CITIZEN

Specifications

COMPACT DOT MATRIX PRINTER MECHANISM
MODEL **MD-910/911**

Rev.1.03 Newly issued on Jul. 16, 1997

Japan CBM Corporation

REVISION-UP LIST

Rev. No.	Date	Comment
1.01	1995.06.21	Revised Edition
1.02	1995.10.11	Revised Edition
1.03	1997.07.16	Revised Edition

REVISION-UP HISTORY (REV. 1.01 to 1.02)

Page	Item	Changing point
2	2.5 Paper feed solenoid	Resistance 7±3Ω→7±1.5Ω
13	4) Example of the drive circuit	Condenser 104→Capacitance 104
14	3.9 Paper feed solenoid	Resistance 7±3Ω→7±1.5Ω
16	3.10 Print Solenoids	current Approx. 1.5A→3.2A or less
19	8) Example of the drive circuit	2SD1145→2SD1347
		(REV. 1.02 to 1.03)
3	2.14 Reliability	
	1) Life	MD-911 1.0→1.5 million lines

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(Note) The specifications herein are subject to change without prior notice due to technical improvement, and so on.
Upon actual use, contact us to confirm the final specifications.

1. OUTLINE

This printer is equipped with 2 serial print heads, each of which has 4 solenoids. One print head covers the half of all the columns, printing one line by reciprocating twice.

The first reciprocating motion of the print head prints a half line (upper half of characters) and feeds the paper by a half character (4-dot line), and the second reciprocating motion prints the remaining half of the line (lower half of characters) and feeds the paper by rest (6-dot line), thus completing 1-line printing.

The printer is driven by one DC motor and is capable of scanning in the right/left direction and paper feeding.

There are 2 kinds of timing signals; one is reset pulse which detects the home position of the print head, and the other is dot pulse which takes timings of print head power-on, paper feed, and motor stop.

MD-910 Series

MD-910 ....24 columns

MD-911 ....40 columns

2. GENERAL SPECIFICATIONS

2.1 Printing System Serial Impact Dot matrix system

2.2 Printing Direction Uni-directional printing

2.3 Printing Speed

Model	Printing Speed
MD-910	2.5 l/s±20%
MD-911	1.8 l/s±20%

(5V, 25°C, Continuous Printing)

2.4 Print Format

Model	Total Dots	Character Size	Colums
MD-910	144 dots/line	(5+1) x 8	24
MD-911	180 dots/line	(4+0.5) x 8	40

2.5 Paper Feed

The paper is fed automatically every 4-dot line.
Line feed and quick feed are performed by turning on the power to the paper feed solenoid. The paper feed solenoid feeds the paper by 6-dot line.

1) Paper feed solenoid

Voltage: $5.0 {}^{+0.5}_{-1.2}$ VDC
Resistance: $7±1.5Ω$ (25°C)

2) Paper feed pitch 3.52 mm (10dot lines)

3) Quick feed speed

Model	Quick Feed Speed
MD-910	5 l/s±20%
MD-911	3.6l/s±20%

(5V, 25°C)

2.6 Inking Dedicating ink ribbon cartridge (black or purple)

2.7 Motor

DC brush motor
Voltage: $5.0 {}^{+0.5}_{-1.2}$ VDC
Current: Peak current   Approx. 1 A
              Mean current   0.3 A or less
              (5.0V, 25°C By Continuous Printing)
For relation between Motor voltage and Print head voltage, and Soleoid voltage, refer to DETAILED SPECIFICATIONS.

2.8 Print Head

1)	No. of wires	: 8 wires (4 wires x 2 heads)
2)	Wire diameter	: ø0.3mm
3)	Wire pitch	: 0.352mm
4)	Printing solenoid	Voltage: $5.0^{+0.5}_{-1.5}$ VDC
		Resistance: $1.7\pm0.3\Omega$ (25°C)

2.9 Printing Paper

57.5 mm wide, ordinary paper or specified pressure sensitive paper

2.10 Detector

1) Dot pulse detector   : Photo interrupter
2) Reset pulse detector   : Leaf switch

2.11 Connecting Method

P.C.B. fixed to the frame with 2.54 mm-pitch copper foil pattern

2.12 Outer Dimentions

90(W) x 45.5(D) x 15.8(H) ±0.5mm

2.13 Weight

105g±10%

2.14 Reliability

1) Life

Model	MCBF
MD-910	1.5 milion Lines
MD-911	1.0 milion Lines

2) Allowable operating temperature : 0°C to 50°C
3) Allowable operating humidity : There should be no abnormalities found after operating for 12 hours at 40°C with relative humidity of 90%.
4) Allowable storage temperature : –25°C to 70°C
   There should be no abnormalities found after storing for 96 hours.

2.15 Insulation Resistance

1 MΩ or more (100VDC)
(Between the connector pins and the printer frame)

2.16 Insulation Voltage

Specified separetely when necessary

2.17 Vibration Resistance

There should be no abnormalities found when vibrations are applied in each of X, Y, and Z directions for one hour at 15 to 55 Hz, with 6 G acceleration and a fixed sweep time of one minite.

2.18 Shock Resistance

There should be no abnormalities found when mechanical shocks are applied 3 times each in the X, Y, and Z directions (9 times in total), shock acceleration of 60 G and duration of 11 ms.

3. DETAILED SPECIFICATIONS

3.1 Print Format

The printer has 2 serial print heads at a fixed interval, each of which has 4 printing solenoids, In 24-column printing, the printing solenoids are turned on in moving the print head by 12 columns (half of 24 columns) in the right direction, thus forming a 4-dot 1 line.

The total number of horizontal dots in the printing range is 144 (12 x 2 x 6 = 144) dots. In 40-column printing, the print head moves 20 columns, and the total number of horizontal dots is 180 (20 x 2 x 4.5 = 180) dots.
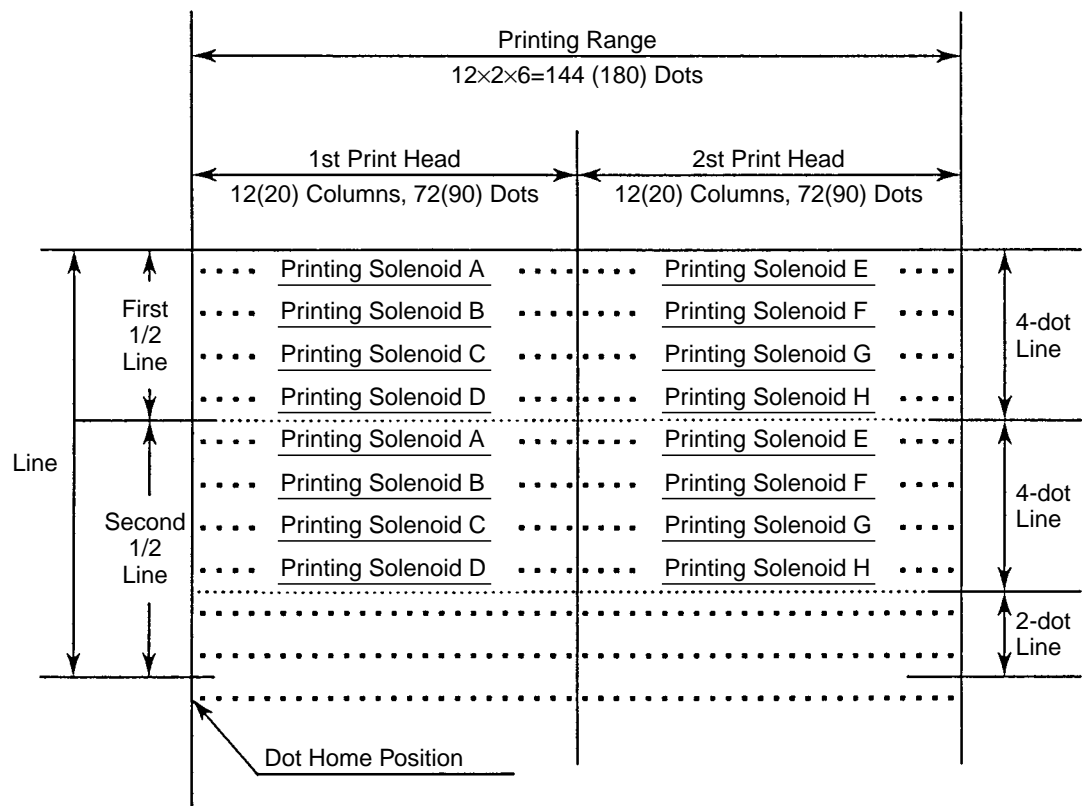
Note) Values in parentheses are for 40-column printing.

1) **5 x 8 martrix (24 columns)**

In the horizontal direction, one character is formed with 5+1 dots, and one dot is equal to an intercolumn space.

In the vertical direction, the first reciprocating motion of the print head gives 4-dot line, and its second reciprocating motion gives another 4-dot line, thus making an 8-dot line.

Ther paper is automatically fed by 4-dot line by the first reciprocating motion of the print head, and by 6-dot line by the second reciprocating motion by turning on the paper feed selenoid, resulting in a total of 10-dot line feed at 3.52mm pitch per line.

Under figure is print sample of "C" and "y".

