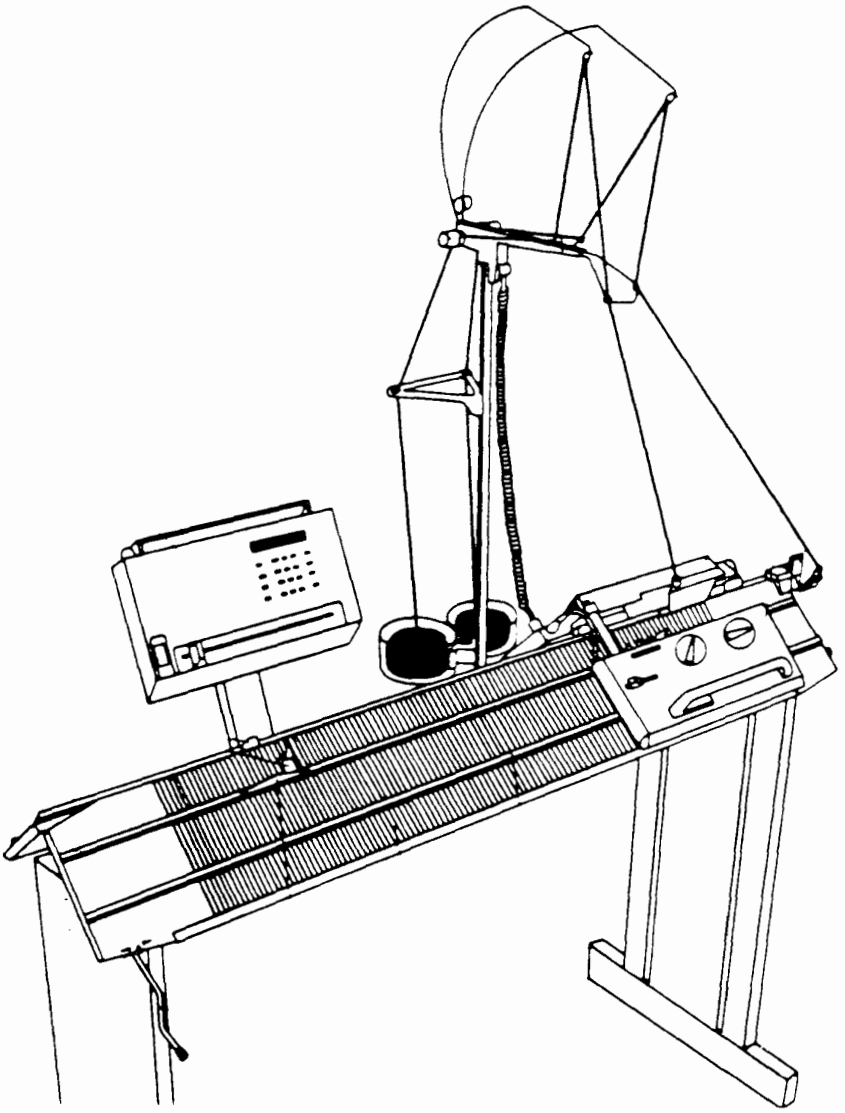
	SERVICE	ELECTRONIC 6000	
ANLEITUNG	INSTRUCTION	INSTRUCTION	INSTRUCCION

E-6000

SERVICE STAGE 1



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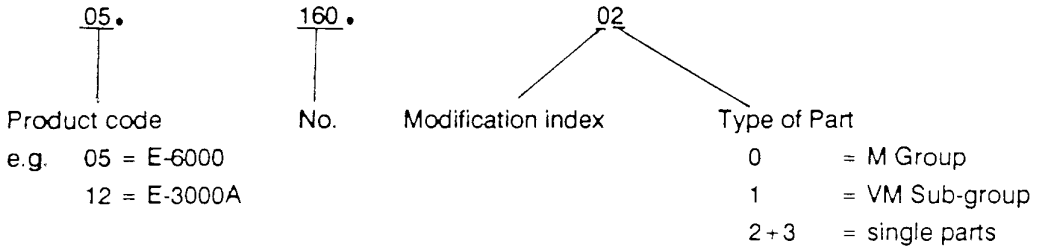
GENERAL

The Use of Documentation

Illustrated List with Drawings

This serves as an aid towards assembly and orientation, as well as for the identification of spare parts.

Structure of the part numbers:



TEST PROCEDURE E-6000 STAGE 1

This serves to localize possible malfunctions (Electronic Unit, Reader, E-Lock or in the Spiral Cable) by dealers or persons with no knowledge of electronics.

Important notes

The electronic unit must always be disconnected from the mains electricity supply before its opening.

- The defective equipment parts shall be accompanied by a fault report, see example on page 4.
- The following equipment parts may only be dispatched or transported in their prescribed packing as shown below:

M-ELECTRONIC-UNIT	IN	05.488.01 VM-PACKING E-UNIT 6000
M-CAM BOX FRONT	IN	05.487.01 VM-PACKING CAM BOX FRONT E-6000
VM-MAIN CIRCUIT BOARD	IN	05.491.02/05.492.02 PACKING BOX/STYROPOR
VM-SELECTOR SUPPORT	IN	95.205.91/95.202.81 PACKING BOX/SPECIAL PLASTIC BAG

EXAMPLE OF A FAULT REPORT

Company: Franz Muster AG

Address: Bahnhofstrasse 10

D-6720 Hintertupfingen

Where applicable mark with ☒

- ☐ M-ELECTRONIC UNIT
- ☐ M-CAM BOX FRONT (E-LOCK)
- ☐ VM-MAIN CIRCUIT BOARD
- ☐ VM-SELECTOR SUPPORT
- ☐ VM-PATTERN READER
- ☐ VM-READER HEAD

SERIAL NUMBER ----------

E-6000

SERIAL NUMBER ----------

VOLTAGE: ☐ 240 V ☐ 220 V ☐ 110V ☐ 100 V

PROG. DATE: ----------

MUSTER (Pattern) DATE: ----------

FAULTY AS FROM TEST NUMBER: ----------

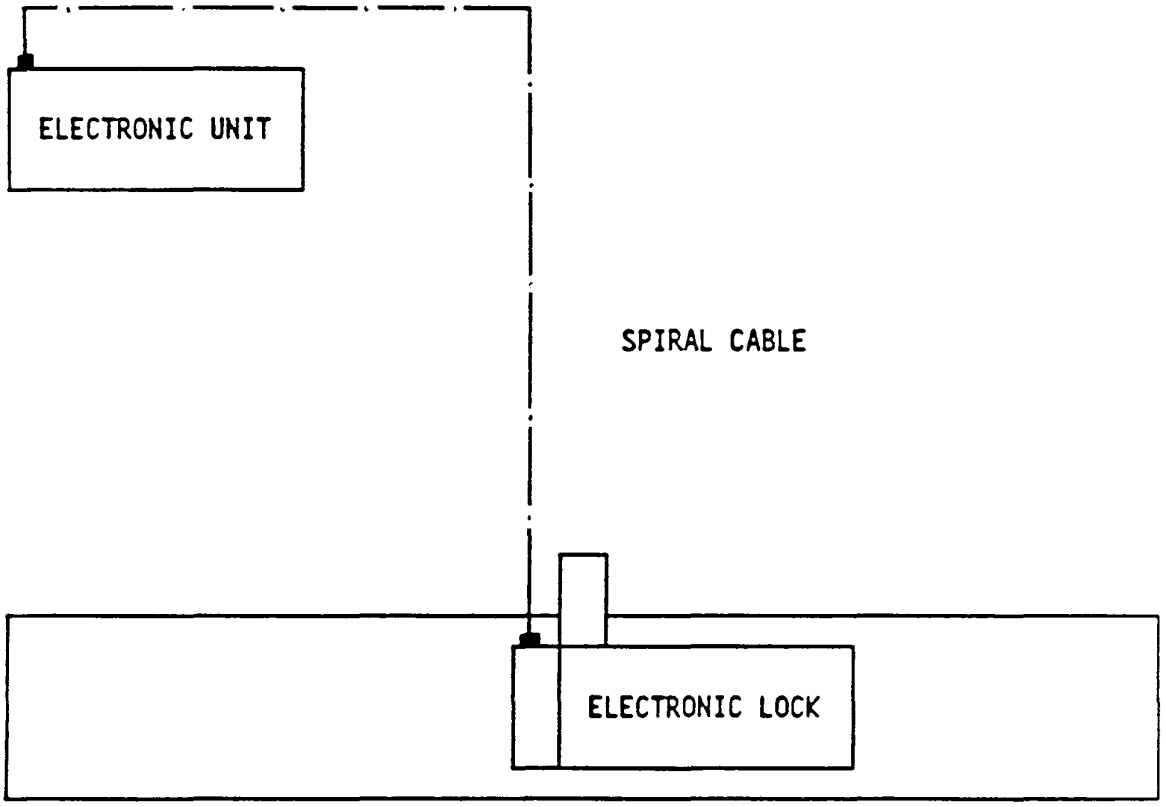
OBSERVATIONS:

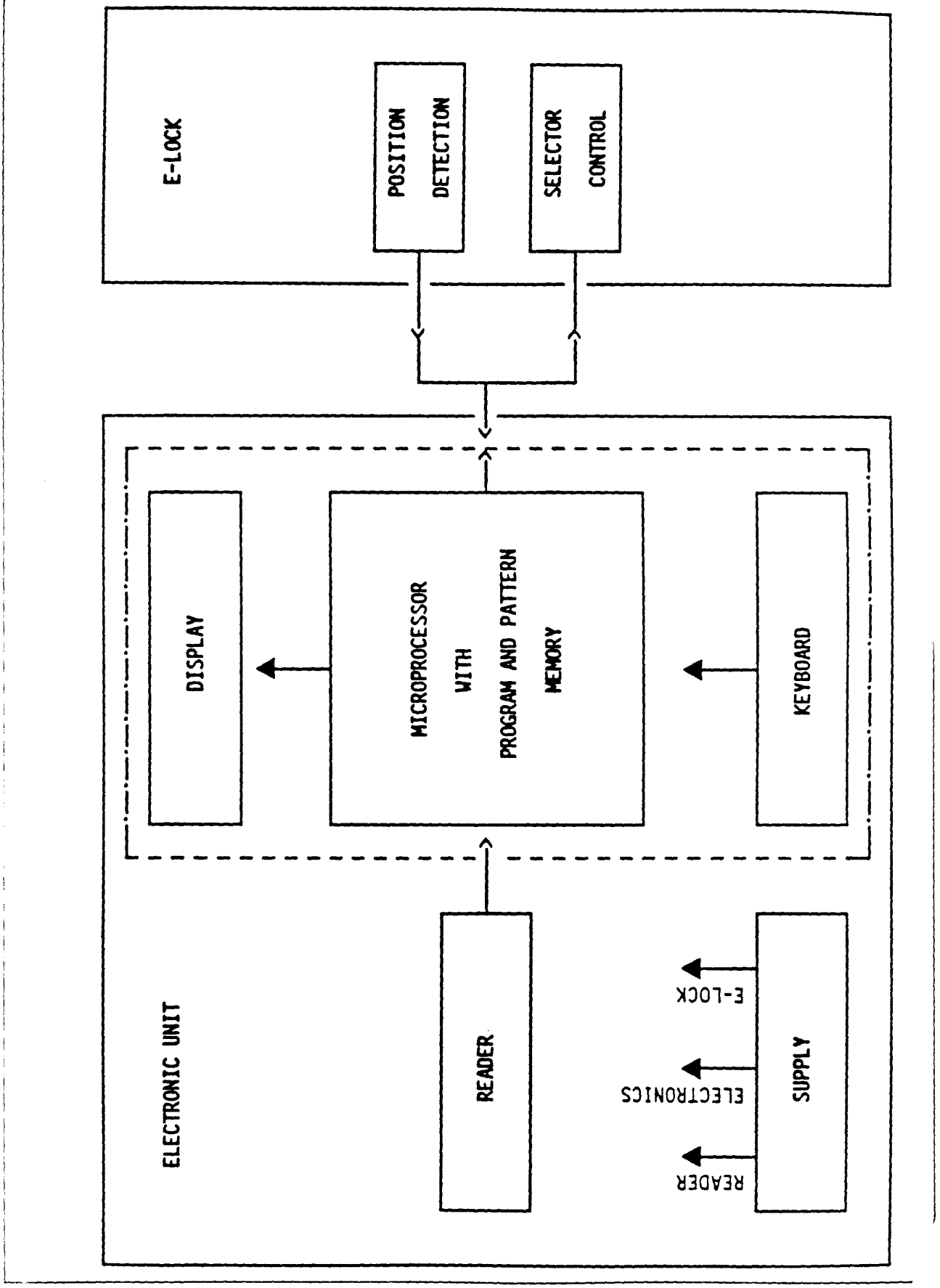
DATE: ---------- SIGNATURE: ----------

BASIC DESCRIPTION

Description of the Unit E-6000

The electronic unit contains knitting and pattern techniques which are transferred through the spiral cable to the electronic lock on the front needle bed to enable the round pusher to be selected accordingly. It is also possible to feed the reader with own pattern.




