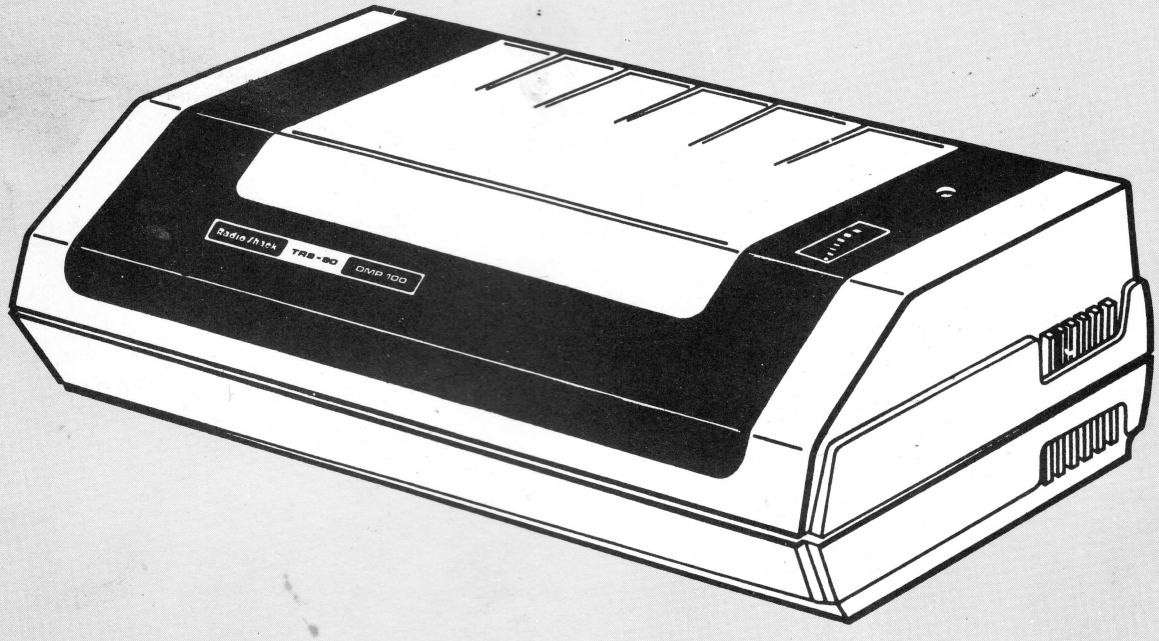
Radio Shack®

Service Manual

26-1253

TRS-80
DMP-100

Catalog Number:26-1253



CUSTOM MANUFACTURED FOR RADIO SHACK, A DIVISION OF TANDY CORPORATION

CONTENTS

1/ Specifications

Print method	Impact dot-matrix print
Print format	5×7 dot-matrix
Character set	96 characters conforming to ASCII standard
Graphics	Able to print 7-dot columns
Character codes	8-bit ASCII serial or 8-bit ASCII parallel
Character size	Height: 7 dots (2.82mm) Width: 5 dots (2.11mm)
Print speed	50 characters/sec at 10 CPI 80 columns
Max. columns	80 at 10 CPI
Characters/inch	10 CPI at 80 columns 5 CPI at 40 columns
Lines/inch	6. . .Alphanumeric mode 9. . .Graphics mode
Line feeds/second	5. . .Alphanumeric mode 7.5. . .Graphics mode
Paper feed	Pin feed
Paper width	Up to 9.5″–wide paper can be used. Pin to pin 9″
Number of copies	Up to 3 copies, including original
Inked ribbon	Inked roller built-in cassette type, single color (Cat. No. 26-1421)
Dimensions	8-1/14″ × 16-1/16″ × 5- 6/16″ (209.5 × 408 × 135mm) DWH
Weight	Approx. 8.6 lbs (3.9kg).
Power requirements	120 ±15 VAC, 60 Hz for USA and Canada, 100 VAC (Japan), 220/240 VAC (Europe), 240 VAC (Australia) 20 watts (character printing) 10 watts (idling)
Temperature	Operation 32°F to 109°F (0°C to +43°C) Storage without damage −40°F to 160°F (−40°C to + 71°C)
Humidity	20% to 80% (non-condensing)

General functions

- Double-width characters can be printed by using a special command.
- Graphics pattern printing is possible.
- In graphics mode, repetitive graphics printing is possible by a certain command.
- It is possible to select printing start-position by designating a dot or character address.
- In the same line it is possible to print character, double-width cahracter, and graphics.
- Wrap-around function.
- Underline function

Print modes

- Character print mode
- Double-width character print mode
- Graphics print mode

Control codes

Single-byte codes

- LF (0A) — Print command with a line feed
- CR (0D) — Print command with a line feed
- SUB (1A) — Print command without a line feed
- DC2 (12) — Indicates graphics print mode
- RS (1E) — Indicates character print mode
- US (1F) — Indicates double-width character print mode
- SI (0F) — Underline start
- SO (0E) — Underline stop

Multi-byte codes

- POS (10,n1,n2) — Designates printing start-position in character units.
- ESC POS (1B,10,n1,n2) — Designates printing start-position in dot units.
- FS (1C,n1,n2) — Designates repetitive graphics, "n1" indicates the number of repetitions, while "n2" indicates the graphics data to be repeated.

Code Table

									0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
									0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
									0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
									0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B8	B7	B6	B5	B4	B3	B2	B1	↘	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
				0	0	0	0	0		POS	SP	0	@	P	`	p								
				0	0	0	1	1			!	1	A	Q	a	q								
				0	0	1	0	2		DC2	"	2	B	R	b	r								
				0	0	1	1	3			#	3	C	S	c	s								
				0	1	0	0	4			$	4	D	T	d	t								
				0	1	0	1	5			%	5	E	U	e	u								
				0	1	1	0	6			&	6	F	V	f	v								
				0	1	1	1	7			'	7	G	W	g	w								
				1	0	0	0	8			(	8	H	X	h	x								
				1	0	0	1	9			)	9	I	Y	i	y								
				1	0	1	0	A	LF	SUB	*	:	J	Z	j	z								
				1	0	1	1	B		ESC	+	;	K	[	k	{								
				1	1	0	0	C		FS	,	<	L	\	l	¦								
				1	1	0	1	D	CR		—	=	M	]	m	}								
				1	1	1	0	E	SO	RS	.	>	N	^	n	~								
				1	1	1	1	F	SI	US	/	?	O	_	o	N/A								

Graphics Data

2/ Construction

Summary – Block Diagram and Flowchart

Figure 1 shows the block diagram and Figure 2 is a flowchart showing the sequence of its motion.

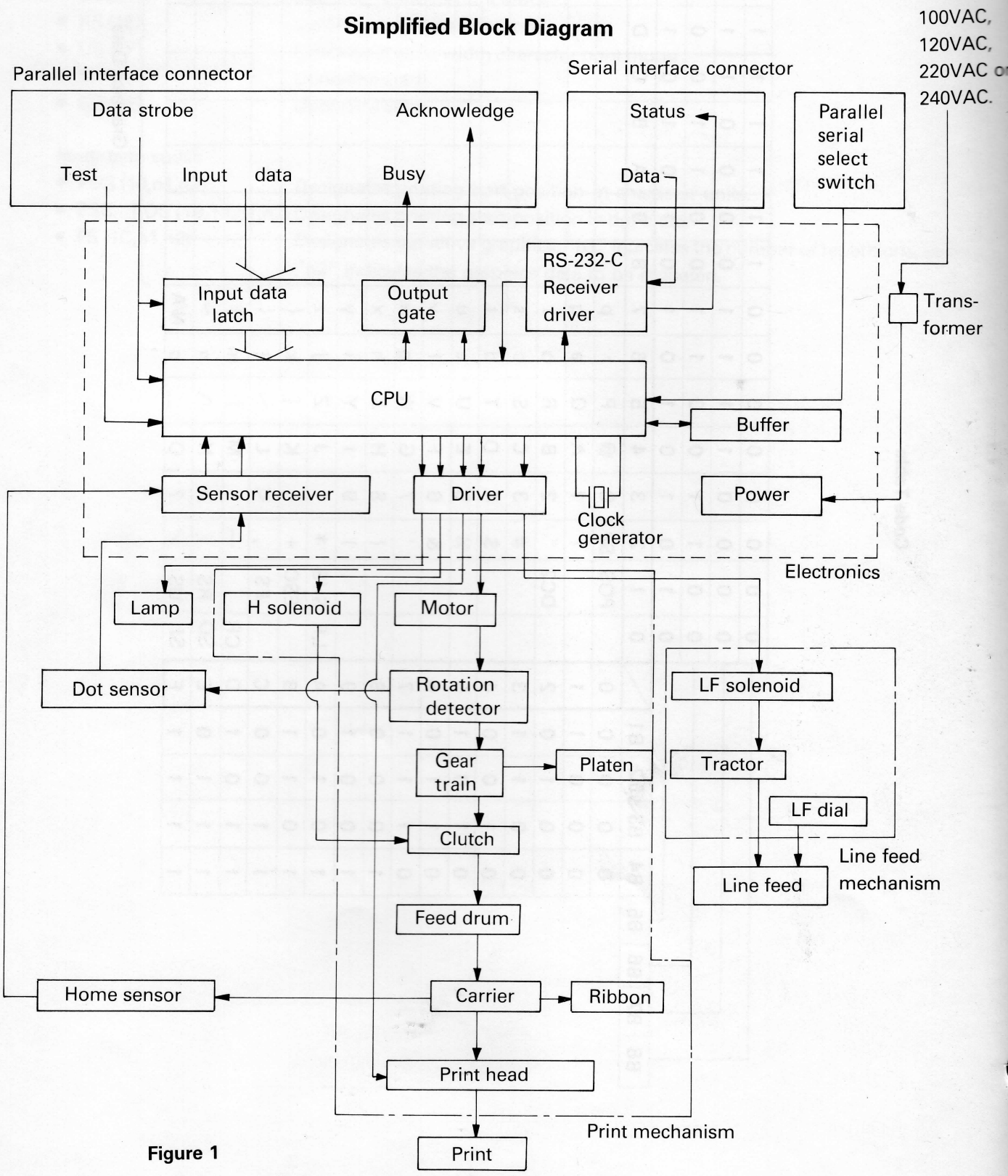


Figure 1

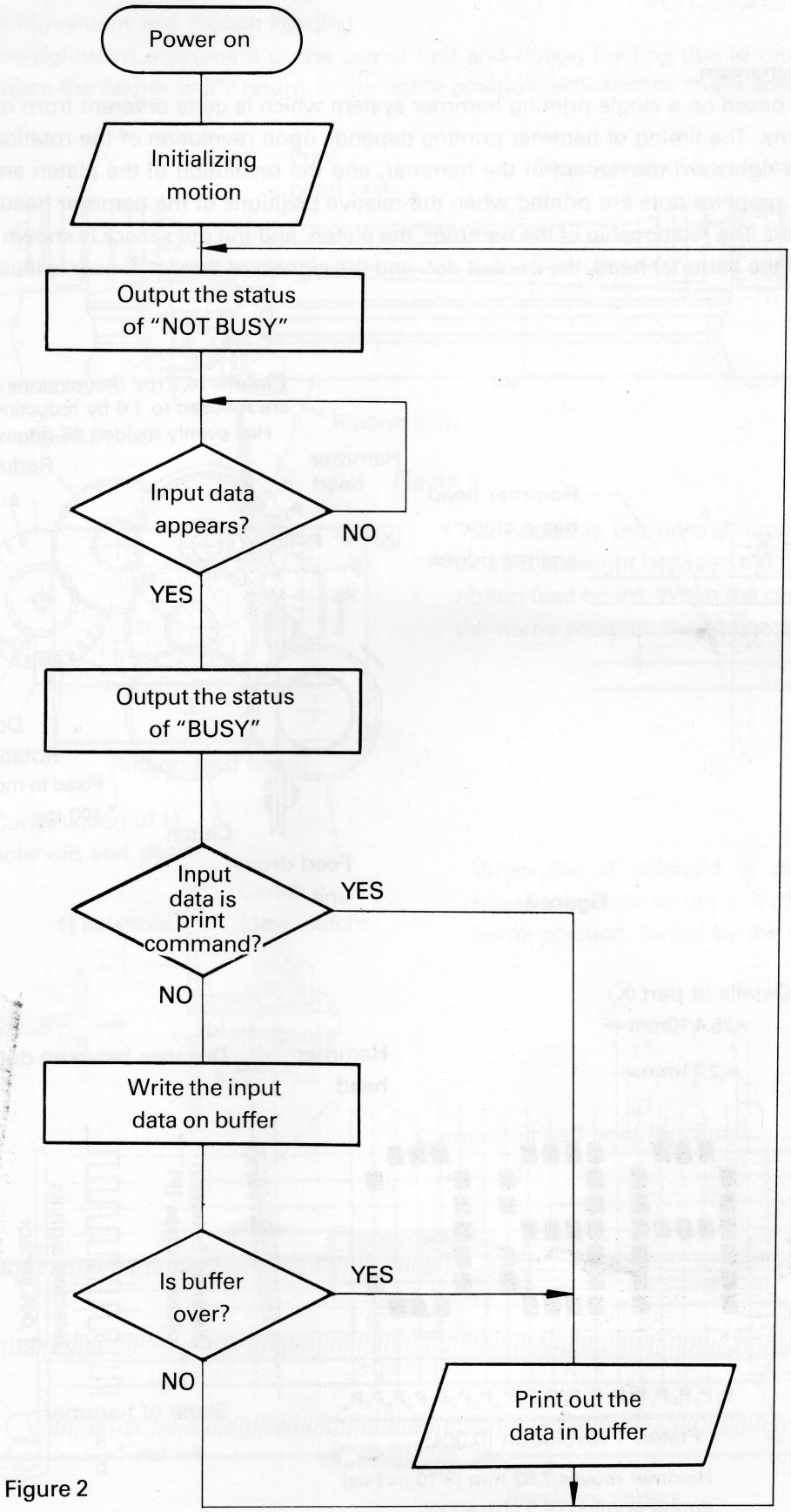

Power on
Initializing motion
Output the status of "NOT BUSY"
Input data appears?
NO
YES
Output the status of "BUSY"
Input data is print command?
YES
NO
Write the input data on buffer
Is buffer over?
YES
NO
Print out the data in buffer

Figure 2

Printing

- Printing Mechanism

This Printer is based on a single printing hammer system which is quite different from other impact dot printing systems. The timing of hammer printing depends upon revolution of the rotation detector. This revolution, the rightward movement of the hammer, and the revolution of the platen are synchronized. Character and graphics dots are printed when the relative positions of the hammer head and the platen are encountered. The relationship of the hammer, the platen, and the dot sensor is shown in Figure 3; the relationship of the hammer head, the printed dot, and the signals of the dot sensor is illustrated in Figure 4.

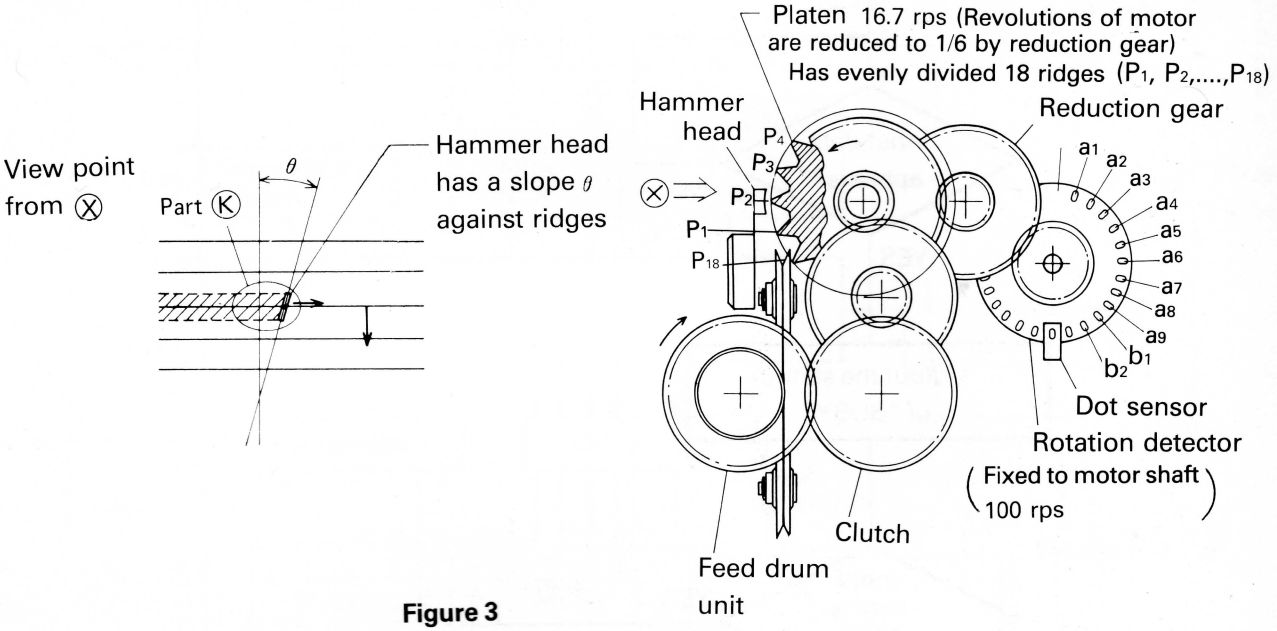


Figure 3

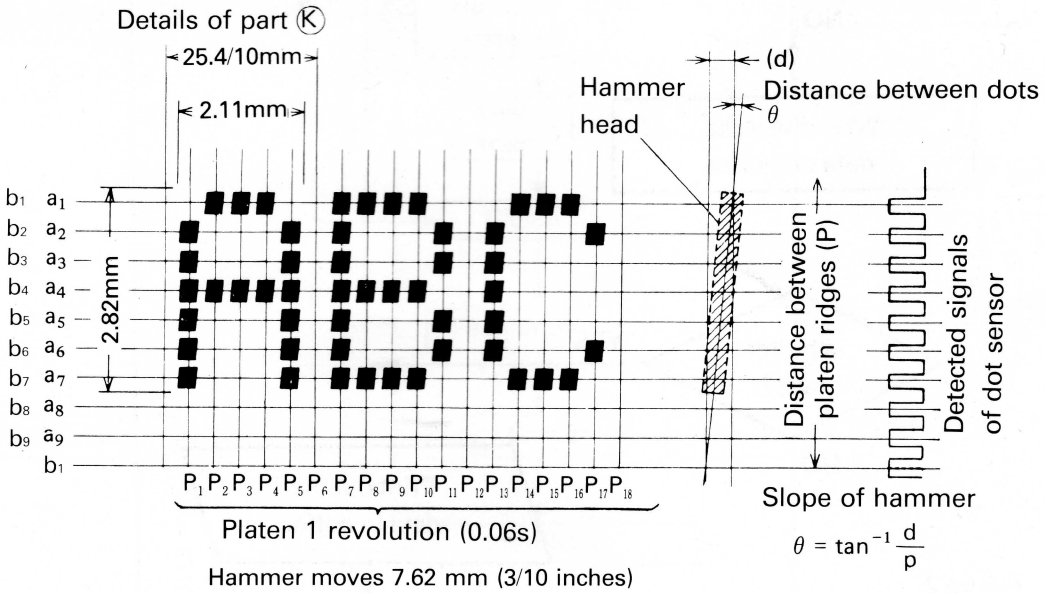


Figure 4

• Carrier Unit Movement and Ribbon Feeding

Figure 5 shows rightward movement of the carrier unit and ribbon feeding due to motor revolutions. Figure 6 describes the carrier unit's return to the home position, activated by the H solenoid.

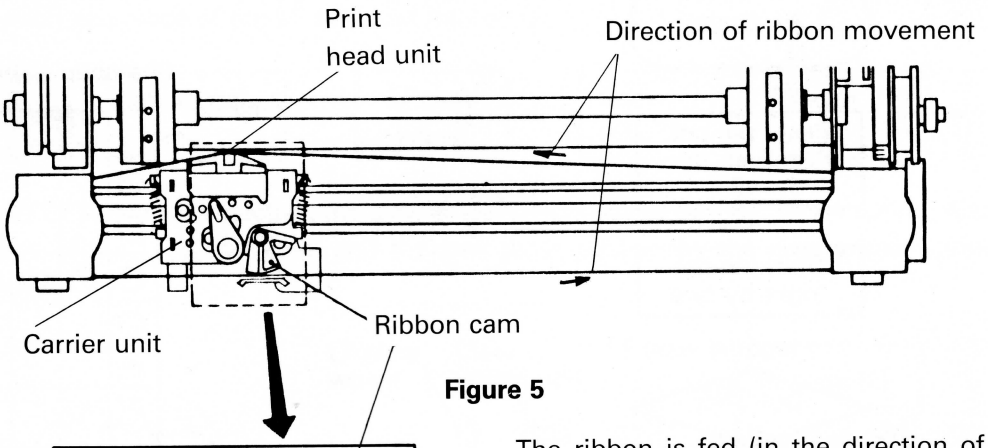
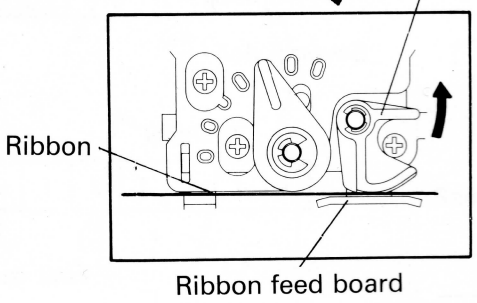
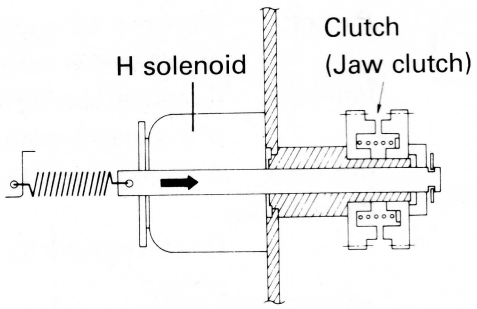


Figure 5



The ribbon is fed (in the direction of the arrow) when it is caught between the ribbon cam and the ribbon feed board. When the carrier unit returns to the home position, the ribbon is not caught.

Construction of H solenoid and clutch



When the H solenoid is pulled, the clutch is released and the carrier unit returns to the leftmost home position, forced by the recovery spring.