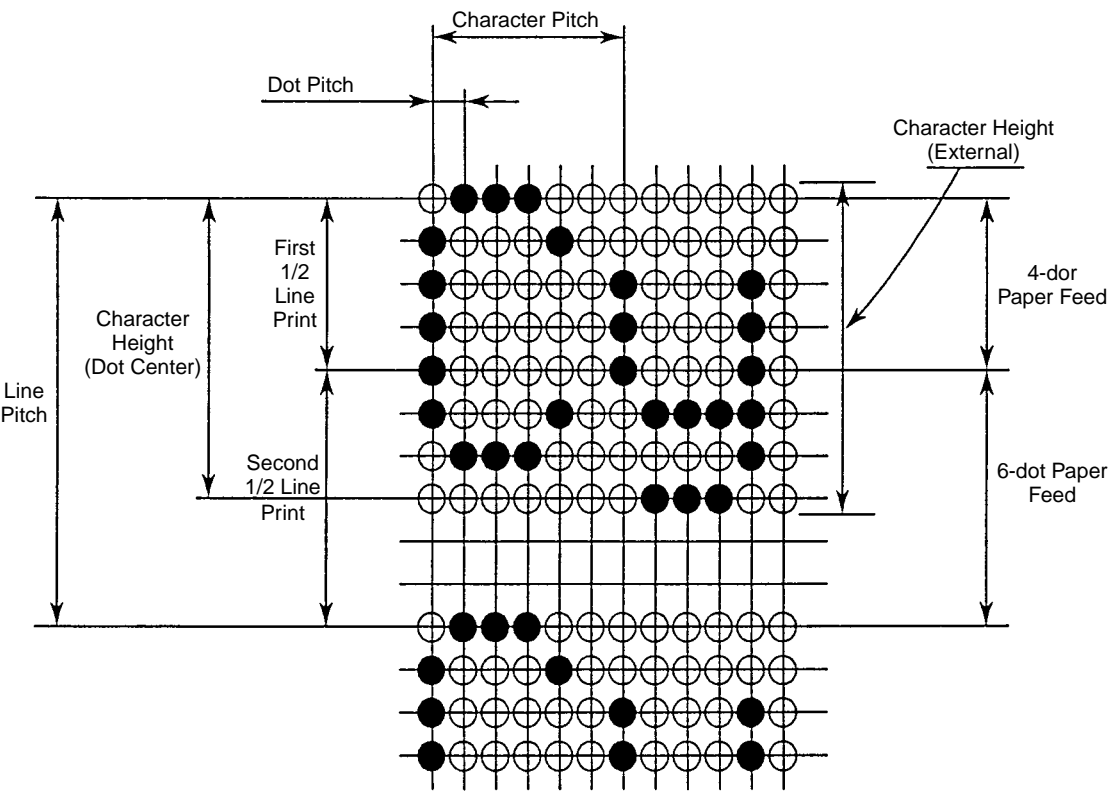|	
Line Pitch	3.52mm (±0.20)
Character Height (Dot Center)	2,464mm (±0.25)
Character Height (External)	2,764mm (±0.25)
First 1/2 Line Print	1,408mm (Reference)
Second 1/2 Line Print	2,112mm (Reference)
Character Pitch	1.98mm (±0.20)
Dot Pitch	0.33mm (±0.15)

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2) 4.5 × 8 matrix (40 columns)

In the horizontal direction, one character is formed with 4+0.5 dots, and 0.5 dot is equal to an intercolumn space.
The rest are the same as for 1) 5x8 Matrix (24 Columns).

Under figure is print sample of "C" and "y".
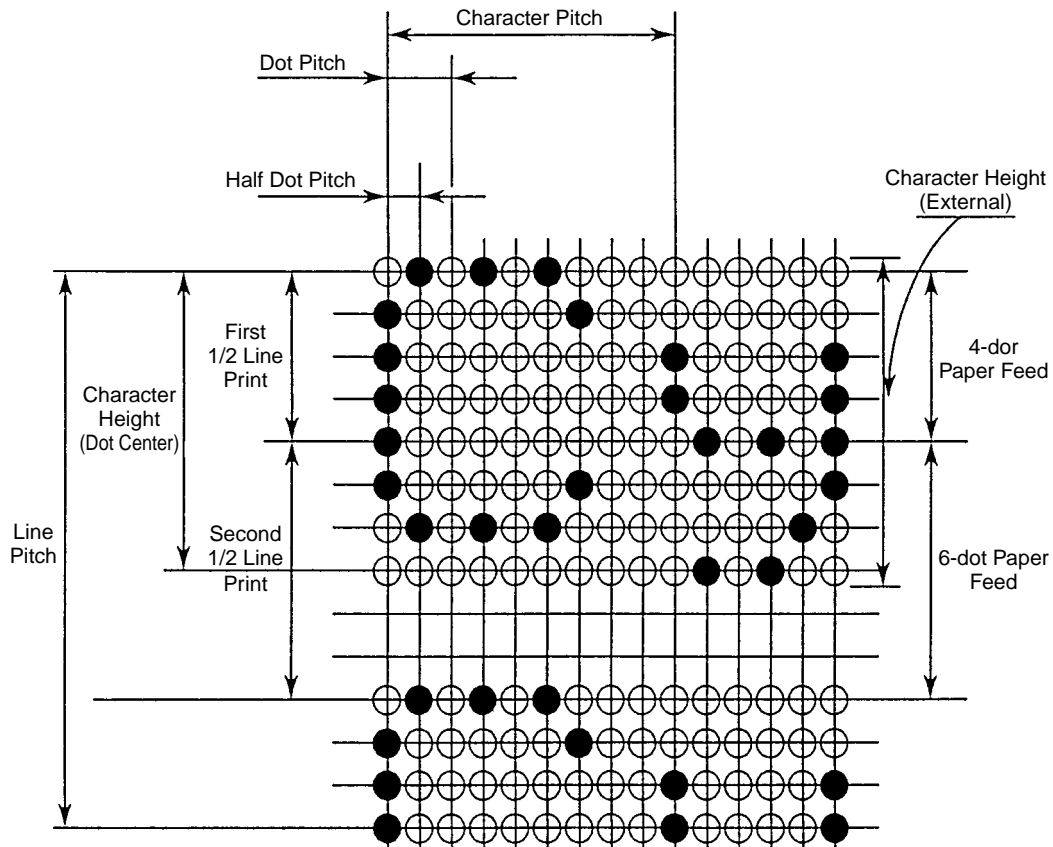
Line Pitch	3.52mm (±0.20)
Character Height (Dot Center)	2,464mm (±0.25)
Character Height (External)	2,764mm (±0.25)
First 1/2 Line Print	1,408mm (Reference)
Second 1/2 Line Print	2,112mm (Reference)
Character Pitch	1.17mm (±0.20)
Dot Pitch	0.26mm (±0.15)
Half Dot Pitch	0.13mm (±0.15)

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3.2 Printing Range
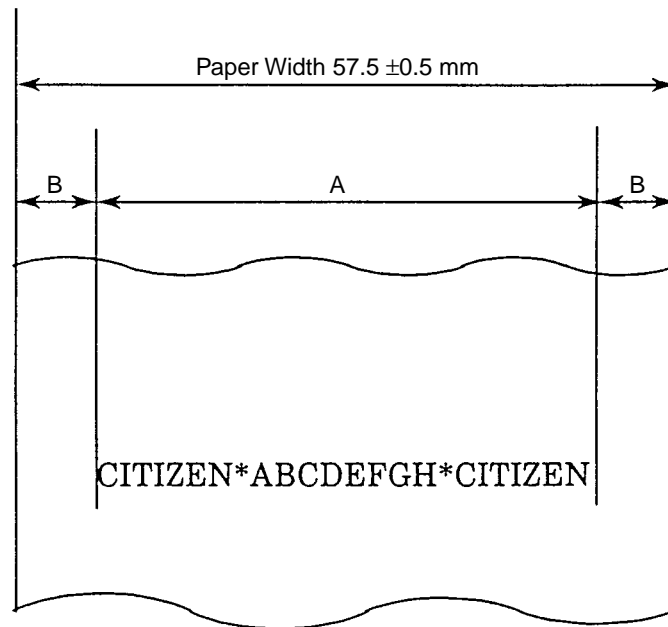
Model	A	B	Horizontal Dot pitch
MD-910	47.5±1	*1 5±2.3	0.33
MD-911	47.5±1	*2 5±2.3	0.26

Unit: mm

Note) *1,*2: it is included slip of paper.

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3.3 Paper Feed

1)	Paper feeding system	Friction
2)	Paper inserting postion	Rear (For detailes, refer to 5. INSTALLATION)
3)	Paper feed pitch	1-line feed .... 3.52mm .... 10-dot line
		Automatic feed .... 1.408 mm (1/18 inch) 4-dot line
		Paper feed solenoid .... 2.112 mm (1/12 inch) 6-dot line
4)	Control system	The paper is automatically fed by 4-dot line in half the printing cycle. It is fed by 6-dot line by turning on the paper feed solenoid. In case of 1-line printing, therefore, 10-dot line printing is performed at 3.52 mm pitch by turning on the paper feed solenoid in the second half of the printing cycle (second reciprocating motion of the print fead). For graphic printing, you may just perform printing by automatic paper feed, ignoring the paper feed solenoid.
5)	Paper tensile force	100g or more
6)	Knob (option)	The paper can be inserted and removed manually with the knob.

3.4 Printing paper

1)	Type	Ordinary paper or specified pressure sensitive copying paper
2)	Shape (ordinary paper)	57.5±0.5mm, ø83mm or less (outer diameter)
		57.5±0.5mm, ø10mm or more (inner diameter)
		Condition of Rolled paper winding start (inner side edge)
		1. No fold and along by inner diameter. (Ref.under fig.)
		2. No flap.
		3. No paste with paper core (In case of rolled paper with core)

Wind starting position

OK   NG
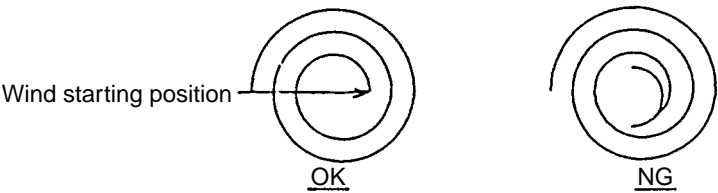
3)	Paper Supplying Load	Paper Supplying Load in printer paper entrance: 30g or less
4)	Recommended paper	
	Single paper:	45 to 55kg/1,000 sheets/1,091 x 788mm (Thickness 0.06 to 0.085)
	Copying paper:	Non-carbon paper; original (34kg paper)+1 copy (34kg paper)
		Total thickness 0.13mm or less

3.5 Inking

1)	System	Dedicated cartridge ribbon
2)	Color	Black or purple
3)	Size	90(W) x 19(D) x 7(H)±1mm
4)	Ribbon feed	Automatically fed while the motor is running.
5)	Service life	Approx. 250,000 characters (purple)
		Approx. 200,000 characters (black) (5.0V, 25°C, continuous printing)
6)	Allowable Operating Temperature	0°C to 50°C
7)	Allowable Storage Period	12 months after production (BliSter-pack.25°C Normal Humidity)
8)	Remarks	Print may be fed by ink feature in continuous printing at low temperature.

3.6 Dot Pulse Detector (DTP)

This dot pulse detector consists of a photo interrupter and a disk having slits directly connected to the motor. It generates 448 output signals during one reciprocating motion of the print head; 336 signals corresponding to the dot position of the print head, and 112 signals corresponding to a return of the print head.

