SERVICE INSTRUCTIONS

PERFECTA 76 / 92 / 115 / 132 / 168

UC / TV

(Servo)

PERFECTA
Schneidsysteme

The Service Instructions manual belongs to the hands of the repair and maintenance personnel !

Table of Contents

General Instructions

This Service Instructions manual is provided as a supplement to the Operating Instructions manual for the **repair and maintenance personnel** and, therefore, is referred to the Operating Instructions manual in several cases.
As a great deal of setting and repair instructions affect the safety of the operator and of the machine, such work should be performed by trained or instructed personnel.

In this place, a few fundamental instructions be given which, as practice shows, are often disregarded:
• Whenever you remove separating guardings such as hoods, panelings etc. for repair and maintenance purposes, always remember that, in most cases, machine elements with hazardous movements are behind. For this reason, guardings must, by all means, be refitted after completion of work.

• Open switch cabinets and switching rooms do not only collect dust that leads to failures, but also involve danger to life and limb.

You are encouraged to take the opportunity PERFECTA offers you to have your technicians trained at our Training Centre.

Safety Inspection

Due to their way of operation consisting of hazardous movements such as clamping and cutting, guillotines must meet a number of safety regulations. Such regulations are met by "Safety Devices" described under the same caption in the Operating Instructions manual.

According to the Accident Prevention Procedures for the Printing and Paper Processing Industry, **VBG 7i, § 40**, the user must ensure that the safety devices - particularly the control system - should be inspected by a specialist every five years.The result of the inspection should be recorded and filed.

Fig.2 shows an acceptance check list as used by **PERFECTA**.

Machines accepted without any objections are provided with a plaquette (Fig. 1) which shows the next inspection date.

Fig. 1

PERFECTA Schneidemaschinenwerk GmbH Bautzen

Schäfferstr. 44, D–02625 Bautzen

Machine Inspection according to VBG 7i, Article 40

Machine Model:_____ **Company:**_____

Serial No.:_____ **Street:**_____ **Place:**_____

		1)	2)
1.0	**Main Switch**		
1.1	Switch Lock	☐	☐
1.2	Marking	☐	☐
2.0	**Clutch/Brake**	☐	☐
2.1	Friction Linings	☐	☐
2.2	ON/OFF Air Gaps	☐	☐
2.3	Slip Rings, Carbon Brushes	☐	☐
2.4	Antifriction Bearings	☐	☐
3.0	**Knife Pushbuttons**		
3.1	Two-Hand Control	☐	☐
3.2	Non-Repeat	☐	☐
3.3	Time Limitation	☐	☐
4.0	**Light Guard**		
4.1	Upward Disable	☐	☐
4.2	Self-Monitoring	☐	☐
4.3	Pilot Lights	☐	☐
5.0	**Clamp**		
5.1	Pre-Clamping (.....N)	☐	☐
5.2	Clamp Lock	☐	☐
5.3	Clamp Front Openings	☐	☐
5.4	Finger Rejector	☐	☐
6.0	**Knife**		
6.1	Knife Overrun	☐	☐
6.2	Knife Hoist	☐	☐
6.3	Manual Cranking	☐	☐
6.4	Non-Repeat Device	☐	☐

		1)	2)
7.0	**Hydraulic System**		
7.1	VD1, VD1.1, VD2	☐	☐
7.2	VD3 Clamping Press. Valve	☐	☐
8.0	**Gears**	☐	☐
8.1	Tightness	☐	☐
8.2	Control Cams	☐	☐
8.3	S52, 53, 54 Control Switches	☐	☐
9.0	**Fully Automatic Mode**		
9.1	Signalization	☐	☐
10.0	**Guardings**	☐	☐
10.1	Flywheel Guard	☐	☐
10.2	Rear Guarding	☐	☐
10.3	Electric Compartment Door	☐	☐
11.0	**Electric System**		
11.1	Clamp and Knife Contactors/Relays	☐	☐
11.2	RF Suppression	☐	☐
11.3	Cabling	☐	☐
11.4	Rubbing and Crushing Points	☐	☐
11.5	Pilot Lights	☐	☐
11.6	Protective Conductor Connection	☐	☐

1) Checked, O.K.
2) Defects found

Safety devices of the machine unobjectionable. ☐

Defects found in the safety devices of the machine: ☐

According to the applicable procedures, the user is responsible for the immediate rectification of any defects found.
Please keep this inspection report.

Remarks:_____

Inspected by:

Confirmed by:

Place:_____ Date:_____

Inspector's Signature

User's Signature

Fig. 2

Knife Drive

Setting the Automatic Stopping Device

The timing of the S52, S53, S54 control switches on the crankshaft is explained by a chart in the "Knife Control" section (control switches).
The proper functioning of the control switches can be checked from the service menu (I/O Test).

The control switches have the following function:

S52
- Taking over knife up-movement from the lower dead centre (LDC).
- Deactivating the light guard effect.
- Stopping the knive travel towards the upper dead centre (UDC).

The cam of S52 should be set so that the machine would stop at the upper dead centre and the cam follower of S54 comes to stop within the first third of its cam length.

S53
- Knife-down travel.
- Clamp locking while the knife is coming down.

S54
- Checking the UDC.
- Emergency shut-off in case of S52 failure.

The gap shown in the timing chart (switching distance) between S54 and S53 should be 1/3 to 1/2 of a flywheel turn. For this purpose, energize the clutch (refer to "Manual Cranking" in the Operating Instructions manual) and check the switching distance.

When the knife drive is automatically stopped, the knife edge must protrude at least **6 mm** over the right-hand clamp bottom edge.

When the knife beam runs over the UDC (S54 no longer operated at stop position), any subsequent cut triggering is disabled.

The display reads **Error 28**: Safety Module Detecting Error.
By pressing the "C" key, concrete **Error 7** appears: Knife Overrun.

After turning off and on the machine, the subsequent cut can be restarted by the knife pushbuttons.
If there is another overrun at the UDC, slight pre-stopping correction can be performed by turning forward the entire cam package within the permissible range.
If such correction by the abovementioned cam shifting is not successful, i. e. if there is still overrun, checking the clutch/ brake assembly of the knife drive should, under any circumstances, be checked.

Knife Drive Clutch and Brake Assembly

System Design (Fig. 3)
Armature disk **3** provided with brake lining **1** or clutch lining **2**, respectively, is axially movable on a spline bushing. It is forced against brake ring **6** by springs **5**. This reliably brakes the machine.

When the clutch is energized, armature disk **3** is attracted by the magnetic field of coil body **7** and pressed against friction ring **8**. The machine is engaged.

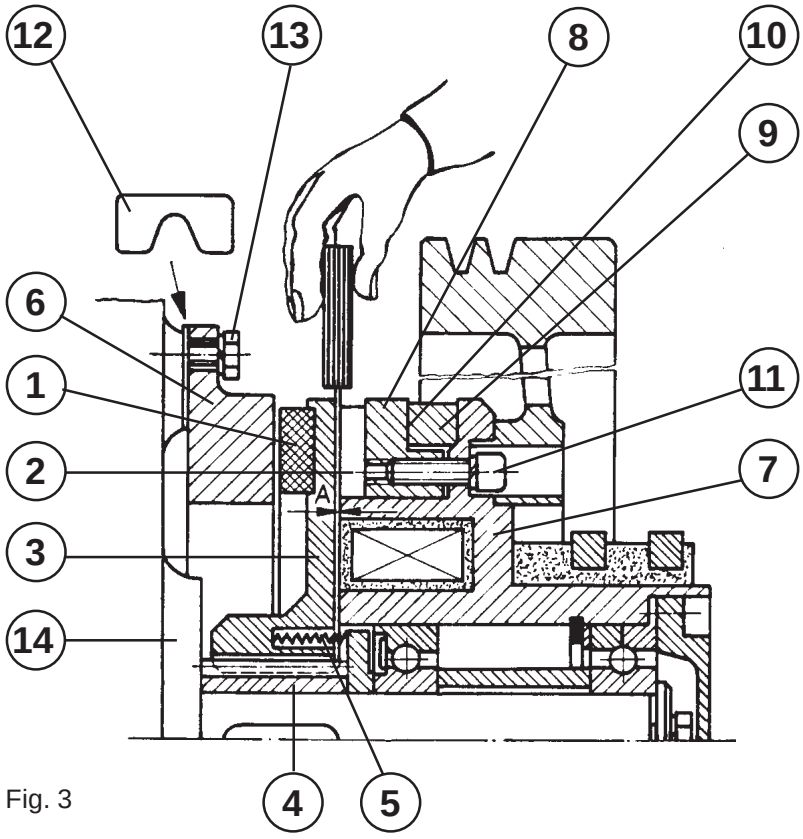

Fig. 3

Checking and Setting the Air Gap

Under normal operating conditions, the air gap should be checked once per year.

For air gap **A**, refer to the Table (Fig. 5).

• **Engaged state** (clutch "ON"):

If air gap **A min** is smaller than specified in the Table, Fig. 5, shims **10** of uniform thickness should be inserted

between coil body **7** and friction ring **8** (Fig. 4) for

machine sizes 76 and 92, or

between friction ring 8 and spacing segment 9 (Fig. 3) for

machine sizes 115 and 132.

For this purpose, slacken screws **11** around the circumference and then re-tighten them uniformly. The shims are available in various thicknesses. Refer to the Spare Parts Catalogue in the Operating Instructions manual.

After the successful installation of the shims, make sure that air gap **A max** specified in the Table is not exceeded (use thinner shims) and air gap **A min** in the braked state (clutch "OFF") is not undercut.

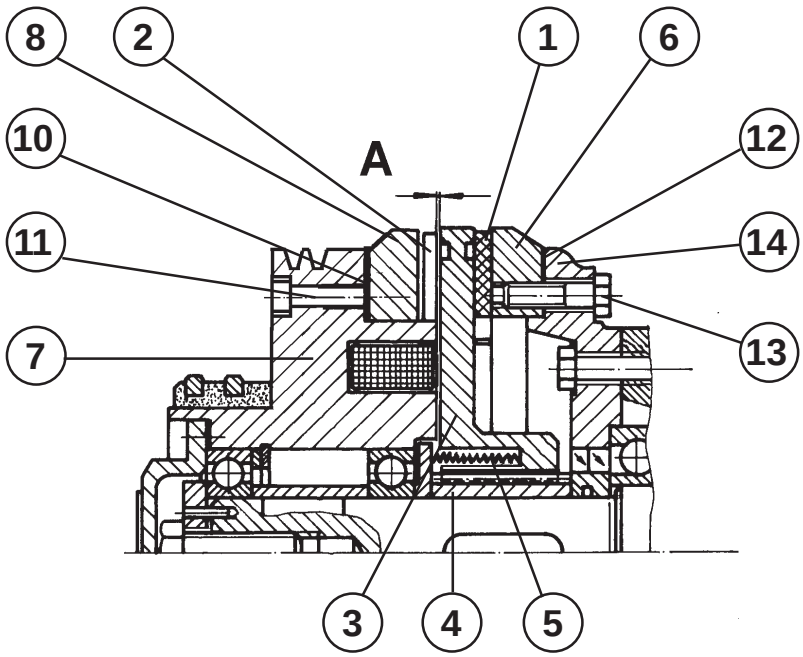

Fig. 4

Braked state (clutch "OFF")

If air gap **A max** is wider than specified in the Table, shims **12** of the same thickness should be inserted between brake ring **6** and gearbox cover **14**. For this purpose, energize the clutch as described in the Operating Instructions manual under "Manual Cranking", slacken screws **13** around the circumference, and then re-tighten them uniformly.

Checking the Bearing Play

For machine sizes 115 and 132 only.

De-energize the clutch.
No perceptible play in the bearing must appear when the flywheel rim top is pulled and pushed by hand.
In case of evident play, replace the antifriction bearings.

Caution!
Bring the knife beam to its lowermost position prior to dismantling the clutch/brake assembly, as the brake becomes ineffective when the compression springs are relieved.

Fig. 5
Knife Drive Clutch/Brake Assembly Air Gaps (mm)

Machine Size		**76**	**92**	**115**	**132**	**168**
Clutch "ON"	A min	0,2	0,2	0,2	0,2	0,2
	A max	0,4	0,5	0,5	0,5	0,6
Clutch "OFF"	A min	0,6	0.7	0,7	0,7	0,7
	A max	0,8	1	1,2	1,2	1,4

Clutch/Brake Assembly Maintenance

Check the air gap annually as described above and correct with shims, if required.

Keep the slip rings clean and grease-free. Clean with fine-grain abrasive cloth, if necessary. Ensure proper contacting between the carbon brushes and the slip ring to avoid brush sparking.
Remove carbon dust with a brush (without metal ring).

If the brake or clutch linings are badly worn out or contaminated with oil, the armature disk must be replaced. Before installing a new armature disk, clean the friction surfaces of the clutch and brake rings with white spirit.
After installation, check the air gaps in conformity with the Table (Fig. 5).

