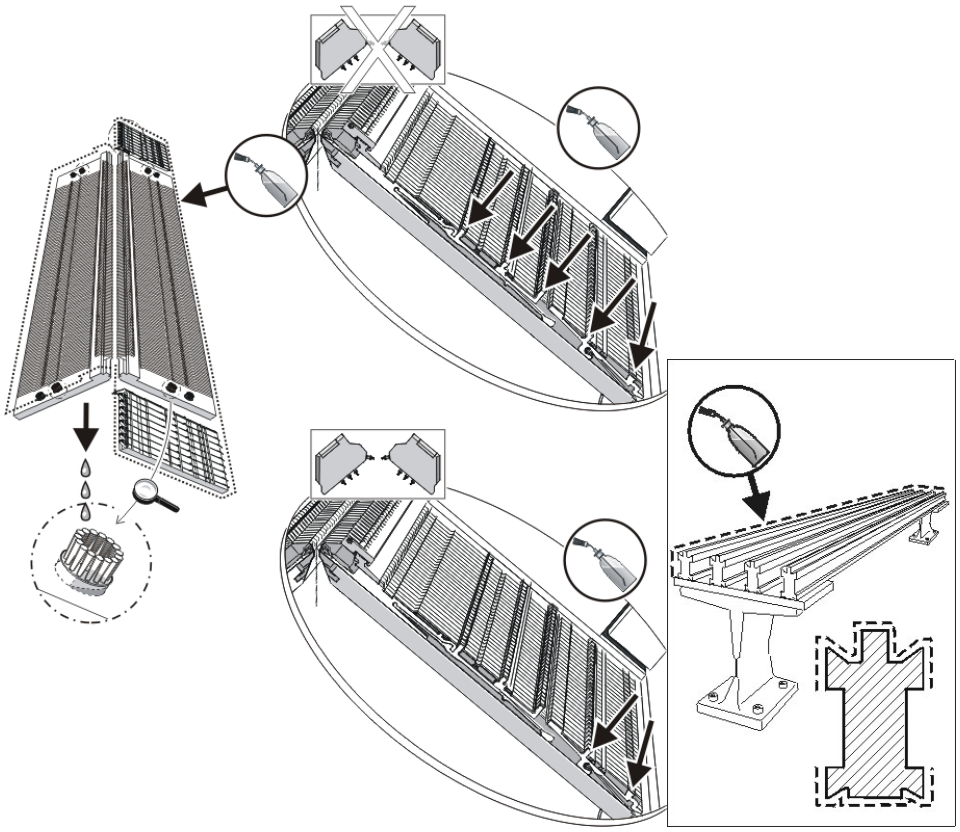
Only the lubricants approved by STOLL may be used.
See operating instructions
Unsuitable lubricants may damage the machine.
Failure to comply will void the guarantee.

Lubricants are gauge-dependent		
Machine gauge	Note	Oil to be used
E 3-14 E 2,5.2 - 7.2		Klüber Silver Tex T46
E 16-18 E 8.2 - 9.2		Klüber Silver Tex T32
After every 10th note appears Oil needle bed		Grease OKS 475

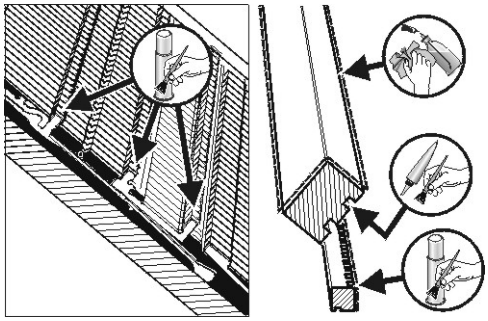
Lubricating intervals	
6-10 operating hours Note: Select a shorter interval if necessary	Oiling the needle bed without central lubrication.
10 operating hours	Oiling the jack bed, the thread clamping and cutting device and the yarn carrier rods.
100 operating hours	◆ Oiling the carriage guide bar ◆ Oiling the needle latch hinges ◆ Greasing the pulse generator rails and the carriage guide ◆ Greasing the coupling parts and the intermediate sliders ◆ Greasing the yarn carrier rods
6 months	Greasing the racking device and needle bed supports

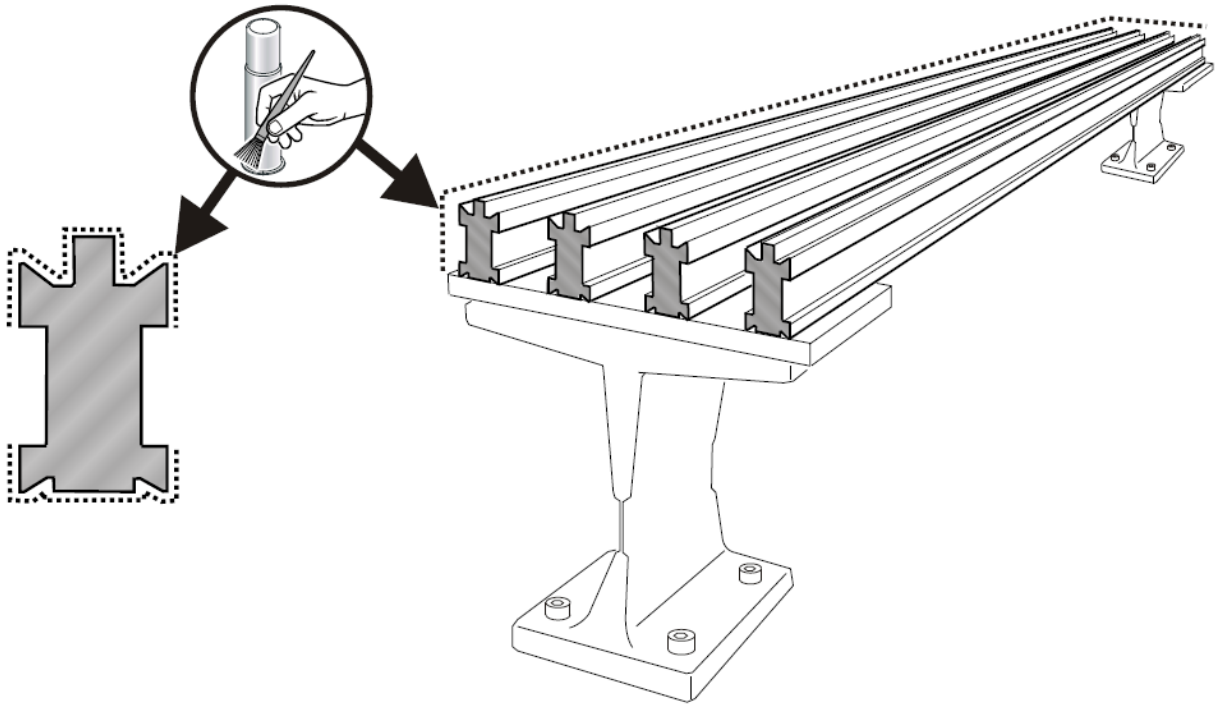
Lubricate with oil:





Lubricate with oil and grease:





Oiling the needle latch hinges:

1. Use a brush to apply oil to the needle latch hinges.
2. Knit with residual yarn until oil lines no longer occur in the fabric.

Observe the lubrication schedule in the operating instructions.

Set the lubrication interval for the needle bed:

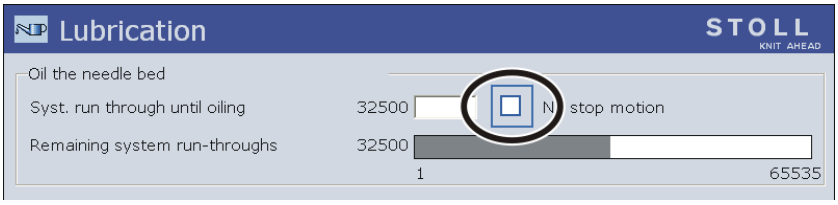
For the needle bed a lubricating interval of between 1 and 65.535 courses can be set.
However, this value depends on:

- Machine speed
- Ambient temperature
- Number of knitting systems

Key	Designation
	Main menu

Key	Designation
	Service
	Lubricating
	Confirm input

1. Call up the "Service" menu from the "Main menu".
2. Call up the "Lubricating" window.



3. Enter a value for "System run-throughs until oiling".
4. Stopping the machine when exceeding the number of system run-throughs:

- **YES:** Checkbox  deactivated
- **NO:** Checkbox  activated

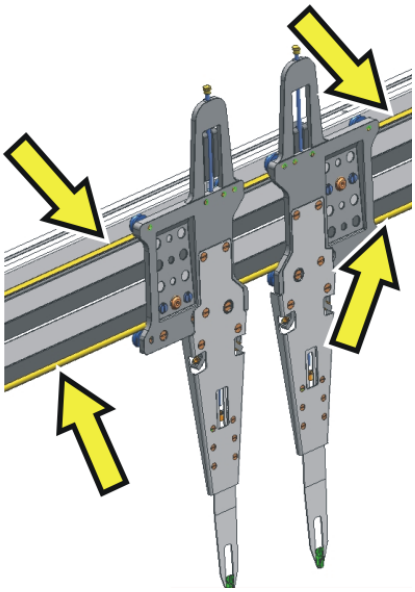
5. Confirm input.
6. Call up Main menu.

39.2.1 Lubricating the CMS ADF

Additional lubrication points:

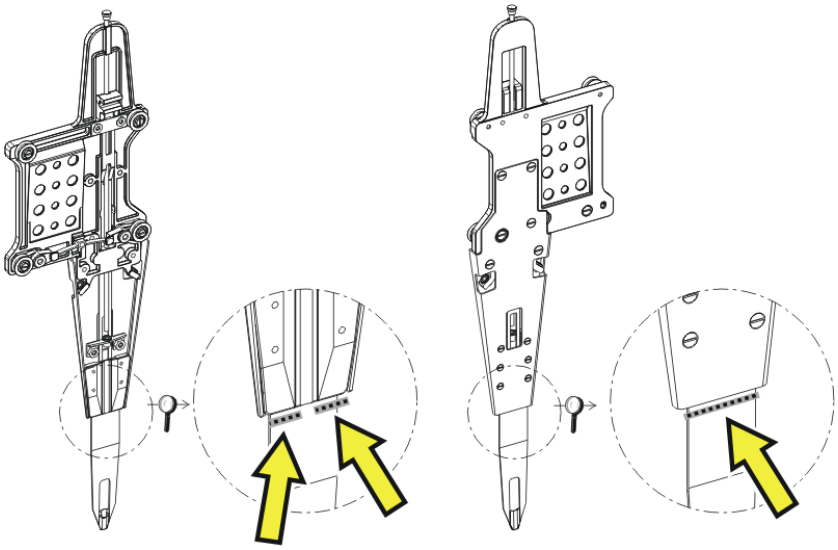
Lubrication interval	Lubricating work	Additional lubrication points with the **CMS ADF**
adjustable engaging width Recommendation: Every 6 - 10 operating hours; select shorter interval if necessary	◆ Oiling the needle bed	
10 operating hours	◆ Oiling the jack bed ◆ Oiling the control of the holding-down jacks	◆ Oiling the wires in the yarn carrier rails
100 operating hours	◆ Greasing the impulse sensor rails ◆ Greasing the coupling parts and the intermediate sliders	
1 Month		◆ Greasing the yarn carrier bows
2 months		◆ Greasing the linear guidance of the carriage
6 Months	◆ Greasing the racking device ◆ Greasing the needle bed supports	

39.2.1.1 Oiling the wires in the yarn carrier rail



→ Apply oil on the wires on the wires in the yarn carrier rail using a paintbrush or the displayed tool.

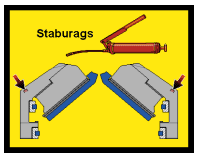
39.2.1.2 Greasing the yarn carrier bows



→ Apply grease on the front and rear side of the yarn carrier bow using a paintbrush.
i: Grease carefully so that the thread does not get soiled.

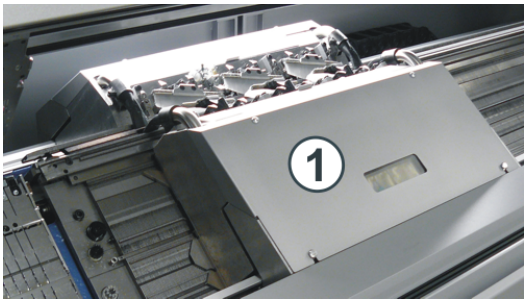
39.2.1.3 Greasing the linear guidance

If the lubricating interval for the linear guidance has elapsed, a pictograph appears indicating that the linear guidance has to be greased.

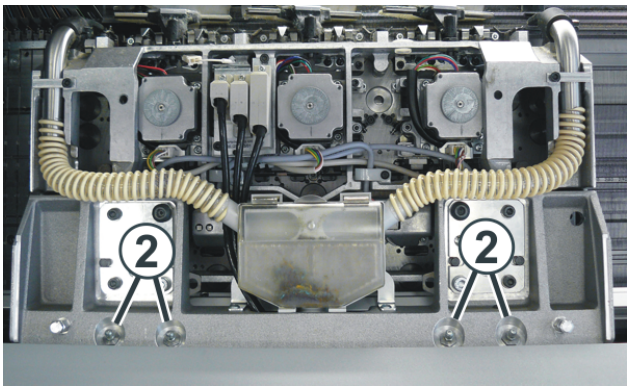


	NOTICE
	An irreversible damage of the linear guidance is possible! In case of insufficient grease, there is the risk of damaging the linear guidance. ➜ If the "Grease linear guidance" icon is displayed, the linear guidance must be greased immediately.

1. Remove the carriage assembly panelling (1).



2. Grease the lubricating nipples (2) with a grease gun (**Klueber Staburags NBU 8 EP, ID 267 423**)



3. Quantity of grease per lubricating nipple: about 3 - 4 cm^3 = press the hand lever three times.
   i: Use a grease gun with a flexible hose to be able to reach the lubricating point more easily.

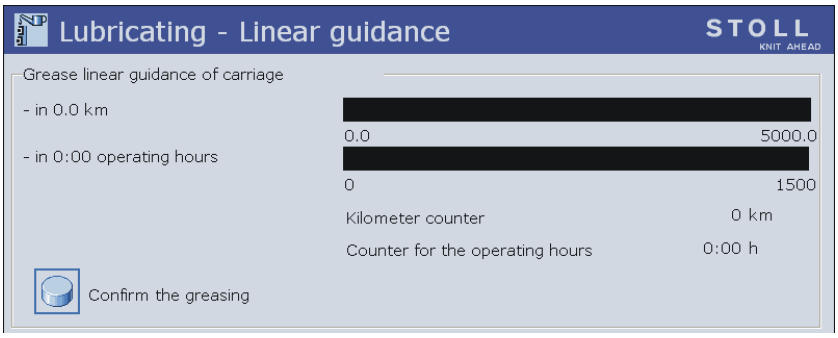
4. Repeat this process at the rear carriage support.

39.2.1.3.1 Confirm the lubrication process

Key	Function
	Call up the "Service" menu
	Call up the "Lubricating" menu
	Call up the "Lubricating - Linear guidance" window
	Call up "Main menu"

Confirm the lubrication process:

1. Call up the "Service" menu from the "Main menu".
2. Call up the "Lubricating" menu.
3. Call up the "Lubricating - Linear guidance" window.

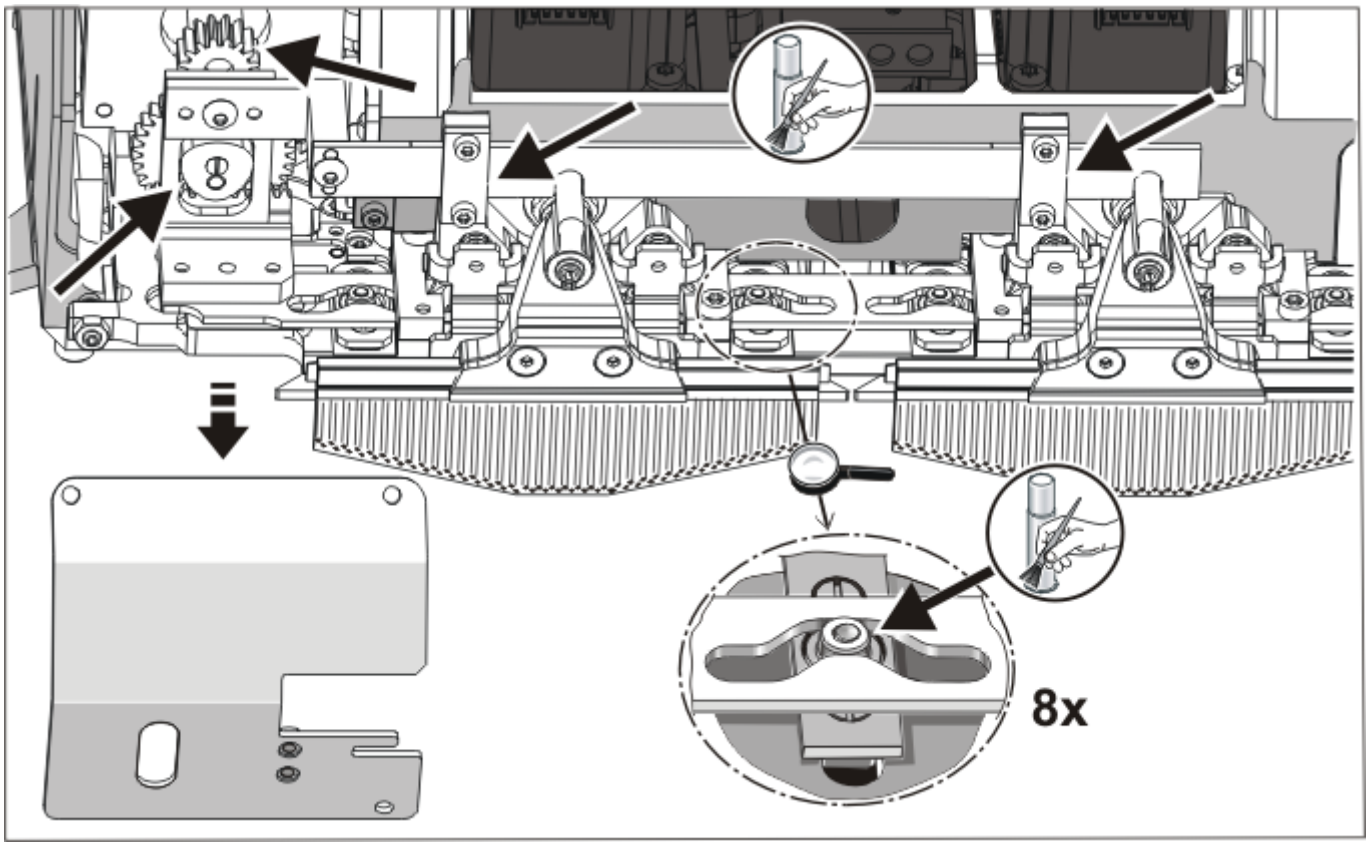


4. Confirm the lubrication process.
   Tap on the "Confirm greasing" key for this.
5. Call up "Main menu".

39.2.2 Lubricate the CMS 822

Greasing the control sliders (**CMS 822**)

With the machine type **CMS 822** the holding-down jack control and the needle brush are driven by a motor.



➞ Apply grease to the control slider and the drive with a brush.

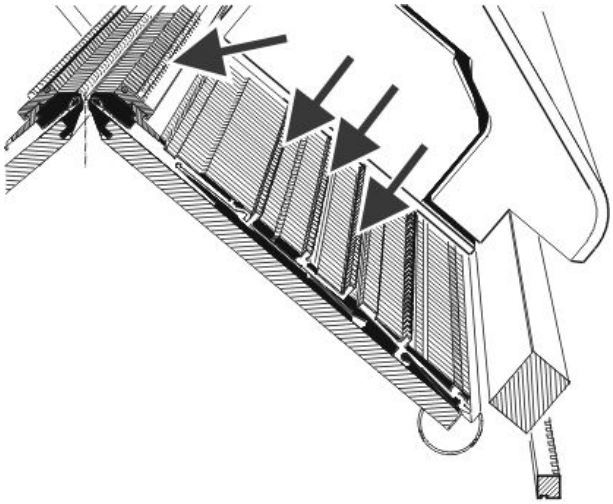
39.2.3 Central lubrication

All machines with four or more knitting systems are equipped with a central lubrication as a standard equipment (not for **CMS 822**). If a central lubrication is mounted on the knitting machine you can switch it on and off.