These signals are used as print head power-on, paper feed solenoid power-on , and motor stop timings.

(Relation Columns and Dot pulse)

Columns	Dot pulse	
	Print	Total
24	288	448
40	360	560

Remark)

The above figures is numbers of Dot pulse in case of one reciprocating motion of head, 1/2 line.

This, No. of 1 line print is twice of the above figures.

1) Timing signal

The output signals of the photo interrupter are shaped in waveforms by the user into timing signals. For the absolute maximum ratings, and electrical and optical characteristics of the photo interrupter (Model RPI-131, Rohm), refer to the next page.

2) Designated Circuit

Construct the circuit using the following designated circuit to ensure perfect detection of the sensor output.
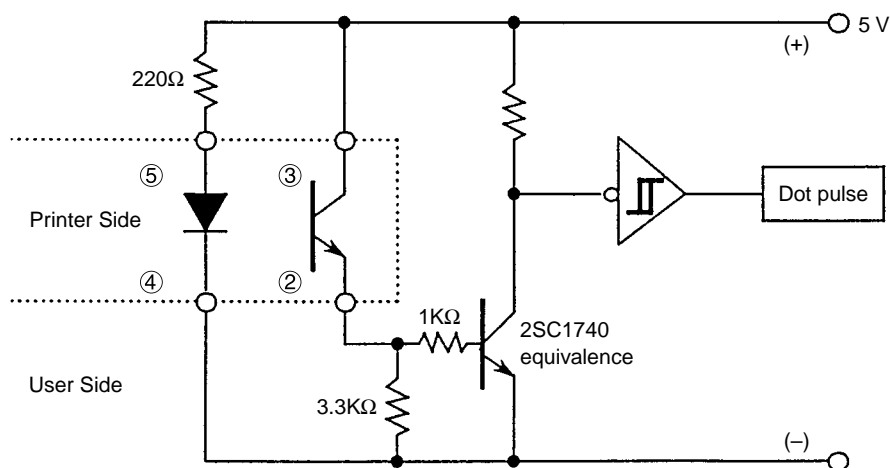
Note)

When a waiting time is long after power-on, see to it that the LED will get illuminated only when the motor is turned on, in order to prevent deterioration of the LED.

3) Cycle (5V , 25°C)

MIN	TYP	MAX
330μs	446μs	—

4) Absolute Max Ratings of Dot Pulse Detector

(1) Input Side (LED)
Regular directional Current: 50mA
Opposite directional Voltage: 5V
Allowable Loss: 80mW

(2) Out put side (Photo Transistor)
Collector-Emitter Voltage: 30V
Emitter-Collector Voltage: 4.5V
Collector Loss: 80mW (25°C)
Detailes are shown in the specification manual of PRI-131.

3.7 Reset Pulse Detector (RP)

A leaf contact is provided, which makes once while the print head reciprocates once. A signal is issued, which indicates the home position and print start reference position of the print head.
When the print head is at the home position, the home position detector is ON.
The print start reference position is at where the detector is changed over from ON to OFF.

1) Contact ratings

Rated voltage: 3 to 10 VDC
Rated current: 0.05 to 2 mA

2) Chattering (The values in the following are, Temperature; 0°C, Motor rotation; constant)

ON to OFF operation
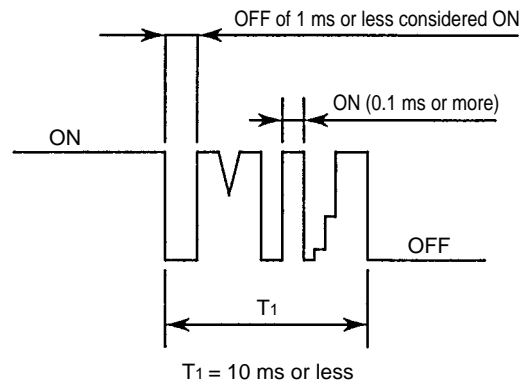
OFF to ON operation

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3) Reset Detect Flowchart

```
                    ┌─────────────┐
                    │   Start     │
                    └─────────────┘
                           │
                           ▼
                      ╱─────────╲          YES
                     ╱ Switch ON ╲─────────────────────────────┐
                     ╲           ╱                              │
                      ╲─────────╱                               │
                           │                                    │
                           ▼                                    ▼
                    ┌─────────────┐                    ┌─────────────┐
                    │ Motor Start │                    │ Motor Start │
                    └─────────────┘                    └─────────────┘
                           │                                    │
            ┌──────────────▼                                    │
            │         ╱─────────╲       YES                     │
            │        ╱ Switch ON ╲──────────┐                   │
            │        ╲           ╱          │                   │
            │         ╲─────────╱           │                   │
            │            │ NO               │                   │
            └────────────┘                  ▼                   │
                                  ┌──────────────────┐          │
                                  │  Don't detect RP │          │
                                  │ during DP 30 (38)│          │
                                  │      cycle       │          │
                                  └──────────────────┘          │
                                           │                    │
        ┌──────────────────────────────────┤◄───────────────────┘
        │                                  ▼
        │                  ┌──────────────────────────────┐
        │                  │ CHeck Switch conditions by   │
        │                  │      adjusting DP            │
        │                  └──────────────────────────────┘
        │                                  │
        │                                  ▼
        │                            ╱──────────╲      YES
        │                           ╱ Switch OFF ╲──────────────┐
        │                           ╲            ╱               │
        │                            ╲──────────╱                │
        │                              │ NO                      ▼
        │                              ▼               ┌──────────────┐
        │                    ┌──────────────┐          │   Count UP   │
        │                    │ Counter Clear│          └──────────────┘
        │                    └──────────────┘                  │
        │                              │                        ▼
        │◄─────────────────────────────┘               ╱──────────╲    YES
        │                                              ╱  Count = 3 ╲────────┐
        │                                              ╲            ╱        │
        │                                               ╲──────────╱         │
        │                                                  │ NO              ▼
        └──────────────────────────────────────────────────┘        ┌─────────────┐
                                                                     │ Print Start │
                                                                     └─────────────┘
```
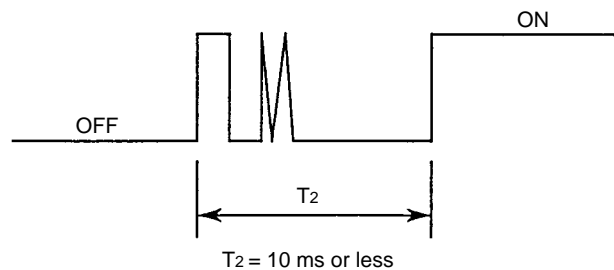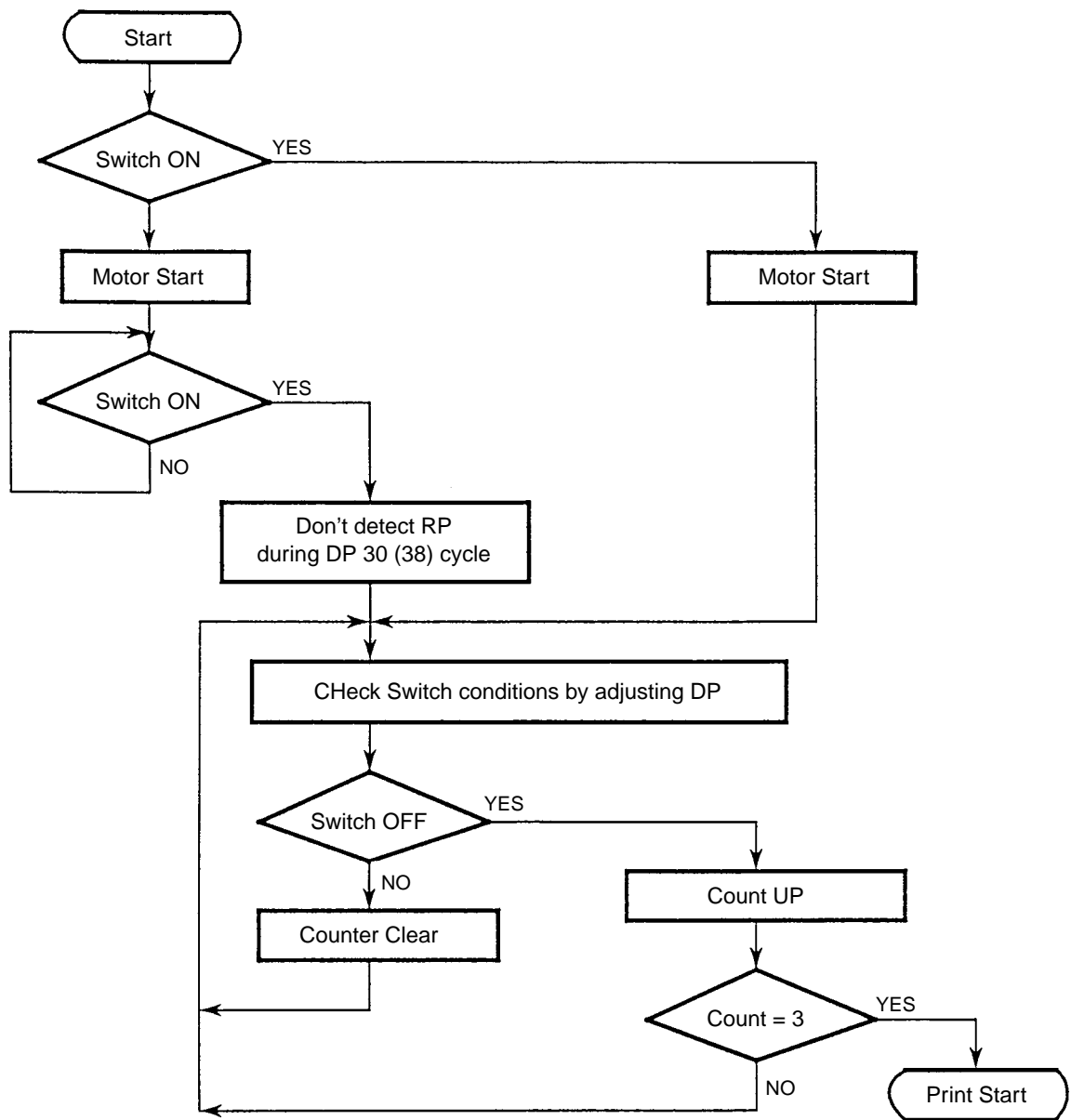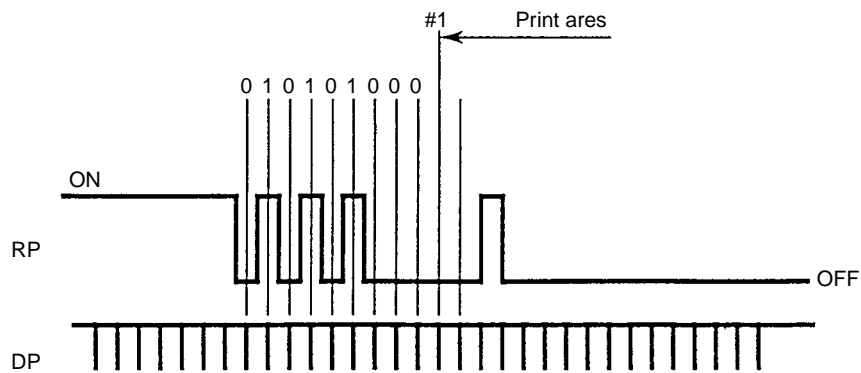
Value in parentheses are for 40-column printing.