E-LOCK
POSITION DETECTION
SELECTOR CONTROL
DISPLAY
MICROPROCESSOR WITH PROGRAM AND PATTERN MEMORY
KEYBOARD
ELECTRONIC UNIT
READER
SUPPLY
E-LOCK
ELECTRONICS
READER

Mains Unit

The mains unit is mounted on the main circuit board and contains 2 fuses, a transformer as well as stabilizing circuits for the electronic supply.

Electronics

The heart of the electronic is the microprocessor which controls all functions and calculates the actual position of the lock by position detection. The required programs are stored in a 32 K Byte program memory and in part of the 32 K Byte pattern memory.

A working memory of 8 K Byte is available as a CMOS RAM which is safe against mains failure. The keyboard and the 8-digit alphanumeric display are used for communication between the operator and the unit. Only the keys which should be in use, in a suposed time sequence, are activated for operation. By present questions to the user the display leads the user through the different stages of programming and with different displays, through the knitting operation itself.

The Reader

By means of two optical reflex light barriers a reference scale and the relevant data information are feed from a reader page, bit by bit to the electronics, where they are stored. At the end of each line the page advances automatically.

The Electronic Lock

The position on the sensor guide rail is scanned by means of two optical sensors and the electronics calculates the movement of the lock by the change of the signal.

The electronic selector displaces the round pusher which is in use, according to the information output from the electronics.

TEST PROCEDURE E-6000 STAGE 1

(Persons without knowledge in the field of electronics)

The objective of the following test is to determine whether the electronics, electronic lock and the spiral cable are in order if something is not operating correctly.

The test consists of the following:

00	Notes on possible operating errors
10 + 20	Functional Test
30 + 40	Diagnostic Test
50	Dismounting and Mounting Instructions
60	Adjustment Instructions
70	Check-List
80	Cleaning and Oiling Instructions

WHICH FUNCTIONAL TEST DO I HAVE TO CARRY OUT IF .....

Important:	first of all, check again whether an operating error has been made !

- Faults by programming; "Test-Number 10"
- Faults with the reader; "Test-Number 14"
- Faults by knitting; "Test-Number 20"

00 NOTES ON POSSIBLE OPERATING ERRORS

	ERROR	CAUSE	SOLUTION
01	ELECTRONICS		
01.0	Key does not function	Not always all keys are activated	Press the correct key
01.2	Loss of stored data	Electronic unit has not been used for more than 10 days	
		Perhaps ERASE was confirmed, instead of ENT	
		Perhaps all ST. PATT were confirmed, instead of ENT	
01.3	Error number appears on the display	Various	See list of errors in the Instruction book
02	READER		
02.1	Transport wheel is blocked	The slide knob is not in the left hand transport position	Move the slide knob to the left hand transport position
02.2	Page cannot be moved	The sleeve near the transport holes is defective	Replace the sleeve for pattern sheet
02.3	The pattern sheet is transported at once by 2 lines	The pattern sheet is set to an even number of lines instead of an odd number	Set pattern sheet to an odd number of lines
02.4	Error number appears when reading in	Page badly drawn or incorrectly positioned	See list of errors in the Instruction book
03	KNITTING		
03.1	The Form has not been knitted	No FORM was entered or the NO key in the FORM was pressed	Check the form input and enter it again, if necessary
03.2	The required pattern was not knitted	Incorrect pattern or technique was given	Check the inputs of the pattern and technique
		Round pusher selected incorrectly	Move the lock slowly
			Check whether all round pushers can be moved easily. If necessary use a cloth or a brush to clean the needle channels and oil them lightly. Replace damaged round pushers.

TEST NUMBER	DESCRIPTION	CONTINUE AT
	FUNCTIONAL TEST	
	If at any stage during the test, no test number is given in the column "CONTINUE AT" follow the next test number.	
10	**TESTING THE ELECTRONIC UNIT (E-UNIT)**	
11	Switch-on test of the E-Unit	
11.1	- Disconnect the spiral cable from the E-Unit	
11.2	- Plug in the main plug	
11.3	- Switch on the mains switch on the E-Unit	
	. The display shows ENGLISH, PROGR, STARTPOS, MEMO or RETURN XX or one of the three languages.	12
	. None of the above texts appears or the display flashes:	
	a) check if on the mains plug is supply	
	b) check the fuse SI2 (5 V) on the VM-Main circuit board, the supply cable and the mains switch	50
	c) change the VM-Main circuit board	50
12	Self-test of the Electronic	
12.1	- Depending upon the display, press the keys ENT and/or > > > to make the E-Unit display PROGR	
12.2	- Press the key R the display shows the first Language	
12.3	- If necessary press the key NO until the display shows ENGLISH	
12.4	- Press the key ENT	
	. The display shows PROGR	13
	. The display shows:	
	a) ERR 4: change IC 1 (PROGR)	50
	b) ERR 5: change IC 2 (pattern) or IC 8 (interface)	50
	c) other: change the VM-Main circuit board	50

TEST NUMBER	DESCRIPTION	CONTINUE AT

13 Testing the Keyboard

13.1 - Check the operation of all keys (without key ABC). Each time a key is pressed the buzzer must sound. It is important to remember, that when this test is carried out all previous data input will be erased.

Press key	Check the display
ENT	ERASE
ENT	CAST ON
O	CAST ON 0
.	CAST ON 0.
-	CAST ON -0.
1	CAST ON -0.1
CLR	CAST ON
2	CAST ON 2
3	CAST ON 23
4	CAST ON 234
5	CAST ON 2345
CLR	CAST ON
6	CAST ON 6
7	CAST ON 67
8	CAST ON 678
9	CAST ON 6789
CLR	CAST ON
1	CAST ON 1
ENT	ALL ST.PATT
NO	ST.PATT A
R	CAST ON 1
> > >	START CAST ON
COR	L.ND -90
ENT	R.ND +90
ENT	START POS

. The display is correct after each key press and the buzzer sounds every time when the E-Unit is working correctly (without reader)

. If one of the displays is not correct.

a) Check the key board and the contact surface of the keys on the VM-Main circuit board. 50

b) Change the VM-Main circuit board. 50

. If the buzzer not sounds.

a) Check the fuse SI1 (15 V) 50

b) Check the buzzer SU1. 50

TEST NUMBER	DESCRIPTION	CONTINUE AT

14 Testing the Reader

Perfect operation of the reader is checked by means of the test reader page 33.625.23. Do not use copies!

14.1 Depending upon the display, press the keys > > > and/ or ENT to make the E-Unit display PROGR.

14.2 - **Press key** **Display shows**

ENT	ERASE
ENT	CAST ON
1 ENT	ALL ST.PATT
NO	ST.PATT A

14.3 - Set the slide knob to the left.

14.4 - Insert the test page into the pattern sleeve and fix the test page using the three red press studs, insert this into the E-Unit and use the transport wheel to set to line 1 (see number in position cut-out).

14.5 - **Press key** **Display shows**

ENT	READER

14.6 - Reading in of the test pattern 1 from row 1 to 22 by moving the slide knob alternately without stopping to the right until the end, so that the page will transport forwards by one row, and then to the left again until the complete pattern has been read in (during reading-in, the number of rows already read accepted are shown on the display).

. If the display shows ALTER, the reader is working correctly.

TEST NUMBER	DESCRIPTION	CONTINUE AT

If the error number 106, 107, 108 or 109 appears on the display:

a) Check if the test page is positioned correctly

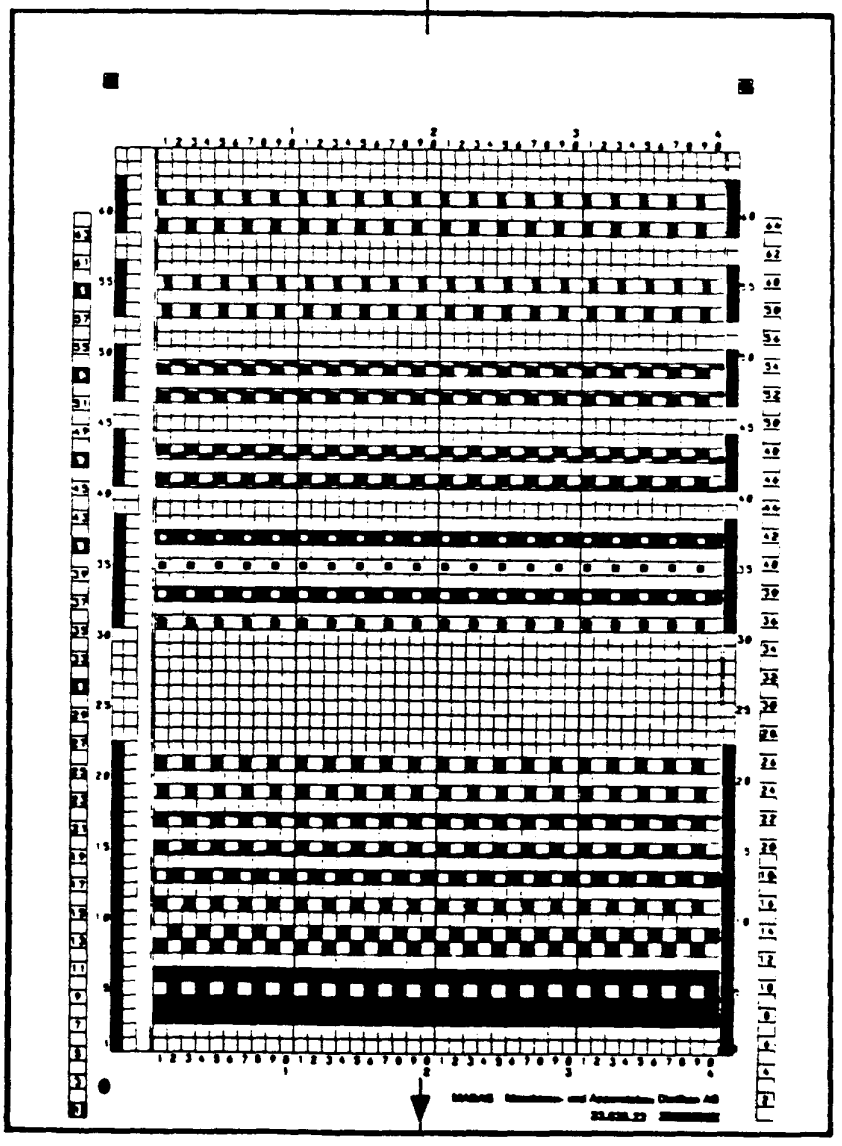
b) Check that the three positioning holes on the test page are not damaged. In this case use a new test reader page

c) The slide knob was perhaps not moved smoothly

d) Confirm the error number with the keys ENT . ENT — 14.6

e) If the error number appears again — 30

33.625.23



TEST NUMBER	DESCRIPTION	CONTINUE AT
20	**TESTING THE ELECTRONIC LOCK (E-LOCK)** To enable a testing of the E-lock a correctly operating knitting machine E-6000 is required. **Note:** In this test, the already stored data will be erased.	
21	Checking the E-Lock	
21.1	- Check that the E-Lock in the area of the light barriers and the selectors is clean. If necessary clean it with a cloth or brush.	
21.2	- Check the adjustment of the VM-Selector support (see 62).	
21.3	- Set the E-Lock on the needle bed front	
21.4	- Check the setting of the auxiliary guidance (see 61)	
22	Checking the needle bed front	
22.1	- Check that the sensing holes in the guide rail E-6000 are not dirty. If necessary clean the guide rail with a cloth or brush.	
22.2	- Check that all round pushers move easily. If necessary clean the round pushers and the needle channels with a cloth or brush and lubricate with Bellodor oil. Replace damaged round pushers.	
22.3	- Move all round pushers to the rest position	23

TEST NUMBER	DESCRIPTION	CONTINUE AT

23 Testing the VM-Selector Support

Important: If the lock operates too quickly, an incorrect selection can occur.

23.1 - Prepare the connection between E-Lock-spiral cable and E-Unit-spiral cable

23.2 - Depending upon the display, press the keys > > > and/or ENT several times until PROGR appears on the display.

23.3 - Submit the test program as shown below:

Press key	Display shows
ENT	ERASE
ENT	CAST ON
99 ENT	ALL ST.PATT (99 = Test CAST ON)
> > >	START CAST ON
ENT	START POS

23.4 - Push the lock to the start position at the right hand side of the needle bed.

23.5 -

Press key	Display shows
ENT	CAST ON
ENT	.... SX (set SX on E-Lock)
ENT	.... GX (set GX on back lock)
ENT	R.EMPTY

Note: Up to now it is only necessary to perform the settings for the E-Lock.

