

UB-322

MAINTENANCE MANUAL

DIGITAL BLOOD PRESSURE MONITOR

A&D
A&D Company, Limited

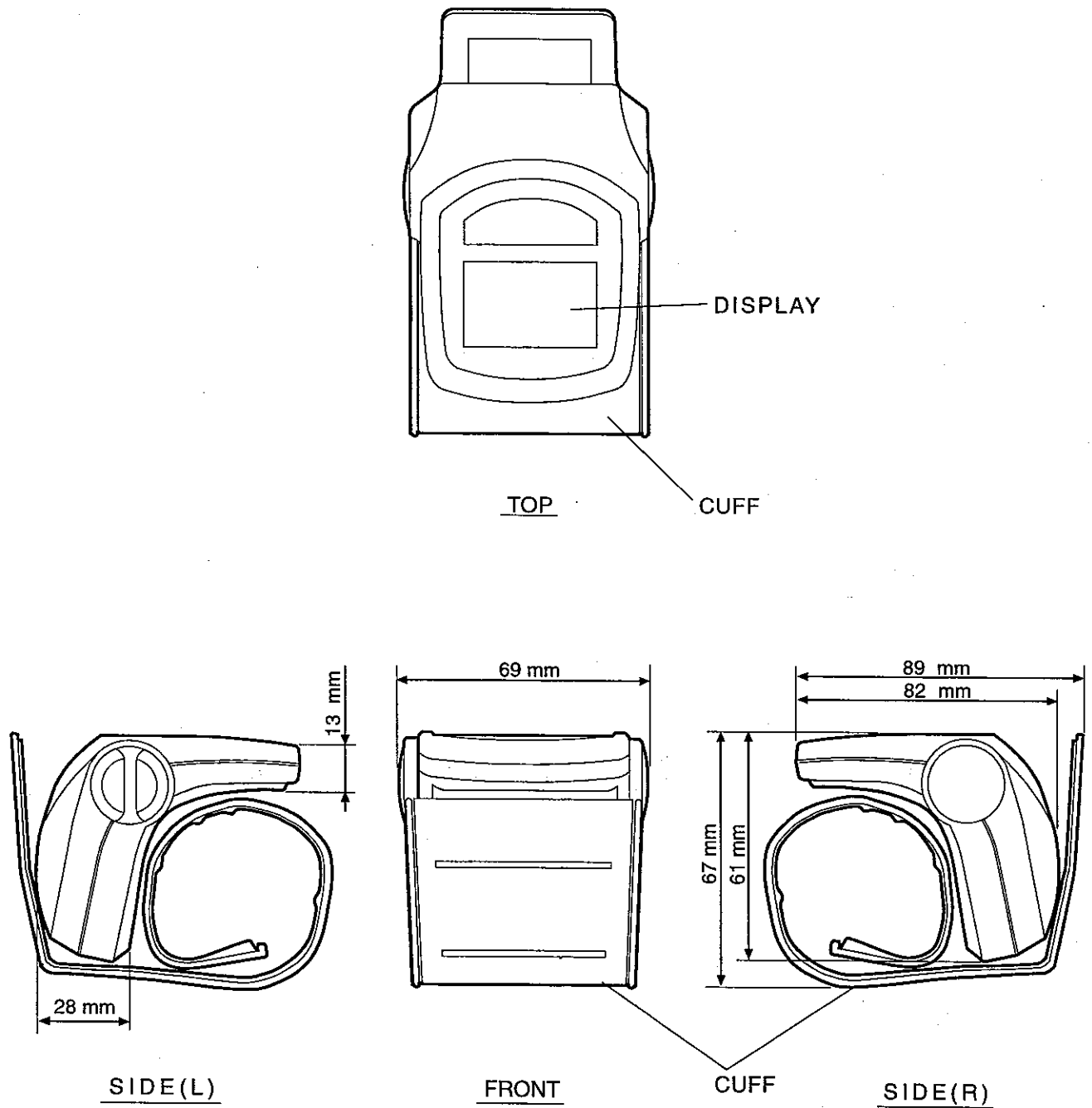