Example of Timing Chart

3.8 Motor

1) Drive and Stop

To start the motor, apply a motor drive signal

To stop the motor, since the print head must stand by almost st a fixed position upon starting next printing, count the dot pulses (#1) from a fall of the home position signal. shut off the motor drive signal at the specified pulse #392(#492), and apply the motor brake signal (60 ms or more) to short between the motor terminals, thus stopping the motor.
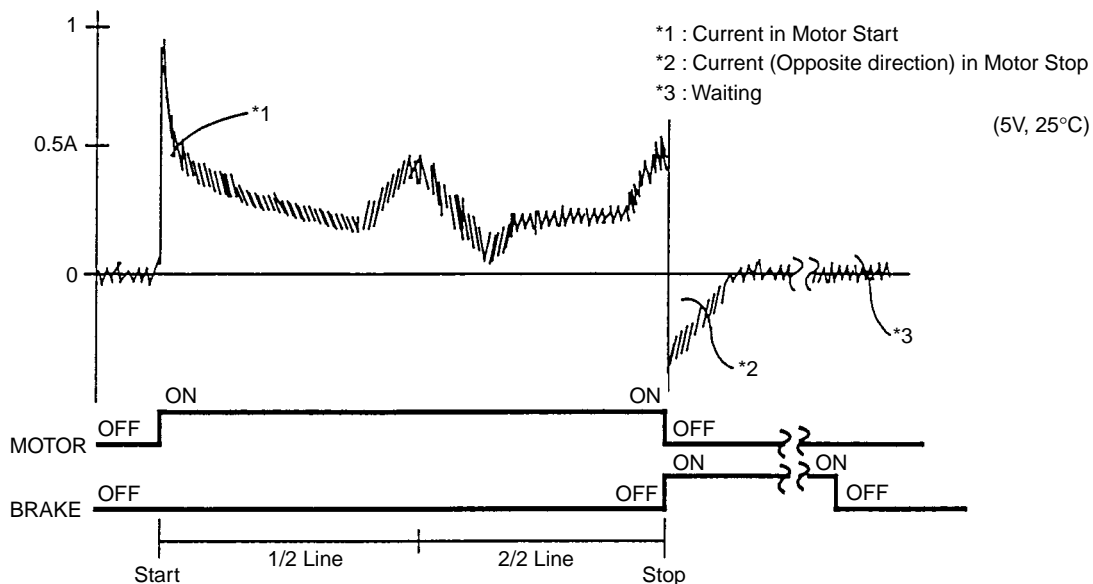
(For timing, refer to 3.11 Timing Chart)

When any abnormalities are detected, you must stop the motor. (Refer to 4. SPECIAL REMARKS)

2) Terminal Voltage

$5.0 \,{}^{+0.5}_{-1.2}\,$VDC

3) Current

(a) Peak current   Approx. 1A (worst case 2.0A or less)

(b) Mean current   0.3A or Less

(c) Current waveform

*1 : Current in Motor Start
*2 : Current (Opposite direction) in Motor Stop
*3 : Waiting

(5V, 25°C)

4) Example of the drive circuit

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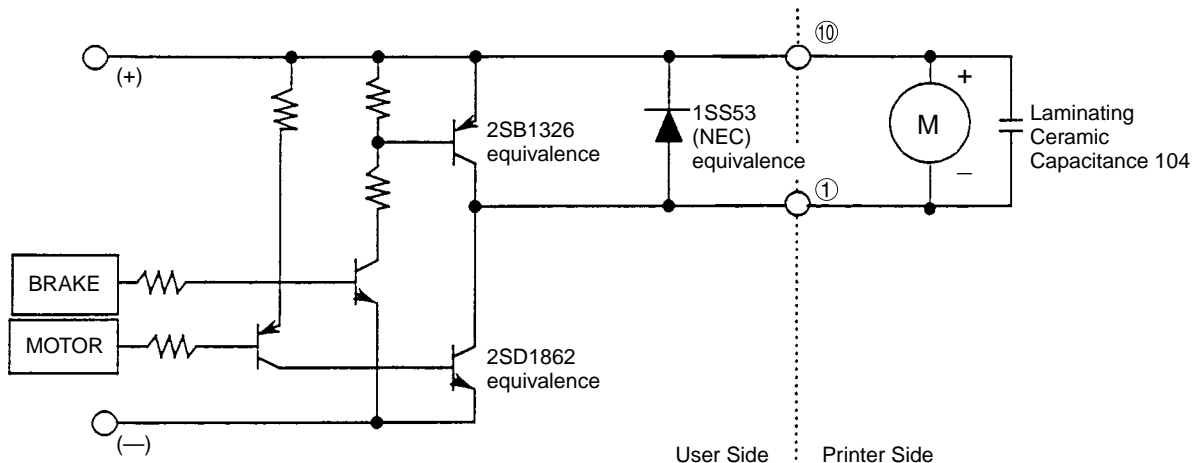
3.9 Paper Feed Solenoid

When printing is completed and the print head is in its return area, the paper is automatically fed by 4-dot line. The paper can be fed by 6-dot line driving the paper feed solenoid at the following timing.

In case of normal printing, the paper is fed by 10-dot line at line pitch of 3.52 mm (6-dot line + 4-dot line (first 1/2 line printing))by turning on the paper feed solenoid for about 10 ms from the dot pulse #276(#352) to #296(#372), which is the 275(351)th pulse counting from #1, in the second 1/2 line printing.

In case of quick feed, the paper is fed by 10-dot line equal to 1 line (3.52mm, 6-dot line +4-dot line (automatically)) by turning on the paper feed solenoids for about 10 ms from the dot pulse #52(#68) to #72(#88), which is the 51(67)th pulse counting from #1 generated first after detecting a home pulse.
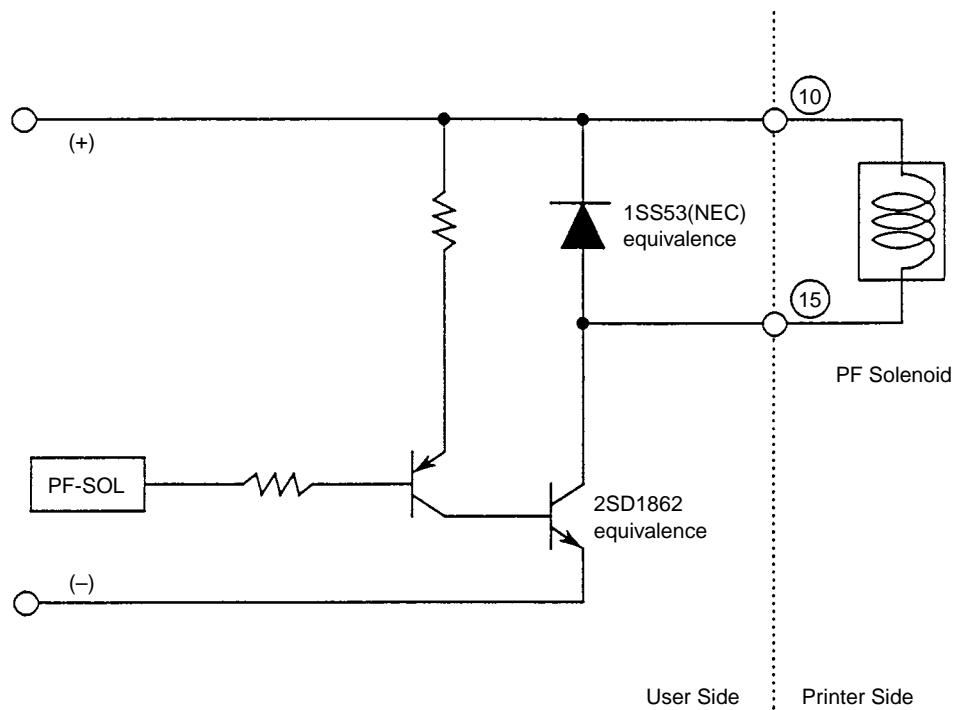
That is, quick feed is twice faster than normal printing.