TEST NUMBER	DESCRIPTION	CONTINUE AT
23.6	- Move the lock to the far left until the end of the needle bed	
	. The display shows [1] and all round pushers are located in the working position	23.7
	. [1] does not appear	41
	. An error number appears	42
	. If single round pushers are incorrect	43
	. If all round pushers are incorrect	44
23.7	- **Press key** **Display shows**	
	ENT ND - - -	
	ENT R.EMPTY	
23.8	- Move the lock to the right; to the start position	
	. The display shows COL 1 and all round pushers are located in working position	23.9
	. If COL 1 does not appear	41
	. An error number appears	42
	. If single round pushers are incorrect	43
	. If all round pushers are incorrect	44
23.9	- **Press key** **Display shows**	
	ENT ST SIZE	
	ENT STRIP O	
	ENT .... KX (set KX on E-Lock)	
	ENT .... AX	
	ENT RC O	

TEST NUMBER	DESCRIPTION	CONTINUE AT
23.10	- Move the lock to the left, display: RC 1	
	. All round pushers are located in the rest position	23.11
	. Single round pushers are incorrect	43
	. All round pushers are incorrect	44
23.11	- Move the lock to the right, display: RC 2	
	. All round pushers are located in the rest position	23.12
	. Single round pushers are incorrect	43
	. All round pushers are incorrect	44
23.12	- Move the lock to the left, display: END C O	
	. If every time 2 round pushers are varying in the working and in the rest position	23.13
	. If single round pushers are incorrect	43
	. If all round pushers are incorrect	44

23.13 - **Press key** **Display shows**

ENT	.... LX (set LX on E-Lock)
ENT	.... BX
ENT	RC 3

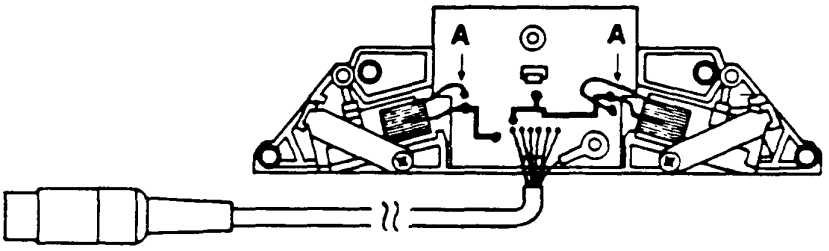
TEST NUMBER	DESCRIPTION	CONTINUE AT
23.14	- Move the lock to the right, display: RC 4	
	. If every time 2 round pushers are varying in the working and in the rest position	23.15
	. If single round pushers are incorrect	43
	. If all round pushers are incorrect	44
23.15	- The sequence of selection is now repeated continuously, whereby:	
	2 rows ---> all round pushers at rest position	
	4 rows ---> 2 round pushers at rest position, 2 at working position (every second row alternately)	
	2 rows ---> all round pushers at working position	
	. If no malfunction appears, then the E-Lock is reviewed and in order	
	. If an error appears	42
	. If single round pushers are incorrect	43
	. If all round pushers are incorrect	44

TEST NUMBER	DESCRIPTION	CONTINUE AT
	DIAGNOSTIC TEST	
30	**D-TEST PATTERN READER**	
30.1	- Dismount the VM-Pattern reader (see 50)	
30.2	- Mount in a functioning VM-Pattern reader (see 57.3)	
30.3	- Carry out Test Number 14	
	. If the test result is positive	
	a) Check the dismounted VM-Pattern reader, if necessary exchange the VM-Reader head	58
	. If the test result is negative.	
	a) Check the connector ST 4 on the VM-Main circuit board	
	b) Check the IC 8, if necessary change it	
	c) exchange the VM-Main circuit board	50

TEST NUMBER	DESCRIPTION	CONTINUE AT
40	**D-TEST E-Lock**	
41	Display R.EMPTY does not change	
41.1	- Check whether the full needle bed front width was used, if not repeat the test as from test number 23 onwards.	
41.2	- Check whether the spiral cable is connected correctly, if not repeat the test as from test number 23 onwards.	
41.3	- Repeat the tests as from test number 23, but connect directly the E-Lock cable to the E-Unit without a spiral cable or using a different spiral cable.	
	. Test result is positive	41.4
	. Test result is negative	41.5
41.4	- Exchange the spiral cable	23
41.5	a) Is there another functioning E-Unit	41.6
	b) Is there another functioning E-Lock	41.7
41.6	- Repeat the test number 23 with this other E-Unit	
	. Test result is positive, then on the faulty E-Unit:	
	a) change IC 8 (Interface)	50
	b) change VM-Main circuit board	50
	. Test result is negative	
	a) change the VM-Selector support on the E-Lock	59
41.7	- Repeat the test number 23 with this E-Lock	
	. Test result is positive:	
	a) change the VM-Selector support on the faulty E-Lock	59
	. Test result is negative:	
	a) change on the faulty E-Unit the IC 8 (interface)	50
	b) change the VM-MAIN circuit board	50

TEST NUMBER	DESCRIPTION	CONTINUE AT
42	ERROR 207/200	
41.1	- Check whether the buzzer sounds	
	. Yes	42.2
	. No	42.5
42.2	- Check whether the E-Lock in the area of the light barriers is clean	
42.3	- Check whether the sensing holes in the guide rail E-6000 are not dirty	
42.4	- Repeat test number 23	
	. Test result is positive; E-Unit and E-Lock are in order	
	. Test result is negative	41.2
42.5	- Open the E-Unit (see 50) and check the 15 V fuse	
	. fuse is defective, exchange it	23
	. fuse is not defective	42.6
42.6	- Exchange the VM-Main circuit board	50

TEST NUMBER	DESCRIPTION	CONTINUE AT
43	Single incorrect selections in one or in both directions	
43.1	- If only an under or over selection in one or both direction appears	43.2
	- If an under and over selection in one direction appears:	
	a) check whether the wires of the coils A shown in the Fig. below are connected correctly with the M-Cam box circuit board.	



	b) adjust again the VM-Selector support	62
43.2	- Are always the same round pushers incorrect selected	
	. If yes, exchange the round pushers, and if necessary also the needle channel.	23
	. If no	43.3
43.3	- Check whether the old pressing pieces left and right 05.140.02/05.141.02 (without pressing spring) are mounted on the E-Lock	

	. If yes, exchange these with the new VM-pressing pieces left and right (with pressing spring) 05.118.01/05.119.01	23

	. If no:	
	a) check the braking (brake spring E-6000) of the round pushers	
	b) adjust again the VM-Selector support	62

TEST NUMBER	DESCRIPTION	CONTINUE AT
44	<u>All round pushers are incorrect selected</u>	
44.1	- If in both directions	44.2
	- If in one direction	41.2
44.2	- Check whether the buzzer sounds:	
	. Yes	41.2
	. No	42.5

TEST NUMBER	DESCRIPTION	CONTINUE AT

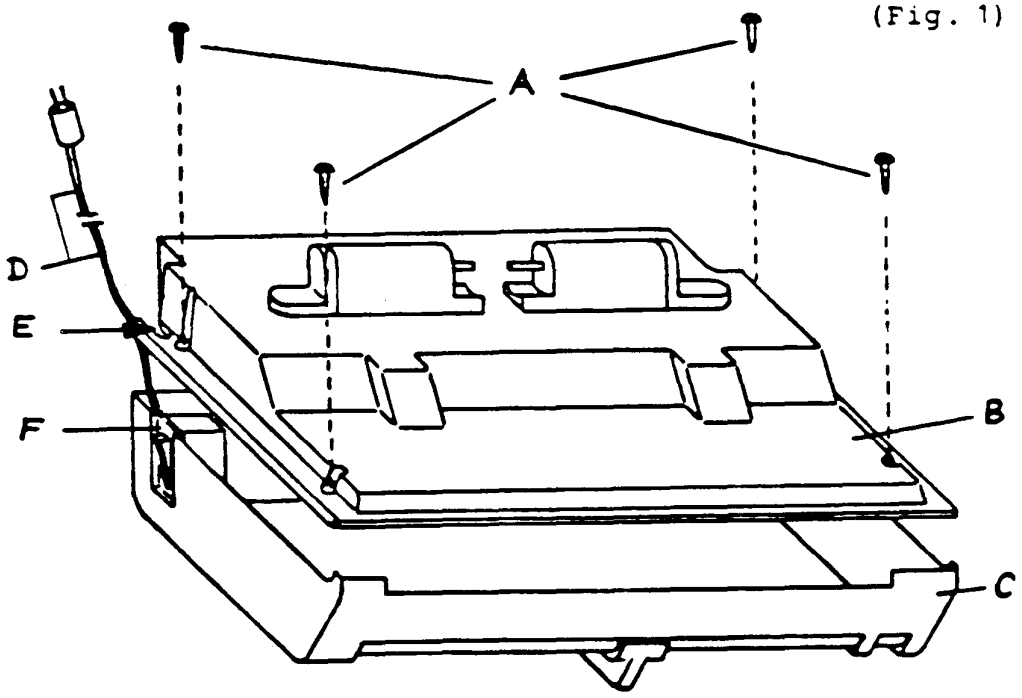
50 **DISMOUNTING AND MOUNTING INSTRUCTION**

51 To open the E-Unit (see Fig. 1)

Attention:
Before opening the electronic unit make always sure to disconnect it from the mains electricity supply.

51.1
- turn the E-Unit
- loosen the four screws "A" from the casing lower part B
- remove the casing lower part B upwards

(Fig. 1)



51.2 Exchange of:

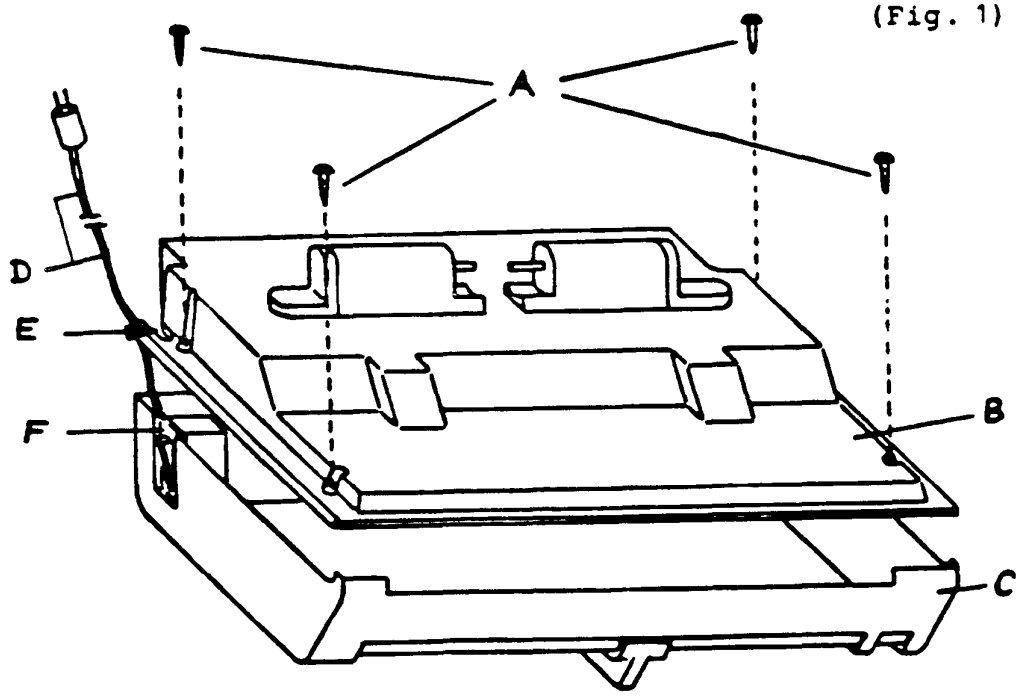
- supply cable	52
- IC's	53
- VM-Main circuit board	54
- Key board	54
- VM-Pattern reader	57
- VM-Reader head	57

TEST NUMBER	DESCRIPTION	CONTINUE AT

51.3 To close the E-Unit (Fig. 1)

- Place the casing upper part "C" of the electronic unit with the front part upon an even table.
- Mount carefully the casing lower part "B" in order that the supply cable "D" fits into the deepening "E" from the casing lower part. Introduce thereafter the main switch "F" in the casing upper part.
- Fix the casing lower part with the four screws "A" together with the casing upper part.
- Test now the E-Unit with a functioning E-6000 knitting machine (test number 10 to 23).

