OPERATION INSTRUCTIONS FOR

MOTORISED FOLDING MACHINE TYPE HSM

The Motorised Folding Machine type HSM is in accordance with The EEC-Machine Directive.

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EC Declaration of Conformity

Manufacture

Company name:	***H.M.Transtech s.r.o.***
Address:	Volgogradska 13B 08001 PRESOV Slovakia
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Hereby declare, that

Machine

No.:	
Name:	HSM

- Is in conformity with:

- The COUNCIL DIRECTIVE of 22 June 1998 on mutual approximation of the laws of the Member States on the safety of machines with special reference to Annex 1 of the Directive on essential safety and health requirements in relation to the construction and manufacture of machines (98/37/EC).

- COUNCIL DIRECTIVE of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (73/23/EEC), amended by (93/68/EEC).

- COUNCIL DIRECTIVE of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility (89/336/EEC), amended by (93/68/EEC).

Position: Production manager
Name: Frantisek GALA
Company: H.M.Transtech s.r.o.

12.10.2005

Date Signature

WHEN STARTING MACHINE THE OPERATOR **MUST** TEST THE EMERGENCY BUTTON. IF THE MACHINE FAILS TO STOP YOU **MUST NOT** USE THE MACHINE.

Index:

1. Assembly and set up

HSM 1000 - 2000

When transported the machine should only be lifted with a forklift from underneath the pallet. The machine must be mounted with the shoes supplied and should be placed on a firm and stable foundation. When lifting the machine off the pallet you must use slings fastened on each side of the clamping beam. Lifting should be carried out with a crane or a fork lift truck of suitable duty.

It is important that all 4 machine shoes support the folder. These should be finely adjusted when the machine has been wired in and the bed beam is under pressure from the clamping beam. Rust inhibitor protects all bright parts and this can be cleaned off with acid free solvent. (See enclosed manual).

HSM 2500-3000 with bed beam support

ASSEMBLY AND BOLTING DOWN OF THE MACHINE

The bed beam support is mounted at the factory.

Mark up the four mounting holes on the floor (Fig. 1, pos. C). Drill holes for 10 mm expansion bolts, and place the bolts in the holes. Place the bed plates (12 x 100 x 620 mm) (Fig. 1, pos. A) on the expansion bolts and place the machine upon these bed plates.

Connect the machine to the power supply (see ELECTRICAL CONNECTION) and drive the clamping beam down until it presses against the bed beam.

Tighten firmly the four adjustment bolts (Fig. 1, pos. B) in the gables so that the bolts press equally in each corner. Tighten the expansion bolts (Fig. 1, pos. C) and lock the adjustment bolt with the lock nut.

Adjusting the bed beam support for pretension of bed beam

Place the bed plate (12 x 120 x 290 mm) (Fig. 2, pos. A) under the bed beam support. Loosely tighten the adjustment bolts (Fig. 2, Pos. A). Check that the bead beam and the clamping beam are parallel on the front edge. (See Fig. 2).

Important:
Compare the middle of the bed- / clamping beam with the left and the right sides.

If the bed/clamping beams are not parallel, then tighten the rear bolt (Fig. 2, pos. 1) to adjust the bed beam forward, alternatively tighten the front bolt (Fig. 2, pos. 2) to adjust the bead beam backwards. Lock the adjustment bolts with the lock nuts, when this operation has been completed.

2. Wiring

The electric cable should be wired directly into the terminal connection block of the electrical box (L1 + L2 + L3 + 0 + earth) for 400V, and alternatively (L1 + L2 + L3 + earth) for 230V, see electrical diagram. In order to achieve adequate power to the machine, it is important that the connection cable is of the correct gauge and kept as short as possible.

Important:
It must be observed that the machine motors are operating in the correct direction.

Checking the correct rotation of machine motors:

1. The machine is delivered with the clamping beam set in the middle position.

2. Wire in the machine (L1 + L2 + L3 + 0 + earth) with a cable of minimum 2.5 mm² thickness. Check that the nominal voltage is available.

3. Activate the main switch.

4. The control power is connected by way of the start-button and green light illuminates after 5 - 10 seconds.

5. The left foot switch "A" is operated, checking that clamping beam moves upwards!
If not, STOP immediately, turn off the main switch, and disconnect the electric supply. Two of the phases should now be changed over in the terminal block and when starting again the clamping beam will be moving upwards.

Security during the folding process

- Check that the emergency stop is not activated.
- Switch on the main switch.
- Switch on the control system by pushing the green operation button (Fig. 8, Pos. T1).
- Adjust the machine as mentioned under point 4.1 and 4.2.
- Operate the machine as mentioned under point 4.2.4.

When operating the machine, the operator must be in front of the machine. The operator must always make sure that nobody or nothing is placed behind the machine or within the working sphere of the machine.

Always place the plate in the middle of the machine. Activate foot pedal "B" for fastening of the plate. Please remove your hands and other body parts from the sheet material when the folding machine is activated.

By replacement of rails and segments the main switch must always be disconnected and locked.

IMPORTANT: On all machines with segment divided beams, e.g. HSM-S, HSM-SH or HSM-Superflex great caution must be taken, when segments are dismounted. Therefore, remove hands and other body parts from the sheet material and folding machine immediately, when the machine is activated.

Overload protection

The motors for the clamping- and bending beams have motor protection relays F1 and F2. See electric diagram. If overloaded, the motor protection F1 and F2 have to be reconnected by pushing the green button.

3. Mounting and operation of back-gauge

Mounting the angle adjustable back-gauge

Important: Place the bending beam in a 90°-angle position, switch off the machine and lock the main switch before mounting the back-gauge.

The supporting bars of the back-gauge are mounted with bolts at the rear of the bed beam.

Operating the angle adjustable back-gauge

The back-gauge is adjusted by way of a measuring tape, and if necessary protractor. The grip on each supporting bar must be fastening correctly once set.

Mounting the spindle adjustment back-gauge

Important: The clamping beam must be placed in its top position, switch off the machine and lock the main switch before mounting the back-gauge.

Do not loosen the lock-handles on the aluminium-blocks until the back gauge is mounted and firmly fixed.

Place the tooth rods (Fig. 4, pos. 60) of the back gauge in the mounting blocks at the rear of the bed beam (Fig. 4, pos. 56). Push the tooth rods completely into the holes and tighten the pin screws on the mounting blocks. To ensure a smooth and easy operation of the back-gauge, make sure that the tooth rods (Fig. 3, pos. 60) and the back-gauge bar (Fig. 3, pos. 58) are parallel.

Operating the spindle adjustment back-gauge

The back-gauge is set at the required length according to the mm counter. Always remember to tighten the grip on the two aluminium-blocks, once the length has been set (Fig. 3, Pos. 161).

Mounting the spindle adjustment finger back-gauge

Where the back-gauge is fitted with fingers on the back-gauge slide into the bed beam, it has to be checked that these fingers (Fig. 4, pos. 57) fit into the relieves in the bed beam blade (Fig. 4, pos. 36).

The back-gauge slide and fingers can be adjusted by loosening the M10 Allen screw (Fig. 4, pos. 160). The back-gauge slide (Fig. 4, pos. 58) can now be adjusted forward and backwards on the support for the back-gauge bar (Fig. 4, pos. 55).

Operating the spindle adjustment finger back gauge

The back-gauge is set at the required length according to the mm counter, the reference point being the top of the fingers.

For use of the back-gauge outside the bed beam blade (Fig. 4, pos. 36) use the back-gauge bar (Fig 4, pos. 58). The fingers are being used as back-gauge, and 100 mm has to be added to the measurement on the mm counter (Fig. 3, pos. 163).

Always remember to tighten the grip on the two aluminium-blocks (Fig. 3, pos. 161) once the length has been set.