Protect the asbestos-free friction linings from oil and grease. Even when doing installation and setting work, make sure your measuring tools and also your hands are grease-free.

Caution!
Bring the knife beam to its lowermost position prior to dismantling the clutch/brake assembly, as the brake becomes ineffective when the compression springs are relieved.

Malfunctions in the Knife Drive

The following malfunctions may occur in the knife drive and are not indicated by the computer control system as error codes:

• The main motor cannot be started.

Remedy:
- Switch S56 for "Manual Cranking" (refer to the Operating Instructions manual) under the flywheel guard is locked. Unlock the switch.

-The flywheel guard is not properly closed. Turn in the screw until the safety switch is closed.

-Defective fuses. Replace the corresponding fuses.

• The knife or clamp drive cannot be started.

Remedy:
-Main motor switched off.

-Defective two-hand control pushbutton. Replace pushbutton.

-No contact between the carbon brushes and the slip rings. Refer to "Clutch/Brake Assembly Maintenance".

-Refer to "Malfunctions in the Hydraulic Clamping System" (flow indicator).

-Pedal locked (S69).

-Y62 does not make contact or is defective.

• Heavy jerk when the knife reverses at its lowermost position.

Remedy:
- The overload protection device has become loose. Re-tighten the overload protection screw. Refer to "Knife Drive Assembly Overload Protection Device" in the Operating Instructions manual.
- Very dull knives are often the cause for the responding of the overload protection ring.

Clamping System

In addition to gap **s** between the knife back and the clamp edge, the play of the clamp in its guideways is decisive to obtain a high-quality and high-accuracy cut.

Gap Between the Knife Back and the Clamp Edge

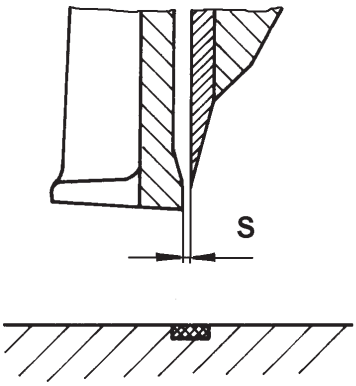

Fig. 6

Keeping specified gap **s**, it is important to bring the clamping pressure as close as possible to the cutting line.
Gap **s** shown in Fig. 6 should be **0.2 + 0.1 mm**.

Clamp **1** can be readjusted with respect to cutting line **2** as follows:

Machine Size 76 (Fig. 7)

• Slacken screws **3** to release clamp guideway **4** at the clamp left and right rear sides.

• Adjust required gap **s** by means of shims **5** to be inserted between clamp **1** and clamp guideway **4**. Inserting shims reduces the gap by the shim thickness, while removing shims widens the gap. The shims are 0.05 and 0.2 mm thick. Refer to the Spare Parts Catalogue in the Operating Instructions manual.

• Tighten the clamp guideway and check the gap across the entire cutting width with a feeler gauge.

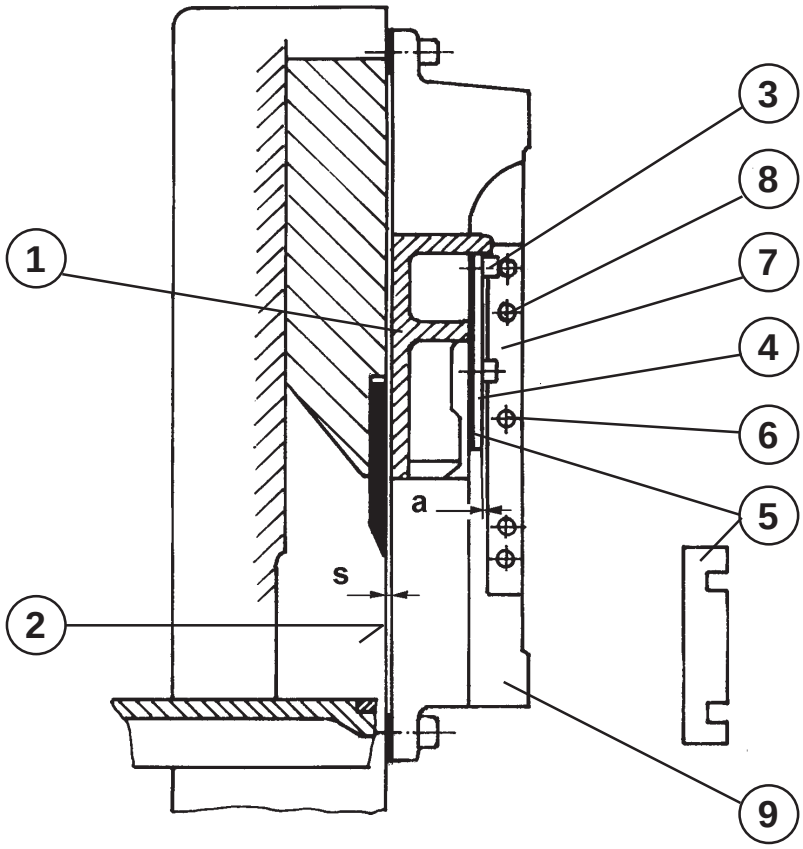

Fig. 7

Machine Size 92 (Fig. 8)

Fig. 8 shows shims **3** under pretensioned roller guideway **4** by means of which the position of clamp **1** with respect to cutting line **2** was set in the factory.
Inserting shim **3** between clamp **1** and roller guideway **4** minimizes gap **s** by the shim thickness, while removing shim **3** increases the gap.
For the proper procedure, refer to "Play in the Clamp Guideway".

Machine Sizes 115/132 (Fig. 9)

• Slacken lower nuts **3** at the clamp left and right sides.

• Slightly turning eccentric pins **4** (both sides uniformly) moves the clamp away from or towads the cutting line.
Check gap **s** across the entire cutting width with a feeler gauge.

• When jamming the nuts, ensure that the positions of the eccentric pins are locked.

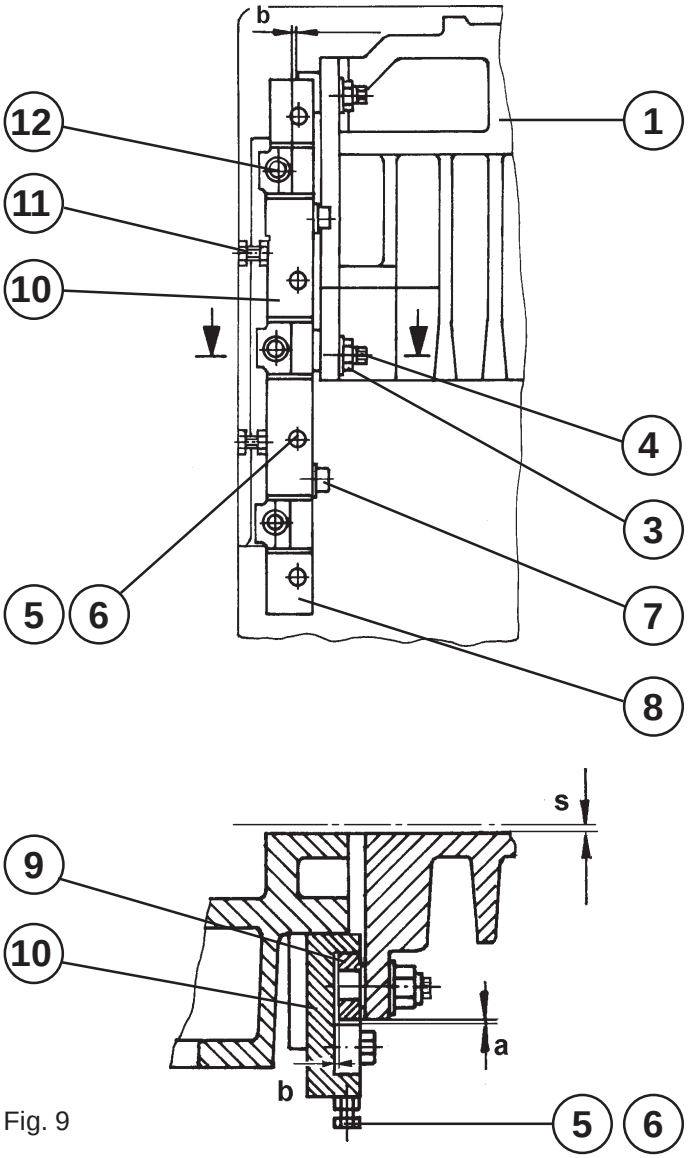

Fig. 9

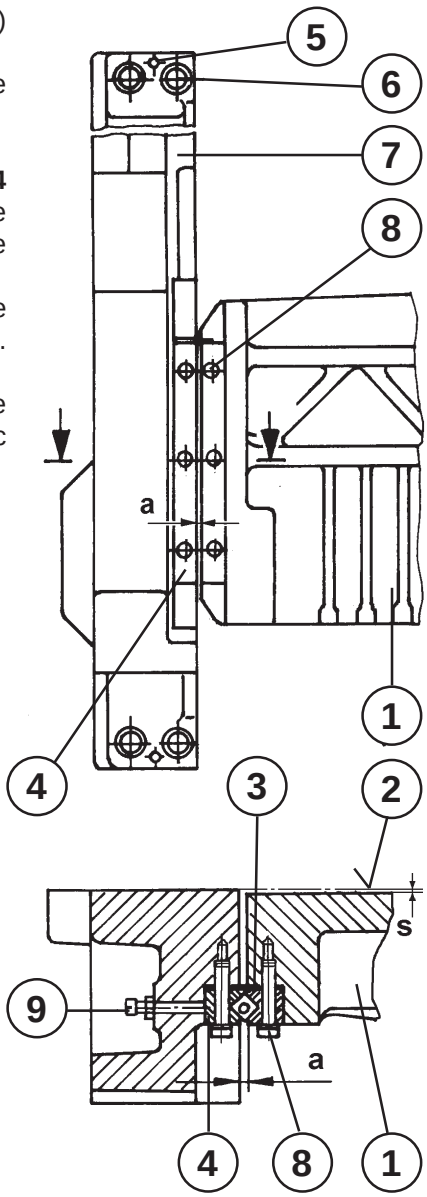

Fig. 8

Play in the Clamp Guideways

Machine Size 76 (Fig. 7)

• Slacken screws **6** of adjusting strip **7**.

• Move adjusting strip **7** against clamp guideway **4** with eccentric pin **8** until play **a** between both parts is **< 0.05 mm**.
When performing this setting, ensure that clamp guideway **4** rests on guide strip **9** of the opposite side. For this purpose, press the clamp towards the knife.

Machine Size 92 (Fig. 8)

The clamp is guided by pre-tensioned roller guideways, i. e. it is play-free. Therefore, readjusting is not necessary.
If any wear is found due to long and hard use of the machine, the roller guides should be replaced. For this purpose, proceed as follows:

• Support clamp **1** by wooden wedges, for example.

• Pull out pins **5** and slacken screws **6** of knife beam guide strip **7**.

• Remove roller guideway **4** by slackening screws **8**. Observe the assignment of shims **3**.

• Slightly tighten the new roller guideways with their associated shims **3** by means of screws **8**.

• Re-pin knife beam guide strip **7** and tighten with screws **6**.

• Check air gap **a** on the roller guideway. Gap **a** should be **0.5 mm** when the roller guideway is properly pre-tensioned.

• If necessary, re-tension the outer roller guide strip by means of screws to be introduced into the tapped holes in knife beam guide strip **7** until gap **a** is obtained. Then, tighten the roller guideway with screws **8**.
Remove the wooden wedges and check the clamp for free movement by pressing the pedal.

Machine Sizes 115/132 (Fig. 9)

• Slacken lock nuts **5** on adjusting screws **6**.

• Slightly slacken screws **7** on adjusting strip **8**.

• Reset adjusting strip **8** against guide blocks **9** by adjusting screws **6** until play **a** between the adjusting strip and the guide block is **< 0.05** mm.
When performing this adjustment, ensure that guide blocks **9** rest on the opposite side of guide strip **10**. For this purpose, press the clamp towards the knife.

• After completing the adjustment, tighten the screws and nuts and check the play over the entire clamp stroke with a feeler gauge.

The lateral play (face play) should be **b = 0.1 + 0.05 mm**.
For this purpose, adjust supporting screws **11** with screws **12** slightly slackened until play **b** is obtained between guide strip **10** and guide block **9**. Tighten screws **12**.

Clamp Parallelism with the Cutting Table

In the factory, the clamp is aligned in parallel with the cutting table surface.
This can be checked by pre-clamping with paper strips put under the left and right sides of the clamp.
If correction should be necessary, proceed as follows:

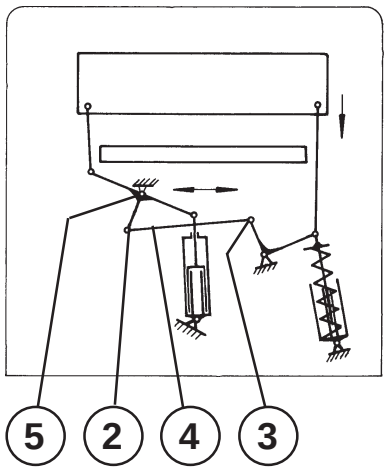

Fig. 10

Machine Sizes 76/92

Fig. 10 shows the clamping principle for machine sizes 76 and 92.