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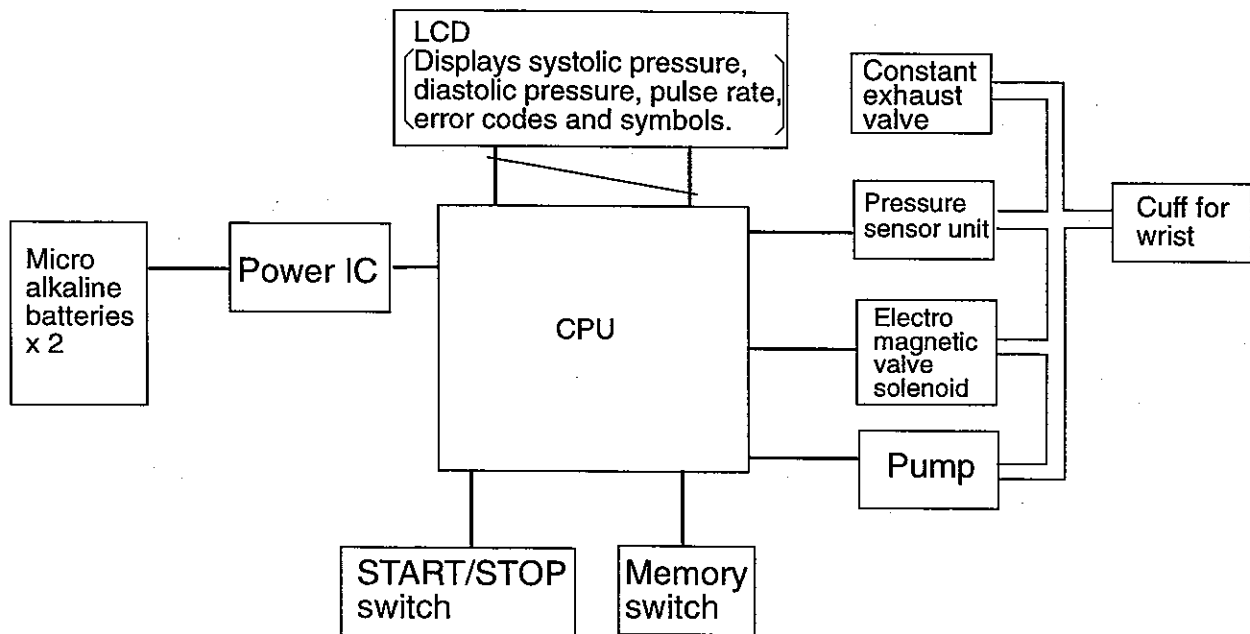
1. SPECIFICATIONS

