A. 1 JAGENBERG Two-Drum Winder
VARI-STEP Type TR 65
Standard Nominal Trim Width 4000 mm

for slitting and rewinding newsprint from 41.25 - 45 g/m^2 and LWC from 48 - 67.5 g/m^2 at a maximum web speed of 2,200 m/min. The speeds obtainable in field operation depend on the quality of the material, on local operating conditions and on beat-free unwinding.

TECHNICAL DATA

Material:	newsprint 41.25 - 45 g/m^2 LWC 48 - 67.5 g/m^2
Web draw:	60 N/cm web width
Specific weight:	13,000 N/m^3
Winder location:	on a suspended floor (thickness to be advised)
Operator's side: Machine 1 + 2:	on left, looking in web travel direction
Drive side: Maschine 1 + 2:	on right, looking in web travel direction
Control desk location: Machine 1 + 2:	on left, looking in web travel direction
Core feeding: Machine 1 + 2:	from left
Elevation:	up to 1,000 m above sea level
Untrimmed web width at unwind:	max. 3,912 mm min. 3,632 mm
Trimmed total rewind width:	max. 3,860 mm min. 3,378 mm

TECHNICAL DATA of Unwind:

Unwind diameter:	max. 2,438 mm min. 403 mm (= reel spool dia.)
Parent reel width:	max. 3,912 mm min. 3,632 mm
Max. load capacity unwind:	300,000 N (30 tons)
Max. weight of parent reel:	about 120,000 N (12 tons) without reel spool
Reel spool:	as per drawings submitted to us, with gear coupling for connection between reel spool and brake generator
Shifting distance (axial regulation):	+/- 100 mm
Shifting distance (radial regulation):	+/- 25 mm
Oscillation range:	+/- 100 mm

TECHNICAL DATA of Winder:

Standard nominal trim width:	4,000 mm
Rating of the machine:	max. web speed up to 2,200 m/min. for basis weights up to 67.5 g/m^2
Diameter of 1st guide roll at web infeed:	355 mm, undivided with chevron grooving
Diameter of 2nd guide roll:	178 mm
Diameter of guide rolls ahead of and following slitting station:	178 mm
Minimum slitting width:	198 mm
Number of slitter pairs:	10
Diameter of rewinding rolls:	max. 1,525 mm min. 400 mm (for mechanical ejection)
Total rewinding web width:	max. 3,860 mm min. 3,378 mm
Min. outer diameter of the rewind cores:	89.15 mm (steel cores) 101.6 mm (fibre cores)
Diameter of rewind cores:	76.2 mm inside diameter
Maximum core tolerance:	+/- 0.3 mm
Adjustment range of core chucks of shaftless rewind:	350 mm per side
Number of tool tapers (tapered mandrels):	1 pair for 76.2 mm core i.d.

Core Dimensions:

1. Steel cores:	i.d. 2.930 - 3.125" o.d. 3.510 - 3.540"
2. Cardboard cores:	i.d. 2.996 - 3.060" o.d. 4"
Maximum trim strip width:	11", divided into 1 x 3" on one side and 2 x 4" on the opposite side

Trim removal:	via lead-off plates, suction studs and injector system
Trim delivery distance:	61 m
Adjustment range of lead-off plates:	350 mm per side
Face length of winder drums:	4,150 mm
Diameter of winder drums seen in web travel direction:	1st winder drum: 850 mm 2nd winder drum: 610 mm
Diameter of rider roll:	265 mm

COMPRESSED AIR

Gauge operating pressure for all pneumatic equipment:	4.2 bar
Room temperature:	up to max 40° centigrade
Relative humidity:	max. 95 %
HYDRAULICS (REXROTH):	operating medium mineral oil as per ISO VG 68 (HLP 36)

solenoid voltage: 110 V - 60 Hz
control voltage: 110 V - 60 Hz
motor voltage: 600 V AC - 60 Hz
motor protection: standard IP 54
standard motor/frame B 3/B 5
motor starting: star-delta

TECHNICAL DATA Electrics:

Power supply:	3-phase AC with neutral, 460 V, frequency 60 Hz for main drives 600 V, frequency 60 Hz for auxiliary drives
Control voltage:	120 V AC
Pilot lamp voltage:	115 V AC
Solenoid valve voltage:	115 V AC
Voltage fluctuations:	+/- 5 %
Permissible rating for direct on-line starting of squirrel-cage motors:	unlimited
Construction:	standard for standard voltages up to 1,000 V as per VDE 0100 and VDE 0113/IEC
Manufacturer:	RELIANCE
Ratings/rpm speeds:	brake generator 184 kW 300/1,800 rpm
	winder drum motor 174 kW 850 rpm
	rider roll motors 2 x 5.5 kW 1,750/2,300 rpm
	frequency converter 43 KVA laid out for 10 slitter pairs
	Mount Hope spreader roll 5.5 kW 1,750/2,300 rpm

DESCRIPTION OF THE EQUIPMENT

JAGENBERG Two-Drum Winder VARI-STEP Type 65,
4000 mm (about 157") Nominal Trim Width

UNWIND

Size 24/24, side-shiftable as a whole, suited for reel spools of one length with two fixed bearings and square coupling, essentially comprising:

two unwind stands, mounted on sole plates, with connecting cross beams, gear motor for side-shifting (shifting distance +/- 100 mm = about 4"), spherical half shells and equipment for manual adjustment of one unwind bearing in web travel direction.

EMERGENCY BRAKE

for the brake generator,
electro-pneumatically operated.

REEL SPOOL COUPLING

divided, with second driver.

RAPID REEL SPOOL CHANGE

The empty spool is ejected from the unwind bearings by pivoting levers and rolls onto supporting arms attached to the unwind, so that a new reel can be loaded before the empty spool is removed.

0131B

FRAMING AND CONSTRUCTION OF THE BASIC MACHINE
mainly comprising:

- base blocks
- machine uprights
- connecting cross beams

2 GUIDE ROLLS
of aluminium tubing, grooved, divided into 2 sections each.
The second guide roll arranged for electric web draw measurement.

THREADING TAPE CRADLE
mounted above the guide rolls

AIRFLOATER
to facilitate web threading.

JAGENBERG MULTI-SPREAD SPREADING UNIT (patented)
with individual adjustment of the segments,
mounted ahead of the slitting station.

UNISET SLITTING STATION
with 10 pairs of slitters.

MOUNT-HOPE Spreader Roll

LEAD-OFF PLATES
for removing the trim strips, including suction studs for connection to the trim removal system.

INJECTOR TRIM REMOVAL SYSTEM
with silencers, silencing hood and motorized damper valve setting.

WINDER DRUMS
with molybdenum coating and grooved.
The first winder drum in web travel direction is grooved and constructed as suction roll in order to hold the web tails remaining in the machine in place when making an automatic roll set change.
The delivery scope includes the suction fan.

THREADING TAPE CRADLE
underneath the first winder drum.

WEB CUT-OFF UNIT
mounted underneath the two winder drums.

REWIND
with adjustment/setting of the core chucks through two electric motors,
counterloading of the core chuck carriages hydraulically.

RIDER ROLL
constructed in sections, for DC drive, with spiral grooving and hydraulic rider roll control.

ROLL SET EJECTOR
with integrated core loading unit, for ejecting the roll set and at the same time loading new cores into the winder drum valley.

GLUE APPLICATOR
for applying a glue track as the cores are fed into the machine manually.

ROLL LOWERING UNIT
organically built into the machine,
doubling as nip safety guard in raised position.

PARKING BRAKE

COUPLING
for direct coupling of drive motor and winder drum journal.

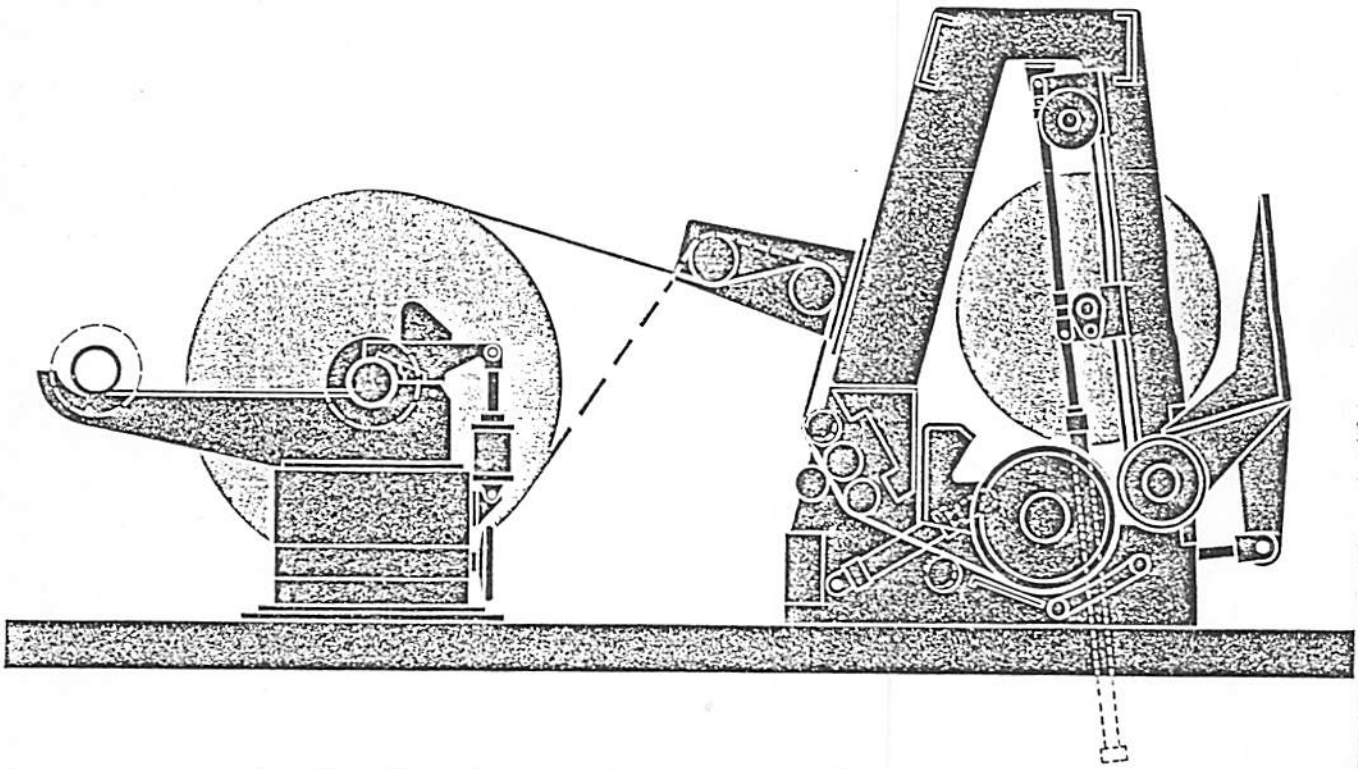
CONTROL DESK
with pneumatics installed, but electrics not installed.

HYDRAULIC POWER UNIT
with back-up pump.

ON-LINE Winding Hardness Measurement

SEQUENTIAL SWITCHINGS I, II and III

The New Jagenberg Two-Drum Winder VARI-STEP



There is one common denominator for all rolls leaving the paper mill: they are not an end product, i. e. they serve no other purpose than to be converted into something else. After having been rewound with care, they are sent once more to the unwind stands for further processing. It goes without saying that converters pose widely varying demands on the quality of individual rolls, considering the multitudes of applications for the final product. However, there is no getting away from one basic demand – regardless of the type or the size of the converting machine: the roll quality must be uniform throughout, ensuring trouble-free unwinding at highest operating speeds.

Amongst converters, the printer is king. His demands on the runability properties of a roll are the most stringent. In view of the fact that 40% of all paper products in the world are printed, it is understandable that the requirements of the printing industry are a winder designer's gospel. And the gospel says that rolls must be of uniform density from the first plies on the cores to the outer periphery. Only perfectly uniform rolls ensure optimum printability.

The next requirement calls for the largest possible roll diameters. Of course, uptimes grow with the growing diameters. Larger diameters also save operators, since only extended flying splice intervals resulting from large roll diameters permit splice preparation without calling for outside help. And this is all-important as splicing intervals become ever shorter due to continuously increasing press speeds. Larger rolls save material, too, if one considers the waste that accompanies every roll change. These savings are without doubt of great interest to the highly competitive packaging industry which represents another 35% of the paper converters or, in other words, potential VARI-STEP users.

Thus, the task for the design engineers was clearly defined: to develop a new winder concept permitting more uniform winding hardness while at the same time increasing conventional roll diameters. This task called for a new concept indeed, since the object of the exercise was to combine these demands in a two-drum winder design in view of the higher prices and increased number of operators in the case of single-drum winders with staggered rewind stations – which, design-wise, are a perfect solution to the problem.

The R & D staff first drafted the known parameters which can influence the winding hardness or – as we often say today: the roll density. These parameters were then thoroughly investigated in theory and tested in practice:

- Size and arrangement of winder drums
- Difference of winder drum peripheral speed (advancing and retarding effects, also called overspeed and lag speed)
- Web tension, and
- Rider roll nip load (roll winding pressure).

Fig. 3a) clearly shows the geometry and position of the winder drums of a conventional two-drum winder, as well as the speed relation between the winder drums. If two drums of identical diameter are selected, and if the drum which is not wrapped by the web is not driven, then the roll hardness greatly increases with increasing roll diameter. At small diameter, there is a strong lag speed. This lag speed diminishes with increasing diameter with the eventual near-synchronisation of the peripheral speed of the two drums.

If the drums are mounted in a slanted plane as shown in **Fig. 3b)**, an increase in diameter of the roll corresponds to a gradual shifting of the roll weight from the non-driven (idling) to the driven drum wrapped by the web. The natural result is an increase in roll hardness or density due to the higher nip pressure on the wrapped winder drum. It is also noticeable that in the medium diameter range, the roll hardness curve levels off. This effect, producing a more uniform density in the medium diameter range, stems from the geometry (slanted plane) in connection with the drum diameters, and results in a certain overspeed of the non-wrapped winder drum from a given roll diameter onwards.

Now it is a known fact that larger drum diameters results in lower roll density. Thus, the diameter of the driven winder drum wrapped by the web was increased **(Fig. 3c)**. In this way, the total hardness level could be reduced and a larger degree of uniformity was obtained. The overspeed inherent in the system already becomes effective at small roll diameters, if larger drum diameters are selected. This effect – in connection with the slanted position of the drums – is the result of a deeper impression of the larger drum in combination with a softer winding structure.

If the second winder drum is furthermore driven by an adequately dimensioned flat belt, adapted to the overspeed requirements as shown in **Fig. 3d)**, a sufficiently high overspeed is obtained in the area of the roll center. In the further winding process, the overspeed then adjusts to the overspeed generated by the system. This contributes to a better level of uniformity.

In order to clearly demonstrate the effect of the new concept, **Fig. 3e)** now shows the roll hardness curve of a conventional winder. In this comparison, both the web tension and the overspeed were identical. However, in the case of a conventional system, the overspeed must be forced upon the roll through an expandable pulley or two-motor drive, over the full roll diameter range. This permits the conclusion that the overspeed factor inherent in the VARI-STEP system treats the paper much more gently.

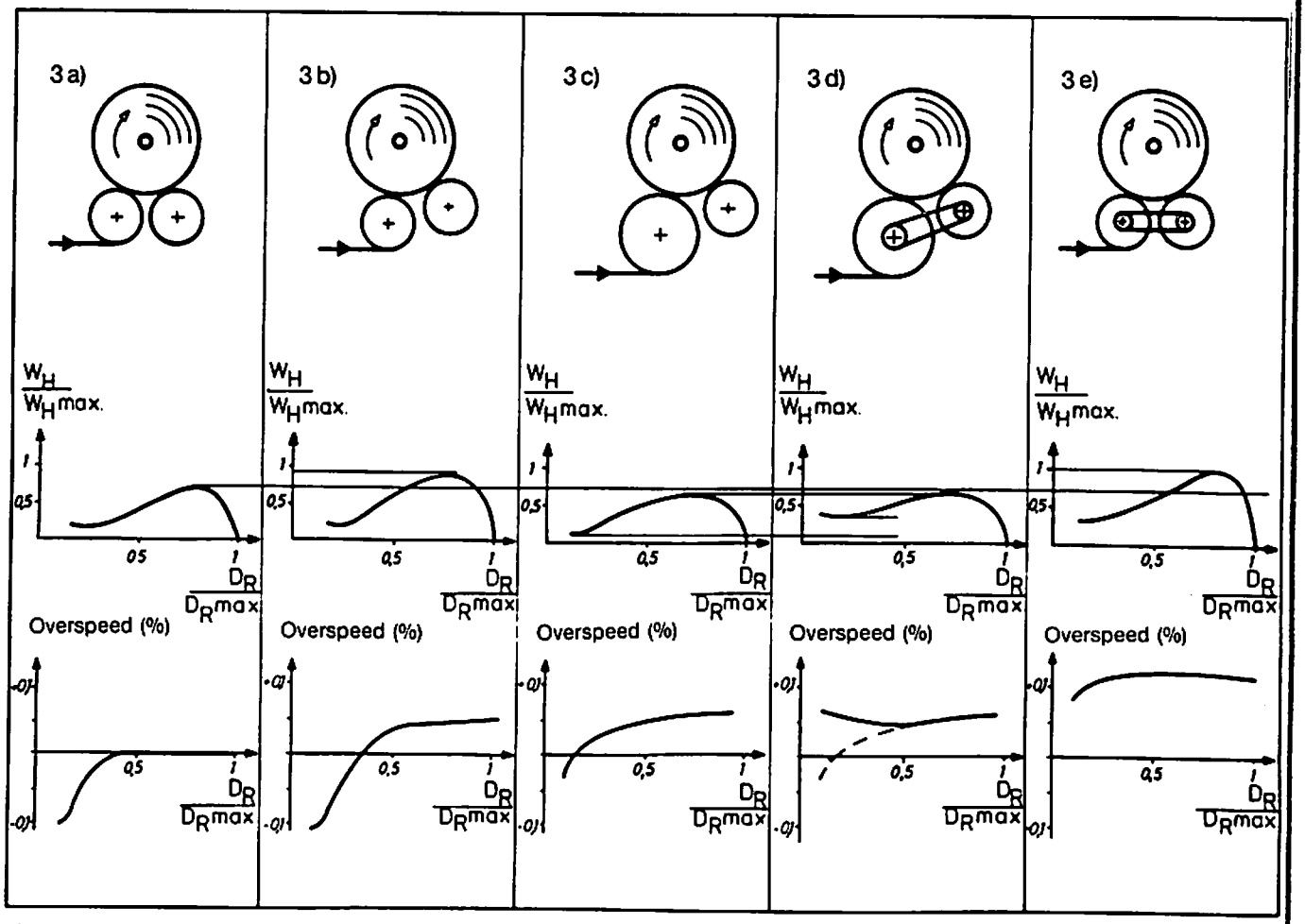


Fig. 3

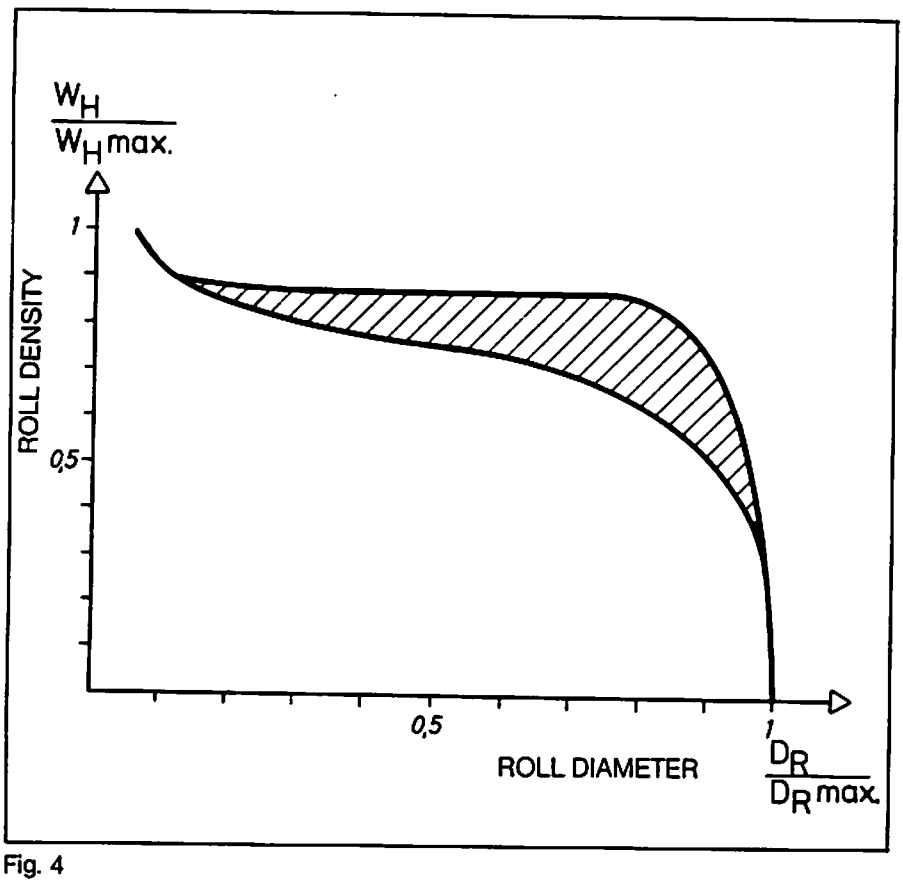


Fig. 4

On top of that, the influence of rider roll nip loading must be considered. A rider roll is required to ensure good roll starts and to achieve the desired optimum roll hardness level in relation to the roll diameter **(Fig. 4)**. In order to reach this goal, the load factor (P) is controlled in such a way that the forces N1 and N2 acting on the nips, i. e. the nip pressure, is raised over a wide diameter range and maintained there, starting right from the roll center **(Fig. 5)**.

A comparison of the roll hardness curves of a conventional winder with a VARI-STEP **(Figs. 3d and 3e)** shows that in order to obtain the desired roll hardness level, a conventional winder needs a much higher rider roll nip load. But a higher load means also a greater danger of shifting or slipping between layers with the possible end result – in really bad cases – of wrinkling (crepe formation). This means that the new VARI-STEP winding system creates less danger of wrinkling through lower rider roll nip loads. The rider roll nip load is controlled electronically by a parabolic curve representing the preset values. Setting is done on the main control board if this is placed sufficiently close to the machine, or at a special control panel.