Machine Size 76 (Fig. 11):

• Remove the hydraulic system front paneling under the cutting table.

• Slacken clamping screws **1** in pusher rod eyes **2** and **3**.

• Turn pusher rod **4** as follows:

- Increasing the distance between the pusher rod eyes moves down the clamp on the right.

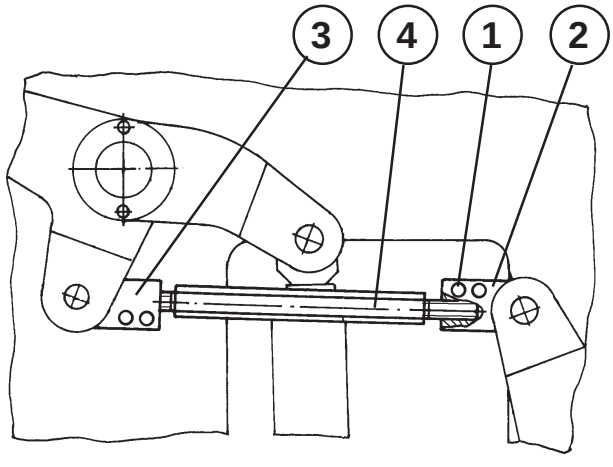

Fig. 11

- Reducing the distance between the pusher rod eyes moves up the clamp on the right.

• Tighten clamping screws **1**, check for parallelism as described above, and re-fit the paneling.

Machine Size 92 (Fig. 12):

Adjusting the clamp right-hand side is analogue to that for machine size 76.
The clamp left-hand side must be adjusted on clamp lever bearing **5** in Fig. **10**. For this purpose, proceed as follows:

• Slacken clamping screw **1** on the front of the cross beam.

• Turn clamping lever pivot pin **2** from the machine back using key surface **3**.

• After checking for parallelism with paper strips, tighten clamping screw **1**.

Machine Sizes 115/132 (Fig. 14)

The clamping principle is shown in Fig. 13.

• Remove the clamping system front and rear paneling under the cutting table.

• Slacken screw **1** on the front lower cross beam.

• Gently turn clamping lever pivot pin **2** or **3** by the key surface from the back of the machine until the paper strip, see above, is seized by the clamp.
Only readjust that clamping lever pivot pin where the deviation exists.

• Tighten screw 1 and re-fit the paneling.

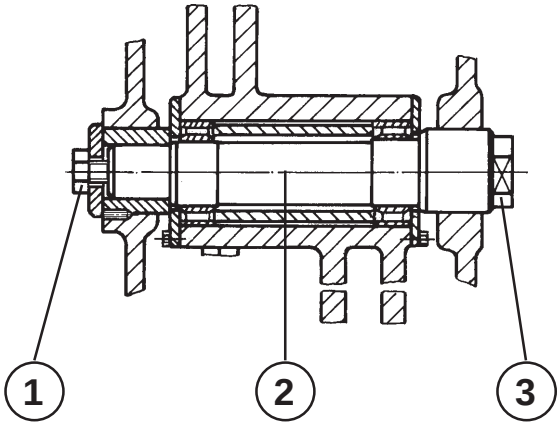

Fig. 12

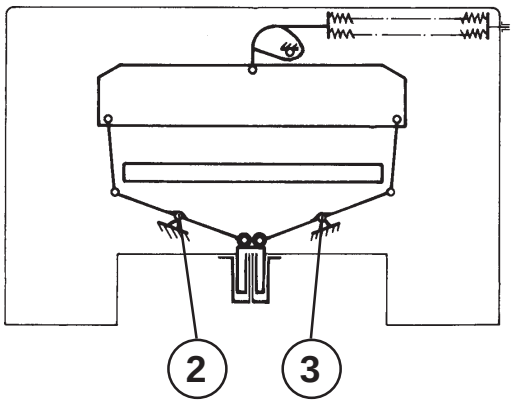

Fig. 13

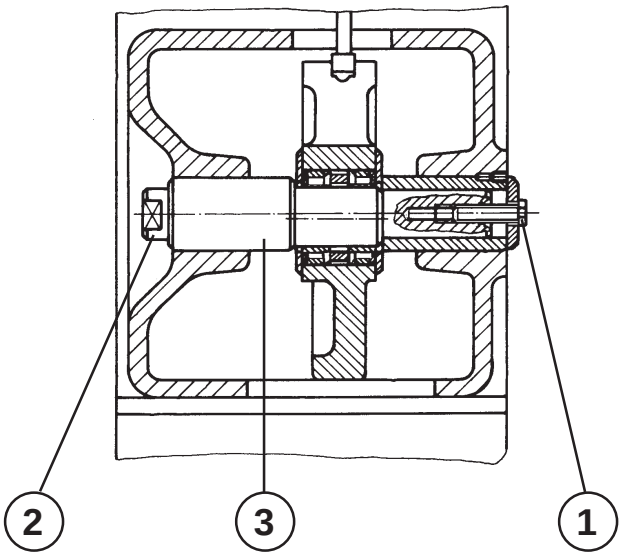

Fig. 14

Machine Size 168 (Fig. 15)

Slacken upper lock nut **3** on tension spindle **2** located in clamp **1**. Turn nuts **4** to adjust the clamp in parallel with the cutting table. Thighten lock nut **3**.
Only adjust the side which shows the deviation.

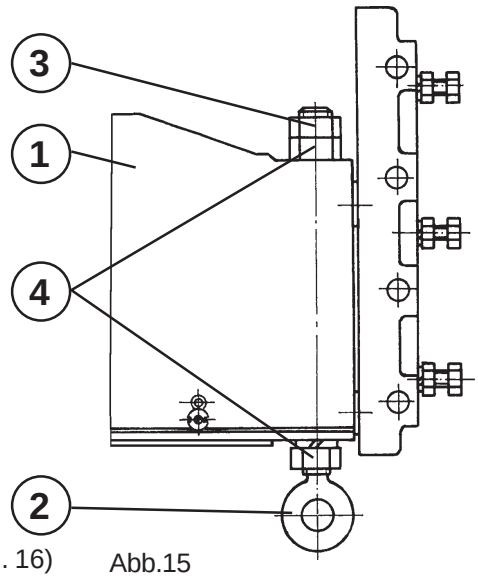

Abb.15

Cutting System

All **PERFECTA** guillotines work on the basis of what is called the slant rocking cut, i. e. the knife as the cutting tool moves along a curved path from left to right.
All findings and experience related to the cutting system regarding the questions of cutting stock, knives, clamping, cutting inaccu-racies and their rectification are summarized in our **"Cutting Compendium"** that you can ob-tain from **PERFECTA**.

Play in the Knife Beam Guideways

In addition to many other factors, a smooth guidance of the knife beam is a prerequisite to a high-quality and high-accuracy cut. Over the years, and depending upon the working conditions, the guideways are subject to wear, although the latter is minimal.
Therefore, the play in the knife beam guideways should, from time to time, also be measured and readjusted, if required.

Machine Sizes 76/92 (Fig. 16)

Knife beam **1** moves between slide surfaces **2** on the machine frame and guide strips **3**. The guide strips have been adjusted with respect to the knife beam with shims **4** so that gap **s** required for establishing the necessary lubrication film is **< 0.05 mm**.

Checking the play:

• Push the knife beam (without knife) against the frame from the rear at the top and bottom positions. Check the play between the knife beam and the guide strip on the left and right sides using a feeler gauge.

• Removing shims reduces air gap **s**. Under any circumstances should it be ensured that the gap is not too small, as, otherwise, lubrication is not guaranteed, with the knife beam tending to get jammed.
This would result in seizure of the sliding surfaces.

Whenever the positions of the guide strips are changed, the air gap between the knife back and the clamp edge must always be checked as described under "Clamping System" and readjusted, if necessary.

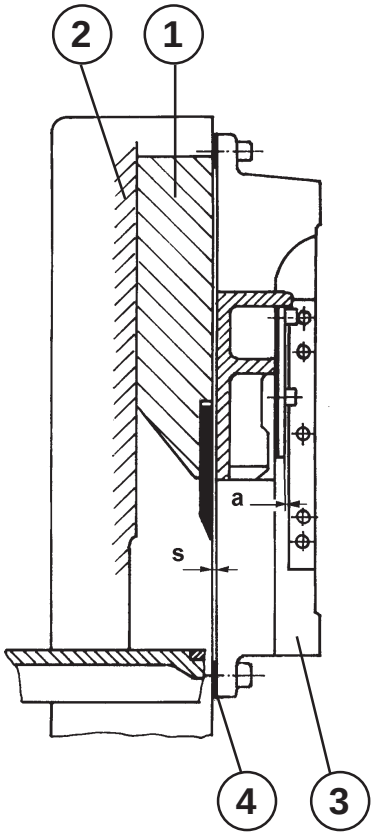

Fig. 16

Machine Sizes 115/132 (Fig. 17)

Knife beam **1** moves between slide surfaces **2** on the machine frame and guide strips **3**. The guide strips are supported in machine front part **5** by guide pins **4**. By means of adjusting screws **6** located under plastic covers **7** on the machine front parts, the guide strips can be moved towards the knife beam. On the cutting table side, guide pins **4** and adjusting screws **6** are secured against moving or turning by clamping screws **8**.

Gap **s** should be **< 0,05 mm** .

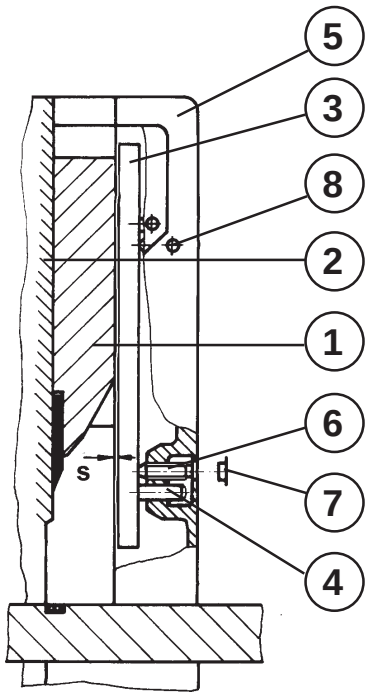

Fig. 17

Checking the play:

• Push the knife beam (without knife) against the frame from the rear at the top and bottom positions. Check the play between the knife beam and the guide strip on the left and right sides using a feeler gauge.

If required, readjust gap **s** as follows:

• Set the knife beam to medium feed height and push it against the frame.

• Remove the front paneling.

• Slacken clamping screws **8** on the left and right of the cutting table (8 screws in total).

• Remove plastic cover **7** and adjust guide strip **3** against the knife beam with adjusting screws **6** until the required play is obtained.

• Re-tighten clamping screws **8** and check the play at the knife beam top and bottom positions once again.

• Re-fit the front paneling.

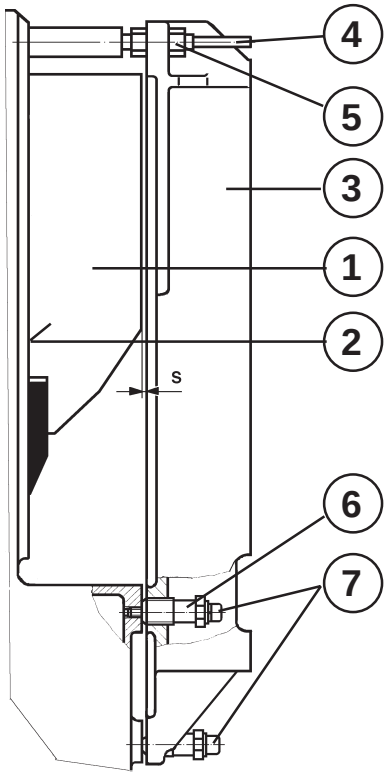

Fig. 18

Machine Size 168 (Fig.18)

Knife beam **1** moves between the slide surfaces on machine frame **2** and guide strips **3**. On top, the guide strips rest on two stud bolts **4** each and are fixed to the machine frame by two nuts **5**.
Below, the guide strips are supported on the machine frame by four threaded bushes **6** and are fastened to the frame by screws **7**.

Gap **s** should be **< 0.05 mm**.

Checking the play:

• Push the knife beam (without knife) against the frame from the rear at the top and bottom positions. Use a feeler gauge to check the play between the knife beam and the guide strip on the left and right sides.

If required, readjust gap **s** as follows:

• Remove the light guards and the upper lateral paneling.

• Set the knife beam to medium feed height and push it against the frame.

• Slacken nuts **5** and screws **7**.

• Use nuts **5** and threaded bushes **6** to adjust the play.

