UA-743

DIGITAL BLOOD PRESSURE METER-FINGER

MAINTENANCE MANUAL

maintenance-UA 743

DIGITAL BLOOD PRESSURE METER-FINGER

A&D Company, Limited

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UA-743 Digital Blood Pressure Meter-Finger
Maintenance Manual v.1.a

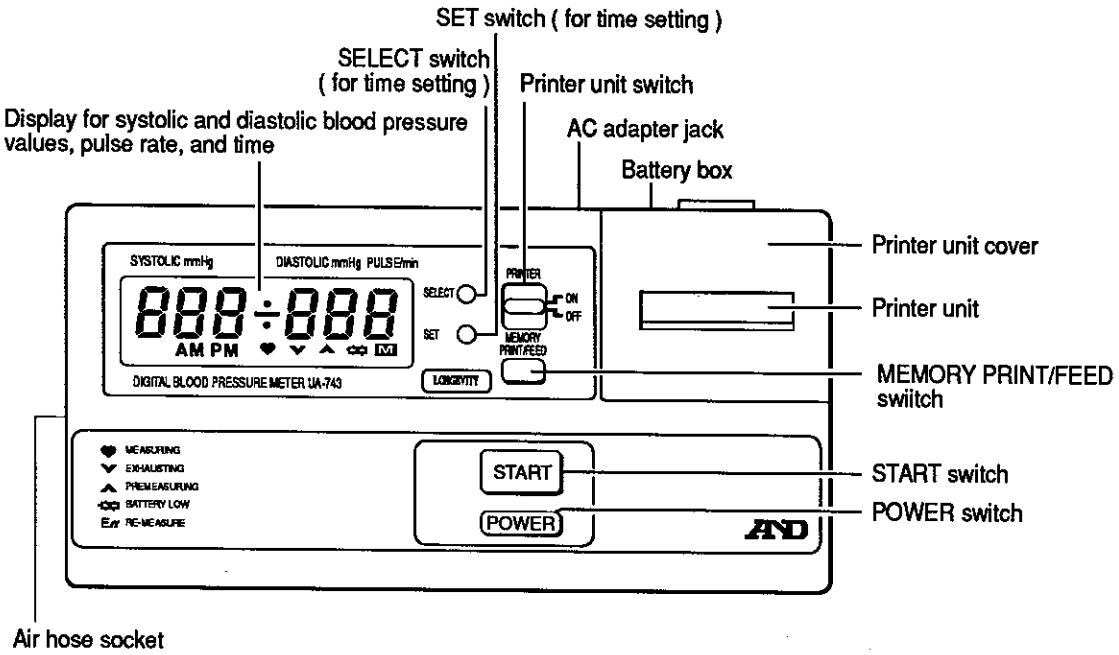
1. General

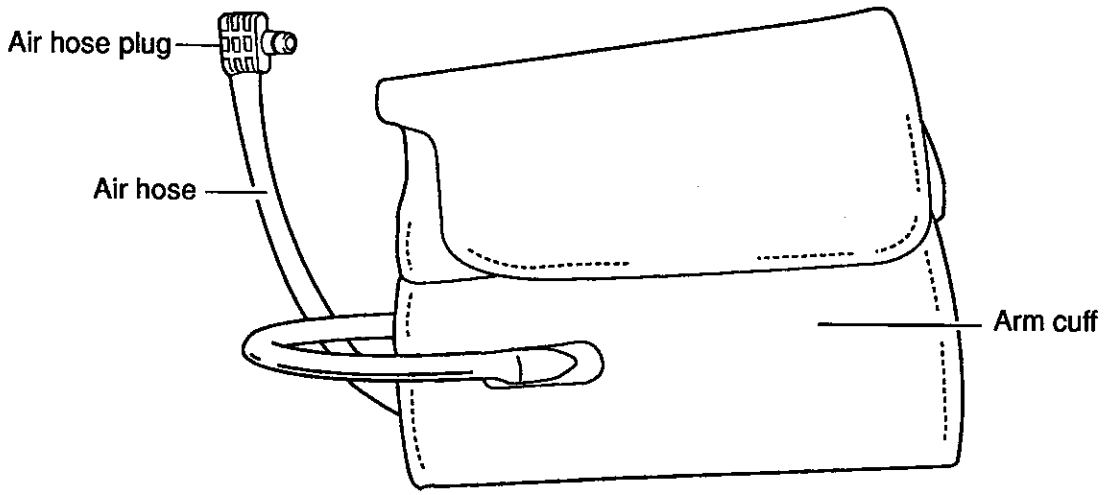
- The UA-743 employs oscillometric method for measurement of systolic and diastolic blood pressure.
- An inflation is controlled automatically according to initial setting.
- At the end of measurement, measured data including date, time, systolic and diastolic blood pressure values, and pulse rate are automatically stored. Last seven data for up two people are always stored by the default setting. It can be set to store last seven data for one person.
- Measured data is printed when measurement is completed. The graph can also be printed in WHO blood pressure trend format.
- One data set is printed at the end of blood pressure measurement.
- Paper out would be detected.