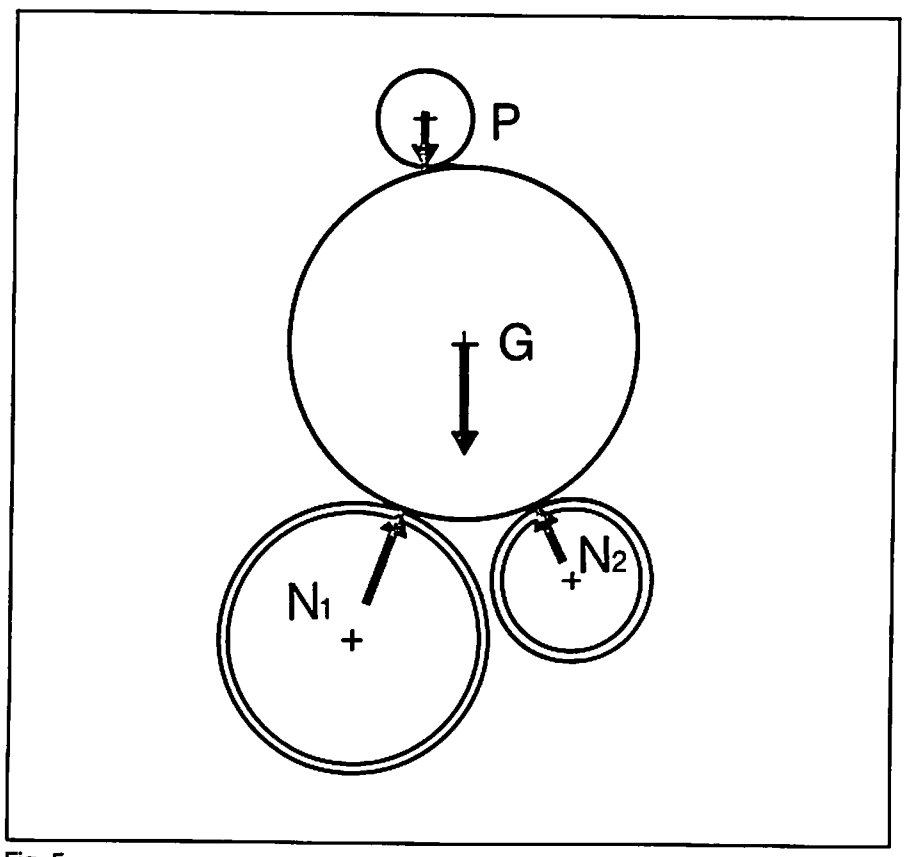


Fig. 5

Fig. 4: Desirable Roll Density Curve

Fig. 5: Influence of the Rider Roll Nip Load

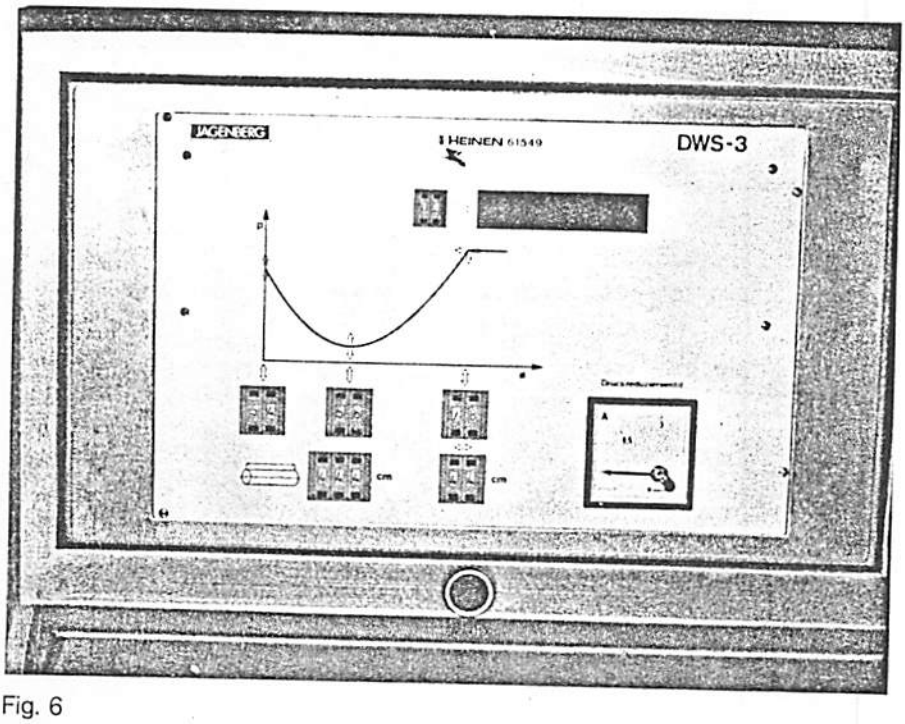


Fig. 6

The input panel shown in **Fig. 6** can be programmed as follows:

- Counterloading pressure in the cylinder at start-up, i. e. for the core diameter
- Minimum counterloading pressure for a given roll diameter, depending on paper garde and finished roll diameter
- Maximum counterloading pressure at which a floating condition of the rider roll is achieved, and
- The roll diameter for beginning of the floating condition.

The system described allows for further fine-tuning the programmed rider roll nip load so that the desired roll hardness level is reached automatically without further operator interference. We are thereby approaching the ideal curve representing a uniform or slightly declining roll hardness level during the total winding process, as shown in **Fig. 7.**

The differences measured between the measuring points are very slight, and the maximum winding hardness in the center and near the periphery of the roll does not cause any damage.

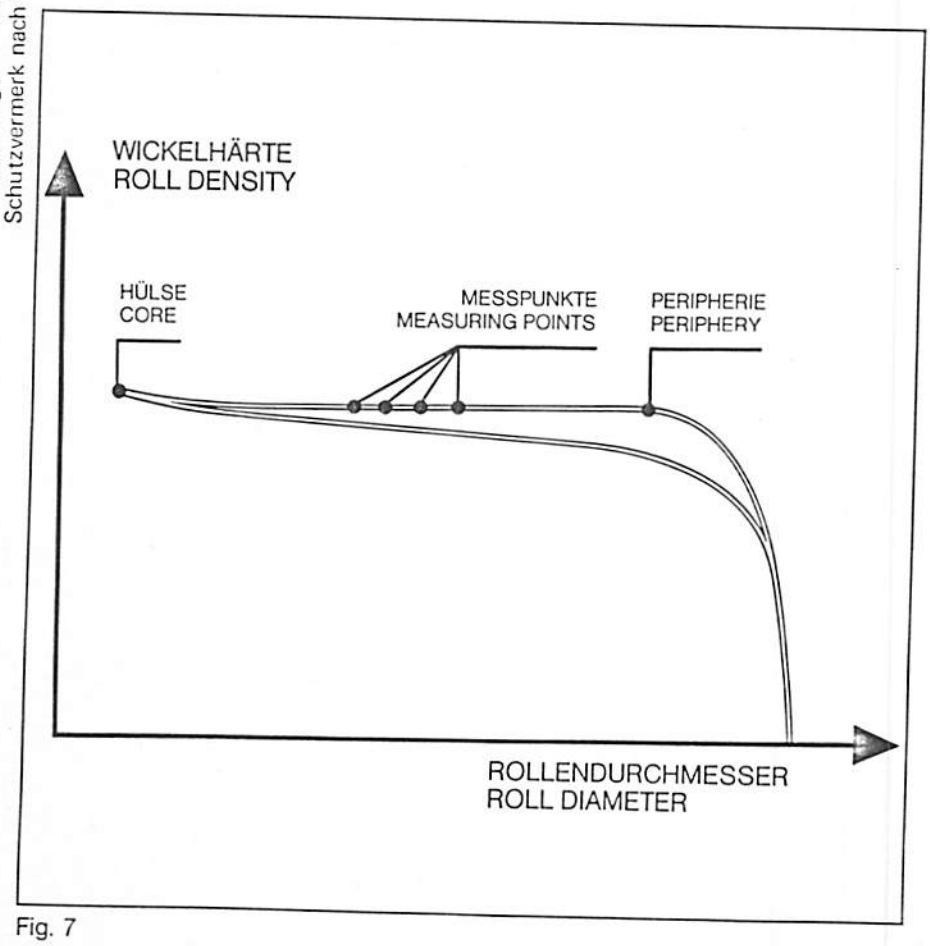


Fig. 7

Fig. 6: Programmable Counterloading Curve

Fig. 7: Roll Hardness Diagram

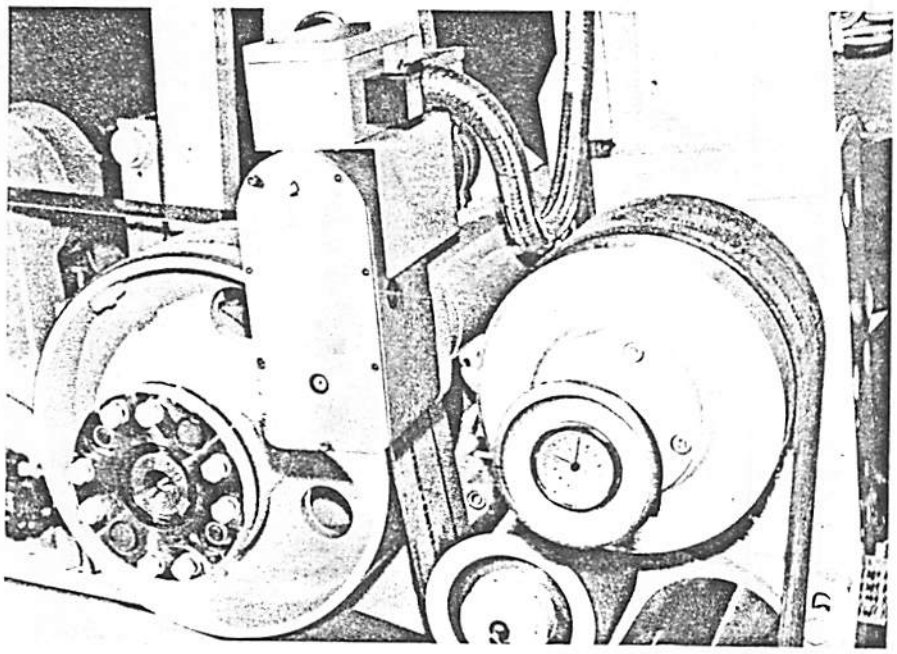


Fig. 8

If widely varying paper grades are to be handled, the VARI-STEP can be equipped with a handwheel for readjusting the variable speed pulley during a stop **(Fig. 8).** The handwheel permits raising or lowering the total hardness level by increasing or lowering the speed difference between the drums. A display dial permits the reproduction of settings once found to be practical. Altering the overspeed during the operation is not necessary since the geometry of the winder drums automatically initiates the desired adaptation. Normally, the most efficient overspeed factor is already ascertained during the commissioning period.

This means that the adjustable pulley will only be required and supplied if certain limits for caliper range are exceeded, or if there are large deviations in the structure of the paper.

In any case, there remains the alteration of the web tension to obtain a rise or fall of the total hardness level. This web tension has a far greater influence on the winding hardness than the variation of the overspeed factor.

Since the conventional hardness test methods such as knocking the finished roll, the gap test, the Smith needle test or the Schmidt-Hammer test are all not too accurate, Jagenberg developed a simple but very safe new method for controlling the winding hardness. In the new method, steel strips of approximately 90 mm (3 1/2") length, 6mm (1/4") width and 5/100 mm (0.002") caliper are inserted during the winding operation into the side of the roll between the sheet plies **(Fig. 9).** Prior to this, the steel strips have been placed into paper sheaths so that the coefficient of friction remains constant between sheath and metal (whereas it would be different with different paper grades).

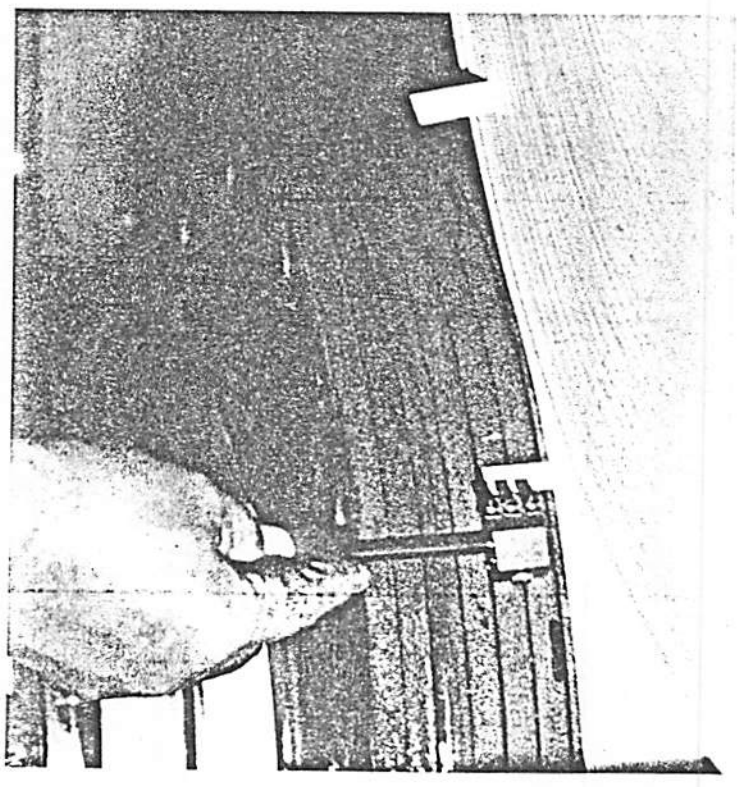


Fig. 9

Fig. 8: Adjustable Belt Pulley

Fig. 9: Inserting Steel Strips for Hardness Testing

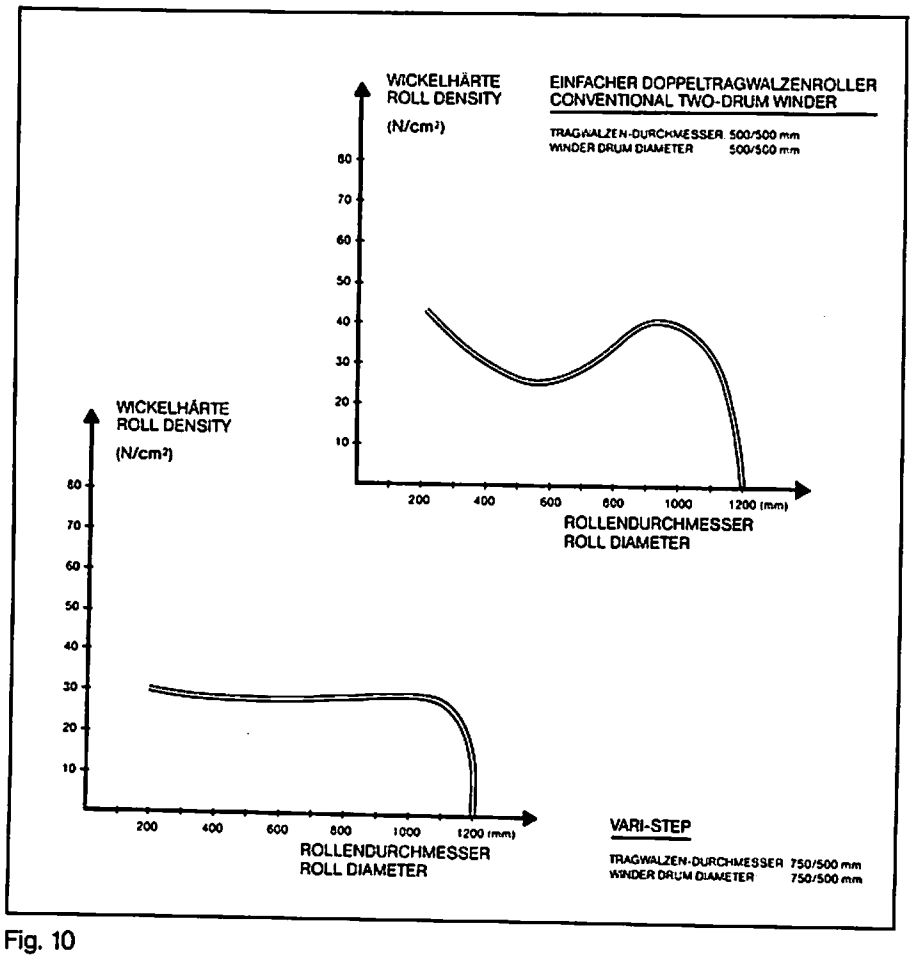


Fig. 10

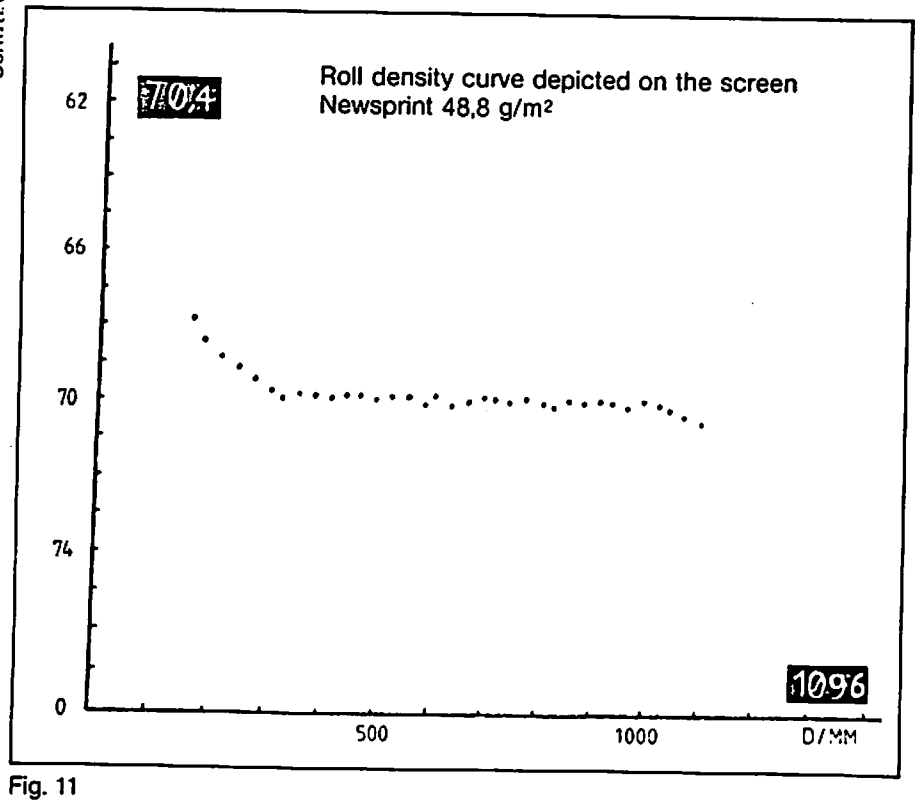


Fig. 11

The force required to pull the metal strip from the roll – in which it was inserted by about 70 mm (2 3/4") – serves as the test value. Since the friction coefficient between sheath and steel strip is a known magnitude, the result of the test measurement reflects the pressure between the roll layers. These results are computed into hardness diagrams. Such a diagram is shown in **Fig. 10.** The left-hand curve represents a two-drum winder with two drums of 500 mm (20") dia. each. The right-hand curve shows the diagram of the VARI-STEP winder with 750 mm (30") and 500 mm (20") winder drums. The diagrams represent comparable winding conditions and machine settings.

A recommendable alternative to the above measuring system is the so-called ON-LINE winding hardness test. The system is based on a Jagenberg micro-processor with graphic color CRT. A printer is optional.

The linear footage of paper as well as the roll diameter are determined continuously. For this purpose, pulse generators are fitted to winder drum and rewind. Footage and diameter serve to calculate the caliper. By computing footage and diameter as well as basis weight of paper, we get the roll density or hardness at any desired roll diameter.

Since the order of magnitude is very small (paper caliper measured in thousandths of a mm, and change in tenths of microns), it becomes necessary to measure each time several plies of paper. Realistic numbers are between 100 and 300 plies. Therefore, there will be a reference value at every 5–40 mm (1/8" to 1 1/2"), depending on paper caliper.

Thus, we obtain a picture of the paper caliper and of the specific density or hardness over the total diameter of the roll during operation **(Fig. 11).** At the end of each winding process there is the possibility to print out the diagram of paper caliper or specific density over the diameter of the roll. Thus,

Fig. 10: Winding Hardness Diagram

Fig. 11: Picture of an ON-LINE winding hardness test

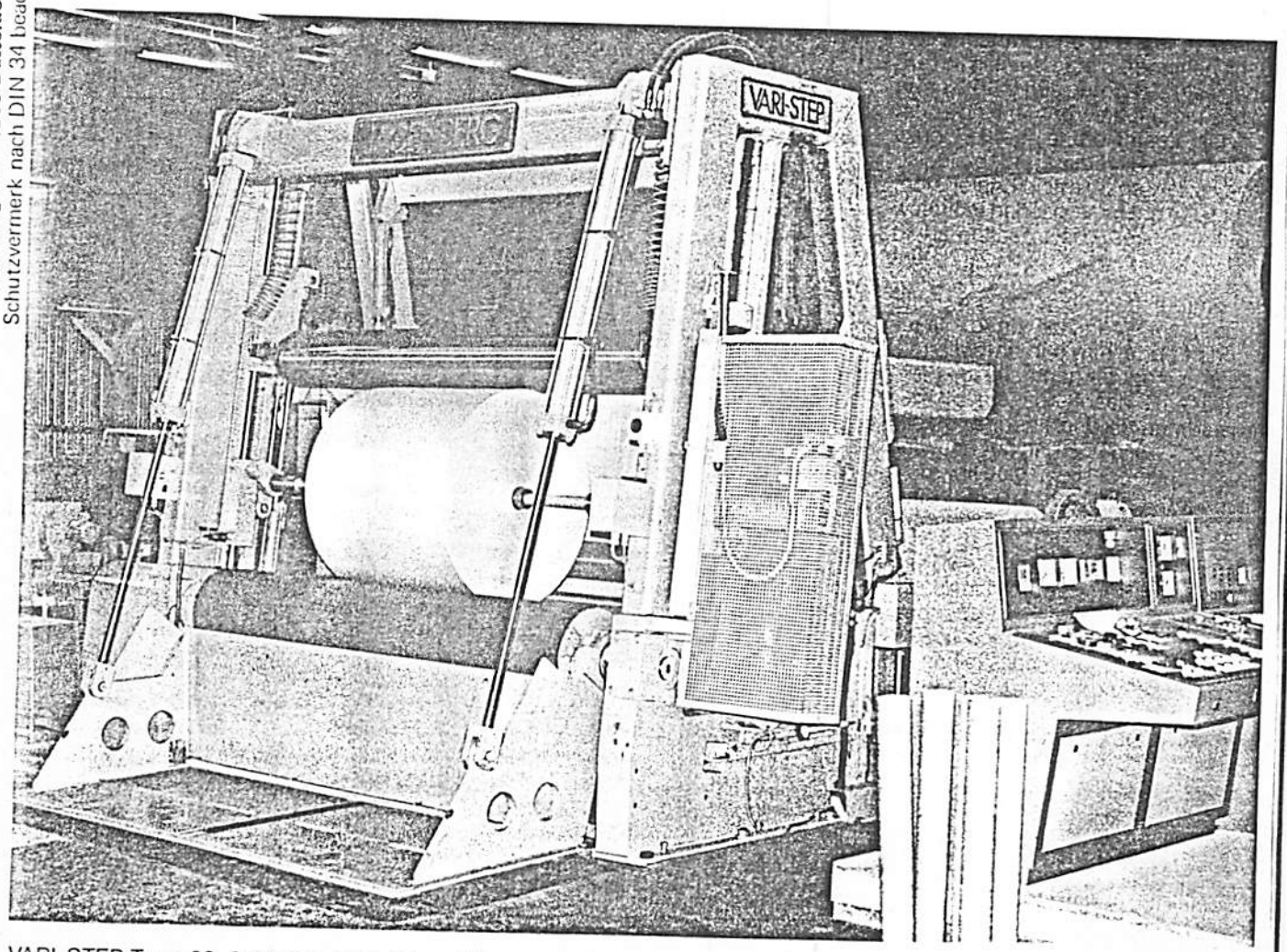
a log sheet is printed for each set of rolls which informs the converter of the state of the rolls. Practical results have proven that the possibility to offer larger diameter rolls which at the same time are more uniformly wound, ensures a better runability at the converter and diminishes waste. VARI-STEP users have been able to double the quota of the paper which could be converted into new and usable rolls, if such VARI-STEP was used as a roll doctor. Often it is sufficient to rewind the rolls on a VARI-STEP as they are – that is, without trimming – in order to eliminate profile faults and to make the winding hardness more uniform, so that ridging due to winding on a conventional winder could be eliminated. This, of course, means recycling a roll without any material loss. If bigger faults have to be compensated for, then additional backstand oscillation which, of course, necessitates edge trimming, and possibly a further subdivision into narrower rolls, can obtain such quality improvement that the supply of these rolls is possible as first grade material.