• Lock nuts **5** and tighten screws **7** and check the play once again at the topmost and lowermost positions of the knife beam on the left and right of the guide strip. Correct, if required.

• Re-fit the paneling and the light guards.
Important: Check the light guards for proper functioning.

Readjusting the Knife Cut-Through Position

The cut-through position is described under "Adjusting the Cut-Through Position" in the Operating Instructions manual.

Machine Size 76/92(Fig.19)

For a.m. cutting sizes the Knife Cut-through position is readjusted at the right hand side of the machine as following:
Right side:
Remove cap from opening**3.**
Loosen screw **5** by two turns.
Insert knife changing tool**1** into centre of bolt**6**.
Anticlockwise turning: Lift knife.
Clockwise turning: Drop knife.
Tighten screw**5**. The position of screw**5** indicates the position of the knife. Screw up means knife up.
Remove the tool after setting!

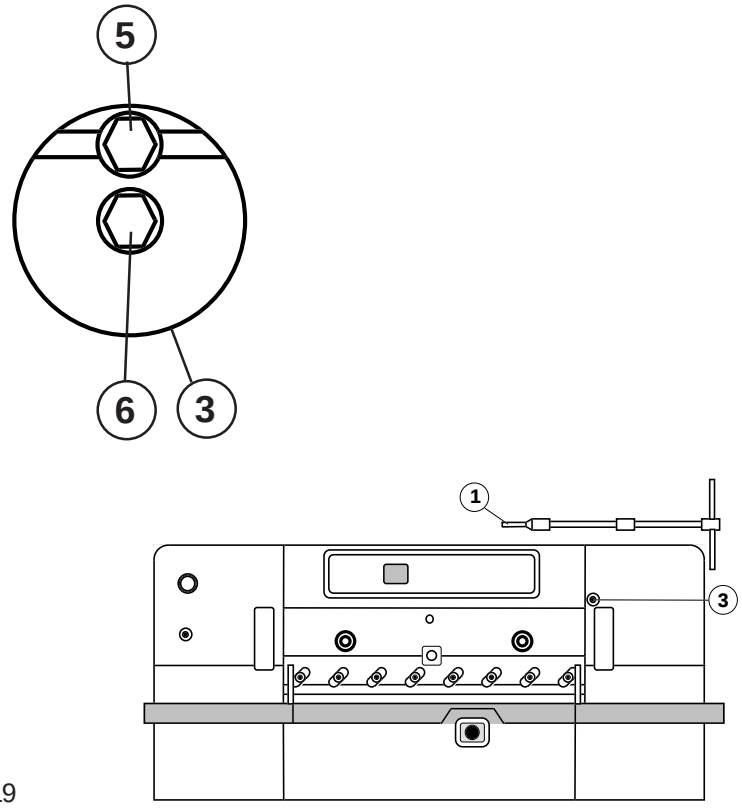

Fig.19

Non-Repeat Device

The upper dead centre of the knife beam is stopped and controlled by control switches **S52** and **S54** and is monitored by the safety processor control system which immediately stops the knife travel in case of any irregularities. Refer to "Setting the Automatic Stopping Device".

In addition, all **PERFECTA** guillotines are provided with a mechanical non-repeat device (catch/locking pin), a third safety means for the upper dead center, which locks the knife beam to the machine frame.

If this non-repeat device responds due to excessive overrun, the knife beam must be manually returned to its upper dead centre. Refer to "Manual Cranking".

In case the overload protection device responds, refer to "Knife Drive Assembly Overload Protection Device".

Setting Instructions

Machine Size 76 (Fig. 20)

The length of chain **1** between solenoid **Y80** and catch **2** is set by a screw **3** so that the catch forms a gap **s = 0.6 - 1.0 mm** with re-spect to the bearing surface on the frame.
Align switch plate **4** with screws **5** so that switch **S81** is operated by stop **6** when the solenoid is dead, and switch **S82** is operated by stop **6** when the solenoid is energized (by activating the manual clutch - refer to "Manual Cranking").
Set the spring-contact switch so that the cam follower still travels ap-prox. **1.5 mm** beyond the switching point.

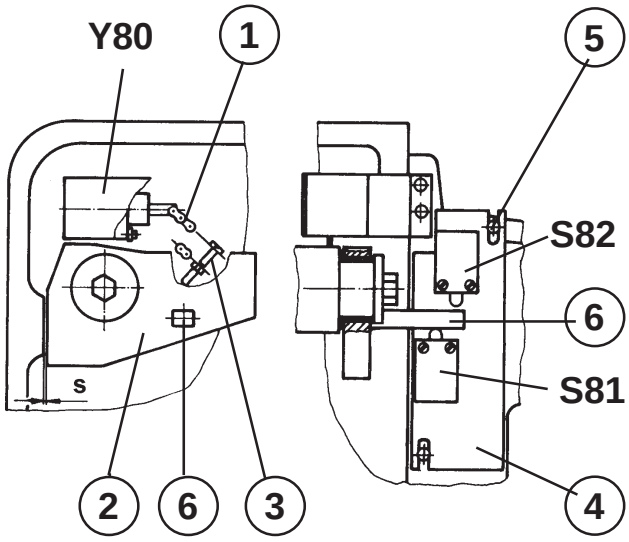

Fig. 20

Machine Size 92 (Fig. 21)

Catch **2** connected with solenoid **Y80** through chain **1** forms gap **s = 0.6 - 1.0 mm** with the stop located on the machine frame when the solenoid is dead. At this position, **S81** is operated. In the energized state (by activating the manual clutch - refer to "Manual Cranking" in the Operating Instructions manual), **S82** is operated by stop **3**.For this purpose, switches **S81** and **S82** can be aligned on switch plate **6** within the range of their oblong holes by screws **5**.

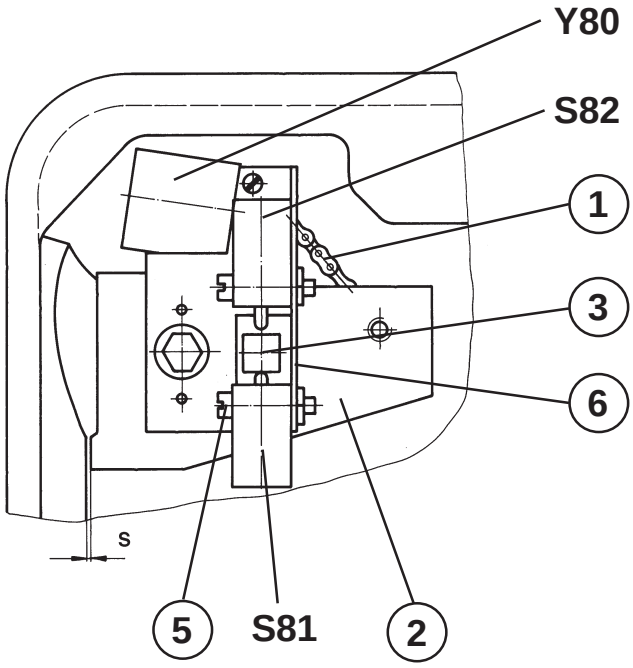

Fig. 21

Machine Sizes 115 and 132
(Fig. 22)

Screw in chain **1** which connects solenoid **Y80** with catch **2** with the aid of threaded pin **3** to be turned in deep enough and lock it so that between catch **2** and catch stop **4** is a gap of **s = 0.6 - 1.0** mm when the solenoid is dead. At this position, **S81** must be in actuated state.

Switch **S82** should be aligned so that it is operated by the catch when the solenoid is energized (by activating the manual clutch - refer to "Manual Cranking" in the Operating Instructions manual).

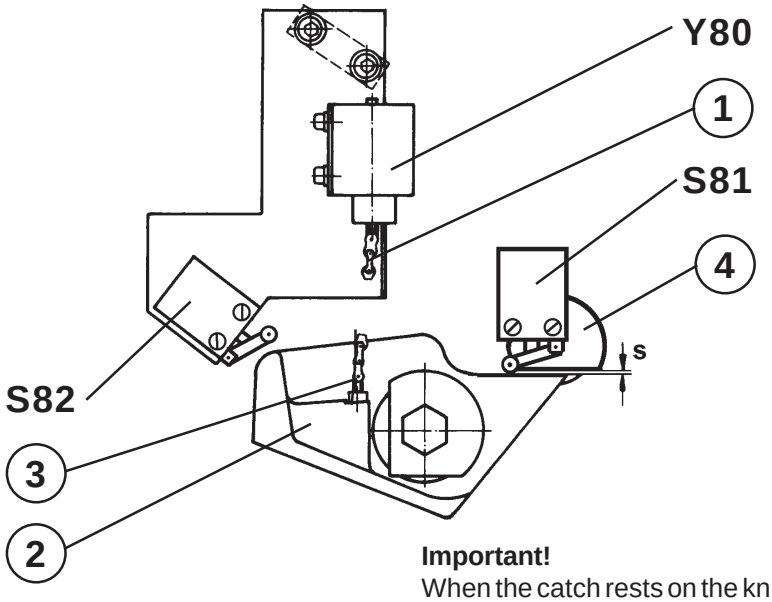

Fig. 22

Important!
When the catch rests on the knife beam contour with **Y80** being dead, **S82** must not yet be operated (except machine size 168).

Machine Sizes 168
(Fig. 23)

Locking pin **1** is guided by bush **2** supported by machine frame **3**.
Solenoid **Y80** withdraws this pin against pull-back spring **4** so that a gap of **s = 2 - 3 mm** is obtained between knife beam slide surface **5** on the frame and the face of the locking pin.
Adjust stop **6** in the solenoid axis so that **S81** is actuated when the solenoid is in its de-energised state.

Adjust switch **S82** so that it is actuated by the stop when the solenoid is in its
energised state (by activating the manual clutch - refer to "Manual Cranking" in the Operating Instructions manual).

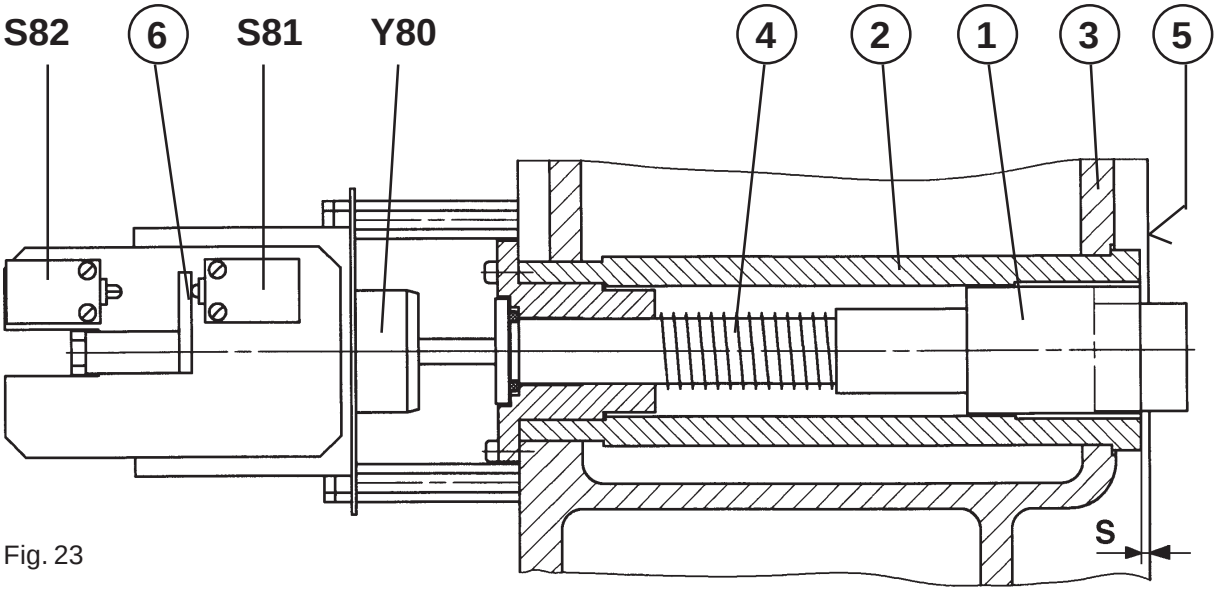

Fig. 23

Cutting System Maintenance

It should be ensured that the knife beam guideways are lubricated at the top **and** bottom positions of the knife beam. Refer to "Lubrication" in the Operating Instructions manual. A lubrication chart is provided on the back of the machine.

Never use knives other than those assigned to the respective ma-chine models and sizes.

For **PERFECTA** guillotines of the same models and sizes, the knives are interchangeable.

When changing the knife, ensure, under any circumstances, that the tapped holes in the knife are clean and the knife bolts are undamaged.

Cutting Table

All **PERFECTA** guillotines are supplied with standard cutting tables and the associated side tables with ground surfaces and of special-quality cast iron. In the factory, the tables are provided with temporary corrosion protective before being shipped. When the machine is installed at the user's, this corrosion preventive must be removed with white spirit. Never use any caustic agents.
The clean table is susceptible to corrosion, particularly in the handling area.

