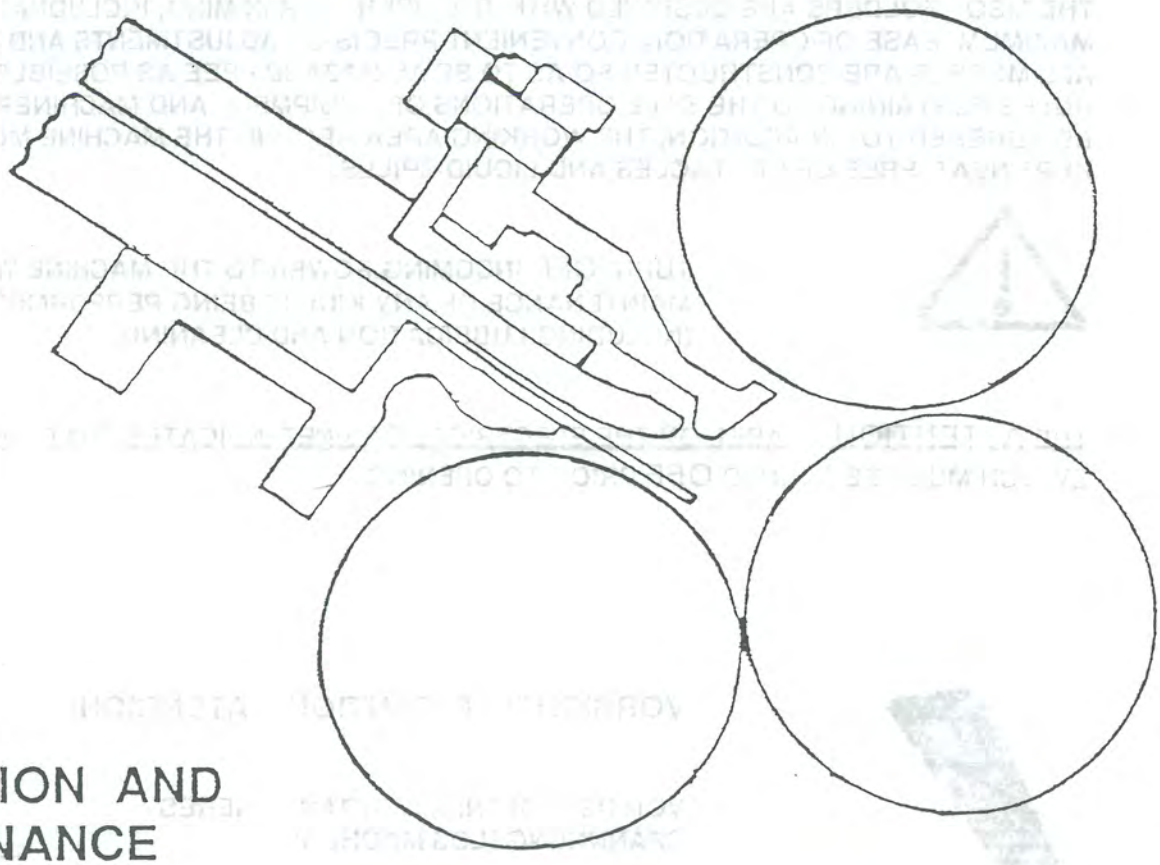
MBO

PAPER FOLDING MACHINES



OPERATION AND
MAINTENANCE
MANUAL

T 46/49

MBO

THE MBO - FOLDERS ARE DESIGNED WITH THE OPERATOR IN MIND, INCLUDING MAXIMUM EASE OF OPERATION, CONVENIENT PRECISION ADJUSTMENTS AND SAFETY. ALL MODELS ARE CONSTRUCTED SO AS TO BE AS HAZARD FREE AS POSSIBLE. ALL RULES PERTAINING TO THE SAFE OPERATIONS OF EQUIPMENT AND MACHINERY MUST BE ADHERED TO. IN ADDITION, THE WORKING AREA AROUND THE MACHINE MUST BE KEPT NEAT, FREE OF OBSTACLES AND LIQUID SPILLS.

TURN OFF INCOMING POWER TO THE MACHINE WHENEVER MAINTENANCE OF ANY KIND IS BEING PERFORMED, INCLUDING LUBRICATION AND CLEANING.

THE ATTENTION - LABEL ON THE ELECTRICAL CABINET INDICATES THAT THE MAIN SWITCH MUST BE TURNED OFF PRIOR TO OPENING.

VORSICHT! ATTENTION! ATENCION!

VOR DEM OFFNEN SCHRANKINNERES SPANNNUNGSLOS MACHEN!

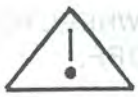
PRIOR TO OPENING BE SURE THAT INSIDE OF CABINET IS DEAD!

AVANT D' OUVRIR, VERIFIEZ QUE L'INTERIEUR DE L'ARMOIRE SOIT SANS TENSION!

ANTES DE ABRIR, ASEGURARSE QUE EL INTERIOR DEL ARMARIO ESTE SIN TENSION!

ATTENTION!
WHEN THE MAIN SWITCH IS TURNED OFF, THE CABINET IS NOT COMPLETELY WITHOUT VOLTAGE.

THE ATTENTION-LABEL ON THE ELECTRICAL CABINET STATES THAT THE CABINET IS NOT COMPLETELY WITHOUT VOLTAGE.



DO NOT OPERATE YOUR MBO -FOLDER WITH ANY OF THE GUARDS REMOVED OR WITH ANY OF THE SAFETY DEVICES DISCONNECTED, BYPASSED OR OUT OF ORDER.

DO NOT WEAR LOOSE CLOTHING AROUND THE MACHINES AND KEEP LONGER HAIR SECURELY TIED UP. REMEMBER THAT THESE MACHINES ARE DESIGNED TO GRIP AND HOLD MATERIAL AND MOVE IT AT HIGH SPEEDS.

DO NOT ATTEMPT TO MAKE ANY ADJUSTMENT ON THE MACHINE WHILE IT IS IN MOTION, UNLESS ADJUSTING DEVICE OR CONTROLS ARE PROVIDED AND THE ADJUSTMENT IS SPECIFICALLY MENTIONED AS A RUNNING ADJUSTMENT.

IF MECHANICAL FAILURE SHOULD OCCUR, OR IF ADJUSTMENTS APPEAR TO BE NECESSARY THAT ARE NOT PART OF THE NORMAL OPERATOR'S PROCEDURES, SHUT THE MACHINE OFF. GET ASSISTANCE FROM YOUR MBO SERVICE REPRESENTATIVE.

DO NOT, UNDER ANY CIRCUMSTANCES, ATTEMPT TO WORK ON OR OVER THE MACHINE WITH TOOLS OF ANY KIND WHILE IT IS RUNNING.

SHOULD A PROBLEM DEVELOP THAT APPEARS TO BE ELECTRICAL IN NATURE, SHUT THE MACHINE OFF. TURN OFF INCOMING POWER TO YOUR MACHINE. SECURE THE SERVICES OF AN ELECTRICIAN OR YOUR LOCAL MBO SERVICE REPRESENTATIVE.

DO NOTATTEMPT TO REMOVE A PAPER JAM, NO MATTER HOW MINOR IT MAY APPEAR TO BE, WHILE THE MACHINE IS IN OPERATION.

WHEN CLEANING THE FOLD ROLLERS, USE THE HANDWHEEL FOR TURNING. BE SURE THE POWER OF THE MACHINE IS OFF.

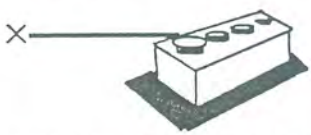
TURN OFF THE POWER TO THE MACHINE BEFORE MAKING ANY ADJUSTMENTS TO SCORING, PERFORATING, OR SLITTING ATTACHMENTS. KEEP HANDS AND CLOTHING AWAY FROM SLITTER SHAFTS WHILE THE MACHINE IS RUNNING.

USE EXTREME CAUTION WHEN HANDLING SLITTER SHAFTS ACCESSORIES. THE BLADES ARE VERY SHARP AND CAN CAUSE SERIOUS CUTS.

WHEN THE (WHITE) PILOT LIGHT ON MAIN CONTROL PANEL IS ON, USE CAUTION. THE MACHINE CAN BE SET IN MOTION FROM ANOTHER CONTROL STATION.

NO PARTS OR MATERIALS SHOULD AT ANY TIME BE PLACED ON ANY SECTION OF YOUR MBO FOLDER, EVEN WHEN POWER IS OFF.

THERE IS A STOP BUTTON ON ALL ELECTRICAL CONTROL PANELS AT THE 8, 16 AND 32 PAGE UNITS OR ON THE MOTORIZED STACKER'S.



WHEN THIS BUTTON IS PUSHED, ALL CONTROL-POWER IS CUT OFF TO ALL MACHINE SECTIONS.

GENERAL DESCRIPTION T46/B18, T49/55, B23, B123, T65, T75, B26, B30

The above folding machines were developed for folding sheets in the sizes as specified in their respective data sheets using pile or continuous feeders (see page 1A). The running speed can be regulated continuously from 200 to 8000 inch/min. depending on the machine and can be varied according to size of the sheet or kind of folding.

The basic machine is supplied with a pile or continuous feeder and the well-proven MBO features of:

* Lattice-type alignment table
* Four (4) fast setting fold plates with attached swinging deflectors and a new sheet stop adjustment
* Combination polyurethane-steel spiral rollers with new gearless and noiseless belt drive and caliper adjustment at the top of the machine
* Solid, quick change, easily removeable knife shafts equipped with plug bearings

The 8-page station is a roll-a-way buckle folding unit with its own drive, quiet running cross carrier rollers, and four (4) plates etc. as described above.

The 16-page station is also a roll-a-way buckle folding unit as described above, but with 12" or 15" working width and four (4) fold plates.

The 32-page station has two (2) plates in a 15" working width.

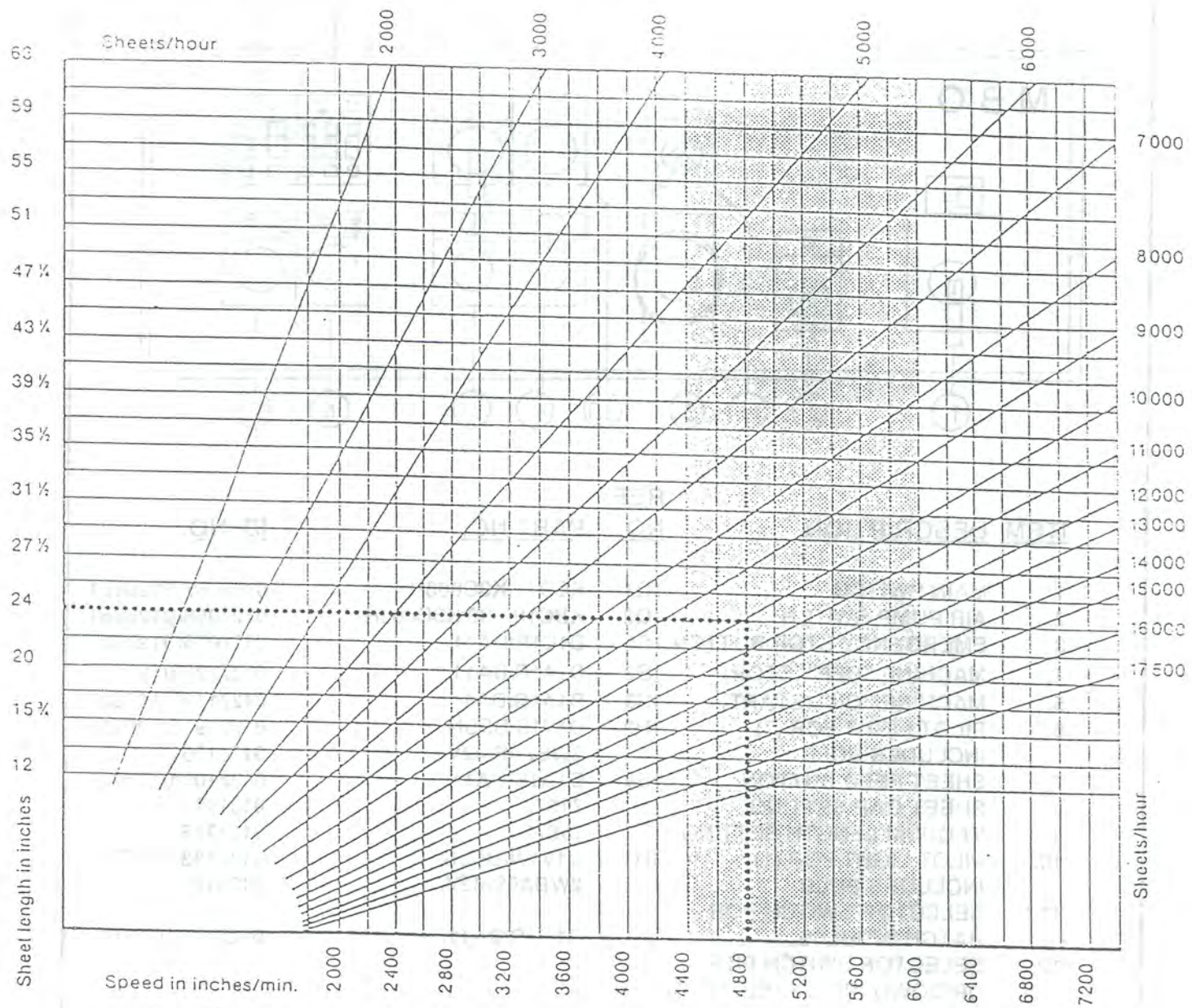
The knife unit "X" can be used on the parallel or the 8-page buckle unit of the B18/T46/T49 as an 8-page or 16-page folding unit. The knife is self-timing by a photocell and is independent of the feeder.