1) Measurement Method	Oscillometric
2) Measurement Range	20~280 mmHg (Blood Pressure) 40~200 P/MIN. (Pulse)
3) Accuracy	Pressure ± 3 mmHg or 2% Pulse $\pm 5\%$
4) Cuff Inflation	Micropump
5) Depressurization	Constant-air-release valve system
6) Pressurization	Automatic quick exhaust
7) Power Source	3VDC, 2 x 1.5V alkaline batteries
8) Battery Life	Approx. 400 times
9) Weight	Approx. 140 grams without batteries
10) Dimensions	89 (W) x 69 (D) x 67 (H) mm
12) Operating Environment	+10~+40°C at less than 85% R.H. (50~100° F)
13) Storage Environment	-20~+60°C at less than 85% R.H. (15~130° F)
14) Display	Liquid crystal type

2. OUTLINE DRAWING



3. BLOCK DIAGRAM



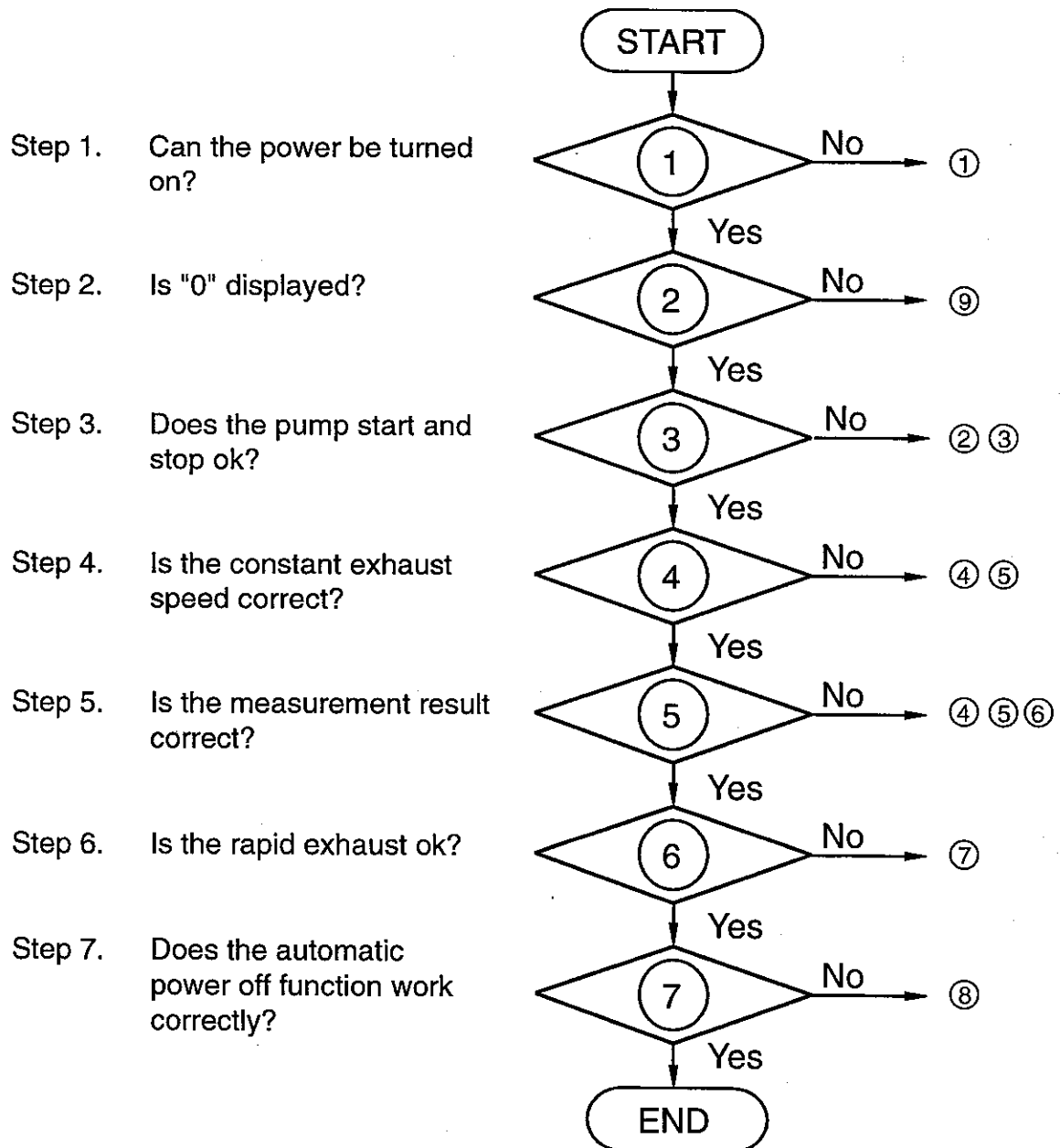
4. TROUBLESHOOTING

This section describes the symptoms, probable causes and solutions to problems. In the case of "can not measure" or "too much error", confirm that the measurement method is correct.