Adjustment of the counter on the spindle adjustment back gauge

The mm-counter (Fig. 3, pos. 163) can be adjusted very precisely by loosening the pin screw (Fig. 3, pos. 2) between the hand-wheel and the counter and by turning the adjustment ring (Fig. 3, pos. 3).
Remember to tighten the M5 pin screw (fig. 3, pos. 2) again after setting.

4. Operating

Operating controls and functions

Foot pedal

Foot pedal "A" is used for returning the clamping beam to the top position, and for returning the bending beam to 0°.

Foot pedal "B" is used for normal operation of the machine. The clamping beam and the bending beam are only clamping and folding when foot pedal "B" is pressed down, the operation will stop immediately when pedal "B" is no longer pressed down. However, the clamping beam will return to 0° and the upper beam will go to 25 mm without stopping, after the folding angle has been achieved.

Choice of cycle

The button for choice of cycle (Fig. 8, pos. T2) can be switched to:

Cycle 0: Foot pedal B is activated and the clamping beam clamps the material. Foot pedal B is activated once more and the bending beam folds the material.

Cycle 1: Foot pedal B is activated and the clamping beam clamps the material and the bending beam folds the material in one working operation.

Emergency switch

On the front of the control box there is an emergency stop switch (Fig. 8, pos. NS1). The foot pedal "B" incorporates an automatic safety device, i.e. if you step down on the pedal totally, the machine is stopped and can only be re-started by pressing the reset button on the pedal.

Restarting of the machine and control after an emergency

The green start button on the control box must be activated (briefly 5-10 sec. reaction time). Foot pedal "A" is activated briefly and then foot pedal "B" must then be activated before the machine is ready again.

Angle adjusting

The folding angle can be adjusted on the left side of the machine (Fig. 5). The folding angle can be set from 0° to the maximum according to the scale.

Important: The angle can only be adjusted when the folding beam is at the start point (0°).

Operating the folding machine

Adjusting the folding beam for the sheet thickness

The height of the folding beam is adjusted for the sheet thickness by loosening the lock-bolts (Fig. 6, pos. A) on both sides of the folding beam. The adjustment bolts (Fig. 6, pos. B) are adjusted on both sides, so the upper edge of the beam is lowered at a minimum once to the same level as the thickness of the sheet (Fig. 7, Pos. x).

The fine adjustment can be made after some test folds; this procedure ensures the same fold at both ends of the material. It is important that the difference between the bed beam and the folding beam is never less than the thickness of the material.

Adjusting a folding machine with radius blade

Angle Adjustment

It is very important, if a folding machine HSM-L is mounted with a radius blade instead of a sharp nose blade, to turn the top screw (Fig. 5, Pos. 150°) on the angle adjustment at 180°.

Important: When replacing the sharp nose blade, remember to replace the top screw (Fig. 5, Pos. 180°) at 150°.

Adjusting the folding beam:

When the motorised folding machine is equipped with a radius blade (radius = R), the adjustment of the folding beam 4.2.1 has to be as follows:

The adjustment bolts (Fig. 6, Pos. B) have to be adjusted on both sides, so that the upper edge of the folding beam is lowered by a minimum of R + 2 x T (plate thickness) (Fig. 7, Pos. x) compared to the bed beam.

Example: Radius blade R=2,5, plate T=1,0 mm the bending beam's upper edge has to be lowered: R + 2 x T = 2,5 + 2 x 1,0 mm = 4,5 mm.

Pre-stressing of the bending beam on the (HSM 1250 - 3000)

For optimising the precision of the bend, it is possible to adjust the crown of the folding beam of the HSM 1250 - 3000. An adjustment screw (Fig. 6, pos. C) adjusts the crown of the folding beam with an 8 mm Allen key on the lower edge of the folding beam.

When the adjustment screw is tightened the curvature of the folding beam increases, and the sheet will be folded more powerfully in the middle than at the sides. On the other hand when then adjustment screw is loosened the curvature of the folding beam is reduced and the sheet will be folded less in the middle than at the sides. The crowning of the folding beam can be correctly set by adjusting the adjustment screw and by making test folds.

5. Operation and security instructions

Starting the machine

1. Turn on the main switch.
2. Push the start/on button. (Reaction time 5-10 sec.).
3. Activate foot pedal "A" and the clamping beam moves to the top position.
4. Activate foot pedal "B" and the clamping beam moves down to the 25 mm emergency stop. (When the foot pedal "B" is deactivated before the clamping beam has reached the 25 mm security distance, the clamping beam will return to the top position.)
5. Activate foot pedal "B" one more time and the clamping beam can be moved step by step from the 25 mm security distance to the clamping point. (The clamping beam has to move 3-5 mm without any interruptions to give the right pressure on the material.)

Emergency Stop Functions:

a. If the emergency stop in foot pedal "B" is activated (dead man's function), when the clamping beam is over the 25 mm security distance, then the clamping beam will immediately return to the top position.

b. If the emergency stop in foot pedal "B" is activated (dead man's function), when the clamping beam is under the 25 mm security distance, the clamping beam will stop immediately.

c. If the emergency stop in foot pedal "B" is activated (dead man's function), when the folding beam folds, then the folding beam will stop immediately.

a. b. c. The machine operates again when the button on the side of the foot pedal is reactivated.

d. After the emergency stop has been pushed, it is important to depress foot pedal "A". The folding beam will now move to 0°, and afterwards move to the 25 mm security distance.

e. If the emergency stop in foot pedal "B" is activated or the operator does not let go of the foot pedal, while the folding beam is returning to 0°, then the folding beam will go to 0° and then move on to the 25 mm security distance.

6. Maintenance

When maintenance work is being carried out, the main switch must always be switched off and locked. Before any work is carried out in the electrical control box power must be turned off at the main supply.

It is important to check the chains from the two motors after 60-80 working hours. The chains must always be tight and well lubricated with chain spray or similar. The chains must be checked every half-year thereafter.

Brake motor & gearbox

First oil change has to be made after 700 hours of working, thereafter changed every 8,000 hours or 2 years. Regularly check the oil-level. Oil capacity app. 0.5 litres. The gearbox has been filled with oil for the temperature range -15° to +60° Celsius.

Recommended oil types

BP Energol GR-XP 220, TEXACO Meropa 220, Shell Amola 220 or Castrol Alpha ES 320.

Adjustment of the brakes is made according to the enclosed original diagram.

There has to be a thin layer of oil on the back-gauge racks.

All electrical wiring, main switch and emergency stop must be regularly checked and tested.

7. Noise level measurement

Sound power of the machine when cutting St. 37
1,25 x 1060 mm plate.

Hz	63	125	250	500	1k	2k	4k	A- weight
Lw/dB	67	63	66	71	77	72	68	80

Noise level at the place of operation:
71 dB (A)

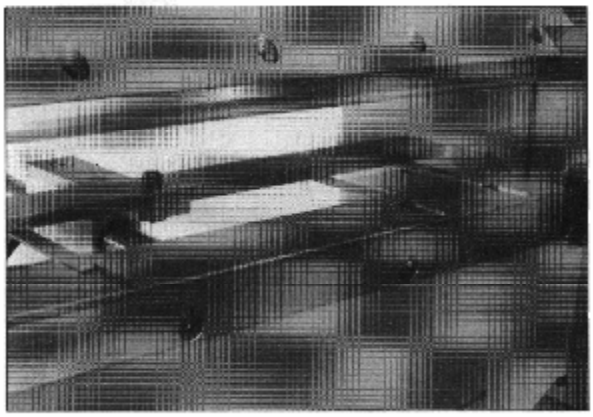
8. Technical Information

Type HSM		1000	1250	1500	2000	2500	3000
Working length	Mm	1020	1270	1520	2020	2520	3020
Max. sheet thickness (400N/mm²)	Mm	2,25	2,0	1,75	1,5	1,0	1,0
Max. clearance	Mm	100	100	100	100	100	100
Motor clamping beam	KW	0,37	0,37	0,37	0,37	0,37	0,37
Motor folding beam	KW	0,75	0,75	0,75	0,75	0,75	0,75
Length	mm	1670	1920	2170	2670	3170	3670
Width	Mm	625	625	625	625	625	625
Height	Mm	1120	1120	1120	1170	1170	1205
Weight	Kg	600	660	730	970	1200	1500

Type	Segment sizes mm
1000	25 30 35 40 45 50 75 100 150 200 270
1250	25 30 35 40 45 50 75 100 150 200 270 250
1500	25 30 35 40 45 50 75 100 150 200 270 500
2000	25 30 35 40 45 50 75 100 150 200 200 270 400 400
2500	25 30 35 40 45 50 75 100 150 200 200 270 400 400 500
3000	25 30 35 40 45 50 75 100 150 200 200 270 400 400 500 500

We reserve the right to alter constructions.