2. Specifications

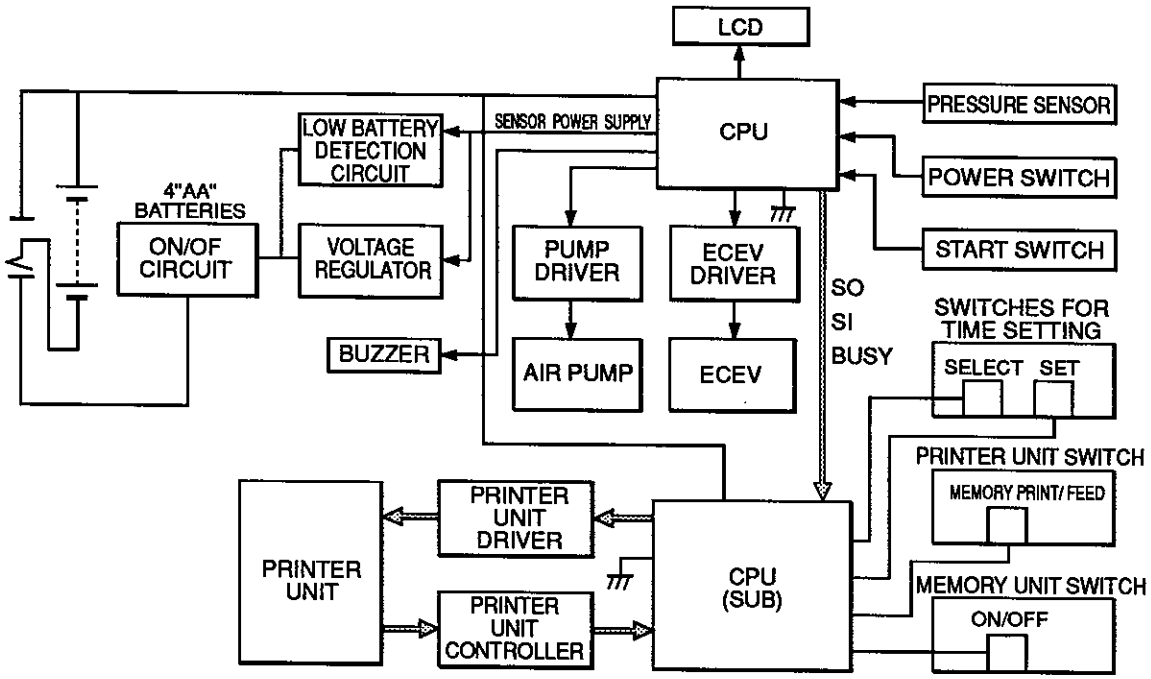
1)	Display	Digital display 29 x 60 mm (LCD)
2)	Measurement method	Oscillometric Method
3)	Measurement range	Pressure: 20 to 280 mmHg Pulse: 40 to 200 beats/minute
4)	Accuracy	Pressure: Within ±4 mmHg Pulse: Within ±5% of reading
5)	Inflation	Automatic, using an electric pump (Inflation values 160, 200, 240, and 280 mmHg)
6)	Deflation	Automatic, using electronically controlled exhaust valve (ECEV)
7)	Exhaust	Automatic exhaust system using ECEV
8)	Printing method	Thermal printing with 38 mm-wide paper
9)	Power supply	4 "AA" size batteries or AC adapter for UA-743
10)	Battery life	Approximately six months (3-minute use with 1 data print for once a day, 14 data print for once in 14 days)
11)	Operating temperature/ humidity	+10 to +40°C Under 85% RH
12)	Storage temperature/ humidity	-20 to +55°C Under 95% RH
13)	Weight	Approx. 670g with batteries
14)	Dimensions	200 (W) x 58 (H) x 100 (D) mm
15)	Measuring parts	Left upper arm
16)	Registration number for medical equipment	1B390
	Registration number for equipment type	Q8718