Pressure accuracy should be checked after repair. See "6. Pressure Adjustment Procedure"

Performance check chart

Check the symptoms against the flow chart and find the corresponding number circled on the right side of the chart. Then proceed to the troubleshooting table



TROUBLESHOOTING TABLE

	Symptom	Probable Cause	Treatment
①	Power does not turn on.	Low battery	Replace the battery.
		Power lead is broken.	Resolder the leads.
		Main board may be defective.	Replace the main board and adjust the pressure reading.
②	Pump does not start.	Air pump is broken.	Replace the pump.
③	No inflation	Cuff leaking.	Replace the cuff.
		Constant exhaust valve is defective.	Replace the constant exhaust valve ass'y.
		Solenoid valve is defective.	Replace the solenoid valve ass'y.
④	Constant exhaust speed is too fast.	Constant exhaust valve is defective.	Replace the constant exhaust valve ass'y.
		Tubing is broken.	Replace the tubing.
		Cuff is broken.	Replace the cuff.
⑤	Constant exhaust speed is too slow.	Constant exhaust valve is defective.	Replace the constant exhaust valve ass'y.
		Tubing is pinched.	Replace the tubing.
⑥	Pressure reading is incorrect.	Pressure reading is adjusted incorrectly.	Readjust the pressure reading.
		Sensor board may be defective.	Replace the sensor board and adjust the pressure reading.
⑦	Rapid exhaust does not work.	Solenoid valve is defective.	Replace the solenoid valve ass'y.
		Tubing is pinched.	Replace the tubing.
⑧	Automatic power off function does not work.	Main board is defective.	Replace the main board.
⑨	Pressure sensor unstable.	Main board is defective. Pressure sensor is defective.	Replace the main board. Replace the sensor board.

5. REPAIR PROCEDURE

Upper case removal

- Step 1. Remove the cuff. (Fig-1)
- Step 2. Remove four screws shown in the drawing. (Fig-2)
- Step 3. Remove the upper case using caution not to damage the LCD.