1) **Terminal voltage** $5.0^{+0.5}_{-1.2}$ VDC (Difference with motor terminal voltage is 1V or less)

2) **DC resistance**   Resistance: $7\pm1.5\Omega(25°C)$

3) **Drive pulse width**

T3 Drive pulse ON delay time   : 0.1 ms or less
T4 Drive pulse OFF delay time : 0.1 ms or less
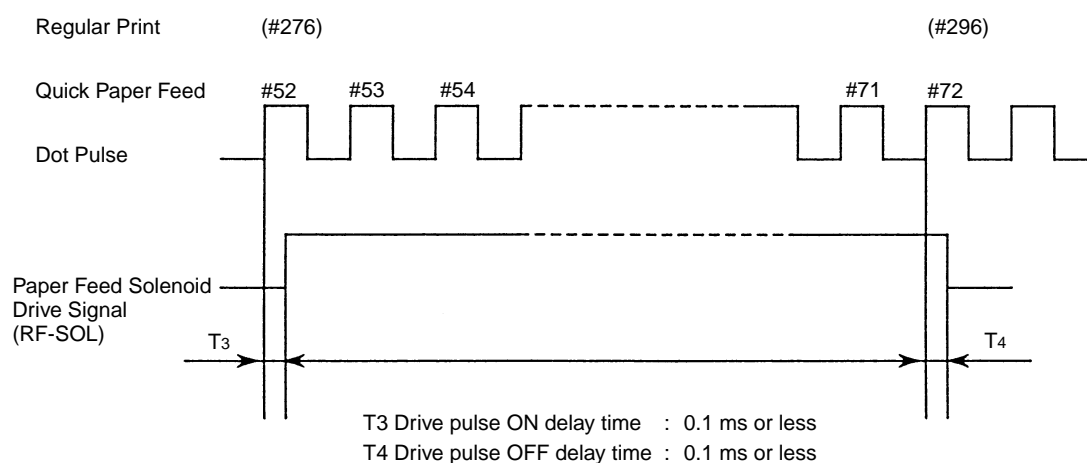
Column	Dot pulse	
	Regular print timing	Quick feed timing
24	#276 to #296	#52 to #72
40	#352 to #372	#68 to #88

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4) Example of the drive circuit

(+)

1SS53(NEC)
equivalence

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PF Solenoid

PF-SOL

2SD1862
equivalence

(−)

User Side : Printer Side

5) Protection of the paper feed solenoid in case of trouble

Refer to 4. SPECIAL REMARKS.

3.10 Printing Solenoids

Dot matrix characters are formed by driving the printing solenoids. Power-on to the solenoids is done 2 of them at the same time in order to limit a maximum current and uses a time-sharing method.

1) No. of solenoids   8 pcs. (4 pcs. x 2)

2) Terminal voltage $5.0 \, {}^{+0.5}_{-1.2}$ VDC

   The relationship between the motor terminal voltage and printing solenoid terminal voltage should meet the shaded range in the following figure.
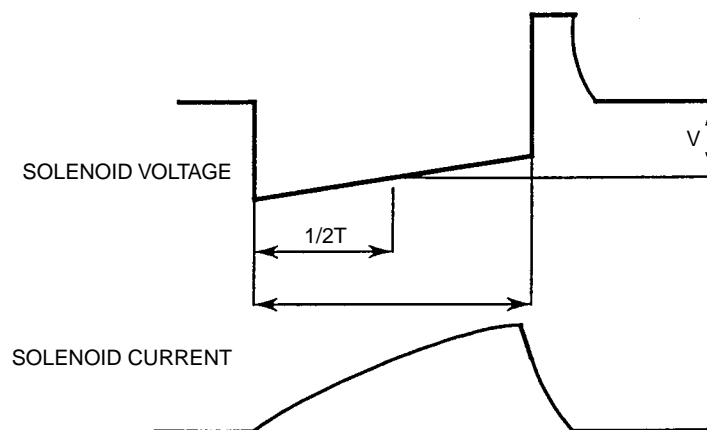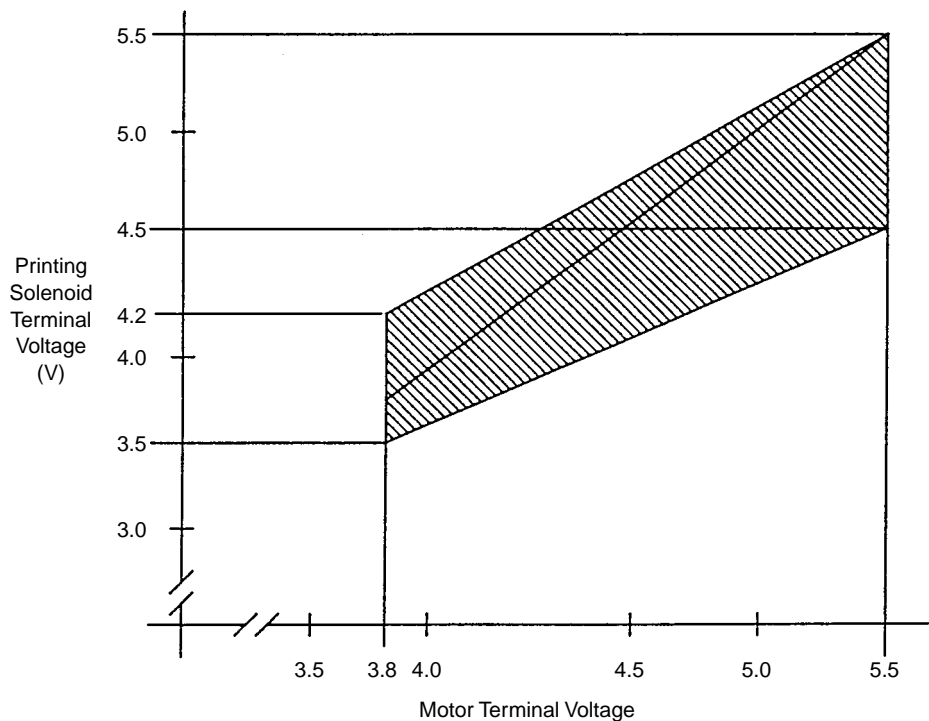
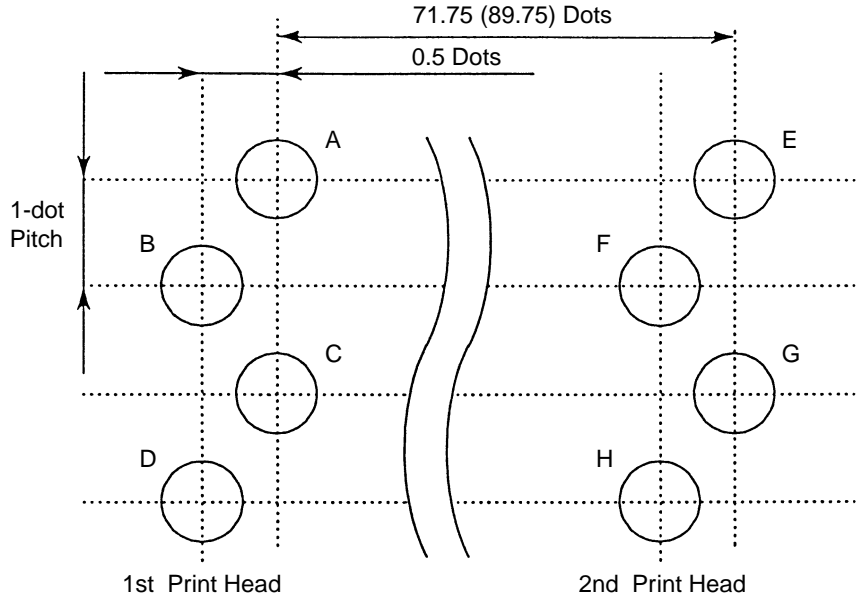**3) Resistance**   Resistance: 1.7±0.3Ω (25°C)

4) Current   3.2A or less/solenoid (peek)
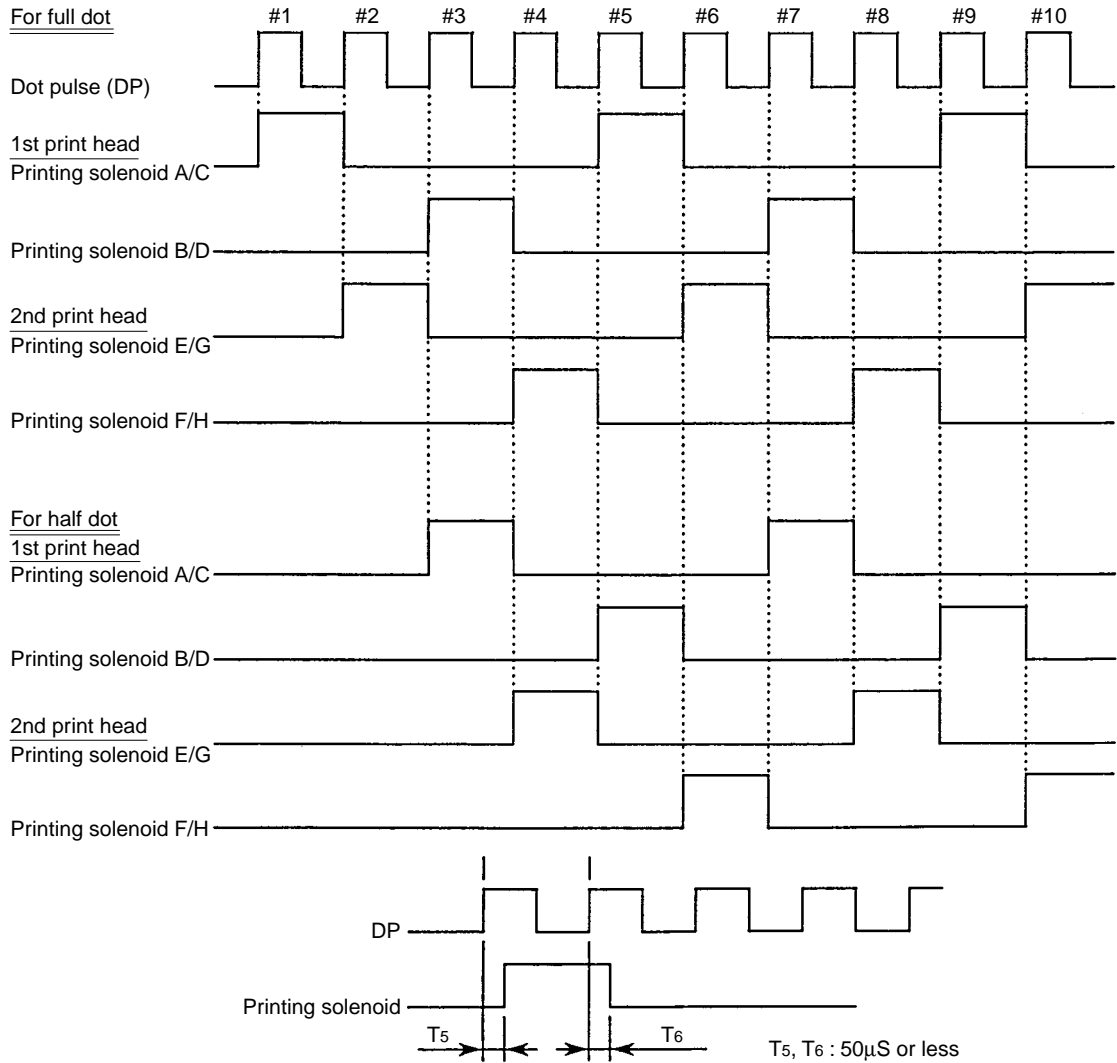
5) Power-on width