Central lubrication disabled

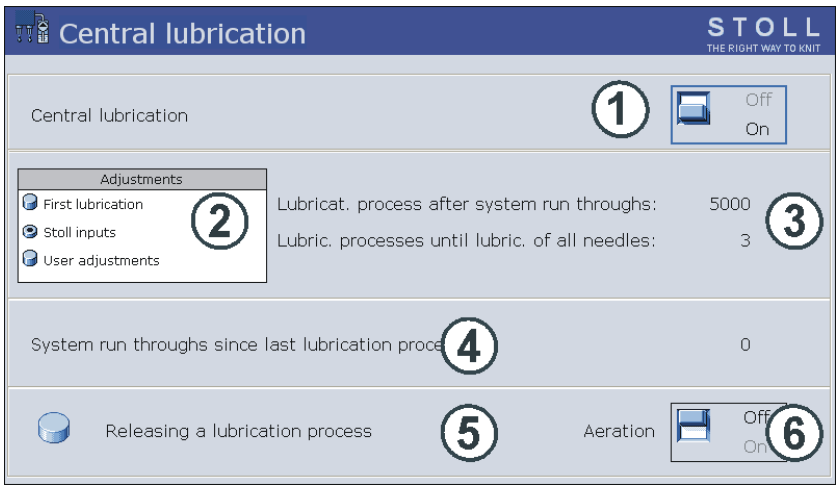
The monitoring of the lubrication interval is automatically activated and you must perform the following lubrication tasks manually:

- Oil needle bed
- Oiling jack bed
- Oiling carriage guide bar



I. Activate the central lubrication:

Key	Function
	Call up the Machine settings window
	Additional function keys
	Central lubrication window

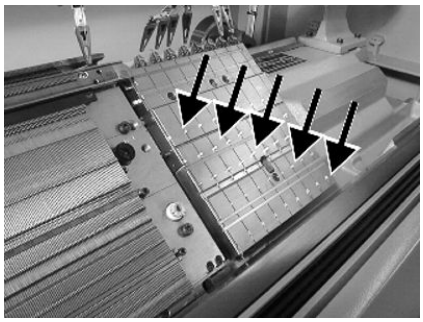


No.	Function
1	Switch on/off the central lubrication
2	Three settings are available for the lubrication interval:
	Initial lubrication: This setting is used for the initial lubrication of a new machine at the Stoll factory. The values cannot be modified. (Caution: risk of soiling the fabric) Select this setting for approx. 15 minutes after a gauge conversion or with a machine, which has been out of operation for a longer period of time.

No.	Function
	STOLL inputs: This setting can be used for production. The values cannot be modified.
	User settings: With this setting, the values can be changed by the user. (Caution: An improper setting could lead to insufficient oiling. Ensure that the central lubrication applies sufficient oil to the needle bed.)
3	Each setting consists of two values.
	Setting of the number of knitting systems after which lubrication occurs. The lubrication procedure stretches across the current traversing path of the carriage.
	Lubrication procedures until all needles are lubricated. Setting of the number of lubrication procedures after which the entire needle bed is to be lubricated.
4	Number of system run-throughs since the last lubrication process.
5	A lubrication procedure is triggered in the next carriage reversal. The entire needle bed is lubricated.
6	The oil line is de-aerated with this switch. The oil pump is switched on for max. 30 seconds. Only use this switch for de-aerating, not for lubrication. Attention: Risk of soiling the fabric.

II. Oil the thread clamping and cutting device on the right

Machines which have central lubrication must have their thread clamping and cutting device on the right-hand side oiled manually. For mechanical reasons, the central lubrication does not reach all eight clamping positions.



→ Use a brush to apply oil to all working butts of the clamping points.

39.3 Save and Copy Service Data

Why to save machine data (dongle data):

- Loss of data
- Installation of a new version of the Stoll operating system
- Exchanging the hard disk

Content of dongle data:

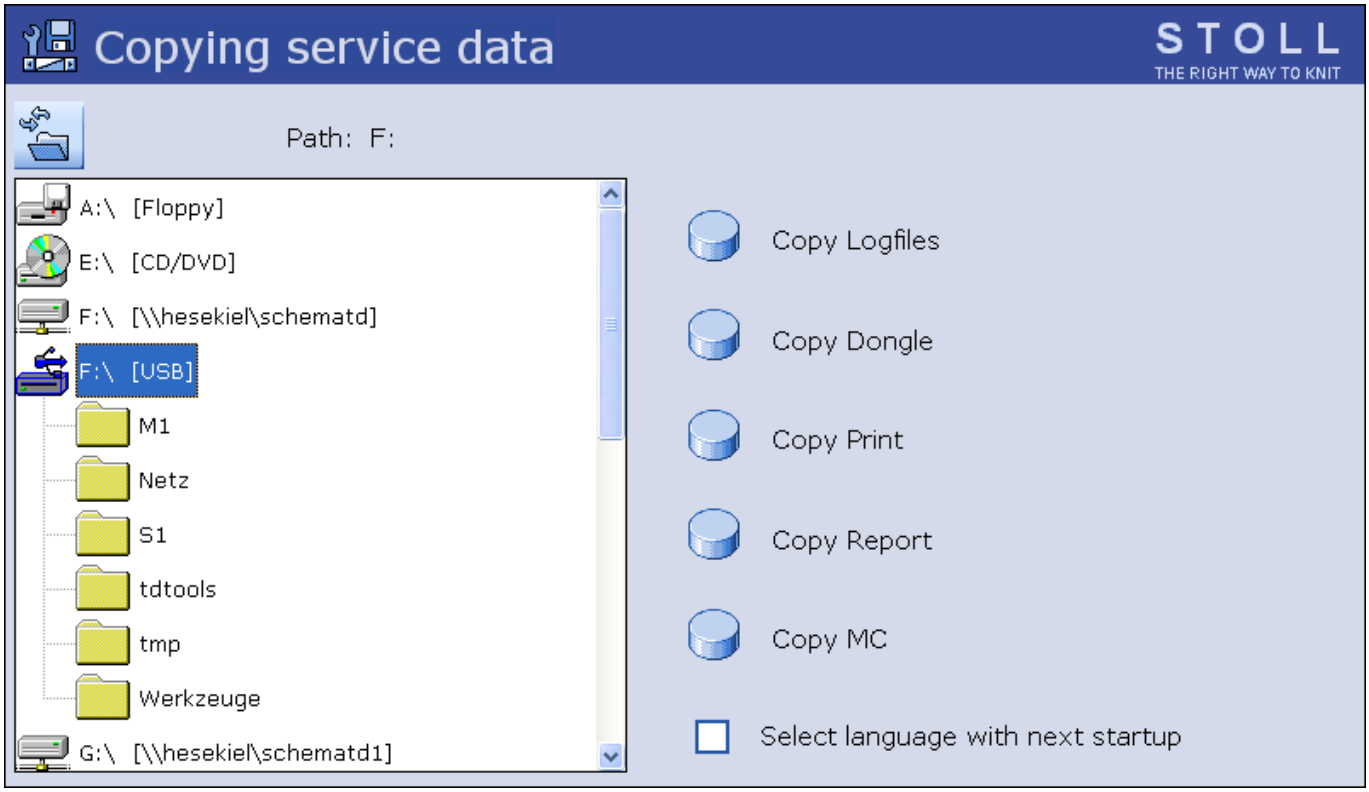
- Machine Data
- Options of the machine
- Configuration of the machine
- Report
- Network settings
- Other internal information

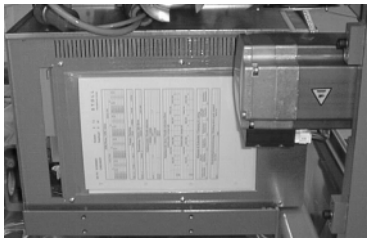
Dongle-Data is saved in a file with the name **mcnumber.dgl** (**mcnumber** = machine number).

Possible data medium for saving:

- Hard disk
- USB Memory Stick
- Floppy (connection of a disk drive via a USB port)
- Network

Copy service data:



Key	Function
Copy Logfiles	Save the error log (**Logfile**) of the internal data previous to the fault.
Copy Dongle	Save all the important machine data
Copy Print	Save the print file (**Printscript**) **Note:** It is also saved with **Copy Logfile**
Copy Report	Save the report data with the Stoll machine number
Copy MC	The machine specific settings (correction values) are saved in a **zip** file. **Caution:** The data can only be transferred back to the machine by manual entry. **Note:** The machine data sheet is attached to the right control cabinet (back). 
	☐ **No language selection** appears after switching on the machine
	☑ **The language selection** appears after switching on the machine

Saving the machine data on USB Memory Stick:

1. Call up the Service menu with the  key.

2. Open the Copying service data dialog with  .
   ⇨ The "Copying service data" dialog box appears.
3. Select the desired storage medium:
   e.g. USB Memory Stick
4. Insert the USB memory stick into the USB socket.
5. Tap on the "Copy Dongle" key.
   ⇨ The entire machine data is saved under the **mcnumber.dgl** file name on the USB Memory Stick.

Loading of the machine settings with the "Load Dongle" key in the window "Basic Settings".

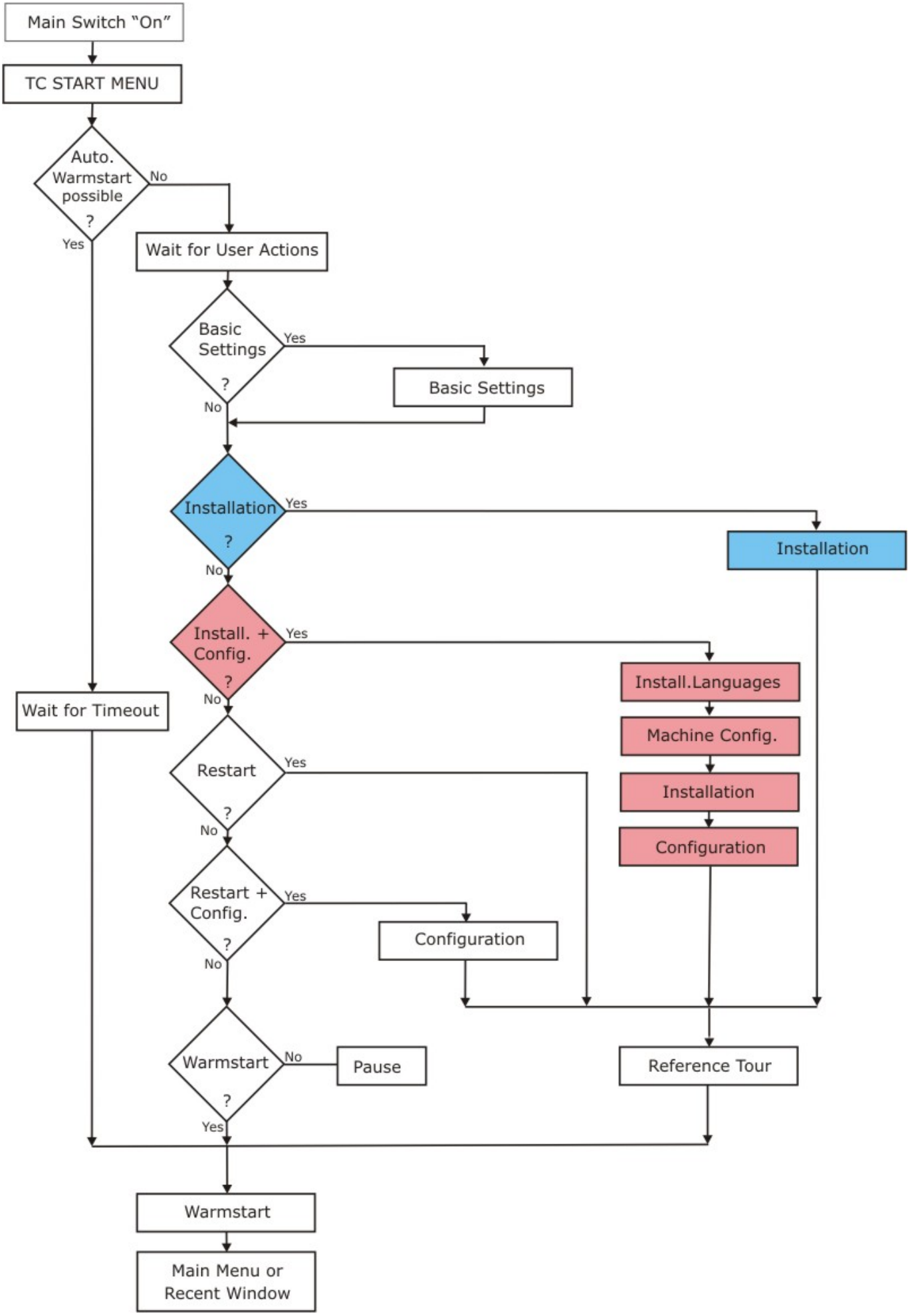
---

6. Go back to the main menu with  .
7. Take out the USB-Memory-Stick.

For saving other service data proceed the same way.

39.4 Installing Software

Boot process of the **CMS** with **OKC** control


Main Switch "On"
TC START MENU
Auto. Warmstart possible ?
No
Yes
Wait for User Actions
Basic Settings ?
Yes
No
Basic Settings
Installation ?
Yes
No
Installation
Install. + Config. ?
Yes
No
Install.Languages
Machine Config.
Installation
Configuration
Wait for Timeout
Restart ?
Yes
No
Restart + Config. ?
Yes
No
Configuration
Warmstart ?
No
Yes
Pause
Reference Tour
Warmstart
Main Menu or Recent Window

The installation of the Stoll operating system can be carried out in two ways:

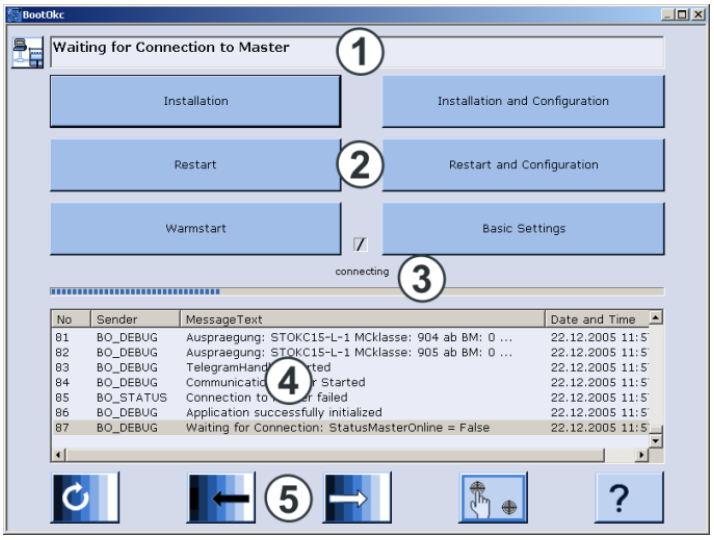
- **Direct Software Installation** (when switching-on the machine).
- **Indirect Software Installation** (during production).

39.4.1 With Performer Machines

39.4.1.1 Install the Software - Direct Installation

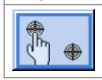
Install the software directly:

1. Switch on machine.
   ⇨ The "BootOkc" window appears.
2. The automatical warm start can be stopped by tapping any key and the following actions can be carried out:
3. Select the desired function.



No.	Function
1	Symbol and Status Bar
2	Function keys
3	Progress Display
4	Display of status and error messages **Note:** Further debug information can be connected to. It is saved in a log file and can be copied with **Copy Logfile**, if needed.
5	Setting keys for the Touch Screen

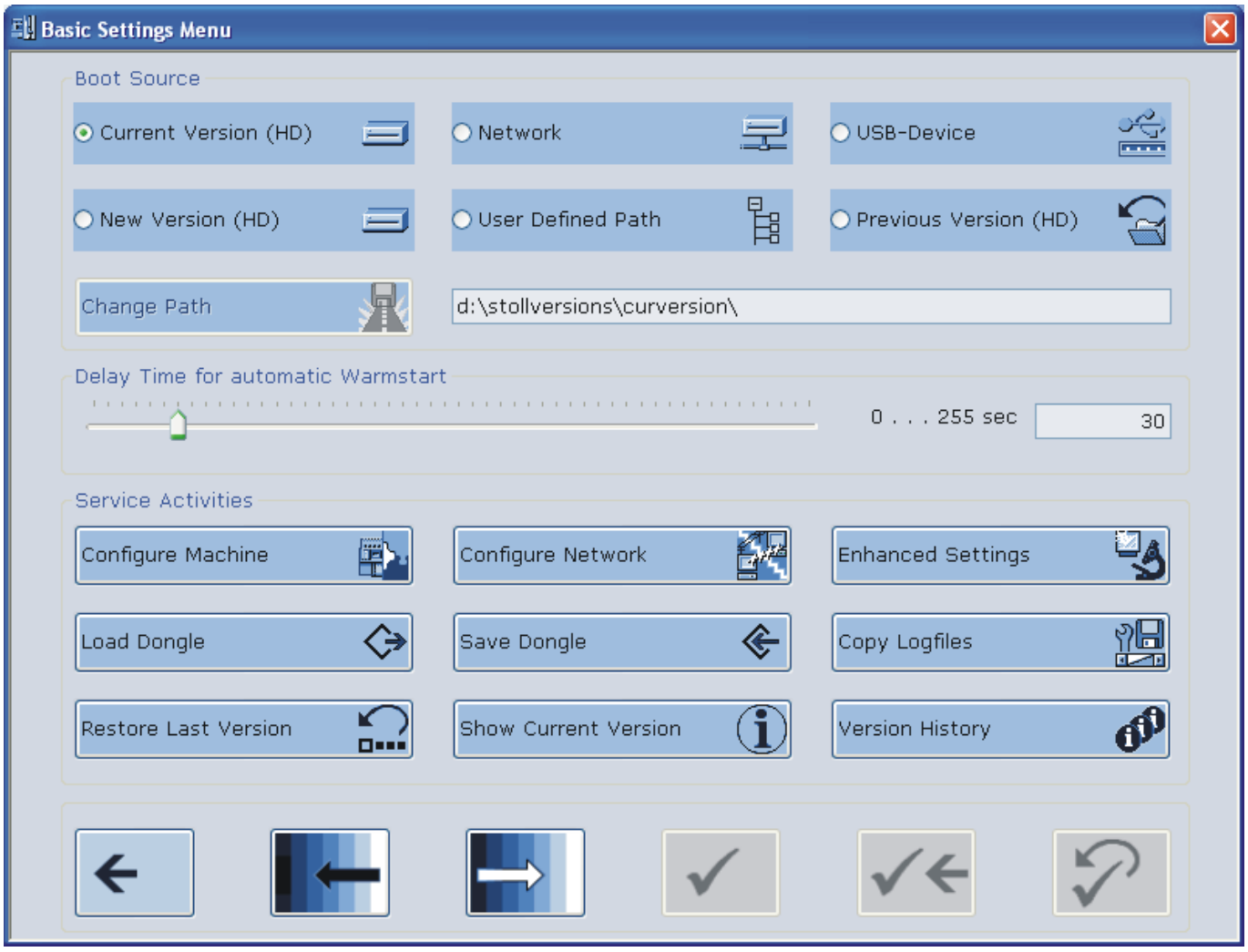
Key	Function
"Installation"	Start the installation process of a Stoll operating system. The storage location of the Stoll operating system can be selected in the "Basic Settings" window.
"Restart"	Starts the software anew (Reboot).
"Warm start"	Carries out a manual warm start.
"Installation and Configuration"	Starts the installation process of a Stoll operating system including configuration of the machine. The storage location of the Stoll operating system can be selected in the "Basic Settings" window.
"Restart and Configuration"	Starts the software anew (Reboot) with configuration of the machine inclusive.
"Basic Settings"	Calls up the "Basic Settings Menu" window.
	Set the screen brightness infinite.
	Set screen brightness one step darker.
	Set the screen one step brighter.

Key	Function
	Calibrate touch screen.

39.4.1.1.1 Install the Software with Language Selection + Settings - Direct Installation

Carry-out the installation with language selection:

1. Switch on machine at the main switch.
   ⇨ The "BootOkc" window appears.
2. Touch the "Basic Settings" key during the warm start.
   ⇨ The automatic warm start will be canceled.



Key	Function
	End setting process without saving
	Save settings
	Save settings and end setting process
	Restore former settings

3. Select a source for the installation data in the "Boot Source" section.

Key	Function
Current Version (HD)	Renewed installation of the existing version.
New Version (HD)	Installation of a new version.
Previous Version (HD)	Installation of the previous version.
Network	Installing the software via network.
USB Device	Installation from an external device which is connected to the USB socket.
User Defined Path	Installation from a user-defined directory.
Change Path	Key for selection of a directory

4. Confirm input with  .

5. Tap the desired key in the "BootOkc" window.

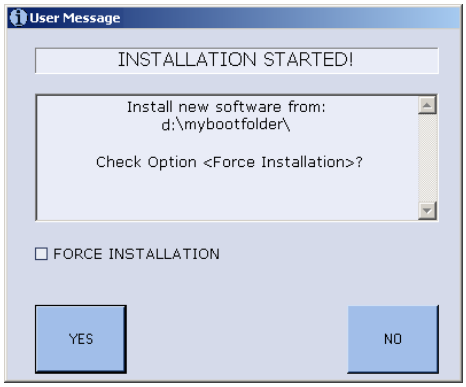
- "Installation":
  Without the possibility of changing the **Machine parameters**.
- "Installation and Configuration":
  With the possibility of changing the **Machine parameters**.

Installation and Configuration

The corresponding dialog boxes for the configuration of the machine will appear with this kind of installing.

Result:

The "User Message" (**INSTALLATION STARTED!**) window will appear and the path to the installation data will be displayed.



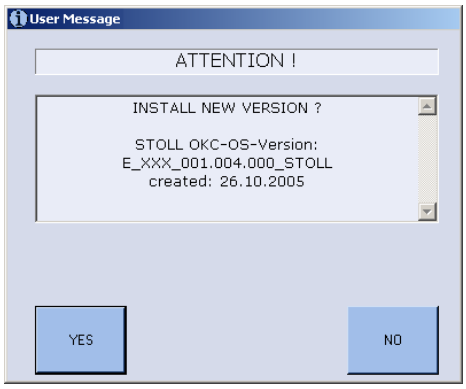
6. **FORCE INSTALLATION**:
   Install the operating system completely new or repair it.

   - or -

➜ **FORCE INSTALLATION**:

Quickly install the data that has changed.