Spindle-adjustable back-gauge with fingers.



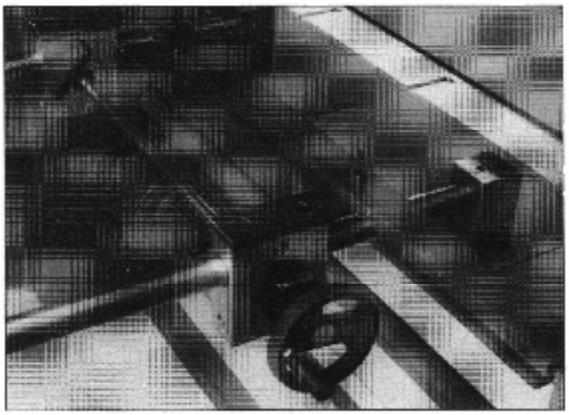


Fig. 1

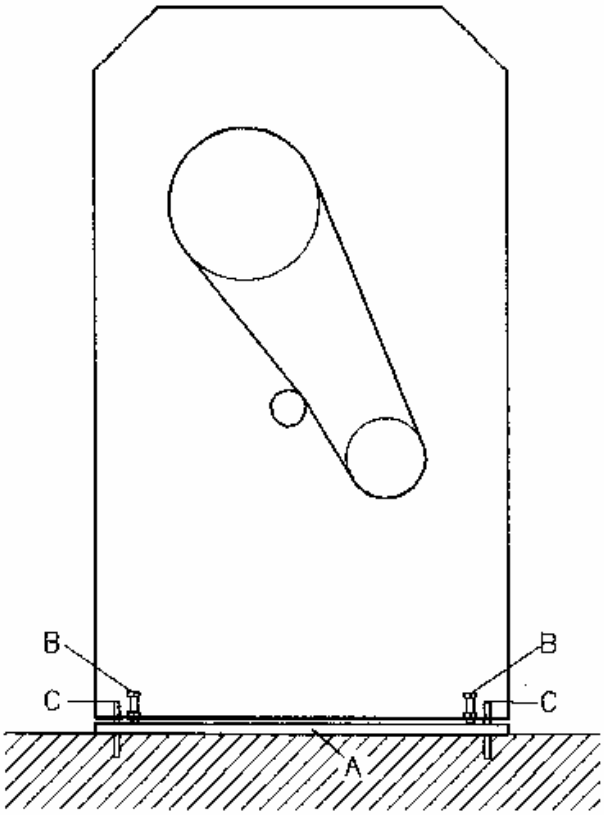
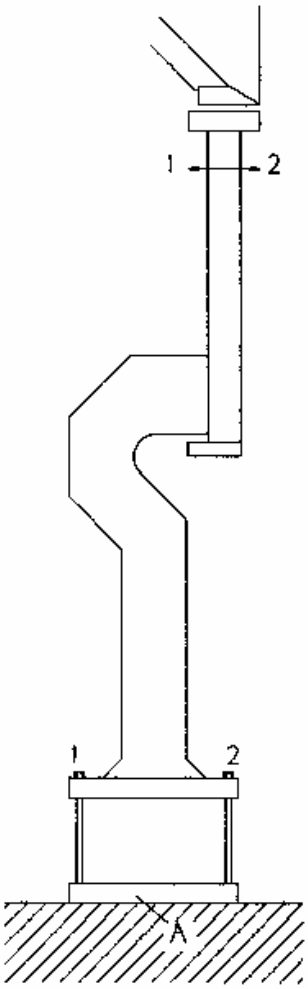