The standard delivery is a hang-on motorized stacker delivery with electronic speed control for the T46/B18/T49/T55 and early B23 folders. The newest B23 and B123,B26/B30 folders use a mobile motorized stacker delivery as standard.

To give the operator a general understanding of the working of the machine, the following description is made in the sequence of the adjustment of the machine from feeder to delivery.

	Sheet Size Min.	Sheet Size Max.	Running Speed Inches/Min.
T46/B18 Pile	4" x 6"	18" x 26"	1575 to 7000
T49 Pile	4" x 6"	20" x 27"	1600 to 7600
T49 Cont.	4" x 6"	20" x 36"	1600 to 7600
T55 Pile	4" x 6"	22" x 31"	1600 to 5600
T55 Cont.	4" x 6"	22" x 36"	1600 to 5600
B23 Pile	4 1/4" x 6"	23" x 36"	1600 to 8000
B23 Cont.	6" x 7"	23" x 50"	1600 to 8000
B123 Pile	4 1/4" x 6"	23" x 36"	1450 to 8000
B123 cont.	6" x 7"	23" x 50"	1450 to 8000
T65 Cont.	6" x 7"	26" x 50"	1600 to 6700
T75 cont.	6" x 7"	30" x 50"	1600 to 6700
B26 cont.	6" x 7"	26" x 50"	200 to 7200
B30 Cont.	6" x 7"	30" x 50"	200 to 7200

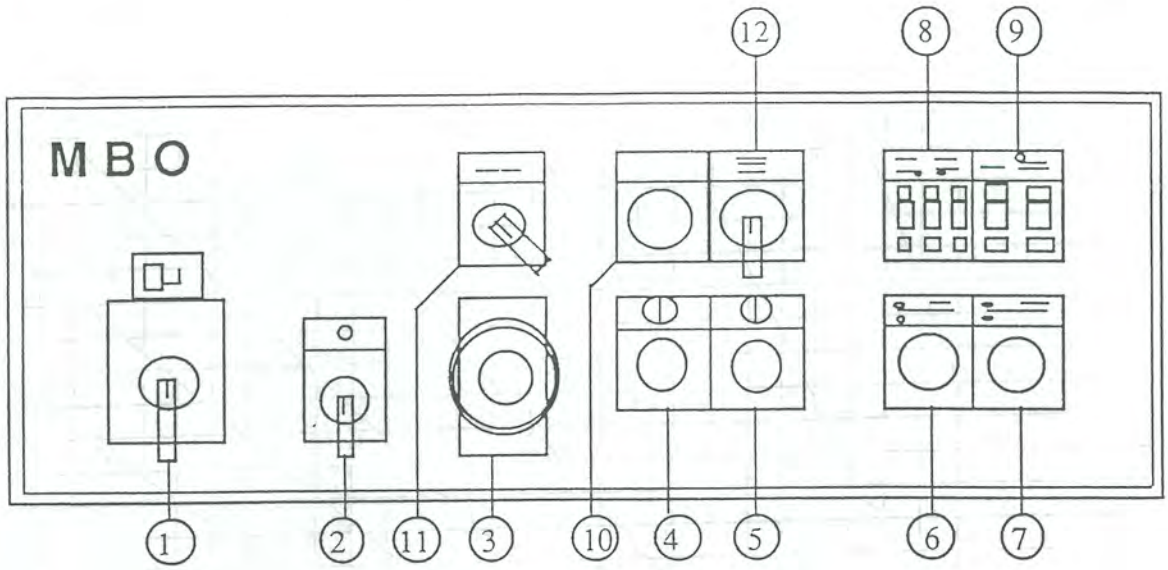
Diagram of production speed
for combi- and buckle folding machines



Example:

If sheet length is approx. 24 inches,
demanded speed to sheet is 4 800 inches/min.
broken line shows production of 10 000 sheets/hour.

MBO	CONTROL PANEL - T46, B18, T49 PILE AND T49 CONTINUOUS FEEDERS



ITEM	DESCRIPTION	REF. NO.	PART NO.	ID. NO.
1.	MAIN SWITCH	1Q1	KCD1Y/K3C003H	0126987/0126961
2.	AIR PUMP SWITCH	1Q2	KBC1B9-30/K3C003H	0127068/0126961
3.	EMERGENCY STOP BUTTON	1S1	D1C1R/DA11	0127076/0127027
4.	MACHINE "OFF" (STOP)	1S2	D1A1R/DA11	0127126/0127027
5.	MACHINE "ON" (START)	1S3	D1A1G/DA11	0127118/0127027
6.	PILOT LIGHT FOR (7)	1H2	D1V1B/DFSN	0127191/0127225
	INCLUDES BULB		2WBA9S-42V	0126136
7.	SHEET FEED BUTTON	1S4	D1A1B/DA11	0127100/0127027
8.	SHEET GAP SETTING		71072	0131914
9.	VACUUM LENGTH SETTING		71071	0131916
10.	PILOT LIGHT FOR (1)	1H1	D1V1W/DFSN	0127183/0127225
	INCLUDES BULB		2WBA9S-42V	0126136
11.*	SELECTOR SWITCH FOR BATCH IMPULSE		D1G2R/DA11	0127142/0127027
12.	SELECTOR SWITCH PILE UP/DOWN (PILE FEEDER MACHINES ONLY)	1S5	D1G3Y DA20	0127159/0127019

* USED ONLY WITH A-56 DELIVERY AND IZVA COUNTER (NOT USED WITH MCC2 COUNTER)

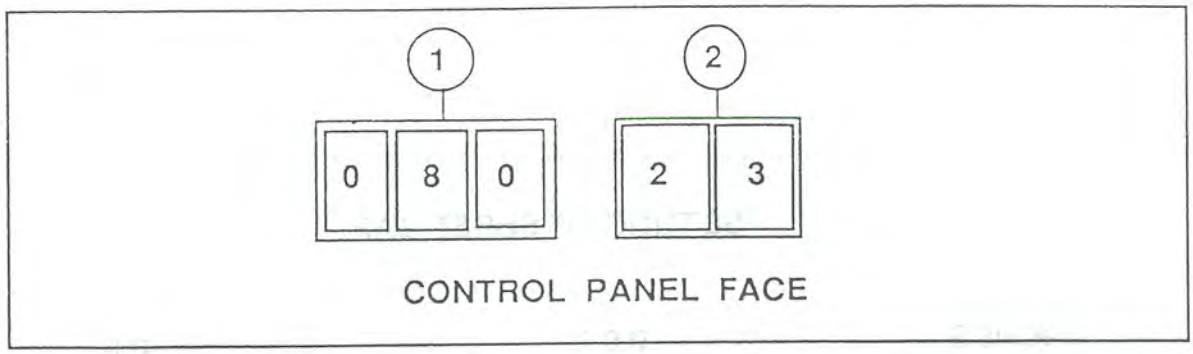
NOT APPLICABLE WITH A-46 & A-49 DELIVERIES

PROVIDES ACCELERATION OF TAPES WHEN USING A-56 DELIVERY

DELAYS SHEET FEED BY INTERRUPTION OF VACUUM TO SUCTION DRUM

MBO OPERATION AND MAINTENANCE MANUAL

SETTING SHEET GAP AND VACUUM LENGTH



INSTRUCTION FOR SETTING THE TWO DIGITAL DISPLAYS ON THE MAIN CONTROL PANEL OF : B18, T46, T49, T55, B23, B123, T65, T75, B26 & B30.

1 THE LEFT-HAND DISPLAY WITH 3 DIGITS IS FOR SETTING THE SHEET GAP. THE DISTANCE ACTUALLY SET ON THE DISPLAY IS THE DISTANCE FROM THE FRONT EDGE OF ONE SHEET TO THE FRONT EDGE OF THE NEXT FOLLOWING SHEET, I.E. SHEET LENGTH AND GAP.

THIS DISTANCE IS SET IN CENTIMETERS INTO THE DISPLAY AND ITS APPROXIMATE EQUIVALENT CAN BE CONVERTED FROM THE INCH SYSTEM INTO THE METRIC SYSTEM BY MULTIPLYING THE INCHES BY 5 AND DIVIDING THE RESULTING FIGURE BY 2:

EXAMPLE: IF WE TAKE A SHEET 28" LONG AND WE REQUIRE A GAP OF 4" THEN TOTAL SHEET LENGTH PLUS GAP EQUALS 32".
32" X 5 = 160
160 ÷ 2 = 80 CENTIMETERS TO BE STORED INTO 1 AS 080.

2 THE RIGHT-HAND DISPLAY WITH 2 DIGITS IS FOR SETTING THE VACUUM LENGTH. THIS IS THE DISTANCE THE SUCTION WHEEL IS IN VACUUM CONTACT WITH THE SHEET, AGAIN, IN CENTIMETERS. THIS IS NORMALLY SET AT APPROXIMATELY 1/3 THE LENGTH OF THE SHEET. WITH THE ABOVE EXAMPLE THIS WOULD BE 23 CENTIMETERS.

EXAMPLE: 28" X 5 = 140
140 ÷ 2 = 70 CENTIMETERS
70 X 1/3 = 23 CENTIMETERS

SETTING OF SHEET GAP

INCHES SHEET LENGTH	0 0 0 SET	0 0 SET
6	020	10
8	025	12
10	030	15
12	035	18
14	040	20
16	045	24
18	050	25
20	055	27
22	060	30
24	065	30
26	070	30
28	075	30
30	080	30
32	087	33
34	092	33
36	098	33
38	104	33
40	110	35
42	115	35
44	120	35
46	125	35
48	130	35
50	135	35

Pile Feeder B18/T46/T49/T55

The self-contained pile table may be loaded from two sides and is controlled by an electric motor. The pile stop, which is located at the bearing block (right side) is to be set to half of the sheet width by use of the scale. The right sheet guide bar (angled) behind the sheet stop is also mounted to this pile stop.

The pile table may be moved up or down by use of the selector switch, which is located at the main control panel. The table is stopped in its lowest position by a limit switch (maximum height of pile is approximately 66cm's 26 inches) Now the sheets, which should be aerated sufficiently, may be pre-piled. Thereafter, turn the selector switch for UP-movement of the pile table (switch remains in this position). The height control, or rather turn-off of transport in the upper direction, is controlled by a microswitch. If the pile is approximately 10-12 mm's (1/2 inch) below the suction wheel, it should stop. When the pile is uneven the distance may be changed by re-setting the height of the microswitch.

Then affix the left sheet guide bar (angled). This bar should be approximately 3 mm's away from side of the pile in order to avoid squeezing the top sheets and to aid good ventilation of the sheets. The microswitch, which is located on the rear end of the pile (centre) hinders floating of the sheets if they are excessively ventilated.

The two guide bars which are located on the left and right upper edge of the pile, may be adjusted in their height by knurled screws. These bars should be placed as deep as possible on top of the pile edges to avoid any leaking of the air blast and, furthermore, to make sure that the sheets are ventilated up to their rear end.

The air pressure and vacuum pump is turned ON by use of switch no. 2 at the main control panel. Open the required airclips, which are placed on the air tube at the front of the pile. The quantity of air should be proportioned in such a manner that approximately 5 to 10 sheets of the pile are thoroughly ventilated, The air tube may be adjusted up or down by twisting the knurled-head screw, which is located on the left side of the air tube. The air tube may also be tilted by use of the lever, which is also located on the left side of the air tube. You may carry out the preceding adjustment if the front edge of the sheet pile is bent down to achieve better results.

T46/B18/T55/T65

The conveyance of vacuum from the suction wheel is controlled by a disk which is placed behind the suction wheel. A red mark is located on this disk, The same marking is located on the housing beside the disk. When these marks are lined up the sheets are sucked by the suction wheel vacuum in their exact center. A lever is located on the front left-hand side of the disk for adjustment of the exact vacuum contact position. If the sheet bends down you should move the lever to the right (clockwise). The starting position for normal (even) pile is, when the 2 red marks behind the suction wheel are lined up.

B23/B123/B26/B30

The conveyance of vacuum from the suction wheel is controlled by a disk which is placed behind the suction wheel as above; however, the adjustment lever and ball knob are at the top of the disk behind the suction wheel.

Double sheet control:

The double sheet control is located in front of the alignment table. A lever is located at the side of the double sheet control which is to be used to insert a piece of paper below the feeler screw. This piece of paper is to be taken from the pile which is being processed. In order to exactly adjust the double sheet control you should turn ON the machine. Place one paper strip (from the pile which is to be processed) underneath the caliper, thereby preventing interuption of the sheet infeed mechanism. If two paper strips are placed between the caliper and the lower roller then the sheet infeed should stop (machine still keeps running). If a readjustment becomes necessary, this may be carried out by use of the knurled-head screw, in order to lift or drop the caliper, and to grant the necessary sensitivity.