PERFECTA offers corrosion-protective wax which inhibits corrosion and improves the sliding properties.
Due to the abrasion caused by the cutting stock, the treatment must be repeated from time to time.
If small deposits of rust should have built up as a result of insufficient care or negligence, remove them **immediately**. Never use abrasive cloth or sand paper. Titanium fleece or a conventional household fibre scouring pad has proven useful for this purpose. When treating the table always work in the grinding direction.

PERFECTA offers optional cutting and side tables with upgraded, i. e. corrosion-resistant surfaces.

Backgauge Drive System

All **PERFECTA** guillotines have a controlled backgauge drive system. The advantage of this drive system is a gentle approaching to and a soft, precise positioning of the cut measurement. The optimum backgauge speed is automatically determined from the distance between the cut marks.
For most of the applications, the guillotines are factory-set to optimum. Via the "Speed" (TV)/"Settings" (UC) menu, the backgauge speeds as well as the start and stop ramps can be adapted to the stock to be processed and to other requirements.

For manual positioning, cutting or programming according to the print, **PERFECTA** guillotines have a so-called "electronic handwheel" with nine different forward and reverse speeds each. Refer to "Backgauge" in the Operating Instructions manual.

Backgauge Guidance

Machine Sizes 76 and 92

The backgauges of the 76 and 92 size guillotines are guided by pre-tensioned linear guideways (roller guideways), i. e. the guideways work in a play-free manner. Therefore, resetting is not necessary.
If any play on the backgauge should be noted, check the set-screws between the backgauge and the guideway for firm seating and proper locking and re-tighten them, if necessary. Refer to "Adjusting Square Cutting" in the Operating Instructions manual.
Depending upon the operating conditions, the linear guideways should be cleaned (with white spirit) and lubricated at least once per year. Refer to "Lubrication" in the Operating Instructions manual.

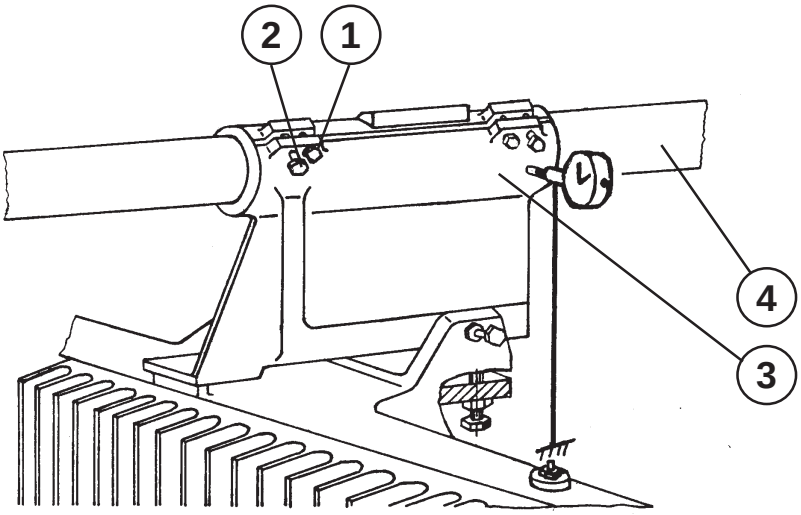

Fig. 24

Machine Sizes 115 and 132

The backgauges of the 115 and 132 size machines have a round guidance (slide guidance) located above the cutting table.

If any play on the backgauge should be noted, check the set-screws between the backgauge and the guideway for firm seating and proper locking and re-tighten them, if necessary. Refer to "Adjusting Square Cutting" in the Operating Instructions manual.

If excessive play in the backgauge guidance may occur after a longer time of operation, readjust the play with draw-in screws **1** and adjusting screws **2** (Fig. 24).

Check the play on the rear hub of guide block **3**. For this purpose, bring the hub to rest on guide column**4** by manually pushing the backgauge on the left and right and read the absolute play off the dial gauge in no-load condition. The play should be within the limits of **0.03 - 0.04 mm**.

Depending upon the operating conditions, the guide column should be cleaned with white spirit once per year. The lubrication cycle specified under "Lubrication" in the Operatring Instructions manual or in the lubrication chart on the back of the machine should be kept.

Machine Sizes 168 (Fig. 25)

Backgauge 1 is guided by a carriage **2** which, run on rollers, moves along a profile guideway beam **3** fitted over the cutting table.
If you find any play on the backgauge check setting screws **4** on the side of the backgauge for tightness and proper locking. Retighten, if required. Refer to "Adjusting Square Cutting"in the Operating Instructions manual.

Around the horizontal axis, the carriage is supported by three fixed rollers **5** and one eccentrically adjustable roller above the guideway beam and by four eccentrically adjustable rollers **6** beneath.
Around the vertical axis, the carriage is secured against distortion by two fixed rollers **5** on the right and two eccentrically adjustable rollers **6** on the left.

If some play should occur after a longer period of operation, you can use the eccentric rollers to eliminate it.
For this purpose, slacken outer nut **7** and gently rotate eccentric pin **8** until the roller gets into contact with the guideway. Retighten the nut.

Then check the rollers for smooth running over the entire length of the guideway.

Depending upon your operating conditions, use white spirit to clean the rollers and the guideways. Do **not** grease the rollers and the guideways.

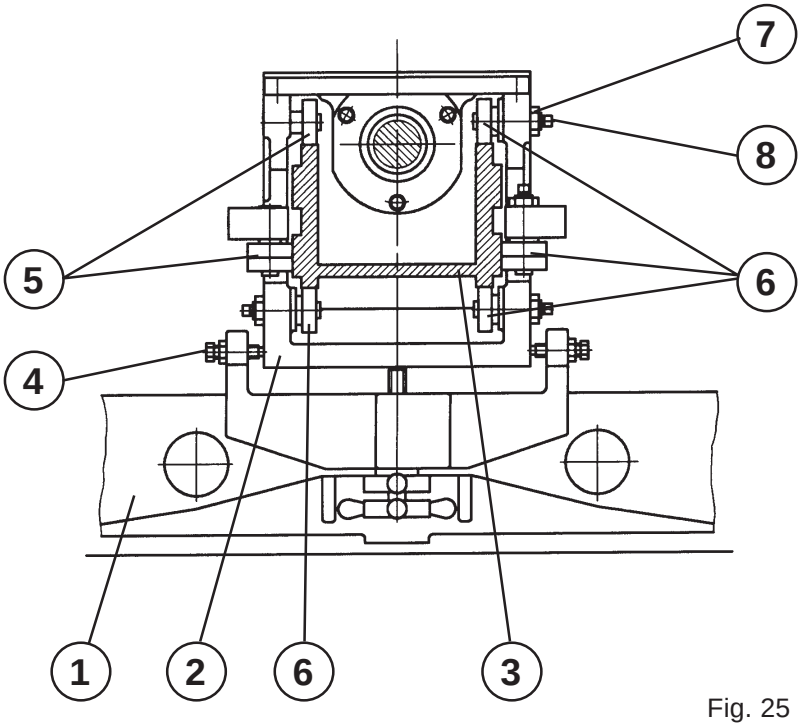

Fig. 25

Thread Backlash Compensation

Machine Sizes 76, 92, 115, 132, 168 (Fig. 26)

For these machine sizes, the backgauge is moved by an acme thread leadscrew **1**. The cutting positions are always approached in forward direction. The existing backlash in the thread is compensated by a compression spring **2** which permanently and firmly presses nut **3** fixed to the backgauge against the driving flank of the leadscrew via nut **4** axially movable but locked against twisting. This flank contact, particularly at the positioning or braking phase, is not discontinued.

Depending upon the operating conditions, the acme thread leadscrew should, as applicable to the backgauge guide assembly, be cleand with white spirit and be greased according to the specified lubrication cycle once per year.

Refer to "Lubrication" in the Operating Instructions manu-al, or to the lubrication chart on the back of the machine.

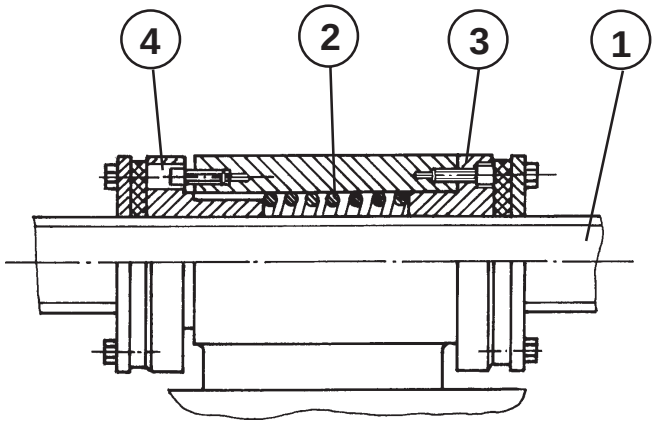

Fig. 26

Measuring System

On **PERFECTA** guillotines, the actual and desired measurements are displayed on the control panel. You can choose from four different units. Refer to "Measurement Display" in the Operating Instructions manual.
The machines are factory-set.
During operation, i. e. while the backgauge is running, the measurement is automatically monitored.
After 70 travels since the last check, the control system makes sure before each backgauge travel event whether a zero pulse is expected within the range of 0.5 mm in front of the destination measurement.
If this is the case, the brake ramp will be started earlier to be able to evaluate the zero pulse.
If the zero pulse appears at the expected position, the travel counter will be reset and will begin to count up again.
If no zero pulse is found at the expected position, the "calibrate machine first" message will be displayed.
If 100 travel events have been done already with no opportunity to check the measurements, the next travel which is in excess of 5 mm will be used to begin braking 5 mm in front of the destination already. Thus, the last 4 mm will be done at slow speed. Within these 4 mm, a zero pulse will appear under any circumstances (4 mm = one motor turn, one zero pulse per turn) and can be used for evaluation.
If the zero pulse appears at the expected position, the travel counter will be reset and will begin to count up again.
If no zero pulse is found at the expected position, the "calibrate machine first" message will be displayed.

Calibrating the Measuring System

Select the "Calibration" (TV)/ "Factory Calibration" (UC) option from the service menu.
Type in through the keyboard the actual measurement between the knife back and the backgauge and press the enter key to accept it. This will change the machine-internal measuring system to the value entered. From the actual position known from the entry, a forward travel will take place until a zero pulse is recognised. This detects and stores the distance between the last millimeter measurement divisible by four (theoretical zero position) and the first actual zero pulse. Then the length will be measured to recognise the machine model/the cutting width.
Caution: Entering a wrong actual measurement may lead to collision as the machine would expect its end positions in the wrong places.
You can use a steel rule for measuring to make a rough check and compare absolutely and relatively positioned and cut material strips for a fine check.
Calibrating from the "Settings" menu will only convert the above-determined offset between the theoretical and the practical zero position to the first zero pulse after calibration range sensor B39 has been reached. For reasons of time, no length measuring will be done.
Important:
Calibrating from the "Settings" menu will, therefore, only make sense after previous calibration from the service menu.

Setting the Proximity Switches

Adjust front proximity switch **B39** so that it is activated at 200 ± 50 pulses (= 2 ± 0.5 mm) below the measurement of 200 mm (= a reading of 20000 pulses) while the backgauge is running forward, i. e. proximity switch **B39** must become active in the range of 20174 ± 50 at a count of 19974, for example, for the first zero pulse below the 20000 mark. Refer to the "Sensor Test" menu.

Set rear proximity switch **B27** so that it is activated at the dimension of **rear table length + 2 mm**.

Adjust both proximity switches so that distance **a** between the proximity switch and the vane is **3 mm** (Fig. 27).

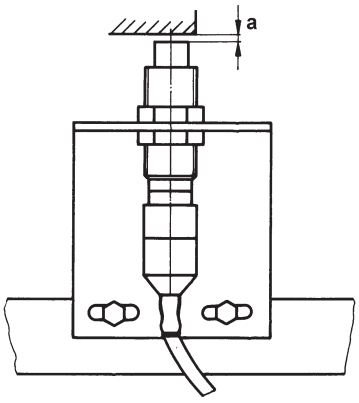

Fig. 27

Hydraulic Clamping System

PERFECTA guillotines have a continuously adjustable double-piston hydraulic system with a very wide clamping force range.

For the ordering designations of the hydraulic equipment, refer to the Operating Instructions manual.

The basic arrangement of the equipments and pipelines is shown in Fig. 28.

Explanation of the abbreviations used:

P = Gear pump
Z = Clamping cylinder (plunger cylinder with fast-speed piston)
Y1, Y2, Y62
= Solenoid-operated multi-way valves with reset spring
VD1, VD1.1
= Pre-clamping pressure-relief valves
VD2
= Fast-speed pressure-relief valve
VD3
= Clamping pressure-relief valve (clamping pressure valve)
VDR
= Pre-clamping multi-way valve
RV1
= Non-return valve
SRV
= Suction valve
STV
= Stop valve
S = Flow indicator
F = Filter

Markings on the control assembly:

PZ
= Line to clamping cylinder (main pressure chamber)
PE
= Line to clamping cylinder (fast-speed piston)
PV
= Clamping pressure valve pressure line
M1
= Test point for "free circulation" and pre-clamping
M2
= Clamping pressure test point
Z1, T2
= Return line to oil tank

In the hydraulic circuit diagram:

_____ = Pressurized oil line
____ = Passive oil line

The spatial assignment of the equipment on the control assembly is shown in Fig. 28.