Fig. 2



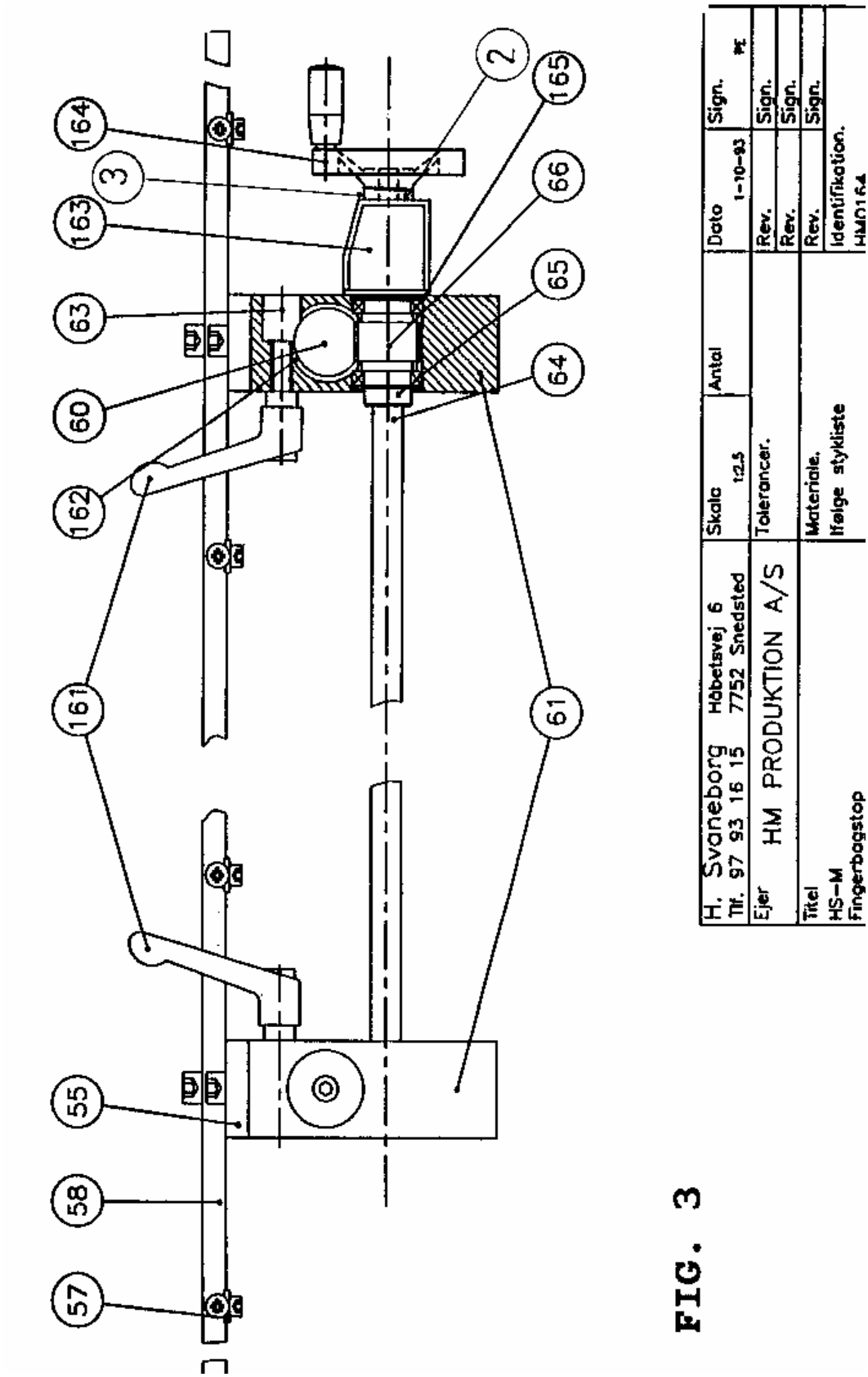
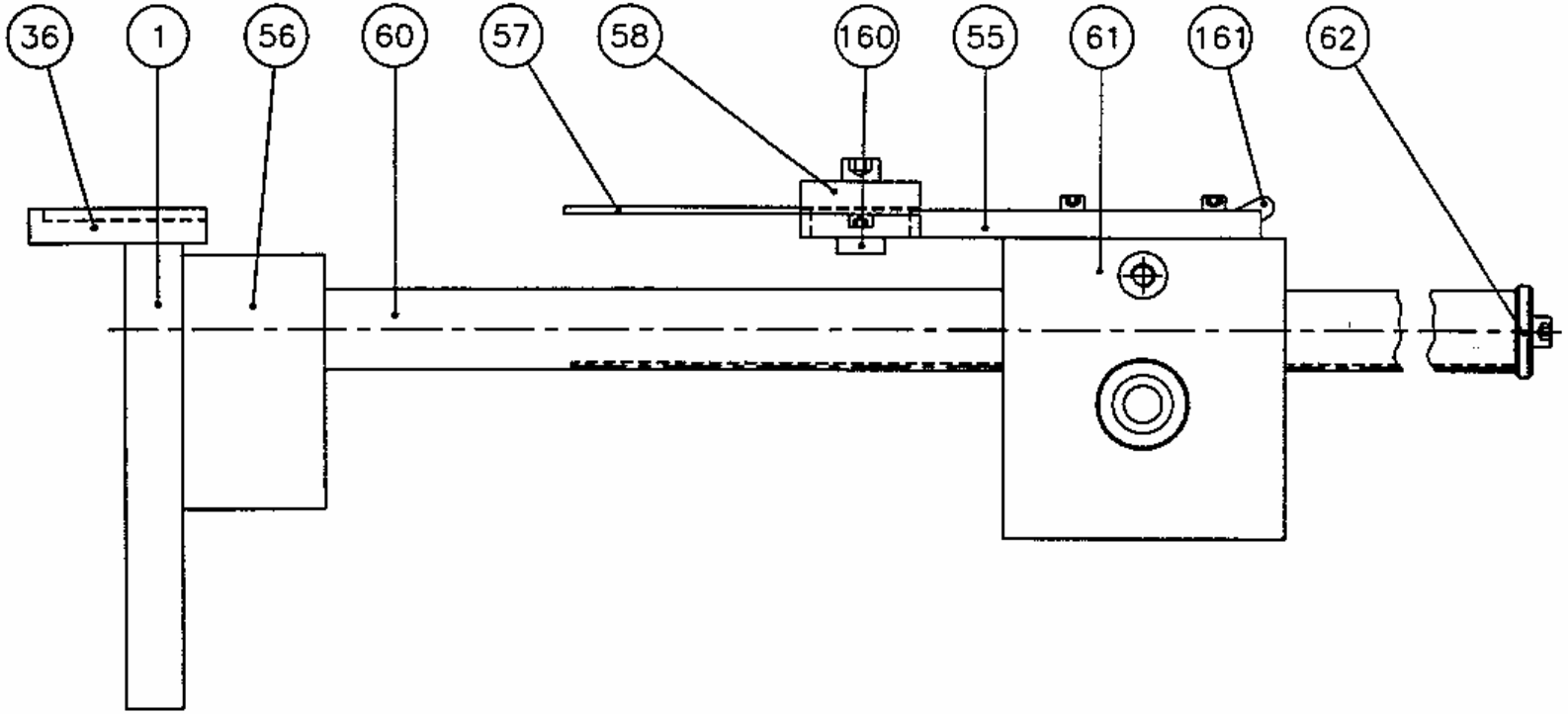


FIG. 3



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			Rev.	Sign.
Titel HS-M Fingerbagstop	Materiale. Ifølge stykliste		Rev.	Sign.
			Identifikation. HM0163	

FIG. 4

Fig. 5

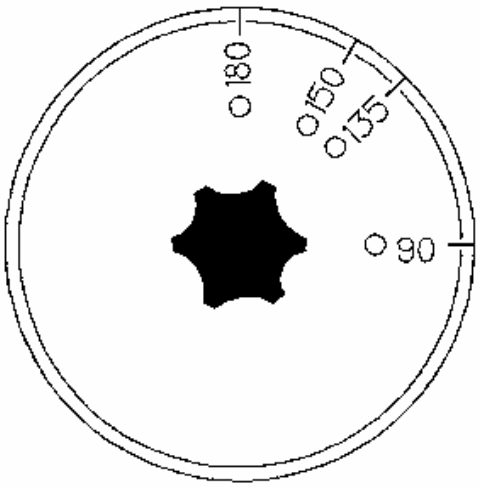


Fig. 6

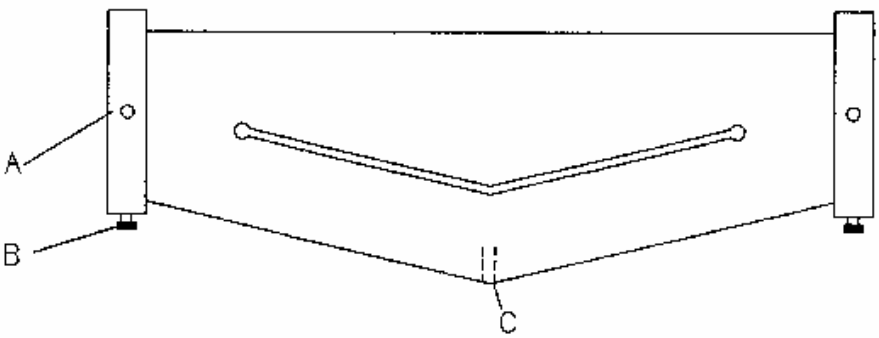


Fig. 7

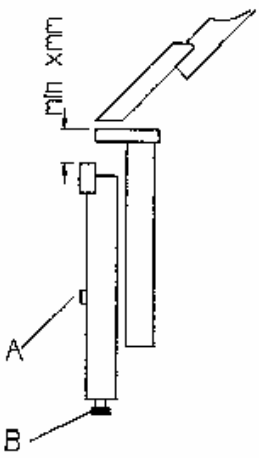
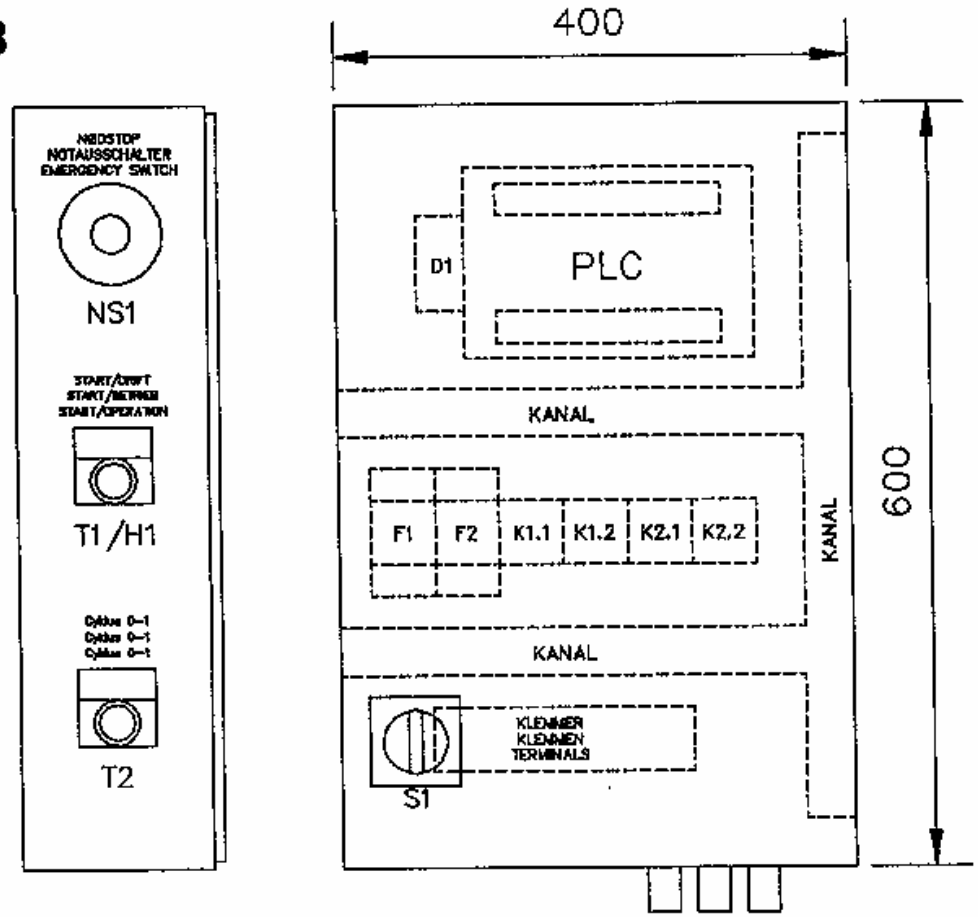