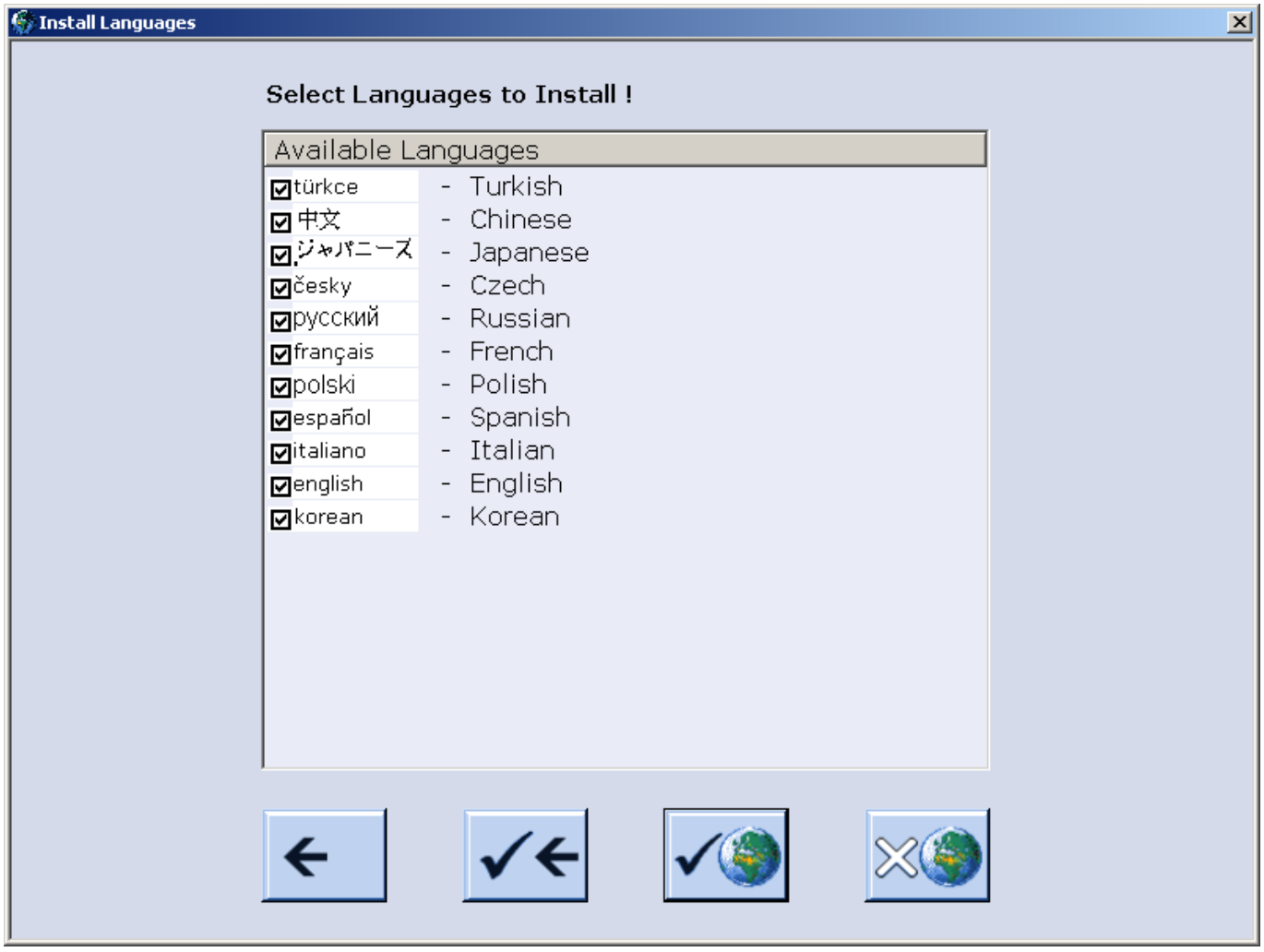
7. To confirm the installation press the key "YES".
   ⇨ The version number of the selected Stoll operating system gets displayed in the "User Message" (**ATTENTION!**) window.



The current operating system will be overwritten.

8. Confirm with the "OK" key.

   ⇨ The "Install Languages" window will appear.



9. Select the desired language(s).

- Tap the  key if **all languages** are to be selected.
- Tap the  key if no language is to be selected.
  Notice: German will be installed automatically.

10. Confirm the language selection with  .

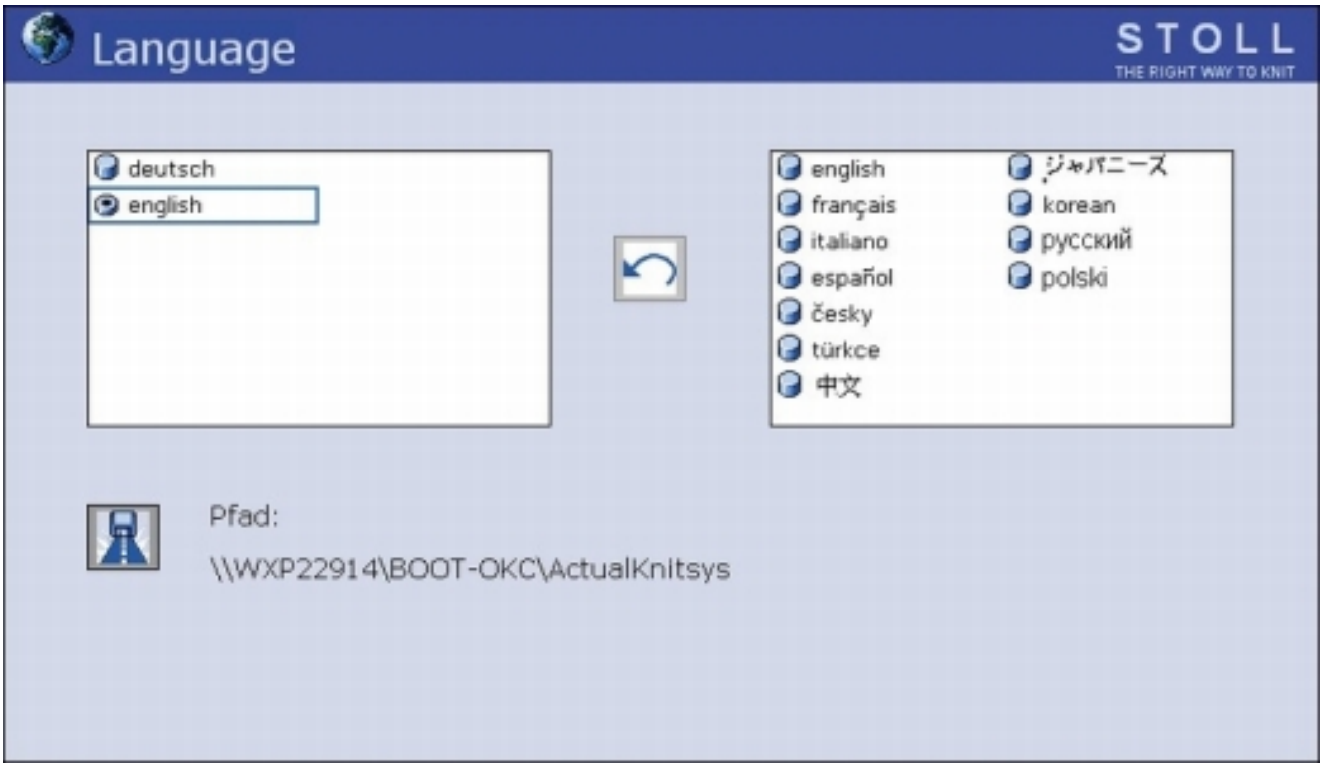
⇨ The installation process gets started.

When selecting the "Installation"

in the "BootOkc" dialog box the windows of the machine configuration will not be displayed.
The "Start reference runs" window appears.

Carry out machine configuration:

▷ The "Language" window is displayed.



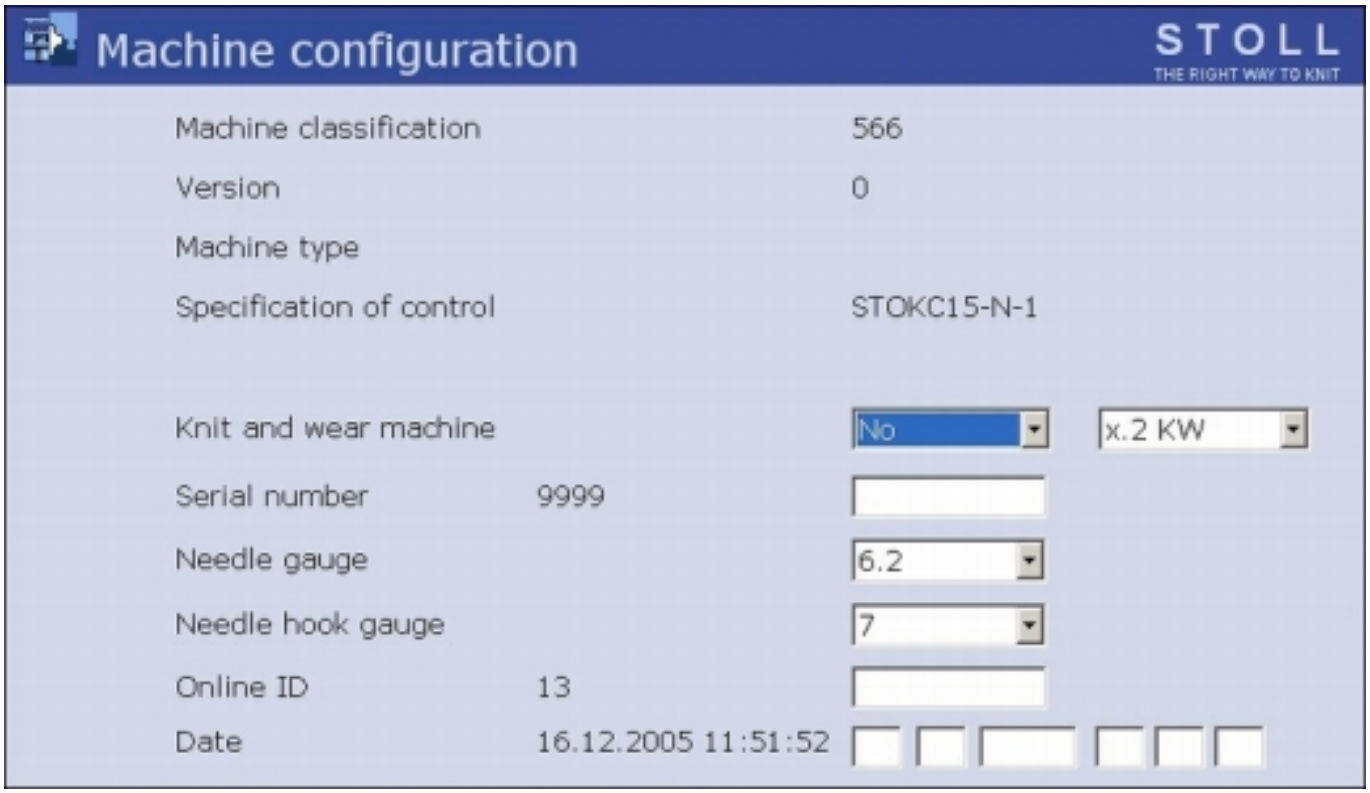
1. Add languages from the right to the left table with  if necessary.

You can do this later on as well.

---

2. Select the dialog language in the left table.
3. Confirm selection.
4. Proceed to the next window.

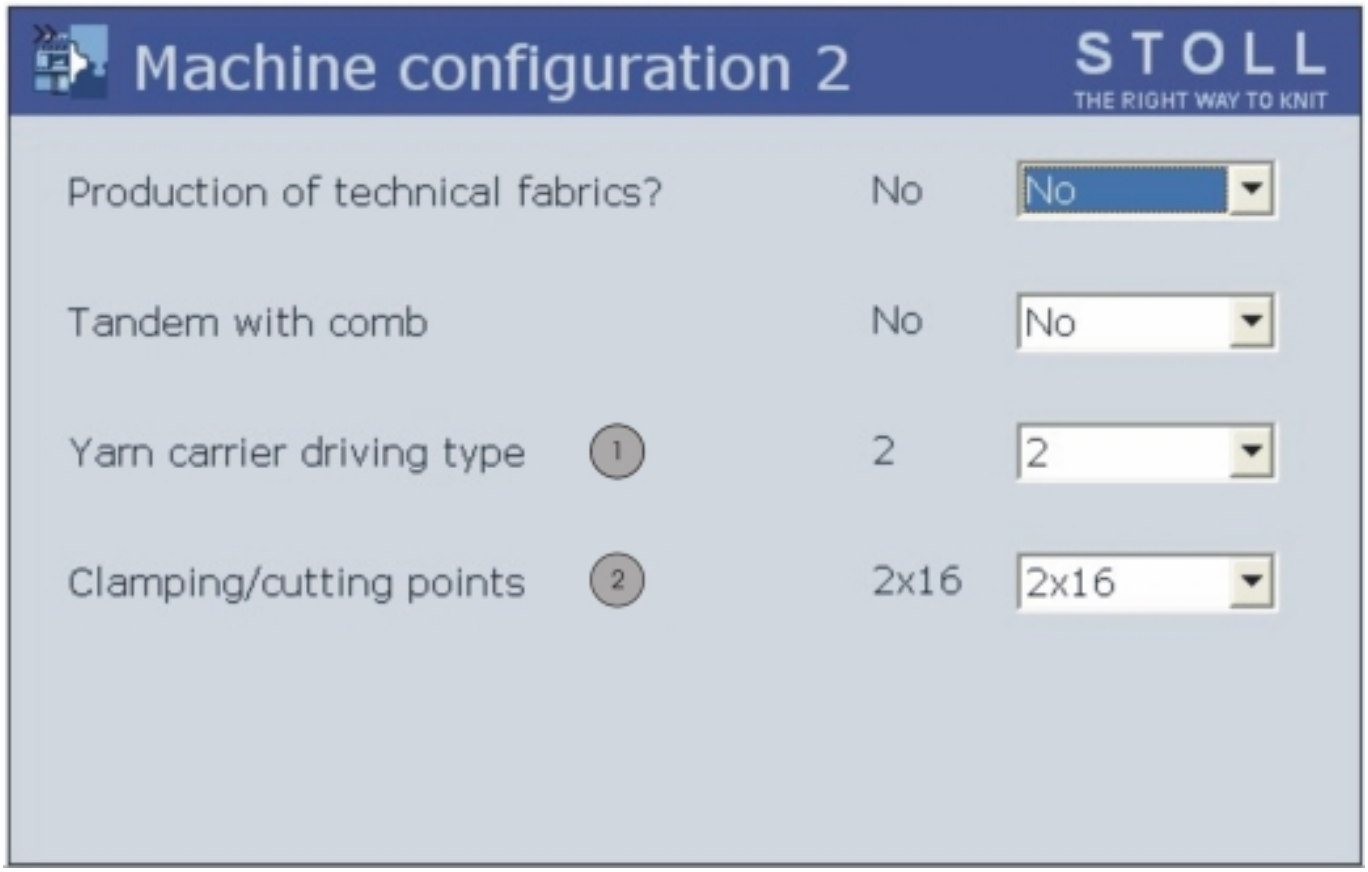
⇨ The "Machine configuration" window is displayed.



The data have been set at the factory and will not be changed.

5. Change **Online ID** and **date** if necessary.
6. Proceed to the next window.
   ⇨ The "Machine configuration 2" window is displayed.

The data have been set at the factory and will not be changed.



No.	Function	
	Tandem with comb	
	No	Operating mode with CMS 822: Wide coupling **without comb** (tandem) **i**: Clamping and cutting device deactivated.
	Yes	Operating mode with CMS 822: Wide coupling **with comb** (tandem) **i**: Clamping and cutting device activated.
1	Specification of the yarn carrier drives (magnetic bar) are available	
	Type 1	Yarn Carrier Drive ◆ All machines with **STx11** control ◆ Sometimes with machines with **OKC 2.0** control
	Type 2	Yarn Carrier Drive ◆ All machines with **OKC 3.0** control ◆ Sometimes with machines with **OKC 2.0** control
2	Quantity of clamping and cutting devices	
	2 x 8	With machines with 8 clamping and cutting points each on the right and on the left
	2 x 16	With machines with 16 clamping positions each on the right and on the left
	2 x 16/8	With machines with 16 clamping and cutting points on each side of which only every other clamping and cutting position shall be used.

7. Proceed to the next window.
   ⇨ The "Machine Options" window is displayed. The data is set at the factory.

Machine fault!
The presence or lack of machine options must correctly be specified, as otherwise a fault may occur on the machine.

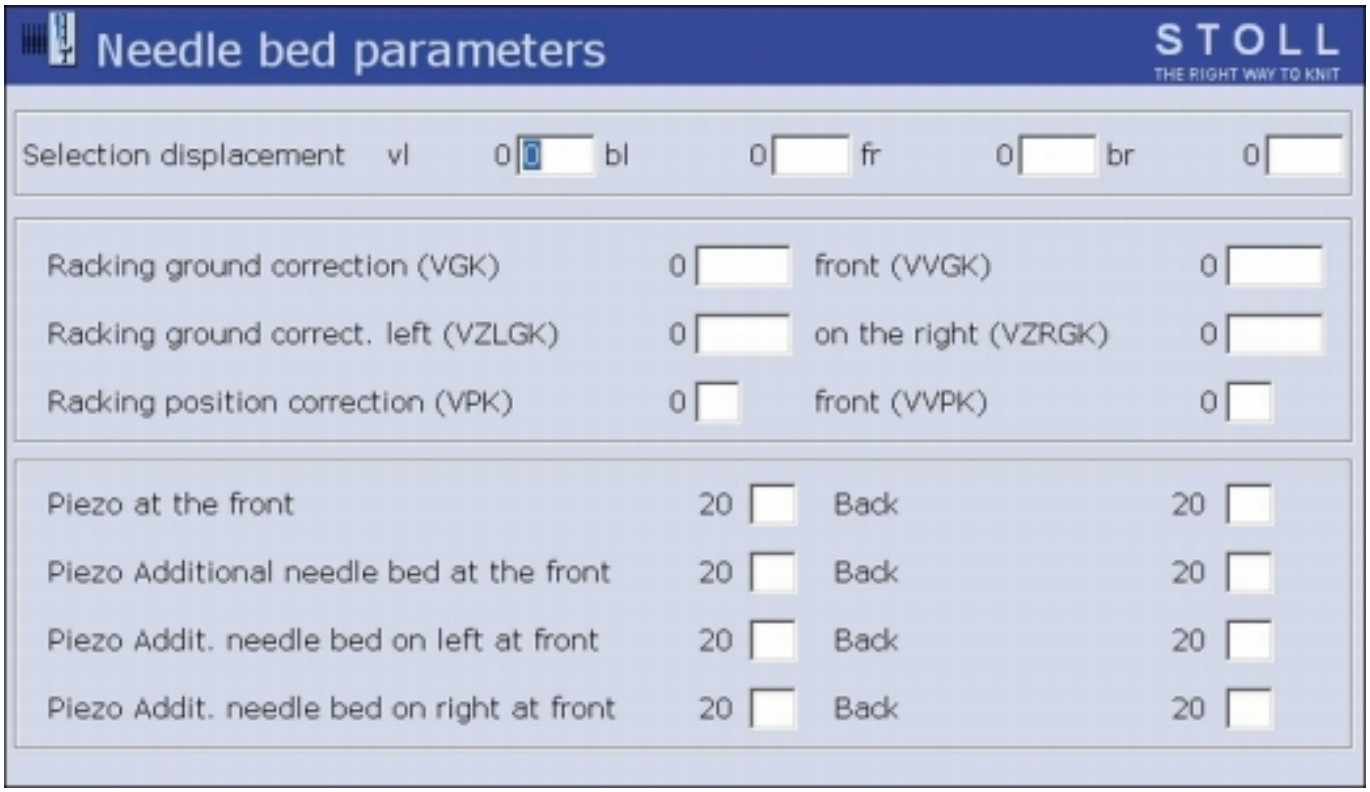
8. If necessary, change the data and confirm the changes.
9. Proceed to the next window.
   ⇨ The "Machine Parameter" window is displayed.

The data is set at the factory.

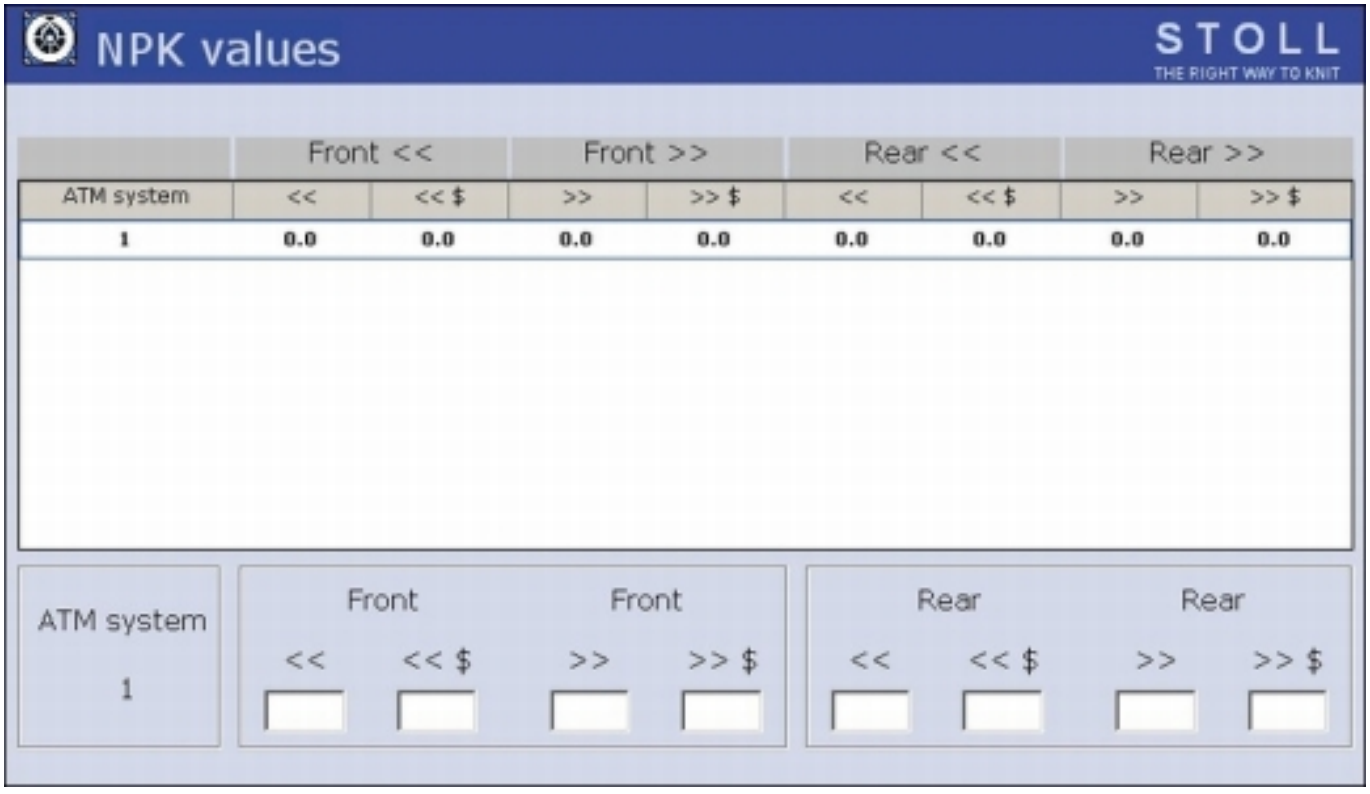
10. If necessary, change the data and confirm the changes.