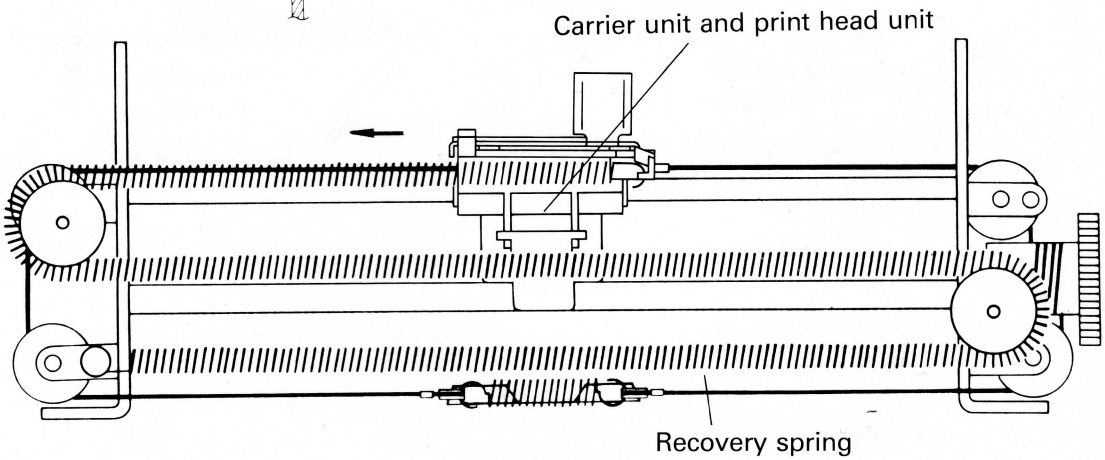
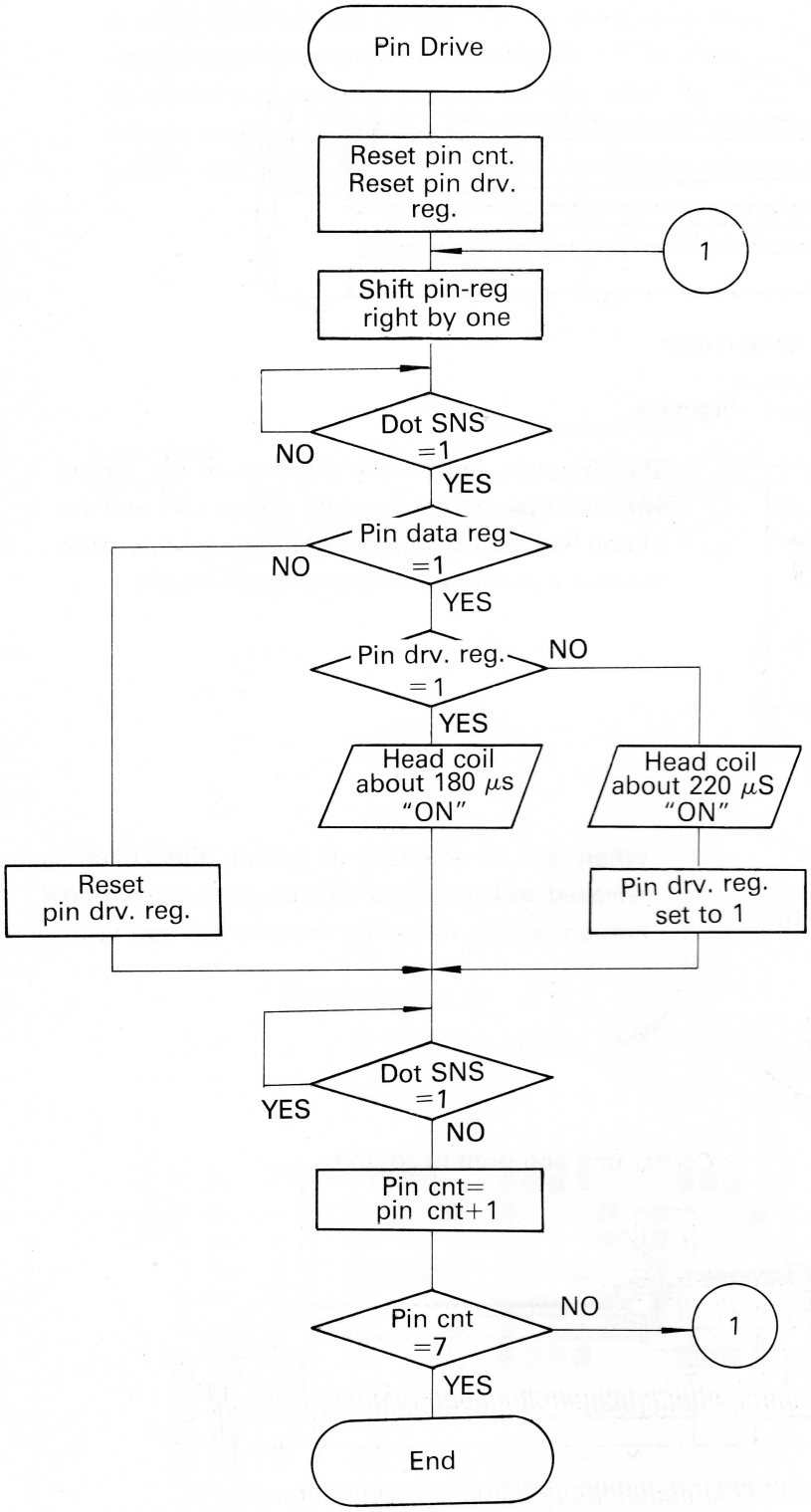
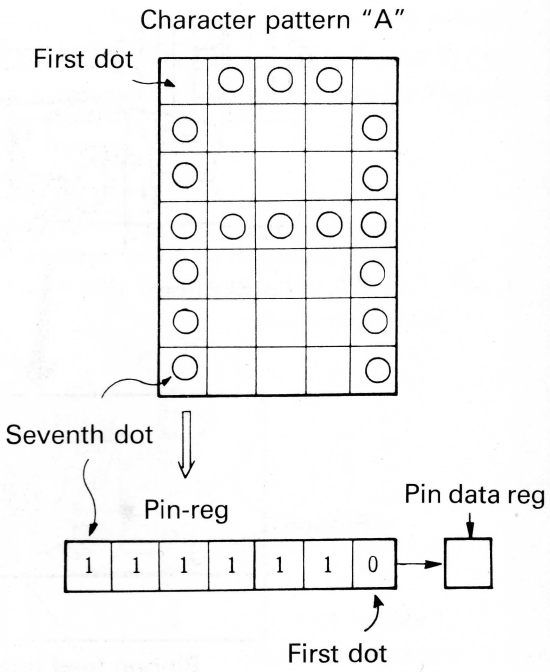


Figure 6

- Hammer Drive (Pin Drive) Flowchart





Pin cnt: A counter for one column (7 dots) of a character pattern.

Pin-reg: A register storing one column (7 d of a character pattern.

Dot SNS: A timing signal for each dot.

Pin data reg: One bit register for a dot to be printed.

Pin drv reg: Decides the width of the output pulse
1 ... 180 μS
0 ... 220 μS

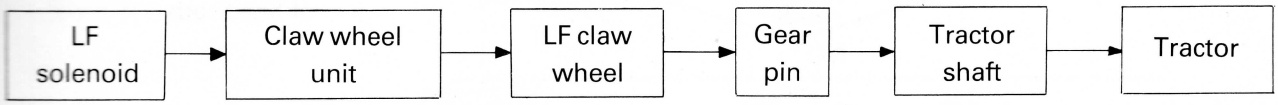
Figure 7

Line Feed

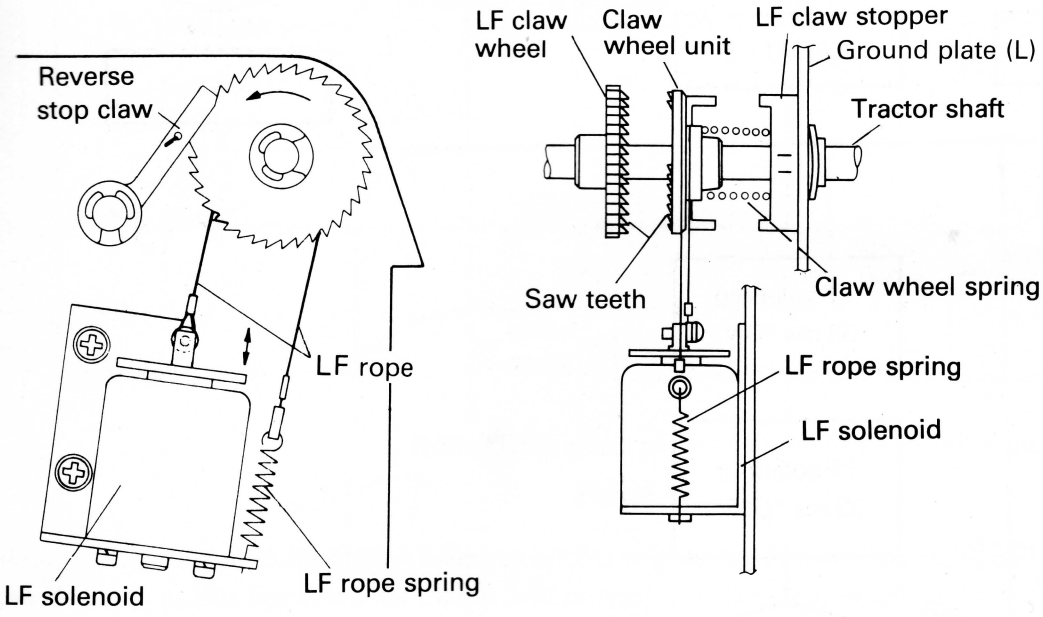
• Line-Feed Mechanism

Figure 8 shows how the line feed (paper feed) is controlled by the motion of the LF solenoid. The LF solenoid is activated three times for printing characters and two times for printing graphics.

The transmission sequence of the LF solenoid motion is:



When the LF solenoid is inactive, the claw wheel unit is pulled by the LF rope spring. Also, the saw teeth of the LF claw wheel and the saw teeth pushed by the claw wheel spring are engaged.



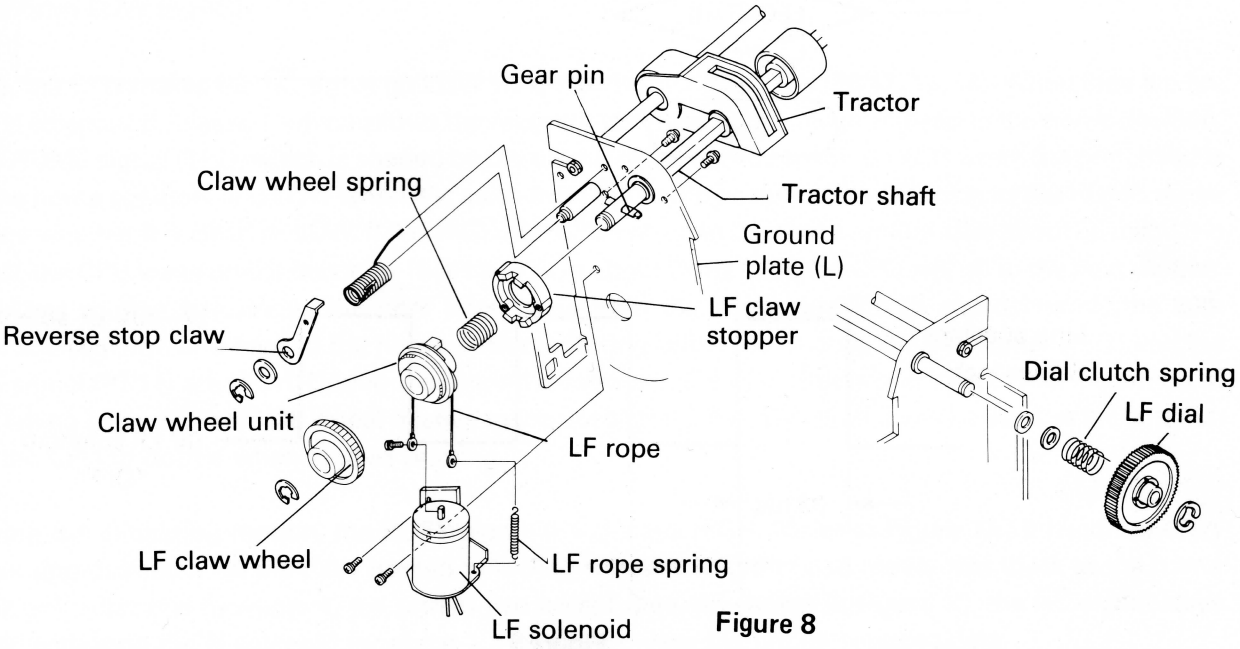
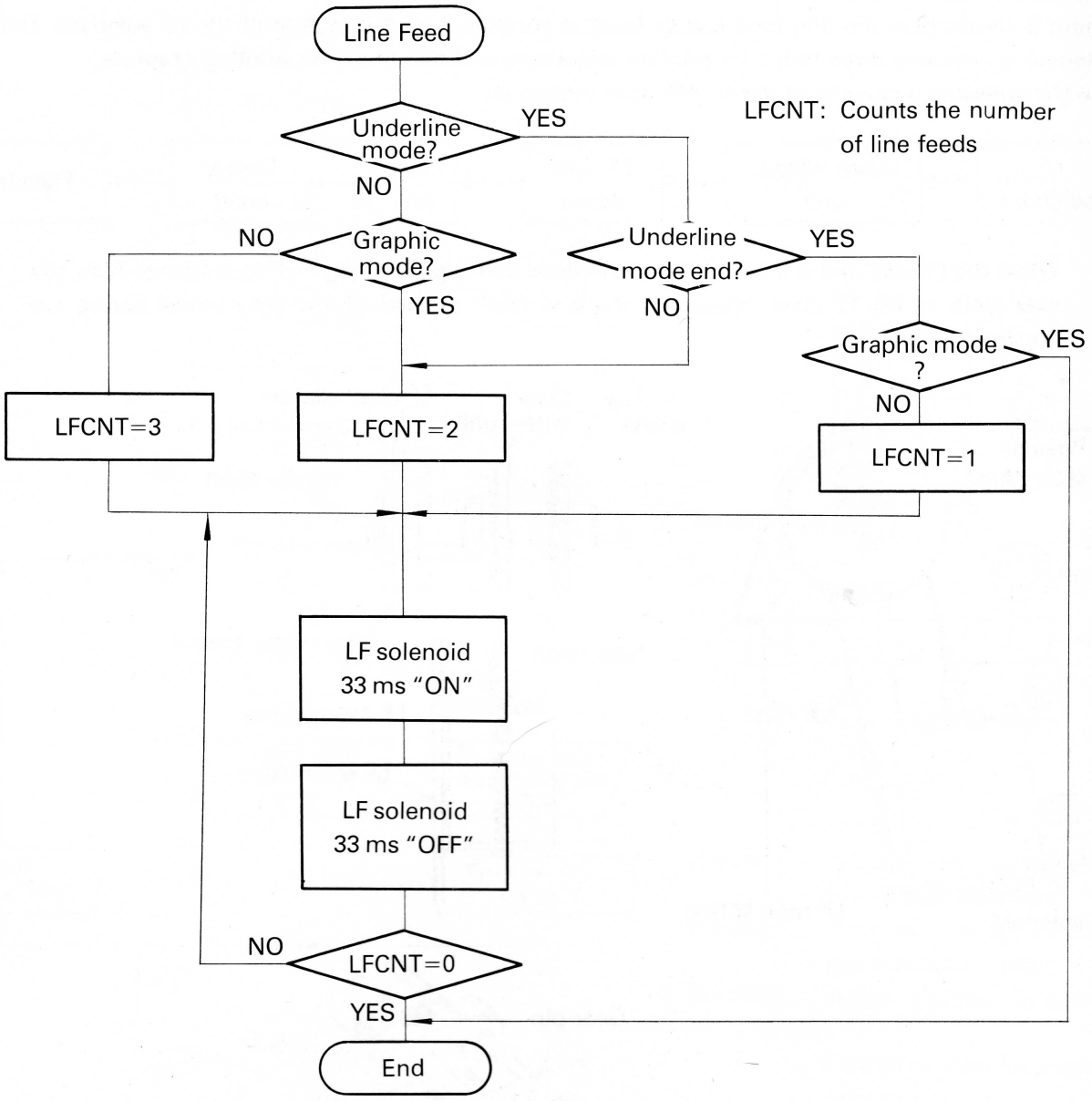


Figure 8

- Line Feed Flowchart



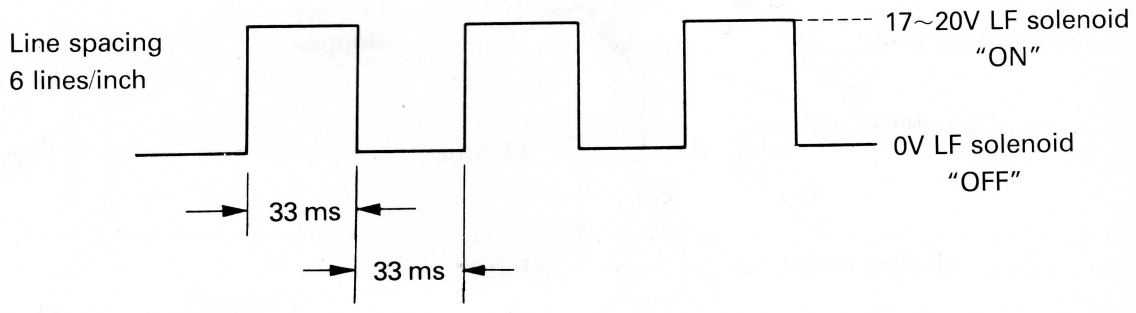
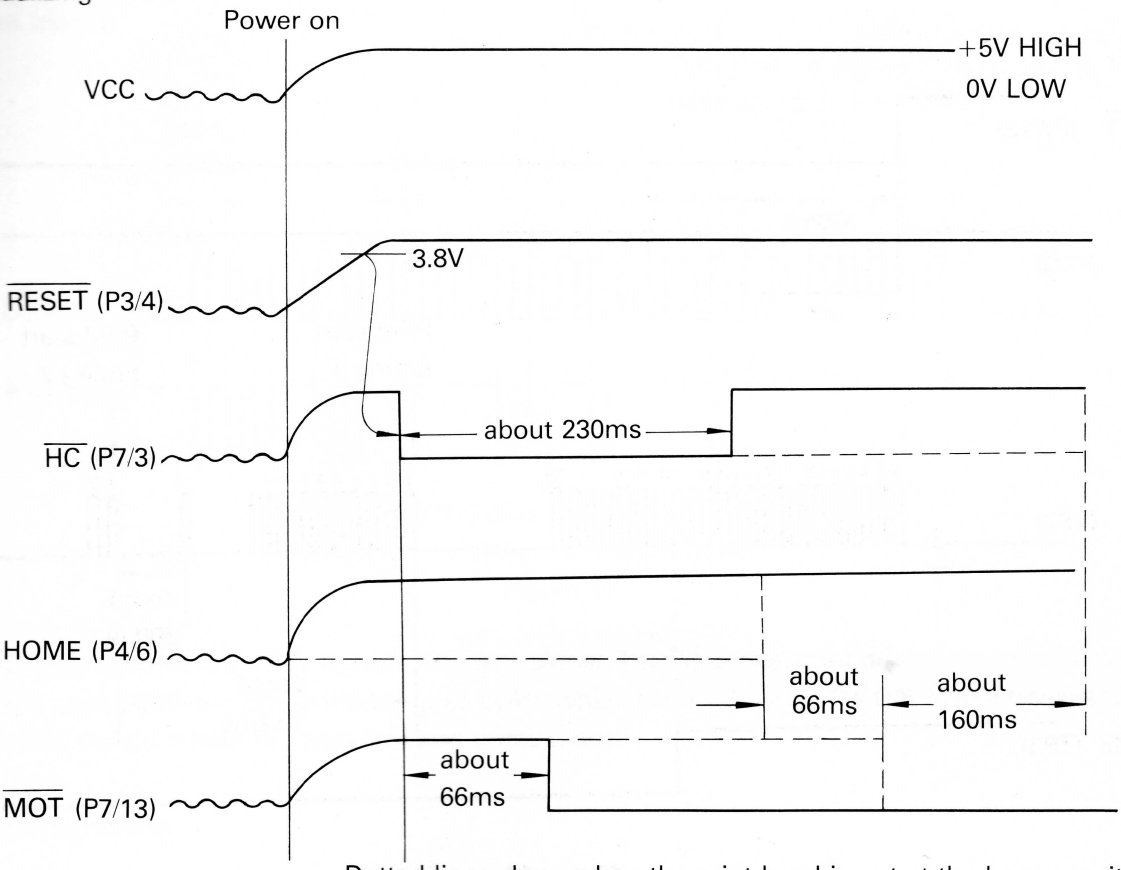


Figure 9

Timing Diagram

- Initializing motion



Dotted lines show when the print head is not at the home position.

Figure 10

When power is applied, P3/4 [No.4 Terminal of CPU chip (IC No. P3)] accepts the $\overline{\text{RESET}}$ signal. The CPU is reset as long as this signal is LOW (about 3.8V or less). The CPU is activated as soon as the $\overline{\text{RESET}}$ signal rises from LOW to HIGH.

First, the CPU makes the $\overline{\text{HC}}$ signal go LOW which turns the drivers ON (P8/12, 13, 14). When they are on, the H solenoid is released, which allows the recovery spring to return the print head to the home position. The HOME signal (TP2), which is shaped by the output of the home sensor, is HIGH when the print head is at the home position, and LOW when it is away from the home position. The CPU checks the HOME signal to see whether it is HIGH or LOW. If it is HIGH, the CPU will go to the next rountine after about 66 ms; if it is LOW, the CPU waits until it becomes HIGH and then about 66ms later, the CPU will go to the next routine. The next routine is to move the print head twice from the home position to approximately the 20th character column and back to the home position. During both movements, the $\overline{\text{PIN}}$ signal (P7/1) and the $\overline{\text{LFC}}$ signal (P7/11) are HIGH. During the second movement, the CPU checks and memorizes the timing of the falling edge of the HOME signal relative to the dot signal (TP1). This timing will be used as the criterion for the CPU to decide when to start printing.

During the initializing motion, the BUSY signal (P4/2) stays HIGH. (Refer to Figure 13.) It becomes LOW when approximately 66 ms have passed following the second print head movement (back to the home position). After this movement, the printer can accept data. As shown in Figure 13, the $\overline{\text{HC}}$ signal stays LOW, activating the H solenoid for about 1.3 seconds unless the printer receives data.

