

PREPARED BY : DATE <i>K. Kubo June 15, 1998</i>	<h1 style="text-align: center;">SHARP</h1> <p style="text-align: center;">LIQUID CRYSTAL DISPLAY GROUP</p> <p style="text-align: center;">SHARP CORPORATION</p> <h2 style="text-align: center;">SPECIFICATION</h2>	SPEC No. LD-10651
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DEVICE SPECIFICATION FOR

# LAMP UNIT

MODEL No.

## LQ0DDB9000

CUSTOMER'S APPROVAL

DATE \_\_\_\_\_

BY \_\_\_\_\_

PRESENTED BY *Y. Inaba*

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- > In case of using the device for applications such as control and safety equipment for transportation (aircraft, trains, automobiles, etc. ), rescue and security equipment and various safety related equipment which require higher reliability and safety, take into consideration that appropriate measures such as fail-safe functions and redundant system design should be taken.
- > Do not use the device for equipment that requires an extreme level of reliability, such as aerospace applications, telecommunication equipment(trunk lines), nuclear power control equipment and medical or other equipment for life support.
- > SHARP assumes no responsibility for any damage resulting from the use of the device which does not comply with the instructions and the precautions specified in these specification sheets.

Contact and consult with a SHARP sales representative for any questions about this device.

## (1) Subject

This literature is applied for LQ0DDB9000 which is the lamp unit for 26cm (10.4") TFT-LCD module.

## (2) Introduction

This backlight unit is a service part for 26cm TFT-LCD module (LQ104V1DG11) of which backlight is designed to be replaceable and exactly same as originally installed one for above model.

## (3) Construction and Outline

The unit is composed of 2 unit of cold cathode fluorescent tubes, I/O wires (including connectors), and lamp holders.

\* Outline drawing of lamp unit : See Fig. 1.

## (4) Input / Output terminals

## 4-1) I/O terminal order

Table 1

Pin No.	Symbol	i/o	Description
1	VHIGH	i	Power supply for lamp (High voltage side)
2	NC	-	No connection
3	VLOW	i	Power supply for lamp (Low voltage side)

## 4-2) I/O connector

1) Installed socket housing ; BHR-03VS-1

2) Mating connector ; SM02(8.0)B-BHS

( produced by Japan Solderless Terminal )

## (5) Electrical characteristics

The characteristics of single lamp are shown in the following table 2.

Table 2

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
Lamp current	$I_L$	2.0	6.0	6.5	mArms	【Note1】
Lamp power consumption	$P_L$	—	3.3	—	W	【Note2】
Lamp frequency	$F_L$	20	35	60	KHz	
Kick-off voltage	$V_s$	—	—	950	Vrms	$T_a=25^{\circ}\text{C}$
		—	—	1250	Vrms	$T_a=0^{\circ}\text{C}$
Lamp life time	$L_L$	—	40000	—	hour	【Note3】

【Note1】Available current range considering light-adjustment.

【Note2】 Calculated value for reference.

[Note3] Since lamp is consumable, the life time written above is referential value and it is not guaranteed in this specification sheet by SHARP.

Lamp life time is defined that it applied either 1 or 2 under this condition.

(Continuous turning on at  $T_a=25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ ,  $I_L=6\text{mA}$ )

1. Brightness becomes 50% of the original value under standard condition.
2. Kick-off voltage at  $T_a=0^{\circ}\text{C}$  exceeds maximum value, 1250 Vrms.

(6) Optical characteristics

Table 3

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Remarks
Luminance	$Y_L$	-	27,000	-	$\text{cd}/\text{m}^2$	$I_L=6.0\text{mA}$
Chromaticity	X	0.293	0.303	0.313		(Tentative Value)
	Y	0.268	0.278	0.288		

Above value is the characteristics of the lamp itself with the inverter

(7) Environmental condition

Following temperature ranges indicate ambient condition to be guaranteed by SHARP for the LCD module LQ104V1DG11 which the lamp unit is incorporated.