11. Proceed to the next window.
    ⇨ The "Needle bed parameters" window is displayed.

i	The data is set at the factory.

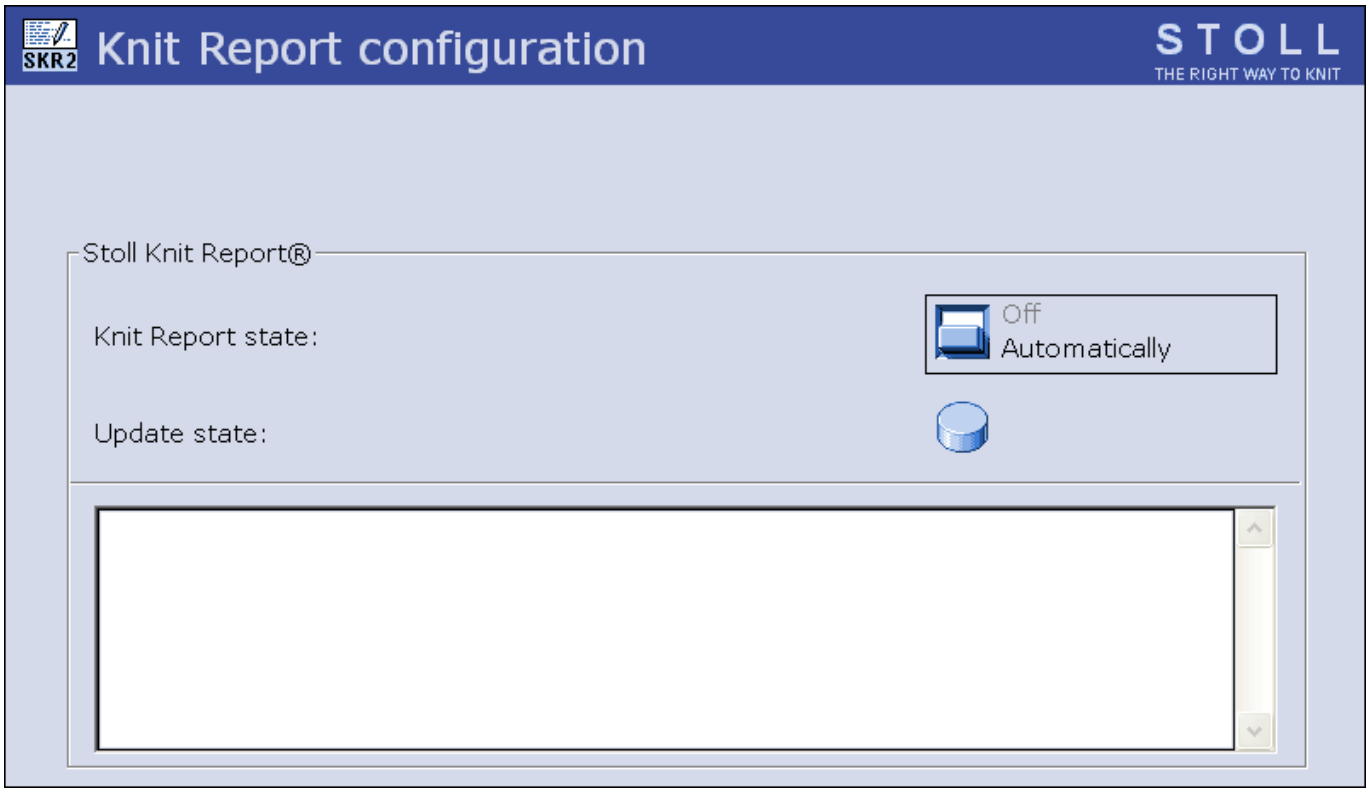


12. If necessary, change the data and confirm the changes.
13. Proceed to the next window.
    ⇨ The "NPK-Values" window is displayed. The data is set at the factory.



14. If other NPK values are to be used, change the values and confirm the changes.

15. Proceed to the next window.
    ⇨ The "Knit Report Configuration" window is displayed.



16. If other settings are to be used, change the settings and confirm the changes.

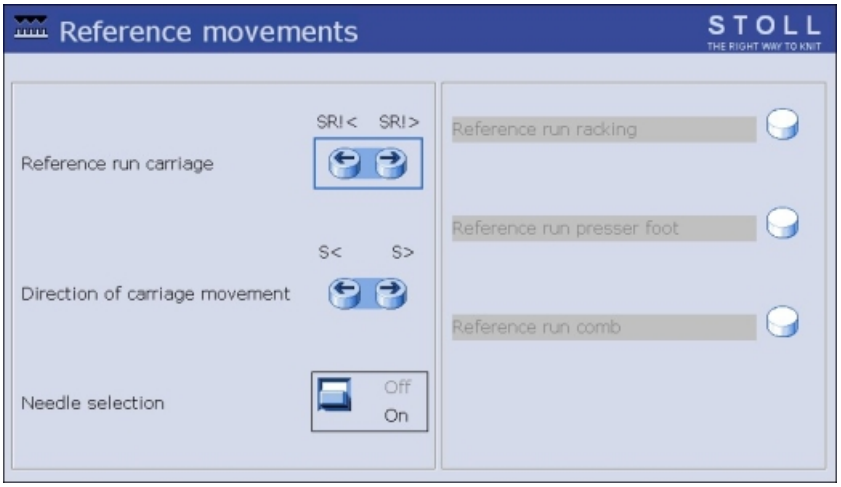
> Use the "additional function keys" to activate/deactivate the running time control and/or measurement of running time.

17. Proceed to the next window.
    ⇨ The machine configuration is complete.
    The "Reference runs" window is displayed.

39.4.1.1.2 Reference Run

Carrying out reference run after installation:

▷ The "Reference runs" window is displayed.



1. Tap the "SR!>" key or the "SR!<" key.
2. Start the machine with the engaging rod.
    ⇨ The carriage assembly carries out the reference run and stops automatically after the left carriage reversal.

3. With the  key continue to the main menu.

   ⇨ The installation process is complete and the "Main menu" is displayed.

Reference run racking

Ensure that the stitches of one needle bed are cast-off.

39.4.1.2 Updating Software - Indirect Installation

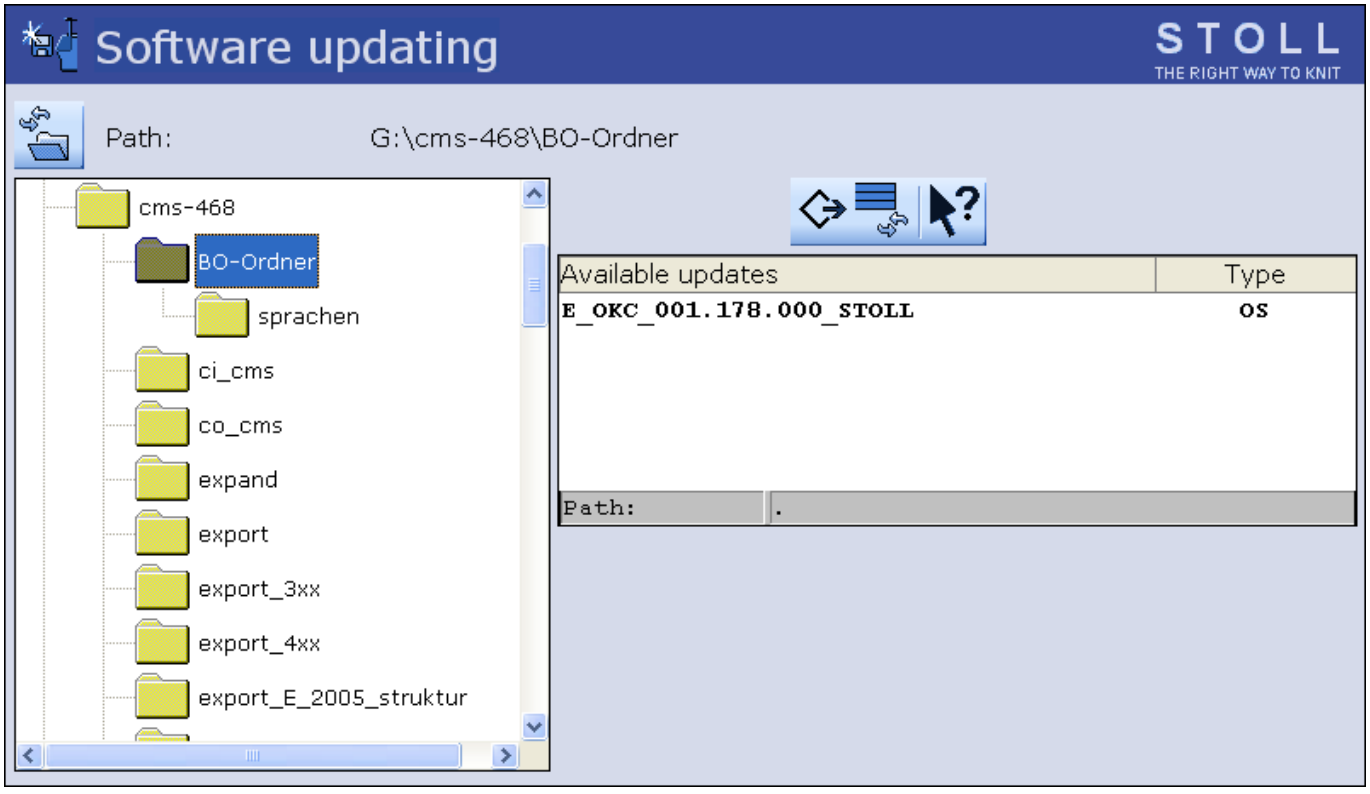
Indirect Installation:

- The new Stoll operating system is located on the hard disk in a **separate memory area** (Update software)
- The software can be loaded while the machine is producing
- The software will be read-in when starting the machine the next time

No data is overwritten when copying the operating system.

Update software:

1. Call up the "Service" menu with the  key.
2. Call up "Software updating" menu with the  key.



	Function
	Copy the software in a separate memory area of the local hard disk
	Update display

	Function
	Direct help

3. Select the desired source folder in the selection window.

- USB Memory Stick
- Network

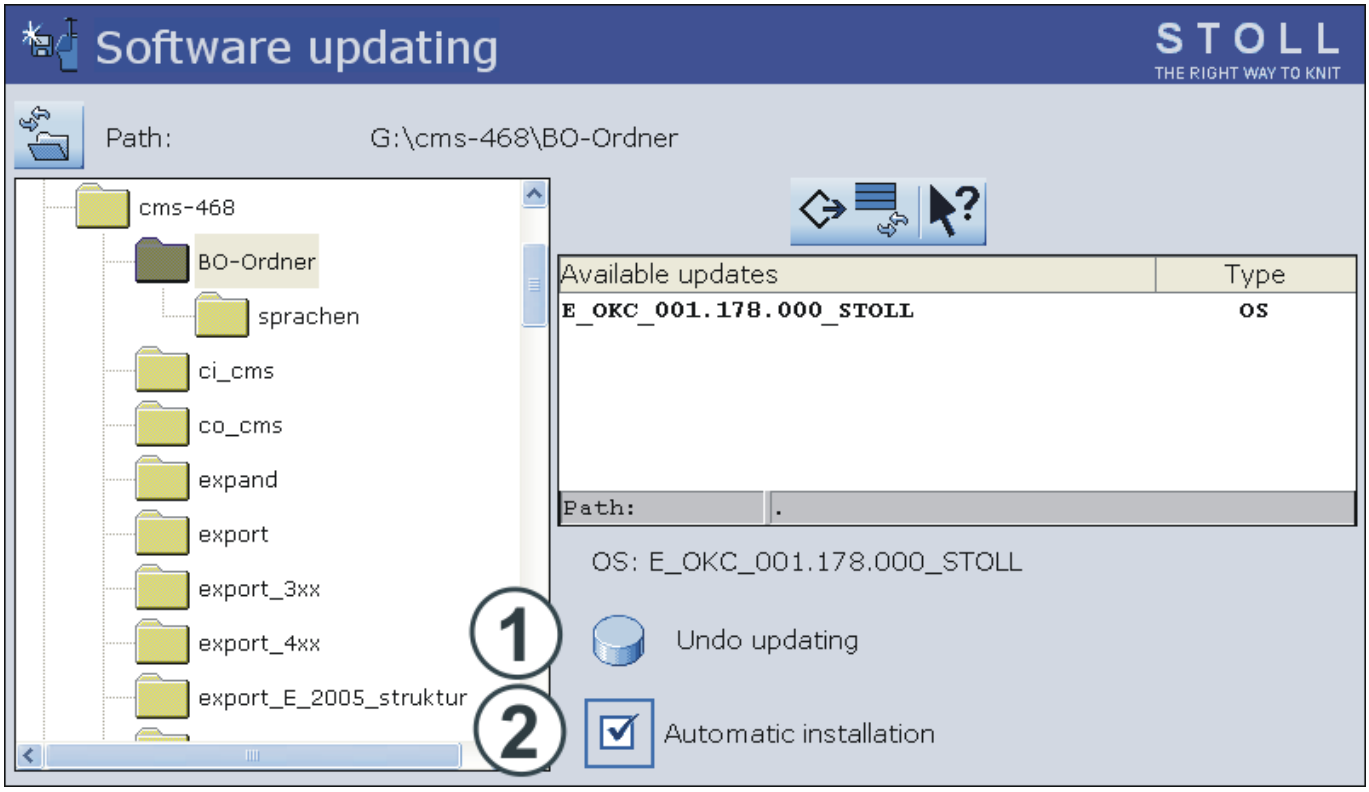
When searching for the Stoll operating system the selected folder section and a section under this section (sub-folder section) is also searched.

4. Select the desired Stoll operating system (Type **OS**).

5. Tap the  ("Carry out update") key.

⇨ The installation files are copied on the hard disk of the machine in a separate storage location.
The "Update successfully installed" appears.

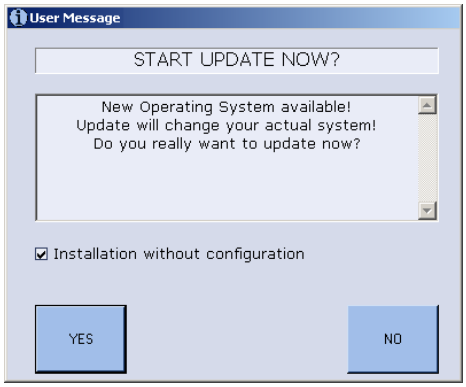
After a successfully completed copy, two program points are displayed in the "Software updating" window.



Key	Function	
1	Software will not be updated. The data in the separate memory area are deleted.	
2	Selection of whether the installation should be executed automatically or manually when the machine is switched on next.	
	☑	After a waiting time of 10 seconds the installation is automatically carried out till the window "Reference runs" (like in the case of "Installation"). Within the waiting time the installation can be cancelled by tapping on "Cancel". **Note:** Select this setting if only the operating system should be updated.

Key	Function	
	☐	Installation as with **Installation and Configuration** Select this setting if machine data has been modified. **Example:** ◆ Gauge conversion ◆ Assembly of special attachment

6. In the "Software updating" window activate the ☑ checkbox.
7. Call up the "Main menu" with the  key.
8. Switch off machine at the main switch.
9. Switch on machine at the main switch.
   ⇨ The **BootOkc**window will be displayed with the **User Message** (**START UPDATE NOW?**) message box:



10. Activate the ☑ **Installation without configuration** checkbox.
    ⇨ This shortens the installation process.

i	Deactivate the ☐ **Installation without configuration** checkbox, if the machine parameters are also to be altered simultaneously with the installation of the new Stoll operating system.

11. Start the installation process tapping on "YES".
    ⇨ The path for the installation data is displayed in the **User Message** (**INSTALLATION STARTED!**) message box.

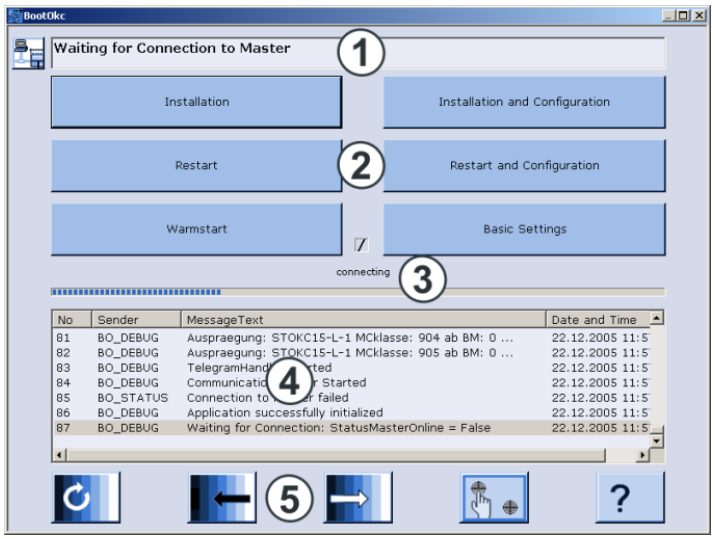
i	Continue the installation procedure as described under Install Software with language selection [▷ 329].

39.4.2 With ADF machines

39.4.2.1 Install the Software - Direct Installation

Install the software directly:

1. Switch on machine.
   ⇨ The "BootOkc" window appears.
2. The automatical warm start can be stopped by tapping any key and the following actions can be carried out:
3. Select the desired function.



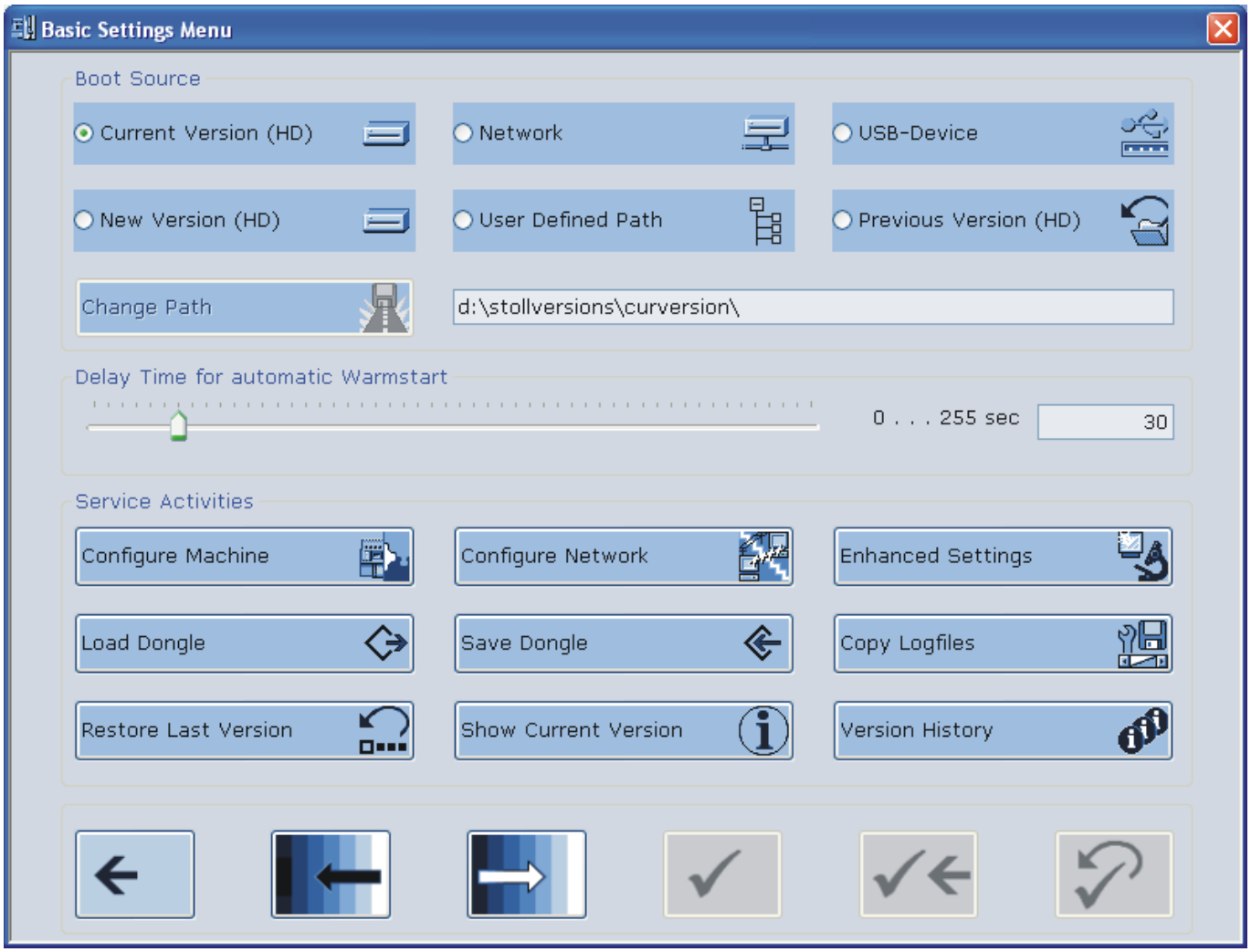
No.	Function
1	Symbol and Status Bar
2	Function keys
3	Progress Display
4	Display of status and error messages **Note:** Further debug information can be connected to. It is saved in a log file and can be copied with **Copy Logfile**, if needed.
5	Setting keys for the Touch Screen

Key	Function
"Installation"	Start the installation process of a Stoll operating system. The storage location of the Stoll operating system can be selected in the "Basic Settings" window.
"Restart"	Starts the software anew (Reboot).
"Warm start"	Carries out a manual warm start.
"Installation and Configuration"	Starts the installation process of a Stoll operating system including configuration of the machine. The storage location of the Stoll operating system can be selected in the "Basic Settings" window.
"Restart and Configuration"	Starts the software anew (Reboot) with configuration of the machine inclusive.
"Basic Settings"	Calls up the "Basic Settings Menu" window.
	Set the screen brightness infinite.
	Set screen brightness one step darker.
	Set the screen one step brighter.
	Calibrate touch screen.