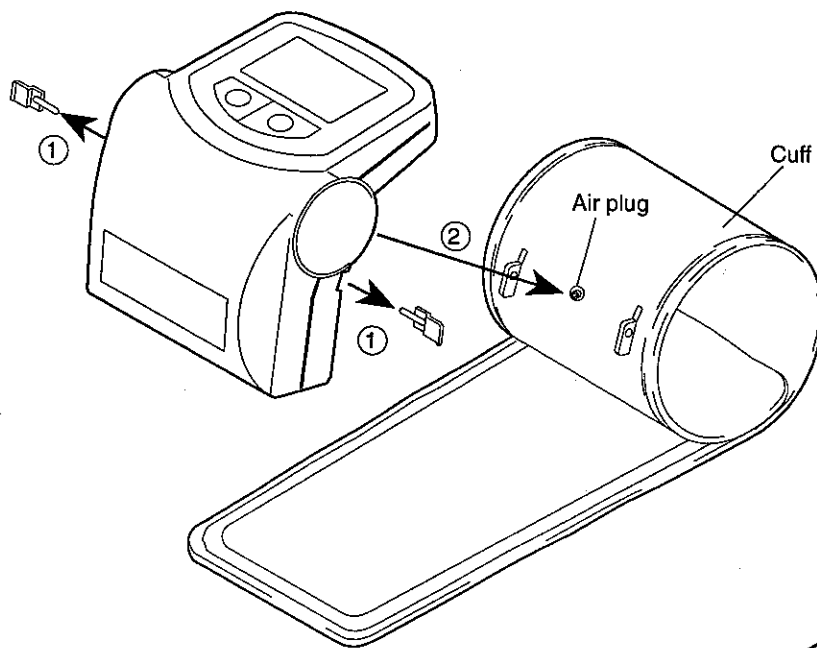


Fig-1

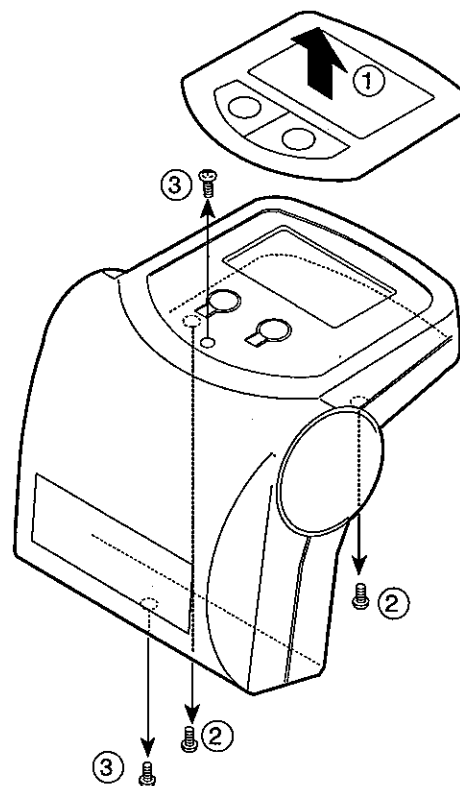
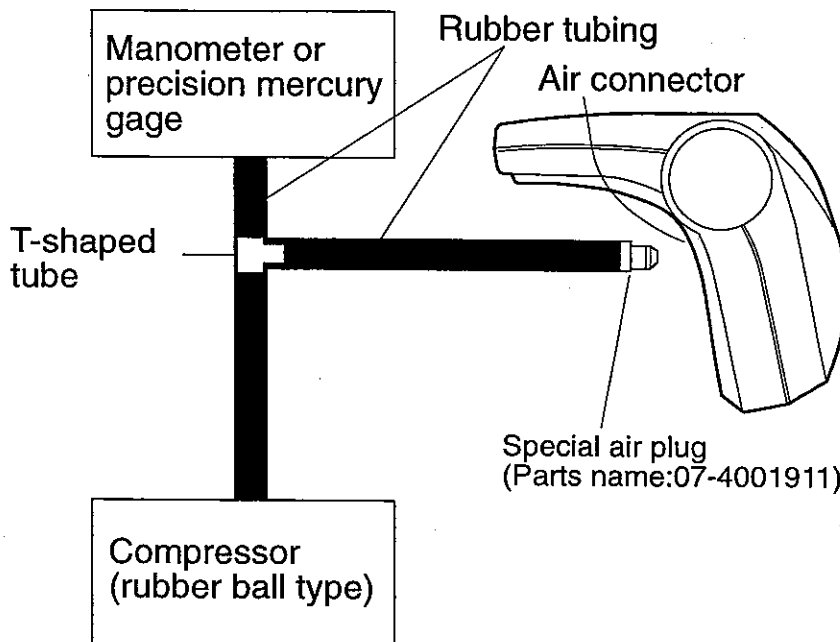


Fig-2

6. PRESSURE ADJUSTMENT PROCEDURE

Test equipment and tools required

- Low capacitance screwdriver
- Manometer or precision mercury pressure gage
- Compressor (rubber ball type)
- T-shaped tube
- Rubber tubing
- Forceps (or hose clamp)



Step 1. Remove the magic fastener, and remove the blind label.

Step 2. Enter the check mode.

<Entering the check mode>

Press the START button. When "0" (zero) appears, immediately supply air up to about 400 mmHg. When the display flashes "320", stop the air supply. Once the display returns to "0" (zero), supply 100 mmHg of air or more.

Step 3.

0
0
0

 is displayed on the LCD panel

Step 4. Increase the pressure to 280 mmHg by using the compressor. Use a precision manometer or mercury pressure gage to monitor the air pressure.