   Turn on the power during the period from the front edge of the dot pulse Tn to that of Tn +1.
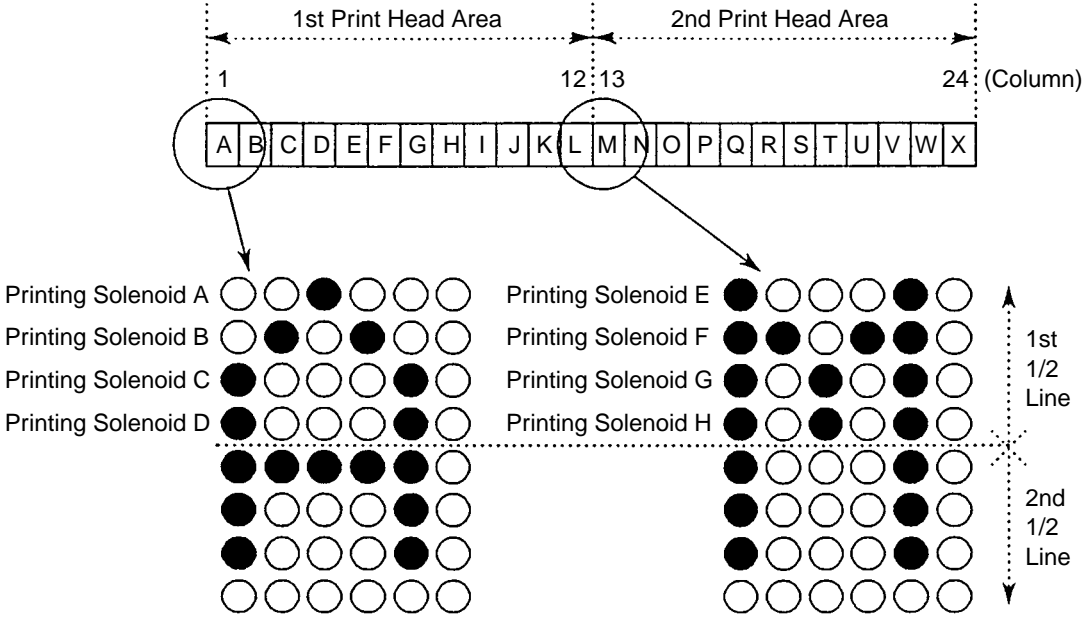
6) Drive timing
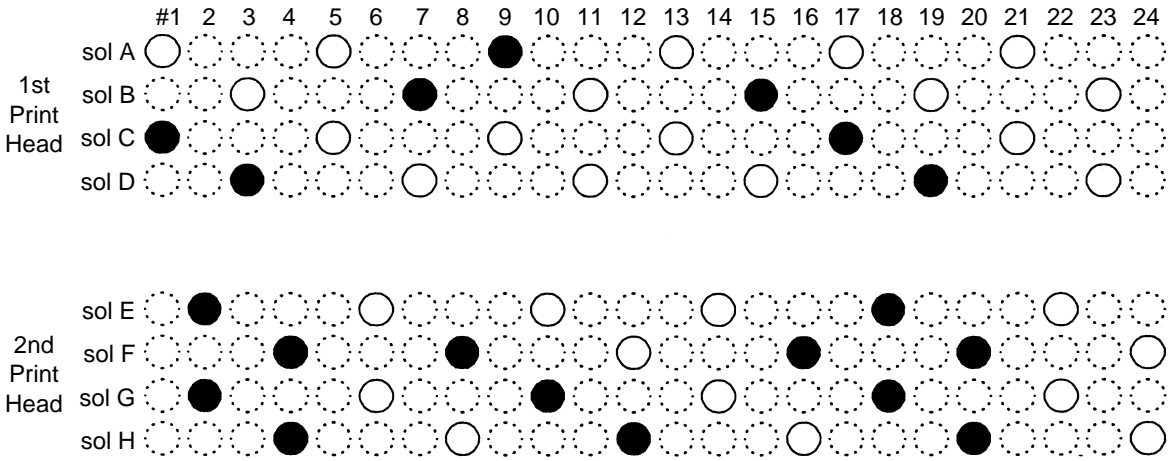
a) Dot layout of the print head

b) Time-sharing drive timing of the print head

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c) example of the time-sharing timing (24 columns)

DP and Print Head for 1st 1/2 Line

A full-line circle indicates the pin at print timing for the very DP. A black-painted circle indicates the pin which performs actual printing.

7) Printing duty

    a) Power-On duty: 1/3

    b) Continuous Power-On: Continuous Power-On to one print solenoid is available until 200 return of print head in 25°C, however, it needs to have rest time twice or more of continuous Power-On time.

8) Example of the drive circuit
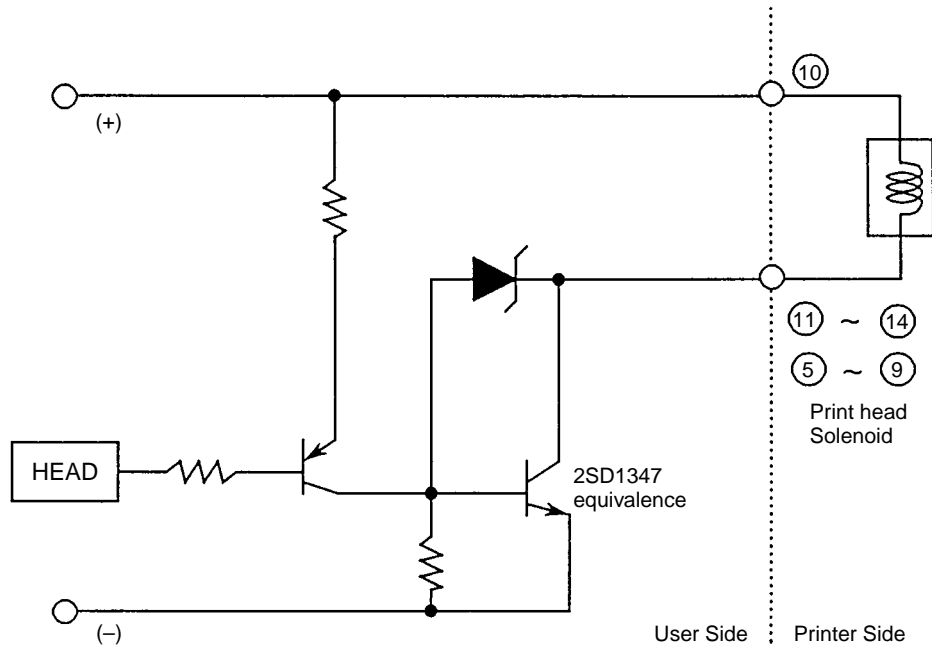
Note: Zener Voltage should be approx. 20V(05X20 equivalence)

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3.11 Timing Chart

1) Initial Setting

Carry out initial setting to place the printer in a printing standby state.

a) Turn on the motor.

b) Motor power-off and motor stop should be done at the timing of the dot pulse #392(#492) counting from the dot pulse (#1) immediately following the home position signal (RP), after detecting ON of RP.
Refer 3.7 3) for RP OFF detect.

c) Complete initial setting.

2) Line printing operation

This printer completes printing one line when the print head reciprocates twice.

a) Turn on the motor.

b) After detecting the home position signal (RP) being turned on, the printing enabled area starts at the pulse #1 immediately following a fall of RP (OFF), and the printing solenoids are turned on at their respective timings.
Refer 3.73) for RP OFF detect.

c) Printing of the first 1/2 line is completed and the paper is automatically fed by 4-dot line.

d) Similarly, the printing solenoids are turned on at the respective timings of the dot pulses starting at the dot pulse #449(#561)=#1 immediately following a fall of RP (OFF).

e) The paper feed solenoids are turned on from about 10 ms from the dot pulse #276 to #296(#352 to #372) to feed the paper by 6-dot line.

f) Printing of the second 1/2 line is completed, thus completed 1-line printing.

g) Turn off the motor at the same timing as initial setting.

h) To perform continuous printing, repeat b) through g).
For details, refer to the timing chart.

Remark)

1) Continuous printing is to controlled by Dot pulse except for print start concerning the chartering of RP.

2) Values in parentheses are for 40-column printing.
Refer the Timing Chart for details.