Summerizing the advantages of the VARI-STEP concept, it can be definitely confirmed that this new machine can do more than a conventional two-drum winder:

- Production of larger and more uniform rolls, also in case of difficult paper grades
- Improved runability during further conversion of the rolls
- Less waste in the mill and at the converter
- Increase of the recycling quota, more saleable rolls of good quality when used as roll doctor.

And all these advantages are obtainable at no more or less cost of operation, whilst the machine itself is simpler to operate and maintain. Auxiliary devices assisting the operator to run the machine more efficiently are already included in the basic machine price or are available as optional equipment (web feeding, slitter station adjustment, shaftless rewind, etc.).

The VARI-STEP can be supplied in trim widths from 2100 mm (84") to 6500 mm (260") and for speeds up to 2200 m/min. (7200 fpm). We should also mention again the very short downtimes which permit considerable production figures. Please ask for further information, a detailed study should be rewarding.



VARI-STEP Type 30, 2100 mm (84") trim width, as roll doctor

Way Valves

The designation is prefixed with the number of ways and the number of switching positions. The number of ways is equal to the number of controlled connections, e.g. a way valve with 5 controlled connections and 3 switch positions: 5/3-way valve. Depending on the type of actuation, there are:

- way valves, mechanically actuated (pushbutton, lever, pedal, feeler, feeler roller)
- way valves, pneumatically actuated
- way valves, electrically actuated (solenoid valves).

Pressure Regulating Valves:

Mechanically actuated regulating and micro-regulating valves

These are pressure valves with two end positions and infinite intermediate positions. The valves are used to regulate the pressure in a compressed air system following the valve (secondary pressure) independently of the pressure preceding the valve (primary pressure) within a certain defined range in dependence on a distance to be covered.

Pneumatically actuated regulating valves (relay valves, pressure ratio valves)

These are remote controlled pressure valves which hold the output pressure (operating pressure) proportional to the control pressure. The pressure ratio between control and operating pressure is determined by the ratio of the regulating areas in the valve pressurized by the control pressure and by the operating pressure.

Pressure Reducing Valves

These reduce the pressure in a compressed air system behind the valve independently of the pressure preceding the valve to a certain value and keep this value constant. Setting is made by turning the adjusting spindle until the related pressure gauge shows the value set.

Blocking and Throttle Valves:

Check valves

These are blocking valves which permit passage in 1 direction only.

Change valves

These are blocking valves with 2 blockable inflows and 1 outflow.

Quick venting valves

These are blocking valves which vent the output line out into the open when the input line is vented, e.g. for quick venting of a cylinder.

Flow control valves

These have free flow in 1 direction and throttled flow in the other and regulate the piston speed of compressed air cylinders.

1. Purpose

The purpose of the maintenance unit is to free the compressed air from solid and liquid contaminants, to monitor the mains pressure (underpressure) and to inject oil into the air.

Part of the clean but unoiled air is used for blower air, in case the machine is provided with this, comparisons:

=HE 11 Web threading,

=HH 34 Trim slitters.

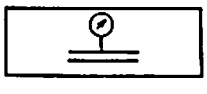
2. Function

2.1 Compressed Air Cleaning

Compressed air filter. The filter separates any remaining condensate and any solid contaminants which may have entered the air from the main piping in form of rust particles.

2.2 Compressed Air Monitoring

Pressure monitor =HA 10.N1-F1. The pressure monitor prevents the machine from operating if the pressure drops below the set minimum pressure (setting "lower switching pressure"). An underpressure initiates a machine stop.



Check valve. The check valve prevents the air from being completely emptied from the system in the machine if there is a loss of pressure in the main supply. Pressure gauge, control desk +P2. The pressure gauge measures and displays the operating pressure. For recommended operating pressure, see technical data =H in Section 1.

2.3 Oil Mist Lubrication

Compressed air oiler. The oiler lubricates the pneumatic operating control elements. Fine atomization of the lubricant ensures optimum lubrication with a small volume of oil.

1. General Remarks

The hydralic unit is a drive unit, the purpose of which is to create a liquid flow and give this the necessary pressures.

This hydraulic drive unit comprises:
tank, drive motor, pump (single or double pump), return filter, control, measuring and regulating units.

2. Function

For a description of the individual units, technical data and details on checking the function prior to commissioning, see:
sub-suppliers' manual =HA 40 in Book 2,
hydraulic diagram and/or
instrument list =HA 40 in Section IV.

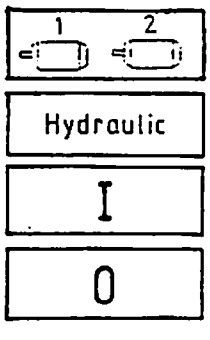
2.1 Oil Tank

When the oil tank is initially filled, the pump must be switched off. The oil level can be checked on the oil level indicator. The filling is not included in our delivery scope. For the grade of oil, see the lubrication chart =H in Section 1.

2.2 Motor and Pump

Types: 1) Motor and single pump,
2) Motor and double pump,
3) Dual motor-pump combination.

2.2.1 Switching Elements, Control Desk +P2



=HA40.N1-S1: Selector switch, hydraulic pump motor: "1 / 2"
Only for hydraulic units with dual motor-pump combination (type 3)

=HA40.N1-S12 Illuminated pushbutton, hydraulic pump: "ON"

=HA40.N1-S11 Pushbutton, hydraulic pump: "OFF"

2.2.2 Pump Switchover Unit

This unit either for double pumps or pump combinations (see hydraulic diagram =HA40) serves to switch over the pumps to pressureless circulation.

This unit comprises a solenoid valve and a pressure limiting valve.

During winding, only the oil volume of pump Q1 is required for rider roll and shaftless rewind. When the machine is stopped, pump -Q2 is switched on for all movements.

2.3 Return Filter

The return filter basically comprises: housing, filter element, dirt trap head and electrical dirt indicator. For description and maintenance see:
return filter =HA40 in Book 2, sub-suppliers' manual.

2.4 Check Valves

The check valves prevent the system from emptying if a pump fails.

1. Parking Brakes, =HB41

Pneumatic diagram: =HB41

1.1 Mode of Operation

For rapid braking of the machine (emergency stop) a brake torque is required, which is generated by drive motors through field reversal.

The parking brake engages only when the machine has been decelerated to a low speed (threading speed). The tachogenerator motor acts on a way valve (solenoid =HB41.N1-Y11 is energized).

A limit switch is located on the parking brake of the drive. When the machine is braked, the limit switch is not actuated, so that the control circuit of the motor motor is not closed. Only after the brake has been released (limit switch is actuated) does the motor start moving.

2. Guide Roll and Rider Roll Brakes =HB45

The brake cylinders of the guide and rider roll brakes are also supplied by the parking brake =HB41 way valve. The guide and rider roll brakes engage simultaneously with the emergency brake of the winder drums.

1.
MODE OF OPERATION

The WEB THREADING elements serve to thread a web of material into the machine.
We differentiate between:

a)
threading a new web after loading a new reel into the unwind

b)
threading the web after a web break.

The most important web threading components are:

- an airfloater to facilitate threading the web up to the first guide roll

- threading tape cradle on the guide rolls. The cradle can be engaged and retracted. The tape rolls are driven by a gear motor.

- guide plates for threading the web up to the slitting station

- guide plates with blower air pipes for transporting the web up to the winder drums

- threading tape cradle on the first winder drum with blower air, for threading the web into the winder drum nip. The tape cradle can be engaged and retracted. The tapes are driven by the winder drum when the cradle is engaged.

- blower air pipes on the ejector unit as well as on the bottom slitter beam as threading aid after a web break.

2.
OPERATION

2.1
For threading a new web, see =H, 4.20
Makeready and Settings on the Machine.

2.2
For threading the web after a web break, see =H, 4.20
Makeready and Settings on the Machine.

3.
SETTINGS

3.1
The threading tape cradle on the guide rolls rests on the same with its own weight only. The lowering (engaging) speed is set on throttle =HE11.-16.

3.2
The engaging speed of the tape cradle on the winder drum is set on throttle =HE11.-13.

3.3
The blower air on the blower air pipes is set on the low-pressure valves =HE11.-07, -08, -09, -10.

1.
MODE OF OPERATION

Purpose of the electrical web tension control is to so regulate the brake generator that the web draw between unwind and winder, once it is set on potentiometer "WEB DRAW" (=HB61.U1-R11), remains constant throughout the winding operation.

The draw measuring units (load cells) are mounted underneath the bearings at both ends of the second guide roll.

The web wraps the guide roll, whereby the resulting force acts on the bearing points. The horizontal share of this force is measured and converted into an electrical signal.

This signal influences the brake torque of the brake generator via amplifier, control unit and potentiometer.

2.
OPERATION

The required web draw (web tension), which depends, among other factors, on the basis weight, on the paper grade, on the web width and on the desired winding hardness, is set on the potentiometer "WEB DRAW" (=HB61.U1-R11).

The existing web draw at any moment is shown in percent on the indicating instruments (=HB61.U1-P14) (=HB61.U1-P15).

1. Mode of Operation

The purpose of the first guide roll following the unwind is to transfer the web on to the following sensing roll with a constant angle of wrap.

Whereas the guide roll is installed in a fixed position, the sensing roll is pivotably mounted on one side to take up the web tension control equipment (see HF21).

Both rolls are not driven and, depending on the equipment, are provided with one drum brake or disc brake each.

1.
MODE OF OPERATION

Purpose of the spreading equipment ahead of the slitting station is to spread and tension the web in cross direction so that it runs into the slitting station free of folds or wrinkles.

2.
OPERATION

The spreading unit can be pivoted around its pivot points into the web or away from the web.

Each roll section of the spreading unit can be adjusted individually by means of the handwheels as required to ensure wrinkle-free web run.

The handwheels are fitted with position indicating dials. The dial shows in each case the respective position of that particular roll section in relation to the middle position (middle position = zero position).

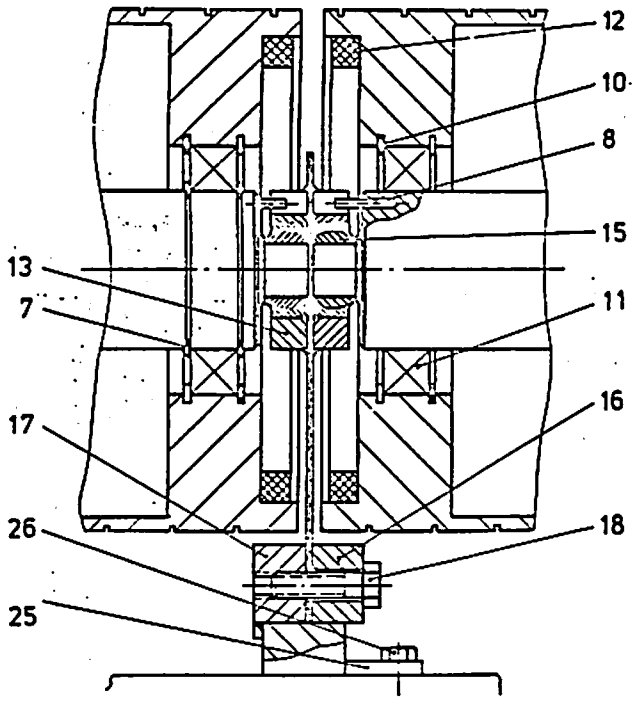
When the screws on both bearings have been loosened, the spreading unit can be raised or lowered.

3.
MAINTENANCE, CHANGING A COMPLETE ROLL SECTION

If a roll segment or section must be removed, remove screws 18 on bracket 17 and remove strip 16. Now pull out the roll segment with the retaining plates.

A new roll segment can now be installed.

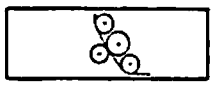
Then insert the retaining plates again and fasten the strip to the bracket again with the screws.



1. Mode of Operation

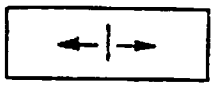
The slitting station divides the paper web into the required number of individual webs. Slitting is done by single slitter pairs consisting of top and bottom slitters. During slitting, the bottom slitter acts as counter knife to the top slitter. The machine is provided with 1 guide roll each ahead of and following the slitting station.

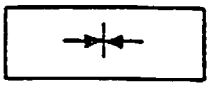
2. Slitter drive (=HB10)



Each bottom sitter is driven by a frequency controlled AC motor:
bottom slitter drives "ON"
=HB10.N1-S12 - illuminated pushbutton - control desk +P2,
bottom slitter drives "OFF"
=HB10.N1-S11 - pushbutton - control desk +P2.

3. Slitter clamping (HH71)





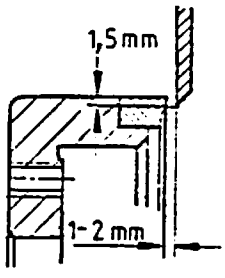
The top and bottom slitters are mechanically interlocked and shifted in pairs via handwheel, pinion and gear rack.
Pneumatic clamping of the bottom slitters against the slitter beam:
bottom slitters "RELEASE"
=HH71.N1-S12 - illuminated pushbutton - control desk +P2,
bottom slitters "CLAMP"
=HH71.N1-S11 - pushbutton - control desk +P2.

The top slitter shut-off valves must be closed when the slitting widths are reset. The valves remain closed on the top slitters which are not required.

4. Slitter Engagement (=HH81)

4.1 Manual Settings

4.1.1 Radial and Axial Distance of the Slitter Cutting Edges



Adjustment is made in slitting position.

Radial: Overlap approx. 1.5 mm
Axial : Lateral distance approx. 1 - 2 mm

If these adjustment figures are not adhered to, damage to the top slitters and poor slitting results can be expected.

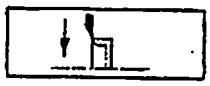
4.1.2 Slitting Pressure

Slitting pressure adjustment, hydraulic diagram =HH81 mounting plate: pressure reducing valve, pressure gauge.
Recommended pressure setting: 2 - 2.5 bar.

4.2. Top Slitters

Separate pneumatic cylinders for penetration depth (radial) and slitting pressure (axial) of the top slitters. Groups:
Trim sitters (=HJ00 + ..)
The top slitters for trim slitting normally remain in slitting position, the shut off valves remain closed.
Inner slitters (=HJ01 - ..)
(Top slitters for the web slit)

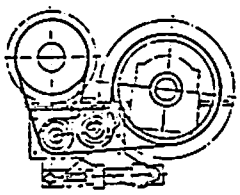
Slitter Engagement:
Top slitters "ON"



=HH81.N1-S12 - illuminated pushbutton - control desk +P2
the top slitters pivot radially into slitting position and then press against the slitting edges of the bottom slitters with a delayed axial movement.

Top slitters "OFF"

=HH81.N1-S11 - pushbutton - control desk +P2
the top slitters retract axially and then radially with delay.



1. DESCRIPTION

The drive belt connects:
- the belt pulley on winder drum 1 (winder drum with the larger diameter) which is driven by the main drive and
- the belt pulley or adjustable belt pulley on winder drum 2
  (adjustable belt pulley = special equipment).

For details of the drive belt, see Manual 2, Sub-supplier's Instruction =HL 21. The belt is tensioned by a hydraulic belt tensioning arrangement.

2. HYDRAULIC BELT TENSIONER

For the hydraulic diagram see =HL 21 (Manual 4).

2.1 SETTING BELT TENSIONING PRESSURE

Pressure setting for the hydraulic cylinder is made on the pressure reducing valve (=HL21.). For the required pressure, see the hydraulic diagram.

2.2 HYDRAULIC CONTROLS

Control is done through a double solenoid valve (=HL21.) with blocked middle position.
Switching positions:

1. Solenoid =HL21.N1-Y12 energized:
   "BELT TENSIONER SLACKEN"
   The belt must be slackened during the ejecting and lowering operations so that winder drum 2 can rotate. Winder drum 1 remains locked in position by the parking brake.

2. Solenoid =HL21-N1-Y11 energized:
   "BELT TENSIONER TENSION"
   When the proximity switch "LOWERING PLATFORM DOWN" (=HR41.N1-B16) is actuated, the belt is automatically tensioned again.

3. Solenoids de-energized:
   "BLOCKED MIDDLE POSITION"
   The solenoids switch into blocked middle position so that in case of a power failure the belt remains tensioned until the machine has come to a stop.

1.
Mode of Operation

The reel diameter indicator basically consists of a diameter scale and a shiftable proximity switch with indicator, held by magnetic force. This switch is actuated by a second indicator which is mounted on the shaftless rewind. The core chucks of the shaftless rewind are guided upwards as the reel diameter increases. When the indicator of the shaftless rewind reaches the proximity switch on the scale, i.e. when the required reel diameter has been reached, the machine switches to halt. It should be borne in mind that the overrun period will be different depending on the machine speed.

2.

Operating Instructions

Shift the limit switch on the guide strip so that its indicator points to the required reel diameter (take overrun period into account).

Important Note

When the machine has been switched off on reaching the set reel diameter, it may only be restarted when the proximity switch has been set to a larger reel diameter.

For safety reasons, it is not permissible to override the proximity switch, as in this case the machine would not be automatically switched off when the max. reel diameter is reached.

1. MODE OF OPERATION

The core chucks of the shaftless rewind assembly serve to guide the rewinding roll set laterally during the winding operation.

The core chucks are shifted in axial direction by rotating field magnets and lead screws.

The maximum shifting distance is 350 mm (about 13 3/4") on each side, i.e. the trim width can normally be reduced by 700 mm (about 27 1/2").

The chucks are retracted and cored up with a constant shifting distance of approx. 60 mm (about 2 3/8").

The vertical movement and counterloading of the rewind carriages is powered on each side by a hydraulic cylinder.

The rewind bearings are mounted on the machine uprights in low-friction guides.

Due to the different winder drum diameters, the center of the rewinding roll describes a curve as the rewind diameter increases.

As the rewind carriages are guided in straight guides, the core chucks must be able to give way for an amount equal to the maximum deflection of the curve.

At the start of winding, for core outer diameters of 90 - 180 mm (3 1/2" - 7"), the shaftless rewind is positively guided; the core chucks are laterally aligned to the cores.

The vertical position of the core chucks in the bottom end position is ensured by interchangeable limit stops.

1.1

Hydraulic Controls (hydraulic diagram =HL 41)

SHAFTLESS REWIND UP

- Solenoid valves =HL41.-64, or =HL41.-68 switch to UP (solenoids =HL41.N1-Y11 or =HL41.N2-Y11 are energized)
- The pressure set on pressure reducer =HL41.-65 + =HL41.-69 is applied to the ring-shaped faces of the cylinder pistons.
- The rising speed is set on throttles =HL41.-67 or =HL41.-71
- The shaftless rewind assemblies are raised in jog (inching) mode.
- The solenoid valves SHAFTLESS REWIND COUNTERLOAD (=HL41.-72 or =HL41.-74) remain shut. (Solenoid =HL41.N1-Y10 or =HL41.N2-Y10 are de-energized).
- In case of power failure, the shaftless rewind assmblies stop.

1.2

Hydraulic Controls

SHAFTLESS REWINDS DOWN

- Solenoid valves =HL41.-64 or =HL41.-68 switch to DOWN (solenoids =HL41.N1-Y12 or =HL41.N2-Y12 are energized).
- The lowering speed is set on the throttles =HL41.-66 or =HL41.-70.
- The shaftless rewinds are lowered in jog (inching) mode.

- The solenoid valves SHAFTLESS REWINDS COUNTERLOAD =HL41.-72 or =HL41.-74 remain shut.
  (Solenoids =HL41.N1-Y10 or =HL41.N2-Y10 are de-energized).

- In case of power failure, the shaftless rewind assemblies stop.

1.3
Hydraulic Controls
SHAFTLESS REWINDS COUNTERLOAD

- During the winding operation, the rewind cores of the end rolls should be relieved of the weight of the shaftless rewind assemblies.
  The relief or counterloading pressure should be so set that there is even a slight upwards tendency of the rewind carriage.

- Solenoid valves =HL41.-72 or =HL41.-74 switch to COUNTERLOAD.

- The pressure set on the pressure reducers =HL41.-73 or =HL41.-75 is applied to the ring-shaped areas of the cylinder pistons.

- The solenoid valves =HL41.-64 or =HL43.-68 remain in middle position (solenoids =HL41.N1-Y11, =HL41.N1-Y12 or =HL41.N2-Y11, =HL41.N2-Y12 are de-energized).

2.
OPERATION

2.1 Retract core chucks (pushbutton station +R511 and +R512)

The core chucks are retracted from the cores by pressing the pushbuttons =HL40.N1-S13 and =HL40.N2-S13. (A1 + A7)

The core chucks on both sides of the machine retract from the cores of the finished roll set by a distance of about 60 mm (about 2 3/8") each. The retracting movement is powered by a rotating field magnet and lead screw on each side.