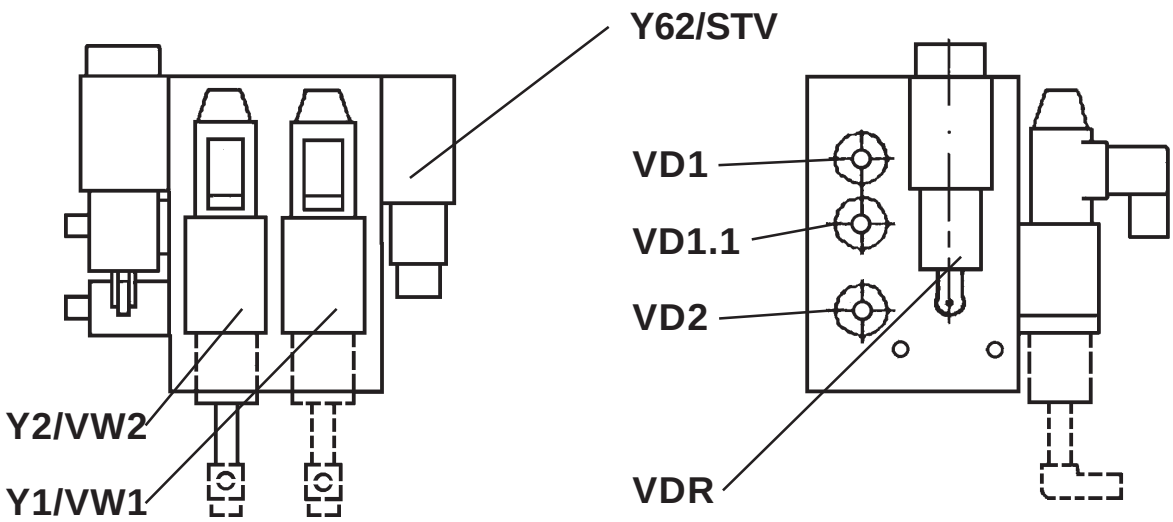

Fig. 28

The individual working stages of the hydraulic clamping system are:

Machine at Basic Position
(free circulation)
(Fig. 29)

The main motor is on. The pump runs. The knife beam and the clamp are at their topmost positions.
Multi-way valves VW1 and VW2 are at rest (Y1, Y2 not operated).
The oil flow returns to the tank via RV1, VW1, VW2, VDR and F with almost no pressure.

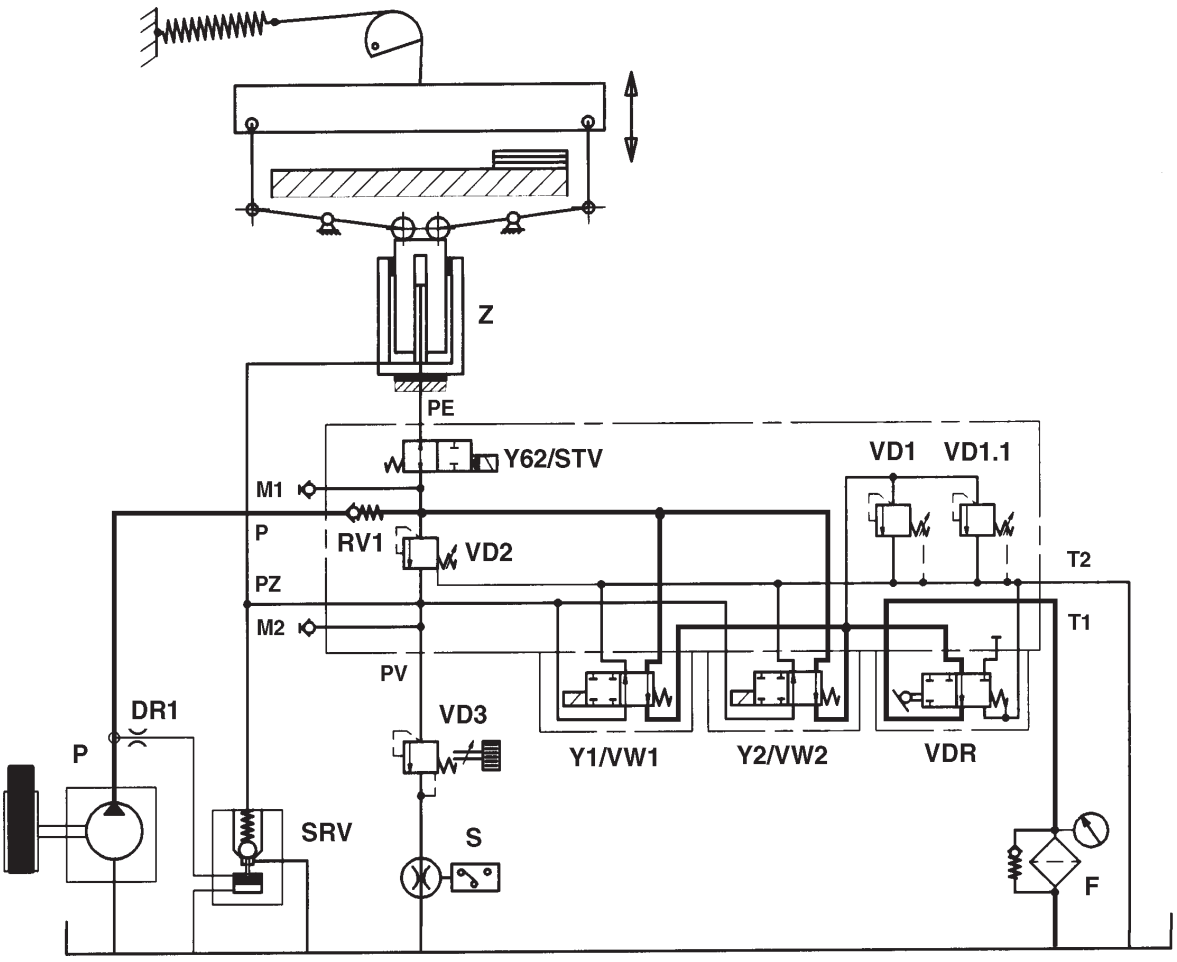

Fig. 29

Pre-Clamping

(Fig. 30)

From the basic position, the VDR valve is operated by the pedal. The former inlet of VW1/VW2 is closed. Pressure builds up from pump P, via RV1, VW1/VW2 as well as VD1 and VD1.1 which determine the value of the pressure. The oil flow is applied to the fast-speed piston. The plunger of cylinder Z comes out and moves the clamp down. Via SRV, the big cylinder chamber fills up with oil. When the clamp touches down, the oil returns to the tank through VD1 and VD1.1.

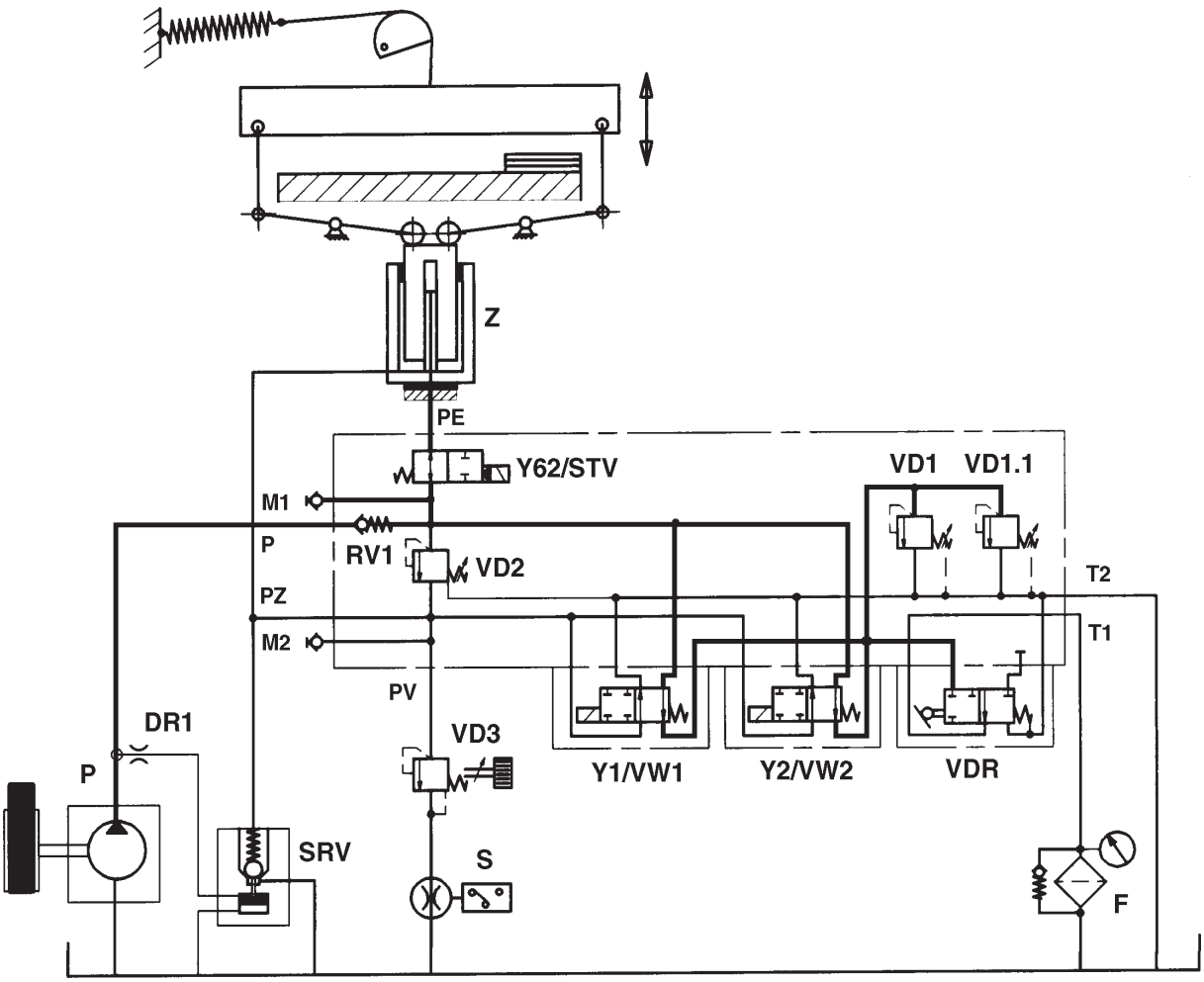

Fig. 30

Cut Triggering

Clamp Fast Speed (Fig.31)

Operating the two-hand knife control pushbuttons activates Y1/VW1 and Y2/VW2. This blocks the oil circulation and applies the entire oil flow to the fast-speed piston of cylinder Z. The plunger comes out with fast speed and moves the clamp down. Via SRV, the big cylinder chamber fills up with oil. When the clamp touches down, VD2 responds due to an increase in pressure.