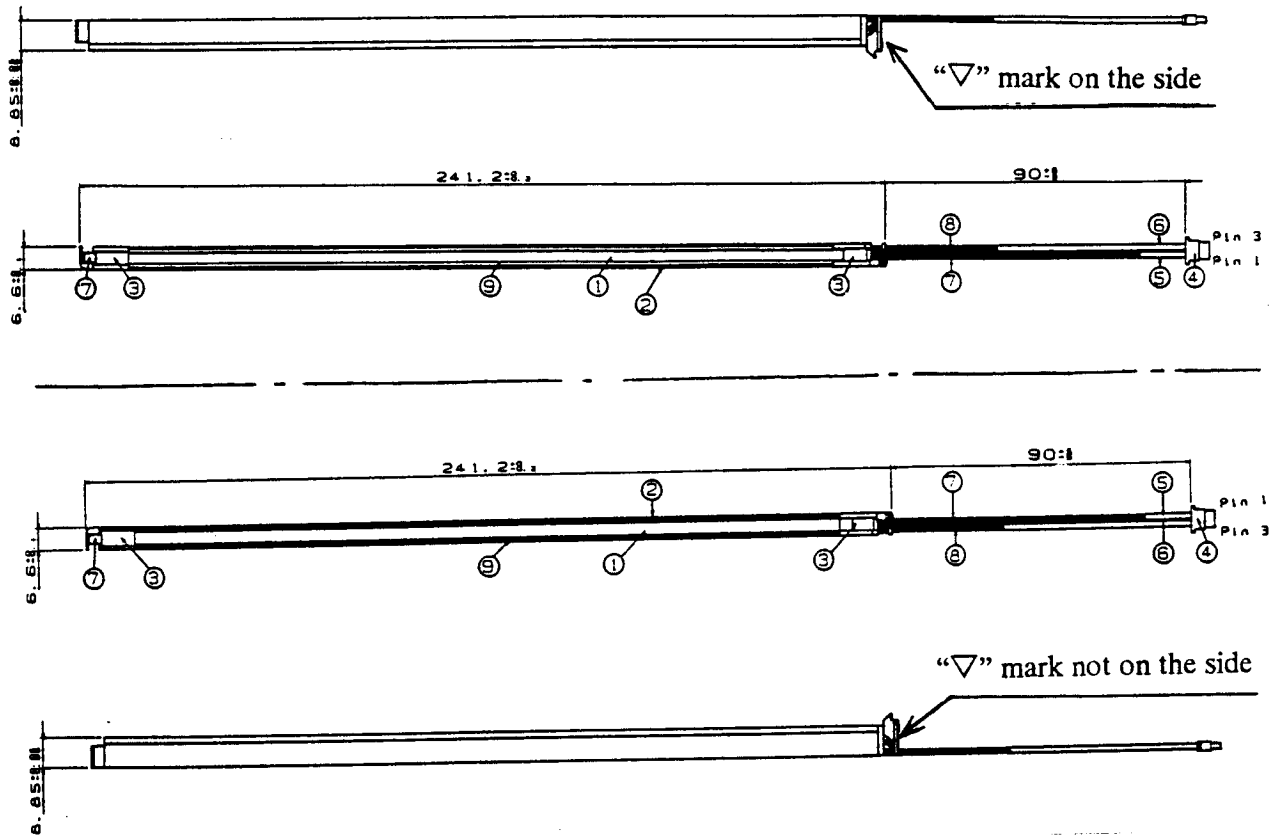
Table 4

Item	Symbol	Temperature	Unit	Remarks
Storage temperature range	Tstg	-25 ~ +70	$^{\circ}\text{C}$	【Note1】
Operating temperature range (Ambient)	Topa	0 ~ +55	$^{\circ}\text{C}$	

【Note1】 Humidity: 95%RH Max. ( $T_a \leq 40^{\circ}\text{C}$ )

Maximum wet-bulb temperature at  $39^{\circ}\text{C}$  or less. ( $T_a > 40^{\circ}\text{C}$ )

No condensation.