When the core chucks have been retracted, move the rewind carriages (core chuck assemblies) up by pressing pushbuttons (B2) =HL41.N1-S13 and =HL41.N2-S13.

In their upper end position, the rewind carriages actuate limit switches (condition for ejecting the roll set).

2.2 Coring up (extending) core chucks into cores

Extend core chuck on fixed side (left side) by pressing pushbutton "CORE CHUCK EXTEND" (+R511 =HL40.N1-S14). (A5)

The core collar of the core chuck must be exactly in line with the left-hand trim slitter in the slitting station.

Slide the first core onto the core chuck, then feed in the remaining cores in the proper order.

Then extend the core chuck on the opposite side by pressing pushbutton =HL40.N2-S14 "CORE CHUCK EXTEND". Core chuck must enter core up to the collar. Make certain that the end of the core is in line with the trim slitter (same scale value for core chuck and trim slitter on both sides).

2.3 Automatic Operation (only for automatic finished roll set change)

In the automatic roll set change, extension and retraction of the core chucks as well as raising and lowering of the core chuck/rewind carriages takes place automatically within the Sequential Switchings I and II.

For description of the Sequential Switchings,
see =H: Product Information, 4.30: Operation and Production.

2.4 Shaftless rewind carriages UP - DOWN

The core chucks/rewind carriages can be raised or lowered in jog (inching) mode by pressing the pushbuttons:

"SHAFTLESS REWIND UP" (=HL41.N1-S13)
(=HL41.N2-S13) resp.
"SHAFTLESS REWINDS DOWN" (=HL41.N1-S14)
(=HL41.N2-S14).

In automatic mode, these movements are carried out automatically within the Sequential Switchings (see Section 2.3).

3.
POSITIONING

3.1 Altering the trim width through manual positioning

Two limit switches each mark the forward and rear end position and therewith determine the space within which the core chuck can move. When re-positioning (setting to a new trim width), the limit switches are bridged, the stop cam contacts the stop screw and the gearing can continue to rotate through a slipper clutch and shift the core chuck to the new position. However,

positioning can only be in the direction "EXTEND", i.e if the core chuck was extended too far, it must be moved back in the direction "RETRACT" by at least 60 mm (about 2 3/8") and positioned anew in the direction "CORE UP".

Pushbuttons: see pushbutton panels +R511 and +R512.

Pushbutton A =	"Core Chuck Core Up"	=HL40.N1-S14;
		=HL40.N2-S14;
Pushbutton B =	"Core Chuck Retract"	=HL40.N1-S13;
		=HL40.N2-S13;
Pushbutton C =	"Core Chuck Position"	=HL40.N1-S10;
		=HL40.N2-S10.

When the pushbuttons are pressed, the following functions are initiated:

Pushbutton A	= core chuck moves the fixed distance of about 60 mm in direction "CORE UP".
Pushbutton B	= core chuck moves the fixed distance of about 60 mm in direction "RETRACT".
Pushbuttons A-C (pressed simultaneously)	= core chuck keeps moving in direction "CORE UP" as long as both pushbuttons remain pressed.
Pushbuttons B-C (pressed simultaneously)	= core chuck keeps moving in direction "RETRACT" as long as both pushbuttons remain pressed.

When the core chucks have been positioned, their next movement of the fixed distance of about 60 mm must only be in direction "RETRACT", since a movement in the direction "CORE UP" would result in a change in the trim width which has just been set.

Before starting to wind a new set of rolls, the pushbuttons for the function "Core chucks core up" must have been actuated, otherwise the machine drive cannot be accelerated beyond "Threading speed".

3.2 Changing the stops to suit the core diameter

The downward movement of the shaftless rewind (core chuck assemblies) is limited by stops which are mounted on the guide tubes of the rewind carriages.

When changing the core outside diameter, these stops must also be changed.

4.
SETTINGS MADE IN THE FACTORY

The two cams for operating the limit switches for axial movement of the core chucks have been set in the factory so that the limit switches are actuated about 0.5 to 1 mm before the stop cam reaches the stop screw.

The slipper clutches for shifting the core chucks are set to a torque of 2 Nm (0.2 kpm).

1.
MODE OF OPERATION

Purpose of the rider roll is to press the rewinding roll set against the winder drums, particularly at the start of winding, thereby establishing the necessary contact for the peripheral forces (nip pressures).

Essential Components:

- rider roll, divided into sections
  (diameter 260 mm = about 10 1/4")
- a pivot point shaft mounted on the rider roll beam.
  Gears mounted on the rider roll beam.
  Gears located at the ends of the pivot point shaft mesh in gear racks mounted on the stands. This arrangement ensures the parallel guiding of the rider roll.
- rider roll carriages on both sides, guided in low-friction rails.
- two disc brakes to brake the rider roll when the same is driven by the web only. (If rider roll is driven by two DC motors via flat belts, braking is via the DC motors).
- hydraulic cylinders, pressurized on both sides of the pistons, directly connected to the rider roll carriages, for electronically controlled counterloading and damping of the rider roll.

1.1
Rider Roll Counterloading Controls

Potentiometer "REWIND DIAMETER" (=QQ80.-R10) registers the momentary rewind diameter. This signal is converted to a hydraulic pressure via the rider roll electronics and an electrically adjustable hydraulic pressure reducer, and this pressure acts on the ring surface sides of the hydraulic cylinder pistons.

During the winding process, this pressure changes according to a curve.

The course of this curve can be altered by adjusting a total of three points along its path:

Point 1:
Counterloading pressure in the cylinder at start of winding.

Point 2:
To obtain a uniform roll structure (winding hardness build-up) at the roll center, it is necessary to increase the nip load on the roll set by increasing the pressure of the rider roll. In other words, up to a rewind diameter of about 300 mm (about 12") the counterloading pressure decreases, and thereafter slowly increases again in accordance with the shape of the curve.

Point 3:
Vertical adjustment
This corresponds to the maximum counterloading pressure in the hydraulic cylinders; the rider roll just barely touches the rewinding roll set (floating state).

Horizontal adjustment
This setting determines the roll diameter at which the floating state should be reached.

1.2
Hydraulic Controls
RIDER ROLL UP

See hydraulic controls (hydraulic diagram =HL51) RIDER ROLL UP

Solenoid valve =HL51.-38 switches to UP
(solenoid =HL51.N1-Y11 is energized).

Full pressure is applied to the ring-shaped faces of the cylinder pistons. The rider roll is raised in holding line, i.e. in self-maintained contact.
(To stop rider roll during upward movement, tip pushbutton "RIDER ROLL DOWN" (=HL51.N1-S14).
The upward speed is set on the throttle =HL51.-41.

In the upper end position of the rider roll, solenoid valve =HL51.38 remains in the position "RIDER ROLL UP" (solenoid =HL51.N1-Y11 energized).

Solenoid valve WINDING PRESSURE =HL51.-07 remains closed.
(Solenoid =HL51.N1-Y13 is de-energized).
In case of current failure, the rider roll stops. The cylinder connections on the ring surface sides are fitted with pipe-rupture safety valves.

1.3
Hydraulic Controls
RIDER ROLL DOWN

Solenoid valve =HL51.-38 switches to DOWN.
(Solenoid =HL51.N1-Y12 is energized).

At the same time, the pilot-controlled check valve =HL51.42 opens. The rider roll lowers through its own weight. The pressure limiting valve =HL51.40 should be set to a pressure which is about 3 to 4 bar (43 - 57 psig) lower than the pressure required for raising the rider roll. However, if this pressure is set too low, the rider roll will deform the cores in the winder drum valley when it seats on them.

The rider roll is lowered in inching (jog) operation.
The lowering speed is set on throttle =HL51.-49.
The solenoid valve WINDING PRESSURE =HL51.-39 remains closed (Solenoid =HL51.N1-Y13 is de-energized).

In case of current failure, the rider roll stops.

1.4
Hydraulic Controls
RIDER ROLL WINDING PRESSURE

Valve =HL51.-49 switches to "WINDING PRESSURE". (Solenoid =HL51.N1-Y13 is energized).
Valve =HL51.-38 is in middle position. (Solenoid =HL51.N1-Y11 and =HL51.N1-Y12 are de-energized).

The pressure prescribed by the electrically controlled pressure reducing valve =HL51.-44 builds up in the raising line (ring-shaped area) of the cylinder.

The hydraulically pilot-controlled check valve (=HL51.-48) prevents oil from flowing off via the leakage oil line of the pressure reducer (=HL51.-44) when the rider roll is stopped. This valve is opened by solenoid valve =HL51.-49 "WINDING PRESSURE".

1.5
EMERGENCY OPERATION

If the pressure reducing valve =HLK51.-39 fails, open shut-off valve =HL51.-47 and close shut-off valves =HL51.-33 and =HL51.-45.

Set the counterloading pressure with the pressure reducer =HL51.-42. Correct setting during the winding operation if necessary.

When switching back to normal operation, open the shut-off valve =HL51.-43 and =HL51.-45 again and close shut-off valve =HL51.-47.

2. OPERATION

The counterloading or relief pressure existing in the raising line (ring-shaped area) of the cylinders is shown on the hydraulic pressure gauge on the control desk.

2.1 RIDER ROLL UP

The rider roll is raised by pressing pushbutton =HL51.N1-S13 "RIDER ROLL UP". The rider roll rises in maintained line contact.

In the Sequential Switchings (when these are supplied), the rider roll is raised automatically in maintained line contact.

2.2 RIDER ROLL DOWN

The rider roll is lowered in inching operation by pressing pushbutton "RIDER ROLL DOWN" (=HL51.N1-S14). If the pushbutton is released, the rider roll stops.

In the Sequential Switchings (when these are supplied), the rider roll is lowered automatically in maintained line contact.

2.3 RIDER ROLL WINDING PRESSURE

The counterloading pressure pre-set by the electronically controlled pressure reducer is applied by pressing the pushbutton "RIDER ROLL WINDING PRESSURE" (=HL51.N1-S10).

When proximity switch "RIDER ROLL DOWN" has been actuated, the counterloading system is switched over with delay to "WINDING PRESSURE".

3.
SETTING THE RIDER ROLL

The rider roll is set or adjusted parallel to the winder drums by adjusting the gears on the pivot point shaft when the rider roll is in its bottom end position.

To adjust, release the shaft clamp of one gear and, when rider roll is properly parallel, tighten it again (tightening torque of the clamping screws: 70 Nm).

The maximum rotating angle of potentiometer =QP80-R10 "Rewind Diameter" is 3600° = 10 rotations. However, only approximately 2880° = 8 rotations are utilized.

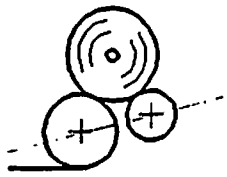
When installing the potentiometer, make certain that when the rider roll is in its bottom or top end position there is approximately one rotation in reserve as safety, so that the potentiometer is not damaged.

NOTE!
The timing belts must only be lightly tensioned, so that no radial forces are exerted on the potentiometer shaft.

4.
MAINTENANCE

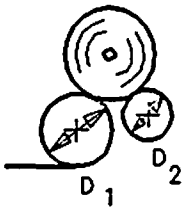
Gear racks, pinions, round guides and roller track should be cleaned daily and lightly greased.

Check the parallelism of the rider roll to the winder drums once a month.



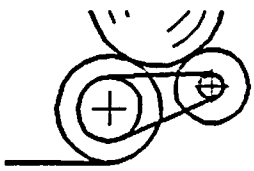
1. Description

The winder drums support the rewind reel set. The VARI-STEP has 2 winder drums of different diameters in a precisely calculated relationship and at different horizontal levels.



1.1 Winder Drum Diameter Combinations (D1 : D2)

- VARI-STEP 30 = 610 : 410,
- VARI-STEP 43 = 750 : 500,
- VARI-STEP 65 = 850 : 610.



1.2 Winder Drum Drive

Single motor drive. Direct drive for the first winder drum or with gear trasnmission. The second winder drum is driven by belt transmission from the first winder drum.

1.3 Surface of the Winder Drums

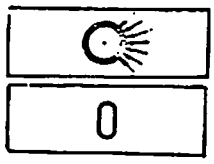
Both winder drums have a rough surface to improve traction.
- Normal version = shot steel blasted,
- special version = molybdenum coated.

1.4 First Winder Drum with Grooving (Special Version)

To avoid an air cushion between the web and the first winder drum which is wrapped by the web to a large degree, the drum can be provided with grooving.

1.5 First Winder Drum with Suction Perforations (Special Version)

To facilitate web threading and to retain the web during automatic reel set change (if supplied), the drum body can be provided with perforations over the entire surface. A partial vacuum created in the drum by drawing off air through a central bore in the drum journal. The suction air can be switched on or off (suction air fan) on control desk +P2 irrespective of the sequential switching:



= HE31.N1-S12 illuminated pushbutton, suction air "ON"
= HE31.N1-S11 pushbutton, suction air "OFF"

2. Mode of Operation

The rewinding reel set only lies approximately evenly on the two winder drums at the start of winding. This helps to form a relatively hard reel center. The diameter ratio of the winder drums and their slanted position to each other effect a shift in the weight of the rewind reel as the diameter increases to the larger winder drum. This reduces the web tension generated in the nips, thus achieving greater uniformity in the reel structure.

2.1 Winding Technology

See "technical information" 2.66-02, winding technology of the VARI-STEP (Trial Report).

1.
MODE OF OPERATION

The adjustable core stop is mounted on the opposite side from the core feeding side.

In its initial or retracted psoition, the stop is fully retracted. The ejector unit can swing past it.

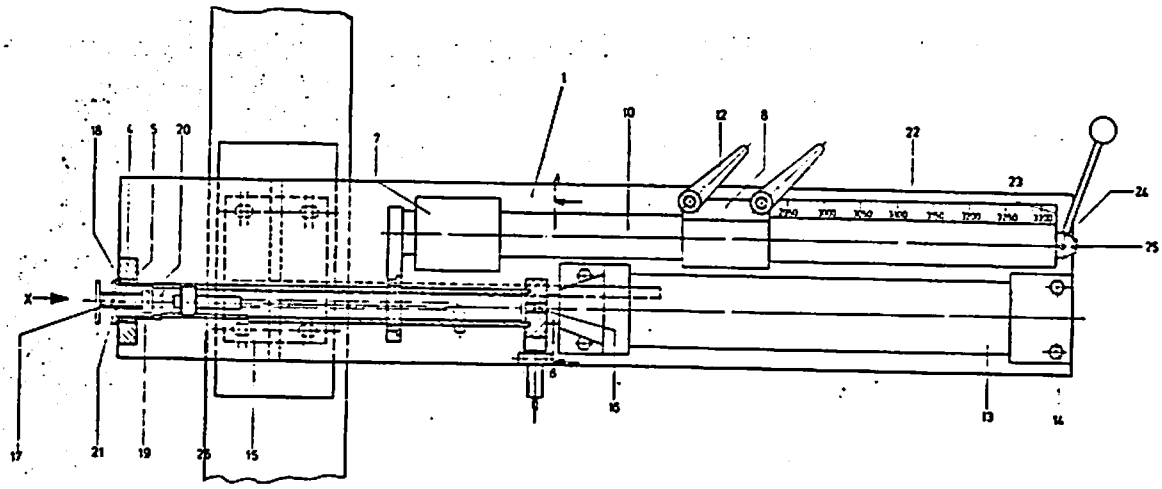
A pneumatic cylinder (13) extends the core stop unit into the opened core clamp, resp. retracts it.

The cylinder stroke is limited by an adjustable stop (10).

A spring-loaded plate (17) is mounted at the front end of the core stop unit; the cores are pushed against this plate. This actuates a proximity switch (26), which indicates by a pilot lamp that the core set is seated snugly up against the core stop.

The core stop assembly is then retracted into its initial position by pushbutton.

Proximity switches register the extended and retracted positions of the core stop assembly.



2.
OPERATION

2.1 Set the core stop assembly to the same scale value to which the trim slitter and the extended (cored-up) core chuck have been set.

2.2 Then press illuminated pushbutton "CORE STOP EXTEND" (=HP95.N3-S13); the core stop is extended pneumatically. When the extended end position has been reached, the proximity switch "CORE STOP EXTENDED END POSITION" (=HP95.N3-S13) is actuated and the illuminated pushbutton lights up.

2.3 Insert the cores into the core clamp in the correct sequence. At the same time, press the foot switch "GLUE APPLICATION ON" (=HP96.N1-S13). A track of glue is consequently applied to the cores as they are fed into the core clamp. (See also HP 96 "CORE GLUE APPLICATION").

When inserting the cores, take care that they are not twisted or rotated.

Feed the cores into the core clamp until they seat snugly against the stop plate of the core stop assembly.

This actuates the proximity switch "CORE AT CORE STOP" (=HP95.N3-B17), and the pilot lamp "CORE ON CORE STOP" (=HP95.N3-H1) lights up.

2.4 Now press pushbutton "CORE STOP RETRACT" (=HP95.N3-S14); the core stop assembly is retracted pneumatically.

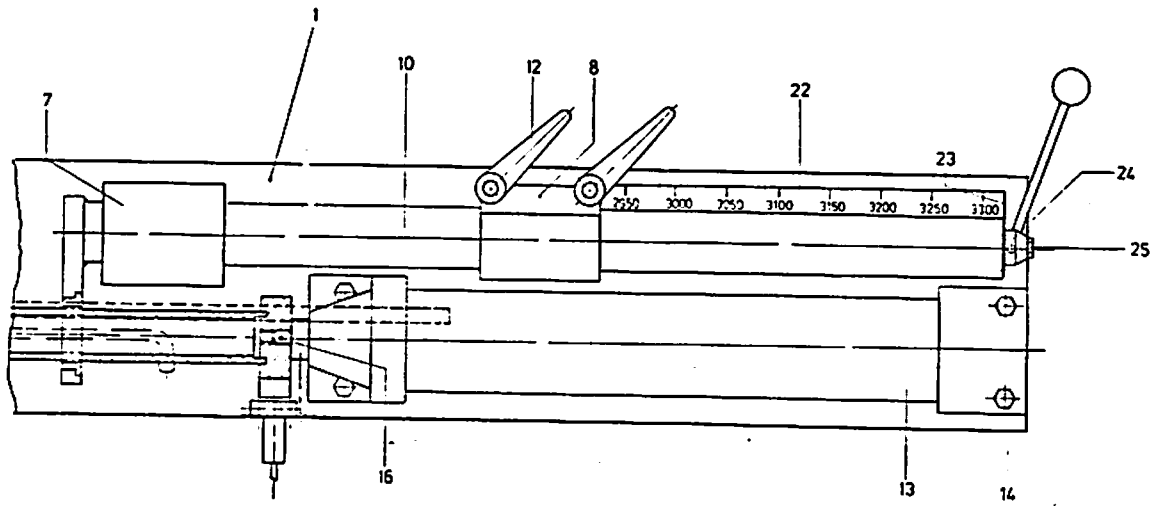
In the retracted end position, proximity switch "CORE STOP RETRACTED END POSITION" (=HP95.N3-B16) is actuated. This enables the ejecting operation and/or the sequential switchings.

3.
SETTING CORE STOP

When the clamping levers (12) are released, the core stop assembly can be shifted in the guides (7 & 8). Set the pointer (23) to the desired web width dimension (AB) on scale (22). The scale is so laid out that a narrower web width than the nominal trim width is symmetrical to the machine centerline.
(The scales for shaftless rewinding and the trim slitter coincide with the scale for the core stop).

When setting is completed, tighten the clamping levers again.

The cylinder can now extend the core stop assembly only up to the cylinder stop (10).



1.
MODE OF OPERATION

The equipment comprises essentially the adjustable core chute and the glue applicating system, which consists of a spray valve, glue tank and the pneumatic control equipment.

1.1 The adjustable core chute limits the opening stroke for the core clamp.

It is the extension outwards of the core clamp and has the same shape.

The abutting ends of core chute and core clamp must be flush.

1.2 For mode of operation and function of the glue applicating system, see separate manual of the manufacturer (Manual 2).

The glue should be sprayed on in a thin fog. Spacing between glue nozzle and core surface should be about 10 - 15 mm (3/8" - 5/8").

We recommend a water-soluable adhesive.
Example: DISPERGAN 11-760 from PKL; for description, see the PKL information sheet in Manual 2, Sub-supplier Instructions.

2.
OPERATION

The spray valve opens when the foot switch "GLUE APPLICATION ON" (=HP96.N1-S13) is actuated.

Note! Actuate foot switch only when there is a core within the range of the glue nozzle. Danger of soiling!

3.
SETTINGS

3.1 Pressure in Glue Tank: 1 bar (about 14 psig)

3.2 Pressure of Control Air: 4 bar (56 psig)
(Connection SL)

3.3 Pressure of Atomizing Air: 1 bar (14 psig)
(Connection ZL)

3.4 When changing to a different core outside diameter, the core chute and the spray valve must be reset accordingly.

4.
MAINTENANCE

4.1 For maintenance of the glue applicating system, see separate instructions of the manufacturer in Manual 2.

4.2 When applicable, the core chute must be cleaned of glue soiling in the area of the spray nozzle.

1.
MODE OF OPERATION

1.1 Roll Ejector

This unit ejects the completed roll set out of the winder drum valley onto the lowering platform.

The roll ejector is mounted pivotable around the center of the first winder drum. The two ejector levers are rigidly connected by the ejector beam to prevent twisting. Movement of the ejector is powered by hydraulic cylinders. The forward (eject) and rear (retracted) end positions are registered by proximity switches.

1.2 Core Clamp, only if the machine is equipped with automatic reel set change equipment (optional)

The machine-wide core clamp is mounted in the ejector beam. The core clamp holds the set of cores, which is brought into a position above the winder drum valley by the pivoting movement of the ejector beam. When the clamp opens in this position, the cores drop vertically into the winder drum valley.

The core clamp halves are supported at several points. The opening and closing (clamping) movements are powered by a pneumatic cylinder.

Uniform opening and closing of the core clamp is ensured by gears mounted on both halves of the core clamp.

1.3 Hydraulic Controls "EJECTOR EJECT / RETRACT"

Valve =HR11.-36 switches to "EJECT".
(Solenoid =HR11.N1-Y11 is energized).
Full pressure is applied to the piston rod side of the cylinder.

Ejection is in inching operation. When the pushbutton is released, the ejector retracts into its rear end position (solenoid =HR11.N1-Y11 is de-energized).

The speeds of the forwards and retracting movements are set on twin valve =HR11-37.

2.
OPERATION

Pressing pushbutton =HR11.N1-S13 pivots the ejector in "EJECT" direction in inching operation.
When the pushbutton is released, the ejector retracts into its rear end position.

In the Sequential Switching I (if this has been supplied), the core clamp opens automatically in the forward end position of the ejector beam.

3.
MAINTENANCE

The bearings and gears of the core clamp halves must be checked for easy movement and must be greased once a week.