3. Components





4. Block Diagram



5. Hardware Description

The UA-743 consists of four blocks as pressure detection, automatic inflation, print, and control(CPU).

Control circuit (CPU) processes detection signals sent from each part and controls display of systolic and diastolic blood pressure values, pulse, etc. in the LCD panel and controls printer unit to initiate printing. The CPU also controls time display by built-in clock.

a) Arm cuff pressure measurement

When arm cuff pressure is increased, sensor capacitance is increased and oscillation frequency becomes lower. The CPU counts the frequency during a constant period and outputs it as the arm cuff pressure value. Measured arm cuff pressure value is displayed using digits in the LCD panel.

b) Blood pressure measurement

The CPU decides a blood pressure value based on detected value, then display in the LCD panel.

The CPU sends signals to initiate pulse measurement, error judgment, buzzer sound, automatic inflation, automatic exhaust, etc.

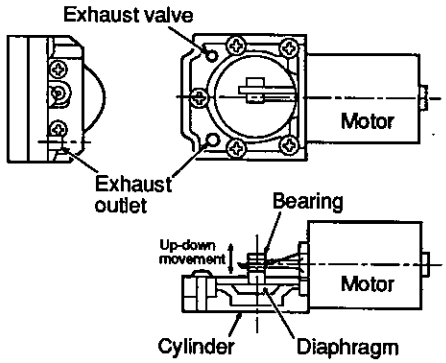
c) Automatic inflation

When the START switch is pressed, inflation increases until it reaches the preset pressure value. If insufficient inflation is detected, the UA-743 reinflate twice until insufficient inflation is not detected.

When inflation is completed, the rapid exhaust valve opens to exhaust air.

The rapid exhaust valve also opens if pressure value exceeds 320 mmHg.

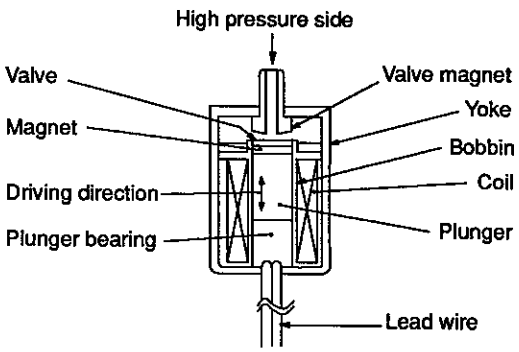
d) Air pump operation



- The motor shaft gears the motor rotation to the coupling rod to initiate its up-down movement which cause the diaphragm compress air.
- Maximum pressure: 320 mmHg