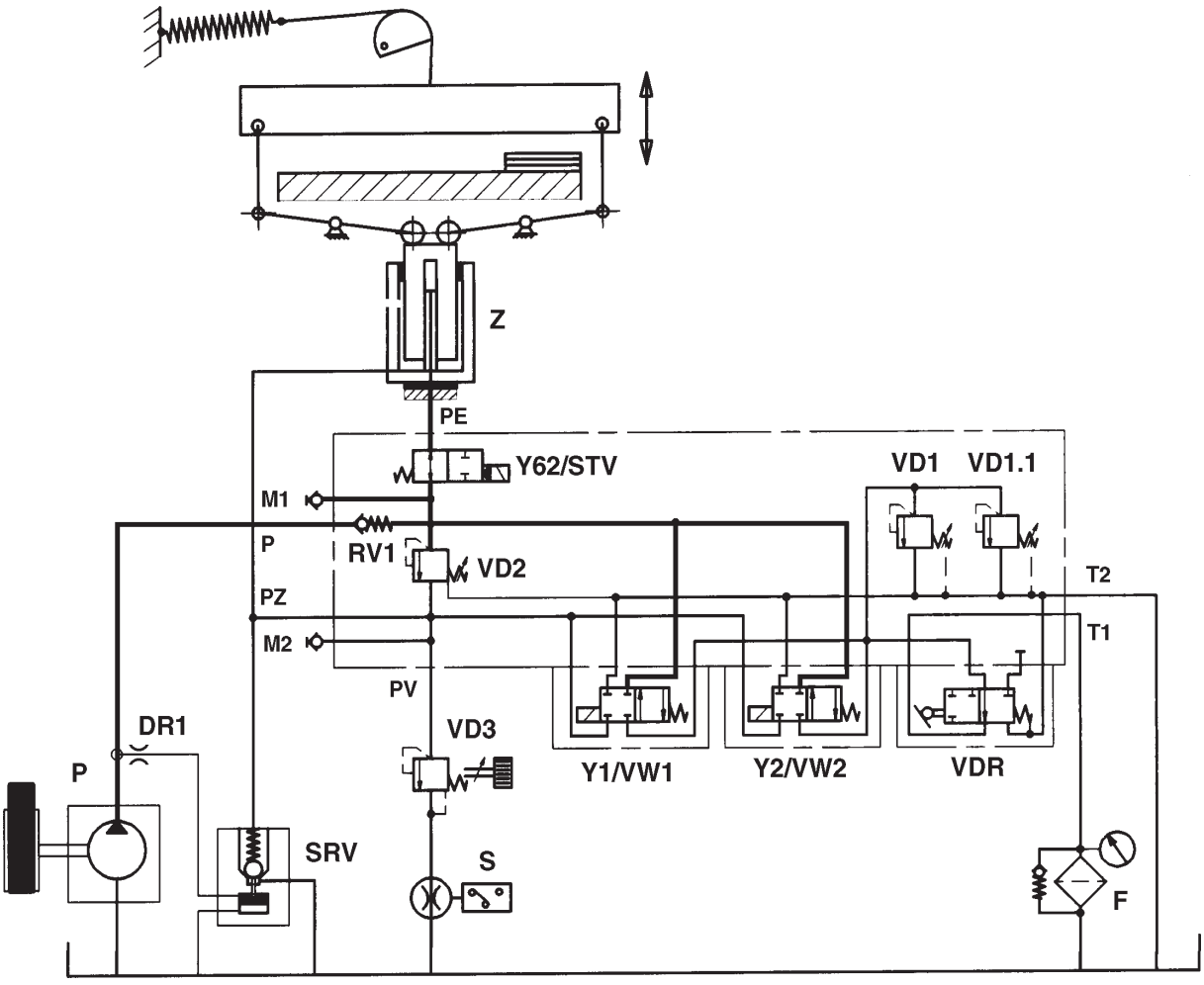

Fig. 31

Main Clamping

(Fig. 32)

Due to the overflowing of VD2, the main pressure preset by clamping pressure valve builds up in the fast-speed and main cylinder chambers.

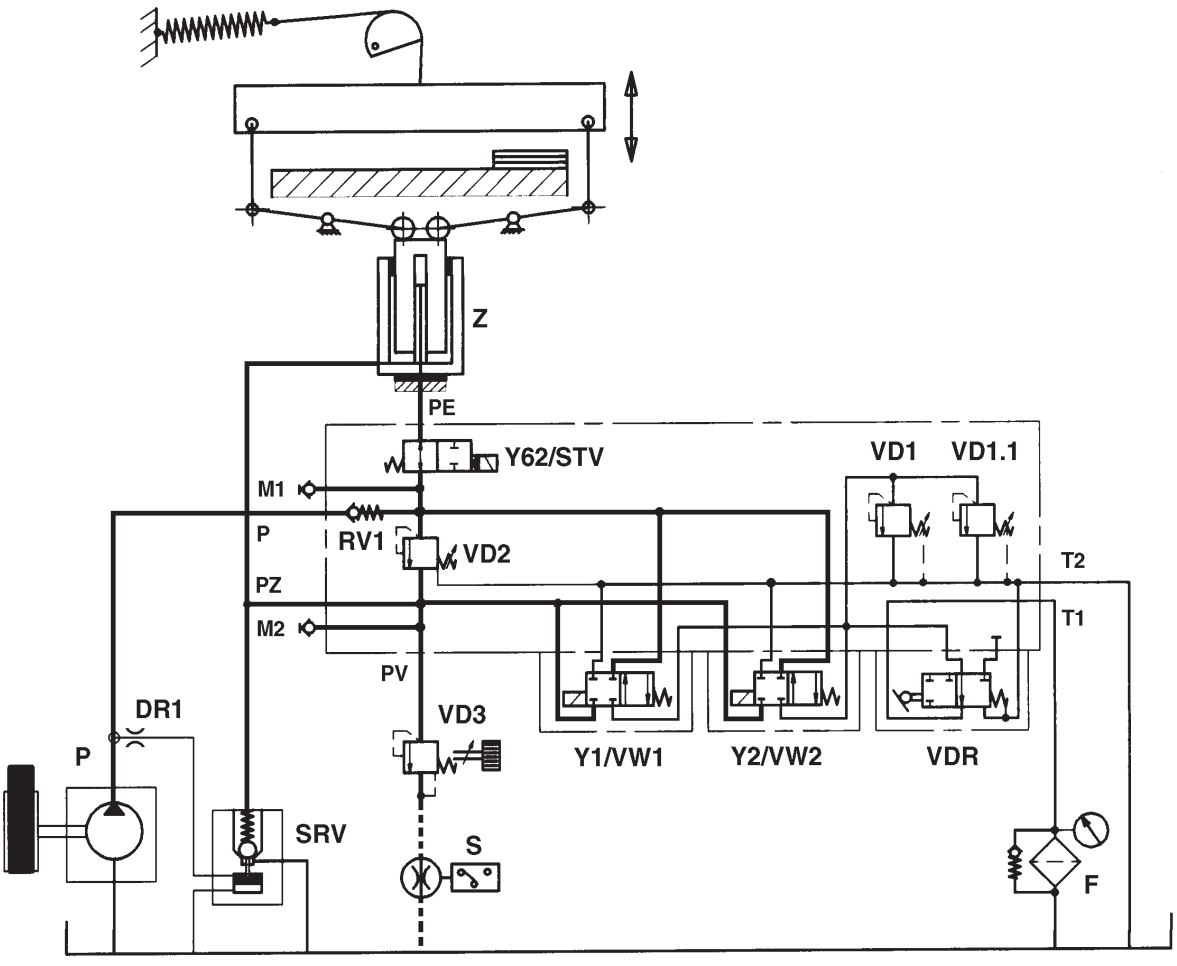

Fig. 32

Decompression

(Fig. 33)

After the knife has cut through, the computer control system turns off Y1/VW1 which then goes open. The pressure existing in the cylinder chamber can thus relax. The oil flow from the pump returns to the tank via VW1, VDR and F.

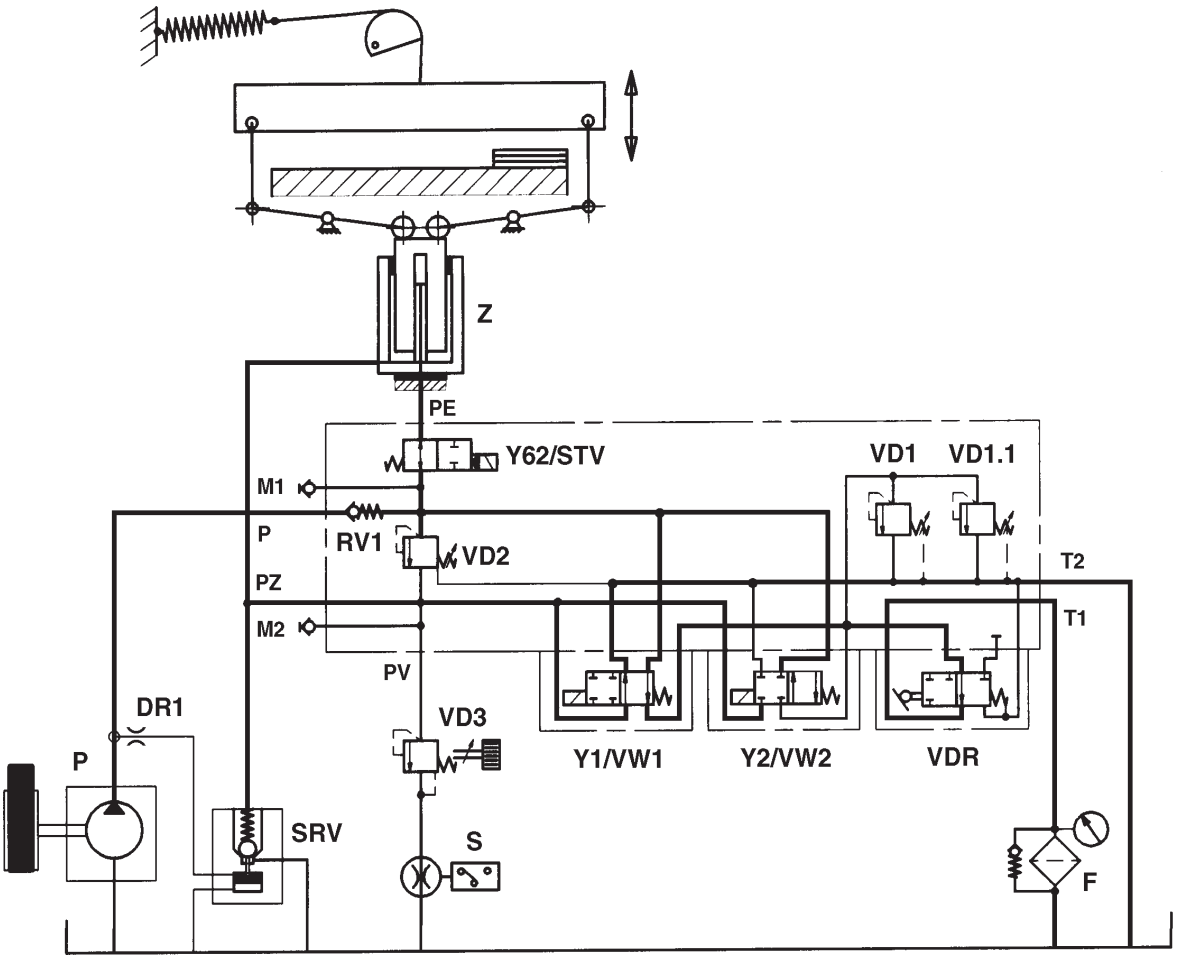

Fig. 33

Clamp Return

(Fig.34)

Due to the decompression, VD3 is no longer overflown, the flow indicator does not detect any volume flow and opens Y2/VW2, whereby the flow cross section for the oil displaced from the cylinder chambers is increased. The clamp moves up.

Machine Sizes 115/132 Only:

The pressure decrease in the pump line opens the SRV suction valve, and further cross section is made available for the oil to be displaced from the cylinder chambers.

For the 76 and 92 machines, the clamp is brought to its topmost position by a compression spring, and by tension springs on the 115 and 132 size machines. This forces the oil out of the cylinder chambers into the tank.

The last section of the stroke is damped without any jerks before the end position in the cylinder is reached.

The basic position as shown in Fig. 29 is restored.

Stroke Limit Function

You can preselect the stroke limit from the machine's setting menu (refer to the Operating Instructions manual).

After a short stroke (the clamp has lifted off the pile), the oil to be displaced from the plunger chamber is blocked through Y62/STV with the clamp being held at this position.

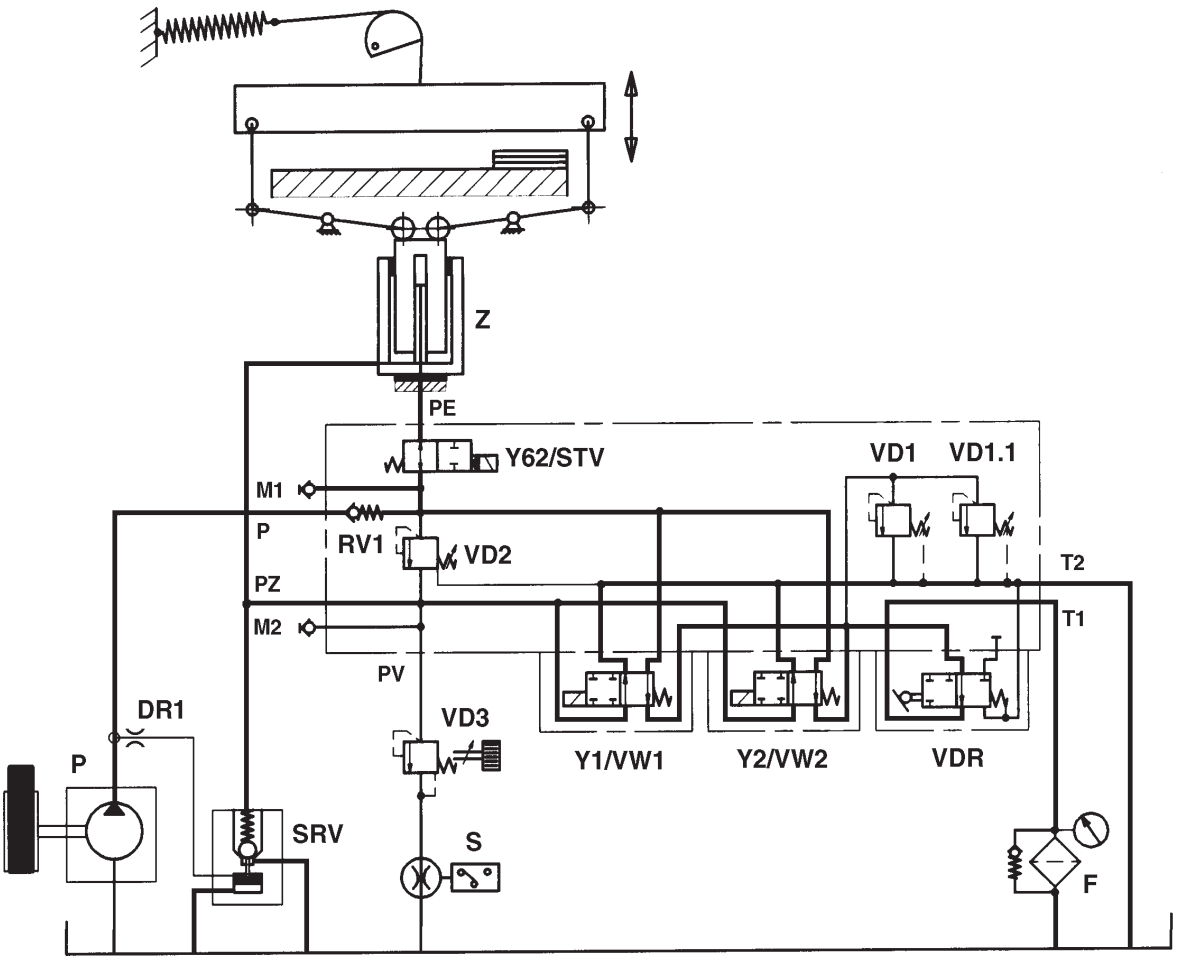

Fig. 34

Start-Up

For reasons of fire precautions, the machine is supplied with an empty oil tank.