0117B

1. Mode of Operation

With this unit the finished reel sets are lowered from the machine down to the floor. The lowering platform is mounted in flange bearings and is pivoted hydraulically round the second winder drum in travel direction.
The cylinders are safeguarded with pipe rupture check valves for the lowering movement.

The upper end position of the lowering platform is simultaneously guard and ejecting position.

When the machine is running, the platform is electrically interlocked with the drive.

2. Hydraulic Controls

Hydraulic diagram =HR41, control battery:

2.1 Way valve,

with Servo valve and two solenoids:

=HR41.N1-Y11 (energized), lowering unit up,
=HR41.N1-Y12 (energized), lowering unit down.

2.2 Flow Control Valve

to adjust the raising speed.

Instrument: JAG-microprocessor-system with graphic color CRT and printer.

Test Method: Footage of paper and roll diameter are determined continuously by pulse generators on winder drum and rewind. Thickness of the paper is computed from length and diameter data. By factoring in the constant basis weight of the paper we get the density of the roll.

Remarks: Caliper of the paper and consequently roll density are determined continuously on the run and displayed on the monitor. Thus there is a constant readout of paper thickness or density over diameter during the run. Since the order of magnitude of these measurements is very small - paper calipers in thousandth of mm and changes on the order of tenth of microns - it becomes necessary to measure several layers of paper at one time. Realistic numbers are between 100 and 300 plies. Therefore, there is a reference value at every 5 to 40 mm (1/8" to 1-1/2") depending on the caliper of the paper. These values are displayed graphically on a CRT during the run. The thickness of the paper or roll density over diameter can be printed on hard copy at the end of each run.

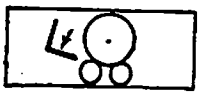
3. Operation, control desk +P2

The end positions of the platform are interrogated by proximity switches (see basic machine instrument location drawing).

3.1 Lowering Platform "UP"

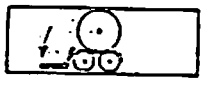
=HR41.N1-S13 pushbutton, actuated in inching operation. The platform pivots into upper end position (guard position). If the pushbutton is released, the platform remains in position. The way valve switches to center position (solenoids de-energized).

3.2 Lowering Platform "EJECT"



=HR41.N1-S10 pushbutton.
The platform lowers out of safety guard position into ejecting position. In this position, the ejected reels are taken up.

3.3 Lowering Platform "DOWN"



=HR41.N1-S14 illuminated pushbutton, actuated in inching operation.
The platform lowers from ejecting position into its lower end position. If the pushbutton is released, the platform remains stationary. The way valve switches to center position (solenoids de-energized).

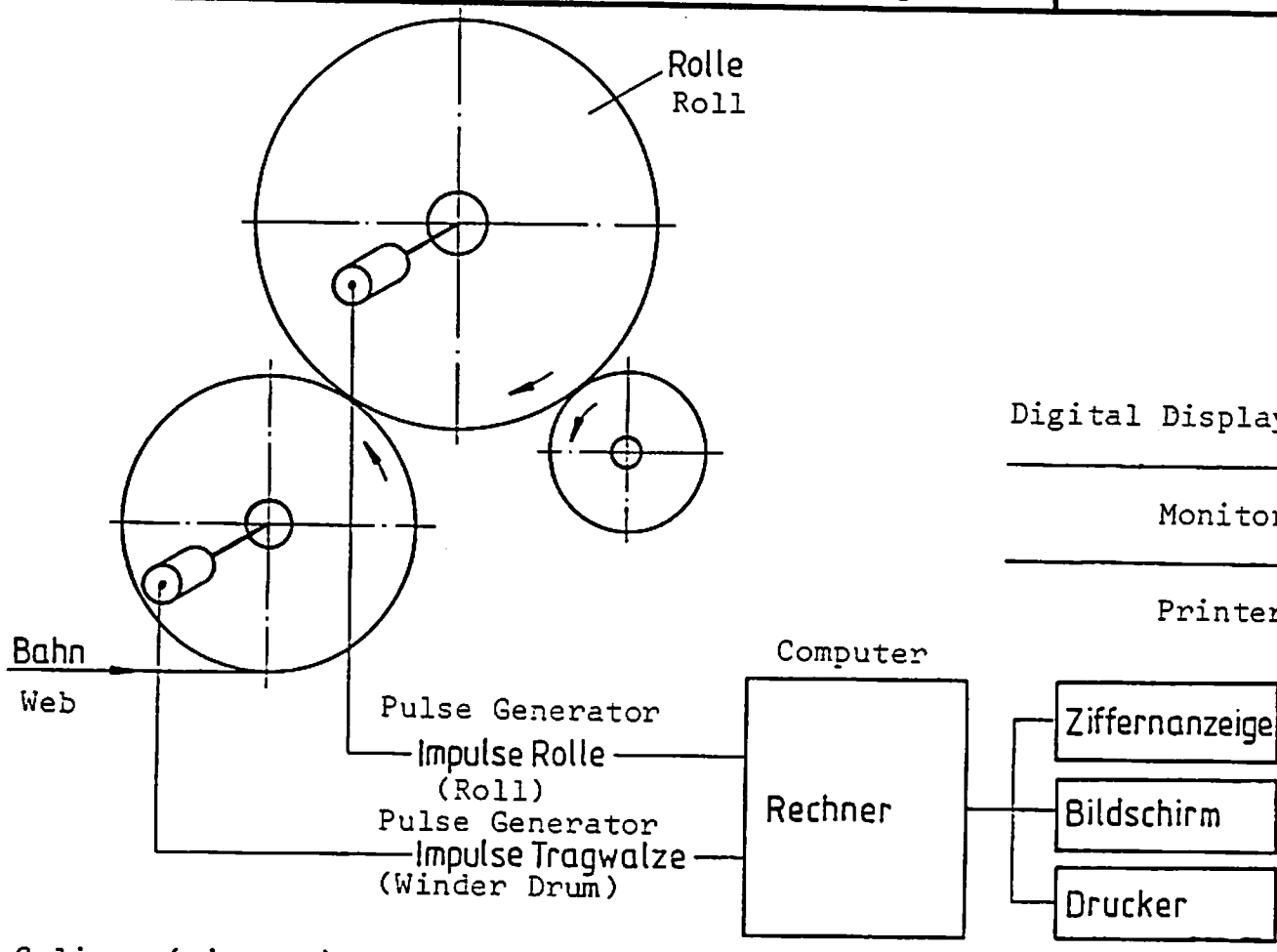
4. Movement Sequence of the Lowering Platform within the Sequential Switching (Special Version)

The movements of the lowering platform in connection with sequential switching (if supplied) are described in chapter "Operation and Production".

Instrument: JAG-microprocessor-system with graphic color CRT and printer.

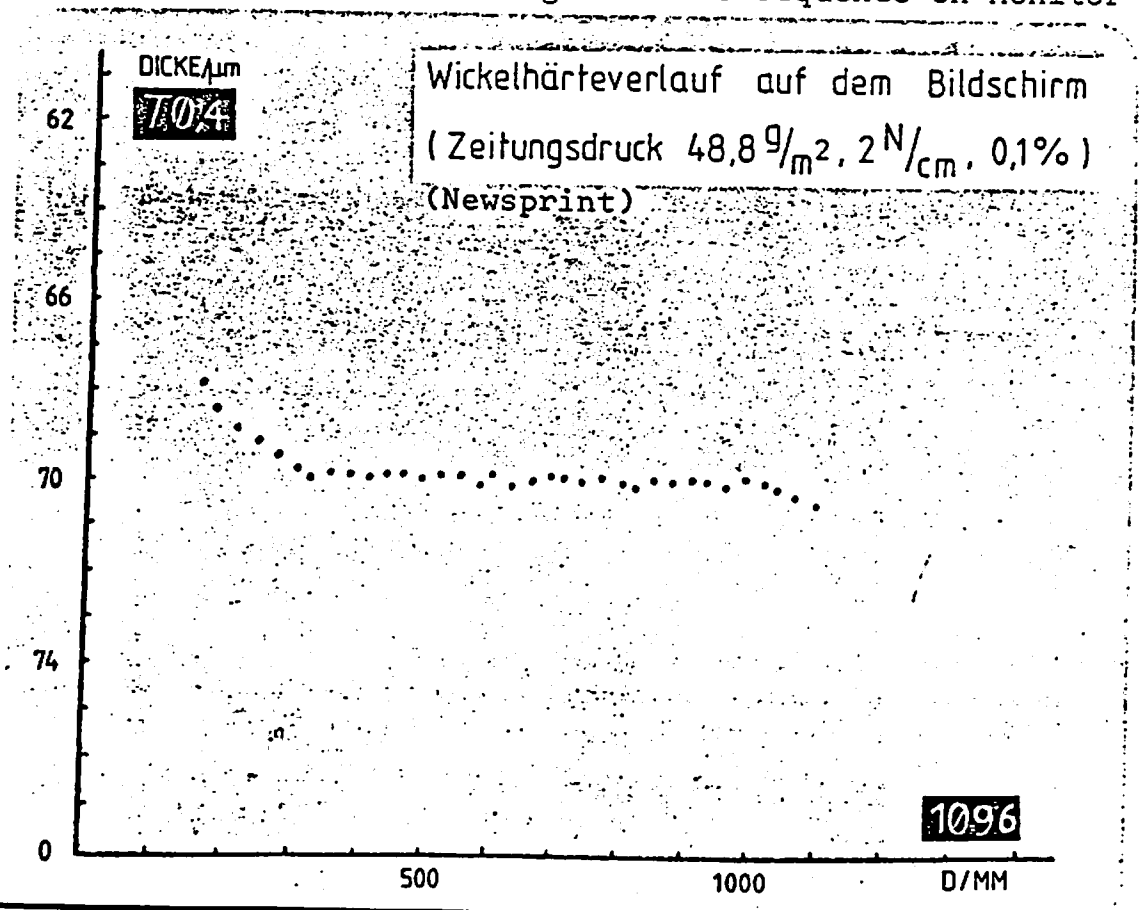
Test Method: Footage of paper and roll diameter are determined continuously by pulse generators on winder drum and rewind. Thickness of the paper is computed from length and diameter data. By factoring in the constant basis weight of the paper we get the density of the roll.

Remarks: Caliper of the paper and consequently roll density are determined continuously on the run and displayed on the monitor. Thus there is a constant readout of paper thickness or density over diameter during the run. Since the order of magnitude of these measurements is very small - paper calipers in thousandth of mm and changes on the order of tenth of microns - it becomes necessary to measure several layers of paper at one time. Realistic numbers are between 100 and 300 plies. Therefore, there is a reference value at every 5 to 40 mm (1/8" to 1-1/2") depending on the caliper of the paper. These values are displayed graphically on a CRT during the run. The thickness of the paper or roll density over diameter can be printed on hard copy at the end of each run.



Caliper (microns)

Winding Hardness Sequence on Monitor



CONTENTS

1. General Description

On a two-drum winder, the rider roll nip pressure is controlled in relation to the rewind diameter in such manner that the finished reel (roll) set has a constant density or hardness throughout the diameter.

The controls are made up from hardware components of the JAGENBERG micro-computer system ZBOJW.

The control program is based on the winder geometry in any specific case, with a high mathematic background, and on specific characteristics in regard to dynamic and static roll density generation.

Rider Roll Relief (Rider Roll Counterloading):

The nip load of the rider roll on the rewinding set must be varied in order to obtain a constant reel density in the finished set.

The rider roll relief via the diameter is a polynomial of higher order, whose co-efficient can be influenced within certain limits through external input of specific factors.

The input variable is the rewind diameter. A dynamic registration of the diameter must be eliminated for various reasons. Since the diameter cannot be registered directly without considerable expenditure for scanners and their installation, a diameter-equivalent is measured.

A ten-turn potentiometer is mechanically coupled with the rider roll (optionally, this can be an absolute angle encoder), and this registers the linear movement of the rider roll in relation to the machine uprights as analog signal.

This analog signal in the range from 0 - + 10 volts is read in by the calculator, filtered mathematically and the momentary diameter is calculated via the winder geometry.

The amount of rider roll relief required for the diameter determined is calculated according to the methematical function and the external inputs, and is output as

1.
Standardized voltage of 0 - + 10 volts when the hydralic pressure reducing valve has separate power electronics.

or

2.
A current within the range from 0.1 - max. 1 Amp., on which a dither adjustable in amplitude and frequency is superimposed. In this case the electronically controlled hydralic valve can be connected directly.

The diameter equivalent is registered with a resolution of 12 bit.

The set point output for the rider roll control is resolved with 8 bits, corresponding to 255 steps. This resolution is higher than the possibilities of an electrically regulated or controlled hydraulic valve, and consequently adequate.

2. Function

The processor controls the nip pressure of the rider roll in relation to the rewind diameter according to a parabolic function which can be freely selected within wide limits, and therewith indirectly influences the density structure of the paper reel (roll).

The actual value signal generator for registering the rewind diameter is a ten-turn potentiometer, which is connected to the rider roll via a timing belt. The position of the center tap of the potentiometer is a direct measure and proportional to the distance the rider roll has travelled. The processor undertakes the task to calculate the diameter frm this.

(The complicated mathematical inter-relationship reel diameter as function of rider roll travel distance is calculated by approximation functions (approximation polynomials of the third degree) in four diameter sections with an accuracy greater than 0.5 mm.)

The control voltage(s) are calculated on the basis of the characteristic curves of the proportional pressure valve (P=F(I)) and the peripheral U/I converter card, and the respective (digital) output signals go from the calculator to the periphery.

Reading the potentiometer, calculation of the diameter, calculation of the pressure point set point value on the basis of the pre-set parabolic function and the output of the control voltage(s) are time-controlled through interrupt. The time intervals for measured value reading can be pre-set on a switch.

All important data such as diameter, set point currents or pressure can be called up and displayed on the 7-segment display via a display selector switch.

An analog measuring instrument (optional) integrated into the front panel permits direct control of the actual control current.

The relief or counterloading pressure actually developed is shown on a pressure gauge (mounted on the control desk of the machine controls).

A further ten-turn potentiometer is mounted in the control desk. This enables the machine operator to manually influence the automatic control sequence at any time during the winding operation.

Optionally, a three digit decade switch is provided for setting the different total trim width of the paper to be rewound.

Processing of the trim width and evaluation of the actual position of the control desk potentiometer are done by the processor. The pre-set function sequence of the density control is thus corrected and adapted to the prevailing operating conditions.

The processor monitors the proper function of the diameter determination and the pressure control. Monitoring includes, among other things, checking for possible interruptions in the line to the potentiometer with possible overrun of the max. permissible travel distance. Issued control signals are check-read and switches are checked for their logical settings.

In case of a defect, a defect or error signal is issued to the machine controls, which switches the machine to "Emergency Stop". The processor interrupts the control lines to the pressure regulating valve and at the same time an error report in encoded form appears on the display (ERR XX).

Acknowledgement of this error report is only possible when the machine is stopped. (Signal "Main Drive Stopped").

An "Emergency Stop" signal (defect on the machine) causes the processor either to set the pressure valve to max. counteloading pressure or to remove the counterloading pressure in order to obtain max. damping, depending on the given application.

3. Setting the Parabolic Function

Any desired parabolic function can be can be set by means of various decimal switches mounted on the front panel, whereby the parabolic function is determined by the following co-ordinates (diameter D/CM, relieving pressure P/%)

DH, PH (Starting values at core)
DS, PS (Values in apex)
DE, PE (End values)

The setting points core diameter DH and apex DS are only accessible internally and are pre-set to 10 cm and 30 cm.

The processor automatically calculates the set point curve resulting from the switch positions. The pressure values are interpreted as values in percent of the maximum possible relieving pressure.

The max. relieving or counterloading pressure is adjustable (internally). It is specific to the machine, i.e. it depends on the rider roll weight, friction etc. and is determined by technical measurements at the time of commissioning.
The maximum relieving pressure is that pressure which holds the rider roll in a balanced condition (floating condition) just before it moves upward.

Basing on theoretical considerations and calculations which have been confirmed by extensive trials and measurements, a basic setting is worked out and recommended for each machine.
It is then up to the user to adapt this curve to his desires or requirements if necessary.

Settings which deviate considerably from the given parabolic function are indicated to the operator by the processor in the form of warnings which do not however influence the machine run.

Incorrect, i.e. unlogical switch positions are displayed as error reports (ERR XX).
In such a case, it is no longer possible to run the machine under electronic control (signal "Automatics ON").

NOTE: The processor accepts a change in the parabola coordinates only when the macine is standing still. (Signal "Main Drive Stopped" present, signal "Winding Pressure" not present)

3.1 Influence of the Potentiometer on the Parabolic Function

There is a linear relationship between the position of the potentiometer and the relieving pressure to be controlled: 1 rotation corresponds to 10% of the maximum possible relieving pressure.

The percentage values read in are additively superimposed on the parabola points PH and PS. Since the end point PEND is not changed, the shape of the curve is maintained. An increase in the control pressure is possible only up to the value of the maximum relieving pressure (100%, floating condition of the rider roll).

3.2 Influence of the Web Width (Trimmed Width)

The parabola points PH and PS are weighted with different value factors, which are calculated depending on the total web width. PEND and the overall course of the curve remain.

NOTE: The processor accepts a change in web width only when the machine is standing still.

Before starting a winding operation or when starting up the machine again, it must be ensured that the potentiometer is in 0 position. Otherwise, the automatic potentiometer position monitor will cause error reports.

4. Possible Read-Outs (7-Segment Display)

The following data which are closely connected with the automatic control process can be called up and displayed:

Selector Switch	Information	Read-Out (e.g. on
00 OFF	OFF	VARI-DUR 85-15Winder)
01	Actual data from panel	83.76.99.80
02	Switches 7 - 0., PCB SK16	00.0A.0F.00
03	Switches 15 - 8, PCB SK16	1E.0A.8C.00
04	Actual web width in cm	--------XXX
05	Maximum relieving pressure (bar)	-------70.0
10	Potentiometer voltage (mV)	-------1000
11	Rider roll travel (mm)	--------100
14	Trim width - diameter	XXX-----100
20	Set point relief pressure (%)	--------3.0
30	Set point relief pressure (bar)	-------58.1
31	Set point value, control current (mA) (Pressure reducing valve)	--------465
32	Set point value, control voltage (mV)	-------5214
40	Rising speed of rider roll (mm/s)	--------0.0
99	Program identificatiom	13-12-82
Others	Roll diameter (mm)	--------100

5. Switch Functions

Printed Circuit Board (PCB) SK1610

Switch	Function
0	
1	Program selecting switch, operating program/service/test programs
2	
3	Time Constant (TC) Measured value registration and control of the relieving pressure TC = S3 S2 X 10 ms
4	
5	Multiplication factor of the rime constants "Time Frame" Integration time for determining average value and digital filtering of measuring values TC X S5 S4 = Time Frame
6	
7	Free
8	
9	Free
10	
11	S11 S10 X 0.5 bar = Maximum relieving pressure, (Floating state of rider roll)
12	
13	S13 S12 = Core diameter (DH) in cm
14	
15	S15 S14 = Apex of parabola (DS) in cm

Note: Setting of switches 0 - 15 must be made in hexadecimal manner.
Switches 0 - 15 are set at time of commissioning. They should only be corrected, if necessary at all, when operating conditions have altered, e.g. after exchange of hydraulic units.

6. Error Report

Various test and diagnostic functions recognize defects which may turn up and prohibited operator interferences which can cause malfunctions of the electronics controls. The following errors/defects are recognized in the processor and displayed:

Internally accessible switches on the SK16 PCB which must be set at time of commissioning or when operating conditions have changed.

ERR 00	Switches 3,2 (time constant TC) or 5,4 (multiplication factor) have changed
ERR 03	Switches 3,2 (TC) are outside the permissible range
ERR 04	Switches 3,2 and/or 5,4 ("Time Frame" too large)
ERR 07	Switches 7,6
ERR 09	Switches 9,8
ERR 11	Switches 11,10 outside the permissible range (Maximum relieving pressure)
ERR 15	S15, S14 smaller/same as S13 S12 DS /= DH Parabola apex smaller/same as core diameter)

Error Reports, Continued

ERR 17	Parabola end diameter smaller/same as apex under DE /= DS
ERR 18	Web width permissible range
ERR 19	Web width permissible range Potentiometer for diameter determination outside the mechanically possible travel distance
ERR 20	Lower limit
ERR 21	Upper limit
ERR 25	Reference potential too high
ERR 31	Control voltage outside the permissible tolerances (pressure reducing valve)
ERR 32	Free
ERR 88	Potentiometer for manually influencing control pressure (relief of rider roll) not in starting position

WARNINGS

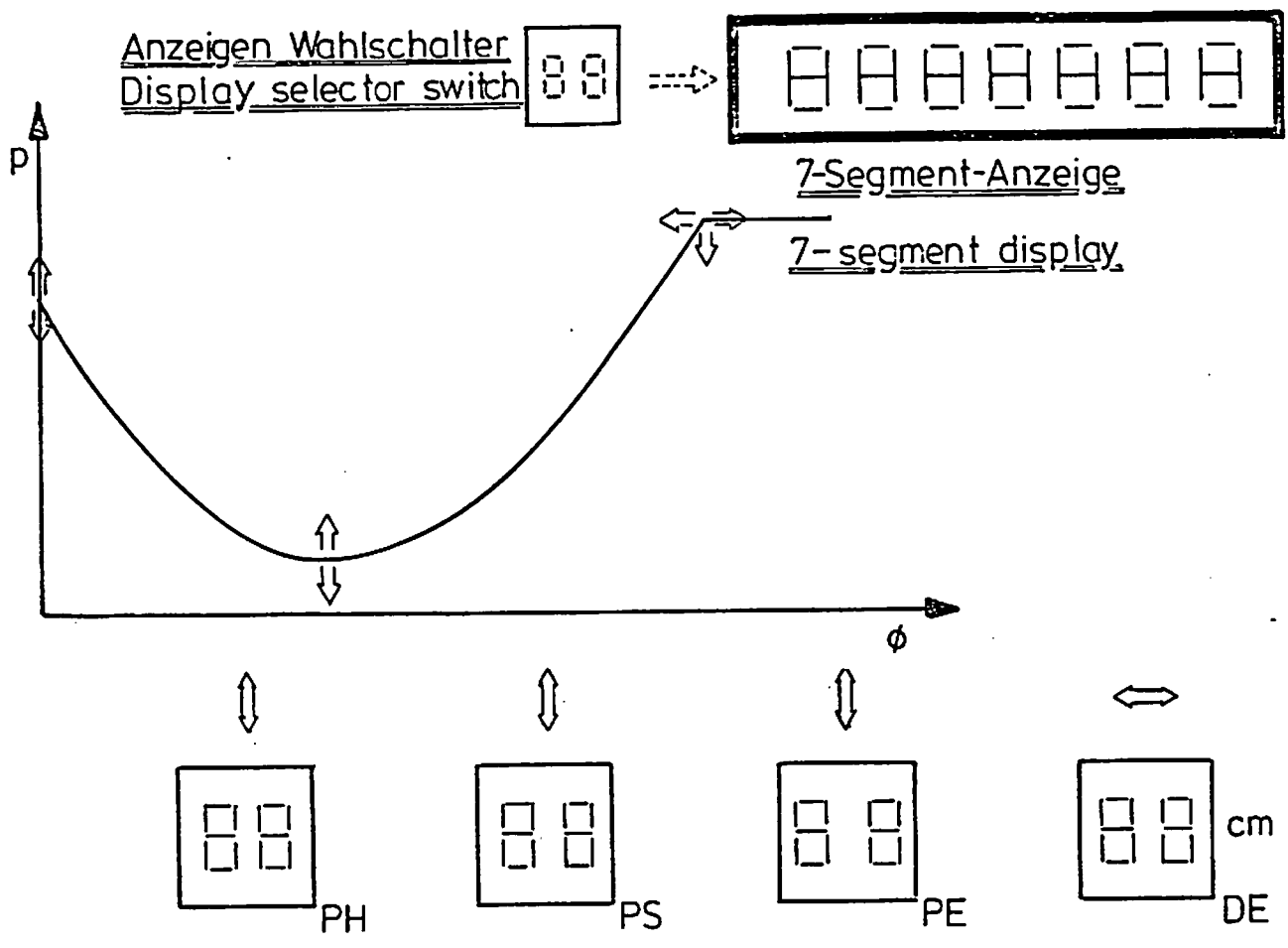
E.1	DE	DS + (DS-DH)
E.2	PS	= PD
E.4	PE	BO (%)

7. Service and Test Programs

The program package of the DWS contains extensive service and test (calibration) programs, which make possible a simple and rapid commissioning of the electronic controls without auxiliary means. In case of a defect, these programs are a valuable aid in recognizing and correcting errors or defects.