39.4.2.1.1 Install the Software with Language Selection + Settings - Direct Installation

Carry-out the installation with language selection:

1. Switch on machine at the main switch.
   ⇨ The "BootOkc" window appears.
2. Touch the "Basic Settings" key during the warm start.
   ⇨ The automatic warm start will be canceled.



Key	Function
	End setting process without saving
	Save settings
	Save settings and end setting process
	Restore former settings

3. Select a source for the installation data in the "Boot Source" section.

Key	Function
Current Version (HD)	Renewed installation of the existing version.
New Version (HD)	Installation of a new version.
Previous Version (HD)	Installation of the previous version.
Network	Installing the software via network.
USB Device	Installation from an external device which is connected to the USB socket.
User Defined Path	Installation from a user-defined directory.
Change Path	Key for selection of a directory

4. Confirm input with  .

5. Tap the desired key in the "BootOkc" window.

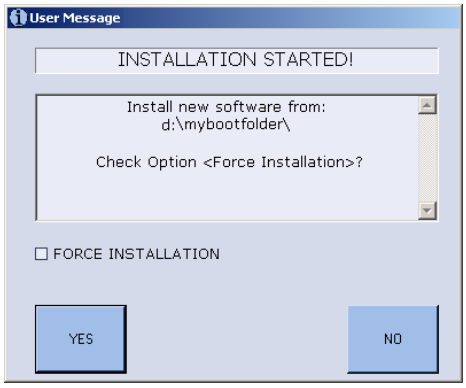
- "Installation":
  Without the possibility of changing the **Machine parameters**.

■ "Installation and Configuration":
With the possibility of changing the **Machine parameters**.

Installation and Configuration

The corresponding dialog boxes for the configuration of the machine will appear with this kind of installing.

Result:
The "User Message" (**INSTALLATION STARTED!**) window will appear and the path to the installation data will be displayed.



6. **FORCE INSTALLATION**:
Install the operating system completely new or repair it.

- or -

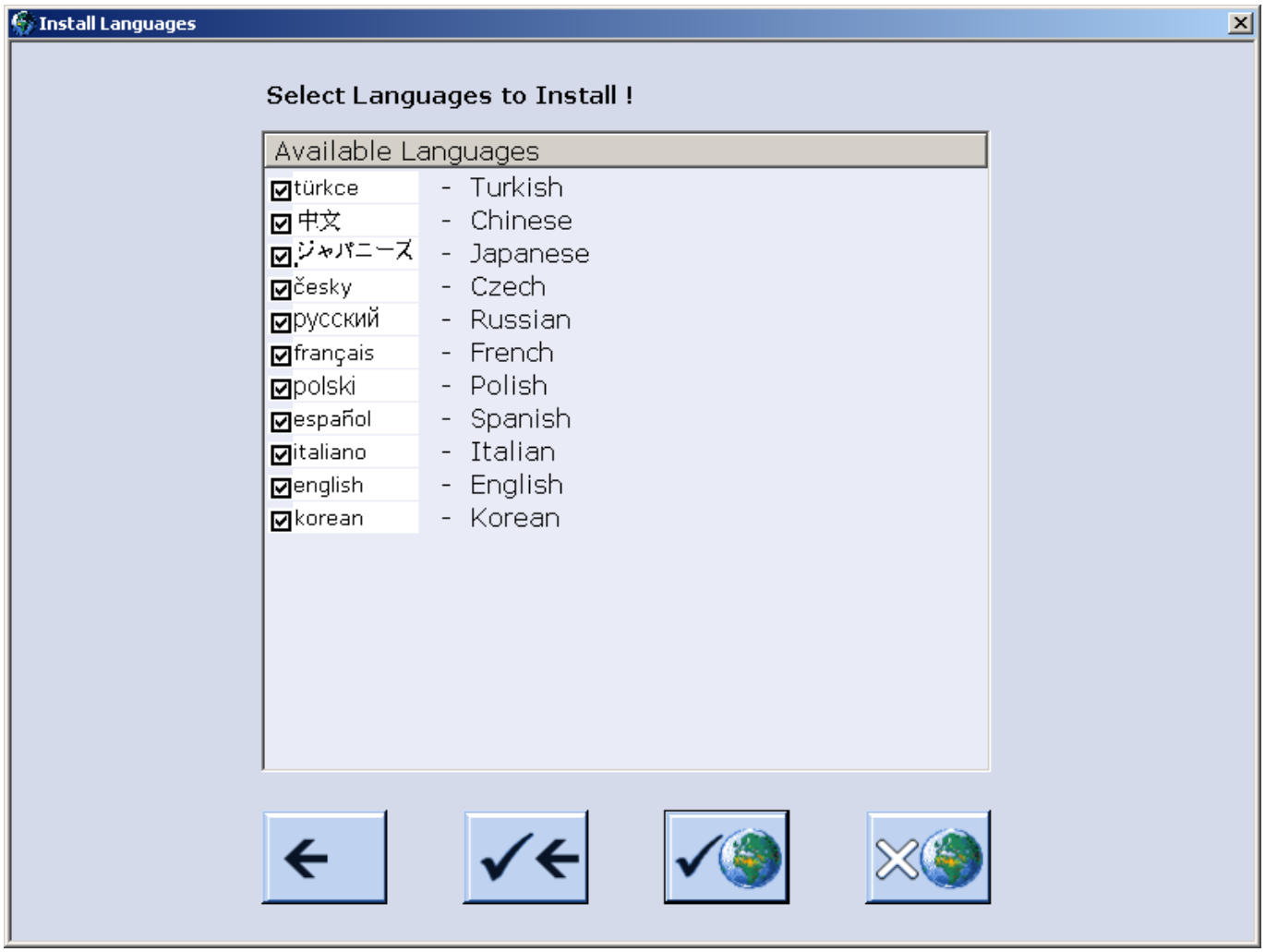
→ **FORCE INSTALLATION**:

Quickly install the data that has changed.

7. To confirm the installation press the key "YES".
   ⇨ The version number of the selected Stoll operating system gets displayed in the "User Message" (**ATTENTION!**) window.

The current operating system will be overwritten.

8. Confirm with the "OK" key.
   ⇨ The "Install Languages" window will appear.



9. Select the desired language(s).

- Tap the  key if **all languages** are to be selected.
- Tap the  key if no language is to be selected.
  Notice: German will be installed automatically.

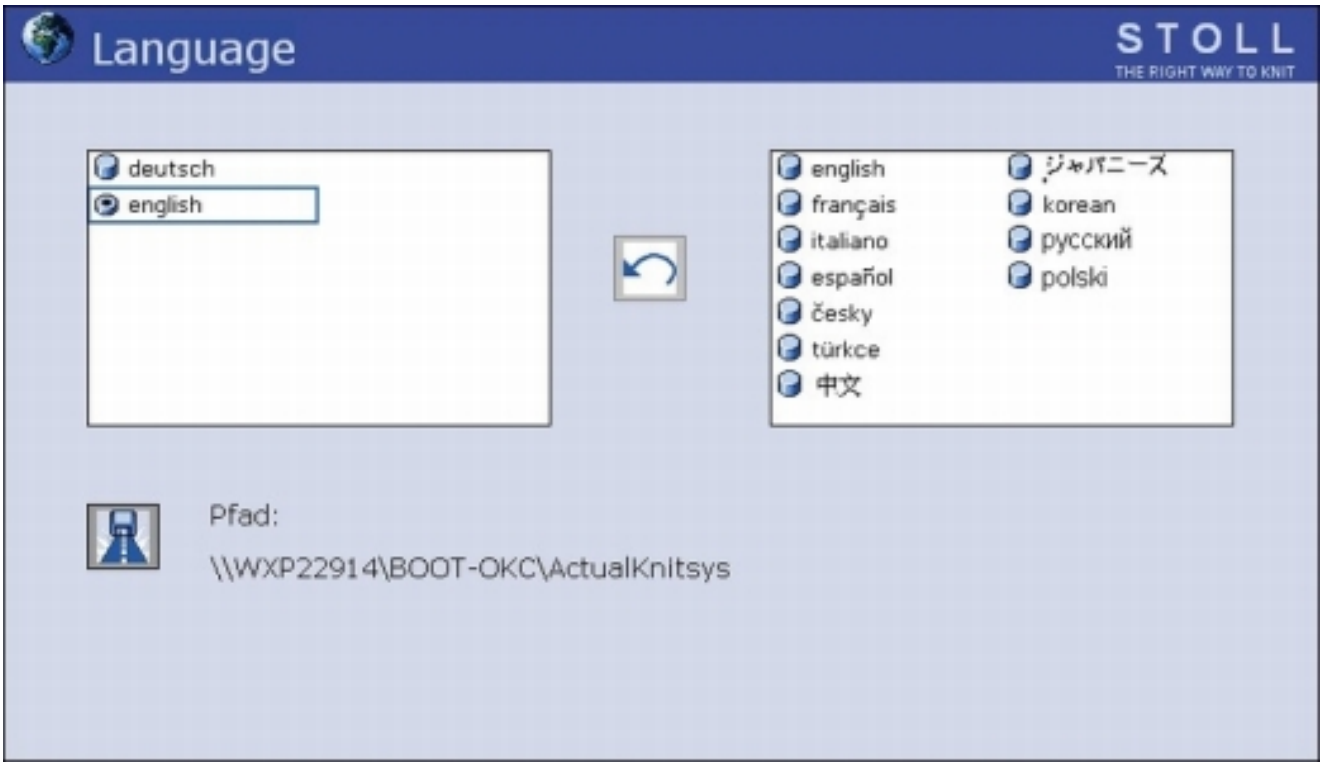
10. Confirm the language selection with  .
    ⇨ The installation process gets started.

When selecting the "Installation"

in the "BootOkc" dialog box the windows of the machine configuration will not be displayed.
The "Start reference runs" window appears.

Carry out machine configuration:

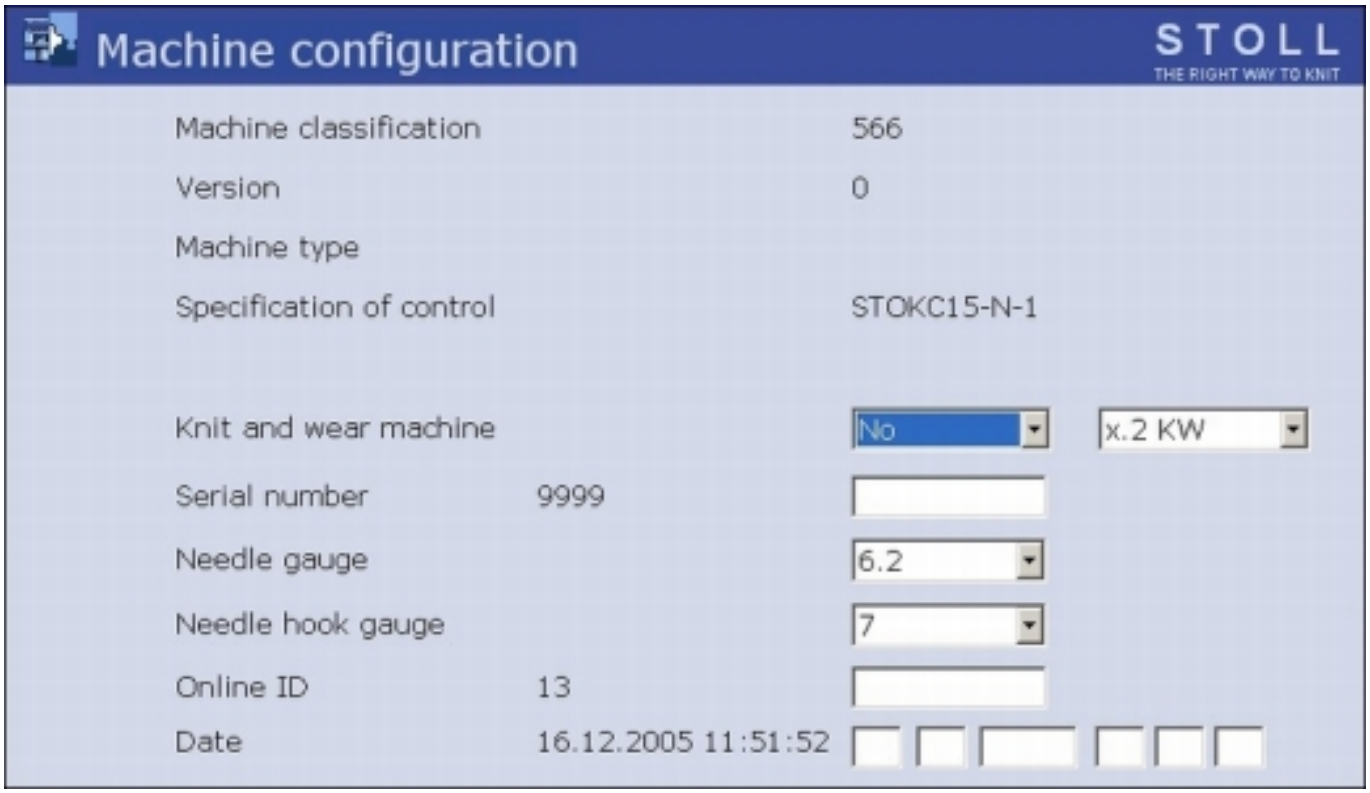
▷ The "Language" window is displayed.



1. Add languages from the right to the left table with  if necessary.

i	You can do this later on as well.

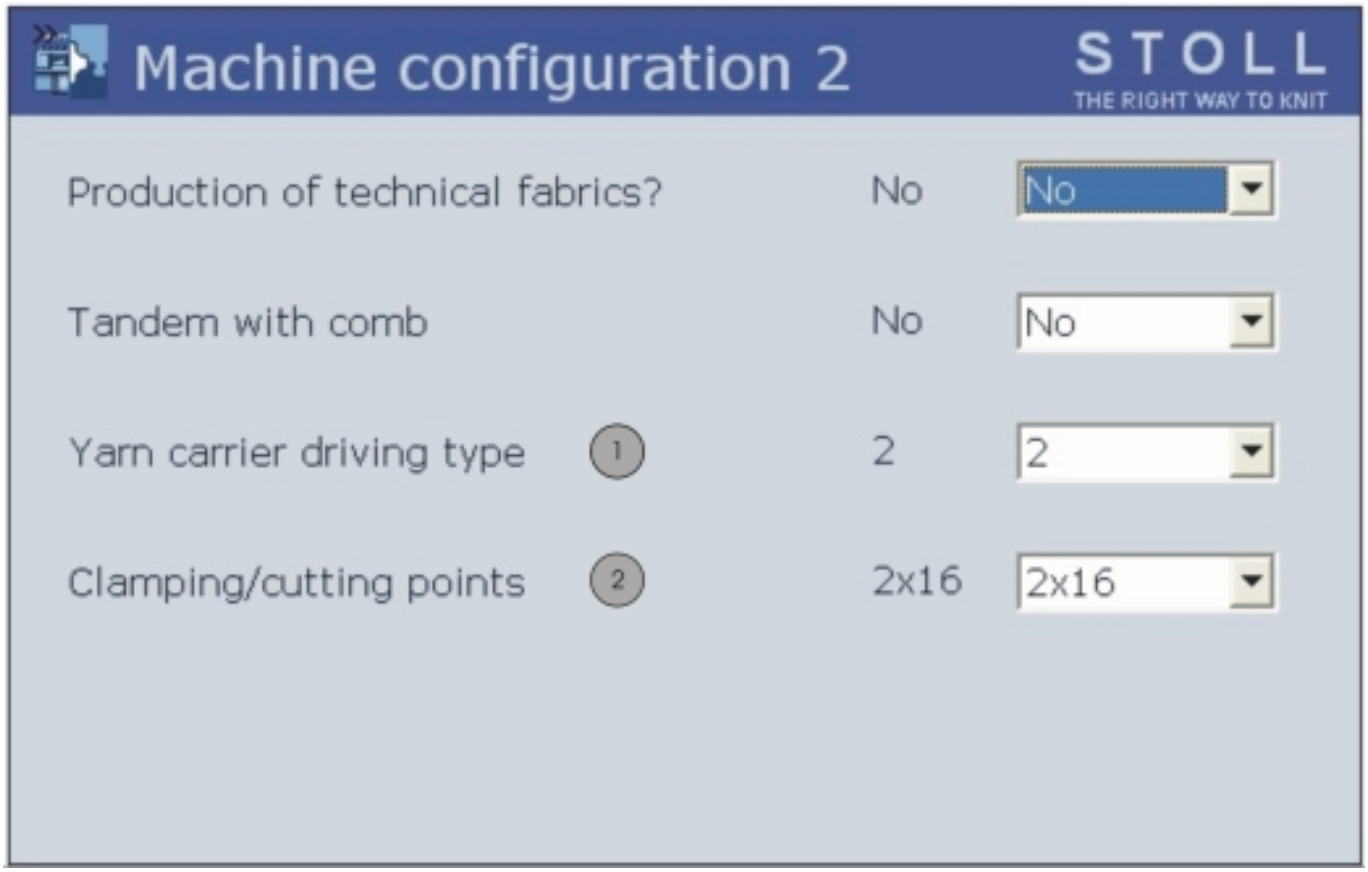
2. Select the dialog language in the left table.
3. Confirm selection.
4. Proceed to the next window.
   ⇨ The "Machine configuration" window is displayed.



The data have been set at the factory and will not be changed.

5. Change **Online ID** and **date** if necessary.
6. Proceed to the next window.
   ⇨ The "Machine configuration 2" window is displayed.

The data have been set at the factory and will not be changed.



No.	Function	
	Tandem with comb	
	No	Operating mode with CMS 822: Wide coupling **without comb** (tandem) **i**: Clamping and cutting device deactivated.
	Yes	Operating mode with CMS 822: Wide coupling **with comb** (tandem) **i**: Clamping and cutting device activated.
1	Specification of the yarn carrier drives (magnetic bar) are available	
	Type 1	Yarn Carrier Drive ◆ All machines with **STx11** control ◆ Sometimes with machines with **OKC 2.0** control
	Type 2	Yarn Carrier Drive ◆ All machines with **OKC 3.0** control ◆ Sometimes with machines with **OKC 2.0** control
2	Quantity of clamping and cutting devices	
	2 x 8	With machines with 8 clamping and cutting points each on the right and on the left
	2 x 16	With machines with 16 clamping positions each on the right and on the left
	2 x 16/8	With machines with 16 clamping and cutting points on each side of which only every other clamping and cutting position shall be used.

7. Proceed to the next window.
   ⇨ The "Machine Options" window is displayed. The data is set at the factory.

Machine fault!
The presence or lack of machine options must correctly be specified, as otherwise a fault may occur on the machine.