Pin NO.	Symbol	Color
1	VHIGH	Pink
2	NC	—
3	VLOW	White

No.	Part unit	Q'ty	Material etc.
①	Lamp	2	$\phi 2.6$ L=227mm
②	Lamp holder	2	PC
③	Lamp rubber cushion	4	Silicon rubber
④	Connector	2	JST BHR-03VS-1
⑤	Wire (High voltage side)	2	UL3239#24DC3kV
⑥	Wire (Low voltage side)	2	UL3239#24DC3kV
⑦	Shrink tube	4	Sumitube F4Z Black 1.5x0.2
⑧	Shrink tube	2	Sumitube F2Z Black 1.5x0.1
⑨	Reflection Film	2	Polyester(GR38W)

Fig. 1. Outline drawing of backlight unit

## (8) Procedure to exchange backlight unit

Lamps for the LCD module can be worn out, so please replace them to new lamps when needed in accordance with the following. Please make sure that power is off before you replace them to prevent you from getting an electrical shock. Lamps can be replaced by two ways, replacement horizontal slide and replacement by backside. Please insert the lamp with care while replacing. Please be careful for any dust goes in.

## 8-1) By Horizontal Slide(refer to Fig.2 and Fig. 3)

- ① Push the white latch (refer to the Fig.G and Fig.H) in the direction A or B with a minus driver. Lamp unit can be drawn out in the direction " F " . (refer to Fig. 2)
- ② Replace the new lamp unit with the one that has a marking "▽" on the surface. And the other new unit with no marking on it. Insert both lamp in the direction " C " When inserting the lamp, push the light guideplate, located inside the LCD module, in the direction " C " or " D " so that the lamp unit can be inserted smoothly. Then insert in the direction " E. " (refer to Fig. 3)
- ③ Please insert the lamp with care while replacing. Please be careful for any dust that goes in. Please make sure that the lamp unit is in all the way. You can hear the sound " click", if the Lamp unit is placed in the right position.
- ④. Not only one side ,both lamps should be exchanged.