- Start of the printing motions

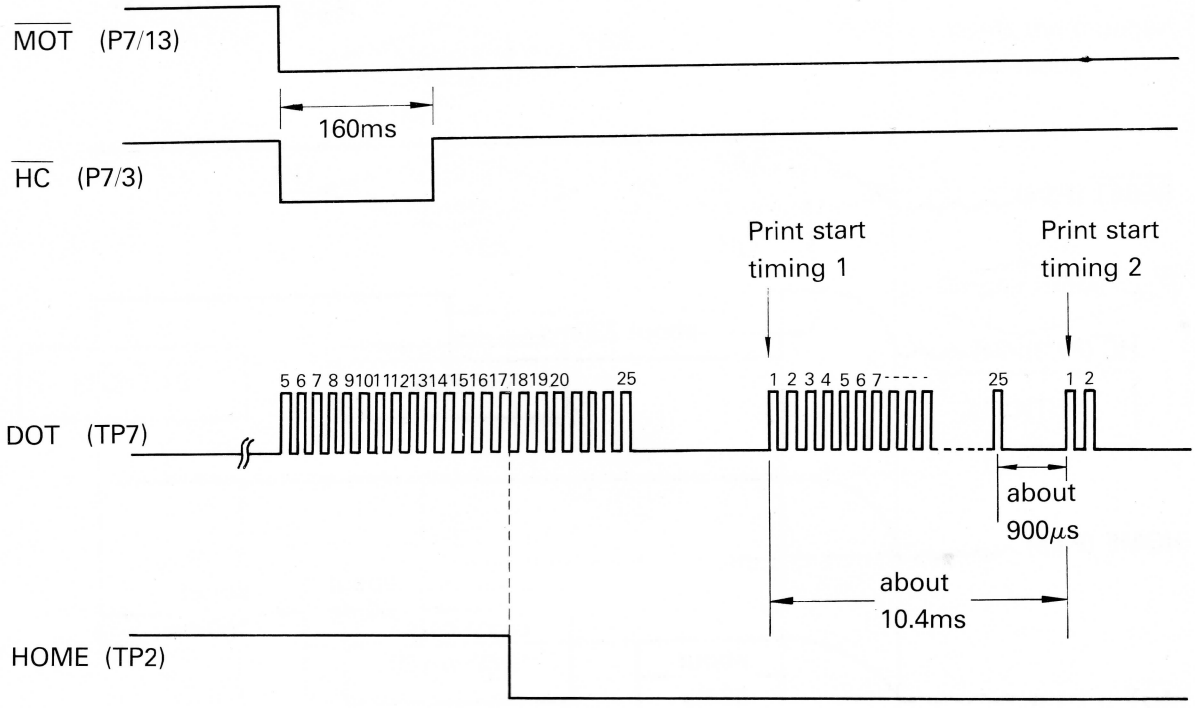
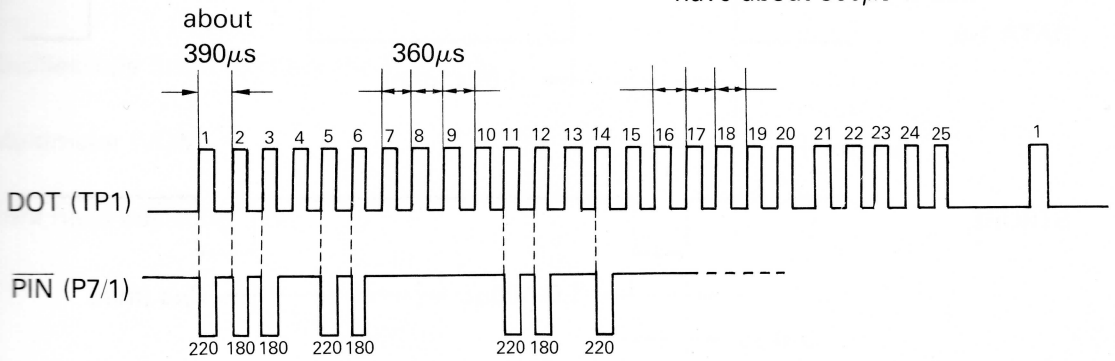


Figure 11

When printing starts, the CPU makes the $\overline{\text{MOT}}$ (P7/13) and $\overline{\text{HC}}$ (P7/3) signals go LOW. Lowering of the $\overline{\text{MOT}}$ signal makes the output of driver P8/15 go LOW which turns transistor Q3 ON. When transistor Q3 turns ON, current will be supplied to the motor, causing it to rotate. Since the $\overline{\text{HC}}$ signal is also LOW, the H solenoid is activated, which disengages the motor shaft from the head carrier so that the motor can reach a constant speed before any movement of the print head. After approximately 160ms, the $\overline{\text{HC}}$ signal is raised to a HIGH, which causes the motor shaft and the head carrier to engage, and allows the print head to be driven in a rightward direction. Next, the CPU waits to see if the print head leaves the home position by sampling the HOME signal (TP2). After comfirming that the HOME signal becomes LOW, which means the head carrier has moved out of the home position, the CPU checks the DOT signal (TP1) in order to decide when to start printing. The DOT signal is a shaped output signal from the dot sensor and, as shown in Figure 11, a group of 25 sequential pulses repeated at constant intervals. When the HOME signal goes LOW, the CPU starts to count the number of dot pulses until the DOT signal stays LOW for approximately 0.9ms. The CPU then uses this counted number to compare with the number stored during initialization in order to decide when to start printing.

- Print motion

Only these 6 pulses (7, 8, 9, 16, 17, 18) have about 360μs width.



WIDTH 220μs: First dot
180μs: Consecutive dot

Figure 12

The CPU synchronizes the $\overline{\text{PIN}}$ signal to the DOT signal. The $\overline{\text{PIN}}$ signal is for driving the print hammer; when it goes LOW, the driver (P8/16) goes LOW, which turns transistor Q4 ON. When transistor Q4 turns ON, the print hammer activates and prints a dot.

- Recovery motion

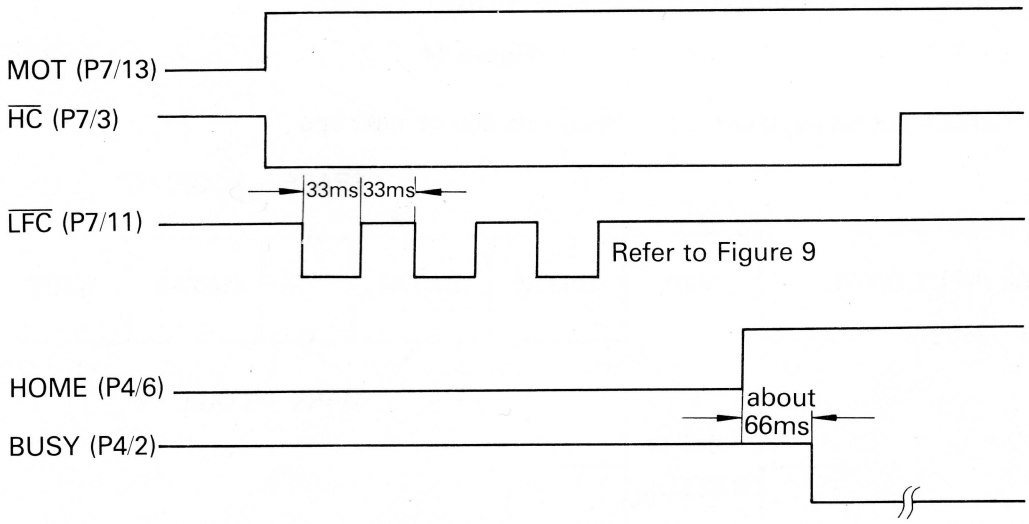
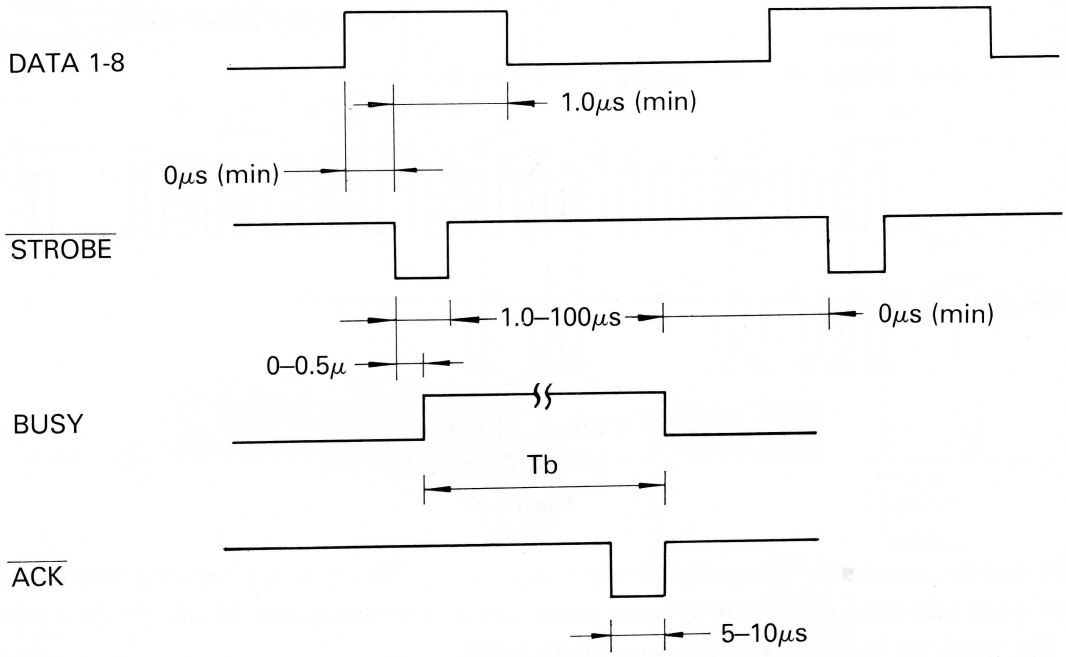


Figure 13

After printing a line, the CPU makes the $\overline{\text{MOT}}$ signal go HIGH and the $\overline{\text{HC}}$ signal go LOW. If a recovery motion includes a line feed, the CPU makes the $\overline{\text{LFC}}$ signal (P11/10) go LOW. When this signal is LOW, the output of driver P8/10, 11 is LOW which activates the LF solenoid for a line feed of 1/18 inch. (Refer to Figure 9, the line feed flowchart.) After performing a line feed, the CPU waits until the HOME signal rises to a HIGH. Then after approximately 66ms, the CPU makes the BUSY signal go LOW. Approximately 1.3 seconds later, the CPU makes the $\overline{\text{HC}}$ signal go HIGH, ending the recovery motion of the head carrier.

Timing Chart of Input

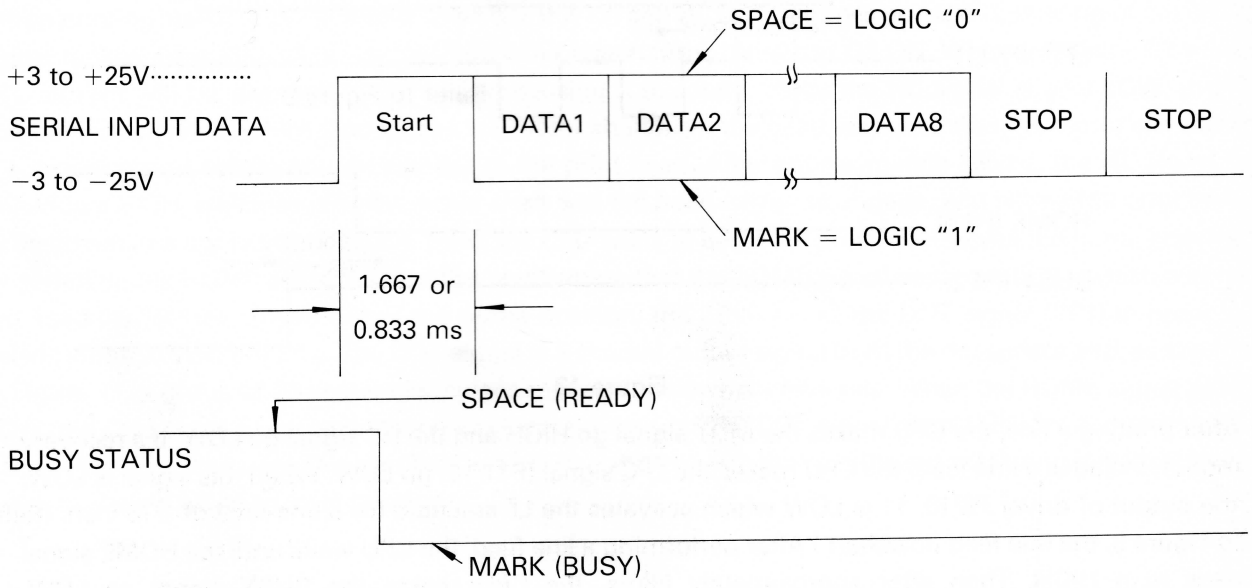
- Parallel input timing chart



Tb; CHARACTER CODE ..... 100 μs or more
CR/LF/SUB CODE ..... PRINT+CARRIAGE RETURN
(about 2 seconds max.)
Reference: CR= (0D), LF = (0A), SUB = (1A)

Figure 14

- Serial input timing chart ..... Baud rate 600 or 1200 bps



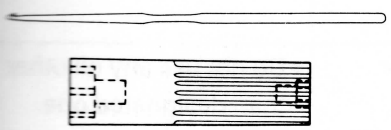
○ 8-bit mode: 8-bit data, no parity, one or two stop bits

Figure 15

3/ Measuring Instruments and Tools

The following items are necessary to repair or adjust DMP-100:

- Oscilloscope (used to check the PCB unit).
- Multimeter (VOM).
- Print head adjusting tools



ⓐ is used to remove the cable guide of the print head.
ⓑ is used to drive the head adjusting nut.
If not available, use non-magnetic material tool.

Figure 16

- Tools (screwdriver, tweezers, pliers and nippers).
- Soldering iron (for electronic parts).
- Desoldering tool.

4/ Maintenance

Cleaning

Due to its material, each part has its own proper cleaning liquid and method. Note that if an improper cleaning liquid is used, or the cleaning method is poor, parts may be damaged or may not function properly. Follow the instructions in Table 1 to clean. It is helpful to use a hair drier to dry but, if the cleaning liquid is flammable, take care to keep it away from the hair drier.

Parts	Cleaning Method	Cleaning Oil	Drying Method	Remarks
Metal parts	Brush washing	Benzine or trichloro-ethylene	Warm air	
Plastic parts of the mechanisms	Brush washing	Benzine	Cool air	• Do not use any oil other than designated one. • Wash quickly, wipe with a cloth and dry rapidly. • Use good, clean oil.
Plastic parts of the enclosure	Do not wash	—	—	Wipe off dirt.
Rubber parts	Do not wash	—	—	Wipe off dirt.
Electrical parts ┌PCB u., Motor H solenoid u., LF solenoid u., Dot sensor u., └Home sensor u. etc., Print head u., Carrier u.	Do not wash	—	—	Wipe off dirt with a cloth with benzine or alcohol.
Rope parts ┌Feed drum u. Head rope (L) u. └Claw wheel u.	Do not wash	—	—	• Do not wipe or touch the rope. • Lubricate with oil only.

Lubricating

Use the following lubricants to repair and adjust the DMP-100 (items requiring lubrication are described in the next chapter):

SF-100
J-5
Screwlocking agent

5/ Disassembly and Reassembly

To disassemble the DMP-100, follow the procedures written in each figure, and for reassembly follow the same procedures in reverse order.

Upper Case

Ref. No.	Description	Manufacturer Part Number
1-1	Cover (T)	84611-2002
S-36	Screw, tapping M3×16	84001-3028
1-2	Case unit, upper (T)	84611-2001U
1-3	Clip, LED	84501-2049
1-4	Harness, lamp	84501-5151

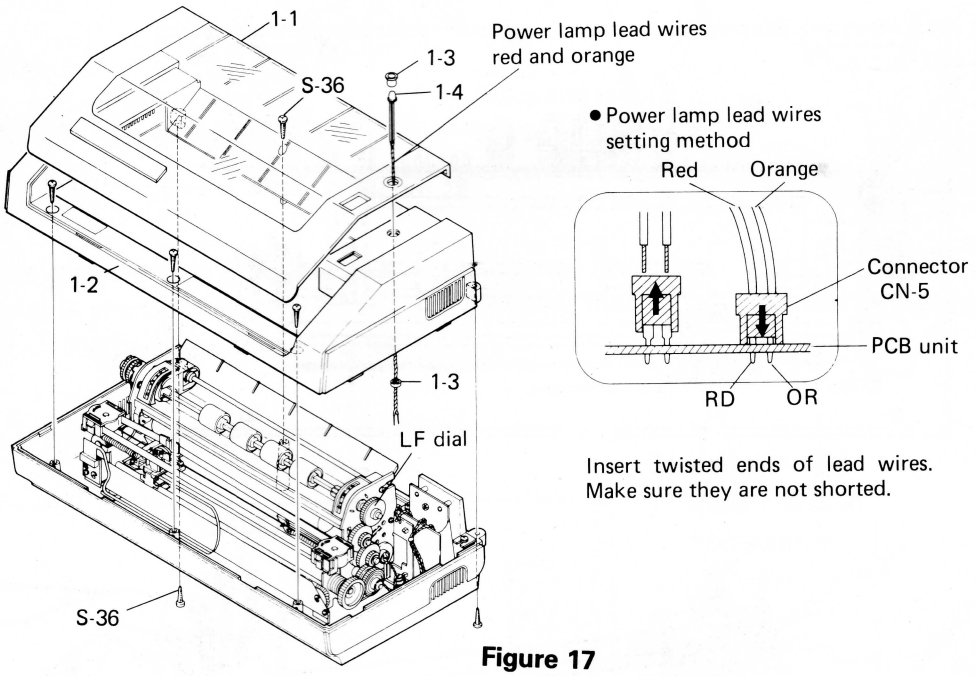


Figure 17

- Confirming the functions

Follow the procedures below to confirm the functions:

1. After applying power, check to see whether or not the power lamp is lit and the printer is initialized.
2. Check whether paper advances properly with LF dial.
3. Is ribbon advancing?
4. Is it possible to set paper properly?
5. Check printed characters (wrong printing, character missing, or smudging).
6. Is printing of the last column possible?
7. Is there any abnormality in character width, height, or space between characters?
8. Is there any dot missing from the upper or lower part of any character?
9. Are printed characters vivid? Is there any dirt caused by the ribbon?
10. Is the spacing of line feed proper?

Lower Case Block and Mechanism

Ref. No.	Description	Manufacturer Part Number
S-36	Screw, tappingM3×16	84001-3028
S-45	Screw M4×4	84001-4008
W-43	Washer, toothed lock M4	84003-4003
2-2	Screw, M. stop	84500-1350
2-3	Lower case block	
2-4	Mechanism	

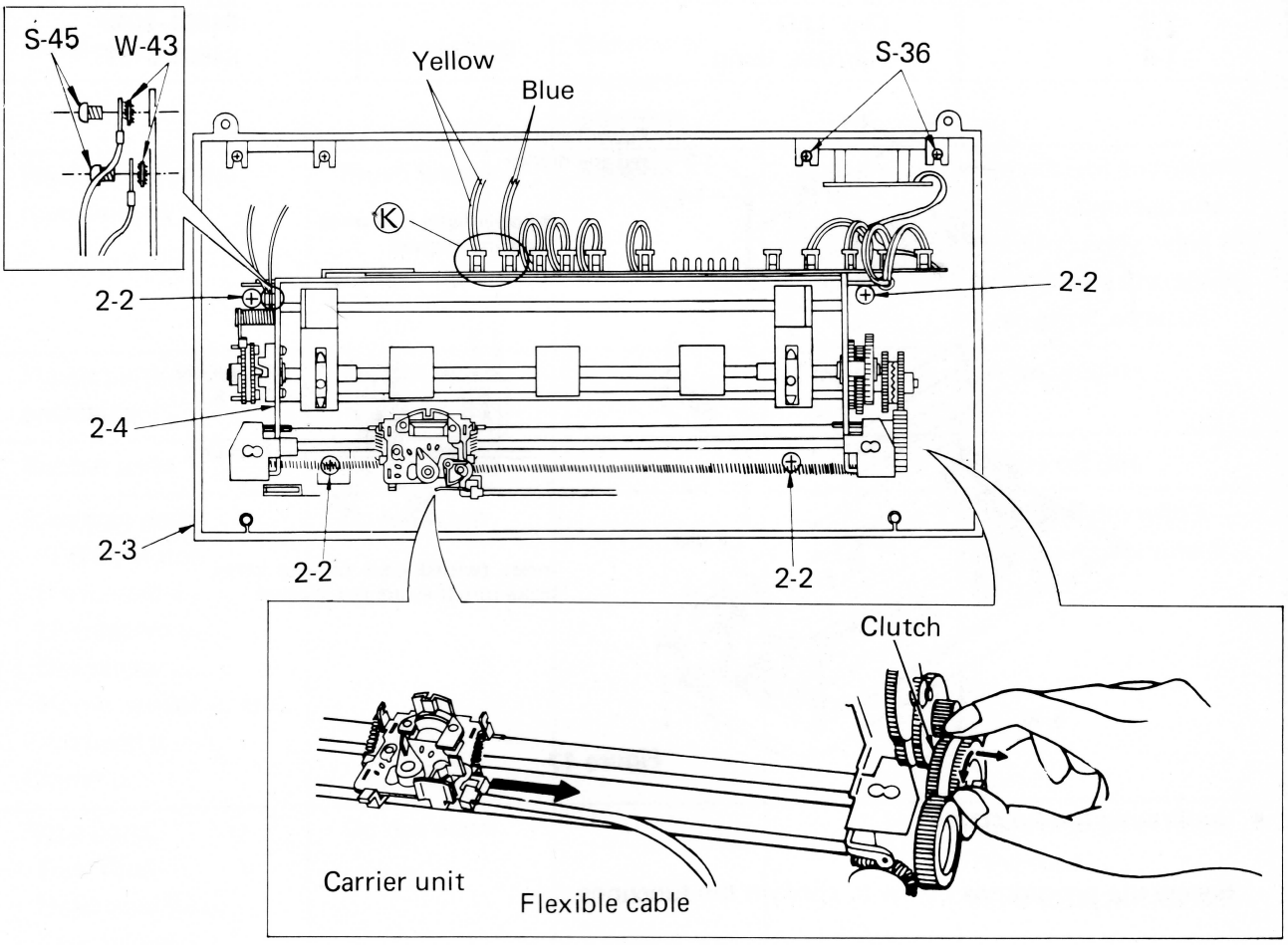


Figure 18

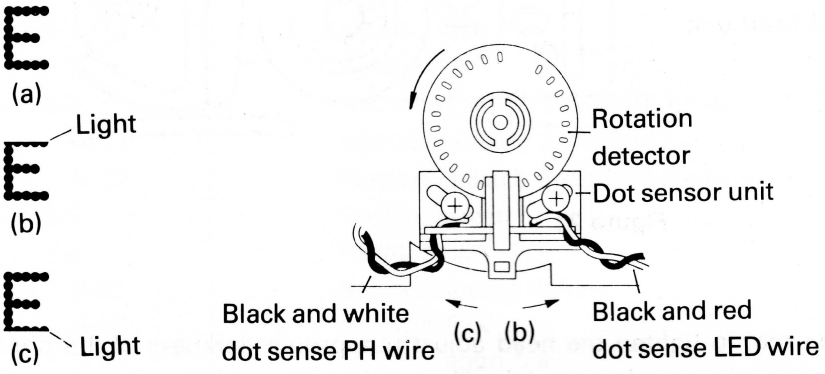
1. Before removing 2-3 and 2-4 with 2-2, the carrier unit must be moved to the center. When setting 2-3 and 2-4, be careful not to catch the lead wires or the recovery spring between 2-3 and 2-4, or to damage them in any way. Do not move the carrier unit directly by hand. By pulling and revolving the clutch on the right side counterclockwise, the carrier unit can be moved to the center.
2. Take care not to damage the flexible cable.