FIG. 8



H.M. AUTOMATIC WILHELMSBORG 7700 THISTED DANMARK TEL: +45 97 92 63 00	H.M. Production A/S Kantbukker/Schwenkbiegemaschine/Folding machine			
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	Corr.	Date	No. 28053001	

9. Service part

Content:
Drawing no. HM 0167 + HM 0168 + HM 0169
Parts list no. HM 0167 + HM 0168 + HM 0169

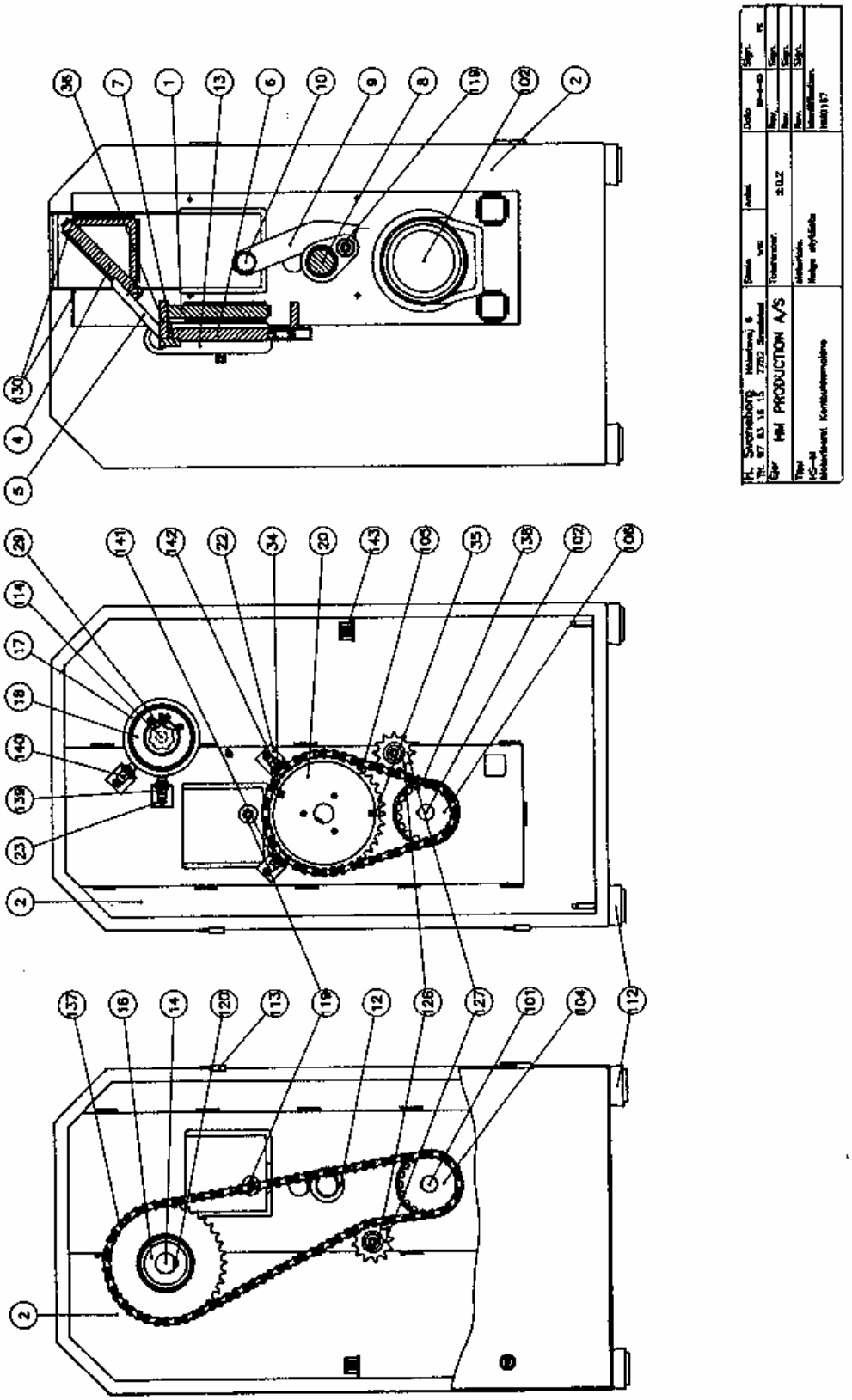
Drawing no. HM 0163 + HM 0164
Parts list no. HM 0163 + HM 0164