MD-910 Timing Chart
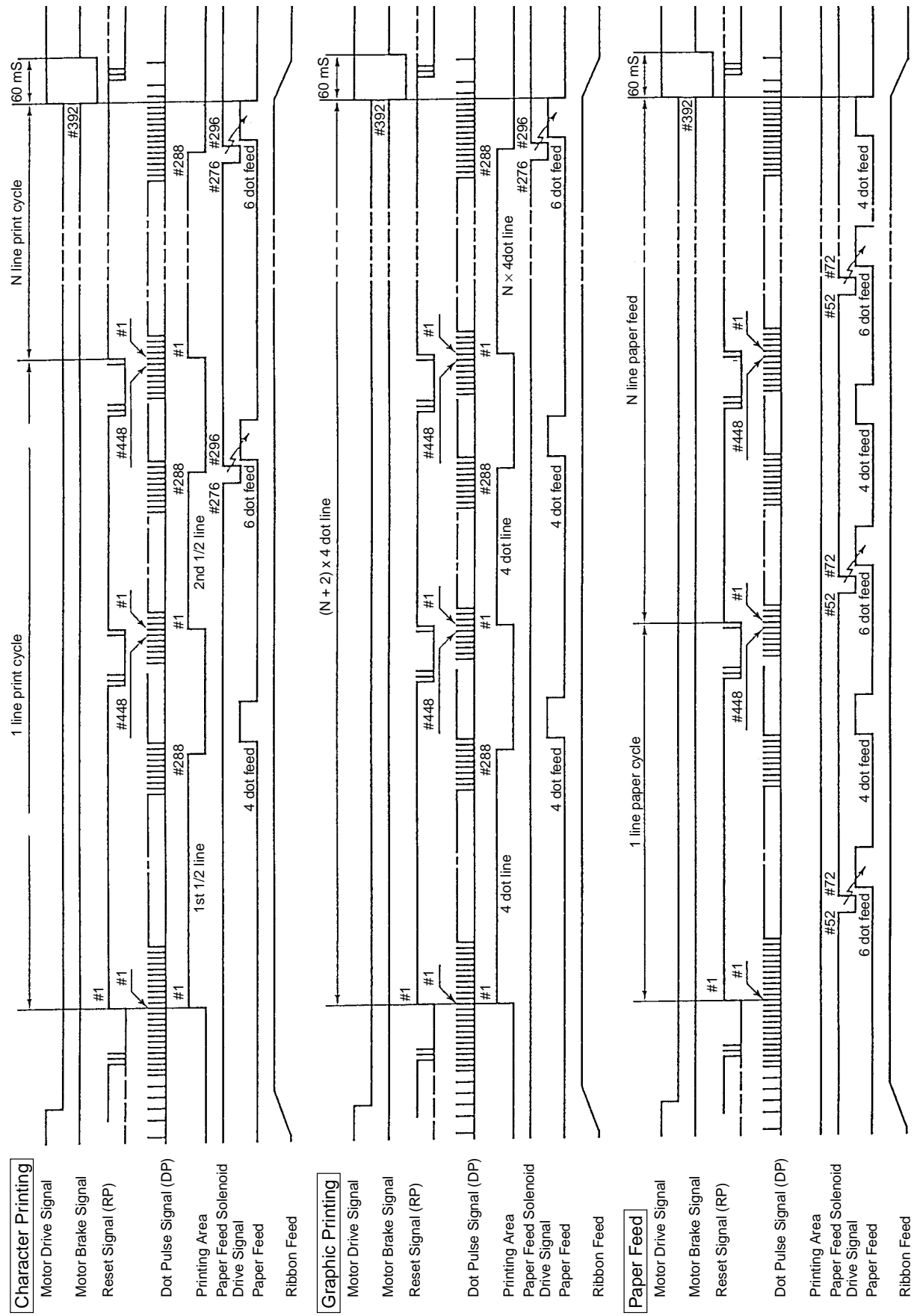
Note:
1. Reset signal (RP) detect only the 1st RP of print start. Continuous print after print start should be controlled by dot pulse signal.
2. It takes 448pcs of dot pulse (#1 to #448) to print 1/2 line.
3. On paper quick feed, it feeds 1 line in the print time of 1/2 line.

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MD-911 Timing Chart
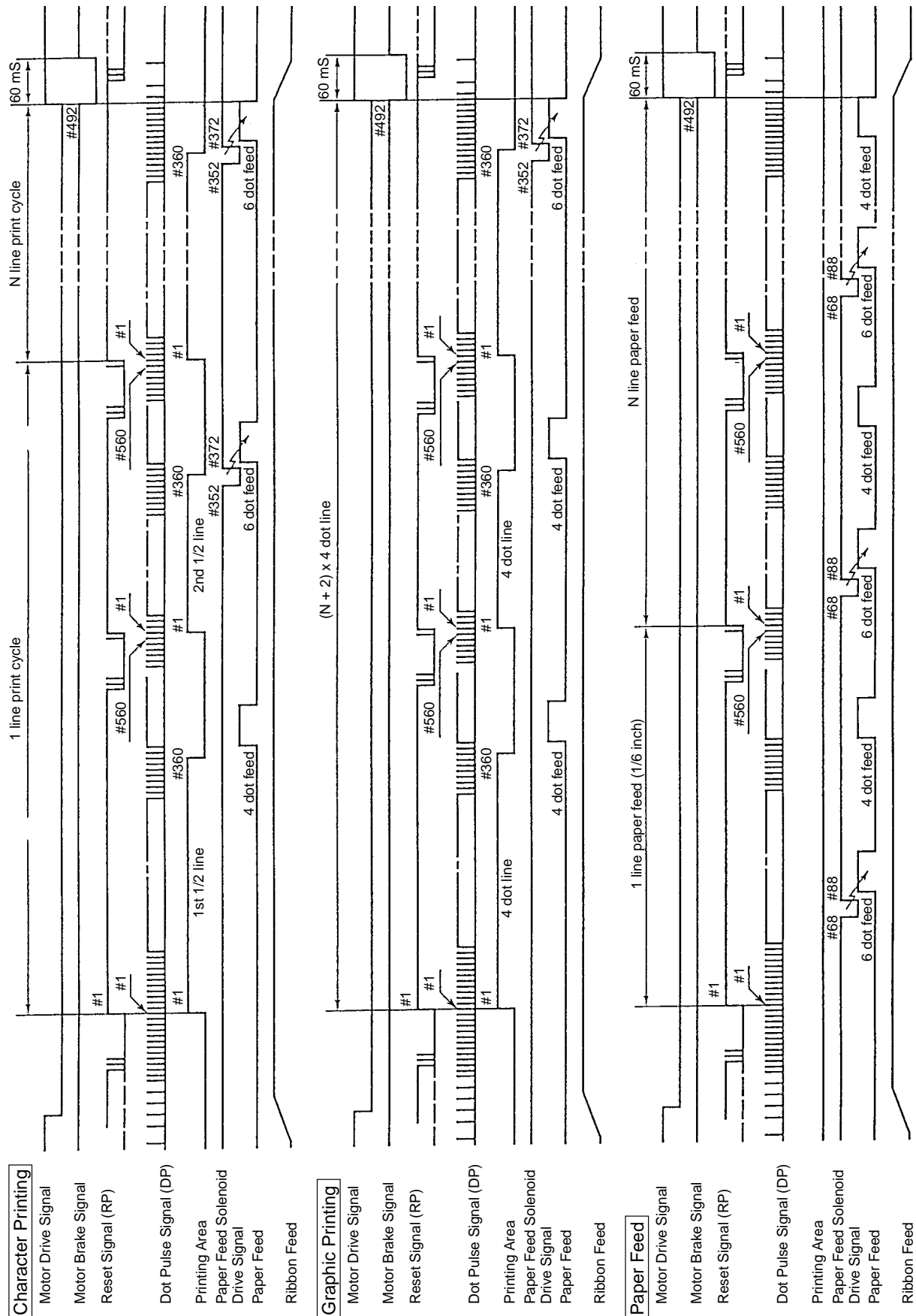
Note:
1. Reset signal (RP) detect only the 1st RP of print start. Continuous print after print start should be controlled by dot pulse signal.
2. It takes 560pcs of dot pulse (#1 to #560) to print 1/2line.
3. On paper quick feed, it feeds 1 line in the print time of 1/2 line.

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3.12 Connector Terminal Array

1) Connector terminal array

Terminal No.	Connection	Remarks
1	Motor (–)	
2	Photo-interrupter	Emitter
3	Photo-interrupter	Collector
4	Photo-interrupter	Cathode
5	Photo-interrupter	Anode
6	Printing Solenoid D	1st Printing Head
7	Printing Solenoid B	1st Printing Head
8	Printing Solenoid A	1st Printing Head
9	Printing Solenoid C	1st Printing Head
10	Common (+)	Printing Head, Motor, Paper Feed Solenoid
11	Printing Solenoid H	2nd Printing Head
12	Printing Solenoid F	2nd Printing Head
13	Printing Solenoid E	2nd Printing Head
14	Printing Solenoid G	2nd Printing Head
15	Paper Feed Solenoid	
16	RP Switch	
17	RP Switch	GND

2) Connector terminal circuit
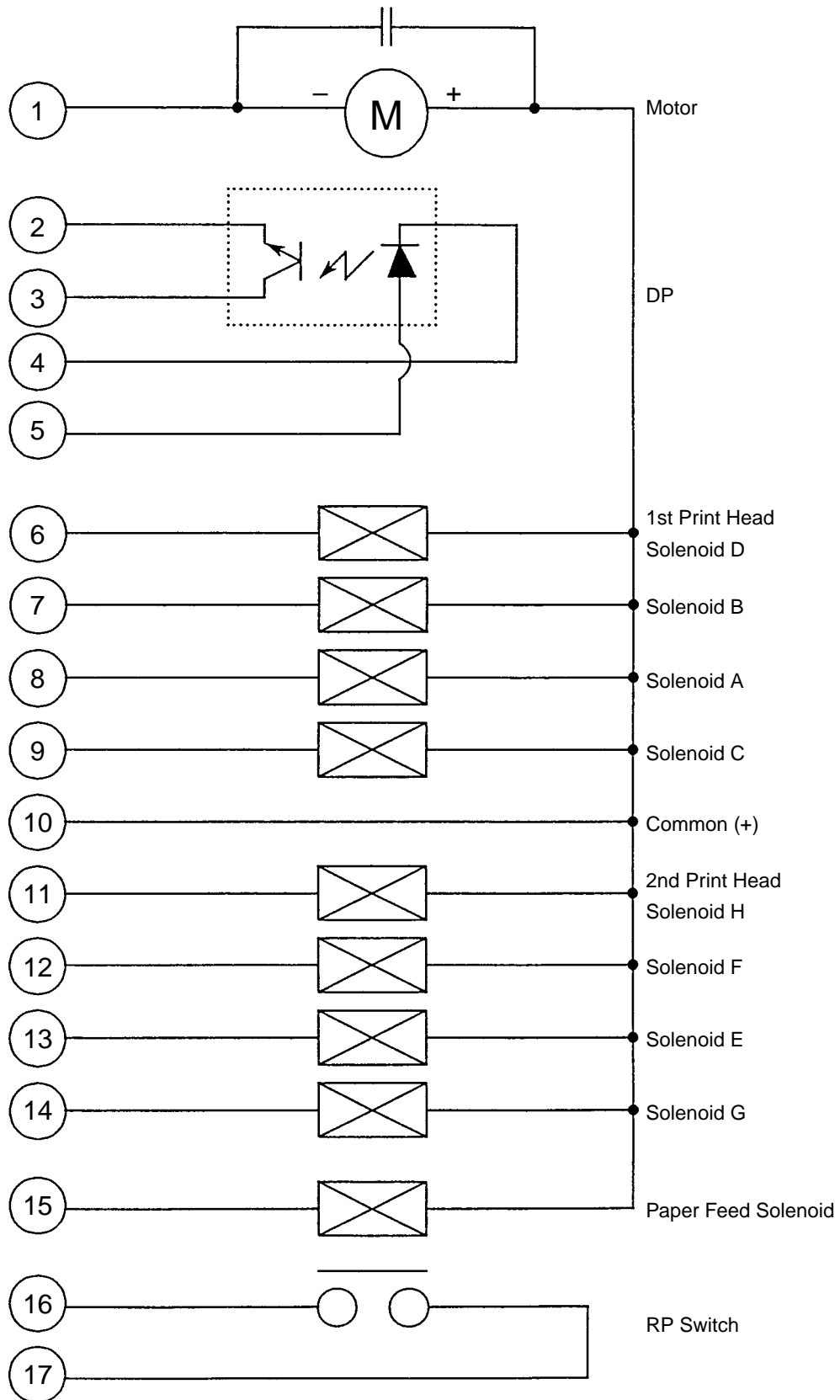
Note
1) For polarity of Motor, terminal No. 1 should be set in minus side.
2) Terminal No.17 of RP Switch should be set GND side.