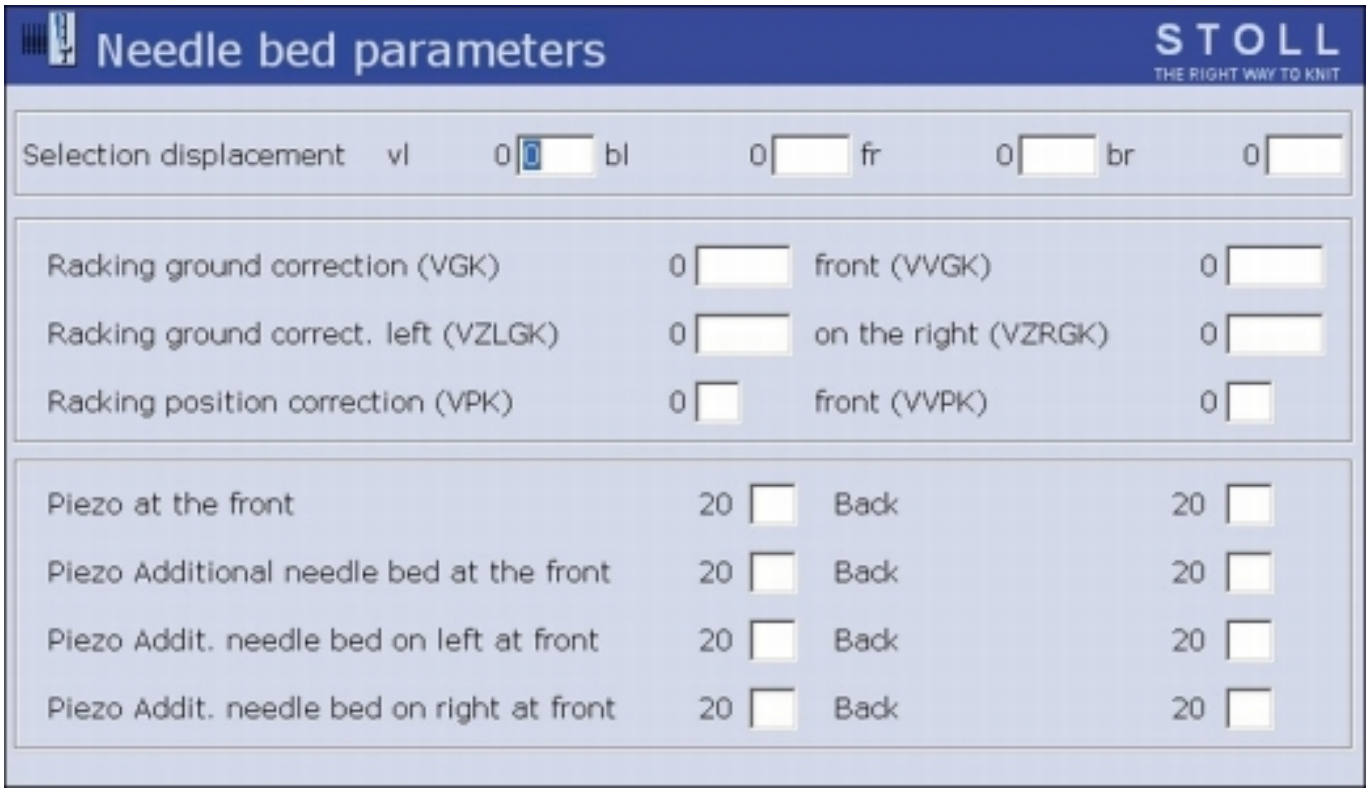
8. If necessary, change the data and confirm the changes.
9. Proceed to the next window.
   ⇨ The "Machine Parameter" window is displayed.

The data is set at the factory.

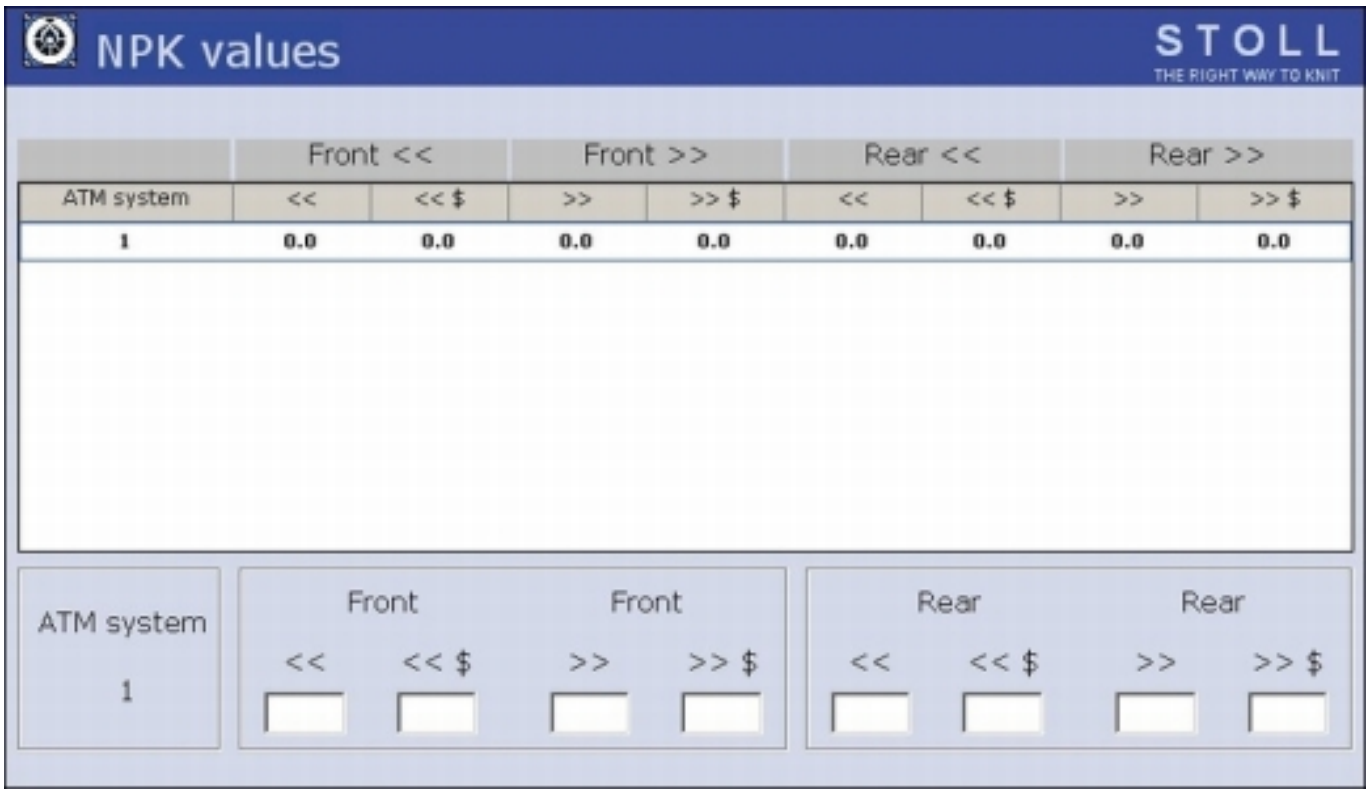
10. If necessary, change the data and confirm the changes.

11. Proceed to the next window.
    ⇨ The "Needle bed parameters" window is displayed.

i	The data is set at the factory.

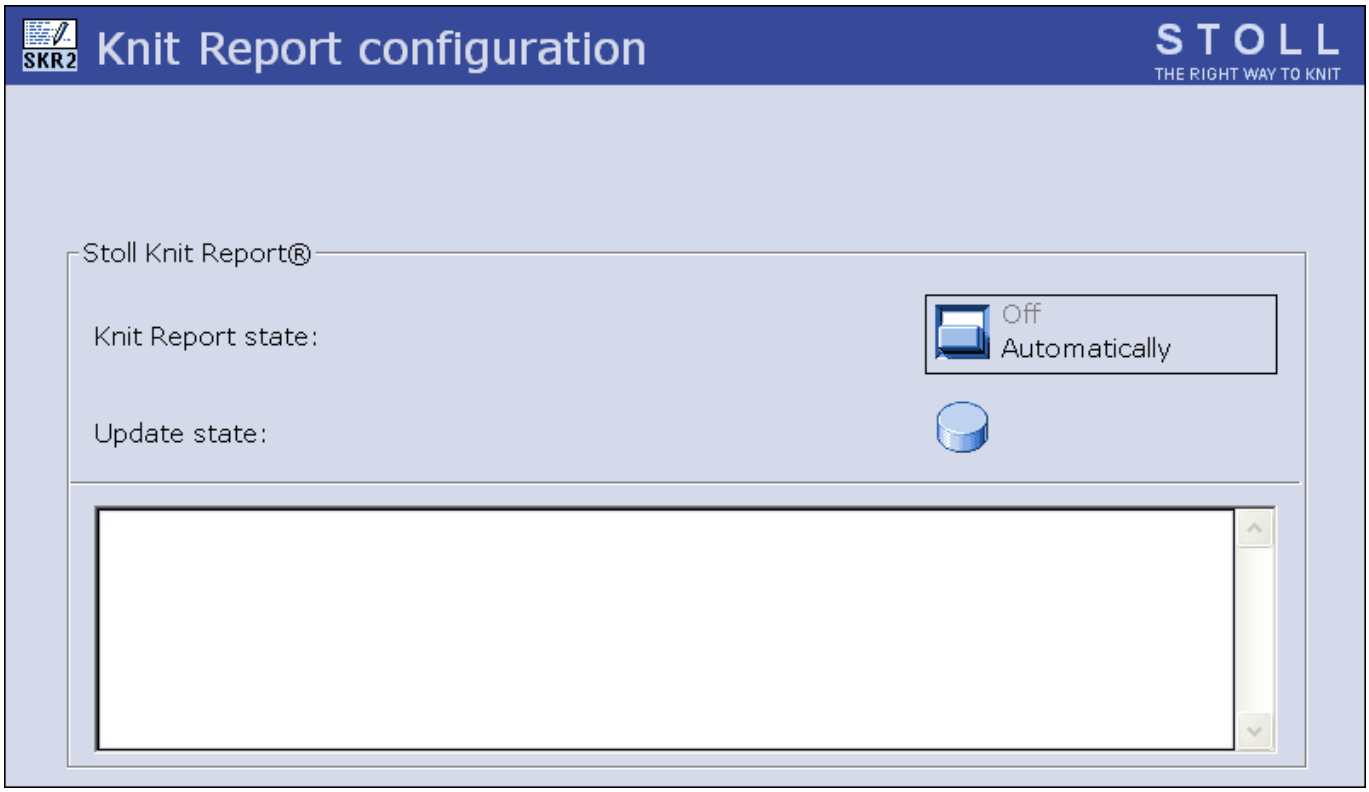


12. If necessary, change the data and confirm the changes.
13. Proceed to the next window.
    ⇨ The "NPK-Values" window is displayed. The data is set at the factory.



14. If other NPK values are to be used, change the values and confirm the changes.

15. Proceed to the next window.
    ⇨ The "Knit Report Configuration" window is displayed.



16. If other settings are to be used, change the settings and confirm the changes.

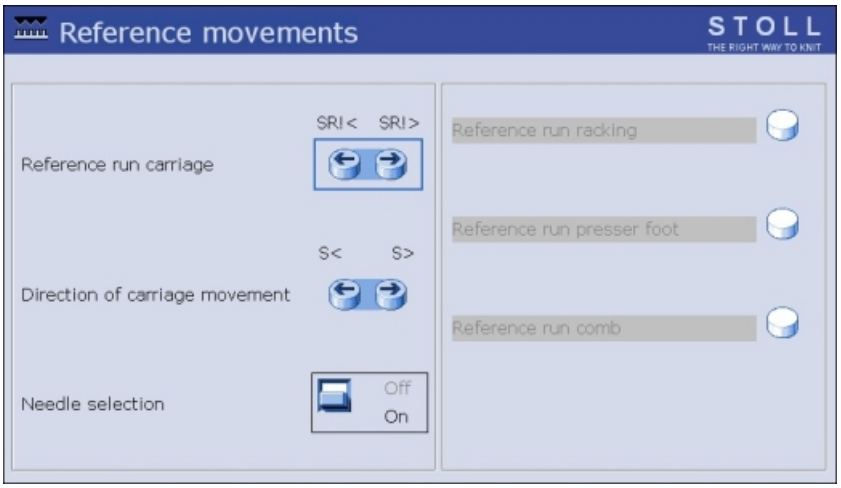
> Use the "additional function keys" to activate/deactivate the running time control and/or measurement of running time.

17. Proceed to the next window.
    ⇨ The machine configuration is complete.
    The "Reference runs" window is displayed.

39.4.2.1.2 Reference Run

Carrying out reference run after installation:

▷ The "Reference runs" window is displayed.



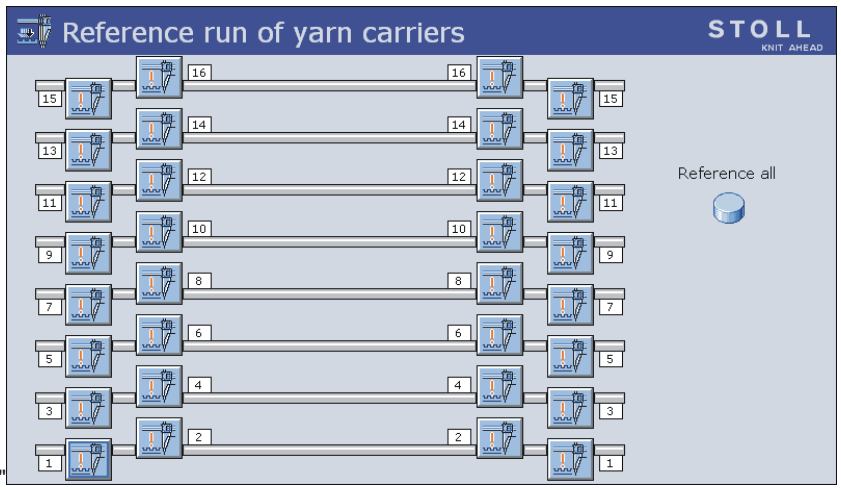
1. Tap the "SR!>" key or the "SR!<" key.
2. Start the machine with the engaging rod.
    ⇨ The carriage assembly carries out the reference run and stops automatically after the left carriage reversal.

3. With machines with weave-in device, then, reference the presser feet with the "Reference run presser foot".

Reference run presser foot

The weave-in devices should only be referenced when the carriage assembly is not located in the area of the clamping / cutting device.

4. With the  key continue to the next "Reference run of yarn carriers.

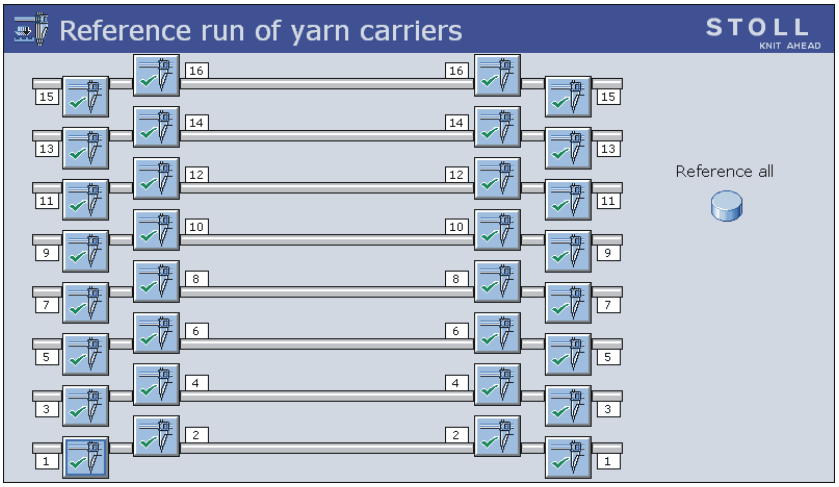


"

	Yarn carrier is ready to knit (referenced)
	Yarn carrier is **not referenced**

5. Tap the "Reference all" key.

⇨ All the ADF yarn carriers are referenced and positioned in a high position in the clamping and cutting bed.



If during a yarn carrier reference run appears the "Command canceled" message, this means that it was not possible to reference one yarn carrier; it must be newly adjusted.

The yarn carrier concerned is characterized by the  icon.

6. With the  key continue to the main menu.

⇨ The installation process is complete and the "Main menu" is displayed.

Reference run racking

Ensure that the stitches of one needle bed are cast-off.

39.4.2.2 Updating Software - Indirect Installation

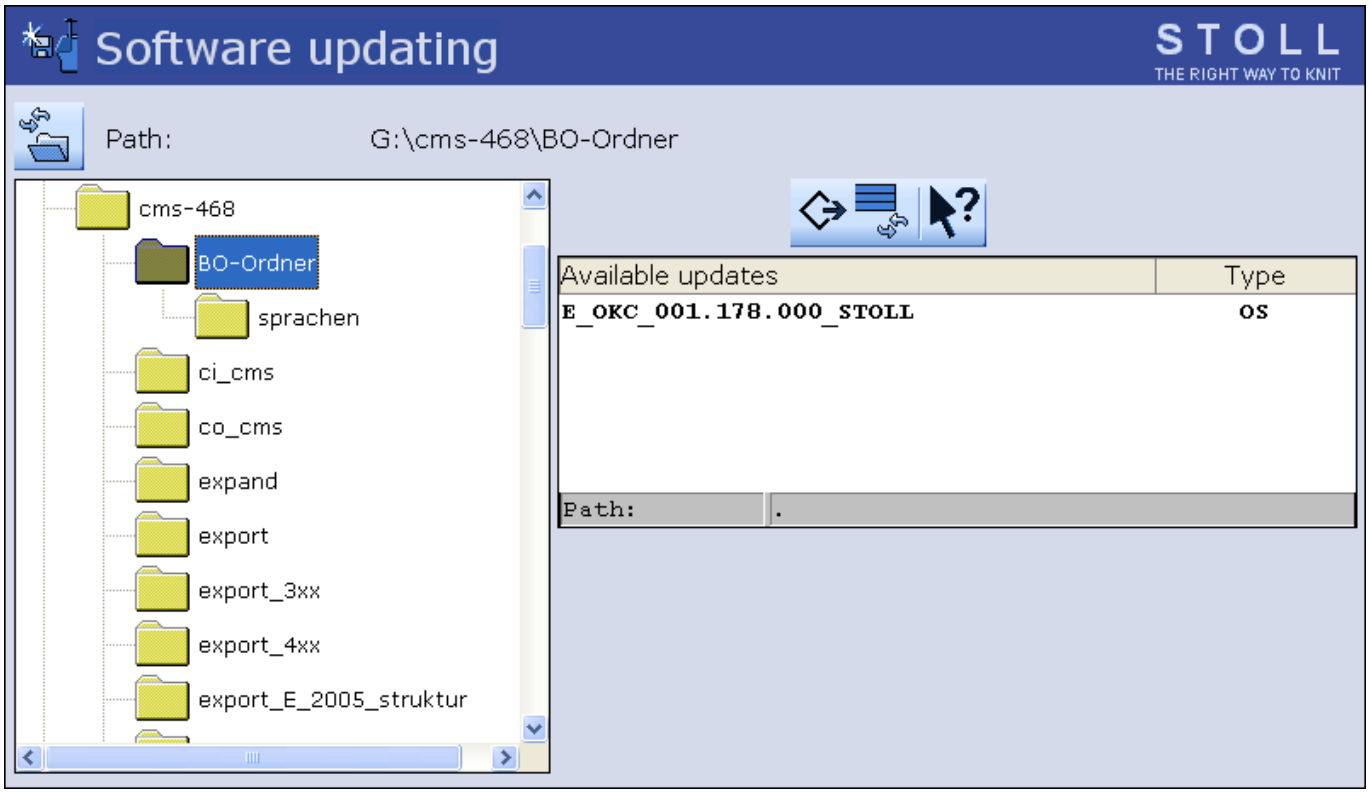
Indirect Installation:

- The new Stoll operating system is located on the hard disk in a **separate memory area** (Update software)
- The software can be loaded while the machine is producing
- The software will be read-in when starting the machine the next time

No data is overwritten when copying the operating system.

Update software:

1. Call up the "Service" menu with the  key.
2. Call up "Software updating" menu with the  key.



	Function
	Copy the software in a separate memory area of the local hard disk
	Update display
	Direct help

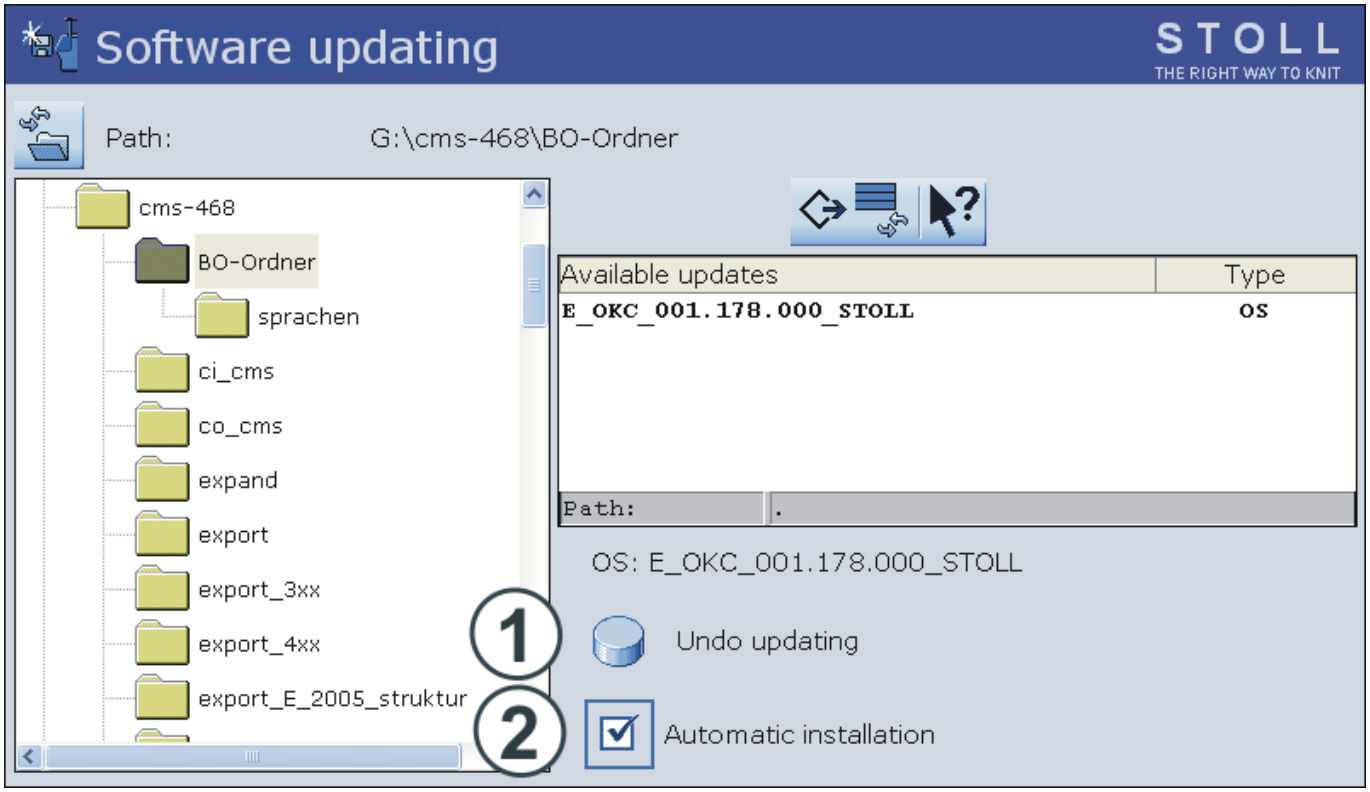
3. Select the desired source folder in the selection window.