When using a rubber bulb pump for inflation, close the rubber tube with forceps to maintain the pressure

Step 5. If the pressure reading is incorrect, remove the upper case as described in the repair procedure to provide access to the adjustment screw

Step 6. Under the following conditions:

Pressure value applied = A mmHg

Reading displayed = B mmHg

Remainder if A - B = C mmHg

Use the formula $A \text{ mmHg} - B \text{ mmHg} = \pm C \text{ mmHg}$

When the result is +C mmHg, turn the adjustment screw for a reading of B - C mmHg

When the result is -C mmHg, turn the adjustment screw for a reading of B + C mmHg

Example: Pressure value applied = 280 mmHg

Reading displayed = 273 mmHg

$280 \text{ mmHg} - 273 \text{ mmHg} = +7 \text{ mmHg}$

$273 \text{ mmHg} - 7 \text{ mmHg} = 266 \text{ mmHg}$

Adjust the reading to 266 mmHg

Step 7. Reduce the pressure to zero and turn the power off (press the START switch).

Step 8. Press the START switch to turn the power on again (zero is set when the power is first turned on). Enter the check mode.

Step 9. Increase the pressure to 280 mmHg by using the compressor and check the accuracy of the display.

When the correct reading is obtained, gradually reduce the pressure and confirm that the pressure readings at 150 mmHg and 50 mmHg are within $\pm 3 \text{ mmHg}$.

Step 10. Remove the special air plug and attach the cuff to the air connector.

Place the cuff on a plastic form about the size of a normal arm.

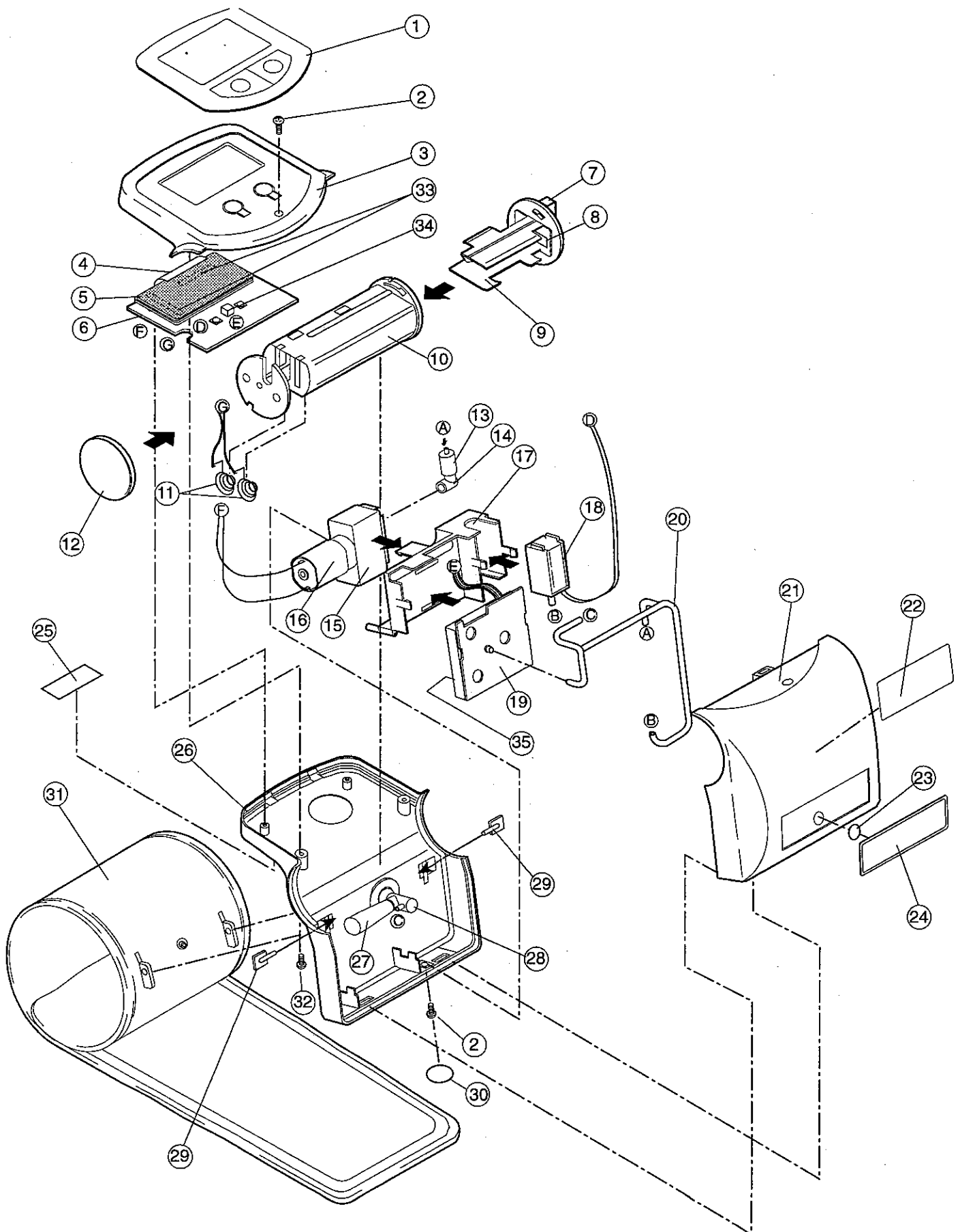
Press the START switch and pressurize the cuff to 160 mmHg.