Alignment table (register table)

When a sheet leaves the feeder, it is carried by the alignment tape towards the the parallel unit along the side guide. You may adjust the side guide by setting the side guide to one-half of the sheet width using the scale on the cross bar. This set-up should correspond with the setting of the pile stop at the pile table. You may use the fine adjustment located at the mounting block of the side guide for small adjustments. You equip the ball rail with either plastic or steel balls to keep the sheets close to the side guide. The first five holes of the ball rail after the suction wheel should always contain steel balls in order to exert sufficient pressure onto the sheet and to increase the speed of infeed. Now insert plastic balls after the first five steel balls when you process light paper. Medium and heavy weight paper sheets require steel balls as much as necessary.

To achieve exact folding in the 8-page unit, it is absolutely necessary that the sheets are fed at a right angle from the alignment table into the buckle plates of the parallel unit. There is an fine adjustment on the side guide (close to the double sheet control) to set the guide at a right angle to the fold rollers. It requires that you loosen the plastic knob, which enables you to set the correct position by turning the eccentric bushing.

Parallel Unit:

The sheet is leaving the alignment table towards the parallel unit where it, due to the buckle plates and deflectors, obtains one or multiple folds. All buckle plates have scales to set the sheet for the fold required fold, and swinging deflectors which may be brought easily into position as required.

Buckle plates:

Fold plate depth (inches)

T46/B18

Parallel				8-Page				16-Page			
#1	#2	#3	#4	#1	#2	#3	#4	#1	#2	#3	#4
21	21	14	14	14	14	14	14	----------			

T49/55

Parallel				8-Page				16-Page			
#1	#2	#3	#4	#1	#2	#3	#4	#1	#2	#3	#4
21	21	14	14	14	14	14	14	14	14	14	14

B23/B123

Parallel				8-Page				16-Page			
#1	#2	#3	#4	#1	#2	#3	#4	#1	#2	#3	#4
21	21	14	14	21	14	14	14	14	14	14	14

B26/30

Parallel				8-Page				16-Page			
#1	#2	#3	#4	#1	#2	#3	#4	#1	#2	#3	#4
25	20	14	14	20	20	14	14	14	14	14	14

T65/75

Parallel				8-Page				16-Page			
#1	#2	#3	#4	#1	#2	#3	#4	#1	#2	#3	#4
25	20	14	14	20	20	14	14	14	14	14	14

The minimum size of product of each buckle plate is approximately 1.5 inches.

How you ascertain which buckle plate to use:

Fold a sheet by hand of the job to be processed. Prepare the necessary folds which are required for this job. Check the imposition and determine the head and side lay of the sheet. Select the buckle plate (s) which are necessary for the required fold(s) and adjust the buckle plate (s) in accordance with the hand-folded sheet.

Setting of buckle plates or deflectors:

After determining which buckle plate is required for a certain job, you set the deflectors into position. You lower the deflectors on the buckle plates which are not required, and you lift the deflectors of the buckle plates which are required. This occurs as follows:

> Loosen the plate lock-up levers to release the buckle plates. Pull the buckle plate away from the fold rollers and "swing" the deflector into the required position. Reposition the buckle plate and tighten the plate lock-up lever.

Setting the sheet stop:

The sheet stops are adjusted with a handwheel for the correct fold length within the range of the buckle plate. Set according to the scale belt and plate indicator.

Fold plate and Fold Roll settings:

This section has been prepared to assist the machine operator. We have not made an attempt to show all kinds of folding impositions which can be made on the folder. If it is necessary you may, in addition to those we are showing you, fold other types of impositions.

The buckle plates which are used at the parallel, 8-page, and 16-page units 2nd, 3rd, and 4th. The calipers for setting the fold rolls and knife shafts are located on top of each side frame, and are numbered continuously.

Caliper no.1 moves the fold roller no.2, and caliper no. 2 moves the fold roller no.3, and so forth.

Correct Roller pressures and how to accomplish them

The most common fault is that the operator tends to use too much roller pressure. The method used to obtain the correct roller pressure is:

a. Draw back all buckle plates from the fold rollers.

b. Insert one piece of paper below each caliper on both sides of the machine.

c. Then, using the same paper, tear strips approximately 2" wide x 8" long and insert them between the rollers approximately 3" from the ends of the roller that you are correcting--one roller at a time.

d. Then hold one piece of paper with one hand, and with the other, turn the hand wheel in the direction that the machine normally travels and feel the roller "drag" on the paper. The rollers should have enough pressure to kiss the paper and transport the sheet when the machine is in motion. If the paper tears, then you should turn the caliper knob clockwise. If you have too little pressure, turn the knob counterclockwise. This should be done on both extreme ends of each roller in turn. If the pressures are "far out", do one end and then the other but come back to the first side again and recheck. You may have to do this several times.

e. After this procedure has been carried out at all fold rollers including the knife shaft, you may set the scale of the calipers to 0 position by holding the caliper and turning the graduated collar to the 0 marking (Fig. 1).

f. If at any time, you wish to make (small/micrometer) adjustments to the roller pressure, you can then check the scale and re-zero the rollers byjust runing the

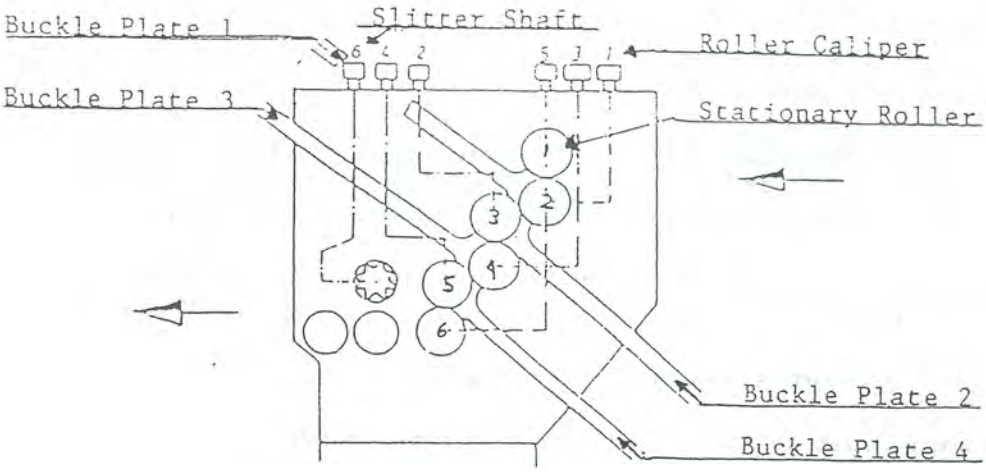
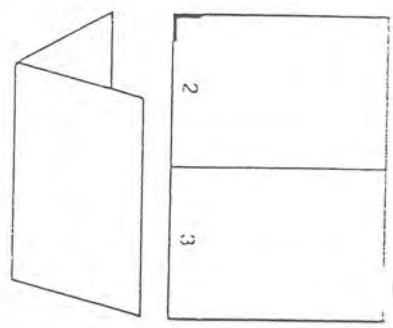


Illustration no. 1

Four pages parallel "buckle plate on top"

Caliper no. 1.....Insert one (1) thickness of paper
Calipers no. 2-6.....Insert two (2) thicknesses of paper
Sheet stop no. 1.....Adjust to 1/2 of the sheet length
Deflectors no. 2-4... Set into position



Four pages parallel "buckle plate at bottom"

Caliper no. 1 & 2.....Insert one (1) thickness of paper
Caliper no. 3-6.....Insert two (2) thicknesses of paper
Sheet stop no. 2.....Adjust to 1/2 of the sheet length
Deflector no. 1.....Set into position
(Two up or multiple up may be folded and cut on the folding machine).

Illustration no. 2

Double parallel fold, 8 pages

Caliper no. 1.....Insert one (1) thickness of paper
Caliper no. 2.....Insert two (2) thicknesses of paper
Caliper no. 3-6.....Insert four (4) thicknesses of paper
Sheet stop no. 1.....Adjust to 1/2 of sheet length
Sheet stop no. 2.....Adjust to 1/4 of sheet length
Deflectors no. 3 & 4..Set into position

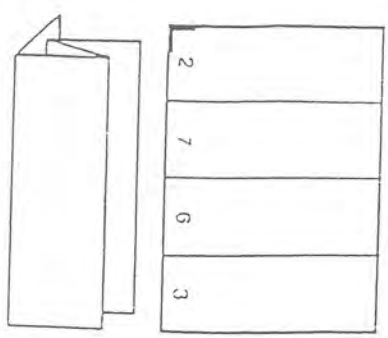
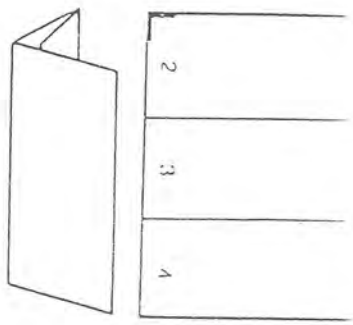


Illustration no. 3a

Parallel fold, 6 pages

Caliper no. 1 & 2.....Insert one (1) thickness of paper
Caliper no. 3-6.....Insert three (3) thicknesses of paper
Sheet stop no. 1.....Adjust to 2/3 of sheet length
Sheet stop no. 2.....Adjust to 1/3 of sheet length
Deflectors no. 3 & 4 ..Set into position



Note: This imposition requires that the operator is keeping a large sheet gap (see setting of sheet gap).

Illustration no. 3 b

Parallel fold, 6 pages

Caliper no 1-3.....Insert one (1) thickness of paper
Caliper no 4-6.....Insert three (3) thicknesses of paper
Sheet stop no. 1.....Adjust to 1/3 of sheet length
Sheet stop no. 3.....Adjust to 1/3 of sheet length
Deflectors no 2 & 4....Set into position

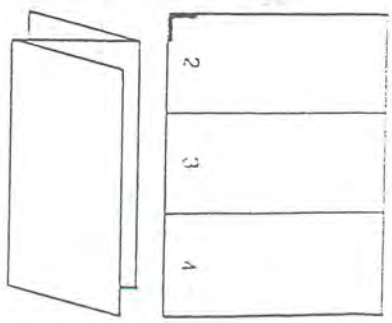


Illustration no. 4

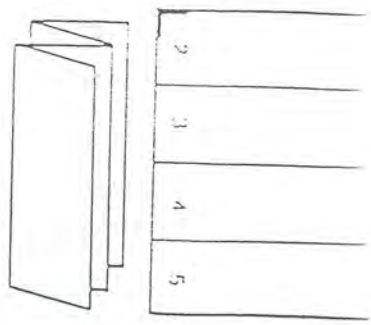
Accordian fold, 6 pages

Caliper no. 1 & 2.....Insert one (1) thickness of paper
Caliper no. 3-6.....Insert three (3) thicknesses of paper
Sheet stop no. 1 & 2...Adjust to 1/3 of sheet length

Deflectors no. 3 & 4...Set into position

Illustration no. 5

5

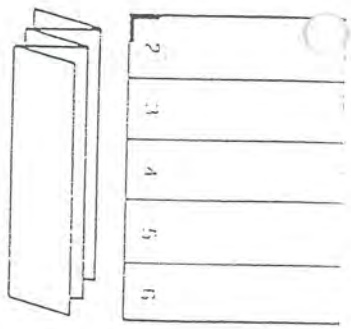


Accordion fold, 8 pages

Caliper no. 1-3.....Insert one (1) thickness of paper
Caliper no. 4-6.....Insert four (4) thicknesses of paper
Sheet stop no. 1-3.....Adjust to 1/4 of sheet length
Delector no. 4.....Set into position

Illustration no. 6

6

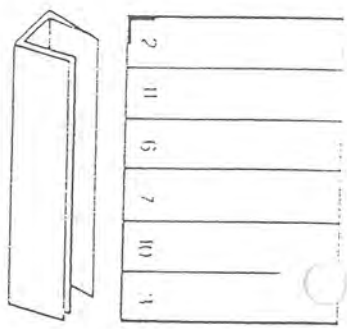


Accordion fold, 10 pages

Caliper no. 1-4.....Insert one (1) thickness of paper
Caliper no. 5 & 6.....Insert five (5) thicknesses of paper
Sheet stop no. 1-4.....Adjust to 1/5 of sheet length

Illustration no. 7

7

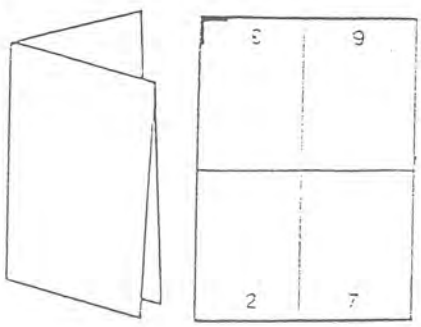


Parallel fold, 12 pages

Caliper no. 1.....Insert one (1) thickness of paper
Caliper no. 2-4.....Insert two (2) thicknesses of paper
Caliper no. 5 & 6.....Inset six (6) thicknesses of paper
Sheet stop no. 1.....Adjust to 1/2 of sheet length
Sheet stops no. 2 & 4..Adjust to 1/6 of sheet length
Deflector no. 3.....Set into position

Illustration no. 8

8



Parallel section adjust in accordance with illustration no. 1
Adjust 8-page section as follows:

Caliper no. 1.....Insert two (2) thicknesses of paper
Caliper no. 2-6.....Insert four (4) thicknesses of paper
Sheet stop no. 1.....Adjust to 1/2 of sheet width
Deflectors no. 2-4.....Set into position