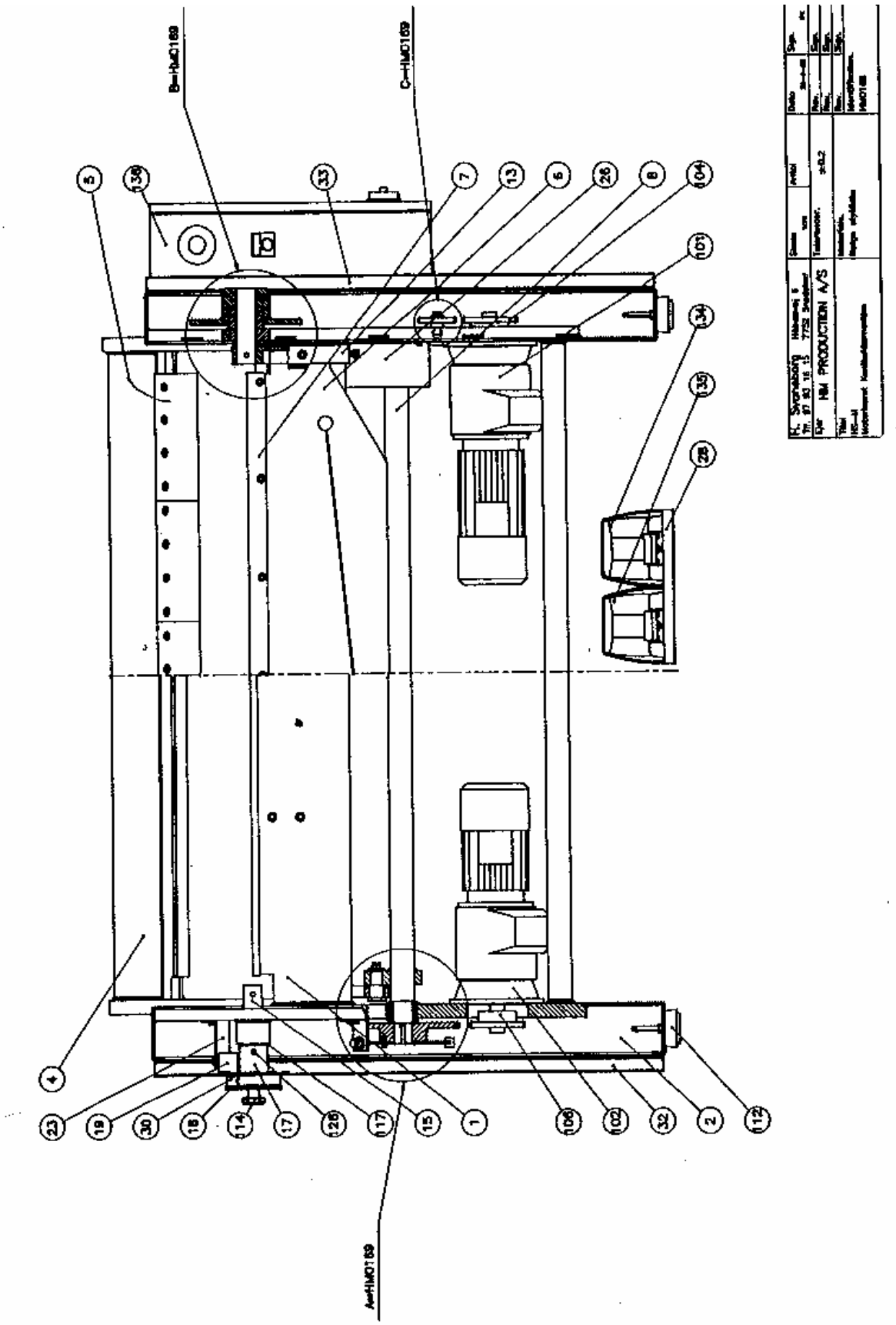
Drawing no. HM 0150
Parts list no. HM 0150

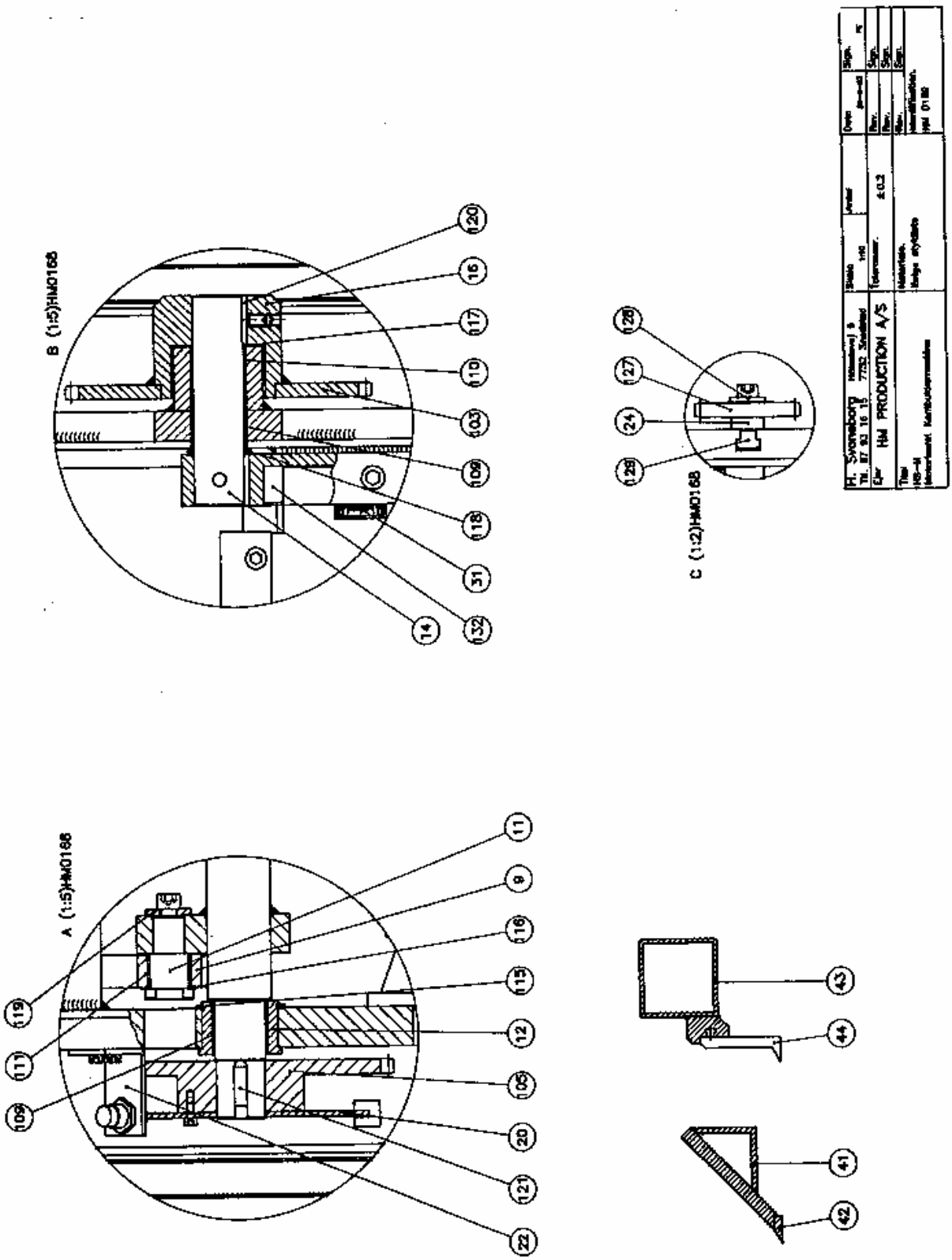
Ref.: Drawing HM 0167 – 0168 – 0169

Pos.	Art. No.	Number	Description
1.		1	Bed beam
2.		2	Screen casing R/L
4.		1	Clamping beam, S
5.			Fingers, S
6.		1	Folding beam
7.		1	Flat blade
8.		1	Main shaft
9.		2	Connecting rod
10.		2	Eccentric pivot
11.		2	Concentric pivot
12.		2	Bearing shell
13.		2	Hinge / Folding beam
14.		1	Shaft / Folding beam
15.		1	Shaft / Folding beam
16.		1	Chain wheel hub
17.		1	Indicator disc
18.		1	Scale disc
19.		1	Indicator cam
20.		1	Cam disc
22.		3	Detector fittings
23.		1	Detector fittings
24.		1	Distance bush
26.		2	Shield right / left
28.		1	Foot switch plate
30.		1	Angel degree scale
32.		1	Door / left
33.		1	Door / right
34.		1	Cam / clamping beam
35.		1	Cam / clamping beam top
36.		1	Rail / Bedbeam
41.		1	Clamping beam, L
42.		1	Sharp nose blade
43.		1	Clamping beam, SH
44.			Finger, SH