Watch the display reading. The rate of pressure drop between readings should be about 3 mmHg.

If necessary, adjust the constant exhaust valve for 3 mmHg between readings.

Step 11. Reassemble the case and test the instrument again.

7. EXPLODED VIEW



8. PARTS LIST

No.	PARTS NAME	DESCRIPTION	MATERIAL
1	08:4006497	LCD COVER PANEL	PET
2	17:14FB-P1.7 X 3	SCREW M1. 7 X 3	SWRCH (Fe)
3	07:3002193	UPPER CASE COVER	ABS
4	KH-22P100L015	CABLE	-
5	VL-BTJ0001-JP	LCD	-
6	PA-0194S1	MAIN BOARD	-
7	09:4005864A	BATTERY COVER	ABS
8	15:4005408	TERMINAL A	C1100CP(Ep-Cu/Ni2)
9	07:3002197A	BATTERY HOLDER	ABS
10	07:3002196A	BATTERY BOX	ABS
11	15:4005409A	TERMINAL B	SWP-A(Ep-Fe/Ni2)
12	07:4005865A	CAP	ABS
13	PA:4000286	CHECK VALVE	-
14	07:4004530	PUMP CONNECTOR	PVC
15	LM:P23B-0001	PUMP	-
16	06:4005418	PUMP CUSHION	CR
17	07:3002195	FRAME	ABS
18	LS-TDS-V05BL	RELEASE VALVE	-
19	PA:0195S1	SENSOR BOARD	-
20	06:4005871	TUBE	NR
21	07:3002194B	UPPER CASE	ABS
22	08:4005427	CUFF LABEL	PAPER
23	10:4006216	BLIND LABEL	PAPER
24	13:4005419	MAGIC FASTENER	PA
25	08:4005868A	RATING LABEL	PET
26	07:2000259	LOWER CASE	ABS
27	PA:4000159	EXHAUST VALVE	-
28	07:4004525	CUFF CONNECTOR	TPU
29	07:4005354	CUFF CLIP	ABS
30	08:4005863	QC LABEL	PAPER
31	13:4005718A	CUFF	-
32	UZ4:0031	SCREW M2 X 8	SWRCH (Fe)
33	06:4005872	LCD CUSHION	NBR
34	06:4006147	CUSHION	U
35	PA:4000250	SENSOR	-

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A&D Co., LTD.

1-243 Asahi, Kitamoto-shi, Saitama, 364-8585 JAPAN
Telephone: [81] (485) 93-1111 Fax: [81] (485) 93-1119

A&D INSTRUMENTS LTD.

<Authorized Representative Established in the European Community>
Abingdon Science Park, Abingdon, Oxford OX14 3YS ENGLAND
Telephone: [44] (1235) 550420 Fax: [44] (1235) 550485

A&D Medical Pty. Ltd.

32 Dew Street, Thebarton, South Australia 5031
Telephone: [61] (8) 8352 3033 Fax: [61] (8) 8352 7409