Note: The repair procedures for 2-3 and 2-4 are described beginning with the section entitled "Lower Case Block".

Adjustments for printing

Make the following adjustments after inserting the ribbon cassette and paper.

1. Adjust the position of the dot sensor unit.
   Print characters and check the darkness of the upper and the lower parts of the characters. If the darkness is not equal, adjust the position of the dot sensor unit.



(a) ... Character looks good.
(b) ... Upper part is light, move the dot sensor to the right.
(c) ... Lower part is light, move it to the left.

Figure 19

2. Adjust the gaps between the carrier unit and the home sensor unit.
   Gaps A and B, should be about 0.5 mm, with B smaller than C. The gaps can be adjusted by twisting the oblique line part of the ground plate (L).

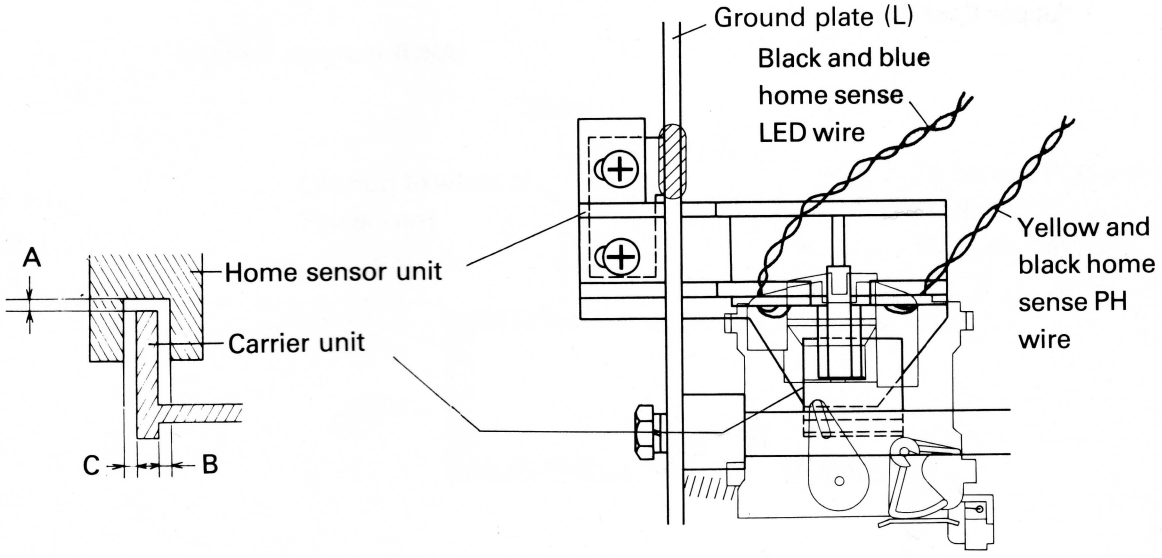


Figure 20

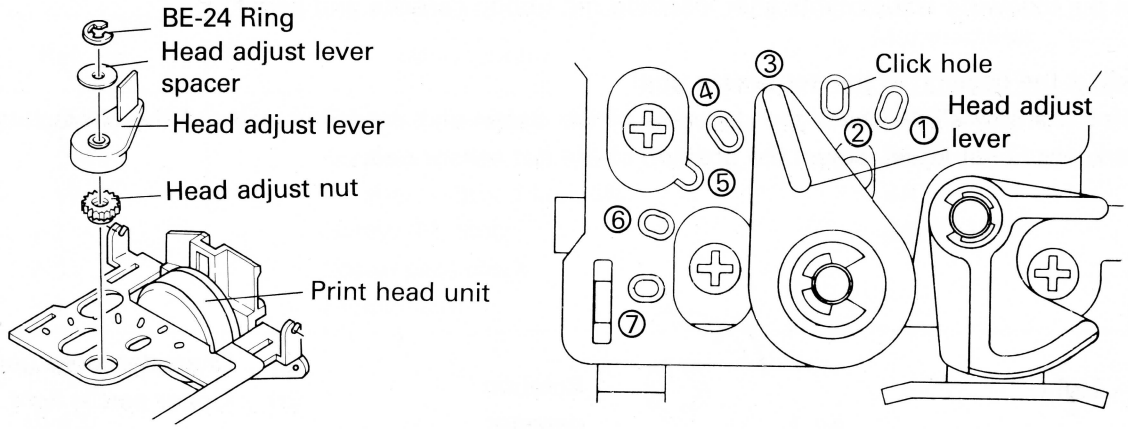


Figure 21

3. Adjust the print head unit
   By using a print head adjusting tool to tighten the head adjust nut, proper darkness of the printed character can be obtained. If there appears to be smudging, loosen it until smudging disappears. Set the head adjust lever at hole ③. (See Figure 21.)

Note:
- Since the print head unit is made of magnetic metal, do not use magnetized tools to adjust it.
- If smudging appears when you receive your printer, loosen the head adjust nut as shown above.
- Confirm the functions (confirm all the items previously described in the section entitled "Upper Case").

Lower Case Block

Ref. No.	Description	Manufacturer Part Number
S-36	Screw, tapping M3×16	84001-3028
M-20	Splice 35115	84500-5401
M-01	Extruded tubing 5×0.25×12	84500-5402
F3	Fuse	84510-5303 (USA)
3-1	Holder, fuse	84510-5251 (USA)
3-2	Bush, cord	84510-2015 (USA)
3-3	A.C. cord set SVT AWG18 KP30	84510-5352 (USA)
M-02	Extruded tubing 3×0.25×12	84095-3465
M-32	Harness, switch (including switch)	84601-5155
3-5	Switch, power	84511-5103
3-6	Panel, power	84501-2006
S-43	Screw, tapping M4×8	84001-4009
S-47	Screw M4×6	84001-4007
N-41	Nut, hexagon M4	84004-4001
W-43	Washer, toothed lock M4	84003-4003
M-31	Harness, GND	84095-3325
M-21	Terminal 171512-5	84092-2039
3-7	Transformer	84520-5201 (USA)
3-8	Case unit, lower (T)	84611-2003U (USA)

Harness diagram (USA)

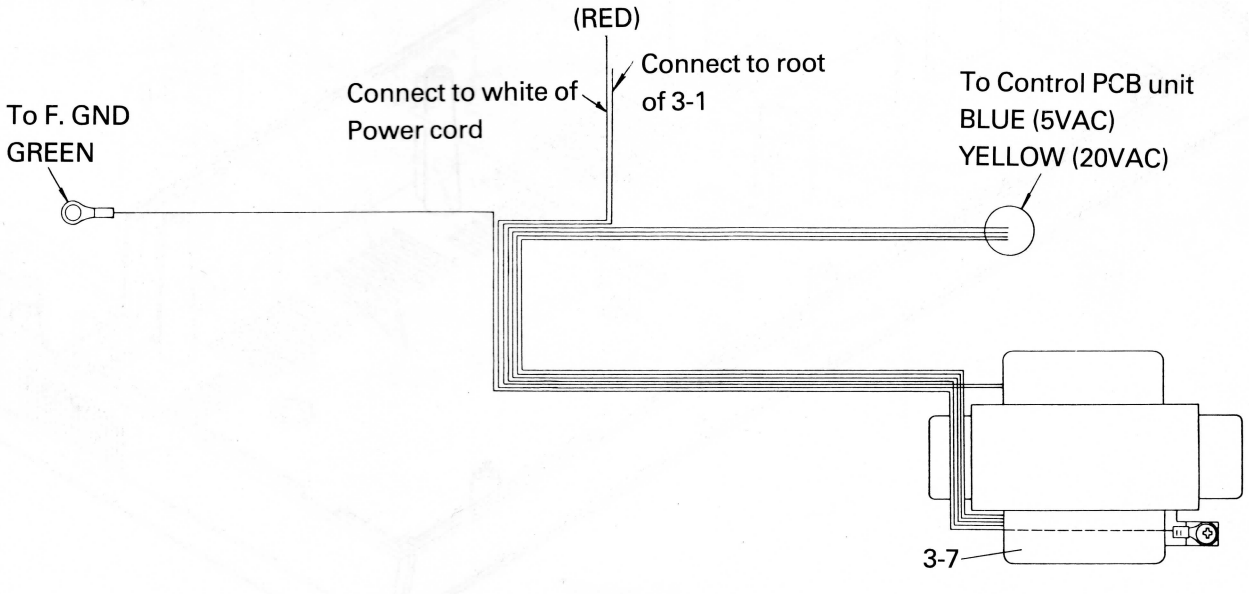


Figure 22

EXPLODED VIEW (LOWER CASE BLOCK) (USA)

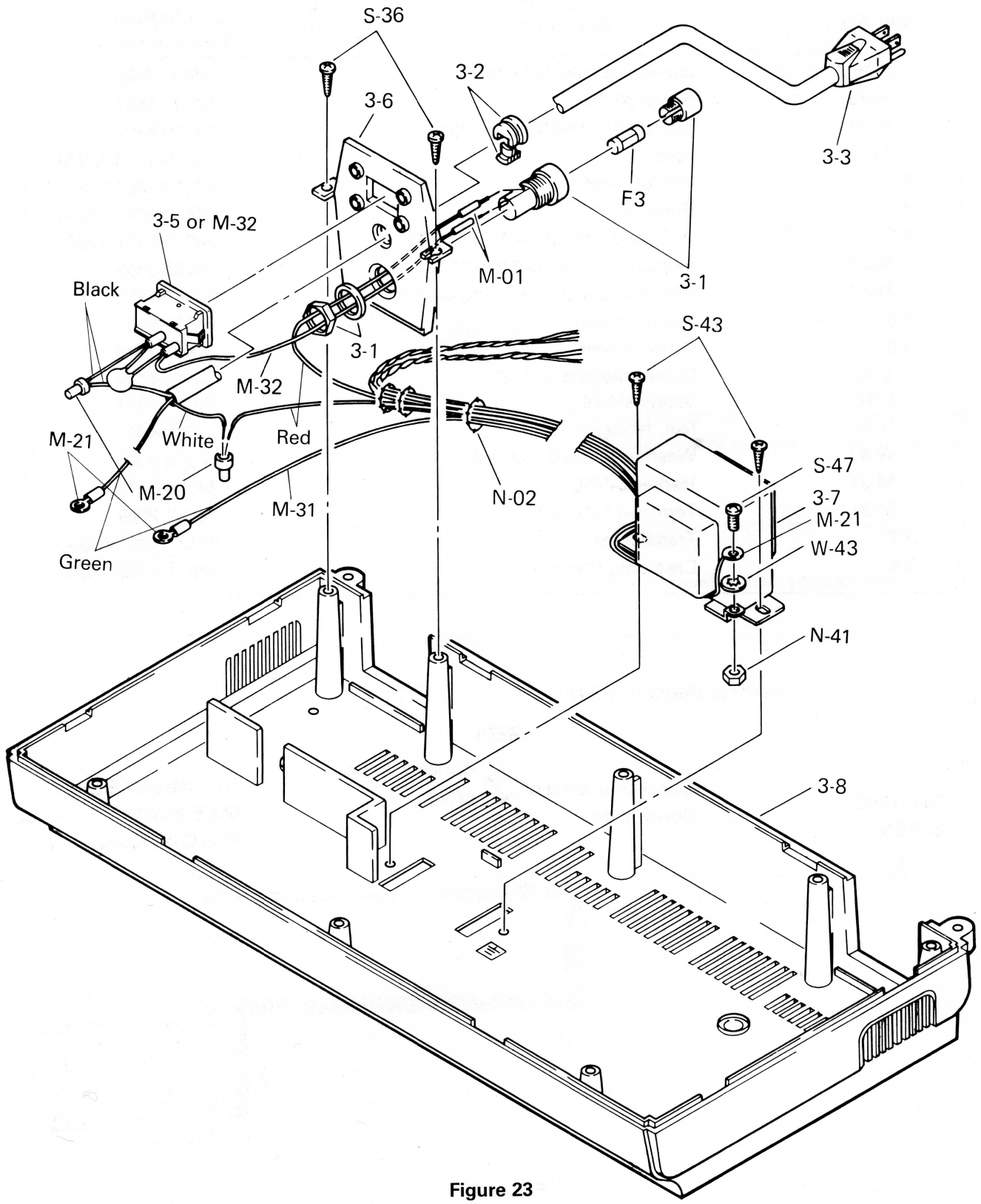


Figure 23

Control PCB (Printed Circuit Board) Unit

When repairing the PCB unit, refer to the schematic diagram (Appendix C), the PCB view (Appendix A), and the timing diagrams (Figures 10-13)

Ref. No.	Description	Manufacturer Part Number
S-35	Screw, tapping M3×8	84001-3026
4-1	Panel, input	84611-2007
S-44	Screw, tapping M4×15	84001-4006
S-48	Screw, tapping M4×6	84001-4011
4-2	Control PCB unit	84611-5001U
F2	Fuse (5.2×20 mm) 1.5A	84091-7256
F1	Fuse (5.2×20 mm) 1A	84091-7248
4-3	Receptacle, PCB	84501-1320
4-4	Support, PCB	84600-1321
N-02	Wire band A KM-85	84500-5409

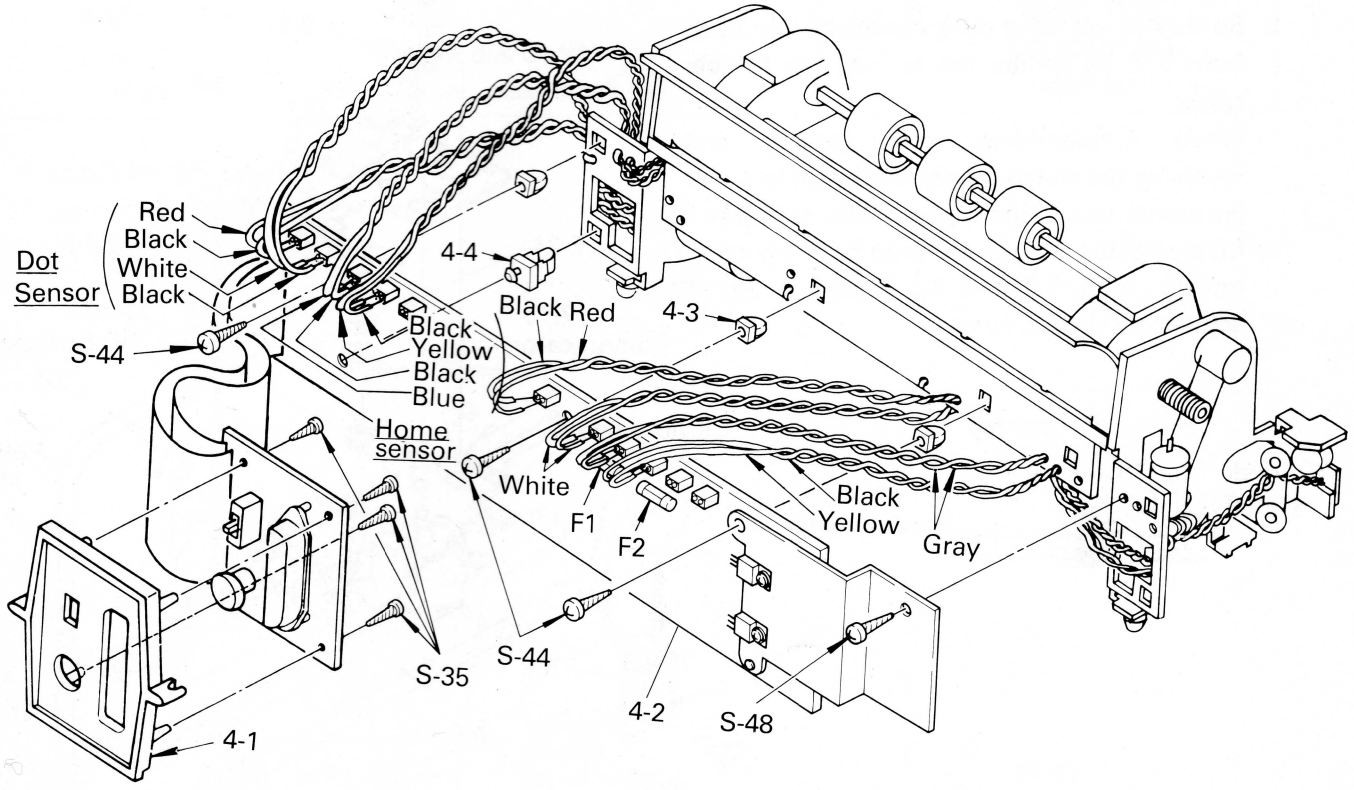
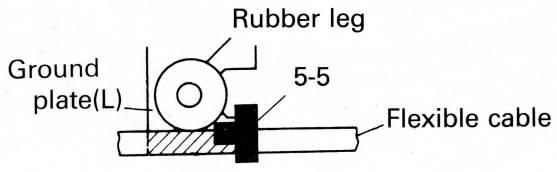


Figure 24

Print Head Unit

Ref. No.	Description	Manufacturer Part Number
E-25	BE-24 ring	84005-2402
5-0	Spacer, head adjust lever	84500-1245
5-1	Lever, head adjust	84500-1242A-01
5-2	Nut, head adjust	84500-1240-01
5-3	Cable guide	84500-1246-01
5-4	Spring, head adjust	84500-1241-01
5-5	Holder, cable	84500-1248
5-6	Print head unit	84600-1200U
S-31	Screw M3×0.5×6	84001-3001
5-7	Board unit, head	84500-1107U
5-8	Connector, head	84500-1108
5-9	Plate, spring press	84600-1167

1. Use a print head adjusting tool ⓐ to remove the cable guide from inside.
2. Be sure to get rid of dust, especially iron dust, from 5-5. Be careful not to hurt the flexible cable.
   When reassembling, keep pulling and revolving the clutch counterclockwise to move the carrier unit to the center. (Refer to Figure 25).
3. Barely tighten 5-2 with the print head adjusting tool ⓑ. E-25, 5-0, and 5-1 should be set after adjusting the print head.