Illustration no. 8

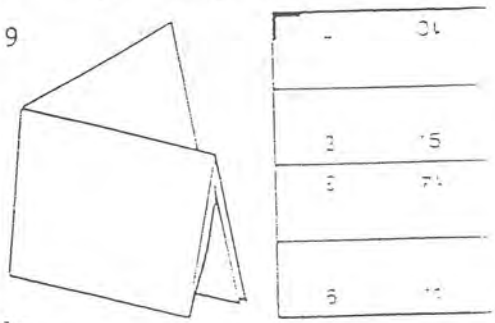
If at 8-page section "buckle plate at bottom" fold is required, adjust as follows:

Caliper no. 1 & 2.....Insert two (2) thicknesses of paper
Caliper no. 3-6.....Insert four (4) thicknesses of paper
Deflector no. 1.....Set into position
Sheet stop no. 2.....Adjust to 1/2 of sheet width
Delectors no. 3 & 4....Set into position

Illustration no. 9, 16 pages

Set parallel section as described in illustration no. 2, and adjust 8-page section as follows:

9

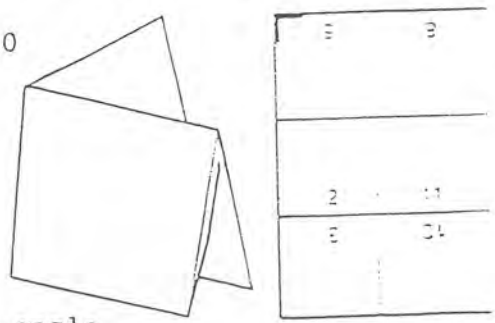


Caliper no. 1.....Insert four (4) thicknesses of paper
Caliper no. 2-6.....Insert eight (8) thicknesses of paper
Sheet stop no. 1.....Adjust to 1/2 of sheet width
Deflectors no. 2 - 4...Set into position

Illustration no. 10, 12 pages right angle

Set parallel section as described in illustration no. 3a and adjust 8-page section as follows:

10

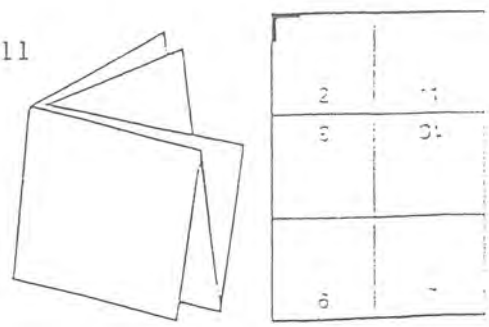


Caliper no. 1.....Insert four (4) thicknesses of paper
Calipers no. 2 - 6.....Insert eight (8) thicknesses of paper
Sheet stop no. 1.....Adjust to 1/2 of sheet width
Deflectors no. 2 -4....Set into position

Illustration no. 11, 12 pages accordion and right angle

Set parallel section as described in illustration no. 4 and adjust 8-page section as follows:

11



Caliper no. 1.....Insert three (3) thicknesses of paper
Calipers no. 2-6.....Insert six (6) thicknesses of paper
Sheet stop no. 1.....Adjust to 1/2 of sheet width
Deflectors no. 2-4.....Set into position

How to assemble and disassemble knife shafts:

The scoring (creasing), perforating, cutting, and trimming devices as well as the transport rollers are installed onto the knife shafts. These shafts with their plug bearing feature may easily be removed from and reinstalled in the folding unit when a new job makes it necessary.

To remove the knife shafts, loosen the socket head screw, in the slot of the bronze bushing, which locks the socket plug. While holding the knife shaft firmly with one hand, pull the knob with the other hand. To take the knife shaft out of the folding unit, move it approximately 1/2 inch in the same direction.

The reassembly occurs in the same manner in reverse. In order to prevent any end play, make sure that the screw fits deep in the slot by pushing on the knob of the plug.

How to assemble and adjust scoring (creasing) knives:

Attach the scoring knife on a knife holder and hold it firmly by use of the locking nut. A hooked spanner is designed for loosening and tightening this nut.

If the scoring knife and a upper buckle plate is used for a job fold, this holder must be mounted with the nut facing the drive side of the machine on the upper knife shaft. If a fold job should be made in a lower buckle plate, the scoring knife must be installed onto the lower shaft with the nut facing the operator side of the machine.

Place the transport rollers (with radius) on both ends of the counter shaft. These rollers must be set into position on both sides of the scoring knife. By increasing or decreasing the distance between the rollers and the knife you may vary the depth of scoring.

How to install perforating knives:

Using the same type of knife holders and locking nuts, which are used for the scoring knives, you can assemble perforating knives on the knife shafts.

The knife must be assembled on the holder with its bevelled side in the direction of the locking nut. By keeping the locking nut in the direction of the drive side, the perforating knife can be installed on the upper shaft.

The counter knife is made of hardened steel and has two sharp edges. One of these edges should be placed against the flat side of the perforating knife. Do not press them firmly together, they should touch only lightly.

When both the perforating and the counter knife are adjusted place the smoother onto the square bar which is located beyond the knife shaft.

Use a 15-tooth perforating knife for heavy and medium paper sheets, and for light paper sheets use a 12-tooth perforating knife.

See enclosure TM 32 or TM35 for additional knives.

How to install cutting knives:

The cutting knife or slitter may be installed onto the upper knife shaft by use of the same holder which is used for the scoring and perforating knives. The cutting knife should be installed in such a manner that the locking nut is directed to the drive side. Once again, the lower (counter) knife is of hardened steel with sharp edges on both sides. One of the sharp edges should be placed against the flat side of the cutting knife. Do not press them firmly together, they should only touch lightly.

How to install the center bleed trim device:

To produce a center bleed trim a special knife holder is used. Assemble the knife (with its flat side against the holder) as well as the required washers, and a second knife (with its flat side) in the direction of the locking nut. The width of the holder is sufficient to produce a center bleed trim of approximately 3/4".

The lower shaft requires two hardened counter knives . Each counter knife must be placed into such a position that it lightly touches the flat side of the cutting knife. Place the steel stripper between the lower counter knives so that the paper waste is deflected down and away from the knife shaft.

How to place scoring and cutting knives as well as transport rolls into position:

Place the transport rolls at an equal distance to each side of the holder on the upper shaft and place the steel collars equally on the lower shaft. The transport rolls are serving the purpose of guiding the sheets after they have left the fold rollers. They also support the cutting, perforating, or scoring of the sheets, and lead them to the next unit (station) or to the delivery.

How you set the cross carrier's side lay of the 2nd folding unit:

This side lay may be set to each sheet size. A sheet, which had been folded at the parallel unit (1st folding unit), should be placed onto the cross carrier of the 2nd folding unit. Move the side lay out or inwards until the edge of the sheet rests approximately 1 inch inside the side edge of the cross carrier. Install the guide fingers equally on the side lay for the width of the sheet coming from the first folding unit, so that the sheet is kept directly under the ball rail.

Install the aluminum smoother bars spaced for the width of sheet, to guide it into the fold rollers of the second folding unit.

The plastic and steel balls, which are delivered with the cross carrier, have the same effect as those balls on the aligning table after the feeder. The quantity of the balls to be used and their distribution in the ball rail depends on the weight, size, and kind of paper which has to be processed.

In order to achieve an exact fold at unit 2, the side guide of the cross carrier may be set by use of the angle adjustment. The small stargrip serves as a locking device, and the knurled ring serves as an excentric.

The sheets which are leaving the parallel unit onto the cross carrier may be supported by making a height adjustment. The rear leg of the cross carrier is equipped with a caster and brake for the exact positioning of the 2nd folding unit. Loosen the setting screw to set the cross carrier height, then lift or drop the complete cross carrier table and re-tighten the setting screw.

Delivery:

The delivery, hang on or mobile, which is delivered with the folding machine, may easily be used at all exits. When the job is finished, the folded sheets are led to the transport belt(s) of the delivery. There are delivery wheels mounted on a shaft over the delivery belt(s) which may be adjusted for different sheet sizes. These wheels stop the sheets and keep them on the delivery belt(s). To prevent signatures from inserting, (which may occur when delivering light weight or springy sheets), the delivery may be adjusted in its height. The speed of the delivery belt(s), driven by a D.C. motor, may be regulated by use of the potentiometer control botton, which is located at the delivery operator control station. The operator may achieve the desired stream of the sheets by increasing or decreasing the speed of the belt(s).

Two cables, i.e. one (1) power supply and one (1) control cable, are connected to the delivery. If the delivery is used with the parallel section, these cables must be plugged into the designated sockets of the main control cabinet. If the 2nd, 3rd, or 4th folding unit is used, the delivery control cable and the power supply cable of the delivery must be plugged into the appropriate sockets of the preceding unit.

Summary

The quality and quantity of work which may be produced with the MBO folding machine depends on the care of the operator during his adjustment and alignment work. Jam-up's or inaccurate folding which do not relate to the condition of the pile or mechanical faults, mostly occur due to inaccurate adjustments or settings. In such a case, the operator should investigate whether all adjustments or settings are in accordance with the Operating Manual.

SAFETY FIRST

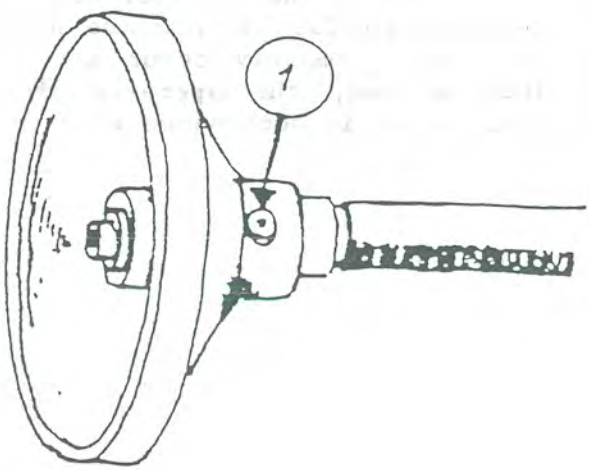
CAUTION:

If mechanical failure should occur, all repairs should be made by qualified service personnel, and therefore must be executed by them or under their supervision only. Any disregard of this safety regulation may cause damage to the machine. To avoid any kind of injuries do not, under any circumstances, attempt to work on or over the machine with tools of any kind while it is running.

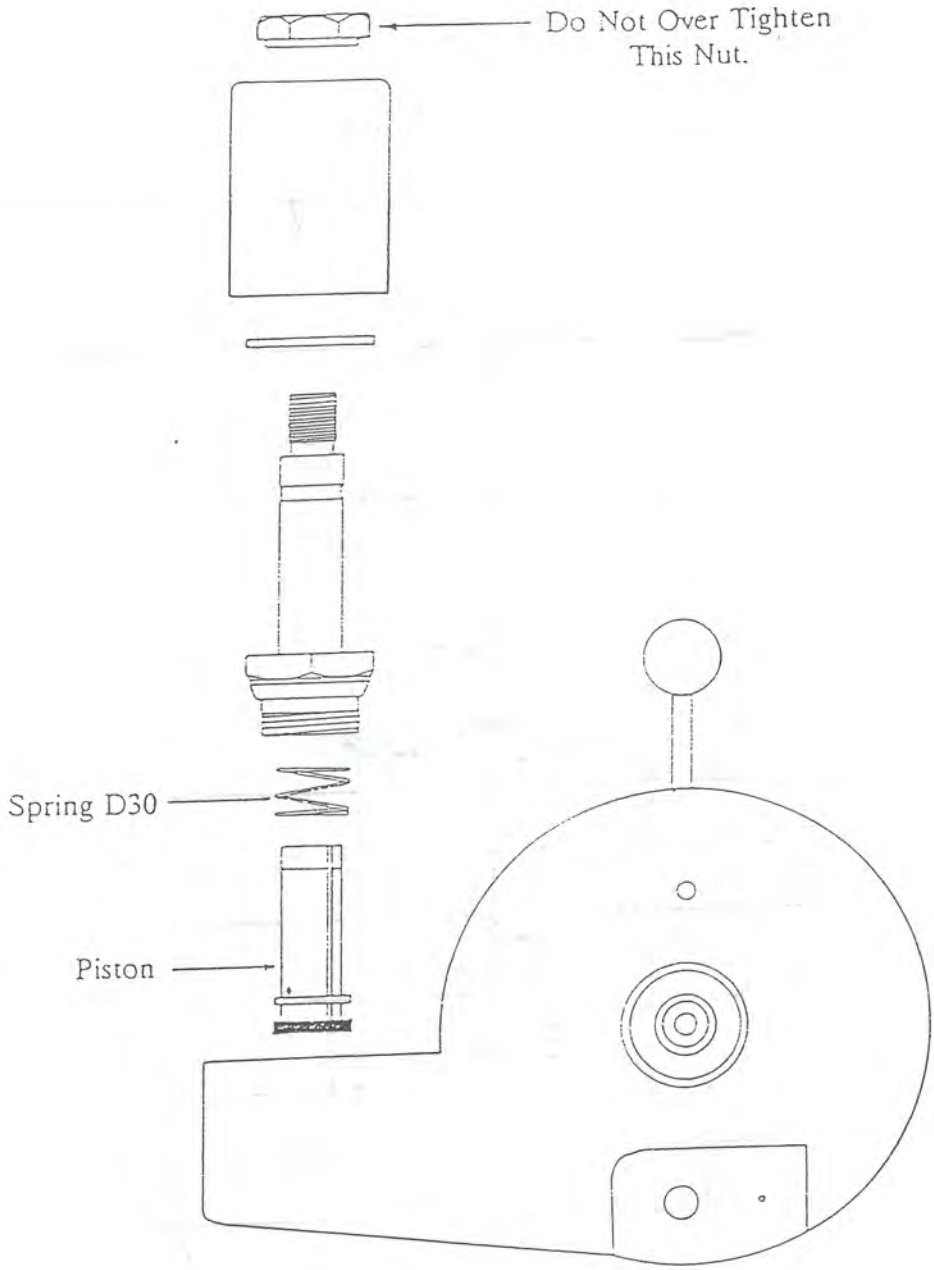
Maintenance:

1. The entire machine is equipped with sealed ball bearings.
2. Lubricate the hand wheel per instructions below.
3. Clean and/or change pump filters as necessary.