  Inflation time until 300 mmHg: 10 to 20 seconds

e) Rapid exhaust valve operation

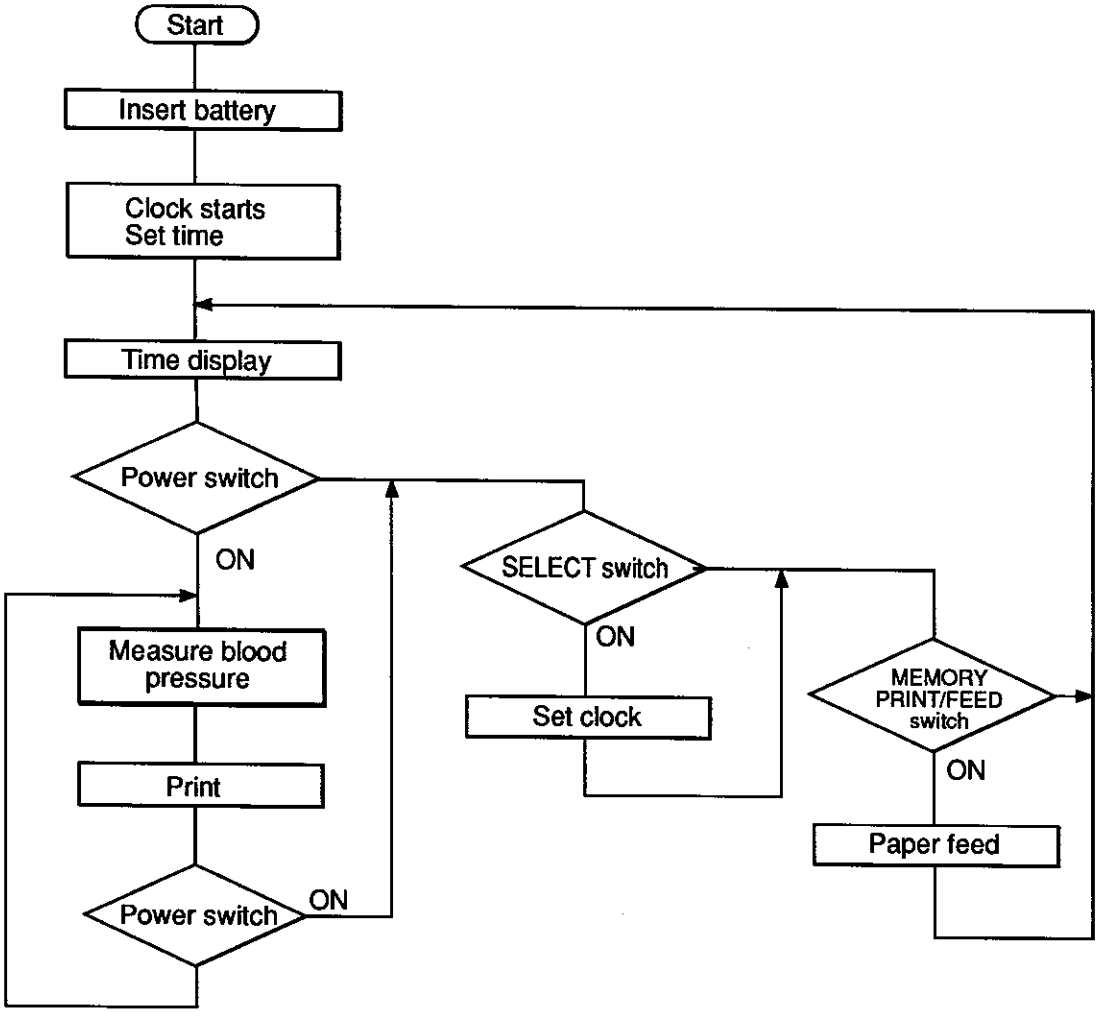


1) When blood pressure measurement starts, the plunger raises the core (valve closed position). When the measurement is completed, an electrical signal operates the coil to lower the plunger. Then, the plunger causes the core to drop, opening the valve for rapid exaust.
2) When the pressure exceeds 320 mmHg, an electrical signal causes the same operation as described above for safety reasons.
3) When power is off, the plunger is in a lower position (valve open).

f) Printer unit operation

When measurement is completed, the printer unit is driven by the CPU (sub) through the printer driver and printer controller circuits, printing date, time, systolic and diastolic blood pressure values, and pulse rate that have been stored in the CPU.