The following programs can be selected with the respective position of the program selector switch (switch 1.0 on PCB SK1610)

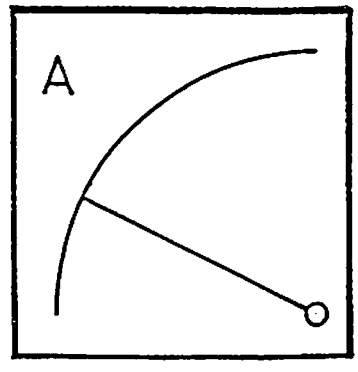
Switch Position	Function
11	Linearity Test of the D/A outputs D/A output 1.0 - 10 V
12	D/A output 2.0 - 5 V
15	D/A outputs adjustable depending on display selecting switch
21	Calibration of thre D/A outputs D/A output 1, 10 V
22	D/A output 2, 5 V
30/31	Setting the maximum relieving pressure
40	Potentiometer - calibration



Schalter zur Einstellung d. Entlastungsdrucks.
Switches for setting relieving pressure

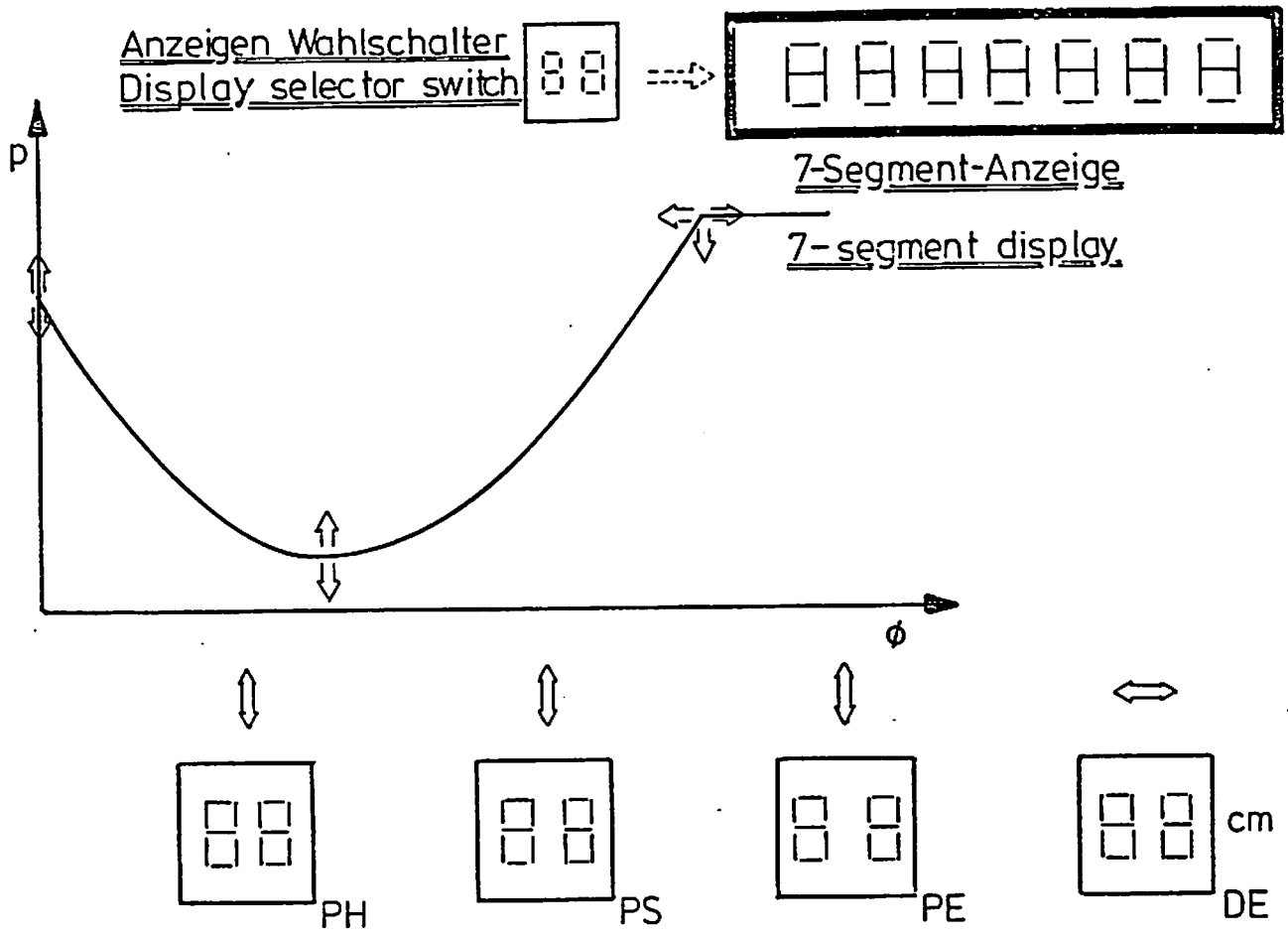
Parabelanfang (Hülsen ϕ) Start of parabola (core dia.)	= PH
Parabel im Scheitelpunkt Parabola in apex	= PS
Parabelende End of parabola	= PE
Einstellung d. End-Durchmesser End dia. setting	= DE

DH; DS intern einstellbar
DH; DS can be set internally



Analoges Meßinstrument zur Anzeige d. Steuerstroms

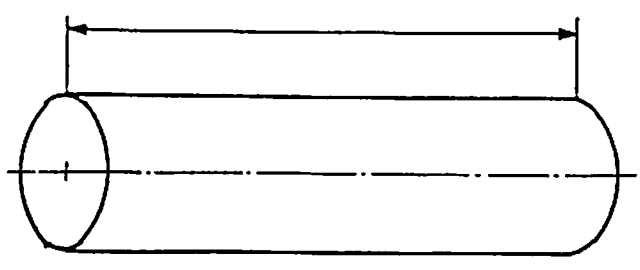
Analog measuring instrument for displaying control curvent.

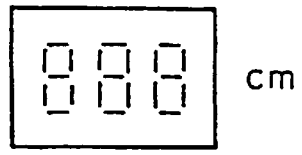


Schalter zur Einstellung d. Entlastungsdrucks.
Switches for setting relieving pressure

Parabelanfang (Hülsen ϕ) Start of parabola (core dia.)	= PH
Parabel im Scheitelpunkt Parabola in apex	= PS
Parabelende End of parabola	= PE
Einstellung d. End-Durchmesser End dia. setting	= DE

DH; DS intern einstellbar
DH; DS can be set internally





Arbeitsbreiteneinstellung
Trim width setting

Hydraulic Diagram =HL51

1. Rider Roll Controls MANUAL / AUTOMATIC

1.1 Manual Control

If there is a malfunction in the rider roll electronics, they can be switched off by switching over to manual control.

AUTO-MATIK

Sequence of operation and functions:
Key switch =HL51.N3-S1, control desk +P2
Switch "MANUAL/AUTOMATIC" to "MANUAL" position:
- Pressure reducing valve =HL51.-44 is de-energized,
- pressure reducer of the rider roll counterloading goes to "0" bar,
- illuminated pushbutton =HL51.N1-S10, control desk +P2 flashes constantly, thus signalizing that the valves of the hand controls must be activated.

Set following valves:
- Close shut-off valve =HL51.-43 and =HL51.-45
- Open shut-off valve =HL51.-47,
- Set the pressure regulating valve =HL51.-46 to the desired counterloading pressure.

1.2 Automatic Controls

Sequence of operation and functions:
Switch back hand valves:
- Open shut-off valve =HL51.-43 and =HL51.-45,
- Close shut-off valve =HL51.-47,
- Reset pressure regulating valve =HL51.-46 to "0" bar.

AUTO-MATIK

Switch key switch =HL51.N3-S1 Control Desk +P2 "MANUAL/AUTOMATIC" to "AUTOMATIC":
- The electronics are switched on,
- Pressure reducing valve =HL51.-44 assumes the basic set point value of approx. 10 bar.

If there is no malfunction in the electronics (in the case of a malfunction, acknowledge fault report in the control desk), the counterloading curves can be adjusted when the drive is stopped (code switches on the front panel of the electronics).

When switching to the status "WINDING PRESSURE", illuminated pushbutton =HL51.N1-S10 lights up, the position of potentiometer =QQ80.R10 "REWIND DIAMETER" is interrogated.

The set point value for the pressure reducing valve "RIDER ROLL COUNTERLOADING" is calculated based on the diameter according to the preselected curve, and the valve assumes the respective valve position.
At the same time, solenoid valve =HL51.-49 "RIDER ROLL WINDING PRESSURE" is switched on (solenoid =HL51.N1-Y13 is energized).

2. Malfunctions in the Electronics

If there is a malfunction in the electronics during operation, the fault is displayed on the fault annunciator panel =HB90.N2-A10, control desk +P2 and the machine is switched to EMERGENCY STOP.

- Pressure reducing valve =HL51.-44 "RIDER ROLL COUNTER-LOADING" goes to "0" bar.
- Solenoid valve =HL51.-49 "RIDER ROLL WINDING PRESSURE" remains switched on (solenoid =HL51.N1-Y13 is energized).

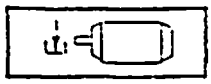
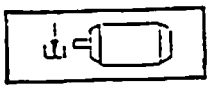
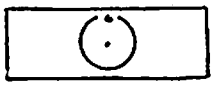
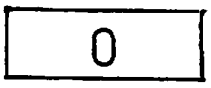
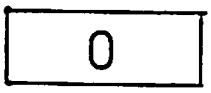
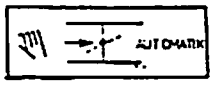
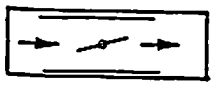
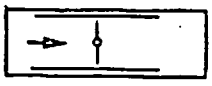
If the fault cannot be acknowledged, key switch =HL51.N3-S1 control desk +P2 must be switched over to MANUAL control and the hand valve must be set.

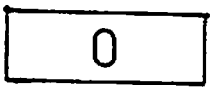
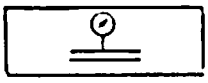
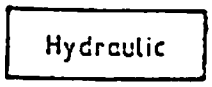
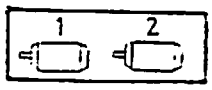
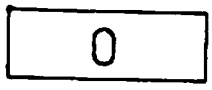
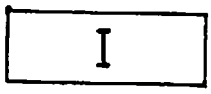
3. EMERGENCY STOP during threading, operation and switched-on winding pressure

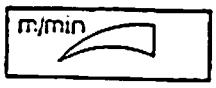
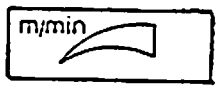
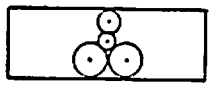
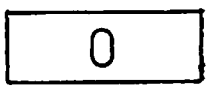
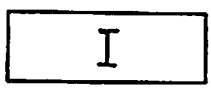
Pressure reducing valve =HL51.-44 "RIDER ROLL COUNTER-LOADING" maintains the momentary pressure.

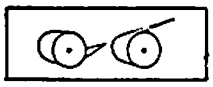
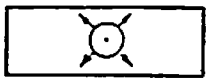
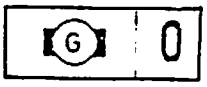
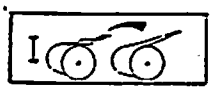
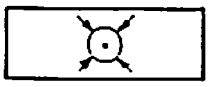
Solenoid valve =HL51.-49 "RIDER ROLL WINDING PRESSURE" remains open (solenoid =HL51.N1-Y13 is energized).

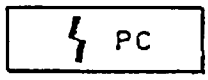
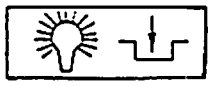
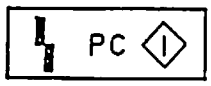
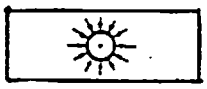
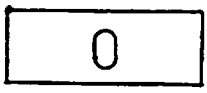
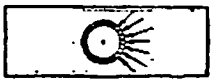
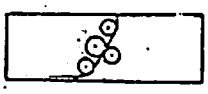
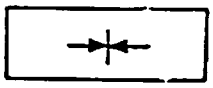
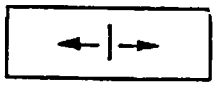
The fault must then be acknowledged.
Pressure reducing valve =HL51.-44 "RIDER ROLL CONTROLS" remains at the curve set point value.

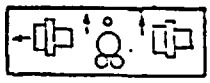
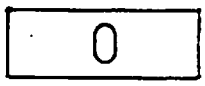
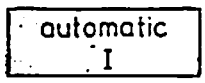
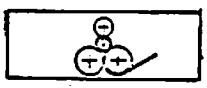
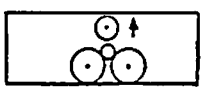
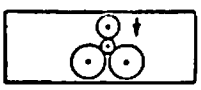
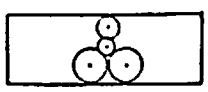
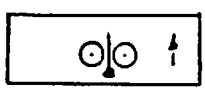
Item No.	Symbol	Equipment Code No.	Equipment Designation, Short Function Description
25		=AE00.N1-H1	Pilot lamp, indicates: "MAIN DRIVE SECURED OFF"
27		=AE00.N1-S1	Selector switch, safety switch, main drive: "ON / OFF"
28,29		=AE00	CONTROL VOLTAGE
29		=AE00.N1-S11	Pushbutton, Controls: "OFF"
28		=AE00.N1-S12	Illuminated pushbutton, Controls: "ON"
87,88		=AQ11	TRIM REMOVAL
88		=AQ11.N1-S11	Pushbutton, Trim removal: "OFF"
87		=AQ11.N1-S12	Illuminated pushbutton, Trim removal: "ON"
89		=AQ12.N12-S10	Selector switch, damper valve setting: "MANUAL - AUTOMATIC"
90		=AQ12.N1-S13	Pushbutton, Trim removal damper valve: "OPEN"
91		=AQ12.N1-S14	Pushbutton, Trim removal damper valve:"CLOSE"
92,93		=BK11	UNWIND SIDE-SHIFTING
92		=BK11.N1-S13	Pushbutton, Side-shift to: "LEFT"
93		=BK11.N1-S14	Pushbutton, Side-shift to: "RIGHT"

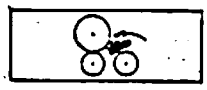
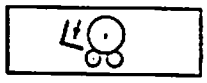
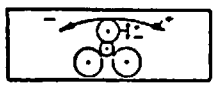
Item No.	Symbol	Equipment Code No.	Equipment Designation, Short Function Description
15		=BK11.N3-P1	Oscillation counter, Oscillation of unwind
93		=BK11.N3-S11	Puchbutton, Oscillation: "OFF"
94		=BK11.N3-S12	Illuminated pushbutton, Oscillation: "ON"
20		=HA10.-10	Pressure gauge, compressed air supply operating pressure
60-62		=HA40	HYDRAULICS
62		=HA40.N1-S1	Selector switch, Hydraulic pump motor: "1 - 2"
61		=HA40.N1-S12	Pushbutton, Hydraulic unit: "OFF"
60		=HA40.N1-S12	Illuminated pushbutton, Hydraulic unit: "ON"
35-37		=HB01	MAIN DRIVE
36		=HB01.N1-S1	Illuminated pushbutton, Main drive: "START - THREAD"
35		=HB01.N1-S3	Illuminated pushbutton, Main drive: "RUN"
37		=HB01.N1-S4	Pushbutton, Main drive: "STOP"

Item No.	Symbol	Equipment Code No.	Equipment Designation, Short Function Description
19		=HB01.N2-H6	Pilot lamp, indicates: "MAIN DRIVE EMERGENCY STOP"
51		=HB01.N2-S6	Muchroom pushbutton, Main drive: "EMERGENCY STOP"
50		=HB01.N2-S16	Mushroon pushbutton, Main drive: "EMERGENCY STOP"
1		=HB01.H1-P10	Ammeter, Main drive current take-up
3		=HB01.U1-P15	Web speed indicator, Main drive operating speed
34		=HB01.U1-R11	Potentiometer, Main drive speed pre-selection
4		=HB07.H1-P10	Ammeter, Rider roll drive current take-up
40,41		=HB10	SINGLE SLITTER DRIVES
41		=HB10.N1-S11	Pushbutton, Bottom slitter drives: "OFF"
40		=HB10.N1-S12	Illuminated pushbutton,, Bottom slitter drives: "ON"

Item No.	Symbol	Equipment Code No.	Equipment Designation, Short Function Description
11		=HB61.H1-P10	Ammeter, Brake generator current
10		=HB61.K1-P13	Indicating unit, indicates: "UNWIND DIAMETER"
46		=HB61.N1-S7	Selector switch, Unwinding from: "BOTTOM - TOP"
48		=HB61.N1-S8	Pushbutton, Unwind diameter: "NEW REEL"
38		=HB61.N1-S10	Illuminated pushbutton, Brake generator: "HOLD WEB DRAW"
45		=HB61.N1-S11	Pushbutton, Brake generator: "OFF"
44		=HB61.N1-S12	Illuminated pushjbutton, Brake generator: "ON"
8		=HB61.U1-P14	Indicating unit, indicates: "WEB DRAW 1"
42		=HB61.U1-R11	Potentiometer, Web draw "NOMINAL VALUE"
43		=HB61.U1-R12	Potentiometer, Brake generator: "MANEUVER"
47		=HB61.U1-R13	Potentiometer, "SET UNWIND DIAMETER"
99		=HB61.N2-H5	Indicating unit, indicates: "BRAKE GENERATOR FAST STOP"
49		=HB61.N2-S5	Pushbutton, Brake generator: "FAST STOP"

Item No.	Symbol	Equipment Code No.	Equipment Designation, Short Function Description
18		=HB90.N1-B1	Pilot lamp, indicates: "FAULT IN PC AUXILIARY DRIVES"
26		=HB90.N1-S1	Selector switch, "TEST LAMPS - ACKNOWLEDGE FAULT"
17		=HB90.N1-S10	Pushbutton, PC fault display: "START"
16		=HB90.N2-A010	Digital display, displays: Fault report indentification no., for list, see 4.55-30
83,84		=HE31	WINDER DRUM SUCTION AIR
84		=HE31.N1-S11	Pushbutton, Winder drum suction air: "OFF"
83		=HE31.N1-S12	Illuminated pushbutton, Winder drum suction air: "ON"
55,56		=HH	SLITTING STATION
56		=HH71.N1-S11	Pushbutton, Slitters: "CLAMP"
55		=HH71.N1-S12	Illuminated pushbutton, Slitters: "RELEASE"
58		=HH81.N1-S11	Pushbutton, Top slitters: "RETRACT"
57		=HH81.N1-S12	Illuminated pushbutton, Top slitters: "ENGAGE"

Item No.	Symbol	Equipment Code No.	Equipment Designation, Short Function Description
66-69		=HL30	SEQUENTIAL SWITCHINGS AUTOMATIC ROLL SET CHANGE
69		=HL30.N1-S11	Pushbutton, Automatic sequencing: "OFF"
66		=HL30.N1-S12	Illuminated pushbutton, Automatic sequencing I: "ON"
67		=HL30.N1-S13	Illuminated pushbutton, Automatic sequencing II: "ON"
68		=HL30.N1-S14	Illuminated pushbutton, Automatic sequencing III: "ON"
78		=HL51.N1-S10	Illuminated pushbutton, Rider roll: "WINDING PRESSURE"
79		=HL51.N1-S13	Pushbutton, Rider roll: "UP"
80		=HL51.N1-S14	Pushbutton, Rider roll: "DOWN"
77		=HL51.N3-S1	Key switch, Rider roll control: "MANUAL - AUTOMATIC"
21		=HL51.N4-U1	Digital display, shows: "RIDER ROLL CONTROL OIL PRESSURE"
81		=HHP81.N1-S13	Illuminated pushbutton, Cut-off knife: "UP"
82		=HP81.N1-S14	Pushbutton, Cut-off knife: "DOWN"

Item No.	Symbol	Equipment Code No.	Equipment Designation, Short Function Description
85		=HR11.N1-S13	Pushbutton, Ejector: "EJECT"(Inching Operation)
71		=HR41.N1-S10	Pushbutton, Lowering Unit: "EJECT POSITION"
72		=HR41.N1-S13	Pushbutton, Lowering unit: "UP"
73		=HR41.N1-S14	Illuminated pushbutton, Lowering unit: "DOWN"
76		=QQ80.R11	Potentiometer, Rider roll: altering rider roll counterloading, shifting the rider roll counter-loading curve.

1. Preparations

1.1 Check, and/or switch on

1.
Utility systems: electrics, pneumatics, hydraulics, lubrication

2.
Safety equipment

3.
Switchgear, indicating instruments.

1.2 Set up, prepare

1.
Slitting station: slitting width, slitter engagement
See Function Description =HH81.

2.
Web length measuring equipment: set counter (shut-off point).
See Function Description =HL10, Manual 2, Sub-Supplier Instructions =HL10.