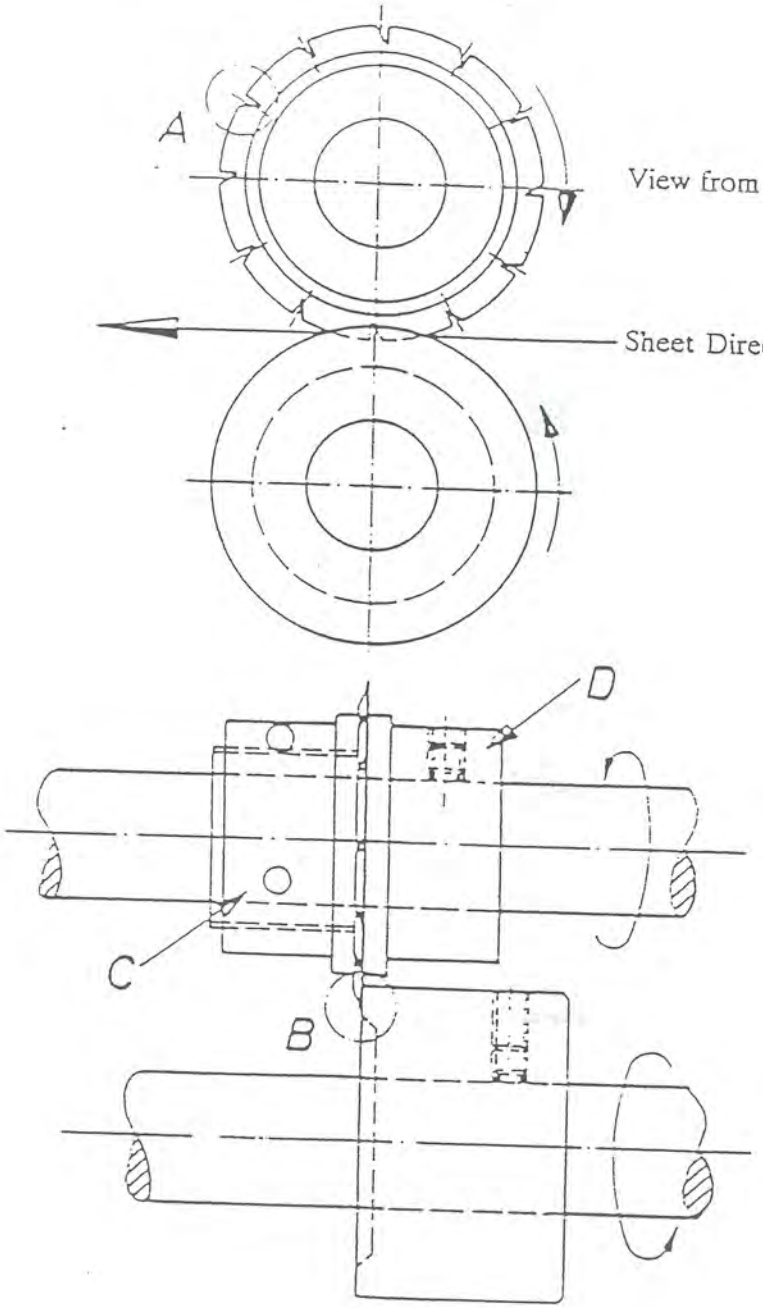
Safety Handwheel



Lubricate with oil (1) every 200 hours



The solenoid requires periodic cleaning. Spray power can cause the piston to get stuck. If the machine refuses to feed or constantly feeds with no sheet separation when the blue feeder button is pressed, please check and clean the solenoid before calling for a technician.



A. When installing perforator, note angle of notch.

B. Flat side of perforator and cutting knife must contact sharp side of lower knife.

C. The threaded nut of the knife holder "D" tightens against the running direction of the shaft.

MBO TM35-A

SCORING- SLITTING- AND PERFORATING KNIVES FOR SLITTER SHAFTS WITH 1 3/16" (30 mm) DIAMETER

Index #	Part #	O/D Inch	O/D mm	Thickness Inch	Thickness mm	Application
SCORES						
1	2.0.5591.020	2	51.5	1/32	0.8	Standard score
2	2.0.5591.080	2	50.8	1/32	0.8	Score against rubber. for cover stock or very heavy paper
SLITTERS						
3	2.0.5591.010	2 1/8	53.5	1/32	0.8	Standard slitter
4	2.0.5591.090	2 1/8	53.5	1/32	0.8	High-speed steel slitter for extra clean cut edges

All scores, slitters and perforators 1 3/8" (35mm) internal diameter. Scores, slitters and punch perforator are closed: all other perfs are split. Inch measurements, cut length and bridge length dimensions are approximate.

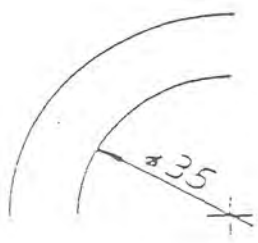
PERFORATORS

Index #	Part #	O/D Inch	O/D mm	Thickness Inch	Thickness mm	Teeth Qty	Teeth Per Inch	Cut Length Inch	Cut Length mm	Bridge Length Inch	Bridge Length mm
5	2.0.5591.030	2 1/16	53	1/64	0.5	15	2.2	5/16	8	1/8	3
6	2.0.5591.040	2 1/16	53	1/64	0.5	22	3.4	1/8	2.5	3/16	5
7	2.0.5591.070	2 1/16	53	1/64	0.5	12	1.8	7/16	11	1/8	2.5
8	2.0.5591.050	2 1/16	52.5	1/64	0.5	42	6.5	1/8	2.5	1/16	1.5
9	2.0.5591.060	2 1/16	52.5	1/64	0.5	70	10.8	1/16	1	1/16	1.2
10	2.0.5591.100	2 1/8	54	1/16	1.2	9	1.3	7/16	11	5/16	8
11	2.0.5591.110	2 1/16	53	1/64	0.5	16	2.4	3/16	5.5	3/16	5
12	2.0.5591.120	2 1/16	53	1/64	0.5	10	1.5	7/16	12	3/16	5

#	Perf Type	Signature	Stock Weight	Application
5	Head	16-Page	All	
6	Head	16-Page	Med./heavy	Reduces dog ears. also for automatic sewing
7	Head	16-Page	Light	Less creasing than perforator #5
8	Tearout	6-Page	Medium	Mailer: multiple perf: high tear strength
9	Tearout	4-Page	Light	Light tear strength
10	Spine	16-Page	Light/med.	Punch perforator for notch binding
11	Spine	16-Page	All	Perfect binding
12	Spine	16-Page	All	Perfect binding

All scores. slitters and perforators 1 3/8" (35mm) internal diameter. Scores. slitters and punch perforator are closed: all other perfs are split. Inch measurements. cut length and bridge length dimensions are approximate.

1



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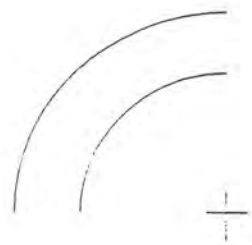

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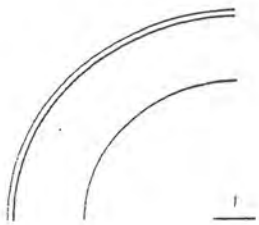

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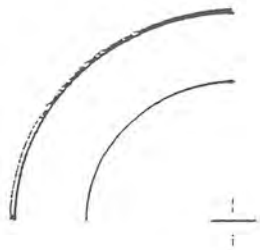

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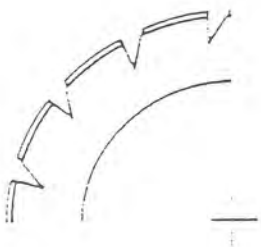

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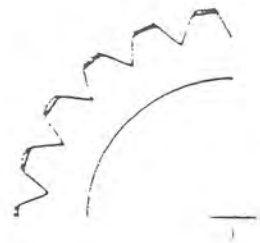

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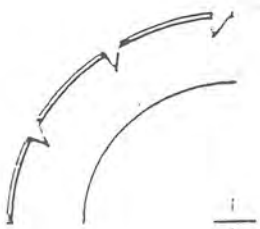

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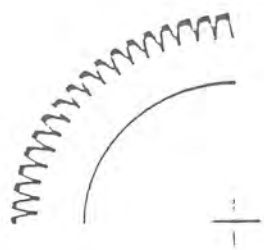

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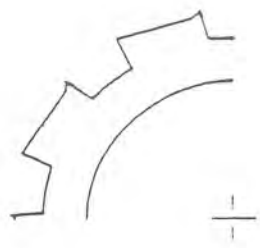

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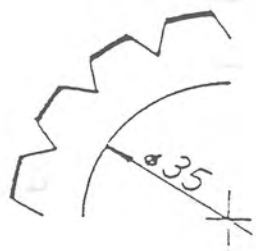

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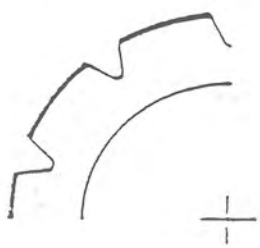
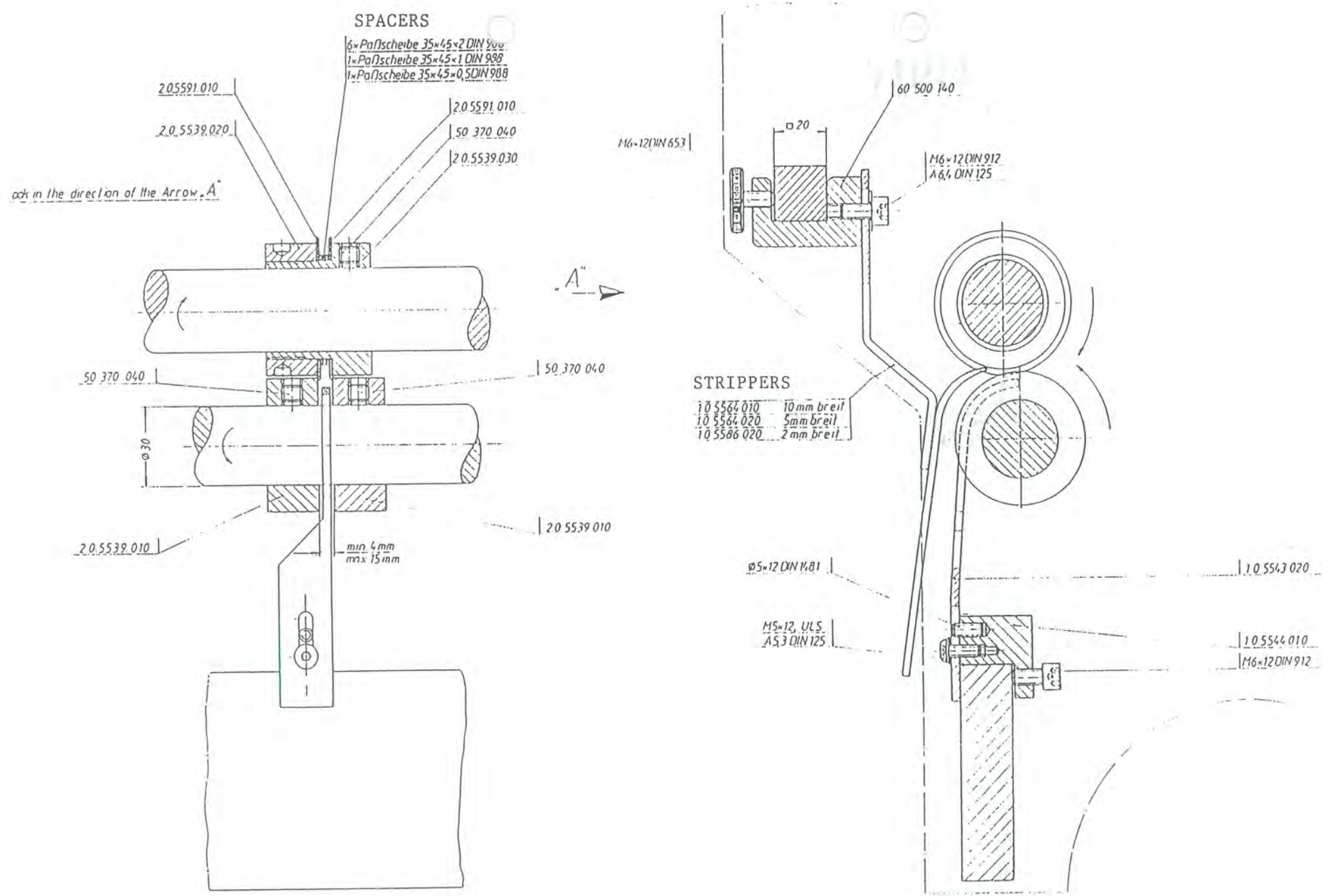