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3) P.C.B. Terminal No.

Note: Pitch between terminal is 2.54mm (1/10 inch).

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4. SPECIAL REMARKS

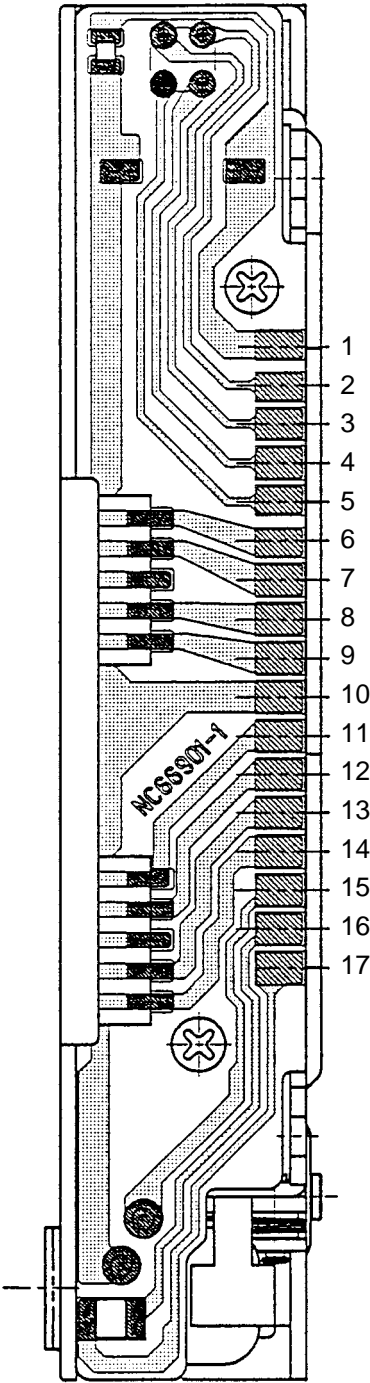## 4.1 Detection of Abnormalities

Abnormality detection should be carried out to prevent burnt-out of the motor due to motor locking caused by abnormal load being applied. Checking is conducted by means of dot pulse cycle.

1) On starting

When the DP cycle reaches 10 ms or more during the period from motor start to a fixed-speed stage. (until 50 ms after motor start)

2) On fixed-speed drive

When the DP cycle reaches 5 ms or more.

When the above condition occurs, turn off the power to the motor and solenoids immediately.

4.2 Maximum Allowable Continuous Power-on Time

In any cases including the abnormal conditions mentioned in 4.1 above, it is strictly prohibited to continuously turn on the power beyond the following length of time.

Printing solenoid	1s
Paper feed solenoid	5s
Motor	5s (Lock condition)

4.3 Handling the Ribbon Cartridge

1) Use the product designated by CITIZEN to maintain print quality and durability.
2) Do not replenish ink to the ink ribbon.
3) The ribbon cartridge must not be supplied, being mounted on the printer at the time of shipment.

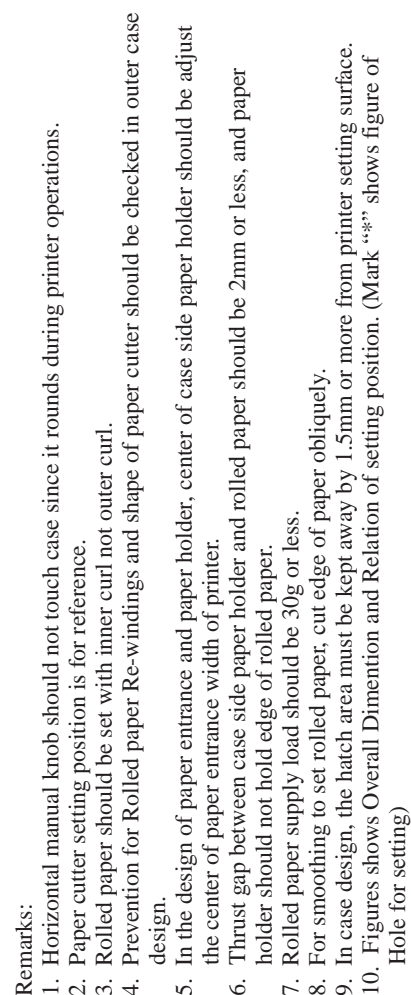## 4.4 Notes for Design of Paper Entrance, Paper Holder

1) Center of paper holder of case side should be adjust the center of paper entrance width of printer, set paper width 57.5±0.5mm.
2) Thrust gap between case side paper holder and rolled paper should be 2mm of less, and paper holder should not hold edge of rolled paper.
3) Supply load of rolled paper must be 30gr or less.
4) For smoothing to set rolled paper, cut edge of paper obliquely.

4.5 Hold of Rolled Paper

1) In the no-hold tupe, roller etc. should be set under rolled paper to reduce paper load.
2) In case at using rolled paper of outer diameter 60mm or more, use of no-hold type is not permitted.

4.6 The Others

1) Do not touch the knob for paper feeding in the print operation.
2) In case of using paper winding (option), set the angle of the winding direction of paper 45° or more to printer bottom. If the angle is set less than 45°, it may occur stain by ink ribbon to the paper.
   Set the paper friction force 90 gram or less. If it set more than 90 gram, it may occur print defect.
3) In the design of the paper entrance, make the paper to be entered horizontally.
   If there is projection in the paper entrance, paper feed pitch may be shortened for increase of paper feed load.
4) Use the paper without crease, rent etc.
5) Use the paper without perforation or hole in the print area.
6) Pull the paper slowly and straight.
7) If the paper is moved after print discontinuance, it is not guaranted print position, print pitch etc. after the print.
8) In the case of copying paper insertion, be careful 2 pieces, of paper not to slip.
9) Keep 0.5mm or more for space between printer bottom and under cabinet except for screw setting horizontal position(approx. ø8mm), otherwise, printer flame may be bent and occur operation defect.
10) When paper in the paper course is slant at bath paper-sending and paper-ejecting side, paper-jam occur sometimes. Then, please stop printing at once.
    If being kept more than 10 minutes without stopping, there is a chance of danger for some parts of paper feed to be broken.

5. OVERRALL DIMENSIONS

5.1 Without Knob Type

Remarks:
1. Paper cutter setting position is for reference.
2. Rolled paper should be set with inner curl not outer curl.
3. Prevention for Rolled paper Re-winding and shape of paper cutter should be checked in outer case design.
4. In the design of paper entrance and paper holder, center of case side paper holder should be adjust the center of paper entrance width of printer.
5. Thrust gap between case side paper holder and rolled paper should be 2mm or less, and paper holder should not hold edge of rolled paper.
6. Rolled paper supply load should be 30g or less.
7. For smoothing to set rolled paper, cut edge of paper obliquely.
8. In case design, the hatch area must be kept away by 1.5mm or more from printer setting surface.
9. Figures shows Overall Dimention and Relation of setting position. (Mark "*" shows figure of Hole for setting)

5.2 Horizontal Knob Type

Remarks:
1. Horizontal manual knob should not touch case since it rounds during printer operations.
2. Paper cutter setting position is for reference.
3. Rolled paper should be set with inner curl not outer curl.
4. Prevention for Rolled paper Re-windings and shape of paper cutter should be checked in outer case design.
5. In the design of paper entrance and paper holder, center of case side paper holder should be adjust the center of paper entrance width of printer.
6. Thrust gap between case side paper holder and rolled paper should be 2mm or less, and paper holder should not hold edge of rolled paper.
7. Rolled paper supply load should be 30g or less.
8. For smoothing to set rolled paper, cut edge of paper obliquely.
9. In case design, the hatch area must be kept away by 1.5mm or more from printer setting surface.
10. Figures shows Overall Dimention and Relation of setting position. (Mark "*" shows figure of Hole for setting)

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5.3 Vertical Knob Type

Charactor Bottom Position
(2 Dots Line Space)

M2 Screw Head Escapement. (2 position)
(2mm ø5 from Frame bottom)

Vertical manual knob

Ribbon cassette

Paper exit range

Paper cutter setting position
(Reference)

Paper entrance

Base level

PULL

M2

ø2.6±0.1 *

Soldering hight: 1 (Max. 1.5)

The Edge of PCB is 0±1 from Base level.

Base level

2-2.6±0.1 *

2-6.4

Soldering hight: 1 (Max. 1.5)

OK (inner curl)   NG (outer curl)

Printer   Printer

Setting Example of Rolled Paper

Remarks:
1. Vertical manual knob should not touch case since it rounds during printer operation.
2. Paper cutter setting position is for reference.
3. Rolled paper should be set with inner curl not outer curl.
4. Prevention for Rolled paper Re-winding and shape of paper cutter should be checked in outer case design.
5. In the design of paper entrance and paper holder, center of case side paper holder should be adjust the center of paper entrance width of printer.
6. Thrust gap between case side paper holder and rolled paper should be 2mm or less, and paper holder should not hold edge of rolled paper.
7. Rolled paper supply load should be 30g or less.
8. For smoothing to set rolled paper, cut edge of paper obliquely.
9. In case design, the hatch area must be kept away by 1.5mm or more from printer setting surface.
10. Figures shows Overall Dimention and Relation of setting position. (Mark "*" shows figure of Hole for setting. M2 position should be set lower by 1mm than other setting surface.)