- USB Memory Stick
- Network

> When searching for the Stoll operating system the selected folder section and a section under this section (sub-folder section) is also searched.

4. Select the desired Stoll operating system (Type **OS**).
5. Tap the  ("Carry out update") key.
   ⇨ The installation files are copied on the hard disk of the machine in a separate storage location.
   The "Update successfully installed" appears.

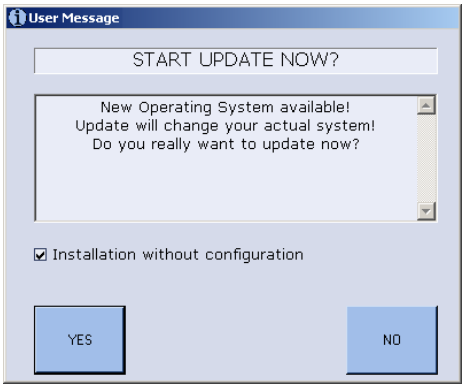
> After a successfully completed copy, two program points are displayed in the "Software updating" window.



Key	Function	
1	Software will not be updated. The data in the separate memory area are deleted.	
2	Selection of whether the installation should be executed automatically or manually when the machine is switched on next.	
	☑	After a waiting time of 10 seconds the installation is automatically carried out till the window "Reference runs" (like in the case of "Installation"). Within the waiting time the installation can be cancelled by tapping on "Cancel". **Note:** Select this setting if only the operating system should be updated.
	☐	Installation as with **Installation and Configuration** Select this setting if machine data has been modified. **Example:** ◆ Gauge conversion ◆ Assembly of special attachment

6. In the "Software updating" window activate the ☑ checkbox.

7. Call up the "Main menu" with the  key.
8. Switch off machine at the main switch.
9. Switch on machine at the main switch.
   ⇨ The **BootOkc**window will be displayed with the **User Message** (**START UPDATE NOW?**) message box:



10. Activate the  **Installation without configuration** checkbox.
    ⇨ This shortens the installation process.

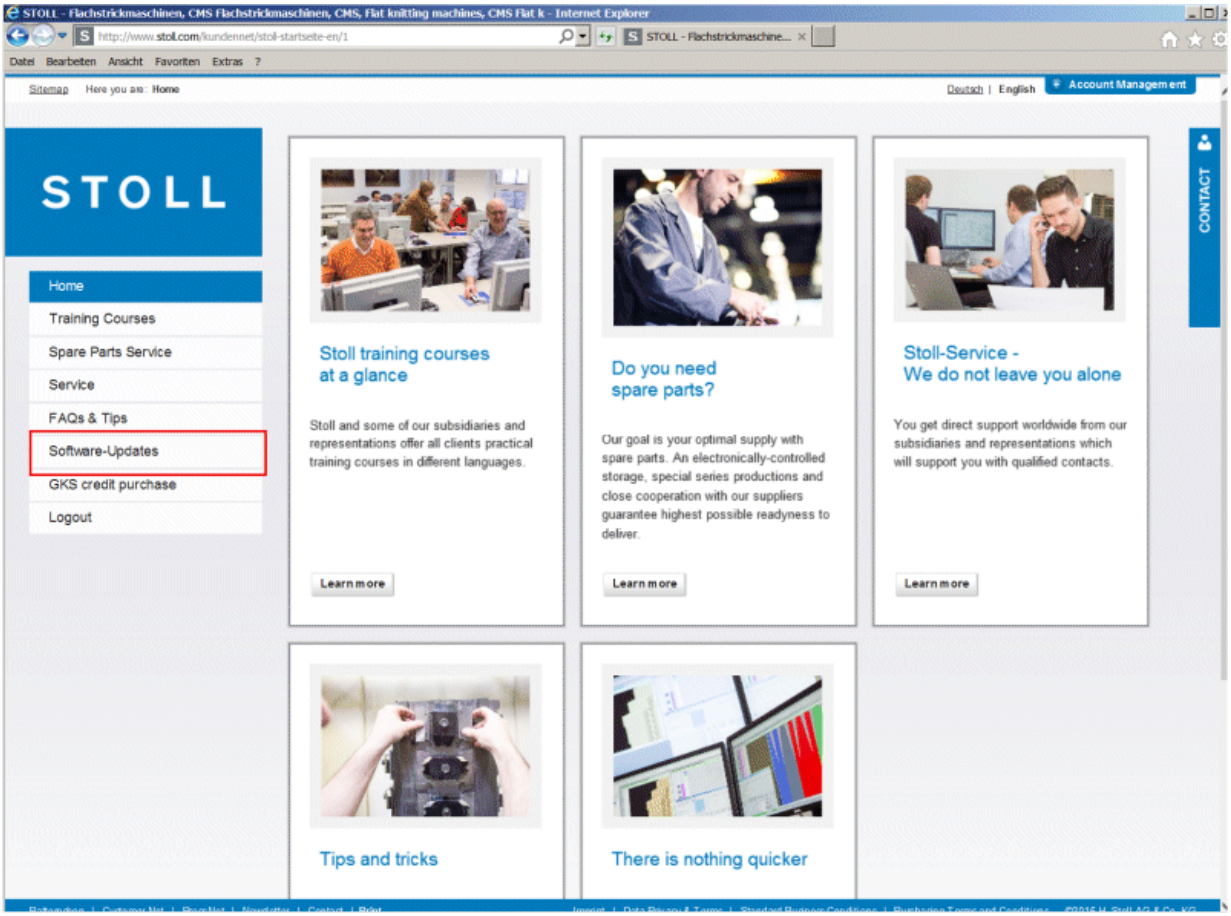
i	Deactivate the  **Installation without configuration** checkbox, if the machine parameters are also to be altered simultaneously with the installation of the new Stoll operating system.

11. Start the installation process tapping on "YES".
    ⇨ The path for the installation data is displayed in the **User Message** (**INSTALLATION STARTED!**) message box.

i	Continue the installation procedure as described under Install Software with language selection [▶ 329].

39.5 Software Download

The Stoll operating system for **CMS** machines can be downloaded via the internet from the www.stoll.com /Service/ Customer-Net/Software-Updates.


STOLL - Flachstrickmaschinen, CMS Flachstrickmaschinen, CMS, Flat knitting machines, CMS Flat k - Internet Explorer
Sitemap
Here you are: Home
Deutsch | English
Account Management
STOLL
Home
Training Courses
Spare Parts Service
Service
FAQs & Tips
Software-Updates
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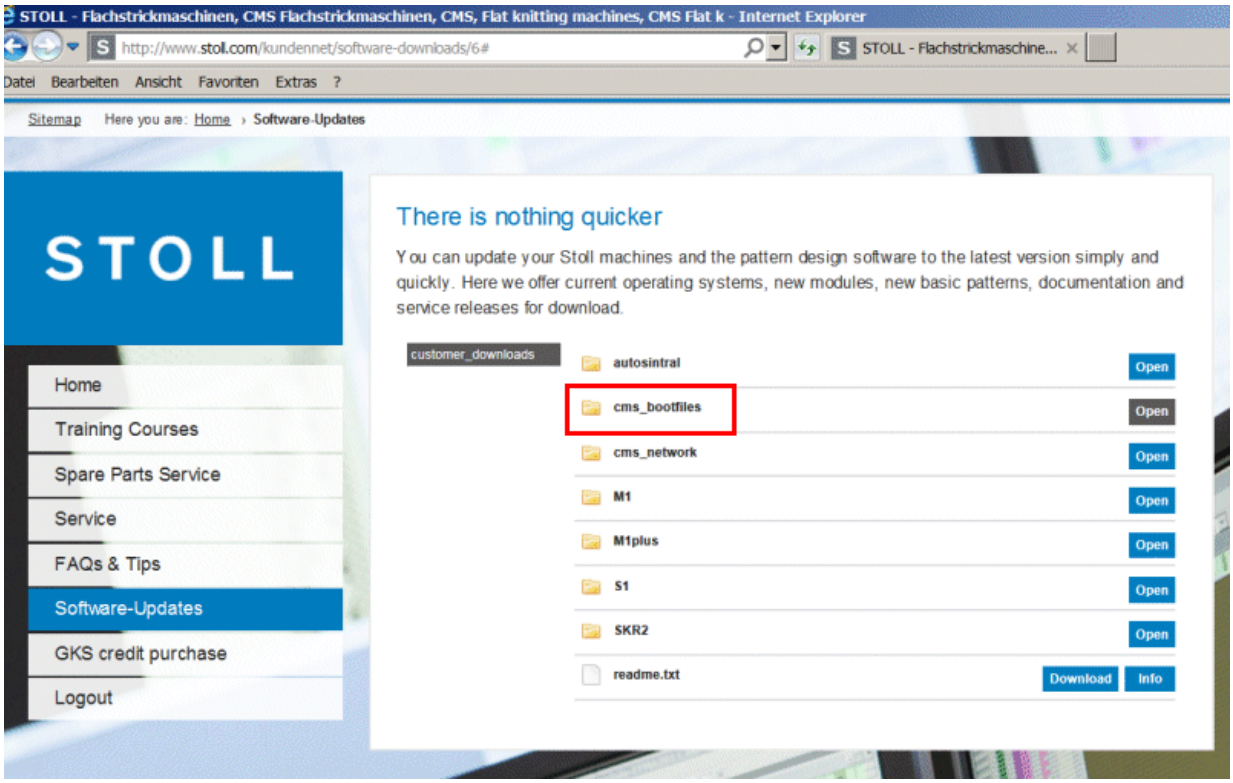
Stoll training courses at a glance
Stoll and some of our subsidiaries and representations offer all clients practical training courses in different languages.
Learn more
Do you need spare parts?
Our goal is your optimal supply with spare parts. An electronically-controlled storage, special series productions and close cooperation with our suppliers guarantee highest possible readyness to deliver.
Learn more
Stoll-Service - We do not leave you alone
You get direct support worldwide from our subsidiaries and representations which will support you with qualified contacts.
Learn more
Tips and tricks
There is nothing quicker


STOLL - Flachstrickmaschinen, CMS Flachstrickmaschinen, CMS, Flat knitting machines, CMS Flat k - Internet Explorer
http://www.stoll.com/kundennet/software-downloads/6#
Sitemap
Here you are: Home › Software-Updates
STOLL
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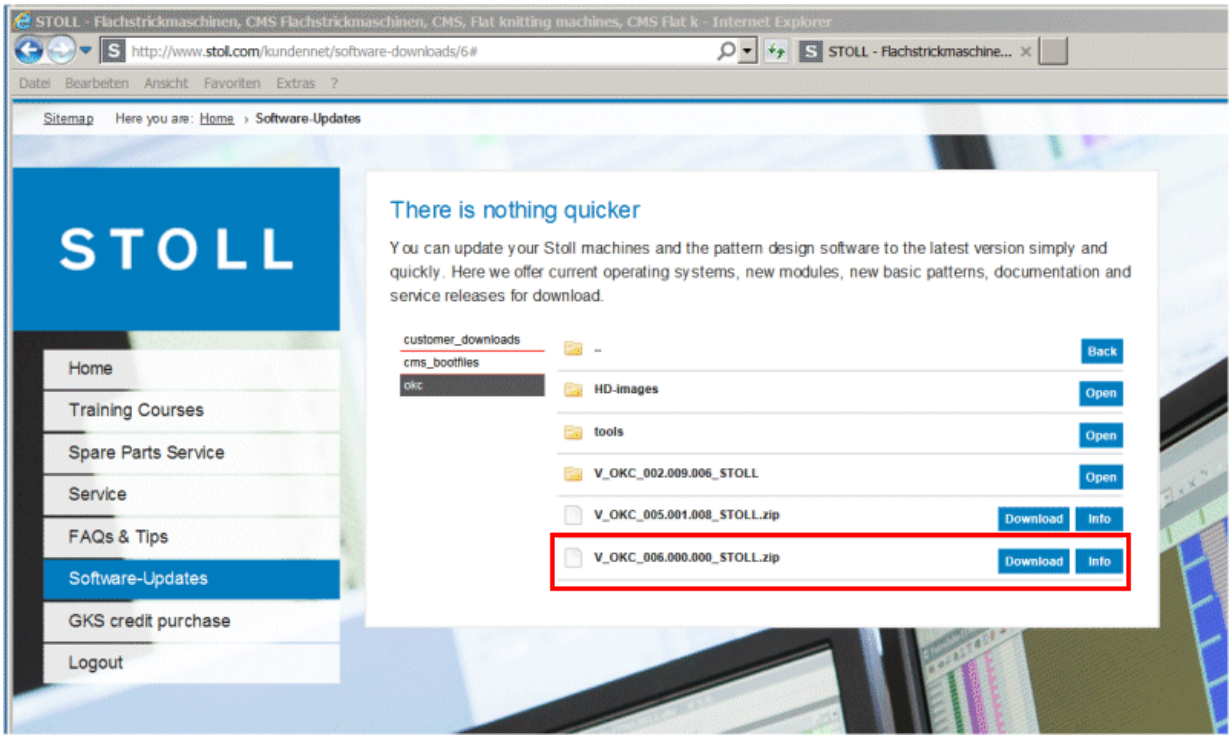
FAQs & Tips
Software-Updates
GKS credit purchase
Logout
There is nothing quicker
You can update your Stoll machines and the pattern design software to the latest version simply and quickly. Here we offer current operating systems, new modules, new basic patterns, documentation and service releases for download.
customer_downloads
autosintral
Open
cms_bootfiles
Open
cms_network
Open
M1
Open
M1plus
Open
S1
Open
SKR2
Open
readme.txt
Download
Info


STOLL - Flachstrickmaschinen, CMS Flachstrickmaschinen, CMS, Flat knitting machines, CMS Flat k - Internet Explorer
http://www.stoll.com/kundennet/software-downloads/6#
STOLL - Flachstrickmaschine...
Datei Bearbeiten Ansicht Favoriten Extras ?
Sitemap
Here you are: Home › Software-Updates
STOLL
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Spare Parts Service
Service
FAQs & Tips
Software-Updates
GKS credit purchase
Logout
There is nothing quicker
You can update your Stoll machines and the pattern design software to the latest version simply and quickly. Here we offer current operating systems, new modules, new basic patterns, documentation and service releases for download.
customer_downloads
cms_bootfiles
okc
..
Back
HD-images
Open
tools
Open
V_OKC_002.009.006_STOLL
Open
V_OKC_005.001.008_STOLL.zip
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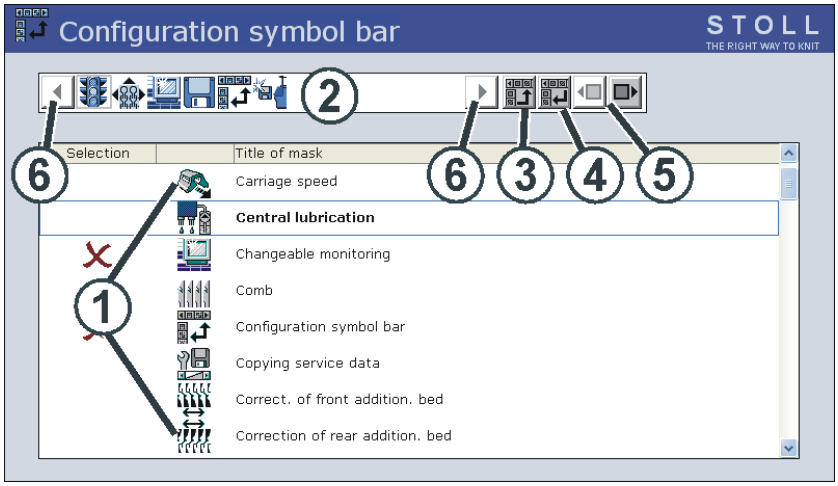
Info
V_OKC_006.000.000_STOLL.zip
Download
Info

40 Miscellaneous

40.1 Toolbar

The configurable toolbar allows you to jump directly to the individual menus without having to pass through the "Main menu" or using the "Additional functions" key.

- The toolbar overlays the title bar of a menu.
- You can include the icons of your favorite menus in the toolbar.



	Meaning
1	List of the menus which can be selected for the toolbar.
2	Presentation of the selected menus.
3	Insert the menu selected in (1) into the toolbar.
4	Remove the menu selected in (2) from the toolbar.
5	Change the position of a symbol in the toolbar (2).
6	If there are more than 11 symbols in the toolbar, the display can be moved to the left or right with the arrow keys.

I. Add a symbol to the toolbar:

1. Call up "Service" menu with the  key of the Main menu.
2. Call up "Configuration toolbar" menu with the  key of the Service menu.
3. Tap the desired symbol (1).
4. Press the (3) key.

- or -

➜ Double-tap on the symbol.

⇨ The symbol is displayed in the toolbar (2).

The marking  indicates that the symbol has been selected from the list (1) for the toolbar.

II. Toggle on or off the toolbar:

You can call up the toolbar in any menu.

1. Tap the left symbol in the title bar.

⇨ The toolbar overlays the title bar.

Exception:

Tap the  key in the "SINTRAL editor".

2. To close the symbols again, tap the empty field next to them.

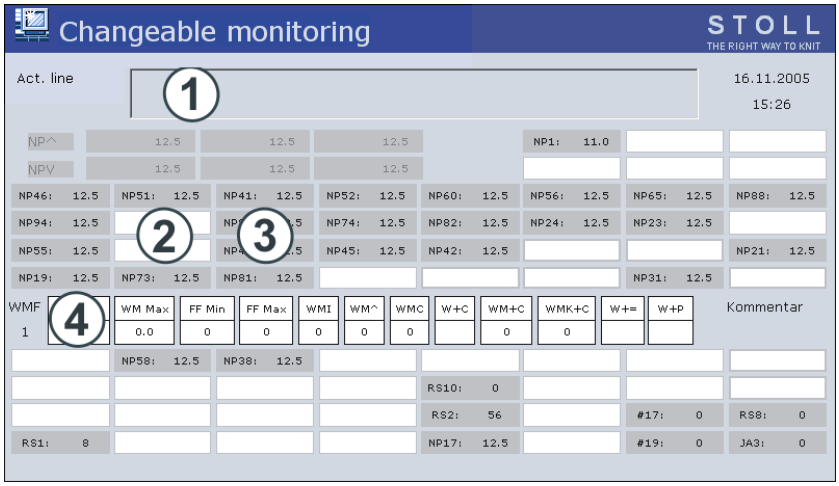
40.2 Monitoring

The current Sintral line and the corresponding values for the cycle counters, Jacquards, stitch tension and counters are displayed in the "Changeable monitoring" window for each carriage stroke during productions.
You can specify yourself which values are to be displayed or have them determined automatically.

The counters and cycle counters which are exclusively used in the **Auto-SINTRAL** program are not displayed.

I. Configure the Monitoring:

➜ Call up "Changeable Monitoring" via the  button of the main menu.

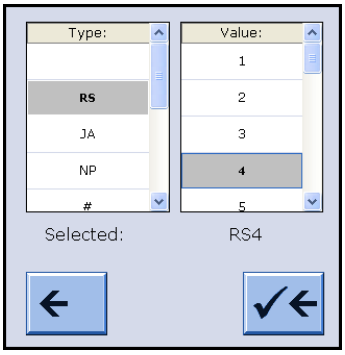


Pos.	Function
1	Display of the current Sintral line
2	White field with frame: The field can be linked to a value. Fields with a thin frame will be covered when switching on function blocks (4). Fields with a thick frame will not be covered when switching on function blocks.
3	Gray field: If a field (2) is limited to a value, the color changes from white to gray.
4	Function block: The display of a function block can be activated and deactivated.

II. Link a field to a value:

1. Tap a white field with a frame.

⇨ The setting window appears.



2. Select the type of the value in the left column.
3. Select the value in the right column.
   ⇨ The selected value is displayed in the lower line.
4. Confirm entries.
5. If necessary, link further fields to a value.
6. If one value is to be deleted, select the empty (white) field above "RS" in the left column below Type.
7. End the setting procedure.