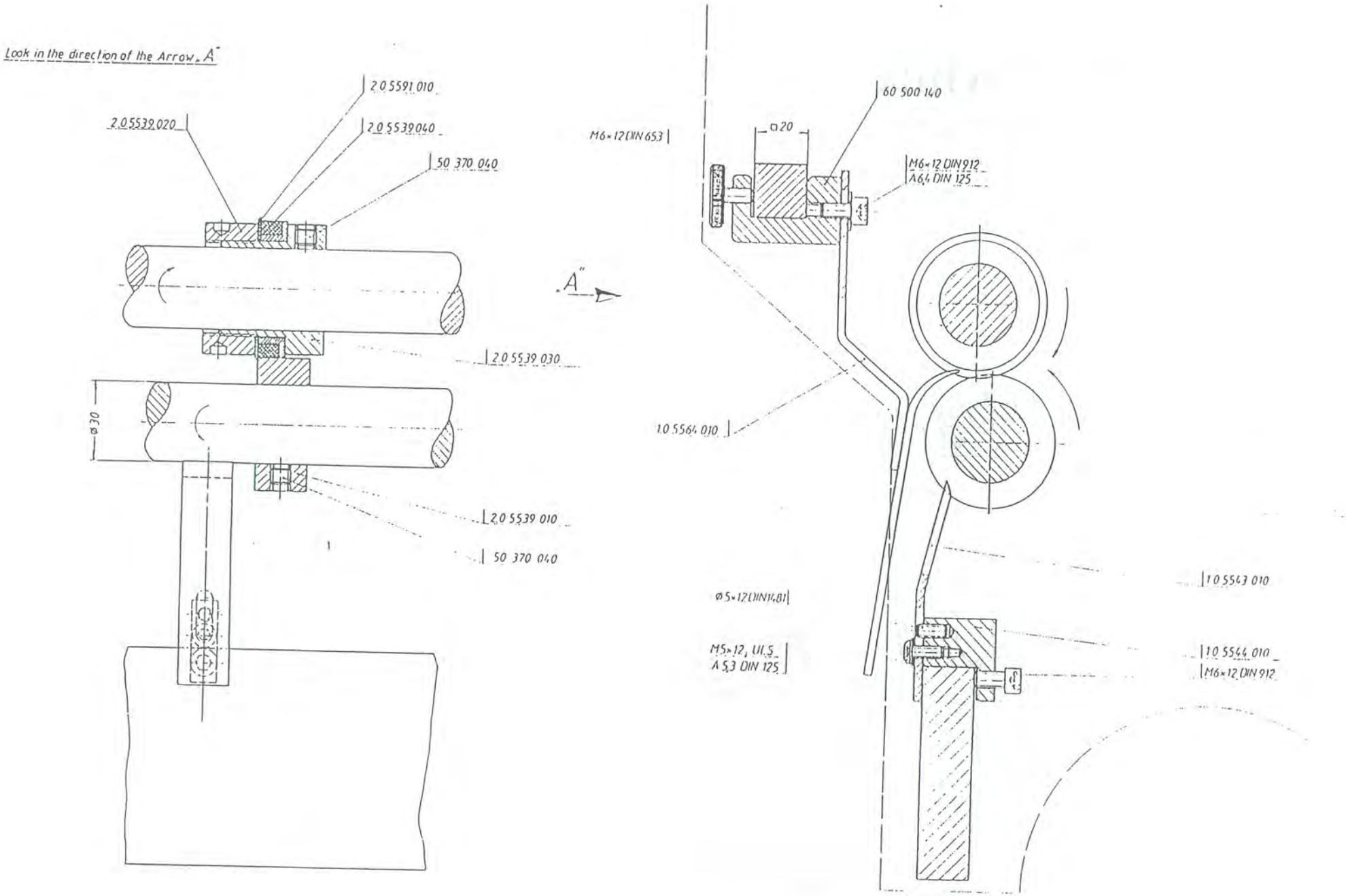


CODE 4930

PART NO. 1.5.5500.131

T46/B18/ T 49/55

MBO Center bleed trim device
Gulley cut device

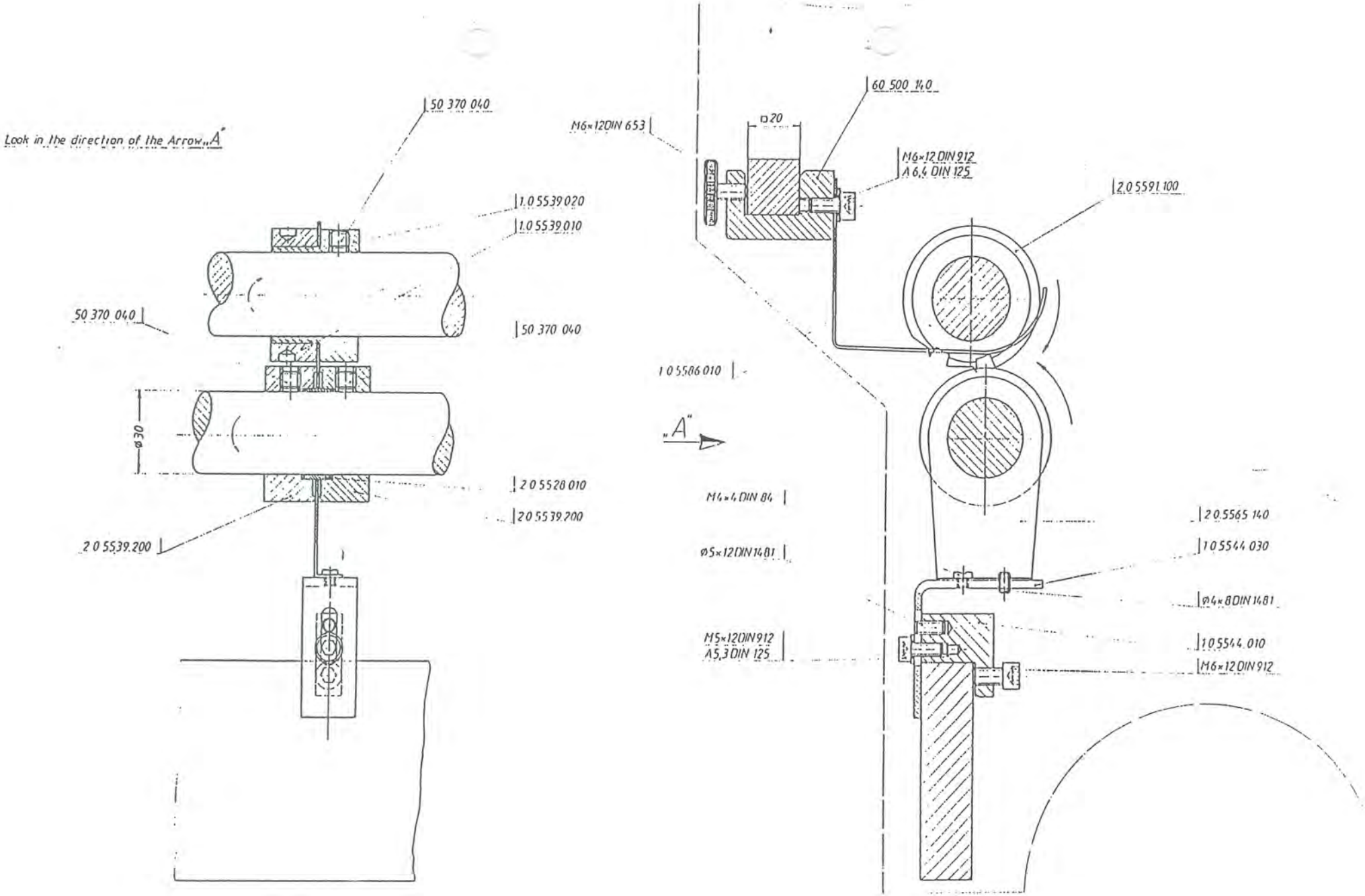


CODE 4949

PART NO. 1.5.5500.141

T46/B18/ T 49/55

MBO Edge trim device

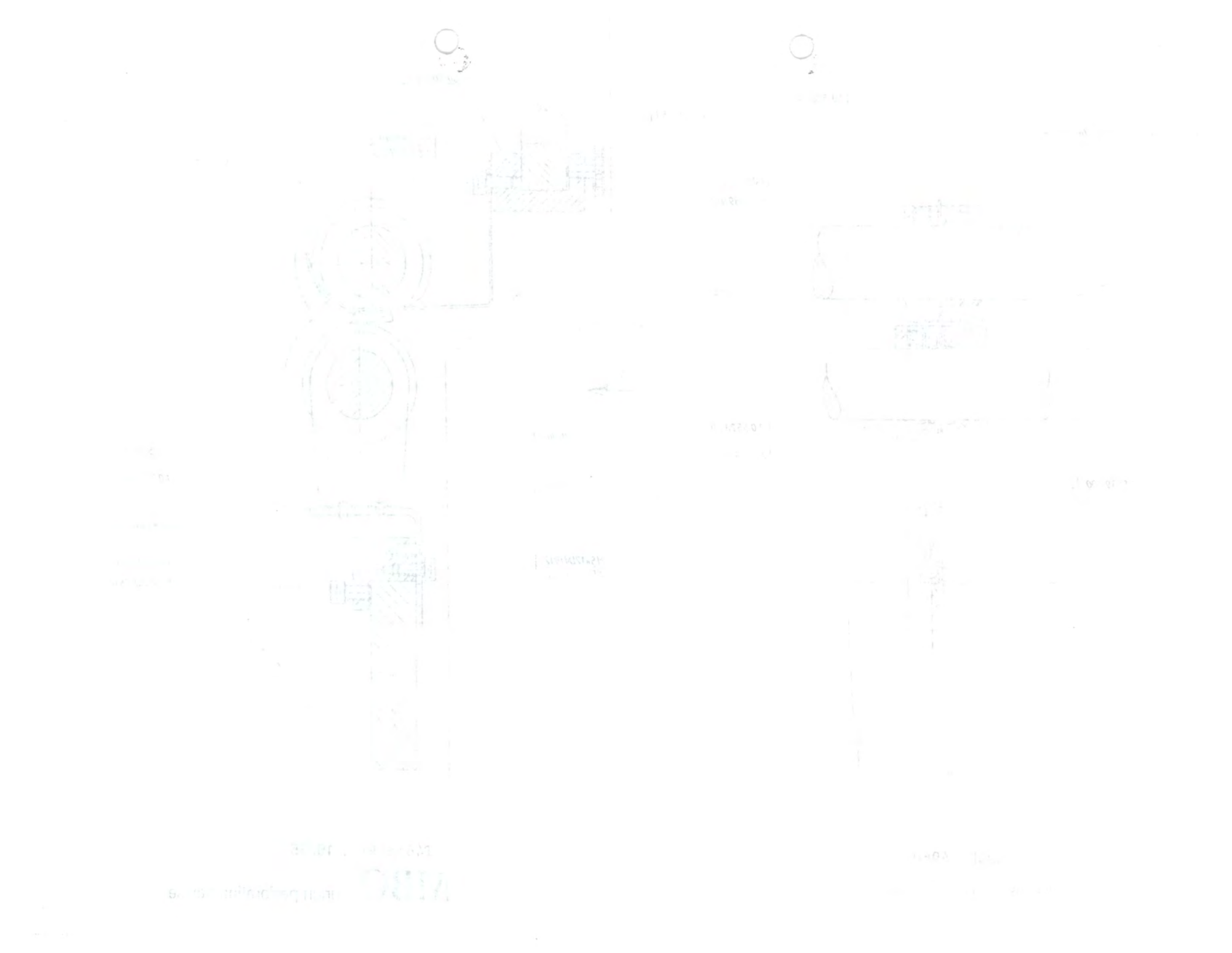


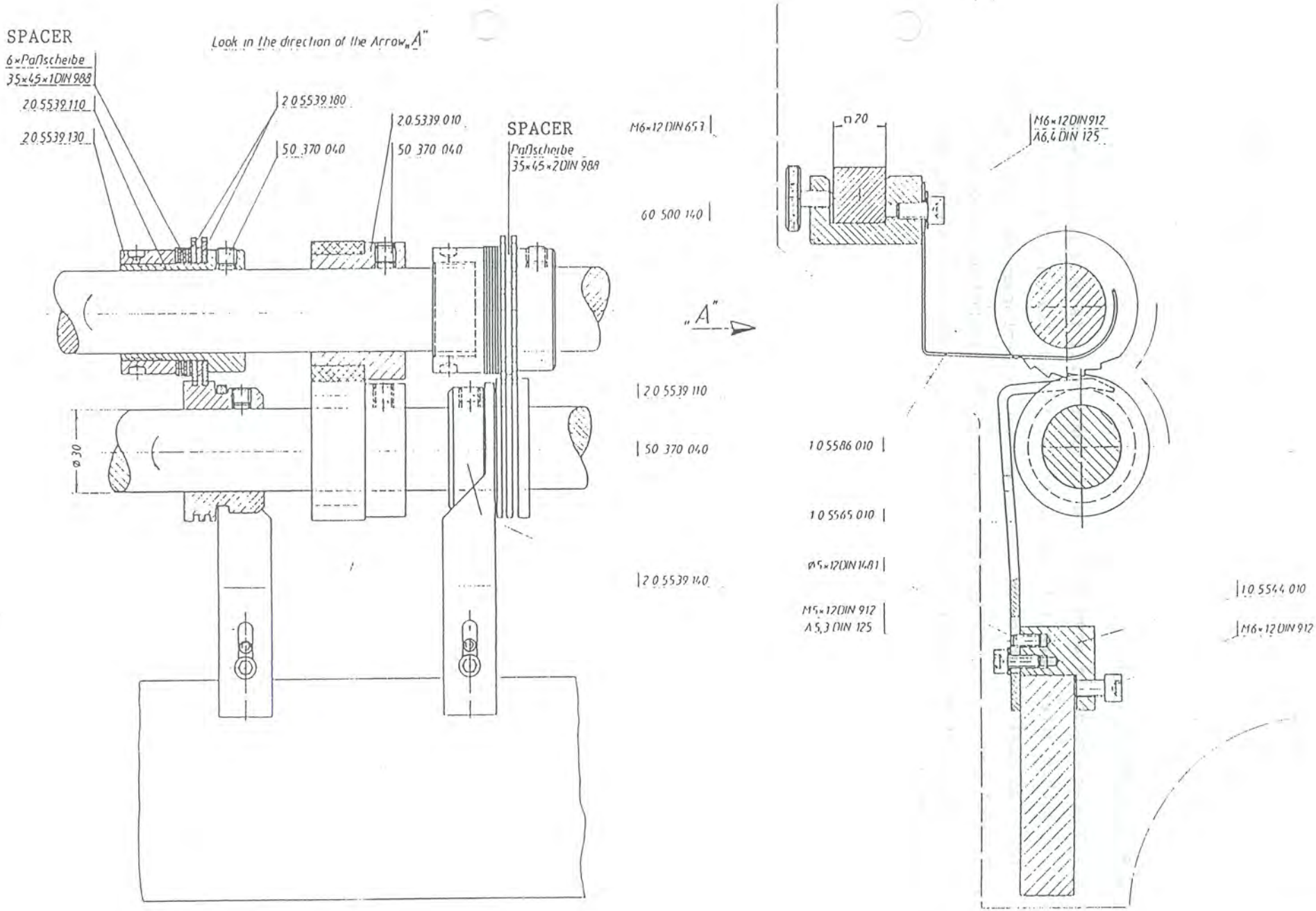
CODE 4960

PART NO. 1.5.5500.221

T46/B18/ T 49/55

MBO Punch perforating device





CODE 4973

PART NO. 1.5.5500.211

T46/B18/ T 49/55

MBO Crimp-lock device

Checking for bad sheets(jam detector)

The photo-cell also serves as a control for bad folded sheets, double sheets or jams. If the photo-cell is not cleared by the passing sheet when 25 is reached then an impulse will not be given to the knife and the machine will switch itself off.

Jam Detector with parallel fold:

If you put the toggle switch in down position the photo-cell is used for controlling the sheets passing them after parallel fold. If the folded sheet is 4 inches long(10cm) set the digital switch on No.14 and machine is kept running unless a sheet longer than 4"(10cm) passes the photo-cell or a sheet is stopped under photo-cell, then machine will stop automatically. If you don't want to use this control set digital switch on "00".

Adjusting instructions for the digital knife control: Reference Picture 1

FUNCTION:

The digital knife control activates the knife in the "X" section. As the sheet passes the photo-cell on the ball rail, it switches the electronic control on. From this point on an impulse counter registers each cm of the distance the sheet is traveling towards the sheet stop. To set up the impulse counter a reference number must be placed in the digital switch. See make ready instructions below.