(Fig. 1)

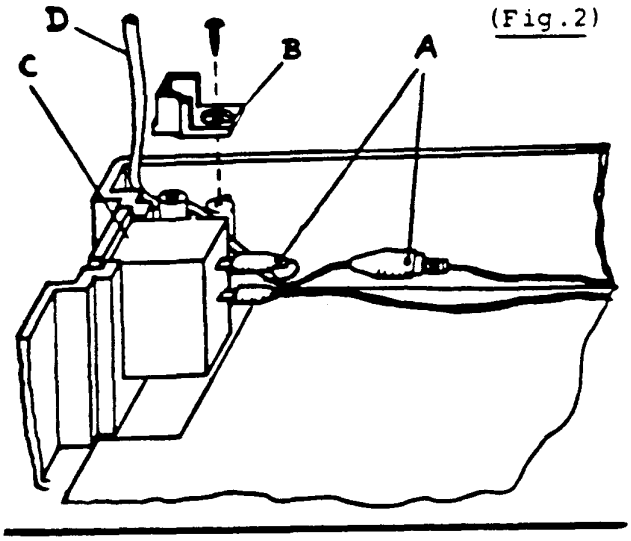


TEST NUMBER	DESCRIPTION	CONTINUE AT

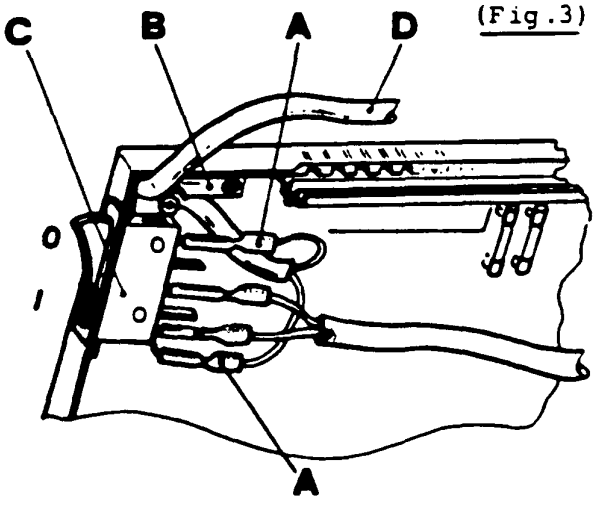
52 To exchange the defective supply cable
(see Figure 2 and 3)

52.1
- Disconnect both connections "A" (plugs) from the supply cable "D", see Fig. 2 or Fig. 3
- Screw off the screw to remove the relief part for cable "B" and remove the supply cable "D"
- Insert the new, proved supply cable in the corner of the casing upper part of the electronic unit, thereafter screw on the relief part for cable "B".
- Connect again both connections "A" of the supply cable "D", see Fig. 2 or Fig. 3. 51.3

(Fig.2)

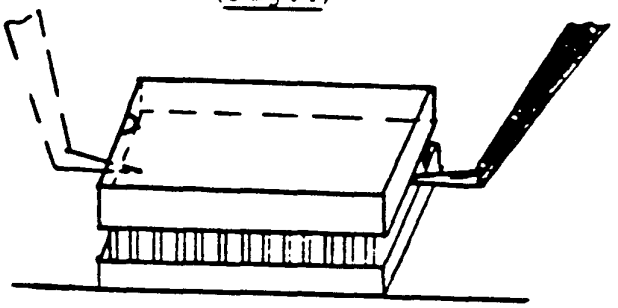


(Fig.3)



TEST NUMBER	DESCRIPTION	CONTINUE AT
53	To exchange one integrated circuit (IC) on the VM-Main Circuit Board Attention: Do not touch any pins in order to eliminate any risk of damage!	
53.1	- To avoid a possible static overcharge, the possibility is given in touching a water pipe or even an earthed device. - Switch off the E-Unit - To remove such an IC, according to Fig. 4, hold such to be exchanged with an angular twister or an orange tool smoothly raising it up on the shorter side. The same procedure shall be done on the other side. Holding the both shorter parts with two fingers, pull now the IC out of its position. These IC's shall be placed immediately on an adequate none static foamed plastic. - Hold the new IC in the same manner and insert it in the same direction like the other IC-processors. Take notice, that all pins should be positioned in the appropriate place. If an adjustment concerning the spacing between the pins should be necessary, press the pin legs laterally on a table to ensure a suitable spacing. Attention to the polarity of the IC's!	51.3

(Fig.4)



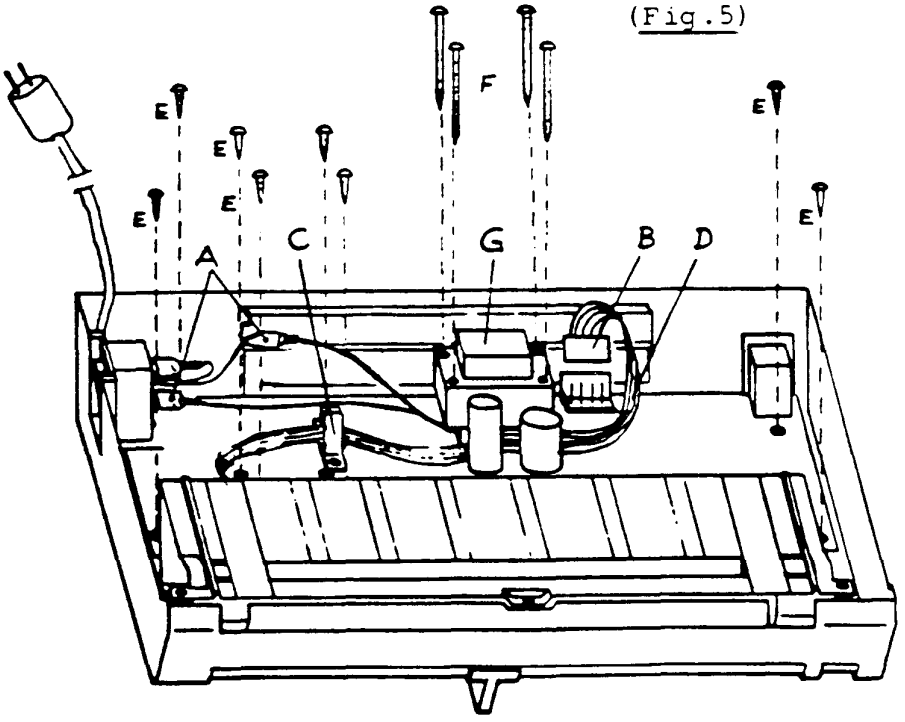
TEST NUMBER	DESCRIPTION	CONTINUE AT

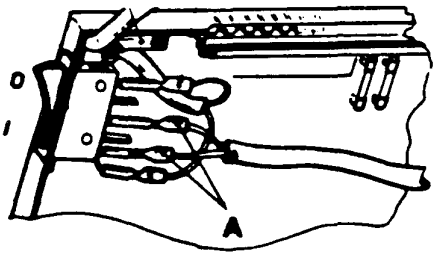
54 Dismounting and Mounting of the VM-Main circuit board

54.1 To dismount the VM-Main circuit board

- Switch off the E-Unit
- Disconnect both connections "A", see Fig. 5 or Fig. 6
- Remove the plug "B" of the reader cable from the main circuit board
- Screw off the cable holder "C" of the reader cable, then remove the cable "D" from the main circuit board
- Screw off the 6 screws "E"
- Screw off the four screws "F" of the transformer
- Raise out the VM-Main circuit board of the casing upper part by holding the transformer.

(Fig.5)

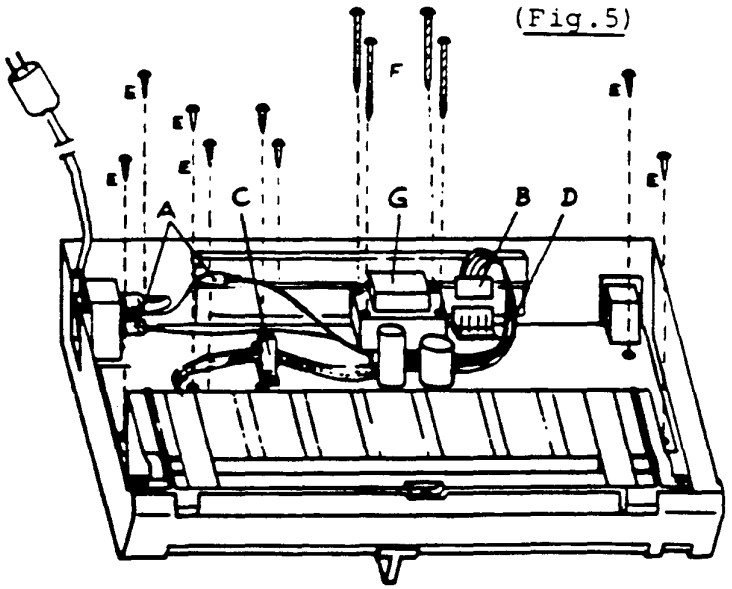


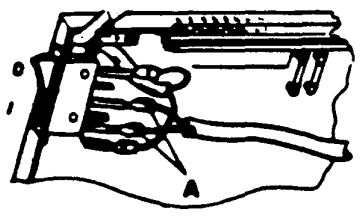


(Fig.6)

TEST NUMBER	DESCRIPTION	CONTINUE AT
54.2	<u>To exchange:</u>	
	. VM-Main Circuit Board	55
	. Key Board	56
54.3	<u>To mount the VM-Main Circuit Board (Fig. 5 and 6)</u>	
	- Check if the key board is correctly integrated in the casing upper part	
	- Hold the main circuit board by the transformer "G" and let it sink carefully on the casing upper part, note the correct positioning of the main circuit board.	
	- Screw on the transformer with the four screws "F".	
	- Screw on the cable holder "C" with the reader cable.	
	- Plug in the plug "B" of the reader cable to the main circuit board and pass the reader cable "D" between the transformer "G" and the electronic components.	
	- Screw on the remaining 6 screws "E".	
	- Plug in the two plugs "A", see Fig. 5 or Fig. 6.	51.3

(Fig.5)





(Fig.6)

TEST NUMBER	DESCRIPTION	CONTINUE AT
55	<u>To exchange the VM-Main Circuit Board</u>	
55.1	- First of all, it has to be verified that the IC 1 and IC 2 should have the same characterization as those of the damaged VM-Main circuit board (Program A...Z, respectively pattern A...Z). If the characterization of the new IC 1/ IC 2 should not meet with those IC's of the damaged VM-Main circuit board exchange them by the ones which were used on the damaged VM-main circuit board. Subsequently the VM-main circuit board has to be testet. - Remount in the new VM-Main circuit board	54.3
56	<u>To exchange the Key Board</u>	
56.1	- Remove the damaged key board from the casing upper part. - Insert the new key board into the casing upper part and press it down so that all 6 position bolts pierce through the holes of the key board. - Control if the inscription of the respective keys are situated correctly.	54.3

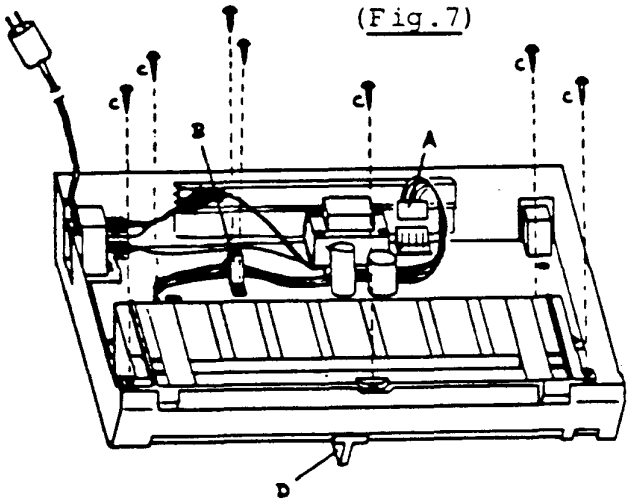
TEST NUMBER	DESCRIPTION	CONTINUE AT

57 To Dismount and Mount the VM-Pattern Reader

57.1 To dismount the VM-Pattern reader (Fig. 7)

- Position the slide knob "D" as shown in Fig. 7
- Disconnect plug "A" from the main circuit board
- Remove the reader cable from the cable holder "B"
- Screw off the 5 screws "C" on the VM-Pattern reader
- Pull out the VM-Pattern reader upwards from the casing upper part.