Further Possibilities:

Key	Function
	End the setting procedure
	End the setting procedure without saving
	Empty all fields
	Automatic configuration

III. Insert function blocks:

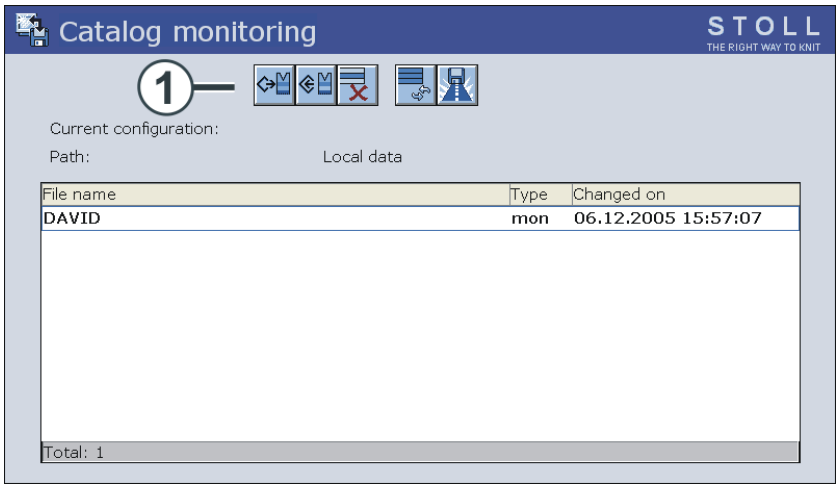
Various function blocks can furthermore be displayed for the configurable values. The selected function blocks are positioned at fixed positions over the existing fields (with thin frames). They are covered only, so that the fields are visible again when switching off the function block.

1. Call up the Additional function keys with the  key.
2. Activate and de-activate the additional function blocks.

Key	Function
	Function block "Stitch tension"
	Block of functions "SEN areas"
	Function block "Yarn carrier"
	Function block "Function name"
	Function block "Fabric take-down value" Only if **YLC** is switched off.
	Function block "Sintral print line"
	Function block "STIXX"

IV. Save Configuration:

1. Call up the Additional function keys with the  key.
2. Select the  key.
   ⇨ The "Monitoring deposit" menu appears.



3. Specify the path for the memory location with the  key.
4. Press the  key.
   ⇨ The input window for the name appears.
5. Call up the virtual keyboard with the  key.
6. Enter a name.
7. Confirm the entry with  .

V. Load configuration:

1. Call up the Additional function keys with the  key.
2. Tap the  key.
3. Specify the path to the desired configuration if necessary.
4. Select the desired configuration in the list under file name.
5. Tap the  key.
   ⇨ The selected configuration will be loaded and displayed.
6. Call up "Changeable Monitoring" menu with the  key of the Main menu.

40.3 Control of Knitting Systems and of Holding-down Jacks

The knitting system:

Each knitting system can knit using the three-way technique without limitation.

Single needle selection in seven positions:

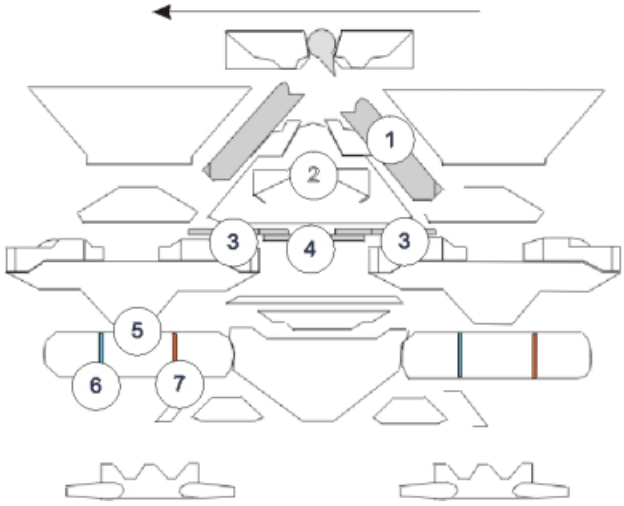
- Stitch
- Tuck
- Out of operation
- Delivery
- Receiving
- Splitting – Delivery
- Splitting - receiving

Possibilities of stitch formation:

- Stitch
- Tuck
- Out of operation
- Transfer from the front to the rear needle bed or vice versa
- Transfer simultaneously in both directions

The selection system only selects the needles which knit a stitch or tuck, transfer or split-stitch.
All other needles are not selected and do not sink the stitches.

I. Layout of the knitting system:

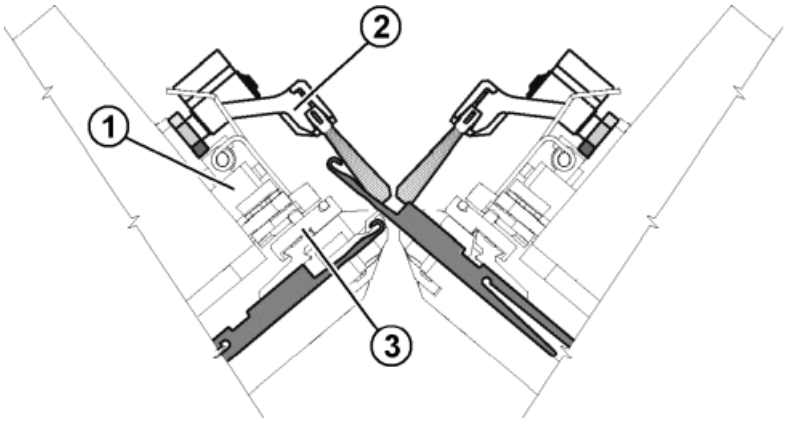


	Designation	Function
1	Stitch cam	
2	Raising cam	
3	Receiving pressure cam	
4	Tuck pressure cam	
5	Selection system	

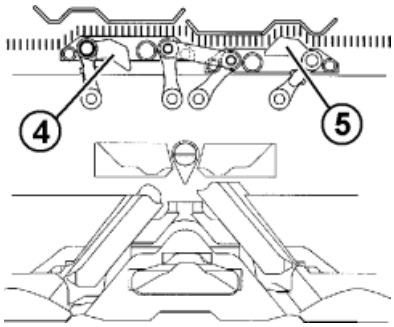
	Designation	Function
6	Selection position 1	Stitch, Transfer delivery, Split delivery
7	Selection position 2	Tuck, Receiving Surrounding, Receiving Split

II. Holding-down function:

The holding-down jacks hold down the fabric when the needles for stitch formation are driven out. The holding down jacks are moved by the holding-down jack control unit on the carriage.



	Meaning
1	Holding-down jack control unit
2	Swiveling brush holder
3	Jack slider
4	Leading jack slider
5	Following jack slider



The leading jack slider (4) is switched upward.
This pivots the holding-down jacks downward into the holding-down position during needle raising and these hold down the stitches.
The following jack slider (5) is pulled back and the holding-down jacks swivel back again. The holding-down jacks are open during yarn insertion.
When the carriage reverses, the jack sliders are switched over automatically.

40.4 Report

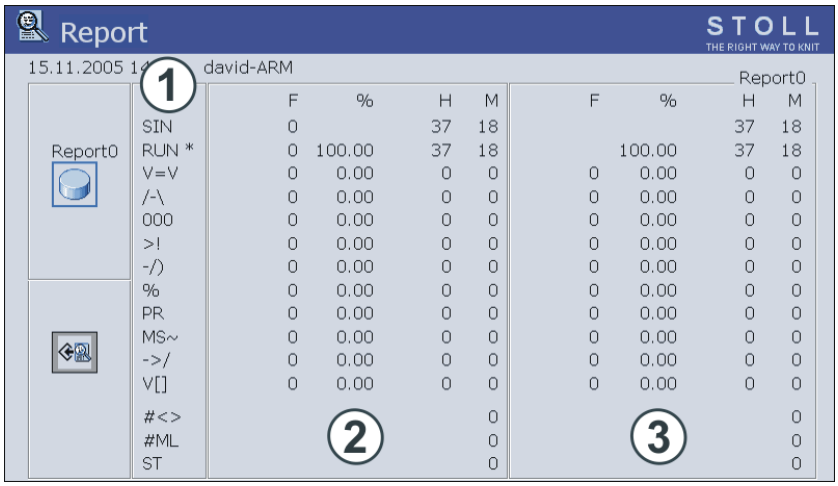
The control collects all operating data recorded since the operating system was first read in and since the current knitting program was started.

Run Report:

1. Call up  in the Main menu
2. Tap the  key.

3.

Call up the "Report" menu with the  key.



	Meaning
1	Types of operating data
2	Data which have resulted after reading in the operating system
3	Data can be deleted with the "Report 0" button.

Event	Meaning
F	Number of errors or number of stop motions
% , H , M	Percent, hours, minutes
SIN	Working time of the control unit (**SINTRAL** loaded)
RUN	Time of Production
V=V	Stop by switching off at engaging rod
/-	Stop by yarn control device, yarn feed
000	Stop by piece counter
>!	Stop by stop resistance
- /)	Stopping by needle position sensor
%	Stop by fabric take-down
PR	Stop by program
MS~	Machine stop or brief power outage
- > /	Stop by shock stop
V[ ]	Racking Error
# <>	Total number of strokes
#ML	Number of strokes at reduced speed
ST	Number of produced fabric pieces

40.5 Running Time Control

In order to display the "Running time control" menu this must be activated in the "Knit Report configuration" menu. ("TC START MENU" / "Restart and Configuration" / "Knit Report Configuration" / "Additional function keys")

The running times of sequence lists, sequences or orders, their individual elements or individual patterns are recorded and displayed in the "Running time control" window.
This adds knitting process data to the commands **MIN**, **MINSEQ** and **MINSEQEL**:

- Display of the running time of a pattern (sequence,sequence element, order).
  The current, last, minimum, maximum and average running times are displayed.
- Display of the expected remaining running time of a pattern (sequence, sequence element, order).
- Display of the number of pieces that have been knitted and are still to be knitted.
- Display of running time with or without loading and standby times.

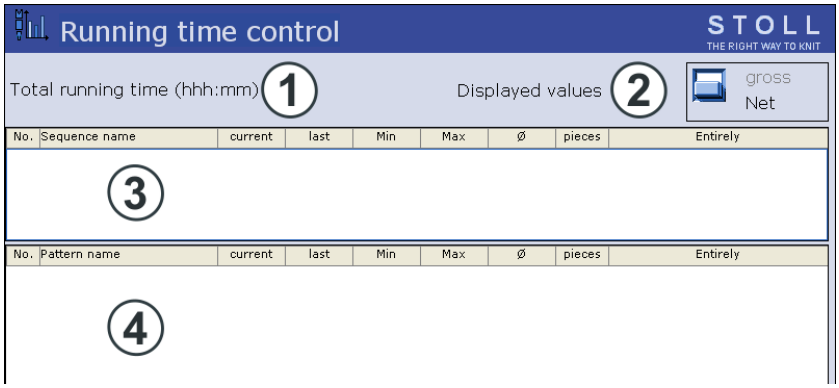
I. Open the Running time control:

1. Call up the "Service" menu with the  key in the "Main menu".
2. Call up the "Statistics" menu with  key.
3. Tap the  key.

- or -

➜ Call it up with the additional function keys in the "Sequence menu" or "Sequence list".

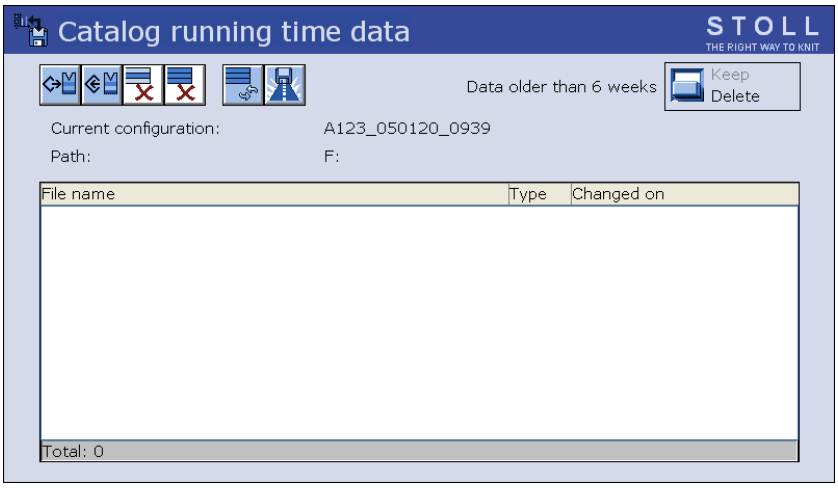
⇨ The "Running time control" menu appears.



	Meaning	
1	Total running time	Display of the estimated total running time of the sequence, sequence list or pattern.
2	gross	Display of the total production time including loading and standing times as well as manual interventions.
	Net	Display of the pure machine running time from **SP** (Start Program) to **piece finished**.
3/4	No.	Current number.
	Sequence/ Sequence element name	Name of the sequence, the order, the sequence element or of the pattern.
	current	Previous running time of the current sequence of the order or of the sequence element or pattern.
	last	Running time of the last knitted sequence of the order or of the sequence element or pattern.
	min.	Minimum running time of the sequence of the order or of the sequence element or pattern.
	max.	Maximum running time of the sequence of the order or of the sequence element or pattern.
	Ø	Average running time of the sequence of the order or of the sequence element or pattern.
	Fabrics	Amount of sequences or orders or of the sequence elements or patterns already knitted.
	Total	Amount of the total sequences or orders or of the sequence elements or patterns.

II. Saving, loading, deleting running time:

1. Tap the "Additional functions" key in the "Running time control" menu.
2. Call up "Storage of running time data" menu with the  key.



3. Specify the desired path for the  key.
4. Select a file under File name.
5. Select an action:

- Save 

i	Switch on the virtual keyboard to enter a name.

- Load 

i	The pattern memory must be deleted in order to load the running time data.

- Delete 

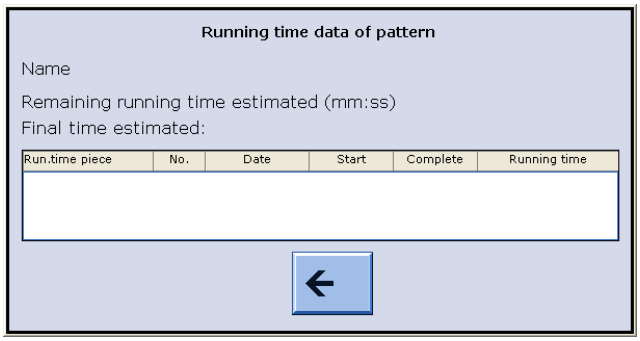
6. If an additional prompt appears, tap the "1" (Yes) key or the "0" (No) key to confirm.

III. Display running time data:

1. Call up the "Running time control" window in the "Service" window.

2. Select sequence, sequence element or pattern.
3. Call up "Additional function keys".

4. Call up the "Running time data of pattern" menu or the "Running time data sequence" menu.

Entry	Meaning
"Name"	Name of sequence, sequence element or pattern
"Remaining running time"	Estimated remaining running time in the format mmm:ss
"End time"	Estimated end (date and time) Possible only after a run-through
"Run.time piece"	At sequence: Longest and shortest run-through time of the sequence At sequence element/pattern: Longest and shortest run-through time of the piece
"No."	Number of the sequence, sequence element or of the piece
"Date"	Creation Date
"Start"	Starting time
"Completed"	Completion moment
"Running time"	Running time in hhh.mm

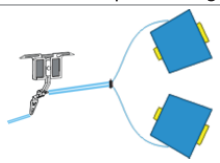
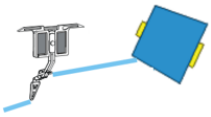
The production times are displayed in the "Running time data of pattern" window.

- Necessary remaining running time for the desired number of pieces.
- Expected end of production for the desired number of pieces
- Longest and shortest running time of the pieces produced up to now.

Reset of the piece counter will re-calculate the running time data.

40.6 Yarn Table

The specified values serve as a guideline. The quality and the specific weight of a yarn must also be taken into account. Instead of a simple yarn, we recommend twisted yarn. With coarser machines it is advisable to use several twisted threads.

Gauge	assembled processing [Nm]	Final count [Nm]
	 Several fine threads are assembled and fed as a thick yarn to the yarn carrier.	 Yarn thickness of the assembled threads Example: **6 x 16/2** **16/2=8** **8:6=1,33**
1,5.2	**2 x 3,7** **6 x 3,7**	**0,7 – 2,0**
2	**6 x 16/2**	**1,2 - 1,4**
2.2	**1 x 3,7** **6 x 3,7**	**0,9 – 4,0**
2.5	**6 x 18/2**	**1,3 - 1,6**
3	**5 x 18/2**	**1 - 2**
3 m.3L	**15 x 20/2**	**0,65 - 1**
3.5	**6 x 24/2**	**1,4 - 2,5**

Gauge	assembled processing [Nm]	Final count [Nm]
4	**5 x 24/2** **6 x 34/2**	**1,4 - 3**
5	**4 x 24/2** **4 x 34/2**	**3 - 4,5**
7	**2 x 22/2** **2 x 28/2**	**4,5 - 7**
8	**2 x 24/2** **2 x 34/2**	**6 - 8**
10	**2 x 36/2** **1 x 24/2**	**8 - 12**
12	**1 x 24/2** **2 x 44/2**	**10 - 18**
14	**1 x 28/2** **2 x 40/1**	**14 - 20**

Economic production and the influencing factors

Gauge	assembled processing [Nm]	Final count [Nm]
16	**1 x 48/2** **1 x 54/2** **1 x 60/2**	**20 - 30**
18	**1 x 54/2** **1 x 60/2** **1 x 80/2**	**20 - 40**
20	**1 x 80/2**	**20 - 40**
2,5.2 (all needles)	**3 x 28/2** **2 x 14/2**	**3 - 4,5**
2,5.2 m.4L	All needles: **3 x 28/2 Nm**	**3 – 4,5**
	Every 2nd needle: **8 x 28/2 Nm**	**1,3 - 2**
	Every 2nd needle with cast-off technique: maximum**13 x 28/2 Nm**	**1,1**
2,5.2 (CMS 830 C) (each 2nd needle)	**3 x 14/2** **6 x 14/2**	**1 - 2**
2,5.2 (each 2nd needle)	**3 x 14/2** **4 x 14/2**	**1,3 - 2**
3,5.2 (all needles)	**2 x 28/2** **3 x 28/2**	**4,5 - 7**
3,5.2 (each 2nd needle)	**3 x 14/2** **7 x 28/2**	**1,5 - 2,5**
3,5.2 m.4L	All needles: **3 x 28/2 Nm**	**4,5 – 7**
	Every 2nd needle: **7 x 28/2 Nm**	**1,5 – 2,5**
	Every 2nd needle with cast-off technique: maximum**9 x 28/2 Nm**	**1,5**

Economic production and the influencing factors

Gauge	Explanation
2,5.2 and **3,5.2** (knit and wear)	If an extreme yarn (non-elastic and/or very thick) is used, it should not be knitted too loosely (in the upper NP area), as there is a danger of wear of the cams and needle bed.

40.7 Stitch Tension Range

The tension ranges for knitting and splitting differ. The reason for this is the shape of the split-stitch piece. The information in the table show the minimum and maximum NP values.

Valid for:
CMS 933
CMS 822
CMS 530
CMS 520
CMS 502
CMS ADF-3

	min. NP	max. NP	min. NP (Split)	max. NP (Split)
E 3	7.0	16.7	8.2	15.6
E 3,5	7.0	16.7	8.2	15.6
E 4	7.0	16.7	8.2	15.6
E 5	6.5	16.9	8.0	14.1
E 7	8.3	18.7	9.8	15.9
E 8	8.8	19.5	10.3	16.6
E 10	7.25	19.2	9.3	17.65
E 12	7.55	20.0	8.4	16.2
E 14	7.95	20.7	8.8	16.85
E 16	7.6	21.9	8.9	17.85
E 18	7.6	21.9	8.9	17.85
E 5.2	7.8	17.5	9.0	14.7
E 6.2	7.55	20.0	8.4	16.2
E 7.2	7.95	20.7	8.8	16.85
E 8.2	8.0	22.3	9.3	18.25
E 9.2	8.0	22.3	9.3	18.25
E 2,5.2	6.5	16.9	8.0	14.1
E 2,5.2 m.4L	6.5	16.9	8.0	16.15
E 3,5.2	8.3	18.7	9.8	15.9
E 3,5.2 m.4L	8.3	18.7	9.8	17.95

Economic production and the influencing factors

Valid for:
CMS 830 C
CMS 730 T
CMS 530 T
CMS 520 C
CMS 520 C+

	min. NP	max. NP	min. NP (Split)	max. NP (Split)
E 3 (CMS 520 C) E 1,5.2 (CMS 520 C+)	7.0 8.3	16.7 18.0	8.2 9.6	15.6 16.9
E 3 m.3L	7.0	16.7	8.2	15.6
E 3,5	7.0	16.7	8.2	15.6
E 4 (CMS 520 C) E 2.2 (CMS 520 C+)	7.0 8.5	16.7 18.2	8.2 9.8	15.6 17.1
E 5	6.5	16.9	8.0	14.1
E 7	8.3	18.7	9.8	15.9
E 8	8.8	19.5	10.3	16.6
E 10	7.4	21.5	9.4	17.7
E 12	7.7	21.5	9.4	15.1
E 14	8.1	22.3	9.8	15.5

	min. NP	max. NP	min. NP (Split)	max. NP (Split)
E 16	8.1	22.5	9.5	15.2
E 18	8.1	22.5	9.5	15.2
E 5.2	7.8	17.5	9.0	14.7
E 6.2	7.7	21.5	9.4	15.1
E 7.2	8.1	22.3	9.8	15.5
E 8.2	8.1	22.5	9.5	15.2
E 9.2	8.1	22.4	9.5	15.5
E 2,5.2	6.5	16.9	8.0	14.1
E 2,5.2 m.4L	6.5	16.9	8.0	16.15
E 3,5.2	8.3	18.7	9.8	15.9
E 3,5.2 m.4L	8.3	18.7	9.8	17.95

Economic production and the influencing factors

CMS 530 T CMS 730 T	E10 E12 E14 E6.2 E7.2	For these gauges there are different cams for loose and tight knitting.