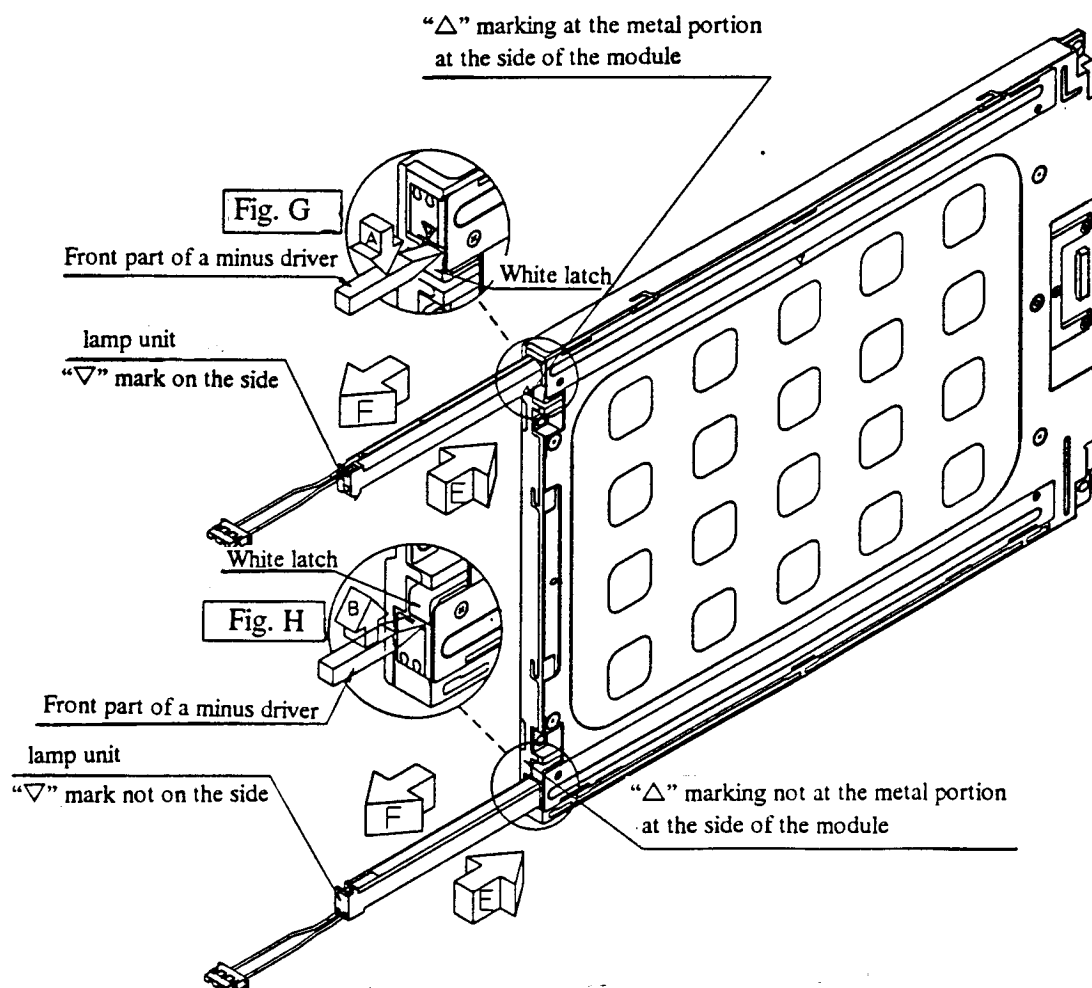


Fig. 2. Procedure to exchange backlight unit by horizontal side

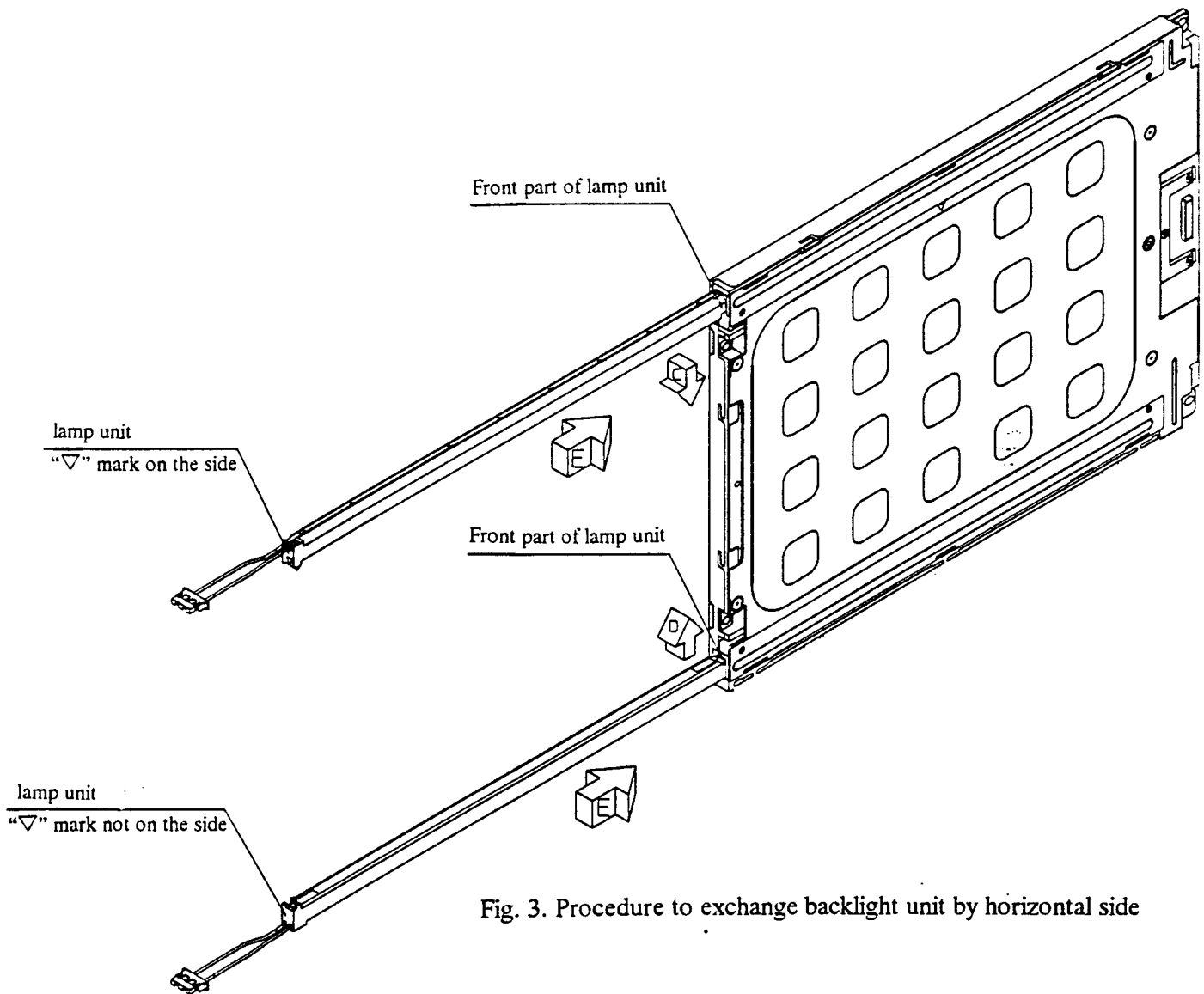


Fig. 3. Procedure to exchange backlight unit by horizontal side

8- 2 )By Backside (refer to Fig. 4 and Fig. 5 )

- ① Remove 4 screws which holds the holder cover. (refer to Fig. 4)
- ② Slide the holder cover to the “J” direction. Then remove the holder covers.
- ③ Remove the Lamp units. (refer to Fig.5)
- ④ Replace the new lamp unit with the one that has a marking “▽” on the surface. And the other new unit with no marking on it.
- ⑤ Slide the holder cover to the “ K ” direction and place the latch to the plug-in hole “L”, located by the LCD module.
- ⑥ Tighten the 4 screws to fix the holder cover along the screw gap of hole. The screw torque should be maximum 2kgf · cm. If you tighten the screw over 2kgf.cm, the screw should be destroyed. Please be careful.
- ⑦ Please insert the lamp with care while replacing. Please be careful for any dust that goes in. Please make sure that the lamp unit is in all the way.
- ⑧ Not only one side ,both lamps should be exchanged.