(Fig.7)



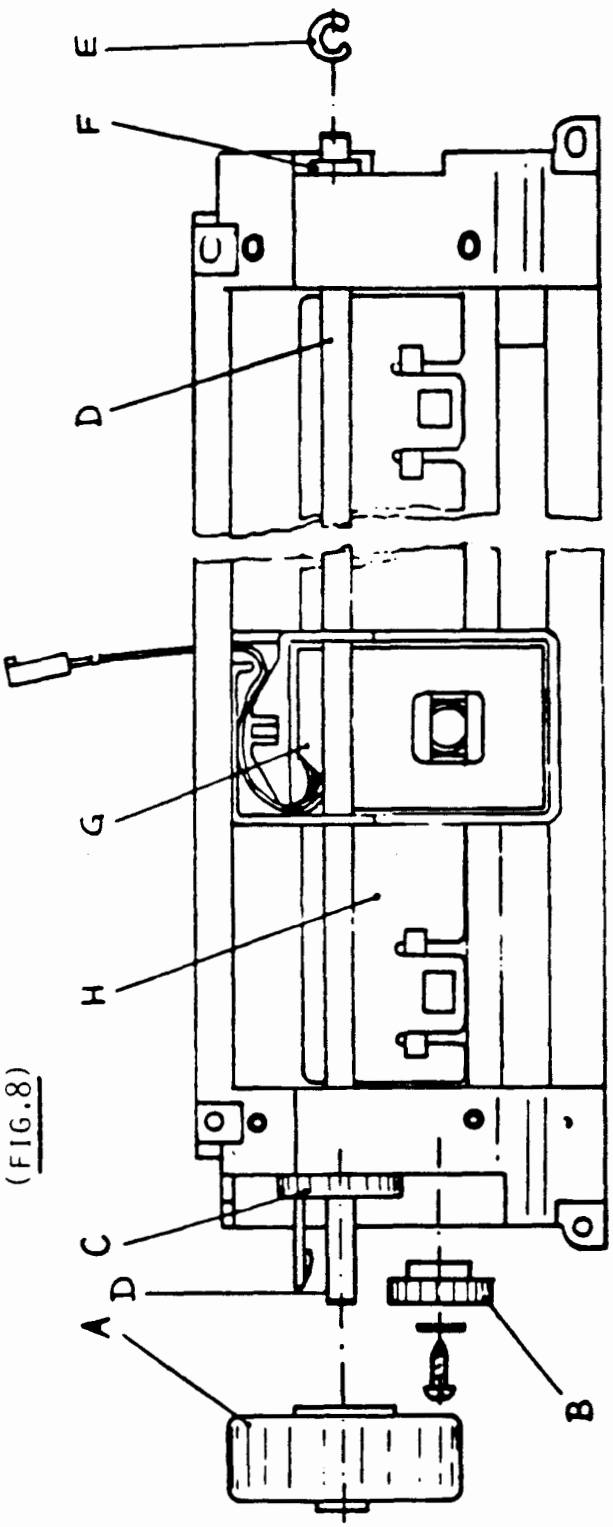
57.2 To exchange:

- VM-Reader head 58
- VM-Pattern reader 57.3

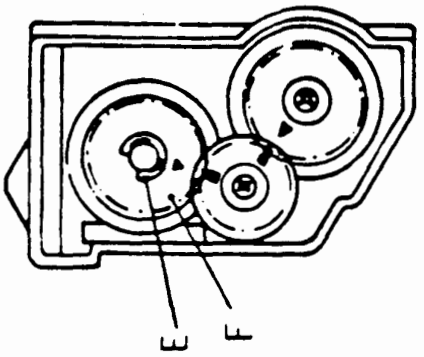
57.3 Mounting the VM-Pattern reader (Fig.7)

- Insert carefully the VM-Pattern reader into the casing upper part.
- Move the slide knob "D" until the VM-Reader head of the VM-Pattern reader clicks into the driver, move now several times the slide knob to the left, then to the right hand performing simultaneous a smoothly sliding.
- Screw on the VM-Pattern reader with the 5 screws "C" on the casing upper part.
- Plug the reader cable into the cable holder "B".
- Connect plug "A" of the cable reader on the VM-Main circuit board and pass the reader cable between the transformer and the electronic components. 51.3

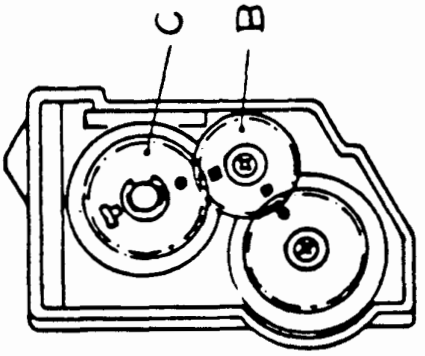
TEST NUMBER	DESCRIPTION	CONTINUE AT
58	<u>To exchange the VM-Reader Head</u> (Fig. 8, 9 and 10 on page 33)	
58.1	- Set into position the 3 gears by turning the drive wheel "A" according to Fig. 10. - Snap out the drive wheel "A" from the axis (loose snap). - Screw off the intermediate wheel "B" on the left side (Fig. 8) - Remove the safety washer "E" placed on the right side from the axis "D" (Fig. 8 and 10). - Pull out the feed wheel "C" from the VM-Pattern reader, together with the axis "D" to the left (Fig. 8 and 9). - Remove the damaged VM-Reader head "G", avoid an overstress of the reference scale "H" (Fig. 8). - Insert the new VM-Reader head "G" - Insert the feed wheel left "C" with the axis "D" from the left side into the frame guides on and through the both openings on the reader head. If the axis has been mounted correctly, right outside of the feed wheel "F" the slot for the safety washer "E" becomes visible (Fig. 8). Check the correct position of the 3 gears (Fig. 10). - Insert the safety washer "E" again on the axis "D" (Fig. 8 and 10). - Move the VM-Reader head "G" to the left and right hand looking for a gentle running of the reader head. - Screw-on the intermediate wheel "B" (Fig. 8 and 9), looking for a correct positioning of the gears (Fig. 9). - Snap the drive wheel "A" into the axis (Fig. 8). Check again the correct position of the gears (Fig. 9 and 10). - Turn the drive wheel and control, that the gear functions correctly.	57.3



(FIG.8)



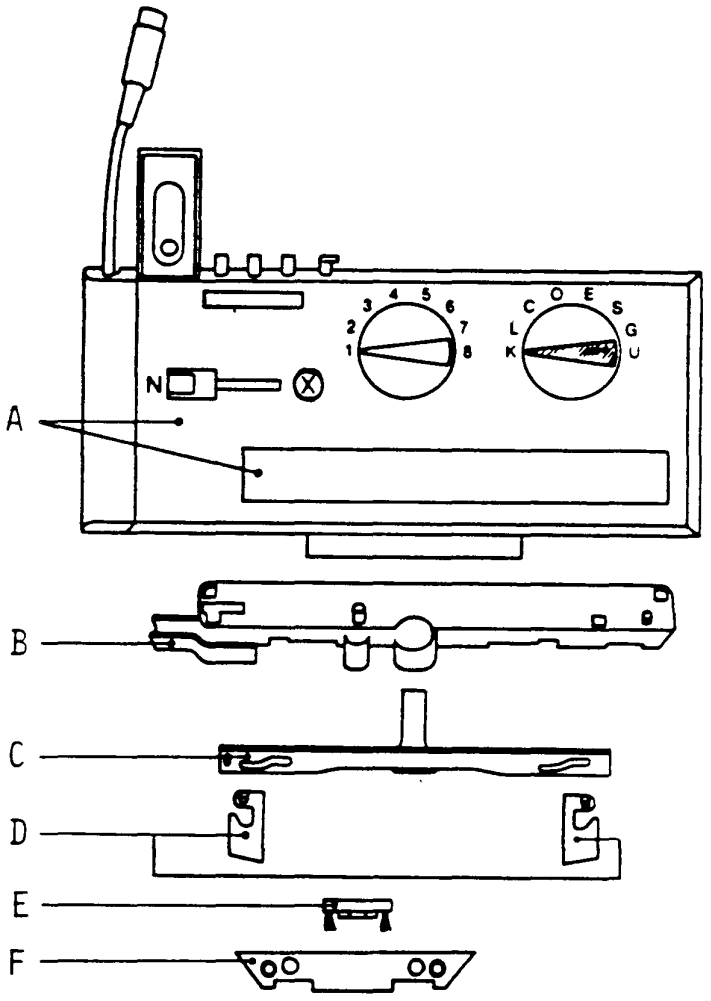
(FIG.10)



(FIG.9)

TEST NUMBER	DESCRIPTION	CONTINUE AT

59 To exchange the VM-Selector Support



59.1 - Set KX on E-Lock

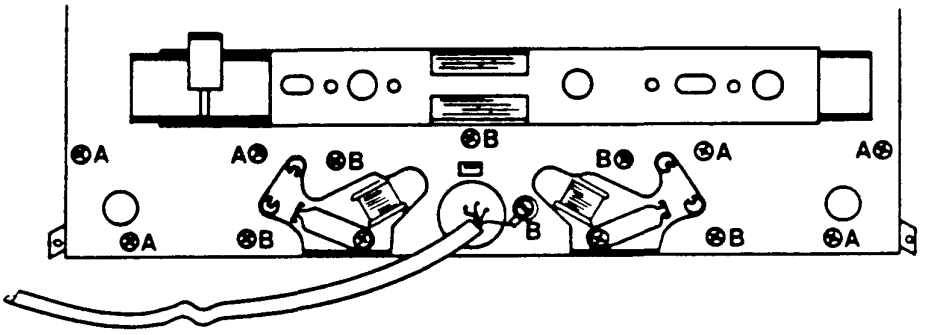
59.2 - Dismount the handle and the hood front A, the VM-Handle support "B", the cam-slider "C" and the pusher cam left and right "D".

Turn the E-Lock

59.3 - Dismount the light barrier brush "E" and the return cam "F". Turn again the E-Lock. 59.4

TEST NUMBER	DESCRIPTION	CONTINUE AT

(Fig.11)



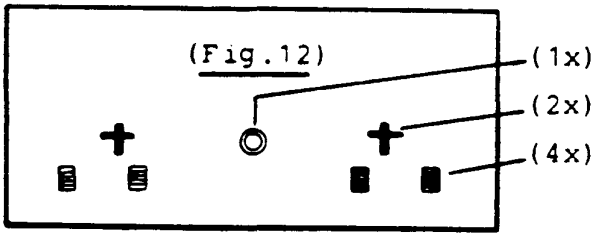
59.4 - Screw off the 6 screws "A" (Fig. 11)

59.5 - Pull out the VM-Cam body left and right, aside

59.6 - Screw off the 6 screws "B" (Fig. 11) from the VM-Selector support

59.7 - Hold the faulty VM-Selector support and pull it slowly out by lifting the E-Lock.

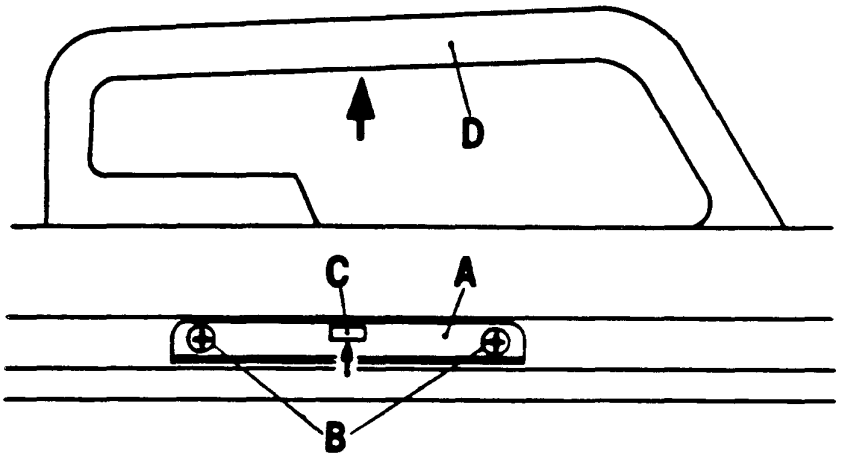
(Fig.12)



59.8 Dismount all the single parts shown in Fig. 12 from the faulty VM-Selector support and mount them in the new VM-Selector support.

59.9 Mount the new VM-selector support in reverse order, as from Test No. 59.7 up to Test No. 59.3

60 **ADJUSTMENTS**



61 - Adjustment of the auxiliary guide (A) on the E-6000

By lifting up the handle (D) check if the E-Lock front has not too much free scope but can however be shifted easily on the needle bed.

Should the cam-box have too much free scope or a heavy movement:

1. Loosen the 2 screws (B) of the auxiliary guide (A).

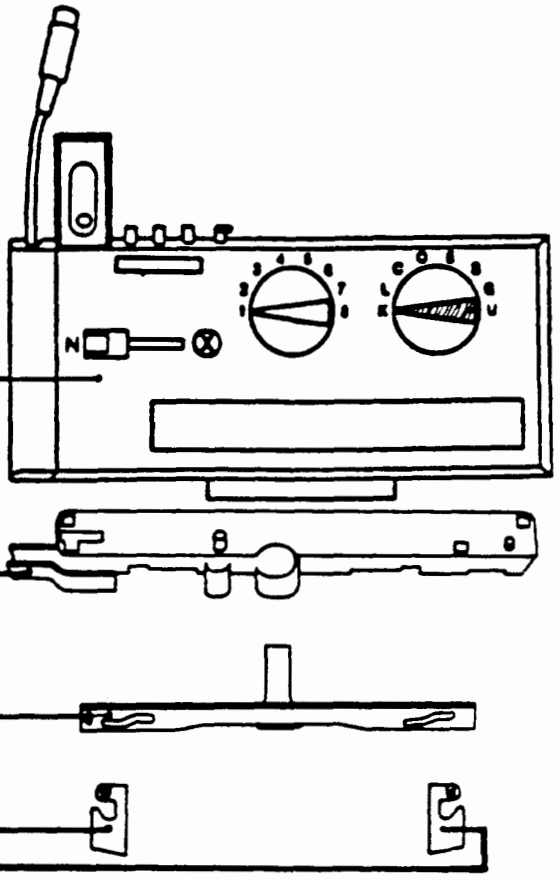
2. Raise the auxiliary guide (A) slightly upwards with the fingers by pressing on the cam (C).