When filling in fresh hydraulic oil, follow the instructions given under "Hydraulic Oil Change" in the Operating Instructions manual.

For oil grades to be used, refer to "Lubricants" in the Operating Instructions manual.

When starting up the system, first check whether the clamp comes down by pressing the pedal and using the "pre-clamping" function. If the movement is not smooth, or if the clamp does not touch down on the cutting table, the hydraulic system must be ventilated. This is done automatically by triggering several cuts with the knife pushbuttons and the clamping pressure (VD3) set to **minimum**.
Check again by using the "pre-clamping" function. Otherwise, proceed as described above.

Important!
Insufficient alignment of the machine at its place of installation as well as canting of the clamp draw rods may adversely affect free traveling of the clamp. The clamp is moved up by compression or tension springs.

Adjusting the Hydraulic Clamping System

If some readjustment of the pressure-relief valves should be necessary, perform the adjustment in a gentle way and observe the fol-lowing:

VD1, VD1.1

For safety reasons, these valves must not be readjusted, as they are set to the pre-clamping force specified in prEN 1010. Increasing the pressure bears the hazard of injuries to the fingers or hands of the operator during pre-clamping.

VD2
With the aid of the VD2 acting as acceleration or fast-speed valve, the clamp fast speed is regulated. The clamp should move down freely. For pre-clamping, it must be possible to stop and start it at any position and should, however, smoothly touch down onto the cutting table. Too high a clamp speed may cause damage to the machine.

Adjust as follows:

• Slacken the lock nut.
• Gently readjust the setting spindle
clockwise = to speed up;
anticlockwise = to slow down.
• Tighten the lock nut.

VD3
The clamping pressure valve is set to the maximum clamping pressure required for the respective machine sizes. Changing the setting is not necessary and may cause damage to the machine.

Fig. 35
Hydraulic Clamping System Settings (MPa)

Machine Size		**76**	**92**	**115**	**132**	**168**
Free Circulation Test Point M1		0,25-0,35	0,25-0,35	0,25-0,35	0,25-0,35	0,25-0,35
VD1, VD1.1 Test Point M1		1,5	2,5	1,5-1,8	1,5-1,8	2,5
Max. pre-clampimg force (N) acc. to prEN 1010		300	300	300	300	500
VD2 Test Point M1		1,8	2,8	2	2	2,8
VD3	min.	0,18	0,29	0,2	0,2	0,3
	max.	13	15,5	12	12	16
Clamping Force (kN)	min.	2	2	3	3	3,5
	max.	25	30	45	45	60

Flow Indicator S
Adjusting should be performed with no oil flowing through the flow indicator (machine at basic position).
The white arrow in Fig. 36 indicates the flow direction of the hydraulic oil.

1st Switching Point (Fig. 36)
Pull the switching unit (reed contact) from the cable connection side into the direction of the arrow until the signal in the I/O test menu display becomes 3E - 32. Mark this position on the switching unit with respect to the enclosure of the flow indicator with a pencil.

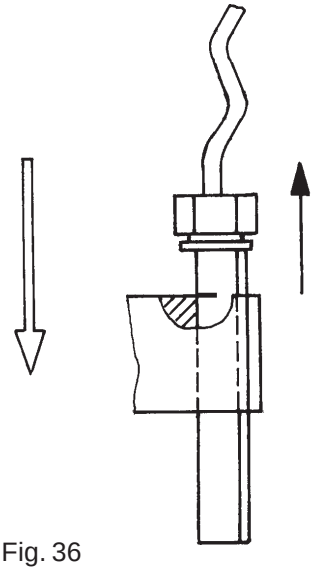

Fig. 36

2nd Switching Point (Fig.37)
Beginning opposite to the cable connection side (reed contact end), pull into the direction of the arrow until the signal in the I/O test menu display becomes 3E - 32. Mark as described above.

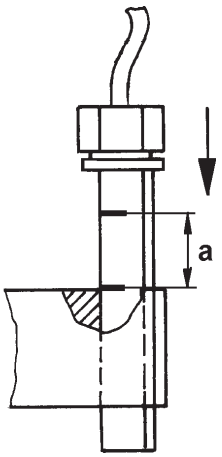

Fig. 37

Adjustment(Fig.38)
Set the switching unit to 1/4 of the switching range from the upper switching point and adjust it.

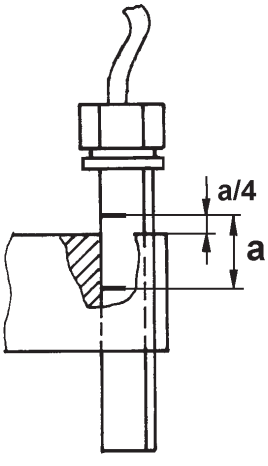

Fig. 38

Checking the Adjustment

All pressure stages can be checked at test point M1 or M2 by means of a test pressure gauge (option).
For setting values, refer to Fig. 35.

Main Clamping Pressure Setting Instructions

A few basic rules for selecting the clamping pressure are given in the"Clamping" section of the **"Cutting Compendium"** you can obtain from **PERFECTA** .
Stock-dependent empirical values can be obtained from the tables in the **"Cutting Compendium"** (Figs. 6 to 10).
They represent reference values for about 2/3 of the maximum feed height and cutting width.

The Operating Instructions manual shows the diagrams of the clamping pressure curves for the individual machine sizes as a function of scaling. The ranges of "low", "medium" and "high" assigned to the various types of stock in the Tables of the **"Cutting Compendium"** are explained there, and their assignment in the clamping pressure scale is marked.

Hydraulic Clamping System Maintenance

Refer to "Hydraulic Oil Change", "Checking the Filter" and "Lubricants" in the Operating Instructions manual.

Malfunctions in the Hydraulic Clamping System

If malfunctions occur in the hydraulic clamping system, always check the following first:

- Oil filling level in the tank. Replenish, if necessary.
- Pump drive. Re-tension belt, if necessary.

Possible malfunctions and their rectification:

•When a cut is triggered by the knife pushbuttons, the clamp touches down on the stock, however, no cut follows. Releasing the knife pushbuttons makes the clamp return to its topmost position.
Remedy:
- The flow indicator is not operated.
To adjust the flow indicator, refer to "Adjusting the Hydraulic Clamping System".
- Defective reed contact of the flow indicator.
Replace contact.

• When a cut is completed,
- the clamp stays on the stock (machine sizes 76 and 92);
-slowly returns to its topmost position (machine sizes 115 and 132).
When another cut is triggered, the display reads **error 28**: Safety Module Detecting Error.
When the "C" key is pressed concrete **error 23**: Valve Monitoring, appears.

Remedy:
- The flow indicator remains operated.
- Reed contact welding. Replacement of the contact is necessary.

• No "pre-clamping" when the pedal is pressed, i. e. the clamp would not come down.

Remedy:
- Check the pump pressure at M1 with a test pressure gauge when the oil is freely circulating, and when pre-clamping. For the values, refer to the Table (Fig. 34)

When no pressure is available:
- Defective pump. Replace the pump.
- VD1, VD1.1 or VD2 is overflown. Repair may, for safety reasons, only be performed by trained personnel.

When the required pressure is available:
- Check the machine for proper alignment and, in conjunction therewith, for free movement of the clamp. Check for possible canting of the clamp draw rods. Readjust the clamp guideways, if necessary.

•The clamp moves up slowly after pre-clamping.

Remedy:
- Check the clogging indicator on the filter according to "Checking the Filter" in the Operating Instructions manual.
- Check the machine for proper alignment and, in conjunction therewith, for free movement of the clamp. Check for possible canting of the clamp draw rods. Readjust the clamp guideways, if necessary.
- Fatigue of the clamp balancing spring.
For machine sizes 76 and 92: Replace spring assembly.
For machine sizes 115 and 132: Tension the tension spring assembly in the machine upper cross beam. Accessible under the upper right paneling.

• No clamp fast-speed movement before clamping pressure build-up.

Remedy:
- VD2 not properly set. Refer to "Adjusting the Hydraulic Clamping System".
Check the pressure at M1 with a pressure gauge according to the Table (Fig. 34).

- VD2 overflow (e. g. spring breakage). Insufficient pressure build-up. Replace valve.

- Multi-way valve Y1 or Y2 does not operate.
Y1 does not operate: Insufficient pressure build-up through VD1, VD1.1.
Y2 does not operate: Free flow through VDR and F into the tank. Replace multi-way valve.

- Air in the hydraulic system. Ventilate system according to Section "Start-Up".

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• No clamping pressure build-up, or clamping pressure is built up too slowly.

Remedy:
- See above: "No clamp fast-speed movement before clamping pressure build-up".
- Lock the clamp after cutting by means of the clamp switch on the front panel.
Refer to "Clamping" in the Operating Instructions manual.
Readjust VD3 over the entire range and check the pressure at M2 with a pressure gauge according to the Table (Fig. 35). Replace VD3, if necessary.
- Check the pressure of the gear pump at M1 with the aid of a test pressure gauge when the clamp is locked and VD3 is set to maximum. If the gear pump does not deliver the maximum pressure, replace the pump.

•The clamp moves up slowly after the cut.

Remedy:
- See above: "The clamp moves up slowly after pre-clamping".
- Y2 does not operate (spring reset). Replace multi-way valve.
- For machine sizes115 and 132: Suction valve SRV does not go open. Check the return spring.

• The clamp bounces when touching down on the stock to be cut.

Remedy:
- Check non-return valve RV1: Foreign bodies in the ball seat. Jammed spring.

• The clamp hits hard against its upper end position.

Remedy:
- Check the end position damping in the clamping cylinder.

• The hydraulic oil forms much foam.

Remedy:
- The suction line of the pump is not immersed deep enough into the oil tank. Push the hose more deeply into the oil tank.
- The connection between the suction line and the pump is not tight. Re-tighten the connection.
- Defective pump. Replace the pump.

• The clamp comes down slowly and with heavy noise only/the clamp does not release the pile any more.

Remedy:
- Rapid speed is blocked by the STV stop valve. Check the stop valve.

• Preclamping with the **pedal** does not work.

Remedy:
- The rapid speed line is blocked by stop valve STV. Check the stop valve.
- Check the setting of switch S69.1.

• The stroke limit function does not work.

Remedy:
- Activate the stroke limit function from the settings menu.
- Check connector X801 on the control processor for proper seating.
- Check the setting of switch S69.1.
- Check stop valve STV.

Adjusting the S69.1 Stroke Limit Pedal Switch

When the stroke limit function is active, adjust switch S69.1 on the pedal so that it deactivates this function before VDR comes into effect (clamp upward movement) when you are slowly pressing down the pedal. VDR will only respond when you press the pedal further down, the ascending movement changing into a descending movement. This guarantees that no pressure will be applied to clamping cylinder **Z** through the main cylinder chamber, even though STV is closed.

There are two possible malfunctions:

• The stroke limit function is not deactivated.

Remedy:
-S69.1 is not sufficiently released to change over when the pedal is fully pressed down.
-Move away the switch some more.

• No stroke limit function takes place.

Remedy:
-S69.1 is not sufficiently pressed to change over when the pedal is not pressed.
-Bring the switch nearer.

Make a sensitive switch correction in both cases.