3.
Roll diameter indicator: set scale indicator (shut-off point at desired or maximum rewind diameter).
See Function Description =HL41.

4.
Shaftless rewind: load cores into winder drum valley, core up core chucks.
See Function Description =HL41.

5.
Lowering platform remains in lowered position during makeready.
See Function Description =HR41.

6.
Parent reel: bring parent reel to unwind.

2. Loading the Unwind

1.
Unwind side-shift to LEFT
Pushbutton =BK11.N1-S13, control desk +P2
Pushbutton "B3", pushbutton station +R502.

2.
Unwind, side-shift to RIGHT
Pushbutton =BK11.N1-S14, control desk +P2
Pushbutton "B4", pushbutton station +R502.

3.
Center unwind radially with handwheel on unwind stand.

4.
Spool Coupling DISENGAGE
Pushbutton "B2", pushbutton station +R10.

5.
Spool EJECT
Pushbutton "B3", pushbutton station +R10.

6.
Load full new reel into unwind.

7.
Spool CLAMP and spool coupling ENGAGE.

Pushbutton "B1", pushbutton station +R10.

8.
Unwinding from TOP or BOTTOM
Selector switch =HB61.N1-S7, control desk +P2.

9.
Unwind diameter NEW REEL
Pushbutton =HB61.N1-S8, control desk +P2.

10.
Unwind diameter SET
Potentiometer =HB61.U1-R13, control desk +P2
(The unwind diameter setting must be adjusted only when the new reel is smaller than the standard maximum unwind diameter).

11.
Brake generator ON
Illuminated pushbutton =HB61.N1-S12, control desk +P2.

12.
Brake generator MANEUVER
Potentiometer =HB61.U1-R12, control desk +P2
(Set the desired peripheral speed of the parent reel).

3. Threading the Web

1.
Rotate reel by hand, tear a threading tail on the web.

2.
Main drive START - THREAD
Illuminated pushbutton =HB01.N1-S1, control desk +P2
Illuminated pushbutton "A3", pushbutton station +R503.

Illuminated pushbutton "A8", pushbutton station +R511.

(When pushbutton is pressed, a horn sounds; press pushbutton again when the start enable is indicated by blinking. The machine will then start up at threading speed).

3.
Brake generator MANEUVER
Potentiometer =HB61.U1-R12, control desk +P2
(Adjust the peripheral speed of the parent reel to the threading speed of the winder).

4.
Web threading ON
Illuminated pushbutton "R1", pushbutton station +R502.

Illuminated pushbutton "R2", pushbutton station +R503.

- Top slitters retract,
- Threading tape cradle on guide rolls engages; the tape drive motor is switched on,
- Threading tape cradle on 1st winder drum engages,
- Blower air is switched on,
- Suction fan is switched on.

5.
Thread the web into the machine.

6.
Threading tape cradle on guide rolls RETRACT (OFF)
Pushbutton "G5", pushbutton station +R503
(The tape cradle is retracted when the web tail has entered the tape cradle on the lst winder drum).

7.
Web threading OFF
Pushbutton "G5", pushbutton station +R502
Pushbutton "G4", pushbutton station +R511
(Actuate when web tail has been picked up at winder drum valley.
- Tape cradle on winder drum retracts,
- Blower air is switched off,
- Suction air fan is switched off).

8.
Feed web into the machine until it comes out machine-wide, free of folds and the web edges are in line with the outer core edges.

9.
Top slitters ENGAGE
Illuminated pushbutton =HH81.N1-S12, control desk +P2
(Keep feeding web until the slit webs have reached the area of the cores).

10.
Main drive STOP
Pushbutton =HB01.N1-S4, control desk +P2
Pushbutton "A3", pushbutton station +R503
Pushbutton "A8", pushbutton station +R511.

11.
Tear off the webs by hand near the cores and fasten the tails to the cores by suitable means.

12.
Rider roll DOWN
Pushbutton =HL51.N1-S14, control desk +P2
(Rider roll lowers in inch/jog mode).

13.
Lowering platform UP
Pushbutton =HR41.N1-S13, control desk +P2
(Raising platform is in inch/jog mode).

14.
The machine is ready to start up.

THREADING THE WEB AFTER A WEB BREAK

Conditions:
- Control voltage is switched on
- Frequency converter is switched on
- Rider roll is in upper end position
- Lowering platform is in lower end position.

SEQUENCE OF OPERATIONS

1.
Remove the web broke from the machine.

2.
Carry out the operating sequences from Section 2.11 "Brake Generator ON"
up to and including
Section 3.1 "Tear Threading Tail".

3.
Switch on blower air pipes on ejector beam and on bottom slitter beam.
Low-pressure ball-type valve =HE11.06 to position "ON".

4.
Carry out operations from Section 3.2 "Main Drive START - THREAD"
up to and including
Section 3.7 "Web Threading OFF".

5.
Shut off blower air pipes on ejector beam and on bottom slitter beam.
Low-pressure ball-type valve =HE11.06 to position "OFF".

6.
Carry out operations from 3.8 "Pulling Web into Machine Machine-Wide"
up to and including
Section 3.10 "Main Drive STOP".

7.
Make a splice; see: Special Instructions =H4.52, Making a Splice.

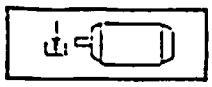
8.
Carry out operations from Section 3.12 "Rider Rolls DOWN"
up to and including
Section 3.13 "Lowering Platform UP".

9.
The machine is ready to start up.

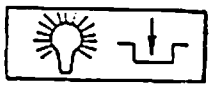
1. Conditions
The operating sequences Makeready and Settings on the Machine (4.20-) have been completed, the machine is ready to start up.

2. Switching On, Winding
Control elements: on control desk +P2 and on pushbutton stations.

2.1 Switching On (in part already completed in Section 1./Instructions 4.20):

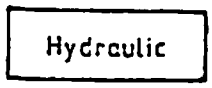


1.
Main drive "ON": Selector switch =AE00.N1-S11

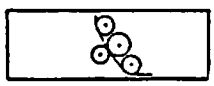


2.
Set fault display to "ACKNOWLEDGE": Selector switch =HB90.N1-S1.

3.
Control voltage "ON": Ill. pushbutton =AE00.N1-S12.



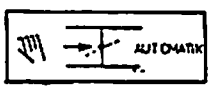
4.
Hydraulic power unit "ON": Ill. pushbutton =HA40.N1-S12.



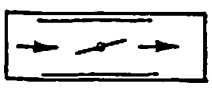
5.
Bottom slitter drive "ON": Ill. pushbutton =HB10.N1-S12.

6.
Top slitters "ENGAGE": Ill. pushbutton =HH81.N1-S12.

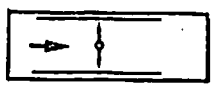
7.
Trim removal "ON": Ill. pushbutton =AQ11.N1-S12.



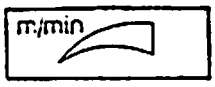
8.
Trim removal damper valve "MANUAL/AUTOMATIC":
Selector switch =AQ12.N1-S10,



- in position "MANUAL", set damper:
  Damper valve "OPEN": Pushbutton =AQ12.N1-S13;
  Damper valve "CLOSE":
  Pushbutton =AQ12.N1-S14,



- in position "AUTOMATIC", damper valve opens automatically when preset speed (about 500 m/min. = about 1600 fpm) is reached (limit monitor in main drive.)



9.
Select operating speed: Potentiometer =HB01.U1-R11.

10.
Rider roll control "MANUAL/AUTOMATIC":
Selector switch =HL51.N3-S1,
- position "MANUAL", e.g. in case of faults in the rider roll control. See Function Description =QQ81;
- position "AUTOMATIC" for electronic rider roll counterloading. See Function Description =QQ80 and QQ81. For switch for setting counterloading pressure see: Control Panel in PC Cabinet, Drawing, Function Description =QQ80.

11.
Rider roll "WINDING" (winding pressure): Ill pushbutton =HL51.N1-S10.
The rider roll is counterloaded with the pressure set (see No. 10. above). If this pushbutton is not pressed, the machine cannot start up.

12.
Set desired web draw: Potentiometer =HB61.U1-R11.
Pressure indication: =HB61.U1-P14.

13.
Oscillation "ON": Ill. pushbutton =BK11.N3-S12.

14.
Main drive "START - THREAD": Ill. pushbutton =HB01.N1-S1
or: - Pushbutton station +R503, ill. pushbutton "A3".
- Pushbutton station +R511, ill. pushbutton "A8".
When the unwind is equipped with brake generator, a horn sounds when the pushbutton is pressed. Thereafter, press pushbutton again when blinking of the button indicates the "Enable". The machine then starts up at threading speed.

15.
Main drive "RUN": Ill. pushbutton =HB01.N1-S3.
The machine accelerates to the operating speed set on potentiometer =HB01.U1-R11 (see No. 9. above.)

2.2 Winding

1.
Set the spreading equipment so that the slit webs are rewound free of wrinkles and the rewound rolls separate easily.

2.
Should it become necessary during winding to re-align the unwind stands (e.g. through wandering of the web) then press pushbuttons
"SIDE-SHIFT TO LEFT" (=BK11.N1-S13) or
"SIDE-SHIFT TO RIGHT" (=BK11.N1-S14)
as required.
Radial adjustment is made on the handwheel on that unwind stand which is opposite the braking side. (Required when there is wrinkling at the web infeed).

3.
If necessary, switch on oscillating movement of the unwind by pressing pushbutton "OSCILLATION ON" (=BK11.N3-S12). To switch oscillation off, press pushbutton "OSCILLATION OFF" (=BK11.N3-S11).

4.
Observe the winding operation. The web separation can be observed through the observation slots in the lowering unit, but only when the lowering unit is in "EJECT" position. However, in this case the operating speed is limited to maximum 1000 m/min. (abt. 3300 fpm) for safety reasons. A higher web speed, up to the rated maximum for the machine, is possible only when the lowering unit is in nip guard position (upper end position).

3. Main Drive STOP

The machine slows down from operating speed to full stop at the normal deceleration rate.

3.1 STOP through Pushbutton Actuation

- Pushbutton =HB01.N1-S4, control desk +P2
- Pushbutton "G7", pushbutton station +R503
- Pushbutton "G10", pushbutton station +R511.

3.2 STOP through Actuation of Cable Pull Switch

- Cable pull switch =HR41.N1-S1, on lowering unit.

The cable pull switch on the lowering unit is a safety switch and must be actuated when there is danger of an accident, e.g. during the makeready work at threading speed. When the cable pull switch is actuated, the drive switches to "STOP", and any upward or downward movements of the rider roll and/or lowering unit which may be in progress at that moment are interrupted.

3.3 STOP through Automatic Shut-Off

- Limit switch =HR41.N1-B17 "Maximum rewind diameter",
  when the set shut-off point (roll diameter indicator) has been reached
- web length counter =HL10.N1-P1, when the shut-off point set on the web length measuring unit has been reached
- light gate =HL15.N1-B1, web break monitor, in case of a web break. The web break monitor is optional equipment.

4. FAST STOP, when Unwind Is Equipped with Brake Generator

The main drive of the winder switches to "STOP" and decelerates to full stop at the normal rate. The brake generator brakes the unwinding reel in the shortest possible time, assisted by the emergency brake.

4.1 FAST STOP through Pushbutton Actuation

- Pushbutton =HB61.N2-S5, on control desk +P2
- Pushbutton "G4", pushbutton station +R10
- Pushbutton "G1", pushbutton station +R12
- Pushbutton "G1", pushbutton station +R501
- Pushbutton "G7", pushbutton station +R502.

4.2 FAST STOP through Automatic Shut-Off in Case of a Web Break

- Light gate =HL15.N1-B1, photo-cell, web break monitor.

5. EMERGENCY STOP through Actuation of Mushroom Pushbutton

The complete line is stopped in the shortest possible time. All movements are interrupted. Exception: the ejector beam retracts into its rear end position.

- Mushroom pushbutton =HB01.N2-S6, control desk +P2
- Mushroom pushbutton =HB01.N2-S16, control desk +P2
- Mushroom pushbutton "R5", pushbutton station +R10
- Mushroom pushbutton "R2", pushbutton station +R12
- Mushroom pushbutton "R2", pushbutton station +R501
- Mushroom pushbutton "R8", pushbutton station +R502.

6. Description of the Sequential Switchings I, II and III for Automatic Roll Set Change

Sequential Switching I

Ejecting the roll set when the unwind reel is not yet empty and web is connected to the rewound roll set.

Sequential Switching II

a) The reel spool (reel shell) is empty or the web has broken, i.e. the connection between unwind and rewind through the web is interrupted. The finished roll set is to be ejected and lowered.

b) Sequential Switching II can also be used when a change in slitting width set-up is to be made within one parent reel without taking the web out of the machine.

Condition: only a slight change in only a few slitting widths, and holes must be torn in the web in the area of the slitters to be shifted.

Sequential Switching III

This is the continuation of Sequential Switching II, with the loading of a new set of cores after the web has been threaded.

6.1 Sequential Switching 1 (for Normal Roll Set Change)

Sequential Switching 1 can be started at a machine speed of about 200 m/min (650 fpm) (adjustable). This point in time is indicated by a pilot lamp on the control desk. Starting the Sequential Switching during the deceleration phase is an accelerated roll set change, contrary to the normal set change which is not started until the machine has stopped.

Basic Conditions for Starting Sequential Switching 1:

- the machine is stopped, the parking brake is pressurized.
- the parent reel is connected to the rewinding roll set through the web.
- the lowering platform is in eject position or in its upper end position (in the latter case, move it to eject position).
- no other Sequential Switching must be in progress.
- the cores, provided with an adhesive track, must have been fed into the core clamp.
- the manual core feeding operation must have been completed and the core stop must be in its retracted end position.
- "Web Threading" is switched off.
- no Emergency Stop must have been actuated.
- the core set must not protrude beyond the core clamp (monitored by photocell).

When pushbutton "SEQUENTIAL SWITCHING I ON" is pressed, the following sequence of functions begins:

1.
The rider roll moves up and actuates a limit switch in its upper end position.

2.
The core chucks of the shaftless rewind retract from the cores. In their rear end position, a signal is generated for raising the rewind carriages. In their upper end position, the carriages each actuate a limit switch.

3.
The cut-off knife bar comes up between the winder drums and actuates a limit switch in its top end position. In case of an accelerated roll set change, the cut-off knife bar only moves up when the machine has come to a full stop.

4.
Not applicable.

5.
The lowering platform pivots into eject position (if it is not already in that position).

6.
When the functions 1 - 5 have been completed, the suction air fan switches on. This creates an underpressure (partial vacuum) in the first winder drum.

7.
As the ejecting movement starts, the core set is clamped by the core clamp. The ejector beam swings forward and ejects the roll set onto the lowering unit. In its forward end position, the ejector beam actuates a limit switch.

8.
The finished roll set rolls onto the lowering platform, whereby the slit webs tear off along the cut-off knife. The web tails remaining in the machine are drawn against the first winder drum through suction holes and held in position.

9.
Not applicable.

10.
Actuation of the limit switch "EJECTOR EJECT (FORWARD)" causes the cut-off knife bar to retract into its lower end position, releasing the limit switch. This causes the core clamp to open, and the core set drops into the winder drum valley.
In opened position, the core clamp actuates a limit switch.

11.
Not applicable.

12.
Not applicable.

13.
The ejected set rolls over a limit switch on the lowering platform, generating a signal. This signal goes into holding position and causes the pushbutton "LOWERING PLATFORM DOWN" to blink.
This signals to the operating crew that the set can be lowered.
Releasing the pushbutton causes the lowering movement to stop. When the lowering unit is in its bottom end position a limit switch is actuated.

14.
When the limit switch "CORE CLAMP OPEN" has been actuated, the ejector beam starts to move into its retracted end position (limit switch "EJECTOR EJECT" is released), the rewind carriages move into their bottom end position, where they actuate a limit switch on each side, which causes the core chucks to move into the cores.

15.
The rider roll lowers when the limit switch "EJECTOR EJECT" is released. If the rider roll reaches its limit switch "RELEASE POSITION" before the ejector beam has reached its retracted end position and before the core chucks have cored up, the rider roll is stopped. After these conditions have been fulfilled, the rider roll continues to lower. When the limit switch "RIDER ROLL DOWN" is actuated, the counterloading system is switched over to winding pressure with a time delay.

16.
Not applicable.

17.
The movements 14 and 15 take place simultaneously.

When the limit switches:

a) rewind carriages down

b) core chucks cored up

c) rider roll down and switched over to winding pressure

d) not applicable

e) ejector beam retracted

f) lowering platform down

have been actuated, Sequential Switching 1 and the suction air fan are switched off.

6.2 Sequential Switching II (for Normal Roll Set Change)

Sequential Switching II can be started at a machine speed of about 200 m/min (650 fpm) (adjustable). This point in time is indicated by a pilot lamp on the control desk. Starting the Sequential Switching during the deceleration phase is an accelerated set change. If Sequential Switching is not started until the machine has stopped, this is termed a normal set change.

Basic Conditions for Starting Sequential Switching II:

- lowering unit must be in raised position.
- no other Sequential Switching must be in progress.
- the manual core feeding operation must have been completed and the core stop must be in its retracted end position.
- "Web Threading" is switched off.
- no Emergency Stop must have been actuated.
- the core set must not protrude beyond the core clamp (monitored by photocell).

When pushbutton "SEQUENTIAL SWITCHING II ON" is pressed, the following sequence of functions begins:

1.
The rider roll moves up and actuates a limit switch in its upper end position.

2.
The core chucks of the shaftless rewind retract from the cores. In their rear end position, a signal is generated for raising the rewind carriages. In the upper end position, the carriages actuate a limit switch on each side.

3.
The cut-off knife bar comes up between the winder drums. In its upper end position, a switch is actuated. In case of an accelerated roll set change, the cut-off knife bar only comes up when the machine has come to a stop.

4.
Not applicable.

5.
The lowering unit pivots into eject position.
The set change time can be reduced by pivoting the lowering platform into eject position manually during the winding operation. In the eject position, the lowering platform actuates a limit switch.

6.
When the functions 1 - 5 have been completed, the suction air fan is switched on, creating an underpressure (partial vacuum) in the first winder drum. However, the suction air fan is switched on only if there is a web in the machine (Sequential Switching IIb).

7.
As the ejecting movement begins, the core set is clamped in the core clamp. The forward movement of the ejector beam ejects the roll set onto the lowering platform. In its forward (eject) end position, the ejector beam actuates a limit switch.

8.
Only in Sequential Switching IIb:
The finished set rolls onto the lowering platform, whereby the webs tear along the cut-off knife. The web tails remaining in the machine are drawn against the first winder drum through suction holes and held in position.

9.
Not applicable.

10.
When the ejector beam has reached its forward end position (no cores are loaded into the winder drum valley), or the ejected roll set has rolled over the limit switch on the lowering platform, the ejector retracts. In its rear end position, a limit switch is actuated.

11.
If no new set of cores was fed into the core clamp during the winding operation, this can be done during the parent reel change which follows.

12.
As the finished set rolls over the limit switch on the lowering platform, a signal is generated. This signal goes into holding position and causes the pushbutton "LOWERING UNIT DOWN" to blink. This signalizes to the operating crew that the set can be lowered.
The set is lowered by pressing the pushbutton. Releasing the pushbutton prematurely cause the lowering movement to stop. In its lower end position, the lowering unit actuates a limit switch.

13.
When the limit switches "LOWERING UNIT DOWN" and "EJECTOR BEAM RETRACTED" and "CUT-OFF KNIFE BAR DOWN" have been actuated, Sequential Switching II shuts off (the suction air is switched on).

6.3 Slitting Wdith Set-up Change

A change in slitting width set-up can be made before a new web is threaded, or during the reel change at the unwind.
See also Sequential Switching IIb.

6.4 Threading a New Web

Preparations for Sequential Switching III

1. remove empty spool (shell) from unwind bearings.
2. load new, full reel.
3. switch on brake generator.
4. tear a threading tail on the web by rotating the reel.
5. press pushbutton "THREAD" (or "CRAWL").
6. press pushbutton "WEB THREADING ON"
   (tape cradles and suction air fan on).
7. press pushbutton "SLITTERS RETRACT".
8. using the maneuvering potentiometer,
   rotate reel in unwind direction.
9. thread the web into the machine,
   then retract threading tape cradle on guide rolls.
10. pick up the web in the winder drum valley.
11. press pushbutton
    "THREADING TAPE CRADLE ON WINDER DRUM OFF".
12. draw web into the machine until it is full width and
    free of wrinkles.
13. press pushbutton "SLITTERS ENGAGE".
14. when the slit webs have reached the winder drum valley,
    press pushbutton "STOP".
15. press pushbutton "CUT-OFF KNIFE BAR UP".
16. tear off the individual slit webs
    across the cut-off knife edge.
17. raise lowering unit in manual operation
    at least to "eject position".

6.5 Sequential Switching III

Sequential Switching III is the continuation of Sequential Switching II.
The new set of cores must have been fed in and the web must have been threaded.

Basic Conditions for Starting Sequential Switching III:

- the machine is stopped, the parking brake is pressurized.
- no other Sequential Switching must be in progress.
- the cores, provided with an adhesive track, must have been fed into the core clamp.
- the manual core feeding operation must have been completed and the core stop must be in its retracted end position.
- the core set must not protrude beyond the core clamp.
- the suction fan remains switched on.
- the last positions/conditions of Sequential Switching II must still exist/prevail (except for the lowering platform).
- the lowering platform must be in uppermost or in eject position.

When pushbutton "SEQUENTIAL SWITCHING III ON" is pressed, the following sequence of functions begins:

1.
Not applicable.

2.
The cut-off knife bar retracts and actuates a limit switch in its bottom end position.

3.
As the core loading (roll ejecting) movement of the ejector beam begins, the cores are clamped in the core clamp. In its forward end position, the ejector beam actuates a limit switch.

4.
When the limit switches "EJECTOR FORWARD" and "CUT-OFF KNIFE BAR DOWN" are actuated, the core clamp opens and the core set drops into the winder drum valley. In its opened position, the core clamp actuates a limit switch.

5.
Not applicable.

6.
Not applicable.

7.
With actuation of the limit switch "CORE CLAMP OPEN", the ejector beam begins to move into its rear end position (limit switch "EJECTOR FORWARD" FREE), the rewind carriages move into their bottom end position, where they actuate a limit switch on each side which causes the core chucks to move into the cores.

8.
The rider roll moves down when the limit switch "EJECTOR FORWARD" is no longer actuated. If the rider roll reaches its limit switch "RELEASE POSITION" before the ejector beam has reached its rear end position and before the core chucks have cored up, then the rider roll is stopped.
When these conditions have been fulfilled, the lowering movement of the rider roll continues.
When the limit switch "RIDER ROLL DOWN" is actuated, the counterloading system is switched over to winding pressure with a time delay.