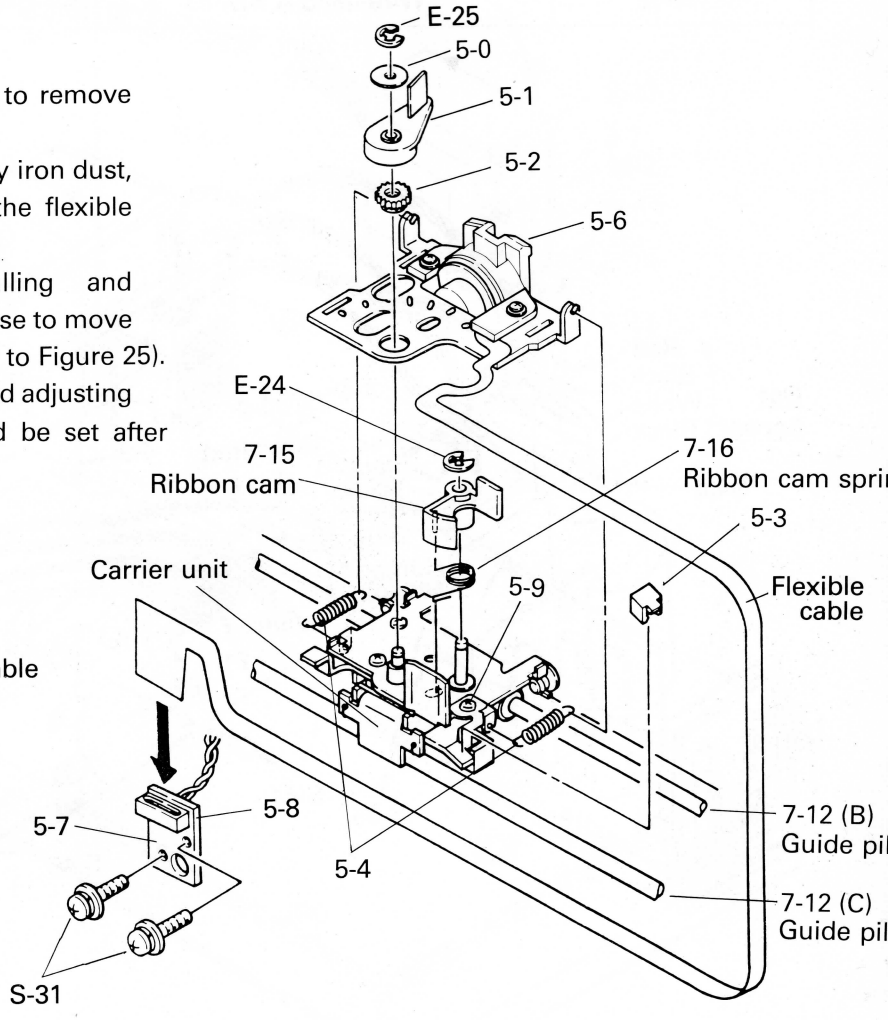


Figure 25

Line Feed Mechanism

Ref. No.	Description	Manufacturer Part Number
6-1	Spring, LF rope	84500-1144-01
E-40	E-40 Ring	84005-4001
6-1A	Spacer, reverse stop	84500-1142
6-2	Claw, reverse stop	84500-1141
6-3	Spring, reverse stop	84500-1140
S-28	Screw M2.6×0.45×6	84001-2604
S-31	Screw M3×0.5×6	84001-3001
6-4	Solenoid unit, LF	84500-1030U
E-38	BE-37 Ring	84005-3702
6-5	Wheel B, LF claw	84500-1131
6-6	Pin, gear	84500-1083
6-7	Claw wheel A unit	84500-1130U-01
6-8	Spring, claw wheel	84500-1128-01
S-32	Screw tapping M3×8	84001-3023
6-9	Stopper, LF claw	84500-1026
E-37	E-37 Ring	84005-3701
6-10	LF dial	84501-1125
6-11	Spring, dial clutch	84500-1124
W-61	Washer, plain small M6	84003-6001

* Lubricate SF-100 on the saw teeth of 6-5 and 6-7

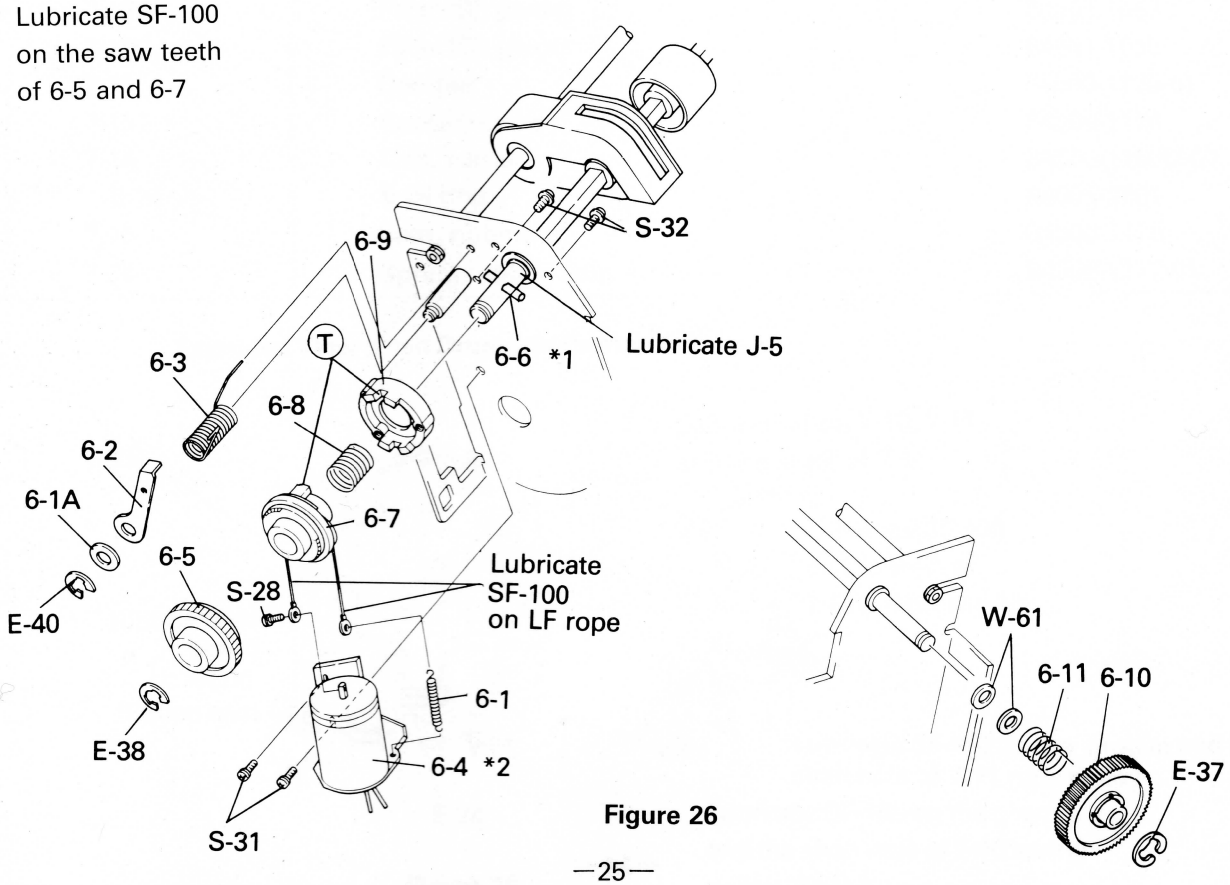


Figure 26

1. 6-6 should be in the groove of 6-5.
2. 6-4 and 6-9 adjusting method:

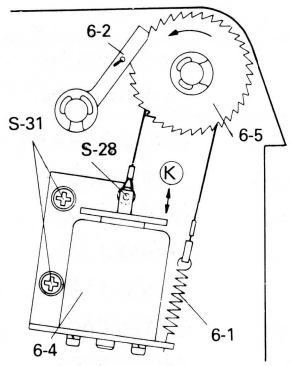


Figure 27

- While pushing down part Ⓚ of 6-4, fix 6-4 with S-31 at the position where 6-2 falls from a tooth top of 6-5. The screw S-28 should be set in the direction shown in figure 27.
- While pressing down part Ⓚ of 6-4, fix 6-9 with S-32 at the position where part Ⓣ of 6-9 and part Ⓣ of 6-7 are coupled thereby stopping the revolution of 6-7.
- Confirm line-feed functions by pressing part Ⓚ for at least two complete rotations of 6-5.

Feed Drum and Carrier Unit

Ref. No.	Description	Manufacturer Part Number
S-30	Screw M3×0.5×4	84001-3011
W-32	Washer, Plain M3	84003-3005
7-1	Guide, FPC	84501-1196
7-2	Spring, recovery	84501-1194
7-3	Spring, rope	84500-1190
7-4	Stopper, Rope (1 set) (different length)	84500-1184 84500-1185 84500-1186
7-5	Rope (L) unit, head	84501-1187U-01
E-17	E-17 ring	84005-1701
7-6	Feed drum unit	84501-1183U
7-7	Step, drum spring	84500-1182
7-8	Spring, drum	84500-1181
E-25	BE-24 ring	84005-2402
7-9	Pin, pulley	84500-1004
7-10	Pulley, spring	84500-1012
N-31	Nut, flange M3	84004-3002
7-101	Screw, rope pulley stop	84500-1005-01
7-11	Pulley, rope	84501-1010
N-31	Nut, flange M3	84004-3002
7-12	Pillar, guide	84501-1051
7-12B	Pillar (B), guide	84501-1052
7-12C	Pillar (C), guide	84501-1053
7-13	Damper	84500-1179-01
7-131	Spacer, carrier	84500-1176
7-14	Unit, carrier	84500-1160U-01
E-24	E-24 ring	84005-2401
7-15	Cam, ribbon	84500-1175
7-16	Spring, ribbon cam	84500-1177-01

Exploded View (Feed Drum and Carrier Unit)

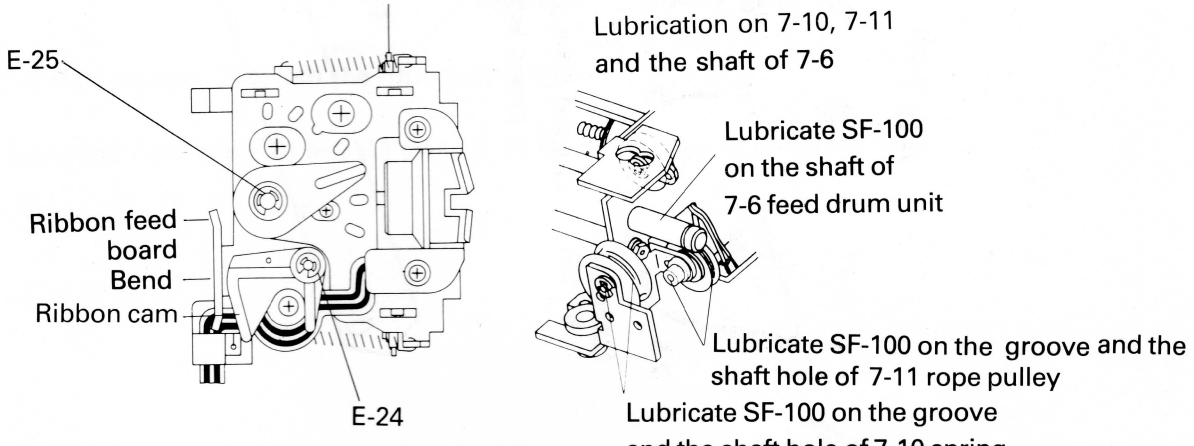


Figure 28

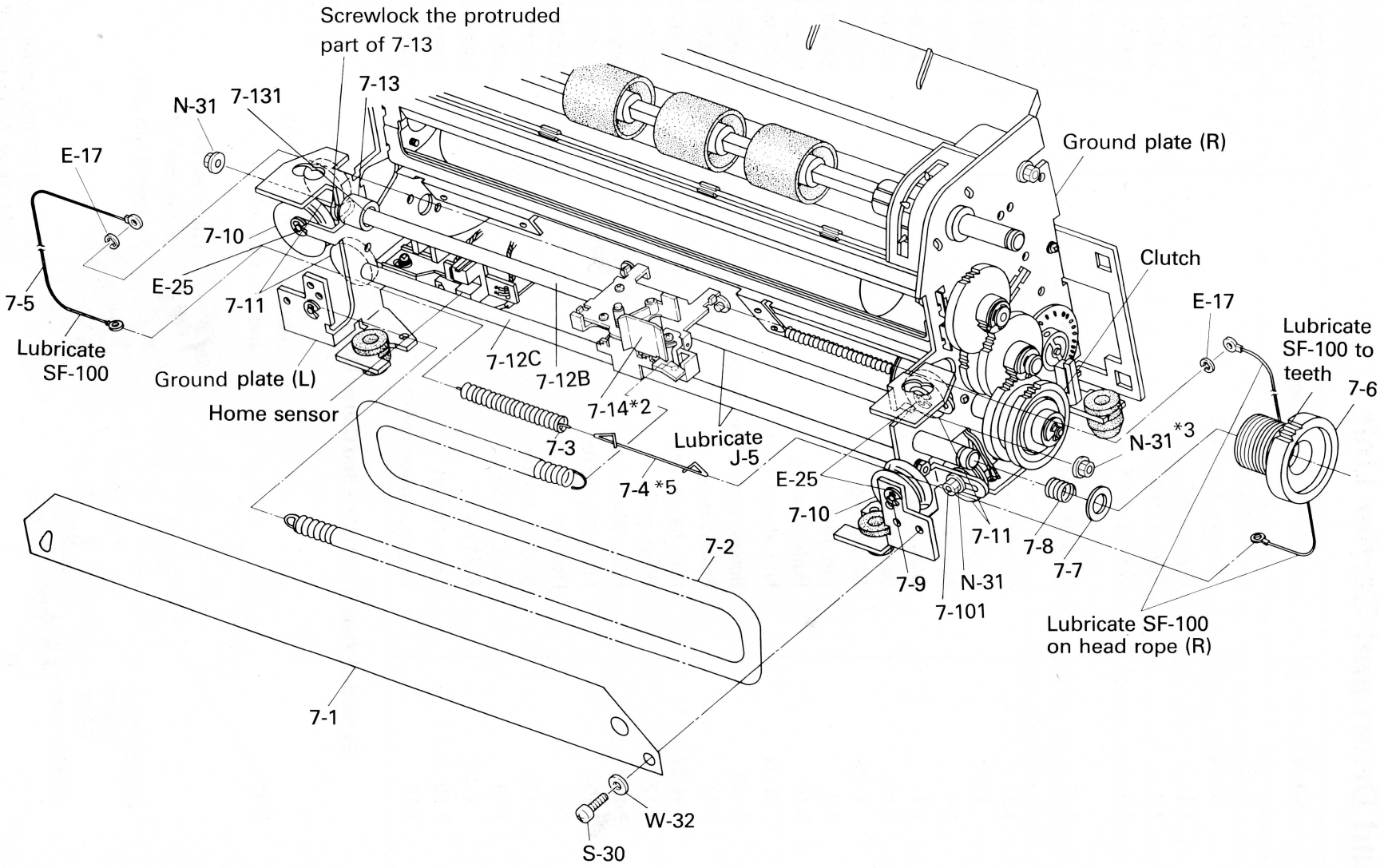

Screwlock the protruded part of 7-13
7-13
N-31
7-131
E-17
7-10
E-25
7-5
7-11
Lubricate SF-100
Ground plate (L)
Home sensor
7-12C
7-12B
7-14*2
7-3
7-4*5
Lubricate J-5
7-2
7-1
W-32
S-30
Ground plate (R)
Clutch
E-17
Lubricate SF-100 to teeth
7-6
N-31*3
E-25
7-10
7-11
7-8
7-7
7-9
N-31
7-101
Lubricate SF-100 on head rope (R)

Figure 29

1. The ribbon cam and the bend of the ribbon feed board must be parallel. If they are not parallel, ribbon feeding may function abnormally. In this case, you can either change the ribbon cam or adjust the bend of the ribbon feed board by using pliers to fit the ribbon.

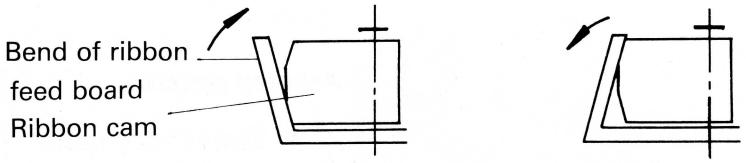


Figure 30

2. When the carrier unit is at the home position, there should be gaps between the home sensor and the carrier unit (refer to Figure 20).

3. Firmly insert a guide pillar into the ground plates R and L, tighten it with N-31, and screwlock on top of N-31.
4. Once you have removed the feed drum unit (7-6), you must install a new one. A new one, which has 7 winds of the head rope (R), is fixed by a fixing tool. The fixing tool should be taken off after you have installed the new feed drum unit.

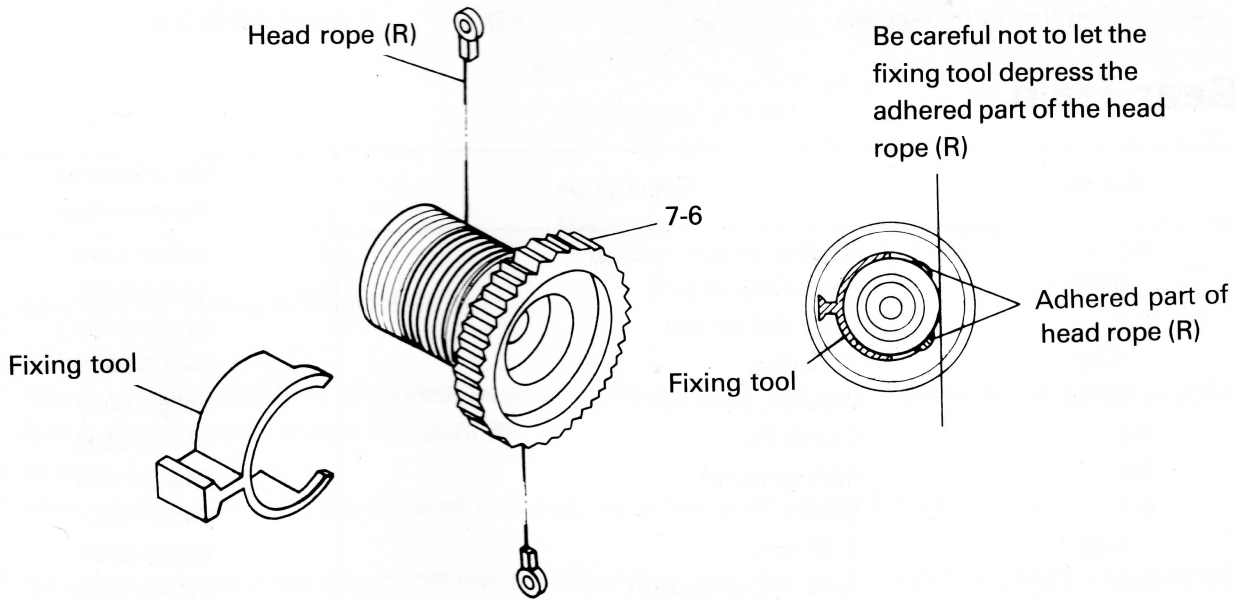


Figure 31

5. Insert the rope stopper (7-4) into the rope spring (7-3).

6. When fixing the head rope (R) and (L) using E-17, be careful not to harm the rope.

7. Check the following after attaching the recovery spring (7-2).
While manually pulling and revolving the clutch counterclockwise to move the carrier unit to the right end, check the rotation of the rope pulley (7-11), the gaps of the rope stopper (7-4), and the adhered position and status of the feed drum unit (7-6).

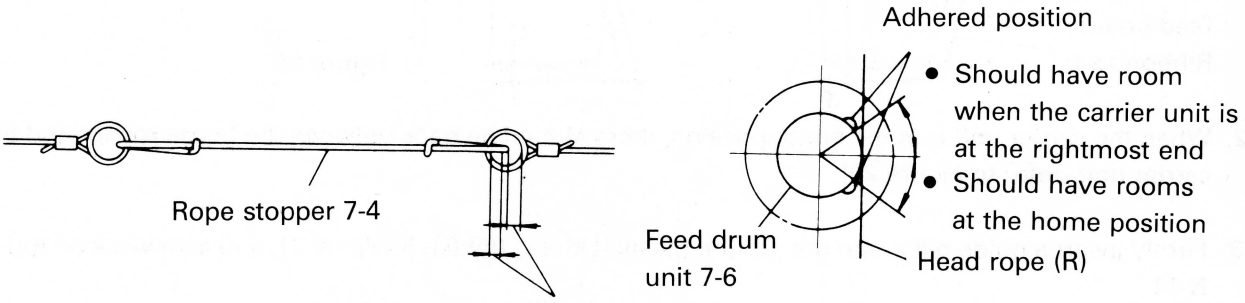


Figure 32

After pressing the H solenoid to release the clutch (figure 6), check the smooth motion of the carrier unit while returning to the home position. Also check the adhered position and the status of the feed drum unit (7-6) at the home position.

Gear Train

Ref. No.	Description	Manufacturer Part Number
8-1	Spring, clutch moving	84500-1093
S-31	Screw M3×0.5×6	84001-3001
8-2	Unit, dot sensor	84500-1100U
E-28	E-28 ring	84005-2801
W-44	Washer, plain M4	84003-4004
8-4	Clutch (B)	84501-1090
8-6	Spring, clutch	84500-1088
8-7	Clutch	84501-1087
E-37	E-37 ring	84005-3701
8-8	Gear (B), reduction	84501-1086
8-9	Pin, gear	84500-1083
8-10	Detector, rotation	84611-1085
E-38	BE-37 ring	84005-3702
8-11	Gear, platen	84501-1082
8-12	Pin, gear	84500-1083
8-13	Gear, reduction	84500-1081
S-26	Screw M2.6×0.45×4	84001-2602
8-14	H solenoid	84500-1016
S-33	Screw M3×0.5×5	84001-3003
8-15	Motor	84600-1014

Exploded View (Gear Train)

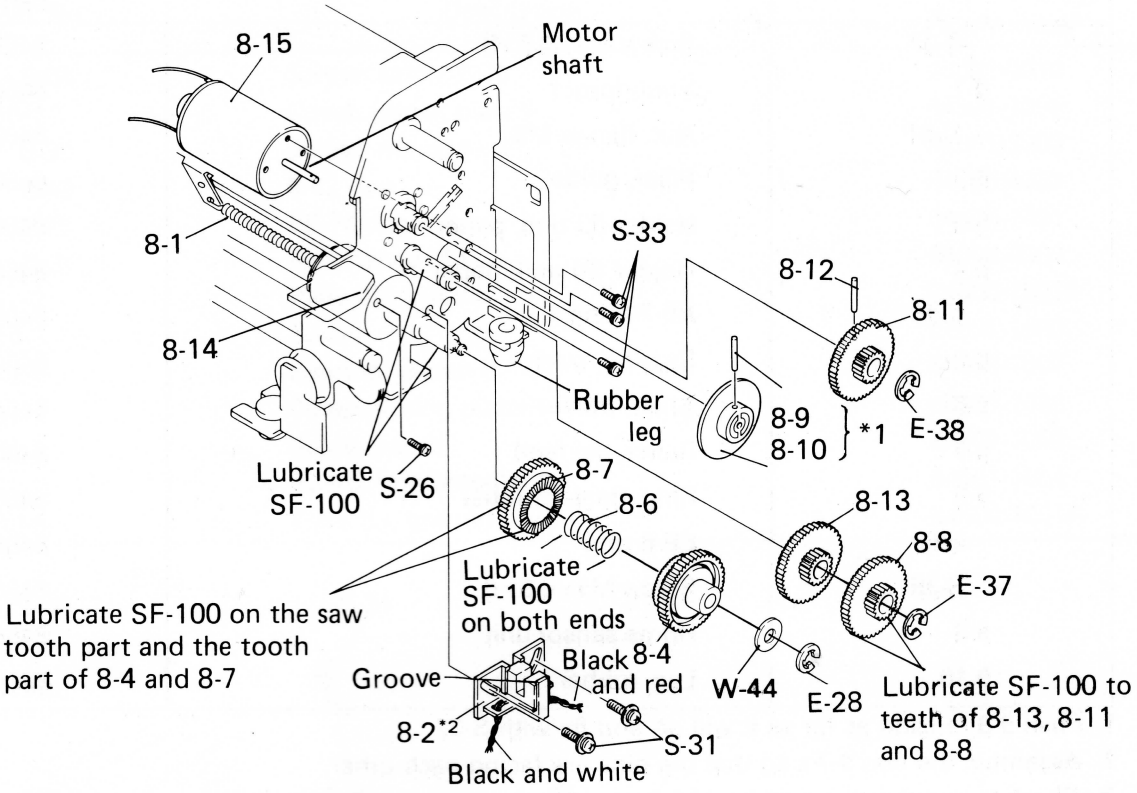


Figure 33

1. Methods for setting 8-10 and 8-9:

- Attaching 8-10
  When a platen ridge is at the horizontal position, couple 8-10 and 8-13 in the status of a_3 and a_4 of 8-10 facing downward as shown in Figure 34.
- Attaching 8-9
  After rotating 8-10 to fit the holes of 8-10 and the motor shaft, insert 8-9 using pliers.