MAKE READY:

Turn adjusting wheel(5) to set sheet stop rail(7). Set stop rail on the inch scale to equal full length of sheet from backbone to lead edge as sheet exits parallel section. A pointer on the end of the sheet stop rail(13)will give a reference number which is then set in the digital switch(14). This gives the basic setting. Then place the toggle switch on the left side of the digital switch in the up position. Example: You read No. 25 on the scale, set digital-switch at 25 and the knife will be activated when sheet has arrived on the sheet stop.

Delay:

If a sheet needs more time to settle on the sheet stop then a higher number should be chosen e.g.30, this means that the sheet will remain 5cm(2") longer on the stop and the knife impulse will be given 5cm (2") later.

Advance:

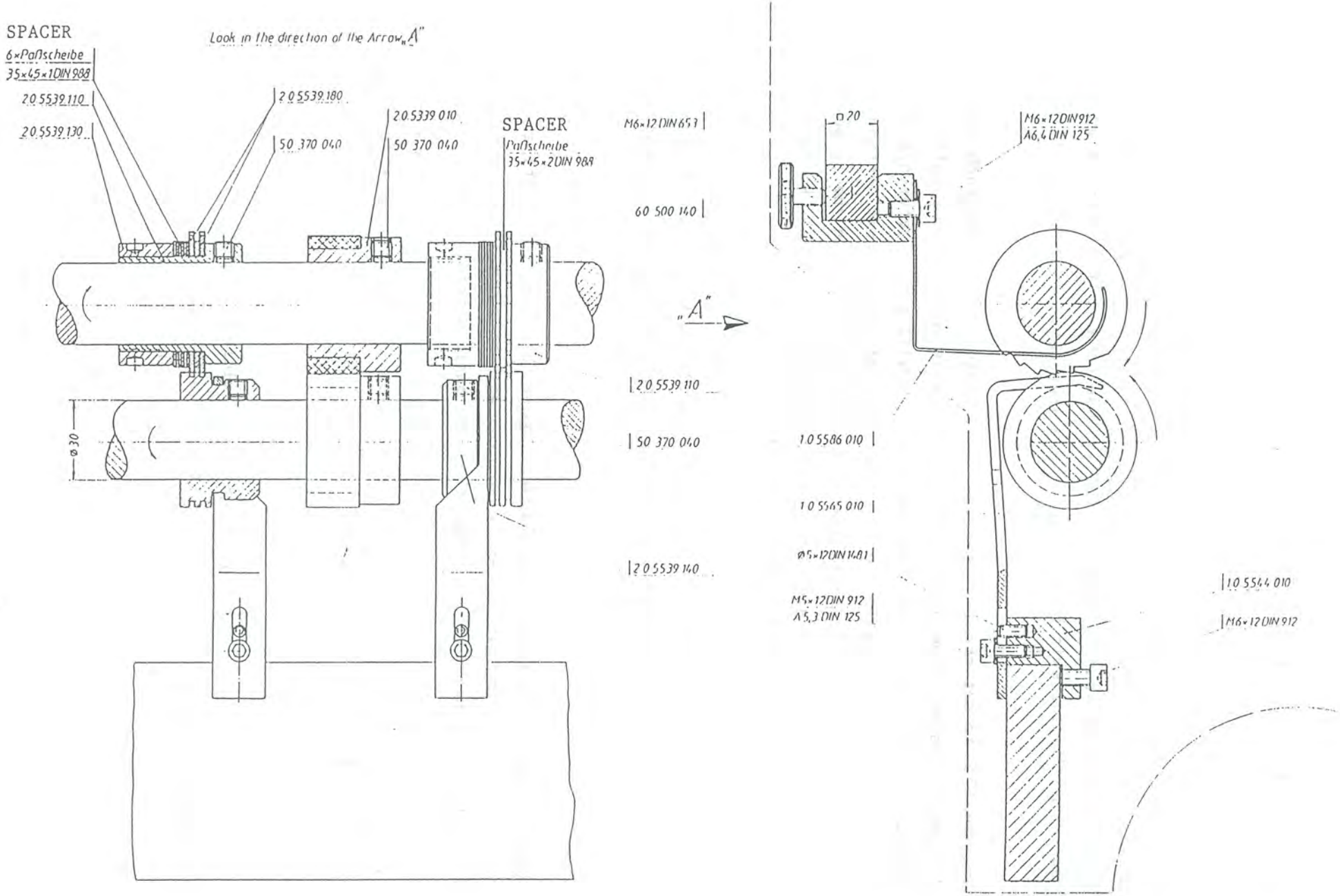
To achieve higher outputs one can choose a lower figure than the basic setting e.g. 20 instead of 25. This means that the knife impulse will be given 5cm(2") earlier, and the knife starts to move 5cm(2") earlier than the basic setting.

Caution:

One has to insure that the sheet will stop on sheet stop just before the knife is activated. If the figure chosen is too small the knife will start to act before the sheet reaches the stop.

Comments:

This speeding up from 2 to about 5cm can be used for folding pre-perforated sheets. When folding non-perforated stock a longer setting is necessary. One should always use the basic setting first and then afterwards program the digital switch to delay or advance the knife action.