3. Tighten the 2 screws (B) again.

62 **ADJUSTMENT OF THE SELECTOR SUPPORT E-6000 (05.111.01)**

IMPORTANT: set the E-Lock on KX

1. - Disassembling of:



2. - Set the selector gauge "C" 03.700.01 on the lock, according to Figure 9, on page 42.

3. - Adjust the VM-Selector support by turning the screws "A" and "B" (Fig. 11) for the left selector and screws "C" and "D" (Fig. 11) for the right selector in such a way that no light gap is to be seen on the bearing surface 1, 2 and 3 (Fig. 10).

> It is important to pay attention to the fact that all 4 screws (A, B, C and D) lie tightly upon the ground plate of the cam box (Fig. 10 / J is correct, K would be wrong).

4. - Press VM-Selector support "E" (Fig. 10) in arrow direction F (Fig. 10) and let it spring back.

5. - Check the adjustment again by using the gauge and readjust it, should it be necessary.

6. - Set lock on needle bed and connect it with the back lock and with the electronic unit as well.

7. - Switch on the electronic unit. According to the display either by pressing repeatedly key > > > and/or ENT to get display PROGR to show.

8. - Enter test program:

Press key	**Display shows**
ENT	ERASE
ENT	CAST ON
97 ENT (test program)	ALL ST. PATT
> > >	START CAST ON
ENT	START POS

9. - Push lock in start position to the right hand side of the needle bed.

Press key	**Display shows**
ENT	CAST ON
ENT	--- SX
ENT	---GX
ENT	R.EMPTY

10. - Move the lock to the very left end of the needle bed.

. Display shows ⊡ and all round pushers are in upper position (working position).

11. - **Press key** **Display shows**

ENT	ND ---
ENT	R.EMPTY

12. - Move the lock back to the start position

. Display shows COL 1 and all round pushers are in the so called 1 : 1 position, i.e.:

1 round pusher up (working position)
1 round pusher down (rest position)

13. - **Press key** **Display shows**

ENT	ST SIZE
ENT	STRIP O
ENT	--- LX
ENT	---BX
ENT	RC O

14. - Now the selection procedure will repeat as follows:

20 rows ---> 1 : 1 selection
20 rows ---> 2 : 2 selection
32 rows ---> 7 : 1 selection

. If there are no fault selections showing, assemble lock again.

. If incorrect selections appear moving from the right to the left side, continue at 20.

. If incorrect selections appear moving fromt the left to the right side, continue at 30.

20. Incorrect selections when moving from the right to the left side
(Lock is on the machine body)

- Turn screw "A" (Fig. 11) by 1/4 turning in clockwise direction.

22. - With the entered test program 97, keep on checking the selections.
  . If no incorrect selections appear assemble the lock again.
  . If still incorrect selections appear, then
    a) Turn screw "A" (Fig. 11) by another 1/4, same direction.
    b) See point 23.

23. - With the entered test program 97, keep on checking the selections.

  . If no incorrect selections appear assemble the lock again.
  . If still incorrect selections appear, then
    a) Turn screw "A" (Fig. 11) by a 3/4 turning in anti-clockwise direction.
    b) See point 24.

24. - With the entered test program 97, keep on checking the selections.
  . If no incorrect selections appear assemble the lock again.
  . If still incorrect selections appear, then
    a) Turn screw "A" (Fig. 11) by another 1/4 turning in anti-clockwise direction.
    b) See point 25.

25. - With the entered test program 97, keep on checking the selection.

  . If no incorrect selections appear assemble the lock again.
  . If still incorrect selections appear, then exchange and adjust VM-Selector support 05.111.01, according Test No. 59/62.

30. Inccorect selections when moving from the left to the right side
(Lock is on machine body)

31. - Turn screw "C" (Fig. 11) by 1/4 turning in clockwise direction.

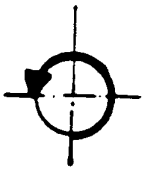
32. - With the entered test program 97, keep on checking the selections.
  . If no incorrect selections appear assemble the lock again.

  . If still incorrect selections appear, then
    a) Turn screw "C" (Fig. 11) by another 1/4 turning, same direction.
    b) See point 33.

33. - With the entered test program 97, keep on checking the selections.

  . If no incorrect selections appear assemble the lock again.

  . If still incorrect selections appear, then
    a) Turn screw "C" (Fig. 11) by 3/4 turning in anti-clockwise direction.
    b) See point 34.



34. - With the entered test program 97, keep on checking the selections.

  . If no incorrect selections appear assemble the lock again.

  . If still incorrect selections appear, then
    a) Turn screw "C" (Fig. 11) by another 1/4 turning in anti-clockwise direction.
    b) See point 35.

35. - With the entered test program 97, keep on checking the selections.

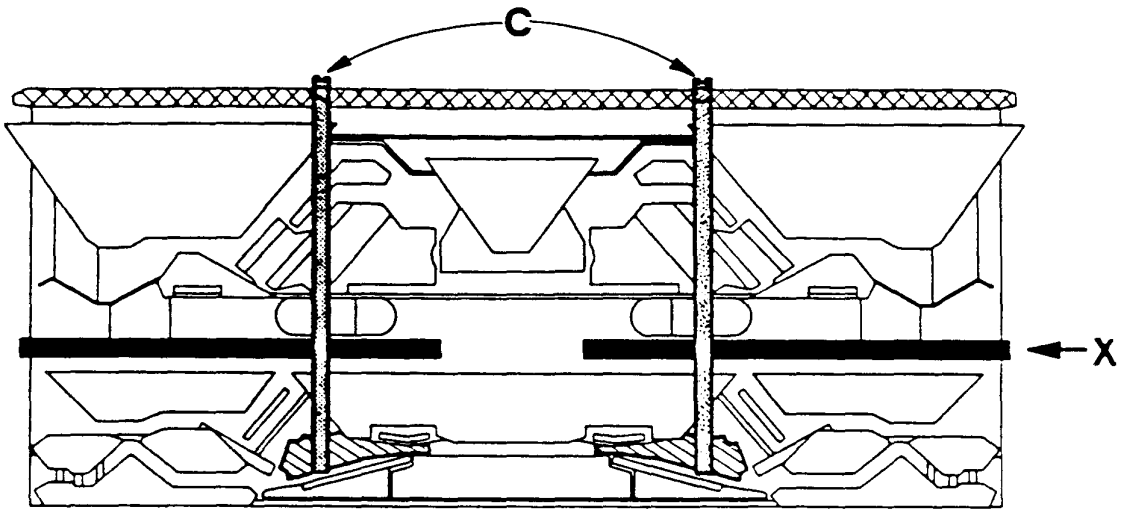
  . If no incorrect selections appear assemble the lock again.

  . If still incorrect selections appear, then exchange and adjust VM-Selector support 05.111.01, according to Test No. 59/62.

Fig.9

links
gauche
left
izquierda
sinistra

rechts
droite
right
derecha
destra



Ansicht
Vue
View
Vista
X

Fig.10

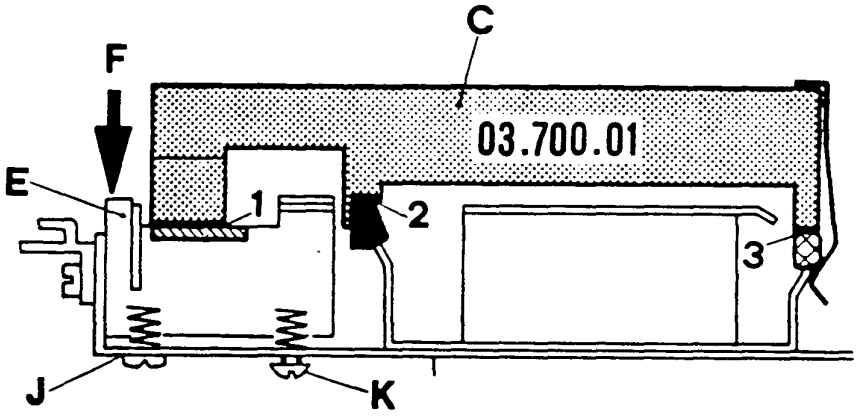
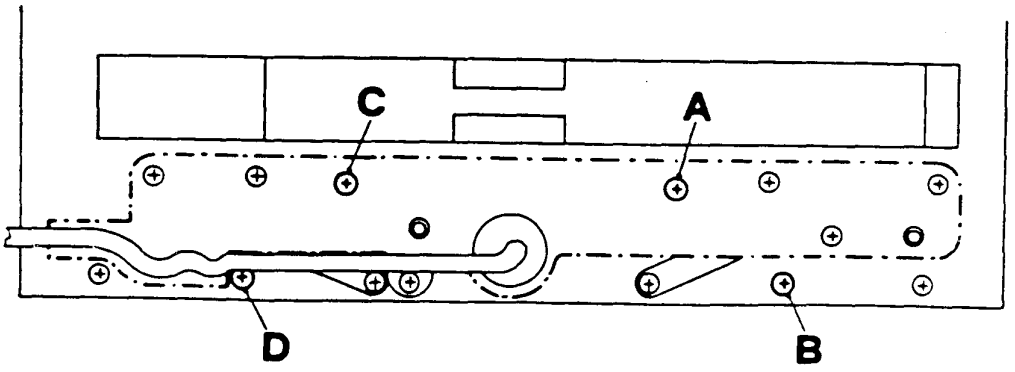
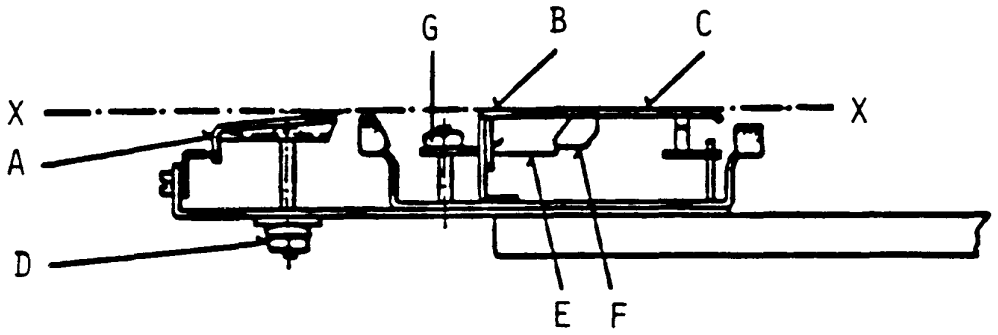


Fig.11



63. Adjustment of the lock parts on the back lock and E-Lock front

(FIG.1)

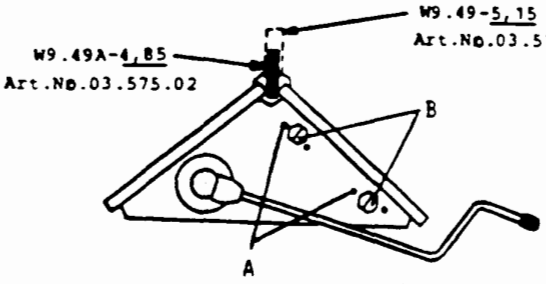


1. **Set the back Lock on AX:**
   - Check whether the pusher cams "A" have the same height (X) at the left and at the right side like "B" and "C".
   - If this is not the case, the pusher cams "A" have to be adjusted by turning the hexagon sleeve nut "D".
2. **Set the back Lock on N:**
   - Check whether the flaps "E" and "F" (Fig. 1) at the left and right have the same height (X) as "B" and "C".
   - If this is not the case, these 2 flaps "E" and "F" have to be adjusted by turning the hexagon sleeve nut "G".
3. **Set the E-Lock on N:**
   - Check and adjust as described above under point 2.

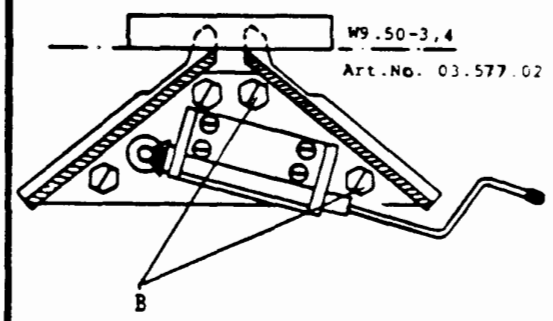
64. Checking/Adjusting the bed distance and height

Attention: do the checking and adjustment only on an even table top.