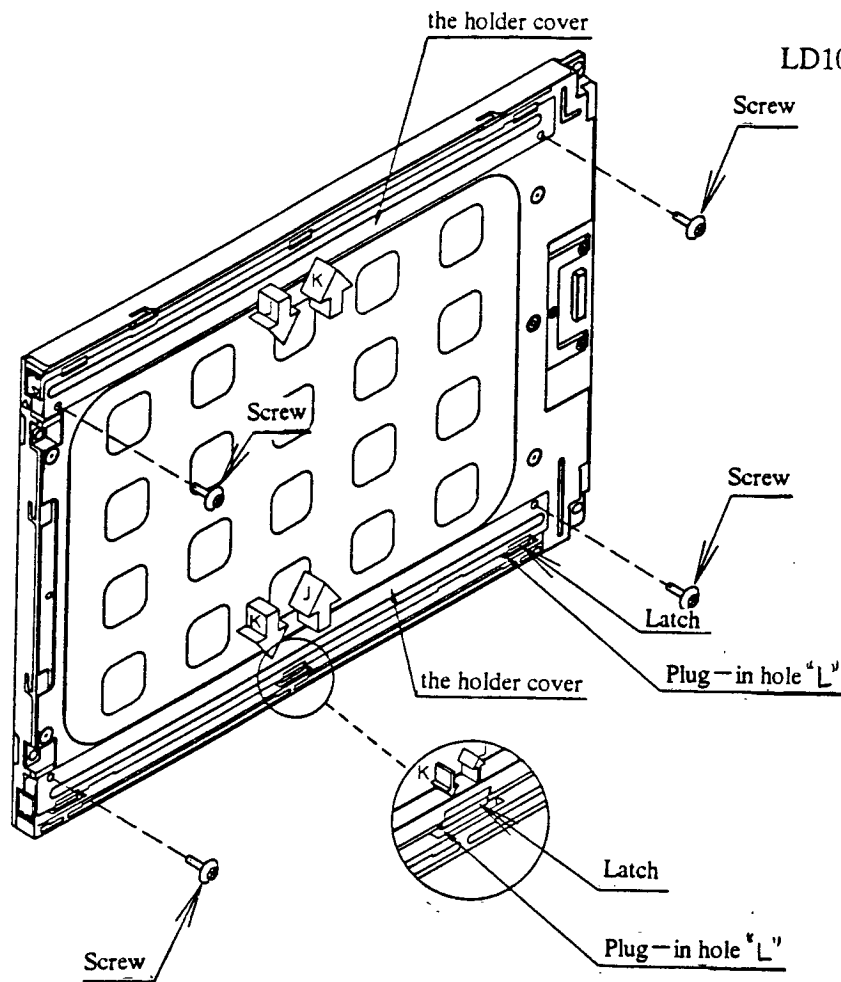


Fig. 4. Procedure to exchange backlight unit by back side

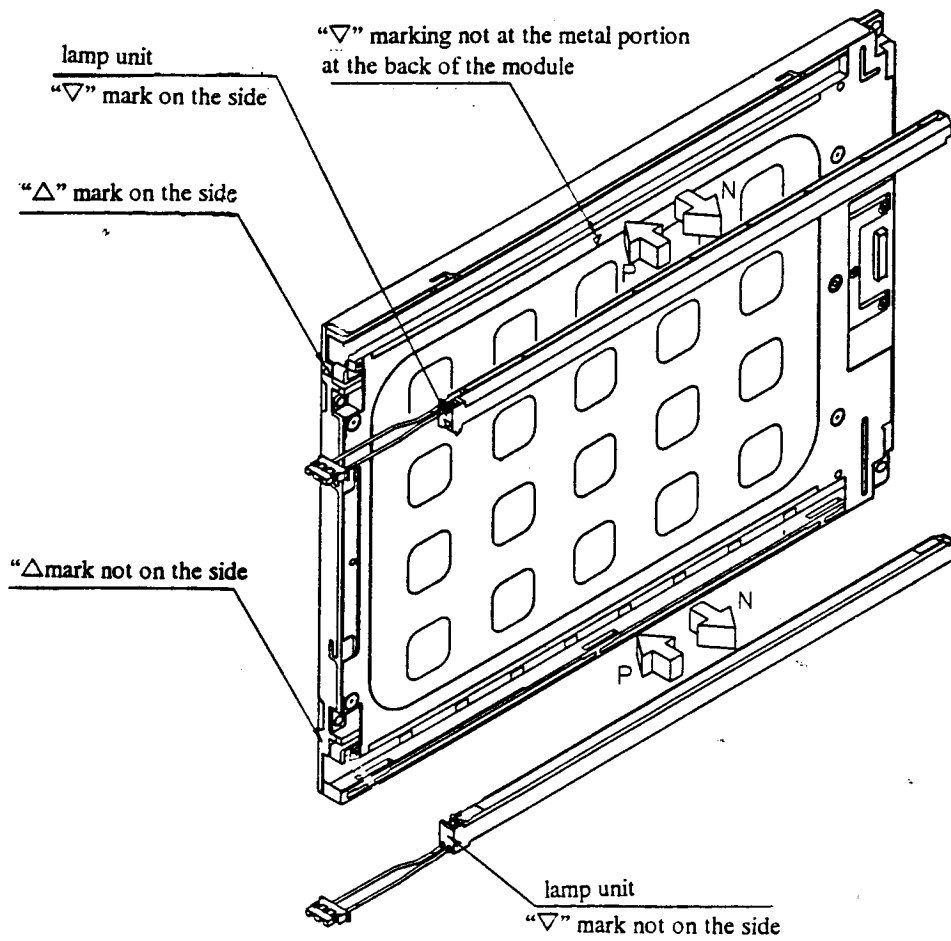


Fig. 5 Procedure to exchange backlight unit by back side



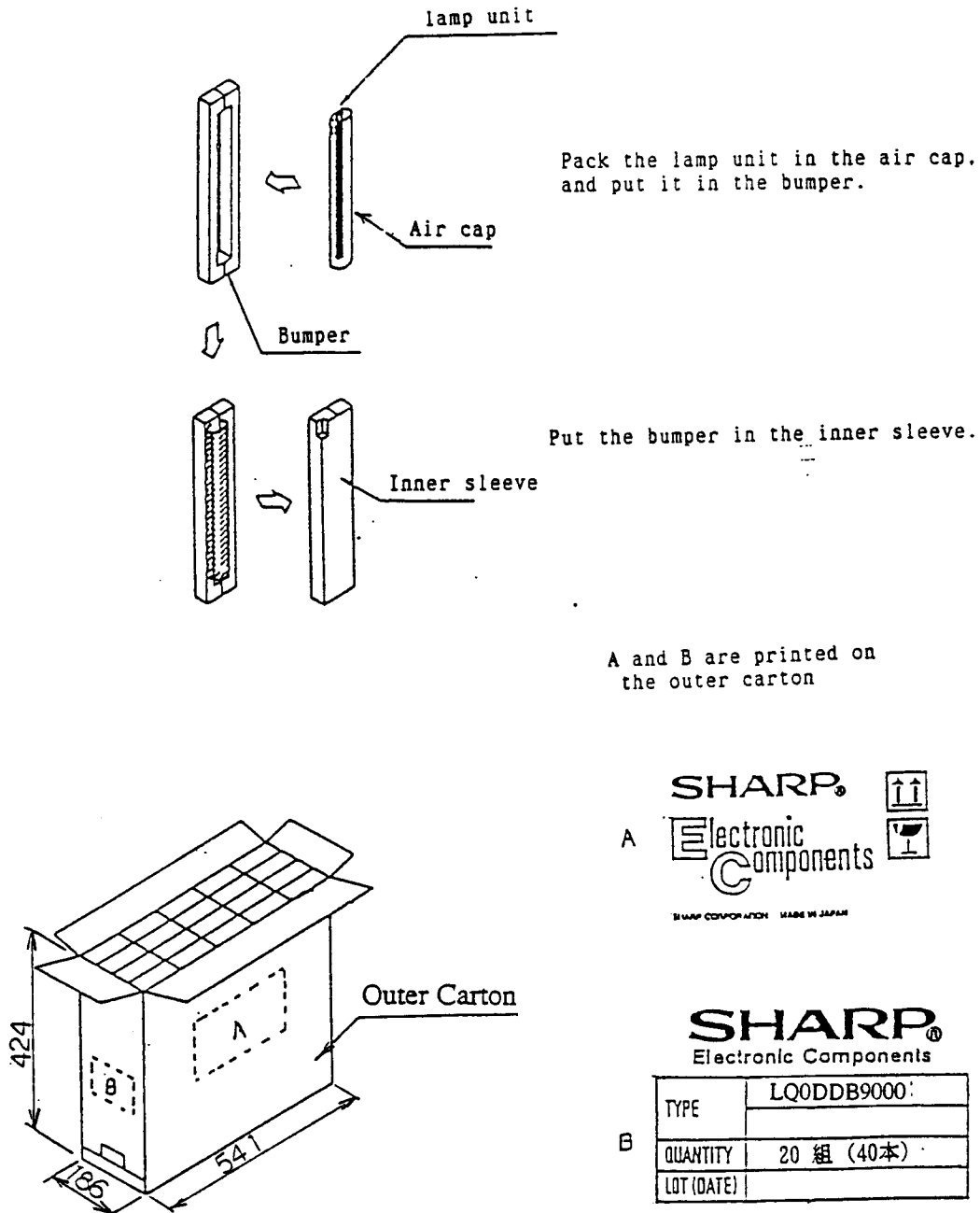
(9) Packing form

Packing form is shown in Fig.6 (Total Weight: 2,960 g)

(10) Others

10-1) It shall be informed before with attachment of the Quality/ reliability data if any changes of design, process, or management system occurs.

10-2) If any problems occurs in relation to the description in the present specifications or other relevant items, it shall be eliminated in all sincerity through discussion.



1 carton contains 20 sets(40 pieces).

Fig. 6 Packing form

Lamp Unit, LQ0DDB9000