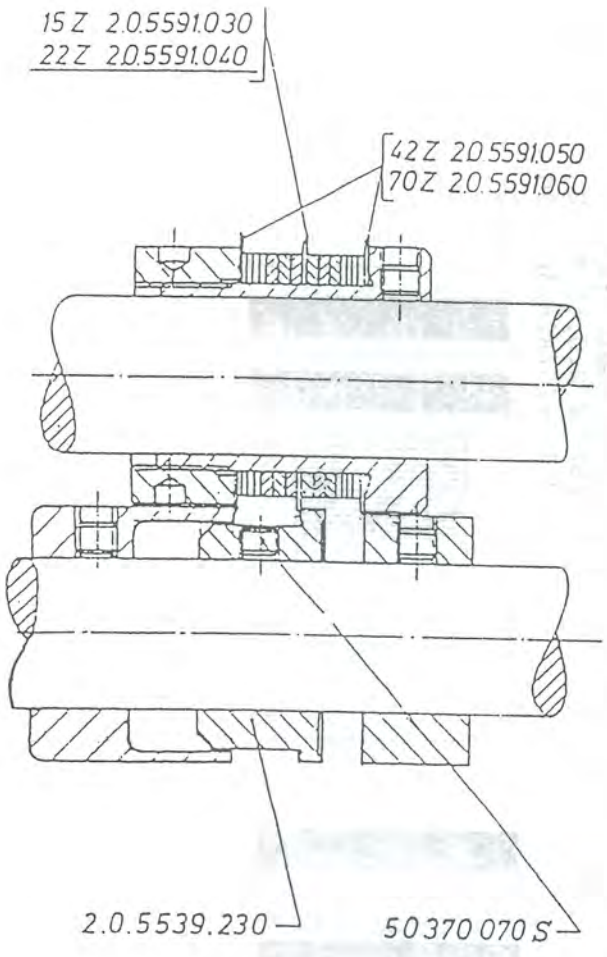


CODE 4973

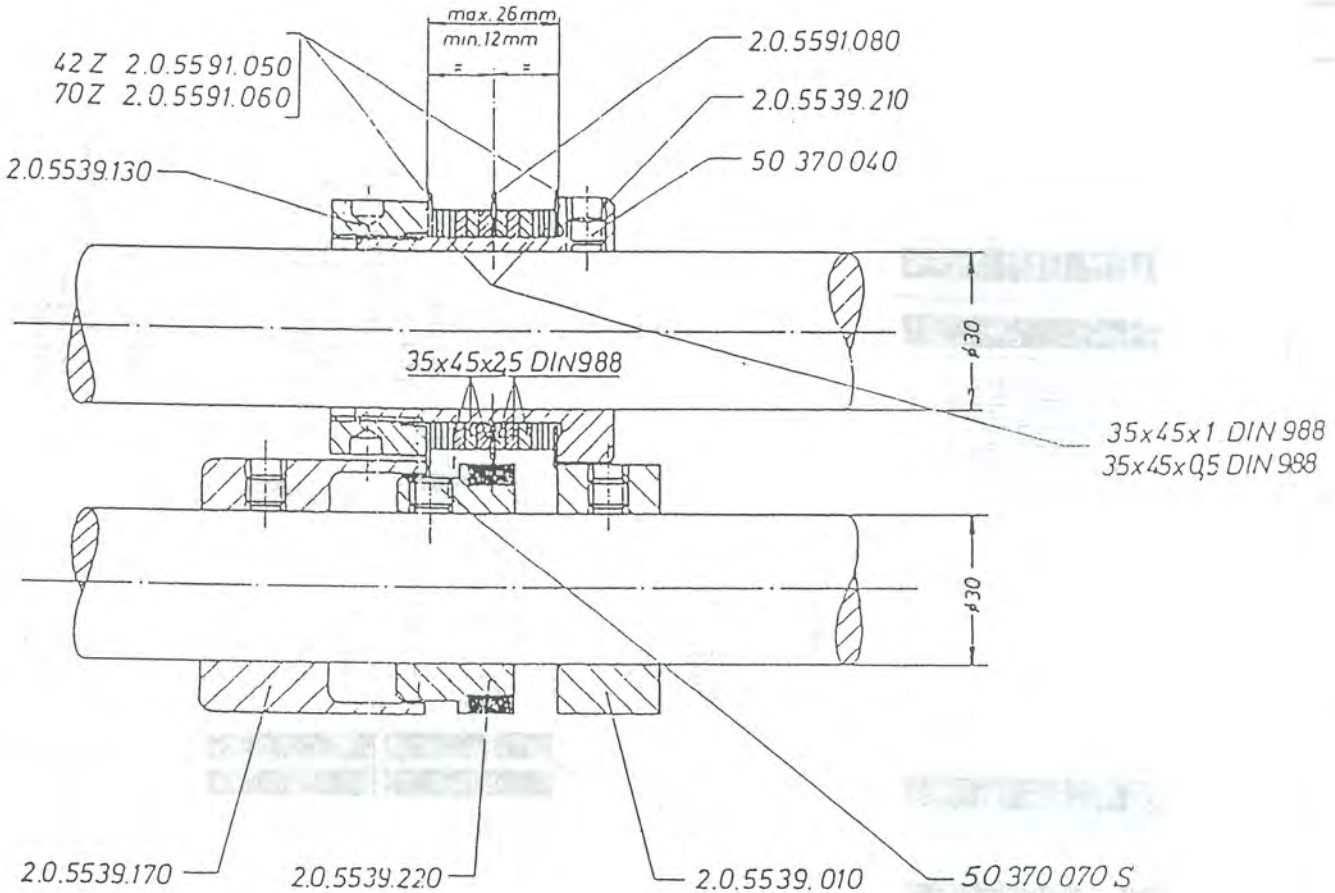
PART NO. 1.5.5500.211

T46/B18/ T 49/55

MBO Crimp-lock device



MULTIPLE PERF DEVICE



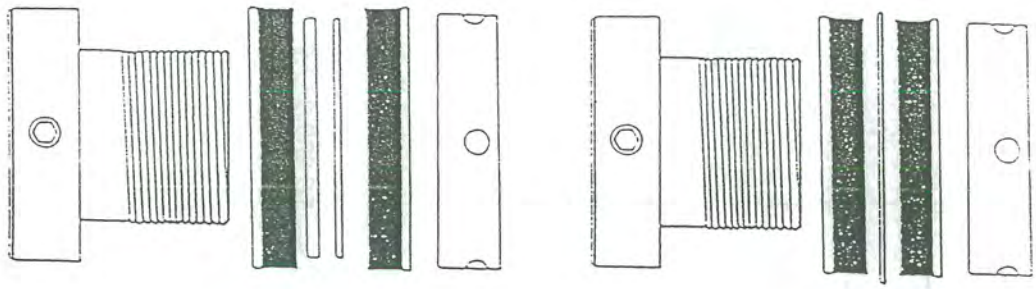
MULTIPLE PERF AND CREASING DEVICE

T46/B18, T49, B23

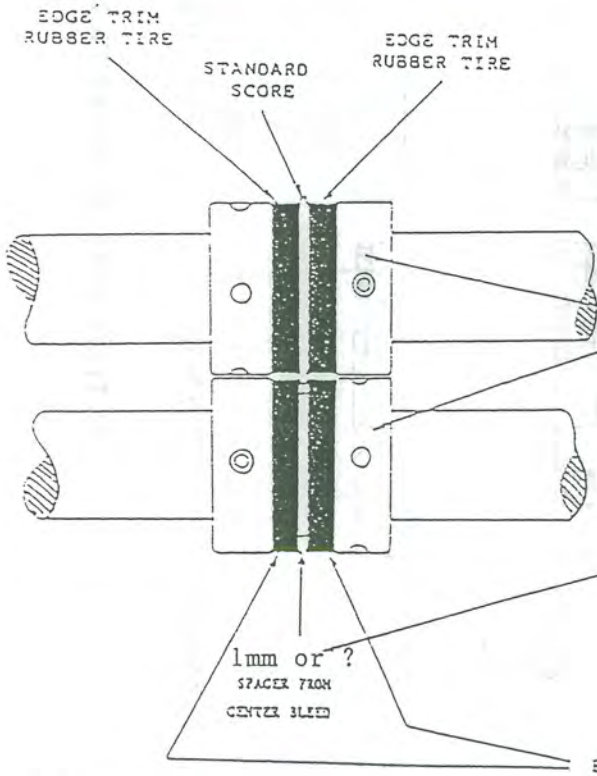
MULTIPLE PERF AND CREASING DEVICE

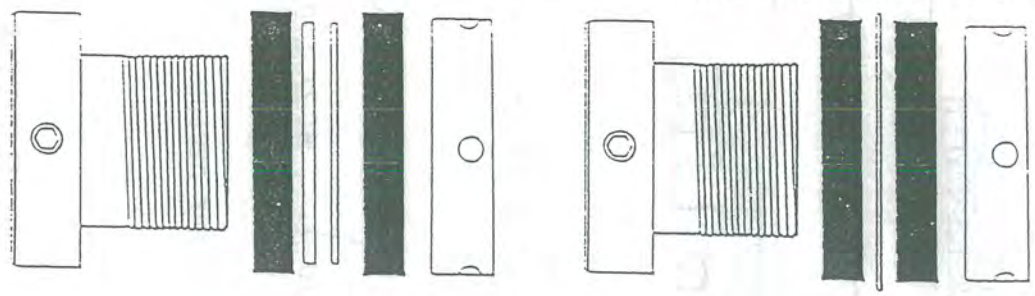
FOR 30 mm DIA. SHAFTS

CODE 4968 PART NO. 2.0.5500.110



B18/T46-49/B23

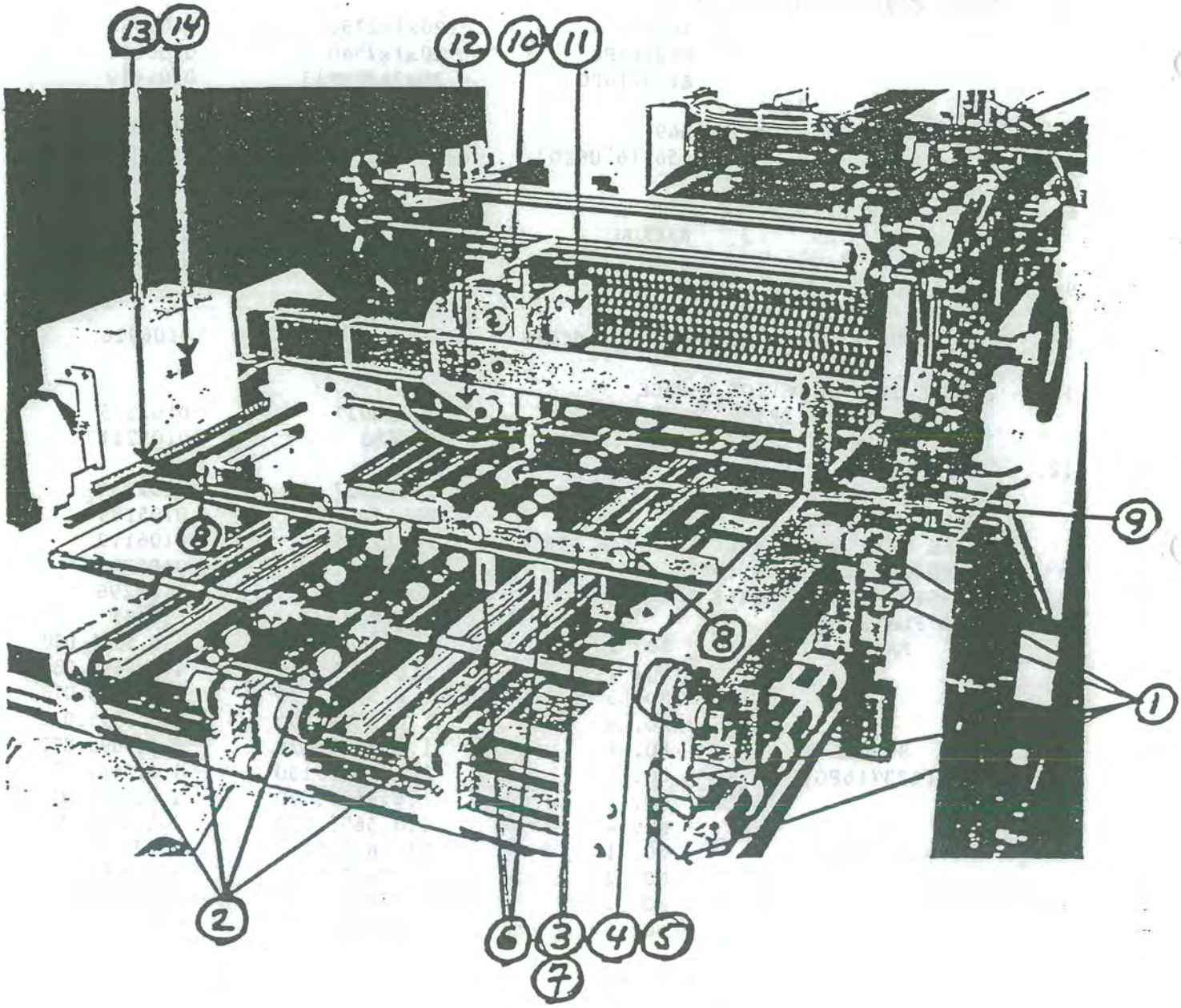




B123/ T65-75/B26-30

	BELT LIST		PART NO.	IDENT. NO.
1.	FOLD ROLLER DRIVE BELT	PARALLEL 4 PLATE	25x1750	0106278
		8-PAGE 4 PLATE	25x1750	0106278
		B23/16PG 4 PLATE	25x1.3x1460	0106245
		B123/16PG 4 PLATE	25x1x1540	0106260
2.	SUCTION WHEEL DRIVE BELT		20x1x2010	0105791
3.	REGISTER TABLE BELT		50x1x1804	0106920
4.	MOTOR V-BELT ALL UNITS		22X550LI	0107516
5.	MAIN DRIVE POLY V-BELT			
		B23/16PG UNIT	360J8	0107557
		B123/16PG UNIT	400J8	0107839
6.	CROSS CARRIER ROLLER DRIVE			
		8-PAGE	20x1x2750	0106038
		B23/16PG	20x1x2540	0106021
		B123/16PG	20x3480NE17	0106179
7.	DELIVERY TAPE(S) MODEL	A49	560x860	0107078
		A56 (6 USED)	40x1x1360	0106823
8.	CONTINUOUS FEEDER TOP BELT			
		NARROW	28x3110	0106997
		WIDE	550x3110	0135269
9.	CONTINUOUS FEEDER BOTTOM BELT		550x2620	0107011
10.	CONTINUOUS FEEDER REAR TEXTILE BELTS		50x2190	0106926
11.	DOUBLE STREAM DEVICE 8-PAGE			
	CONVEYOR DRIVE TIMING BELT		100xL037	0102335
	CONVEYOR TAPES 8-PAGE (3 USED)		20x680	0105221
12.	"X" UNIT BELTS			
	CONVEYOR DRIVE TIMING BELT		100xL037	0102335
	CONVEYOR TAPES		20x610-585	0105189
	KNIFE UNIT DRIVE BELT FROM PAR. OR 8-PAGE		20x1x2950	0106112
	TRANSPORT TAPES TO KNIFE		20x1x1820	0105767
	TRANSPORT TAPES AFTER KNIFE		20x800	0105296
13.	FOLD PLATE BELTS		INCH	PLAIN
	PARALLEL	NO. 1	1.0.5695.100	1.0.5695.080
		NO. 2	1.0.5695.110	1.0.5695.080
		NO. 3	1.0.5695.120	1.0.5695.070
		NO. 4	1.0.5695.130	1.0.5695.070
	8-PAGE	NO. 1	1.0.5695.120	1.0.5695.070
	(B23/16PG)	NO. 2	1.0.5695.130	1.0.5695.070
		NO. 3	1.0.5695.120	1.0.5695.070
		NO. 4	1.0.5695.130	1.0.5695.070
	B123/16PG	NO. 1	01.5673.07	01.5673.01
		NO. 2	01.5673.08	01.5673.01
		NO. 3	01.5673.07	01.5673.01
		NO. 4	01.5673.08	01.5673.01

Picture No 1



The new self-timing knife folding "X" unit can be used either attached to the parallel folding unit as a 8 page section or attached to the 8-page buckle section as a 16 page unit. The folding rollers and knife shafts as well as the electric clutch for the knife motion are driven by a belt from the preceding folding unit. The electric supply to the clutch as well as the electronic controls are made by cable connections. The fold roller perferator shaft adjustments are made at the operator's side by caliper setting.(1) Four transport tapes(2) move the sheets to the sheet stops,(3) which according to scale is adjusted at the left side of the machine,(5) according to sheet size as many stop fingers,(6) as possible should be attached to the sheet stop bar(7). For the final positioning of the sheet the side lays(8) have to be set, one at each side. The height of the folding knife(9) can be adjusted by a handle(10) situated at the top of the clutch assembly(11) turning to the left means deeper, turning to the right means higher adjustment of the knife. The knife can also be changed in respect to the parallelness to the folding rollers. For doing that, the handle(12) tips the knife from front to back to compensate squareness of the fold or edge trim.

The slitter shafts under the folding rollers can be taken out by means of plug bearings like in the parallel fold. The stacker delivery is put on on the left side on X-Fold-Unit.

If knife unit "X" is used on 8-page buckle section, the sheet must always run in center through the 8-page section to the knife "X" unit. For that purpose a conveyor table with yellow tapes is fastened to the parallel unit, which will transport the sheet to the side guide of the 8-page unit. When running a large sheet size, the 8-page unit must be moved away from the parallel section so that the tail of the sheet will clear the conveyor table.