9.
Not applicable.

10.
When the limit switches:

a) rewind carriages down

b) core chucks cored up

c) rider roll down

d) not applicable

e) ejector beam retracted

have been actuated, Sequential Switching III and the suction air fan shut off.

7. Manual Core Feeding with Glue Track Application

Basic Conditions for Core Feeding:

1.
no Sequential Switching must have been started.

2.
the ejector beam must be in its retracted end position.

Sequence of Operations:

1.
Set the core stop assembly to the same scale value which the core chucks have when they are cored up.

2.
Press pushbutton "CORE STOP FORWARD".

3.
Push the core sections into the core guide (chute) in the proper sequence according to the slitting width set-up.

4.
Actuate the foot switch for the glue spray nozzle; this applies a glue track to the core.

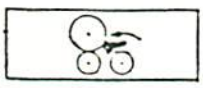
5.
Push the complete core set up against the core stop with the help of a feeding mandrel. The correct location of the core set is indicated by a pilot lamp. (Pilot lamp "CORE SET UP AGAINST CORE STOP" =HP95.N3-H1 lights up.)

6.
The manual core feeding operation is completed when the illuminated pushbutton "CORE STOP RETRACT" has been actuated and the core stop cylinder has retracted to its rear end position.

8. Unloading the Roll Set W I T H O U T Sequential Switching

1.
Conditions:
- retract core chucks from roll set,
- move rewind carriages into upper end position,
- move lowering unit into eject position
- move rider roll into upper end position.

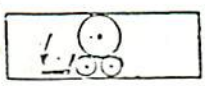
2.



Pushbutton =HR11.N1-S13 EJECTOR EJECT
Keep this pushbutton depressed until the roll set has been deposited on the lowering unit and has there touched the contact strip. As the ejecting movement begins, the belt tensioner of the winder drum transmission belt at the same time slackens the belt. This ensures that the free turning of the second winder drum can take place, as is required for ejecting the set.

3.
Release pushbutton =HR11.N1-S13,
the ejector retracts to its end position. Blinking of the ill. pushbutton =HR41.N1-S14 LOWERING UNIT DOWN indicates that the set can now be lowered.

4.



Press ill. pushbutton =HR41.N1-S14 LOWERING UNIT DOWN.
For safety reasons, the roll set is lowered in jog or inch mode (i.e. if the pushbutton is released, the lowering movement stops). When the bottom end position is reached, the lowering unit actuates a proximity switch. The belt tensioner then tightens the winder drum transmission belt again. The roll set rolls out of the lowering unit along the sloping surface.

In case of a web break, the web ends must be carefully spliced so that the quality of the rewound reel will not suffer. The same is true when a new unwinding reel is to be spliced to the trailing edge of the previous reel.

To make a splice, proceed as follows:

1. Disengage top knives and point up the web to be spliced.
2. Thread up the web through the machine at crawl speed as usual. If the leading edge of the web does not adhere to the rewound reel, fasten it temporarily (fig. 1).
3. As soon as the web is running through the machine properly, reengage the top knives. Remove the rewound but not slit paper layers (and the damaged trailing end of the used-up parent reel) with a knife (fig.2).
4. Unwind the broke from the rewinding reel at crawl speed. As soon as the web end is free (fig. 3) stop machine. Tack web end to reel.
5. Stick "Scotch" tape No. 254* (30 mm wide, adhesive on one side only) on to the front winding drum across the whole crown width as shown in fig. 4. On to this tape, stick the "Scotch" tape No. 405 (19 mm wide, adhesive on both sides, one side protected by a plastic foil). Now remove the protective foil from Scotch tape No. 405.
6. Pull the trailing web edge down across the front winding drum tightly (fig. 5) and press the web against the adhesive face of the Scotch tape No. 405. Crease the overhanging end of the web and tear it off.
7. Lower rider roll (switching position "winding"). Start up machine at crawl speed. The narrow Scotch tape will separate from the smooth surface of the wider tape (fig. 6); the new web entering between the winding drums will adhere to the narrow Scotch tape without wrinkle formation as the latter comes around to the rear winding drum (fig. 7).
8. As soon as the splice appears at the front of the machine, shut off drive motor. Crease and tear off the overhanging web end (fig. 8).
9. The Scotch tape forming the splice is now cut with a knife at each web slit. The splice can now be reinforced with adhesive tape.

The wide Scotch tape on the front winding drum can be left there for making further splices.

Whereas the tape No. 254 must be replaced in short intervals, the tape No. 549 (Teflon film) can be used over a period of up to 6 months.

Scotch tapes are supplied by Messrs. Minnesota Mining & Manufacturing Co. (3M).

* or "Scotch" tape No 549 (thickness: 0,0039" ≈ 0,1mm)

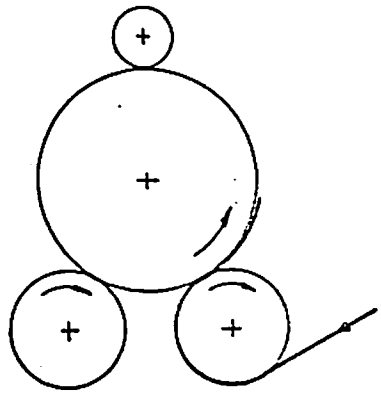


Fig. 1

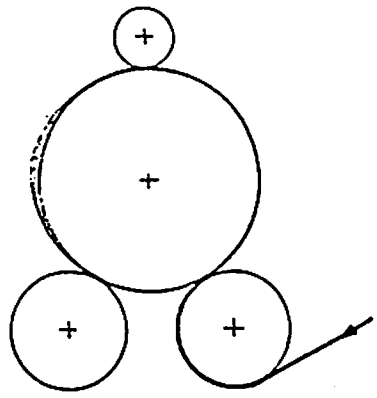


Fig. 2

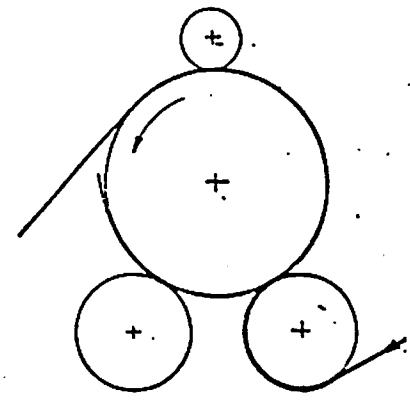


Fig. 3

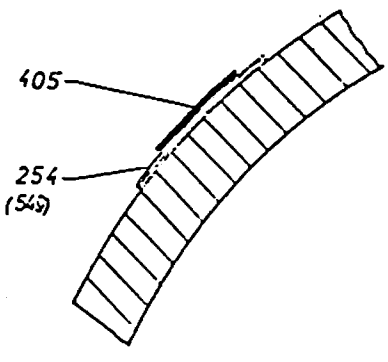


Fig. 4

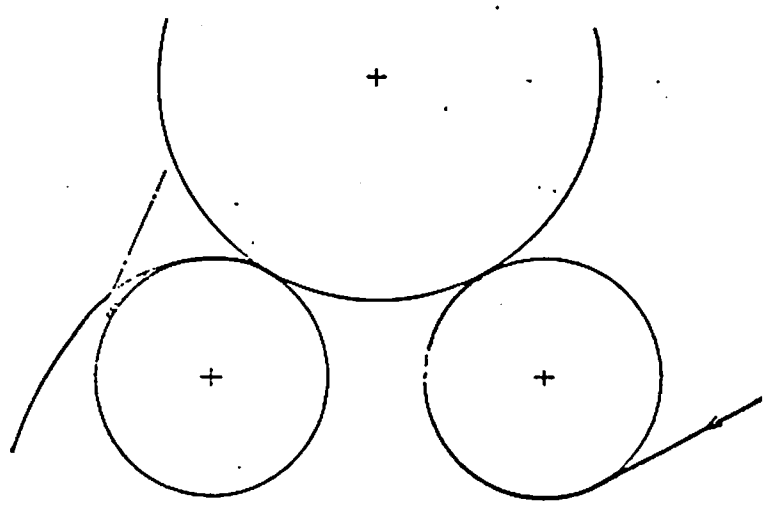


Fig. 5

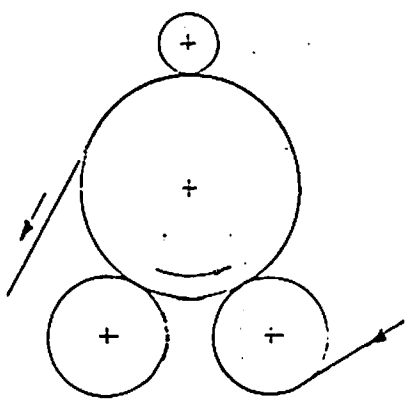


Fig. 6

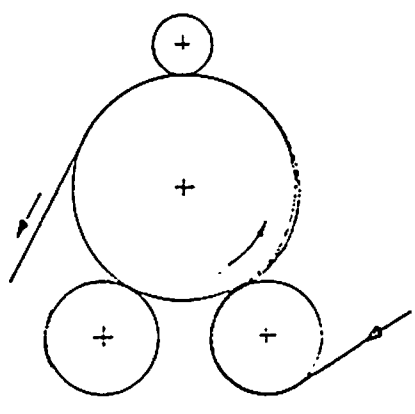


Fig. 7

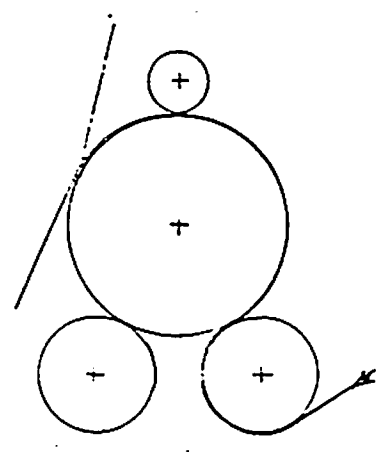
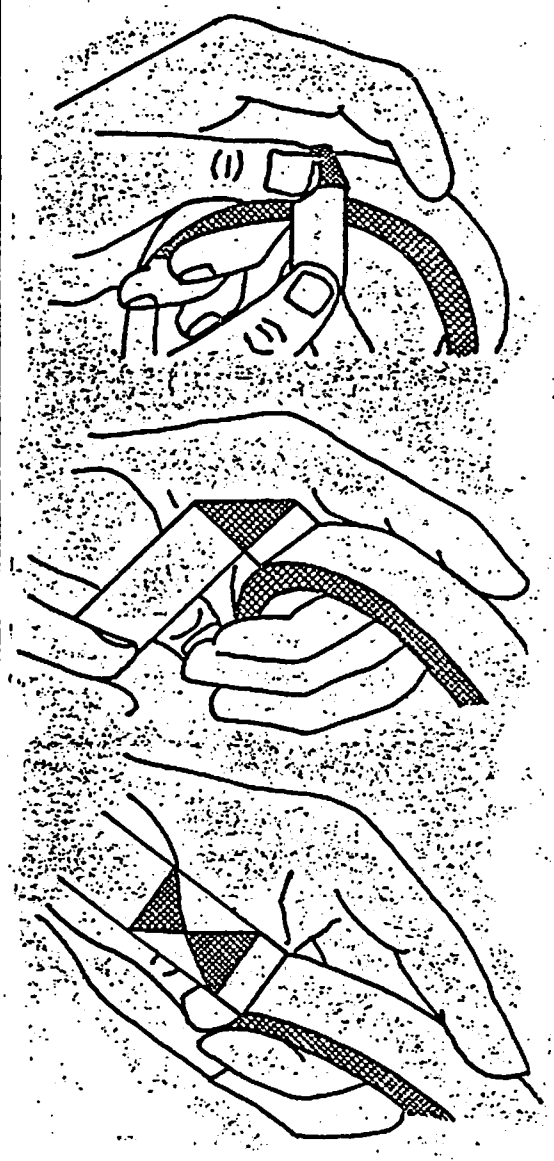


Fig. 8

Scotch

Adhesive Tape No. 405



Instructions for removing the adhesive tape from the protective film

Loosen a short piece of tape from the roll. With this strip, crease a right angle, whereby adhesive face must lie on adhesive face. Press the crease together with the thumb for a short interval.

Release crease and pull adhesive tape back into its original position <u>with a sharp snap.</u>

This is what the tape should now look like. The adhesive tape can now be easily and quickly removed from the protective film!

WESTVACO FAULTS

Westvaco, Störmeldeliste

800MR-W1 (GRAY)

REF NO	LEGEND	QTY
53	FAST STOP	1
54	NORMAL STOP	1
55	HYDRAULIC UNIT FILTER	1
56	HYDRAULIC UNIT MINIMUM PRESSURE	1
57	STOP CABLE	1
58	START INTERLOCKS	1
59	ACCELLERATION INTERLOCKS	1
60	SLITTER MOTOR	1
61	AIR PRESSURE	1
62	PROTRUDING CORE AT EJECT	1
63	SPOOL COUPLING DISENGAGED	1
64	ROLL ON LOWERING CRADLE	1
65	EJECTOR FORWARD	1
66	AUTO ROLL CHANGE	1
67	MAIN DRIVE	1
68	DRIVE SECURED	1

800MR-W61 (RED)

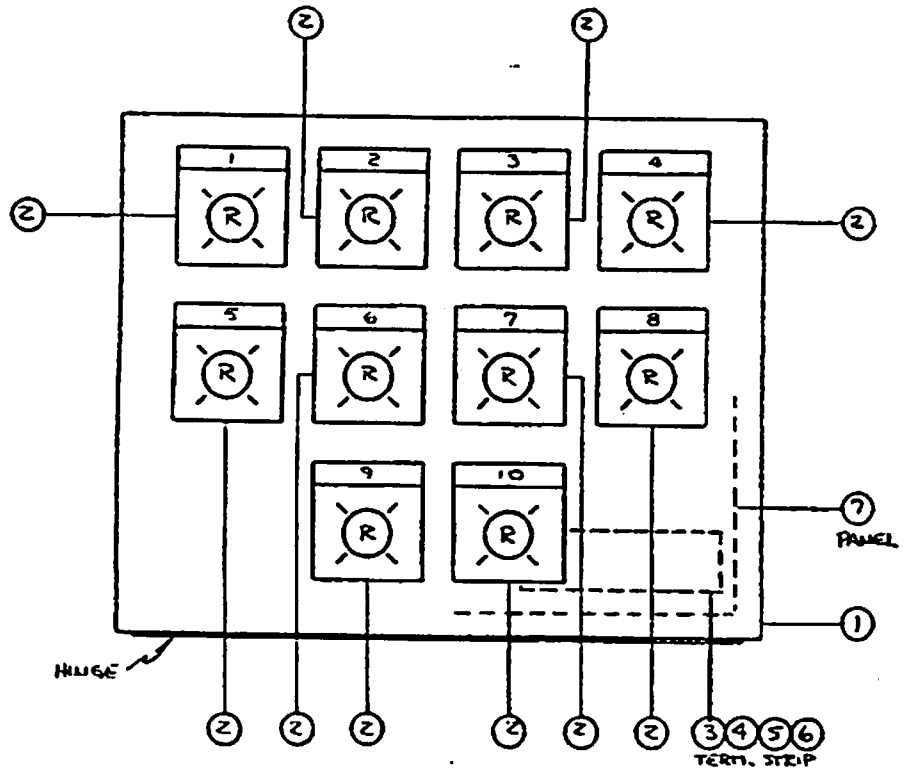
REF NO	LEGEND	QTY
69	EMERGENCY STOP	1

Ref.-Nr. Legende

53 Schnellhalt
54 Normalhalt
55 Hydraulikaggregat Filter
56 Hydraulikaggregat min.Druck
57 Halt-Kabel
58 Start Verriegelungen
59 Beschleunigung Verriegelungen
60 Messermotor
61 Luftdruck
62 Vorstehende Hülse beim Ausstoße
63 Tambourkupplung ausgerückt
64 Rolle auf Absenkbühne
65 Ausstoßvorrichtung vor
66 Rollenwechselautomatik
67 Hauptantrieb
68 Hauptantrieb gesichert
69 Nothalt

Betr.: Westvaco, Luke
Vari-Step 65; 30.23665

Vari-Step 65;



✱	REF. NO.	LEGEND	QTY.
	1	SLITTER NO. 0 FAULT	1
	2	SLITTER NO. 1 FAULT	1
	3	SLITTER NO. 2 FAULT	1
	4	SLITTER NO. 3 FAULT	1
	5	SLITTER NO. 4 FAULT	1
	6	SLITTER NO. 5 FAULT	1
	7	SLITTER NO. 6 FAULT	1
	8	SLITTER NO. 7 FAULT	1
	9	SLITTER NO. 8 FAULT	1
	10	SLITTER NO. 9 FAULT	1

MAKE FROM AB800T-X559 (10 REQ'D)

○ DENOTES ITEM NO. ON B.O.M.

89.3091.08179

			NEXT ASSY	USED ON	DRAWN J. OLSON	ABGENBERG	DRAWING NO. 89.3091.08179	REV
			TITLE R530 PILOT LIGHT STATION		DATE 6-11-84	ABGENBERG INC. ENFIELD, CT., 06082 USA	SCALE HALF	SHEET 1 OF 2
		MODIFIED FROM	DATE	REV	APPR.			

UF 3

BRUNING 40-534 60886

+R530

The purpose of maintenance is to reduce wear and tear, and to avoid or eliminate damage in good time. Maintenance, inspection and repair work should be carried out as an organized routine.

Special instructions concerning maintenance, inspection and repair work are contained in:
Section I of this manual and
Book 2 Sub-suppliers manuals.

General Instructions

1. Supply systems

Check supply systems daily: electrics, pneumatics, hydraulics and lubrication.

2. Checking functions

Daily checks should be made on all safety, guarding, switchgear and operating equipment, e.g.: safety guards, photocells, proximity switches, switchgear and indicating instruments.

3. Lubrication

It is essential that the lubricating instructions are observed. Open bearings, gear racks, pinions, round guides and roller bars should be cleaned daily and lightly greased.

3.1 Sliding surfaces

Lead screws, gear wheels, gear racks, guide surfaces and guide strips. During the running in period (approx. 600 operating hours) there will be slight wear on the sliding surfaces of these machine parts which will tend to smooth down the sliding surfaces. This wear, consisting of fine metal particles, contaminates the lubricating grease. The sliding surfaces of these parts should therefore be cleaned with a suitable medium during and following the running-in phase and regreased.

4. Piping and fittings

Regularly check all piping and fittings for rust formation, dirt deposit and leakage. Loose fittings should be retightened, scuffed piping should be replace.

5. Clamping bolts, screw connections

All clamping bolts, particularly foundation screws, should be checked regularly for proper seating and retightened if necessary.

6. Cleaning

The machine should always be kept clean. Dust should be vacuumed, and not blown off. Rags soaked with cold cleaner (cleansing petrol) or petroleum are suitable for cleaning heavily soiled machine parts.

When using high pressure cleaner units (steam and/or water) all bearing points should be regreased after the machine has been thoroughly cleaned.

The maintenance instructions, lubrication and operating media tables will be found in the operating instructions Manual II, subsupplier instructions. When maintenance and repair work must be carried out, observe the instructions of our subsuppliers.

In the following, excerpts for maintenance of the pneumatic equipment:

Compressed Air Oil Mist Lubricator

When the unit is without pressure, fill the oil mist lubricator up to the mark with lubricating oil of the viscosity group ISO VG 22 (viscosity 2 to 2.5 E° at 50 °C, e.g. Shell-Tellus oil C22). Subsequent replenishing can take place without interrupting operation (check valve at the inlet). For cleaning the vessel use test gasoline as per DIN 51632. The oil vessel must not come into contact with agressive medias such as acetone, nitro-thinner and the like.

Using the adjusting screw, so set the oil delivery volume that one drop of oil is misted for every 300 litres of air flowing through.

Compressed Air Filter (Water Trap)

The unit must be drained at regular intervals; under no circumstances may the water level increase above the separating cap, since otherwise the separated-out water would be pulled along again. A manually operated drain valve at the bottom of the container is used for draining off the condensate.

To ensure highest capacity at lowest pressure drop, it is necessary to clean the filter insert regularly. To clean the condensate container, use test gasoline as per DIN 51632 (same as for oil mist vessel).

Noise Reducer (Silencer)

If soiled, clean the silencers with nitro-cleaning medium.

Other Components

Under normal operating conditions, regular maintenance work is not required. Disturbances in operation are almost always caused by not properly cleaned air.

The primary principle of good maintenance is the correct and regular lubrication with the properly chosen lubricants. For lubricating the machine, observe the following documentation:

- lubrication diagram (lubrication plan, lubrication instructions)
- lubrication instruction - explanation
- lubrication table
- lubrication and maintenance instructions for equipment of our subsuppliers, see Operating Instructions Manual 2, Sub-Supplier Instructions.

1. Lubrication Diagram

Shown on the lubrication diagram are:

- location of the lubricating points (central lubrication points), designated with item number.
- type of lubricant, indicated by lubrication symbol and lubricant number as per Jagenberg lubrication table and lubrication instruction - explanation
- type of lubrication, shown by lubrication symbol and picture symbol as per Jagenberg lubricating instruction - explanation
- lubrication interval, shown by picture of symbol (clock) and statement of operating hours, see Jagenberg lubricating instruction - explanation.

2. Lubrication Instruction - Explanation

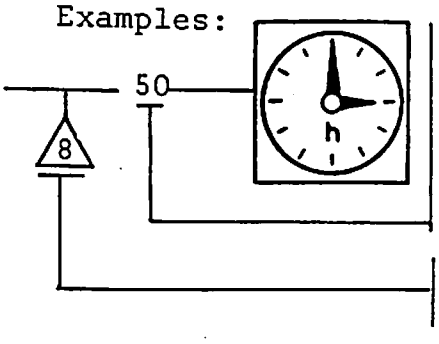
This contains the lubricant designations, guiding test values, fields of application and type of application, furthermore an explanation of the symbols and picture symbols used in the lubrication diagram.

3. Lubrication Table

The lubrication table is a selecting and comparison table and contains lubricant recommendations of well-known lubricant manufacturers. The lubricants named there have proven themselves on our machines. We therefore recommend that these or provably equivalent ones be used.

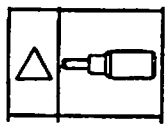
4. Explanation of Lubricating Instructions

Examples:

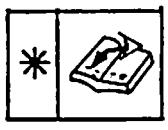


Lubrication Interval: 50 operating hours (≙ 1 x weekly in 1-shift operation)

Lubricant: No. 8 = grease



Grease lubrication (w/ grease gun)



Lubrication & Maintenance as per Operating Instructions (see Manual 2, Sub-Supplier Instructions)