6. Operation Flow



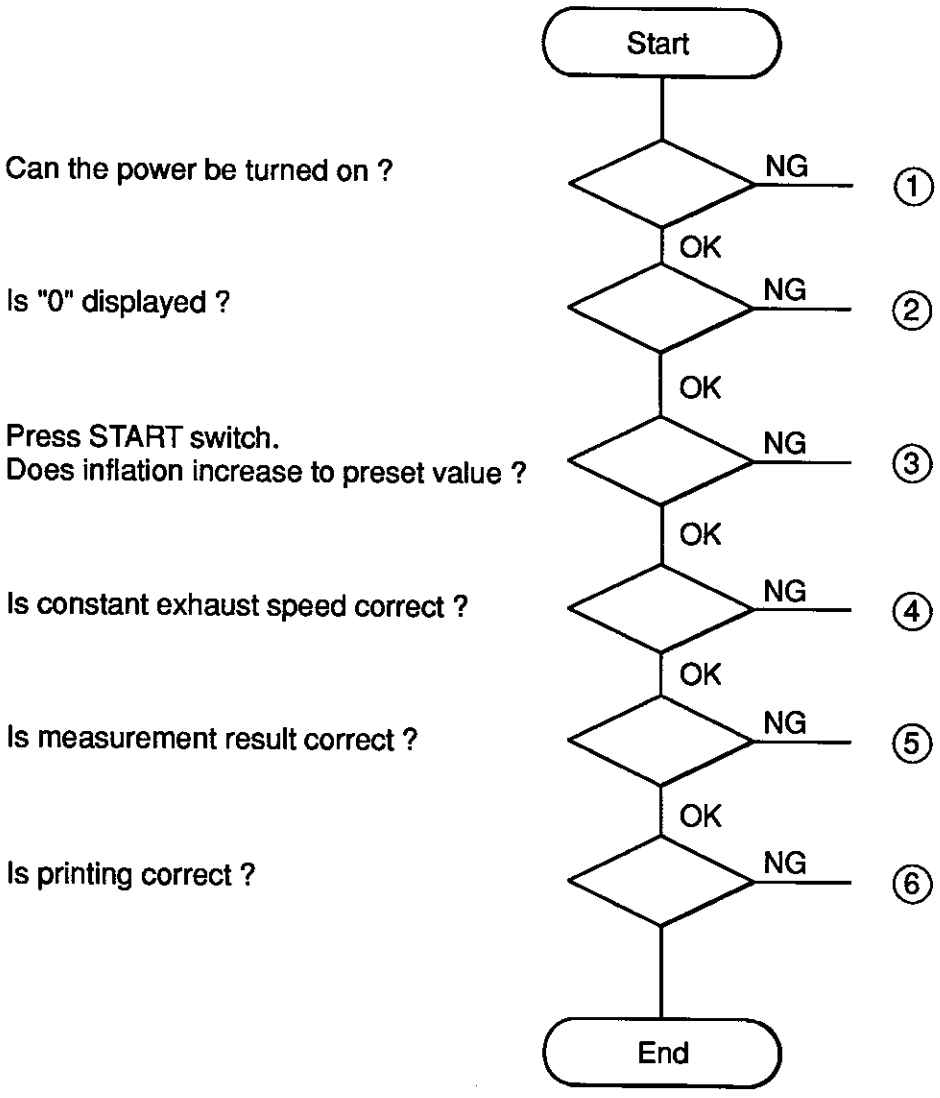
7. Troubleshooting

This section describes the symptoms, causes and treatments of troubles.

Pressure accuracy should be checked after repair. See 8.2 Pressure Reading Adjustment.

Step 1 Performance test chart

Check the symptom against the flowchart, find the corresponding number circled on the right side of the chart, then proceed to step 2, Troubleshooting table.