Pos.	Art. No.	Number	Description
101.	RF63DT80N4BM	1	Gearmotor DT80
102.	RF63DT71D4BM	1	Gearmotor DT71
103.	12B-1A38	1	Chainwheel
104.	12B-1B19	1	Chainwheel
105.	12B-1B38	1	Chainwheel
106.	12B-1B18	1	Chainwheel
109.	404440	4	Bearing bush
110.	404420	2	Bearing bush
111.	303425	4	Bearing bush
112.		4	Machine shoe
113.	6010	4	Hinge
114.	501030	1	Star grip
115.	U60 x 2	2	Locking ring
116.	PS 3040	6	Fitting disc
117.	PS 4050	4	Fitting disc
118.	SS 4050	4	Supporting disc
119.	AMF 82842	4	Washer
120.	12835	3	Feather
121.	10830	1	Feather
126.	1060	3	Pipepin
127.	1234KS	2	Tightening wheel
128.	AMF82834	2	Washer
129.	1012	2	T-slot nut
130.	T100G	4	Guideway coating
132.	2025	2	Rubber element
134.	F1-SU1Z/UV1-D-UN1		Foot switch
135.	F1-SU1-UN	1	Foot switch
136.		1	Controlling box
137.	34-1	1	Chain / folding beam
138.	34-1	1	Chain / clamping beam
139.	EI1805PPOS	1	Detector Folding beam
140.	EI1805PPOS	1	Detector Folding beam
141.	EI1805PPOS	1	Detector Clamping beam
142.	EI1805PPOS	1	Detector Clamping beam
143.	I88SU1Z-W	2	Door switch



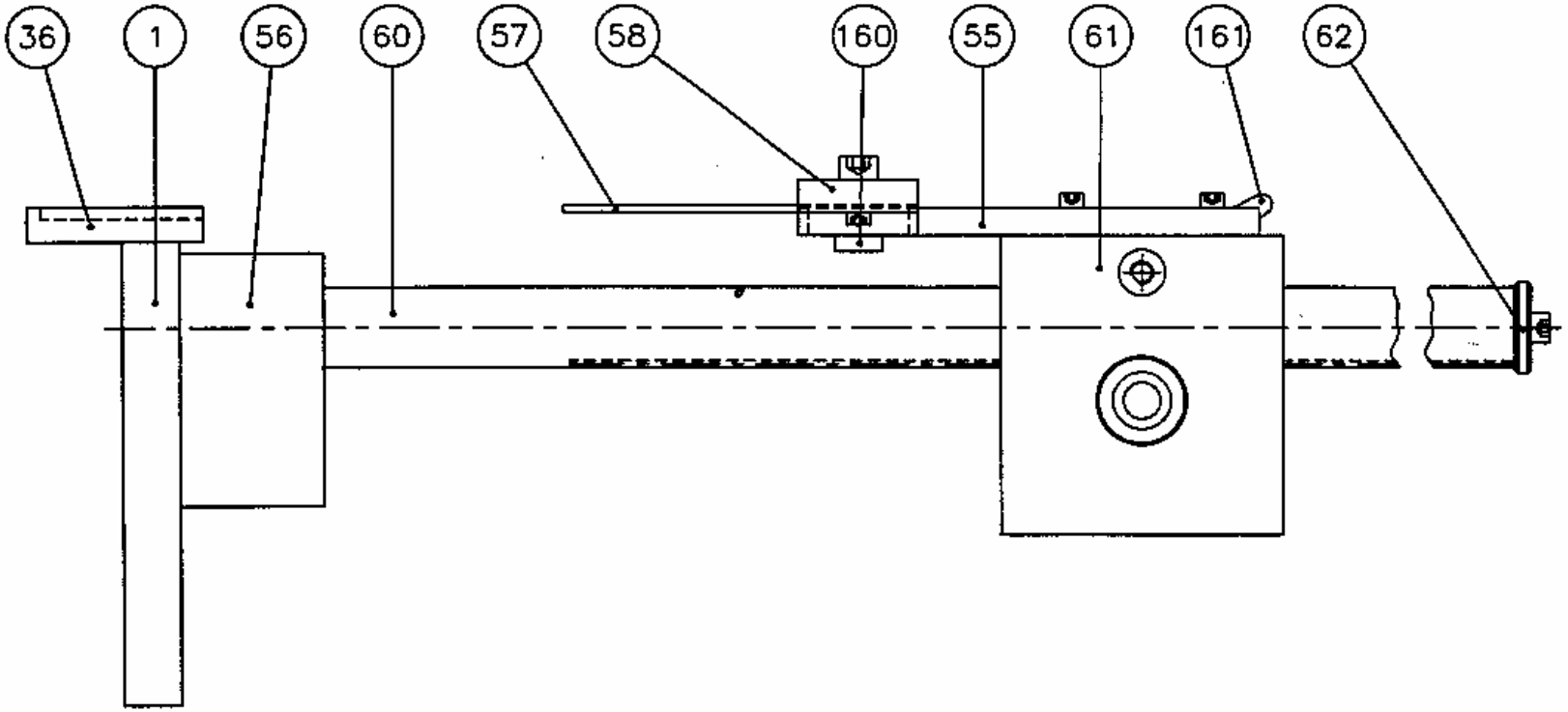




Ref.: Drawing HM 0163 – 0164

Pos.	Art. No.	Number	Description
36.		1	Bed beam blade with track
55.		2	Support
56.		2	Clamping block
57.			Finger
58.		1	Back gauge bar
60.	42E33001	2	Rack
61.	43D33001	2	Bearing housing
62.	41C33002	2	Stop disc
63.	41C31000	2	Locking cotter
64.	47A31065	1	Shaft
65.	41C31001	1	Stop ring
66.	42E33002	2	Gearwheel
160.	1012	2	T-slot nut
161.	KPT651050	2	Clamping handle
162.	354125	4	Bearing bush
163.	DA0902-10	1	Counter
164. (1)	SHH125	1	Handwheel
165.	680522	4	Ball bearing