2. Insert the M. stop screw (Figure 18) into the rubber leg, and then fix 8-2 with S-31. Make sure that there are gaps between the grooves of 8-2 and 8-10

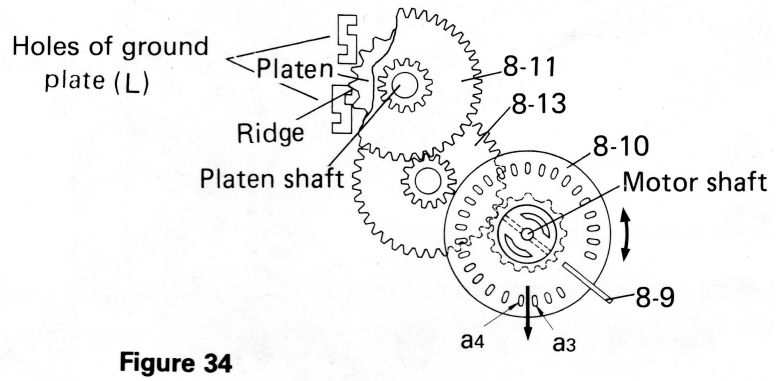


Figure 34

Tractor

Ref. No.	Description	Manufacturer Part Number
S-37	Screw M3×0.5×8	84001-3021
9-1	Soundproof	84501-1197
N-31	Nut, flange M3	84004-3002
9-2	Pillar, guide	84501-1051
9-3	Holder (L) unit, paper	84500-1149U
9-4	Holder (R) unit, paper	84500-1147U
E-75	BE-74 ring	84005-7401
9-5	Bearing, tractor	84500-1008
9-6	Shaft, tractor	84501-1068
9-7	Roller, pin feed	84500-1070
9-8	Ring, tractor rubber	84500-1071
E-60	CE-6 ring	84005-6001
S-38	Screw M3×0.5×6	84001-3016
9-9	Home sensor unit	84500-1104U
9-10	Leg, rubber	84500-1095

1. Push 9-9 outside as far as it will go and fix with S-32
2. Assemble the two 9-7's so that the pins are facing each other.
3. Check to see that the surface of 9-6, part Ⓛ, is smooth and has no scar.

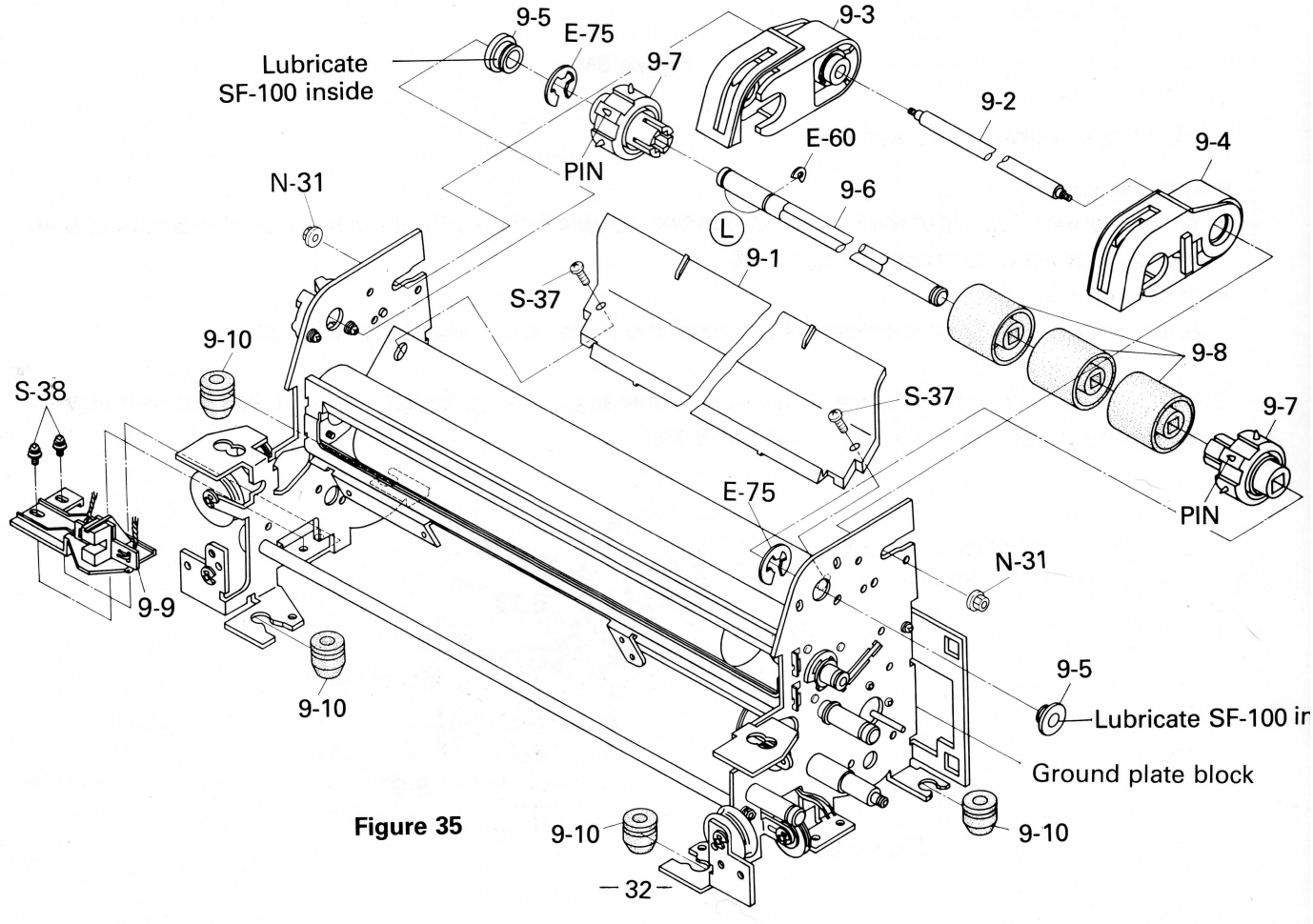


Figure 35

Platen

Ref. No.	Description	Manufacurer Part Number
S-04	Screw M3×0.5×6	84001-3010
10-1	Cover, upper, platen	84501-1066
S-33	Screw M3×0.5×5	84001-3003
E-42	E-42 ring	84005-4003
E-75	BE-74 ring	84005-7401
N-31	Nut, flange M3	84004-3002
10-2	Plate (R), ground	84500-1001A
10-3	Platen	84501-1060
10-4	Bearing, platen B	84500-1007
10-5	Cover, under, platen	84501-1058
10-6	Guide, paper	84501-1056
10-7	Board, reinforcement	84501-1054
10-8	Plate (L), ground	84500-1021A

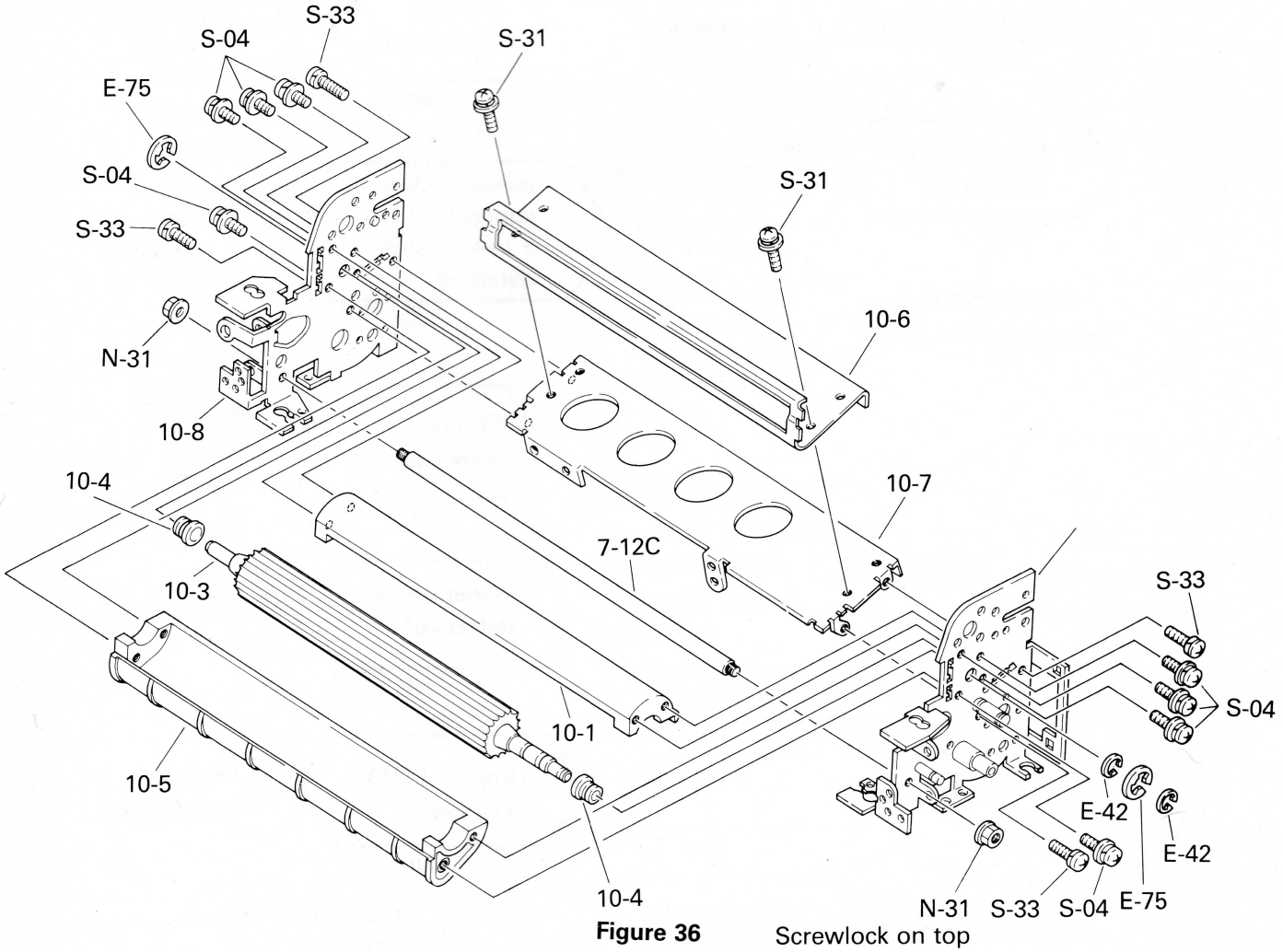


Figure 36

Note In case a platen ridge is broken, it is better to throw the mechanism away than to replace a platen because it takes much time and also a special tool is required to set the both ground plates in parallel position.

6/ Troubleshooting

• The power lamp does not light.

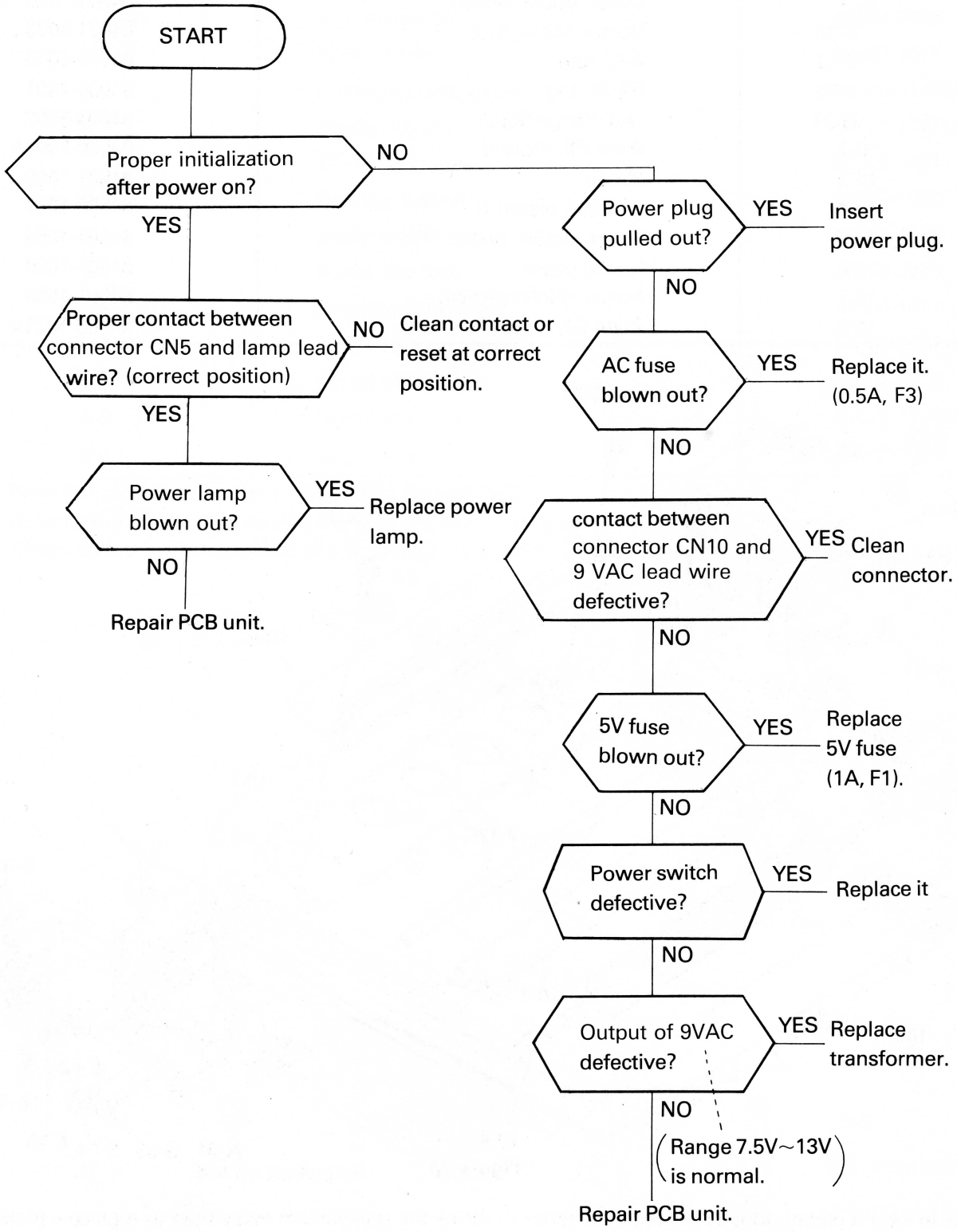


Figure 37

•No initialization.

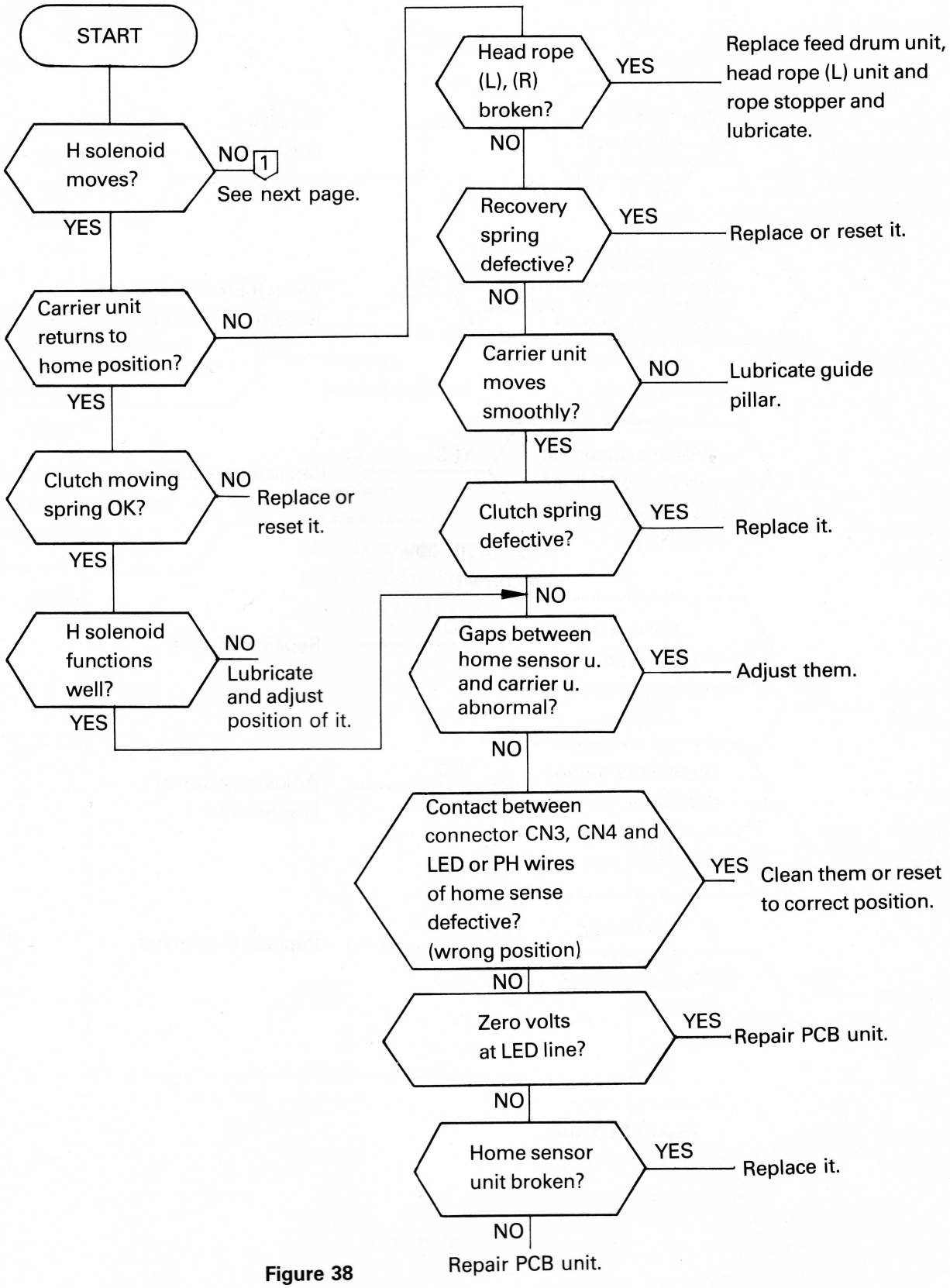
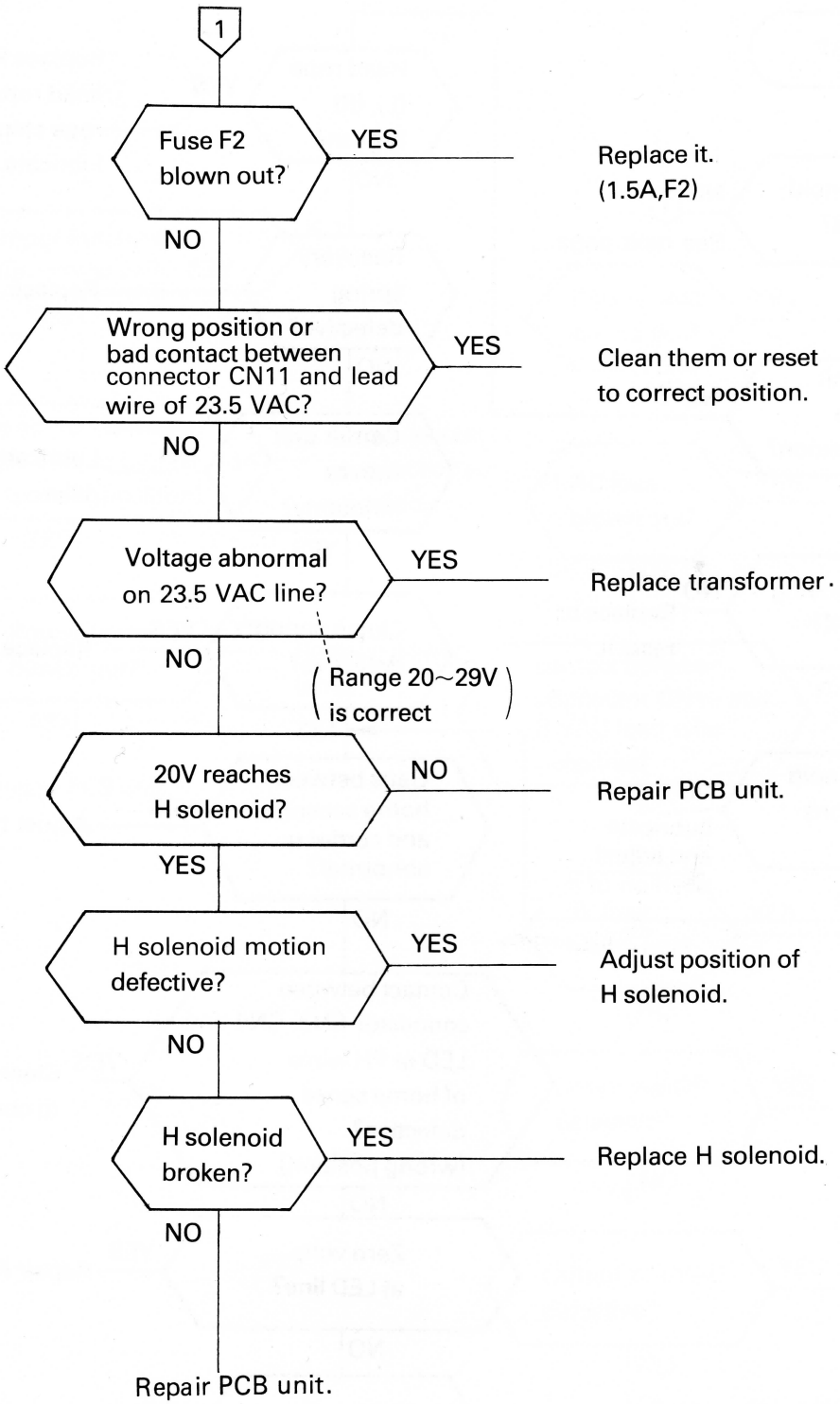


Figure 38


1
Fuse F2 blown out?
YES
Replace it. (1.5A,F2)
NO
Wrong position or bad contact between connector CN11 and lead wire of 23.5 VAC?
YES
Clean them or reset to correct position.
NO
Voltage abnormal on 23.5 VAC line?
YES
Replace transformer.
NO
(Range 20~29V is correct)
20V reaches H solenoid?
NO
Repair PCB unit.
YES
H solenoid motion defective?
YES
Adjust position of H solenoid.
NO
H solenoid broken?
YES
Replace H solenoid.
NO
Repair PCB unit.

• The carrier unit does not move with a print command.