Step 2 Troubleshooting Table

	Symptom	Cause	Treatment	Replacing Part No.
①	Power does not go on	Low battery	Replace electrode	
		Electrode defective	Replace electrode	U4-3533-A U4-3534-A U4-3535
		Part defective	Replace board	
②	"0" is not displayed	Pressure reading adjusted incorrectly	Replace board	PA-0107IM
		Sensor defective		
③	No inflation	Tube broken	Replace tube	UA4-3864
		ECEV broken		LS-SS-068K-002A
		Air pump defective		UA3-572
		Constant exhaust valve broken	Replace valve	UA4-2680-A
		Arm cuff broken		UA4-4930
④	Abnormal constant exhaust speed	Speed adjusted incorrectly	Readjustment	
		Constant exhaust valve broken	Replace valve	UA4-2680-A
		Tube broken	Replace board	UA4-3864
		Air connector broken	Replace connector	U4-2452-B
⑤	Measurement result incorrect	Adjusted incorrectly	Replace connector	
			Replace board	PA-0107IM
⑥	No printing	Printer unit defective	Replace printer unit	EP-MTP104-16 CB

8. Adjustment

❑ Printer Pulse Width Adjustment

Step 1 Supply power via AC adapter jack.

Step 2 Connect frequency counter to J73.

Step 3 Adjust frequency with V69 while pressing the MEMORY PRINT/FEED switch.

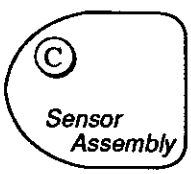
A rank	5.8 kHz
B rank	6.3 kHz
C rank	6.8 kHz

Note: Frequency varies according to part rank.

❑ Pressure Reading Adjustment

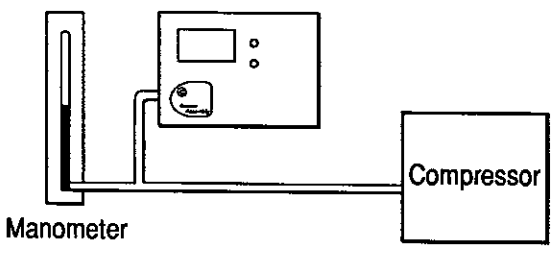
Step 1 Connect AC adaptor while pressing SELECT and SET switches.

Step 2 Confirm is displayed after all segment marks were displayed. Increase pressure to 280 mmHg by using compressor connected to air socket.