(FIG.1)



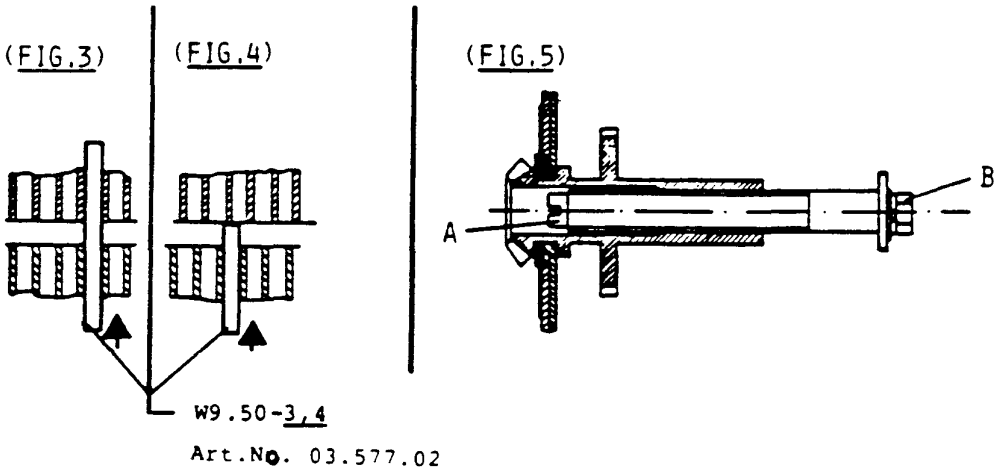
(FIG.2)



1. **Checking the bed distance:**
   - Minimum distance:
     the gauge W9.49 A - 4.85 mm, should pass through the striking combs, without jamming, according to Fig. 1
   - Maximum distance:
     the gauge W9.49 - 5.15 mm should not pass through the striking combs, according to Fig. 1.
2. **Checking the bed height**
   - Turn the racking handle upwards, according to Figure 2.
   - The gauge W9.50 - 3.4 mm should be placed between the striking combs horizontally, according to Fig. 2.
   - If step 1 and/or step 2 are incorrect, readjust again. The bed distance and bed height can only be adjusted together, according to step 3, a-d.
3. **Adjustment of the bed distance and bed height**
   a) On the front bed, left and right, according to Figure 1 drive out the 4 pins "A" and loosen a little the 4 screws "B".

3. b) Move the front bed until the bed distance is between the tolerance of 4,85 - 5,15 mm according to step 1. At the same time adjust the bed height according to step 2.
   c) After the adjustment of the bed distance and bed height, refasten the 4 screws "B".
   d) The holes for the 4 pins (Fig.1) will not fit anymore. To drive in again the 4 pins "A", it is necessary to drill the previous additional 4 holes with a twist drill, diameter 2,9 mm.

65. Checking/adjustment of the racking



1. Turn racking handle upwards.
2. Insert gauge W9.50 - 3.4 mm into the front striking comb and push backwards. The adjustment is correct if the gauge enters without jamming into the back striking comb, according to Fig. 3.
3. Adjustment is wrong if the gauge knocks against the back striking comb, as shown in Figure 4 and must be readjusted again according to step 4, a-d.

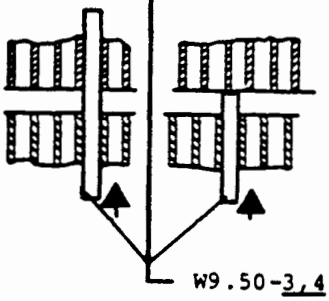
4. Adjustment of the racking
   a) Hold with screw driver at the racking spindle "A" (Fig. 5) and loosen slightly screw "B" with a 8 mm fork spanner.

4. b) Turn the racking spindle "A" with screw driver to the right or to the left until the gauge W9.50 - 3,4 mm will slide through both striking combs without jamming, according to Fig. 3.

c) Refasten the screw "B" (Fig. 5), as doing so, hold with the screw driver the racking spindle "A" so that this cannot be displaced.

d) The racking device has a certain free scope which must be well distributed. Control through inserting the racking handle and check by turning to the right and left.

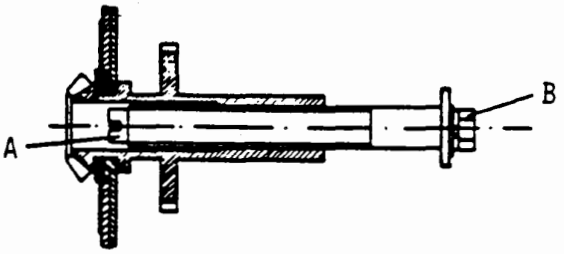
(FIG.3) (FIG.4)



W9.50-3,4

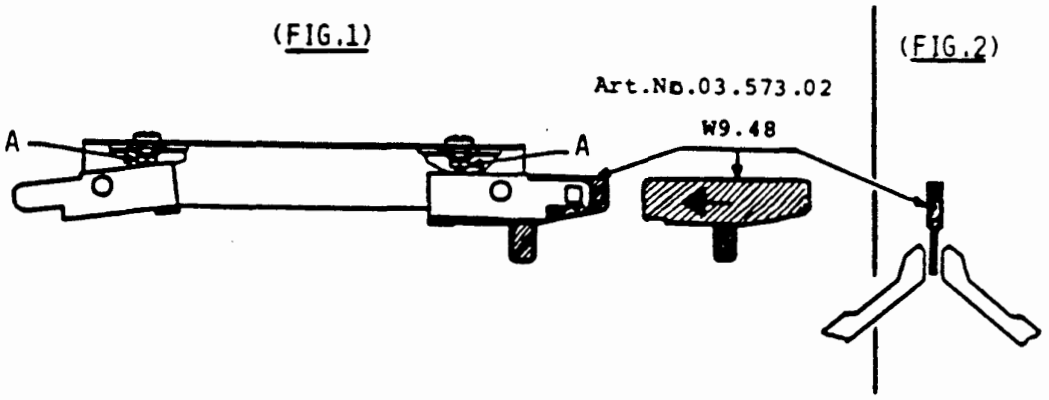
Art.No. 03.577.02

(FIG.5)



66 **How to centre the stripper device (cam box back)**

(FIG.1)



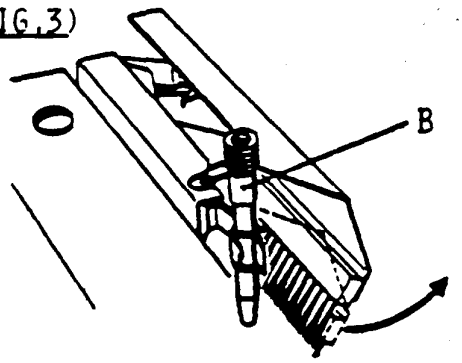
(FIG.2)

Check the adjustment as follows by using gauge W9.48, Art. No. 03.573.02:

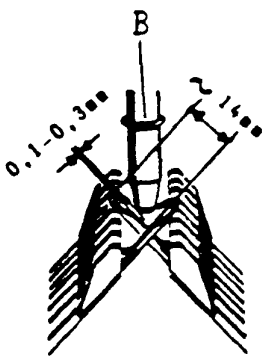
1. Insert gauge W9.48 into holder on the right hand side (Figure 1).
2. Check as from the front side of the machine (Fig. 2) whether the bolt of the gauge is positioned in the middle of the striking combs (Fig. 2) during the movement of the locks in both directions.
3. In case of a wrong adjustment, loosen slightly the hexagon nut A (Fig. 1) with box spanner until the stripper device can be moved.
4. Move the stripper device so long until the bolt is positioned in the middle of the striking combs (Fig. 2).
5. Refasten the hexagon nut "A" (Fig. 1).
6. Make the same adjustment on the left side.
7. Check both adjustments again.

67 Adjustment of the feeding eyelet

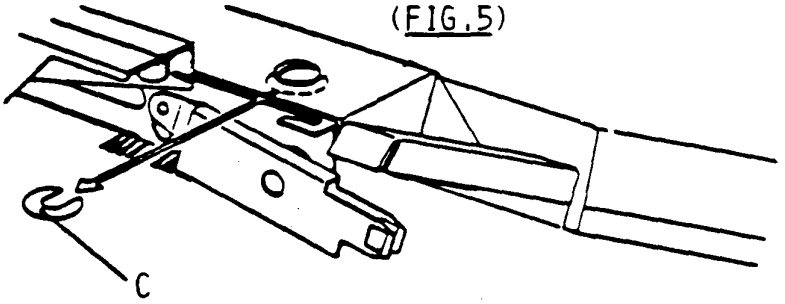
(FIG.3)



(FIG.4)



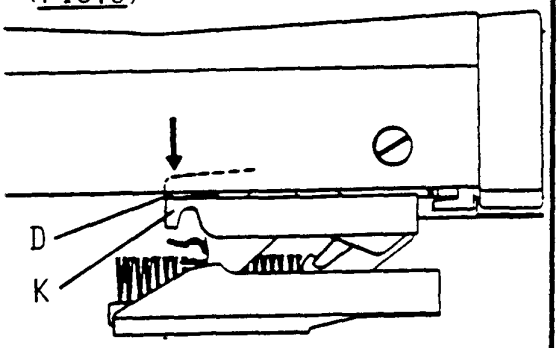
(FIG.5)



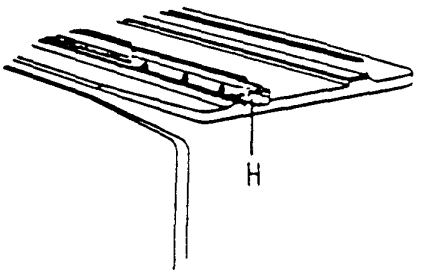
1. Set both locks on GX
   Bring 10 needles up into working position on the front and back bed, as shown in Figure 4, and open all needle latches.
2. Take a VM-Feeding eyelet (B) and place it into the feeding eyelet carrier on the lock, see Fig. 3. To be able to do so, pull slowly the carrier forwards. This opens in a pincer-like movement (Fig. 3). Press the feeding eyelet with its middle part, into the carrier as shown in Fig. 3.
3. When moving the lock across the needles, the lower edge of the feeding eyelet (B) should be positioned deep enough in the needle-cross (about 0,1 - 0,3 mm) without touching the latches of the needles (Fig. 4).
4. If the feeding eyelet (B) is placed too high, distance washers (C) (Fig. 5) have to be inserted.
5. If the feeding eyelet (B) is placed too low, distance washers (C) (Fig. 5) have to be removed.
6. Do not loosen too much the hexagon nuts "A" (Fig. 1, on page 47).
7. After adjusting, tighten the hexagon nuts "A" (Fig. 1, on page 47) securely. Make the same adjustment on the left side.
8. Remove the feeding eyelet (B).

68 Adjustment of the pincer movement of feeding eyelet carrier of M-Lock unit

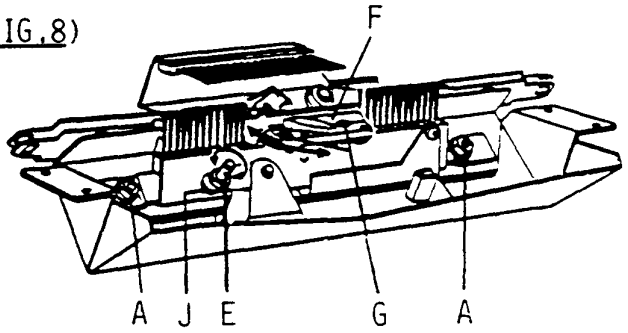
(FIG.6)



(FIG.7)



(FIG.8)

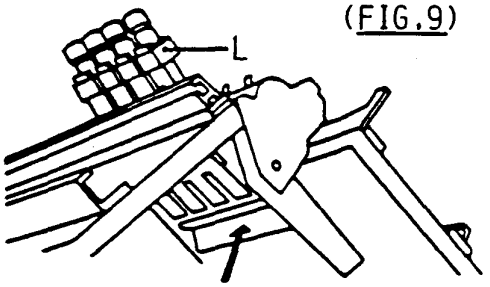


1. The switch lever resp. the eccentric bolt "E" (Fig. 8) effects the opening of the carring device. The eccentric bolt "E" is used for adjusting the opening movement too. The adjustment of the opening movement has to be made in the middle of the curved cam "H" (Fig. 7). With fork spanners 7 and 9 mm, the fastening nut "J" and the eccentric bolt "E" (Fig. 8) can be turned, until the adjustment is made correctly according to step 2. Then hold with the fork spanner the eccentric bolt "E" and tight the nut "J".
2. The adjustment is correct, when the auxiliary lever D lightly touches the carrier K as shown in Fig. 6.

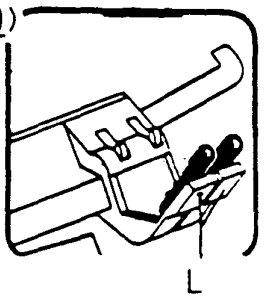
Note: An inaccurate adjustment may result in an insecure taking over of the feeding eyelet.
If the adjustment is too tight, the lock will run stiffly in the area of the curved cam "H" (Fig. 7).