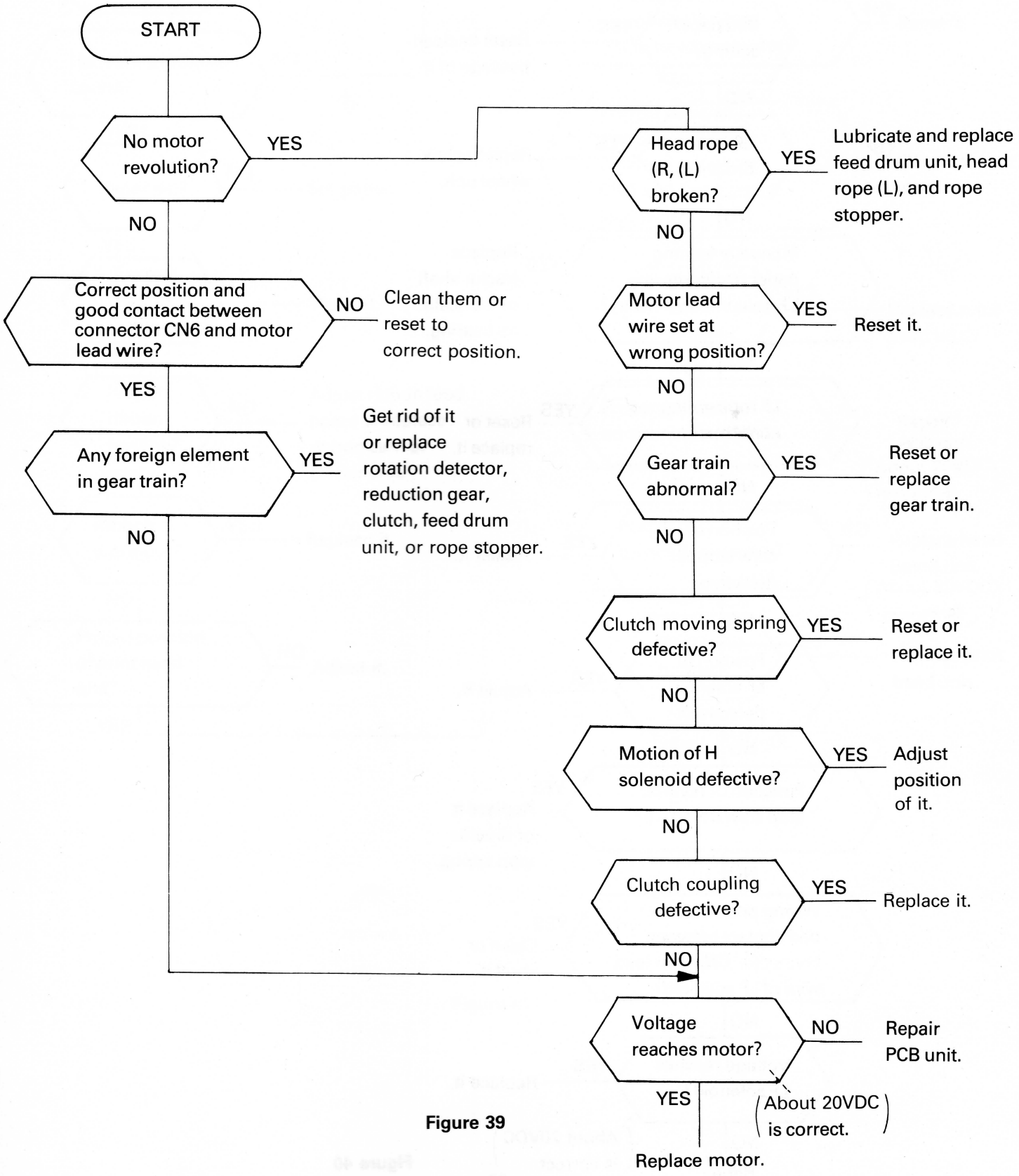


Figure 39

• Improper paper feed movement.

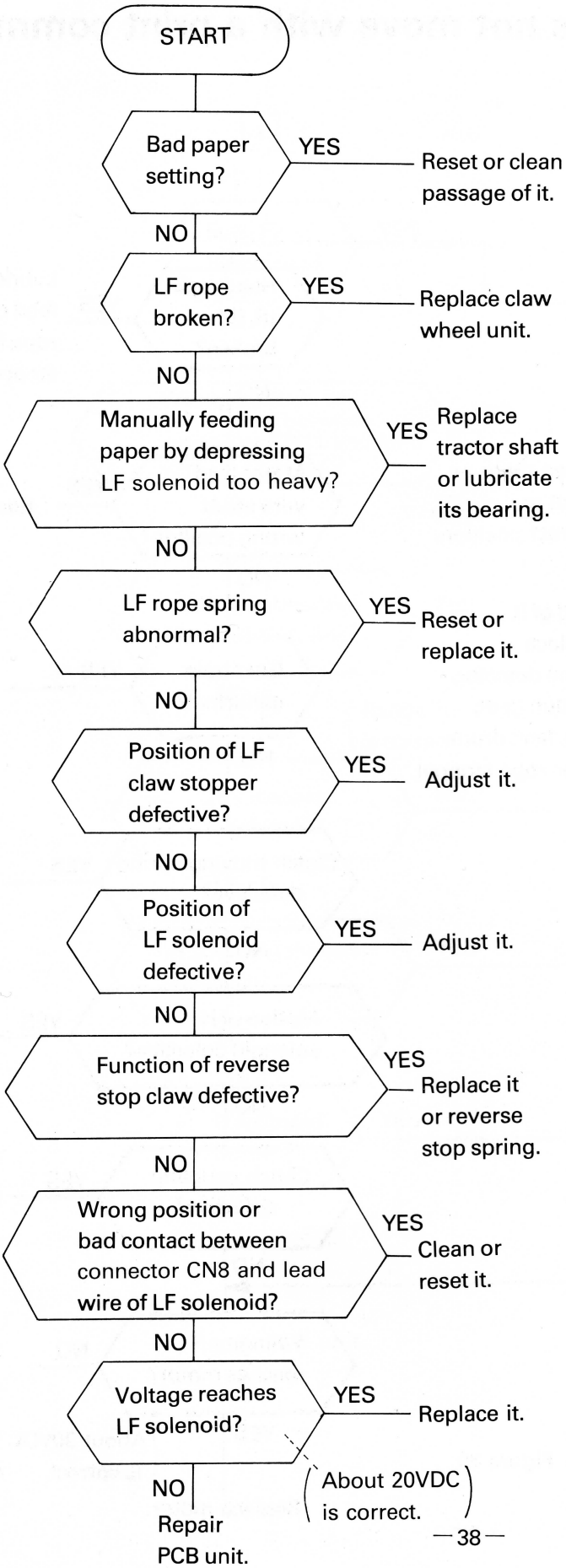


Figure 40

• No printing or poor print quality.

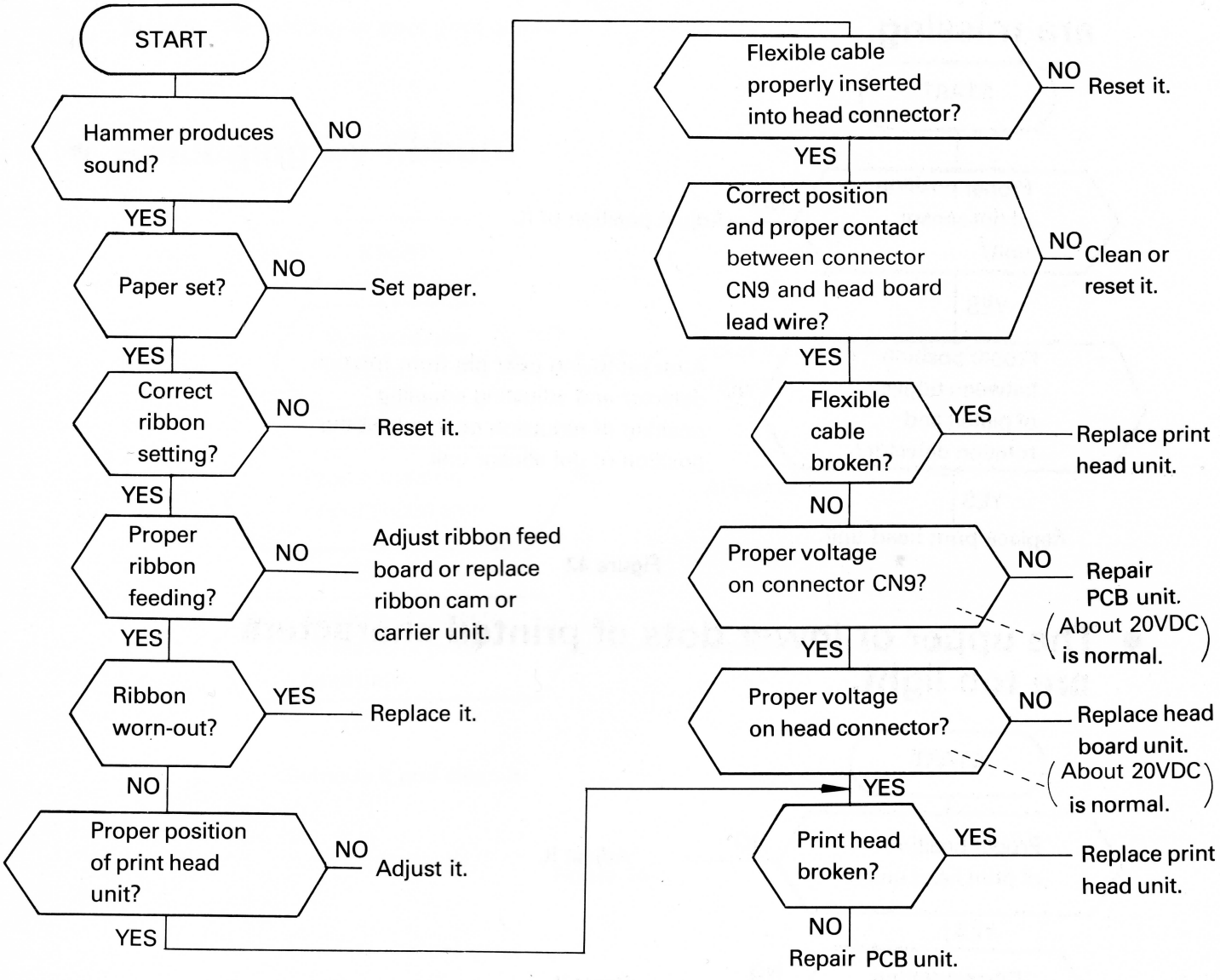


Figure 41

• The upper or lower dots of printed characters are missing.

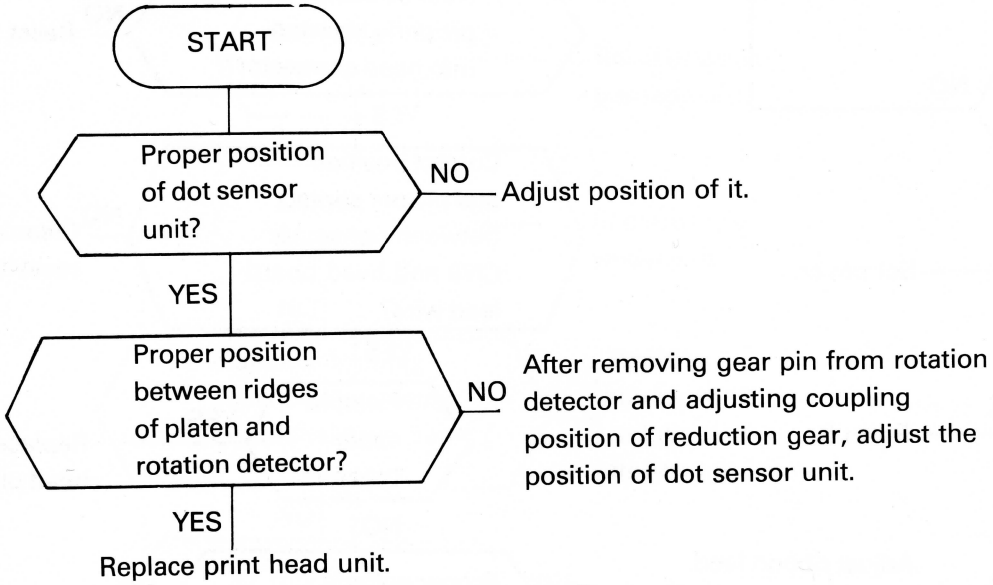


Figure 42

• The upper or lower dots of printed characters are too light.

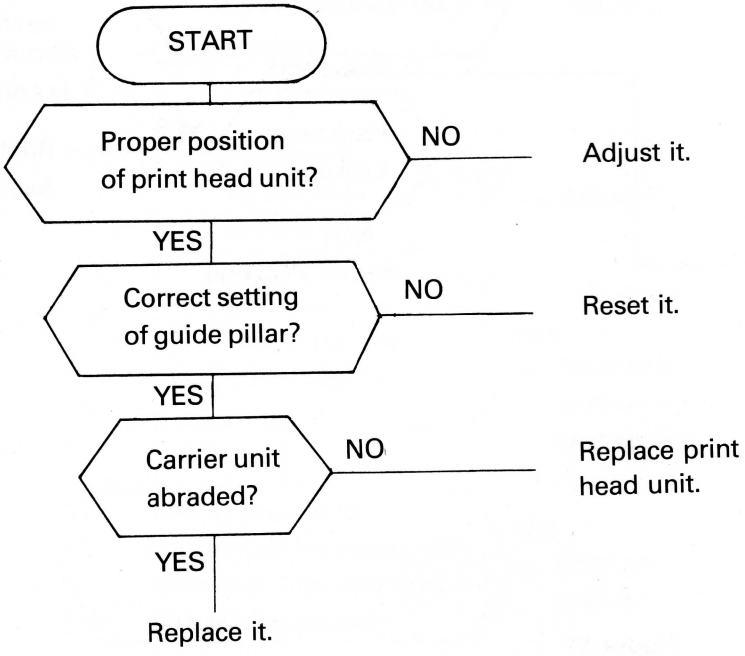


Figure 43

• Printing is too light.

Refer to "No printing or poor print quality".

• Smudging by ribbon.

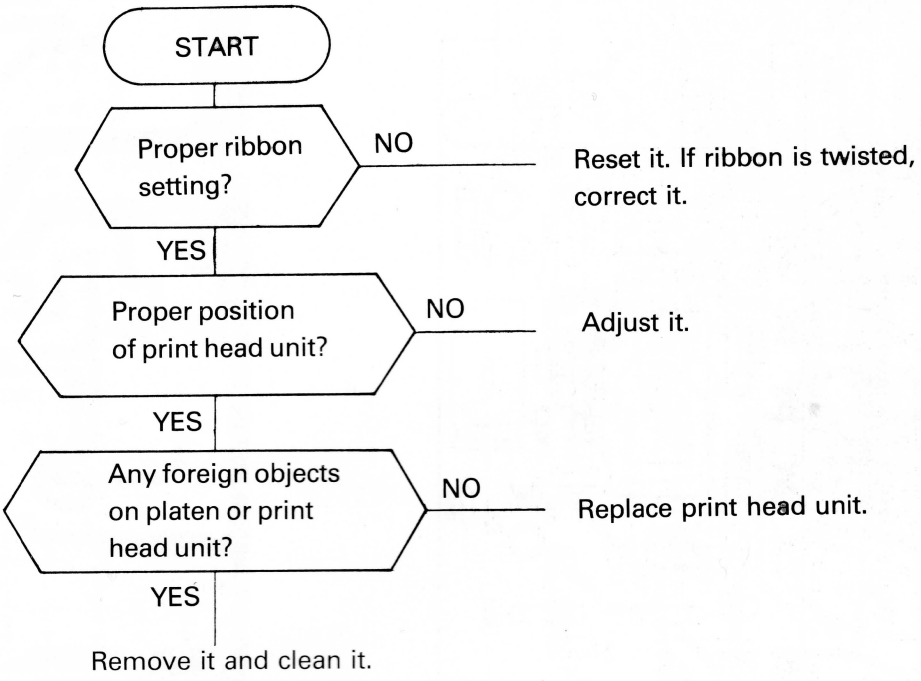
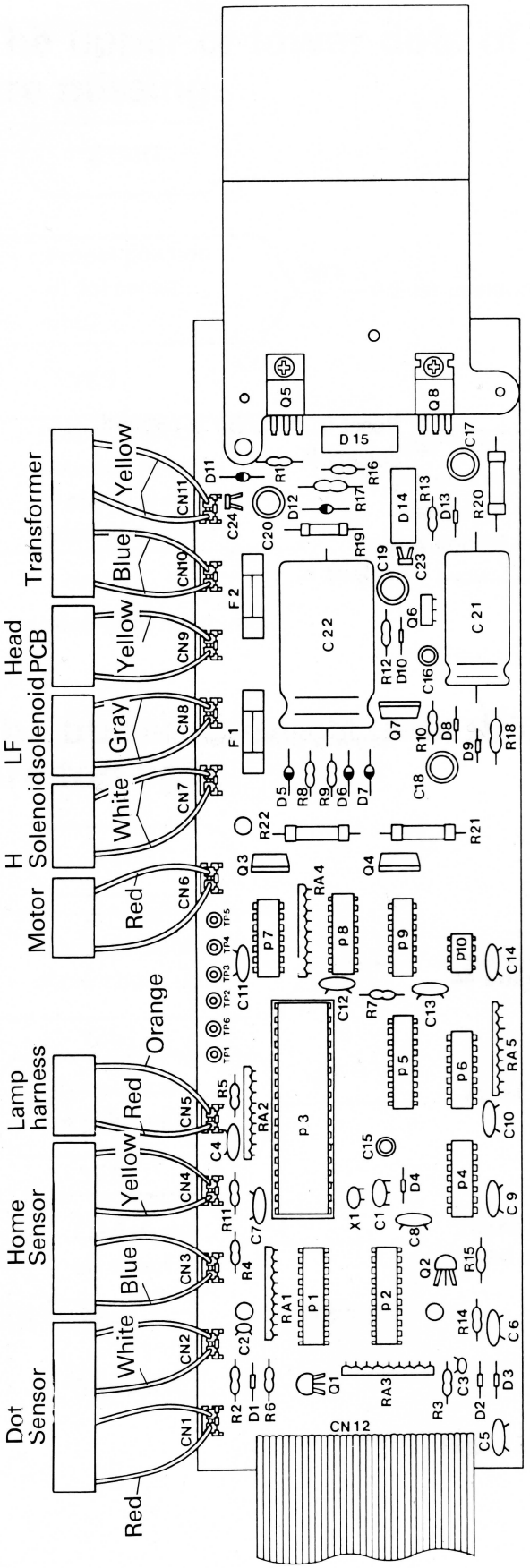
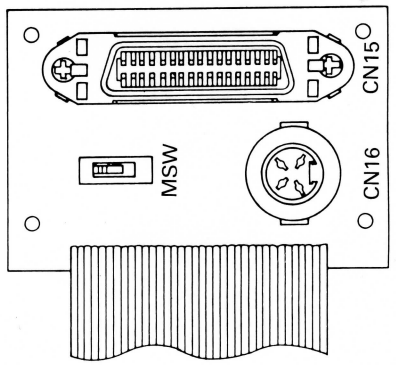
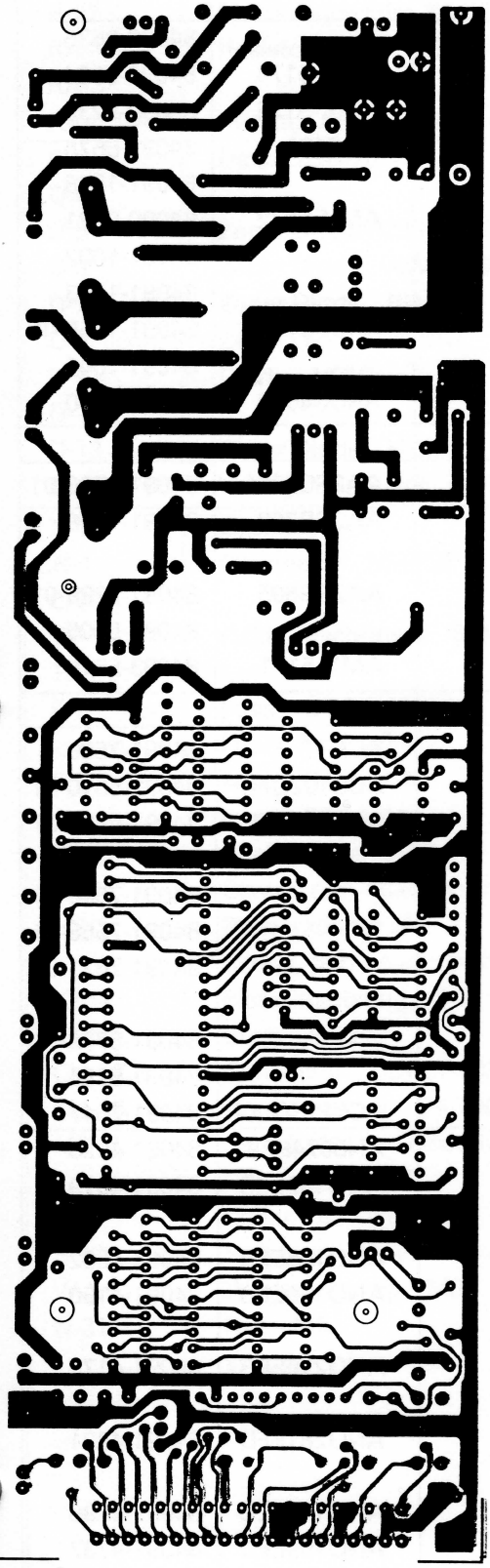