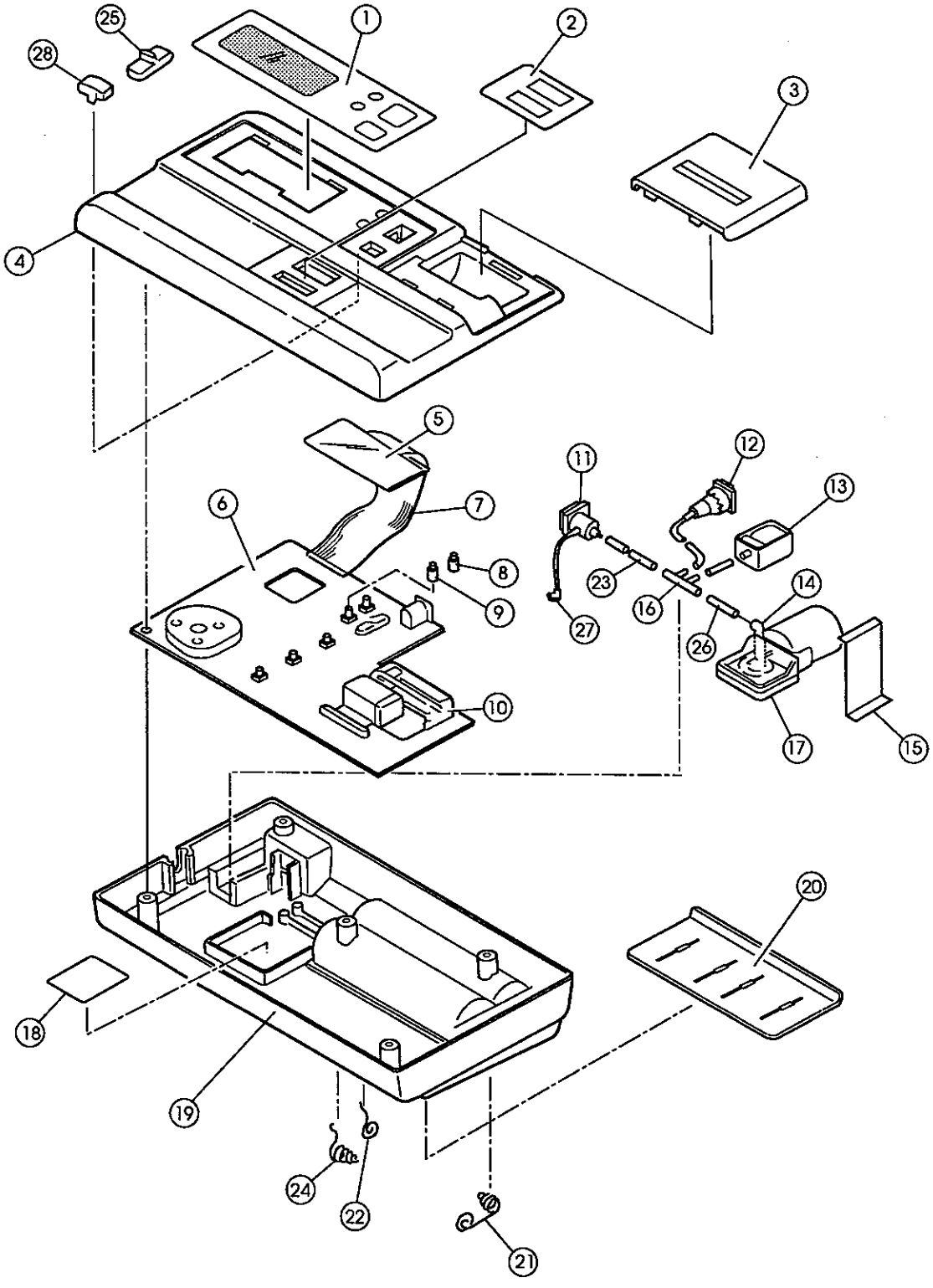


Step 3 Adjust pressure reading by turning volume C.

Step 4 Turn power on and check that pressure reading difference between the UA-743 and manometer is ±1 mmHg.



9. Exploded View



Parts for 743JA-C

	Part name	Part No	Q'ty
1	LCD panel	UA-4159	1
2	Key sheet	U4-4158	1
3	Paper cutter	U2-358	1
4	Upper case	U4-3919	1
5	LCD	VL-LF7404G	1
6	Main board	PA-0/0 7IM	1
7	Sheet seal	KH-22P/50L100	1
8	Key top M	U4-3845	1
9	Key top M	U-4-3845	1
10	Printer unit	ET: EP-TMP104-16CB	1
11	Air socket	U4-2731-A	1
12	Constant exhaust valve assembly	UA4-2680-A	1
13	Electrically controlled exhaust valve assembly	LS-SS-068K-002A	1
14	Air pump L shape connector	U4-3609	1
15	Air pump holder plate	U4-3845	1
16	Joint pipe	U4-3213	1
17	Air pump assembly	UA3-572	1
18	Cushion	U4-3861	1
19	Lower case	U4-4401	1
20	Battery cover	U4-4402	1
21	Electrode A	U4-3533-A	1
22	Electrode B	U4-3534-A	1
23	Silicone tube ϕ2.6 x ϕ4 x 40	TS-26400040 TP	3
24	Electrode C	U4-3535	1
25	Slide switch	U4-4161	1
26	Silicone tube ϕ3 x ϕ5 x 25	TS-30500025	2
27	L shape connector	04-3242-A	1
28	Key top A	U4-4160	1

Parts for 743 EX-C

1	LCD panel	U4-4842	1
2	Key sheet	U4-4843	1
3	Upper case	U4-4850	1

Parts for 743 US-C

1	LCD panel	U4-4842	1
2	Key sheet	U4-4843	1
3	Upper case	U4-4850	1

Arm cuff

743 JA-C	Welded soft cuff T Air plug	Blue ST-60	UA4-4930 U4-2452-B
743 EX-C	Welded soft cuff T Air plug	Gray ST-60	UA4-4929 U4-2452-D
743 US-C	Welded soft cuff T Air plug	Gray ST-60	U4-4929 U4-2452-D

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