69 Adjustment of the face cam

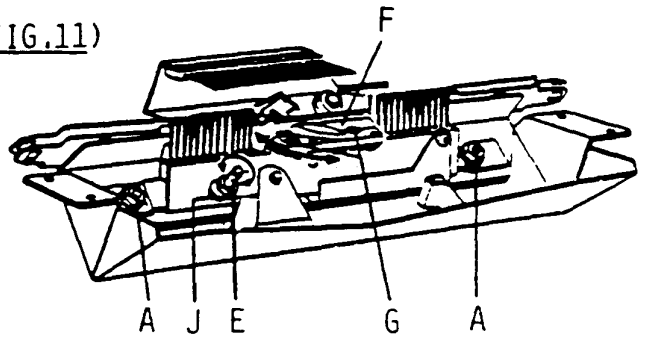
(FIG.9)



(FIG.10)



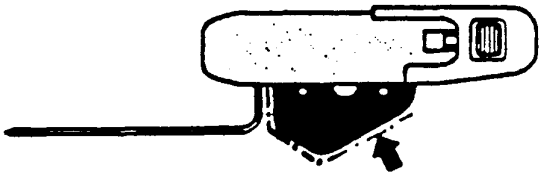
(FIG.11)



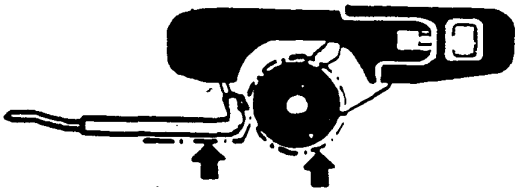
1. Put the four-color changer (Fig. 9) out of action according to instruction book for COLOR, Art. No. 33.254.73/english.
2. Put the two-color changer (Fig. 10) out of action according to instruction book for ELECTRONIC 6000
   Art. No. 33.231.53 PASSAP/english
   Art. No. 33.231.54 PFAFF/english
3. Move connected locks slowly from the left to right into the area of the color changer (Fig. 9 or Fig. 10), watching the movement of the supports L. These must show a downward movement of about 1 - 2 mm. Pay special attention to the feeding eyelet at far right (Fig. 9).
   In case the supports L do not move downwards or a strong resistance is noted, the face cam F (Fig. 11) has to be re-adjusted after loosening the two special screws "G" (Fig. 11). When adjustment is completed refasten both screws "G".

Note: An inaccurate adjustment of the face cam F may result in an insecure taking over of the feeding eyelet.
If the adjustment is too tight, the lock will run stiffly in the area of the color changer (Fig. 9 or Fig. 10).

70 **CHECK-LIST E-6000 (Points 1 to 10)**

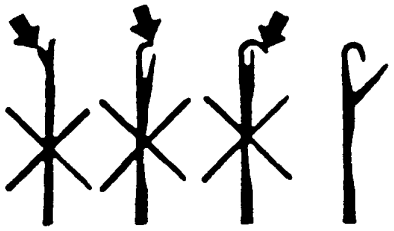


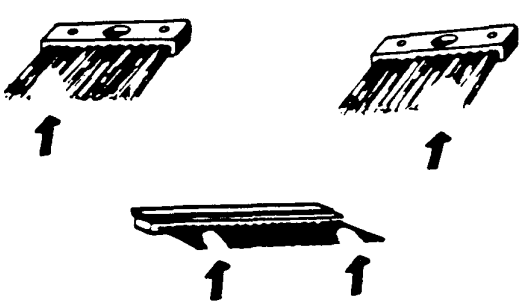
09.720.23



09.743.33 09.735.40

1. Stripper
   Check the outline, marked with arrow. Light damaged areas can be repaired by using a fine sand paper.
   By strong damaged outlines the stripper has to be replaced (orange stripper: complete, black stripper: is the wheel not damaged replace only the flat blade).





2. Checking the function of the latch needles and brushes
   a) Move the both locks far right, then set the lock back and front to N and remove the feeding eyelet as well as the strippers.
   b) Put the 4 VM-Edge springs out of the latch needle area.
   c) Turn the racking handle downwards.
   d) Push all the back and front latch needles, entirely to the top edge of the main rail.
   e) Close all latch needles using a sheet of paper. Damaged latch needles (as shown above marked by arrow) can not be closed with a sheet of paper and have to be replaced. Light damaged ones, perhaps could be repaired by bending the latch by hand (without tool).

2. f) If all the back and front latch needles, on the top are closed, move with both locks on N position slowly from the right side to the left side.

   g) Check whether the brushes (on the lock back) have opened on the back and front all the latches of the needles. Not opened latch needles on the back and front must be marked on the main rail by a pencil.

   h) Push all the back and front latch needles, again to the top edge of the main rail and close all latch needles using a sheet of paper. See also (e) damaged latch needles. With both locks on N position move slowly from the left to the right side.

   i) Check whether the brushes (on the lock back) have opened on the back and front all latches of the needles. Not opened latch needles on the back and front must be marked on the main rail by a pencil.

   j) Push all marked latch needles on the main rails upwards and check whether the needle head or the latch are damaged or bended. Latches which are not open, have not to be classified as damaged. The reason for not opening could also be a vibration caused by the locks or because of defective or worn-out brushes. See pictures on page 51, worn-out brushes.

   k) Damaged brushes have to be replaced.

Important:

- Damaged latch needles give rise to manifold knitting mistakes, e.g. longitudinal rows, etc. This means, that the latch needles, first of all, have to be checked if any knitting mistakes appear.

- Damaged resp. worn-out brushes give rise for knitting mistakes, because the 3 brushes have a double function. On the one hand they have to open the latch needles before knitting and on the other hand, they keep them open during the knitting to feed the yarn.

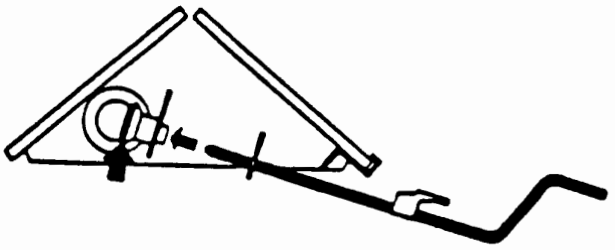
3. Brake spring

A damaged brake spring (see Fig.) causes a sliding out of the latch needles from the working position into the rest position. Replace damaged brake spring.

4. Needle channel

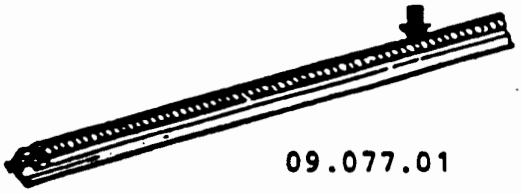
A damaged needle channel, as shown in above Fig., has to be replaced. Art. No. 05.067.02 for needle bed front
Art. No. 09.229.12 for needle bed back

5. Racking gear



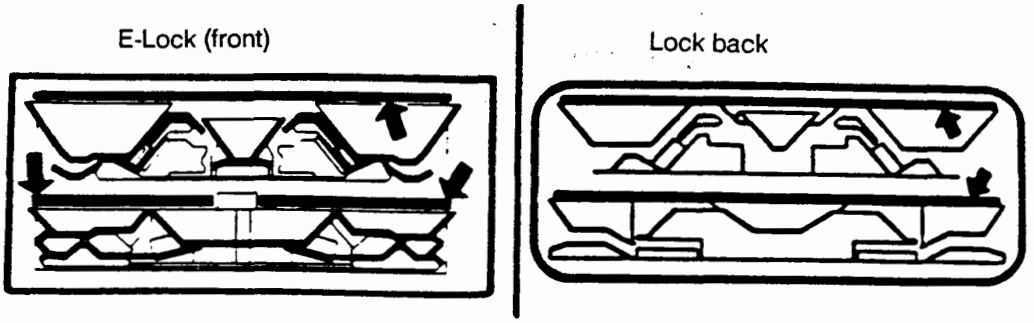
If the racking gear is damaged, the pinion 16.343.02 or the racking shaft 10.151.12 have to be changed. After replacing it, the same has to be adjusted again, according to Step 65 on page 45-46.

6. Set of racks



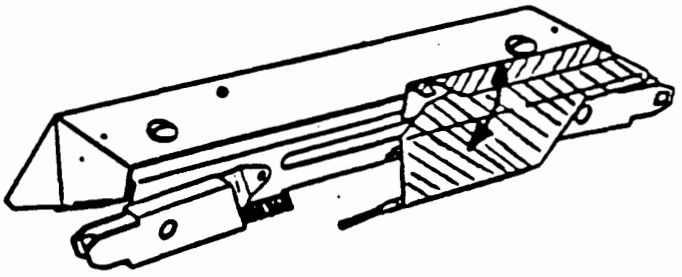
- Between the 7 rack-segments no free scope shall appear.
- Damaged rack-segments have to be changed according the instruction 33.559.03, which makes part of the set of racks Art. No. 09.077.01.

7. Cam box guides



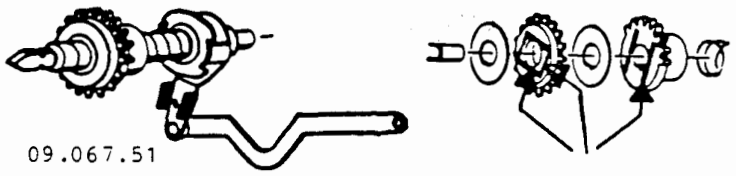
- Too much free scope of the locks, as a result of worn-out cam-box guides (as pointed out above by arrow) gives rise to several mistakes and damages. Worn-out cam-box guides have to be changed.
  - Art. No. 05.131.02 2 pieces on E-Lock (front)
  - Art. No. 16.160.12 1 piece on E-Lock (front)
  - Art. No. 16.160.12 1 piece on Lock back
  - Art. No. 16.161.12 1 piece on Lock back

8. M-Lock unit (14.614.00)



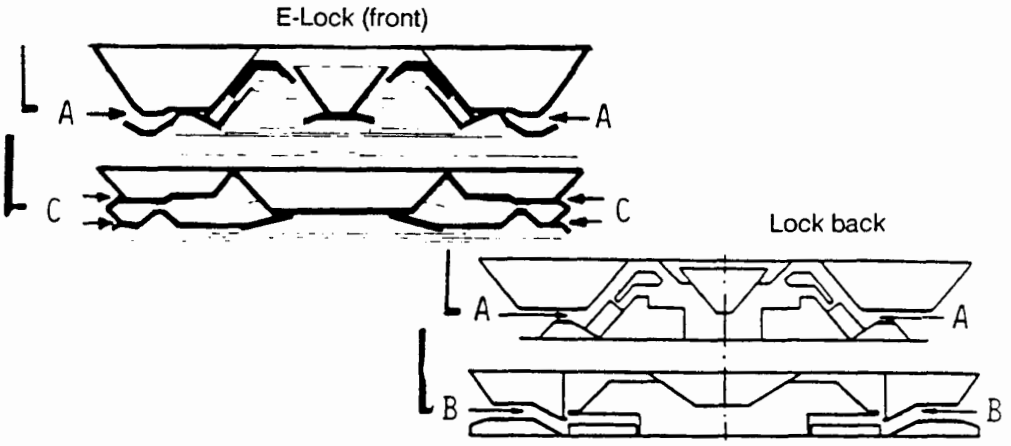
- All turning and sliding parts on the M-Lock unit shall often be cleaned and oiled.
- Worn-out parts causes several mistakes. If necessary change the VM-Support 14.641.01 as pointed out above by arrow.

9. VM-Drive of feeding eyelet (09.067.51)



- Damaged and worn-out gears cause faults and shall be exchanged.
- The gears, as pointed out by arrows, have to be greased before mounting them. During the operation they also can be easily oiled.

10. Checking the needle and pusher channel



- Check the needle channel "A" of the E-Lock front and Lock back, with a needle-foot.
- Check the pusher channel "B" of the back lock with a pusher foot.
- Check the pusher channel "C" of the E-Lock (front) with a round pusher foot.

Important

- Simultaneous to this control the sliding edges of the needle and pusher sliding parts have to be controled if they are worn-out. With the fingernail check notches can be detected.
- Damaged sliding edges must be mend with an oilstone or have to be exchanged.
- Damaged sliding edges cause damages on the needle channel, latch needles and pushers.

80 CLEANING AND OILING/GREASING

1. After approximately 10 hours of operation the E-6000 has to be cleaned and oiled at the parts as shown in the picture on the next page (57). Clean always first with a cloth and then oil easily with a clean brush.
2. For a larger cleaning (wet-cleaning) we recommend the following mixture:
   90 % surgical petrol +
   10 % oil
   this mixture can also be utilized to lubricate the guide rails on the needle bed during the operation.

3. We recommend following surgical petrol

   - SHELLSOL K (D70)
   - BP ENERGOL HPO
   - EXXSOL D 80 (ESSO)

4. We recommend following oil:

   - SHELL VEXILLA OIL G (BELLODOR OIL)
   - VEXILLA ISSO 32 (SHELL)
   - TELURA Z 32 (ESSO)
   - TEXTILMACHINE OIL S46 (ESSO)

5. We recommend following grease:

   - SHELL UNEDO GREASE 2
   - BP ENERGREASE PR 2
   - CAZAR K2 (ESSO)

Important

A good maintenance of the E-6000 always clean and well oiled prolongs the live of the single parts enormously !

SERVICE	ELECTRONIC 6000	
ANLEITUNG	INSTRUCTION	INSTRUCTION	INSTRUCCION