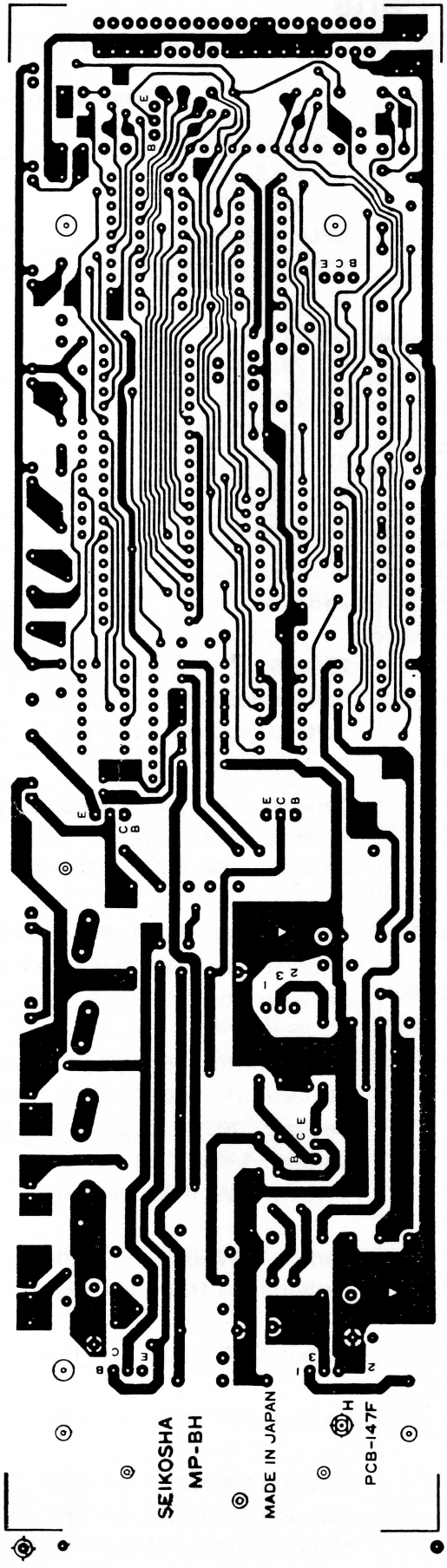
Figure 44

Appendix A/ Printed Circuit Board (PCB) Views









PCB-E-144

Appendix B/ Parts List

PCB Parts

Model: B_{02} (USA), B_{03} (Europe), B_{04} (Australia), B_{05} (Canada)

Ref. No.	Description	Model	Radio Shack Part Number	Manufacturer Part Number
	Integrated Ciurcuits			
P-1	IC 74LS374			84090-9636
P-2	IC 74LS373		AMX-5174	84090-9504
P-3	CPU MBL8049-NM162		AMX-5175	84090-9235
(P-3)	IC Socket (40P) DILB40P		AJ-7189	84091-6675
P-4	IC 74LS14			84091-1568
P-5	RAM 2114		AMX-5172	84090-9521
P-6	IC 74LS00			84091-1002
P-7	IC 74LS05			84091-1703
P-8	IC ULN2003AN		AMX-5173	84091-1355-01
P-9	IC 74LS74			84091-1045
P-10	IC 75150		AMX-4650	84090-9610
	Transistors			
Q-1, Q-2	2SC2001		AA2SC2001	84091-2726-01
Q-3~	2SB703		AA2SB703	84091-1908
Q-5				
Q-6	2SB605		AA2SB605	84091-2289-01
Q-7	Voltage Regulator μA7805UC			84093-5505
Q-8	Voltage Regulator μA7812UC		AMX-5171	84093-5515
	Capacitors			
C-1	Capacitor Exclusive for oscillator CSC300 30PF		ACF-7345	84091-7680
C-2, C-3	Ceramic 25V 0.001μF +/−10%		ACC102QFCP	84091-5016-01
C-4~	Ceramic 16V 0.1μF −20/+80%		ACC104QDCP	84091-5814-01
C-14				
C-15, C-16	Al Electrolytic 50V 1μF −10/+75%			84091-7540-01
C-17	Al Electrolytic 6V 220μF −10/+50%			84091-7558-01
C-18~	Al Electrolytic 50V 47μF −10/+50%			84091-7621-01
C-20				
C-21	Al Electrolytic 16V 2200μF −10/+30%			84091-5776
C-22	Al Electrolytic 50V 2200μF −10/+30%			84091-5784
C-23	Ceramic 100V 0.022μF −20/+80%		ACC223QLCP	84091-7647
R-1	Carbon 1/4W 15Ω +/−10%		AN0074EEB	84091-4028
R-2~	Carbon 1/4W 100Ω +/−10%		ANO132EEB	84091-4079
R-4				
R-5	Carbon 1/4W 300Ω +/−10%		ANO158EEB	84091-4532
R-6~	Carbon 1/4W 1KΩ +/−10%		ANO196EEB	84091-4150
R-10				
R-11~	Carbon 1/4W 2.2KΩ +/−10%		ANO216EEB	84091-4176
R-13				
R-14~	Carbon 1/4W 10KΩ +/−10%		ANO281EFD	84091-4231
R-16				
R-17	Carbon 1/2W 220Ω +/−10%		ANO149EED	84091-4796
R-18	Carbon 1/2W 330Ω +/−10%		ANO159EFD	84091-4737
R-19	Metal oxide Film 1W KΩ +/−5%		ANO196EGD	84093-5122
R-20	Metal Oxide Film 2W 75Ω +/−5%		ANO116EHD	84091-3943

Model: B_{02} (USA), B_{03} (Europe), B_{04} (Australia), B_{05} (Canada)

Ref. No.	Description	Model	Radio Shack Part Number	Manufacturer Part Number
R-21	Metal Oxide Film 2W 150Ω +/−5%		ANO142EHE	84091-3765
R-22	Metal Oxide Film 2W 330Ω +/−5%		ANO159EHE	84091-3811
RA-1~	Resistor Array 1/8W 10KΩ +/−10%		ARX-0245	84091-3307
RA-3				
RA-4, RA-5	Resistor Array 1/8W 1KΩ +/−10%		ARX-0244	84091-3587
D-1~	Diode 1S2076		ADX-1763	84091-2424
D-4				
D-5	Zener Diode HZ11C3			84091-2968
D-6	Zener Diode AW01-30		ADX-1764	84091-2963
D-7	Zener Diode RD 13EB		ADX-1516	84091-6951
D-8	Zener Diode HZ9A2			84091-2921
D-9~	Diode V06C		ADX-1514	84091-2581
D-12				
D-13	Zener Diode HZ6C2		ADX-1515	84091-2939
D-14, D-15	Voltage Regulator SIRBA10		ADX-1517	84093-5734
X-1	Oscillator		ACA-8172	84093-5599
CN-1~	Connector MWP2P-1B		AJ-6971	84092-3868
CN-11				
TP-1~	P.C.B. Disconnect 60803-2		AJ-6972	84092-3272
TP-6				
F-1	Fuse GGS 1.0A	B_{02}, B_{05}	AHF-1192	84091-7248
	Fuse ES2 1.0A	B_{03}, B_{04}		84091-6977
F-2	Fuse GGS 1.5A	B_{02}, B_{05}	AHF-1193	84091-7256
	Fuse ES2 1.6A	B_{03}, B_{04}		84091-6985
(F-1)	Socket, fuse AFP-216			84091-6471
S-31	Screw, pan-head, spring & plain washer M3×6			84001-3001
HS-1	Plate, radiator (A)			84611-5413
	Screw, pan-head, spring washer M3×6			84001-3010
(Q-5)	Plate, insulating S-7		AHC-1656	84095-3285
(Q-5)	Bush B-17		AHC-1657	84095-3283
CN-15	Connector DDK57-20360-9		AJ-7190	84092-2314
CN-16	Din Connector D4-730N-10		AJ-6975	84092-2322
MSW	Switch (Mode Select Switch) SS-222		AS-2681	84091-8627
	Wire SMV2J-B			84095-3392
	Collar ø3×5			84009-0002
S-02	Screw, pan head M3×12			84001-3013
W-31	Washer, spring M3			84003-3001
N-31	Nut M3			84004-3001
	Washer, plain M3			84003-3005

Mechanical Parts

Model: B_{02} (USA), B_{03} (Europe), B_{04} (Australia), B_{05} (Canada)

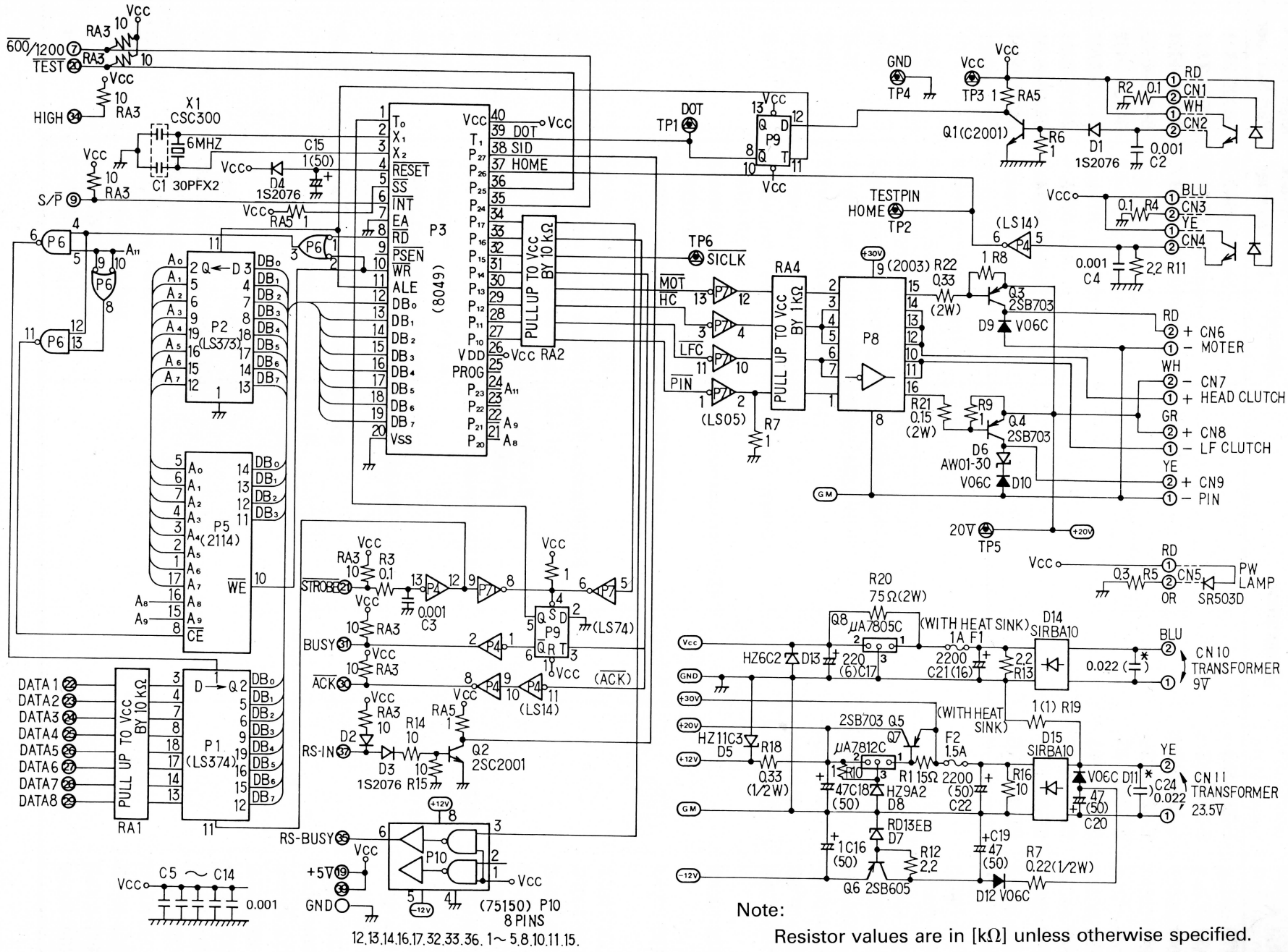
Ref. No.	Description	Model	Radio Shack Part Number	Manufacturer Part Number
1-1	Cover (T)		AZ-6659	84611-2002
1-2	Case unit, upper (T)		AZ-6658	84611-2001U
1-3	Clip, LED		AHC-1651	84501-2049
1-4	Harness, lamp		AW-2847	84501-5151
2-2	Screw, M. stop		AHD-1652	84500-1350
F-3	Fuse GDL 1/2 0.5A	B_{02}, B_{05}	AHF-1242 •	84510-5303
F-3	Fuse EAWK 0.25A	B_{03}, B_{04}		84511-5302
3-1	Holder, fuse FH032	B_{02}, B_{05}	AHF-1243	84510-5251
3-1	Holder, fuse FEB031-1401	B_{03}, B_{04}		84511-5252
3-2	Bush, cord R-5	B_{02}, B_{05}	AHC-1652	84510-2015
3-2	Buch, cord EA-5	B_{03}, B_{04}		84551-2015
3-3	AC cord set SVT AWG18 KP30	B_{02}, B_{05}	AW-2845	84510-5351
3-3	AC cord set GTCE-3 KP-4819D	B_{03}		84092-3914
3-3	AC cord set GTSA-3 KP-550	B_{04}		84092-3922
3-6	Panel, power	B_{02}, B_{05}		84501-2006
3-6	Panel, power E	B_{03}, B_{04}		84501-2008
M-20	Splice 35115		AHC-1646	84500-5401
M-32	Harness, switch (switch included)		AW-2844	84601-5155
M-31	Harness, GND		AW-2846	84520-5121
3-7	Transformer ETP 57E 159H	B_{02}, B_{05}	ATA-0984	84520-5201
3-7	Transforme ETP 57Q 46E	B_{03}, B_{04}		84521-5204
3-8	Case unit, lower (T)		AZ-6660	84611-2003U
4-1	Panel, input		ART-4287	84611-2007
4-2	PCB unit, control BH-02	B_{02}	AX-9214	84611-5001U
4-2	PCB unit, control BH-03	B_{03}, B_{04}		84612-5001U
4-2	PCB unit, control BH-05	B_{05}		84614-5001U
N-02	Wire band A KM-85			84500-5409
M-01	Extruded tubing 5×0.25×12			84500-5402
4-3	Receptacle, PCB ES-5			84501-1320
4-4	Support, PCB		AHC-1653	84600-1321
	Seal, ribbon		AHC-1654	84611-2040
	Seal, caution		AHC-1655	84520-2041
	Seal, fuse (120V, 0.5A)		AHC-1650	84520-2016
5-0	Spacer, head adjust lever		AHC-1647	84500-1245-01
5-1	Lever, head adjust		ART-4286	84500-1242A-01
5-2	Nut, head adjust		AHD-7255	84500-1240-01
5-3	Guide, cable		AHC-1648	84500-1246-01
5-4	Spring, head adjust		ARB-7564	84500-1241-01
5-5	Holder, cable		AHC-1649	84500-1248
5-6	Print head unit		AH-4494	84600-1200U
5-7	Board unit, head		ART-4285	84500-1107U
5-8	Connector, head HBLB6R-IJ		AJ-6973	84500-1108
5-9	Plate, spring press			84600-1167
6-1	Spring, LF rope		ARB-7118	84500-1144

Model: B_{02} (USA), B_{03} (Europe), B_{04} (Australia), B_{05} (Canada)

Ref. No.	Description	Model	Radio Shack Part Number	Manufacturer Part Number
6-2	Claw, reverse stop		AHC-0501	84500-1141
6-3	Spring, reverse stop		AHD-1653	84500-1140
6-4	Solenoid unit, LF		AS-9182	84500-1030U
6-5	Claw wheel B, LF		ART-4288	84500-1131
6-6	Pin, gear		AHC-0502	84500-1083
6-7	Claw wheel A unit		ART-4289	84500-1130U
6-8	Spring, claw wheel		ARB-7067	84500-1128
6-9	Stopper, LF claw		ART-3372	84500-1026
6-10	LF dial		AD-5503	84501-1125
6-11	Spring, dial clutch		ARB-7066	84500-1124
7-1	Guide, FPC		AHC-0500	84501-1196
7-2	Spring, recovery		ARB-7063	84501-1194
7-3	Spring, rope		ARB-7064	84500-1190
7-4	Stopper, rope		ART-3367	84500-1184
7-5	Rope (L) unit, head		ART-4296	84501-1187U-01
7-6	Drum unit, feed		ART-4295	84501-1183U
7-7	Step, drum spring		AHC-0487	84500-1182
7-8	Spring, drum		ARB-7060	84500-1181
7-9	Pin, pulley		AHC-0506	84500-1004
7-10	Pulley, spring		ARA-2867	84500-1012
7-11	Pulley, rope		ARA-2868	84501-1010
7-12B	Pillar (B), guide			84501-1052
7-12C	Pillar (C), guide		ART-4291	84501-1053
7-13	Damper		AHC-0505	84500-1179
7-14	Carrier unit		ART-4294	84500-1160U-01
7-15	Cam, ribbon		ART-4301	84500-1175-01
7-16	Spring, ribbon cam		ARB-7566	84500-1177-01
8-1	Spring, clutch moving		ARB-7565	84500-1093
8-2	Dot sensor unit		ART-4299	84500-1100U
8-4	Clutch (B)		ART-4297	84501-1090
8-6	Spring, clutch		ARB-7062	84500-1088
8-7	Clutch		ART-4298	84500-1087
8-8	Gear (B), reduction		ARA-2865	84501-1086
8-10	Detector, rotation		ART-4290	84611-1085
8-11	Gear, platen		ARA-2864	84501-1082
8-13	Gear, reduction		ARA-2863	84500-1081
8-14	H solenoid		AS-9144	84500-1016
8-15	Motor		AM-4692	84600-1014
9-1	Soundproof		ART-3453	84501-1197
9-2	Pillar, guide		ART-3373	84501-1051
9-3	Holder (L) unit, paper		ART-4293	84500-1149U
9-4	Holder (R) unit, paper		ART-4292	84500-1147U
9-5	Bearing, tractor		ART-3371	84500-1008
9-6	Shaft, tractor		ART-3370	84501-1068

Ref. No.	Description	Model	Radio Shack Part Number	Manufacturer Part Number
9-7	Roller, pin feed		ARA-0324	84500-1070
9-8	Ring, tractor rubber		AHC-0504	84500-1071
9-9	Sensor unit, home		ART-4300	84500-1104U
9-10	Leg, rubber		AF-0324	84501-1197
10-1	Cover, upper, platen			84501-1066
10-2	Plate (R), ground			84500-1001A
10-3	Platen			84501-1060
10-4	Bearing, platen B			84500-1007
10-5	Cover, under, platen			84501-1058
10-6	Guide, paper			84501-1056
10-7	Board, reinforcement			84501-1054
10-8	Plate (L), ground			84500-1021A
	Screw, pan head M2×3			84001-2006
S-26	Screw, pan head, spring washer, M2.6×0.45×4		AHD-2368	84001-2602
S-28	Screw, pan head, spring washer, M2.6×0.45×6		AHD-2365	84001-2604
S-30	Screw, pan head M3×0.5×4		AHD-2363	84001-3011
S-33	Screw, pan head, spring washer, M3×0.5×5		AHD-2364	84001-3003
S-31	Screw, pan head, spring & small plain washer, M3×0.5×6		AHD-2366	84001-3001
S-38	Screw, pan head, spring & small plain washer (WS) M3×0.5×6			84001-3016
	Screw, pan head tapping (Type B cutting) M2.6×6			84001-2611
	Screw, pan head M2.6×4			84001-2606
S-32	Screw, pan head tapping (Type P cutting) M3×8			84001-3023
S-36	Screw, pan head tapping M3×16			84001-3028
	Screw, pan head (Type S cutting) M3×5			84001-3020
S-37	Screw, pan head (Type S cutting) M3×8			84001-3021
S-44	Screw, pan head tapping (Type B cutting) M4×15		AHD-2379	84001-4006
S-45	Screw, pan head M4×4			84001-4008
S-47	Screw, pan head M4×6		AHD-2373	84001-4007
S-48	Screw, pan head (Type S cutting) M4×6			84001-4011
	Screw, pan head tapping M3×6			84001-3031
S-35	Screw, pan head tapping M3×8			84001-3026
	Screw, pan head tapping M4×8			84001-4009
	Washer, plain, small (BRASS) M2			84003-2005
W-32	Washer, plain M3			84003-3005
W-44	Washer, plain M4			84003-4004
W-43	Washer, toothed lock M4			84004-4003
W-61	Washer, plain, small M6			84003-6001
N-31	Nut, flange, FS M3			84004-3002
N-41	Nut, hexagon M4			84004-4001
E-17	E-17 RING			84005-1701
E-24	E-24 RING		AHE-0038	84005-2401

Ref. No.	Description	Model	Radio Shack Part Number	Manufacturer Part Number
E-28	E-28 RING		AHE-0040	84005-2801
E-37	E-37 RING		AHE-0042	84005-3701
E-40	E-40 RING		AHE-0043	84005-4001
E-42	E-42 RING			84005-4003
E-25	BE-24 RING			84005-2402
E-38	BE-37 RING			84005-3702
E-75	BE-74 RING		AHE-0045	84005-7401
E-60	CE-6 RING		AHE-0044	84005-6001
	BG-10 RING			84005-0001


600/1200
TEST
HIGH
S/P
X1
CSC300
6MHZ
C1 30PFX2
C15
D4
1S2076
RESET
INT
EA
RD
PSEN
WR
ALE
DB0
DB1
DB2
DB3
DB4
DB5
DB6
DB7
P3
(8049)
P2
(LS373)
P5
(2114)
P1
(LS374)
RA1
PULL UP TO Vcc BY 10 kΩ
RA2
DATA1
DATA2
DATA3
DATA4
DATA5
DATA6
DATA7
DATA8
STROBE
BUSY
ACK
RS-IN
RS-BUSY
D2
D3
1S2076
R14
R15
Q2
2SC2001
P10
(75150) P10
8 PINS
12.13.14.16.17.32.33.36. 1~5.8.10.11.15.
C5 ~ C14
0.001
+5V
GND
DOT
SID
HOME
SICLK
MOT
HC
LFC
PIN
(LS05)
R7
RA4
P8
(2003)
TESTPIN
HOME
TP1
TP2
TP3
TP4
TP5
TP6
Q1(C2001)
R6
D1
1S2076
C2
R2
R4
R5
R11
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
CN11
MOTER
HEAD CLUTCH
LF CLUTCH
PIN
PW LAMP
TRANSFORMER
9V
23.5V
Q3
2SB703
D9
V06C
R8
R9
R21
Q4
2SB703
D6
AW01-30
V06C
D10
R20
75Ω(2W)
Q8
μA7805C
(WITH HEAT SINK)
D14
SIRBA10
HZ6C2
D13
C17
C21(16)
R13
F1
1A
Q5
2SB703
(WITH HEAT SINK)
R19
HZ11C3
D5
R18
Q7
μA7812C
R10
R11 15Ω
F2
1.5A
D15
SIRBA10
R16
D11
V06C
C24
C20
47C18
HZ9A2
D8
RD13EB
D7
C16
C19
R12
2.2
R7
0.22(1/2W)
Q6 2SB605
D12 V06C
Note:
Resistor values are in [kΩ] unless otherwise specified.
Capacitor values are in [μF] unless otherwise specified.
*US only

RADIO SHACK A DIVISION OF TANDY CORPORATION

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