(1) HSM 2000 – 3000 SHH175



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			Rev.	Sign.
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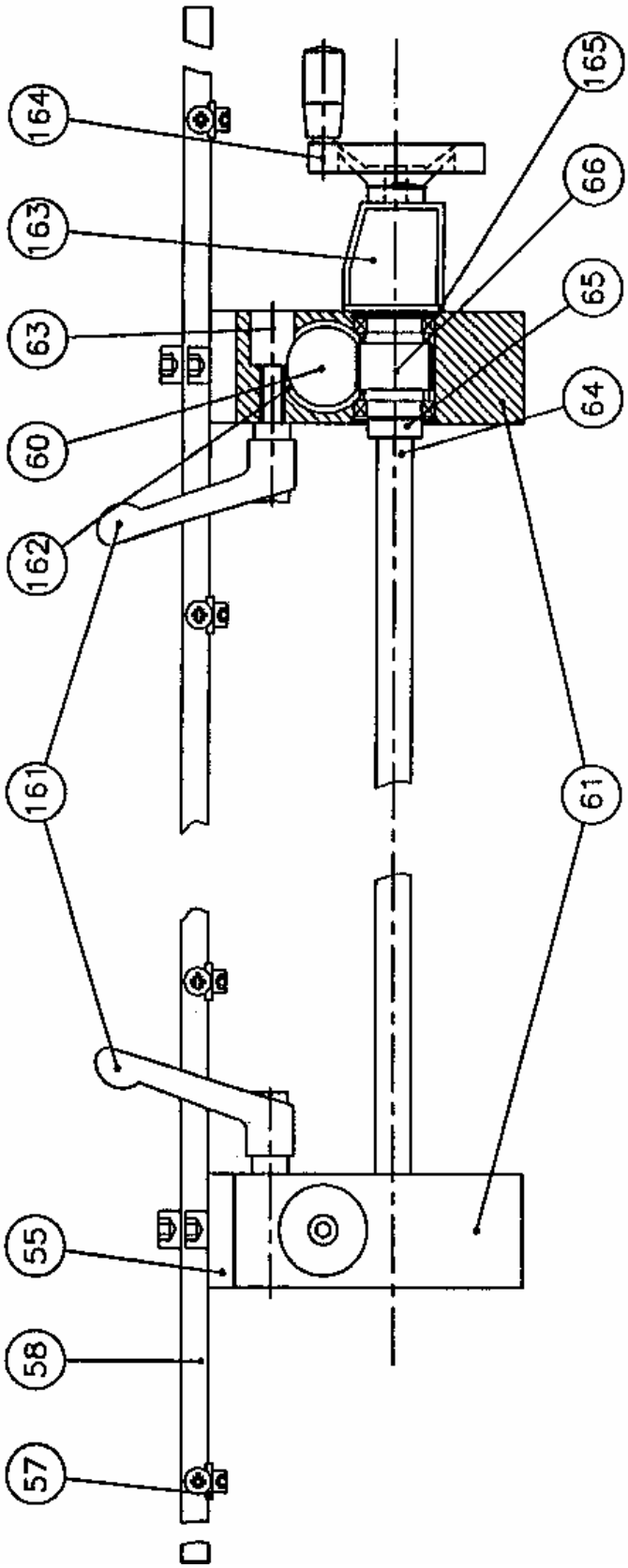
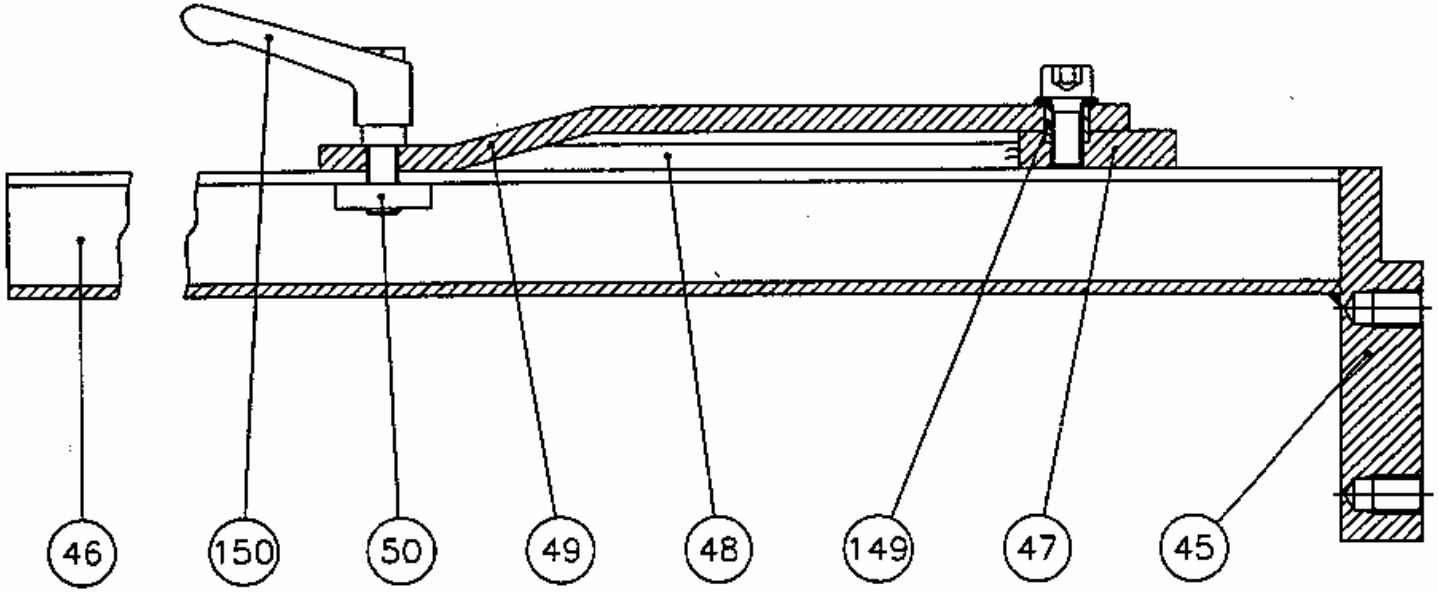
			Identifikation. HM0163	



H. Svaneborg Håbetsvej 6 Tlf. 97 93 16 15 7752 Snedsted	Skala 1:2.5	Antal	Dato 1-10-93	Sign. PE	
Ejer HM PRODUKTION A/S	Tolerancer.		Rev.	Sign.	
			Rev.	Sign.	
Titel HS-M Fingerbøgstop	Materiale. Ifølge stykliste		Rev.	Sign.	Identifikation. HM0164

Ref.: Drawing HM 0150

Pos.	Art. No.	Number	Description
45.		2	Clamping block
46.		2	Supporting bar
47.		1	Back gauge slide
48.		1	Space part, fixed
49.		1	Space part, adjust.
50.		2	Square not
149.	101412	1	Distance bush
150.	KPT651020	2	Clamping handle



H. Svaneborg Håbetsvej 6 Tlf. 97 93 16 15 7752 Snedsted	Skala 1:2	Antal	Dato 29-9-93	Sign. PE
Ejer HM PRODUCTION A/S	Tolerancer.		Rev.	Sign.
			Rev.	Sign.
Titel HS-M Bagstop	Materiale.		Rev.	Sign.
			Identifikation. HM0150	

10. Sheet thickness in mm

Material	Ultimate tensile strength (N/mm²)	1,00	1,20	1,25	1,50	1,60	1,75	2,00	2,25	2,50	3,00	4,00	5,00	6,00
ST 37	400	1,00	1,20	1,25	1,50	1,60	1,75	2,00	2,25	2,50	3,00	4,00	5,00	6,00
ST 42	460	0,93	1,12	1,17	1,40	1,49	1,63	1,87	2,10	2,33	2,80	3,73	4,66	5,60
ST 52	550	0,85	1,02	1,07	1,28	1,36	1,49	1,71	1,92	2,13	2,56	3,41	4,26	5,12
ST 50-2	550	0,85	1,02	1,07	1,28	1,36	1,49	1,71	1,92	2,13	2,56	3,41	4,26	5,12
ST 60-2	660	0,78	0,93	0,97	1,17	1,25	1,36	1,56	1,75	1,95	2,34	3,11	3,89	4,67
C 15	480	0,91	1,10	1,14	1,37	1,46	1,60	1,83	2,05	2,28	2,74	3,65	4,56	2,48
C 35	560	0,85	1,01	1,06	1,27	1,35	1,48	1,69	1,90	2,11	2,54	3,38	4,23	5,07
40 Mn 4	775	0,72	0,86	0,90	1,08	1,15	1,26	1,44	1,62	1,80	2,16	2,87	3,59	4,31
25 Cr Mo 4	1000	0,63	0,76	0,79	0,95	1,01	1,11	1,26	1,42	1,58	1,90	2,53	3,16	3,79
100 Cr 6	650	0,78	0,94	0,98	1,18	1,26	1,37	1,57	1,77	1,96	2,35	3,14	3,92	4,71
Spring steel 58 Cr V4	1400	0,53	0,64	0,67	0,80	0,86	0,94	1,07	1,20	1,34	1,60	2,14	2,67	3,21
Rustproof														
18 – 12	590	0,82	0,99	1,03	1,24	1,32	1,44	1,65	1,85	2,06	2,47	3,29	4,12	4,94
27 – 5	690	0,76	0,91	0,95	1,14	1,22	1,33	1,52	1,71	1,90	2,28	3,05	3,81	4,57
Copper	230	1,32	1,58	1,65	1,98	2,11	2,31	2,64	2,97	3,30	3,96	5,28	6,59	7,91
	465	0,93	1,11	1,16	1,39	1,48	1,62	1,85	2,09	2,32	2,78	3,71	4,64	5,56
Aluminium														
Al 99,7 Soft	50	2,83	3,39	3,54	4,24	4,53	4,95	5,66	6,36	7,07	8,49	11,31	14,14	16,97
AlMg4Mn Cr ***Soft***	275	1,21	1,45	1,51	1,81	1,93	2,11	2,41	2,71	3,02	3,62	4,82	6,03	7,24
Zn Al 4	270	1,22	1,46	1,52	1,83	1,95	2,13	2,43	2,74	3,04	3,65	4,87	6,09	7,30
Zn Al 4 Cnl	310	1,14	1,36	1,42	1,70	1,82	1,99	2,27	2,56	2,84	3,41	4,54	5,68	6,82