

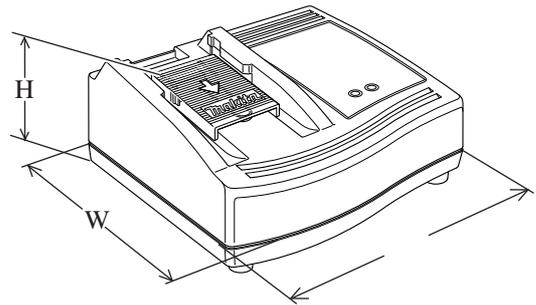
Models No. ▶ DC24WA

Description ▶ Charger

CONCEPTION AND MAIN APPLICATIONS

9.6V - 24V Ni-MH batteries of new charging system can be charged with this DC24WA.

Its feature is * Maintenance charge (trickle charge).



| Dimensions : mm (") | |
|-----------------------|--------------|
| Length (L) | 155 (6-3/32) |
| Width (W) | 180 (7-3/32) |
| Height (H) | 86 (3-3/8) |

► Specification

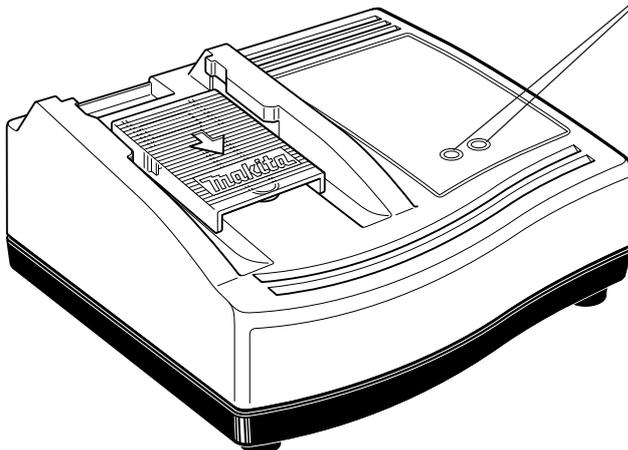
| Voltage (V) | Current (A) | Cycle (Hz) | Input |
|-------------|-------------|------------|-------|
| 220 - 240 | / | 50 - 60 | 90 |
| 220 - 240 | | 60 | 90 |
| 220 | | 50 - 60 | 90 |
| 230 - 240 | | 50 - 60 | 90 |

| Charging time (min.) | 2.0Ah | | | | 3.3Ah | | | |
|----------------------|-------------------|--------|--------|--------|-------------------|--------|--------|--------|
| | 9.6V | 12V | 14.4V | 24V | 9.6V | 12V | 14.4V | 24V |
| Approx. 40 | BH9020 BH9020A | BH1220 | BH1420 | | | | | |
| Approx. 55 | | | | BH2420 | | | | |
| Approx. 70 | | | | | BH9033 BH9033A | BH1233 | BH1433 | |
| Approx. 90 | | | | | | | | BH2433 |

► Features and benefits

Digital communication system controlled by computer

Computer-controlled charger with CPU built-in realizes the battery type and the history of charging and discharging of battery, and controls the charging in the most suitable manner to keep the maximum life of battery.



| Indication lamp telling the following matters. | | |
|--|--|--|
| ● ● | Two green lamps blink | Before starting of charge. |
| ● ○ | One red lamp turns on. | under charging process. Battery power : 0 - 79% |
| ● ● | Two red lamps turn on. | under charging process. Battery power : over 80% |
| ○ ○ | Two green lamps turn on. | Finish of charge. |
| ● ● | Two red lamps blink. | Stand by to start charge The temperature of battery is higher than 70°C. |
| ● ○ | One red lamp blinks. | Stand by to start charge The temperature of battery is lower than 70°C. |
| ● ● ● ● | Two red and green lamps blink alternately. | Impossible to charge because of *The service life of battery is over, or *Clogged terminal portion |

| Specifications | | | | Model No. | | | |
|--|-------------------|-----------------|-----------------|------------------------|-----------------|-----------------|-----------------|
| | | | | M A K I T A | | | |
| | | | | DC24WA | DC24SA | DC14SA | |
| Charging time | 3.3Ah | 24V | Battery BH2433 | Approx. 90 min. | Approx. 60 min. | / | |
| | 3.0Ah | | Battery BH2430 | | | | |
| | 2.0Ah | | Battery BH2420 | Approx. 55 min. | Approx. 30 min. | | |
| | 1.7Ah | | Battery BH2417 | | | | |
| | 3.3Ah | 14.4V | Battery BH1433 | Approx. 70 min. | Approx. 30 min. | | Approx. 50 min. |
| | | 12V | Battery BH1233 | | | | |
| | 9.6V | Battery BH9033A | | | | | |
| | 2.0Ah | 14.4V | Battery BH1420 | Approx. 40 min. | Approx. 20 min. | Approx. 30 min. | |
| | | 12V | Battery BH1220 | | | | |
| | | 9.6V | Battery BH9020A | | | | |
| Charging control system (controls output current) | | | | Yes | Yes | Yes | |
| Cooling system for inserted battery | | | | No | Yes | Yes | |
| Combination with the adapters ADP01, ADP02 and ADP03 | | | | No | Yes | Yes | |
| Conditioning charge | | | | * Yes | Yes | Yes | |
| Maintenance charge (trickle charge) | | | | Yes | Yes | Yes | |
| Power display for battery | | | | Yes | Yes | Yes | |
| Dimensions | Length (L) : mm | | | 155 | 175 | 155 | |
| | (") | | | (6-3/32) | (6-7/8) | (6-3/32) | |
| | Width (W) : mm | | | 180 | 215 | 180 | |
| (") | | | (7-3/32) | (8-1/2) | (7-3/32) | | |
| Height (H) : mm | | | 86 | 110 | 110 | | |
| (") | | | (3-3/8) | (4-5/16) | (4-5/16) | | |
| Net weight : kg (lbs) | | | | 0.7 (1.5) | 1.7 (3.8) | 1.3 (2.9) | |

*** Yes : But refer to the list mentioned below**

The comparison of the conditioning charge system of DC24WA and DC24SA

| The conditioning charge system | DC24WA | DC24SA |
|---|---|--------|
| Select the most suitable charge to keep the maximum life of battery, by receiving the data about the history of battery's usage. | Yes | Yes |
| Yellow lamp informs of that the inserted battery has been used with severe manner repeatedly. And the most suitable charge is selected for such battery. The charging time can be changeable. | No The charging time is steady. | Yes |

< 1 > Removing charger case

Charger case can be removed from charger case cover by unscrewing 4 pcs. of tapping screws BT 4x20. See Fig. 1.

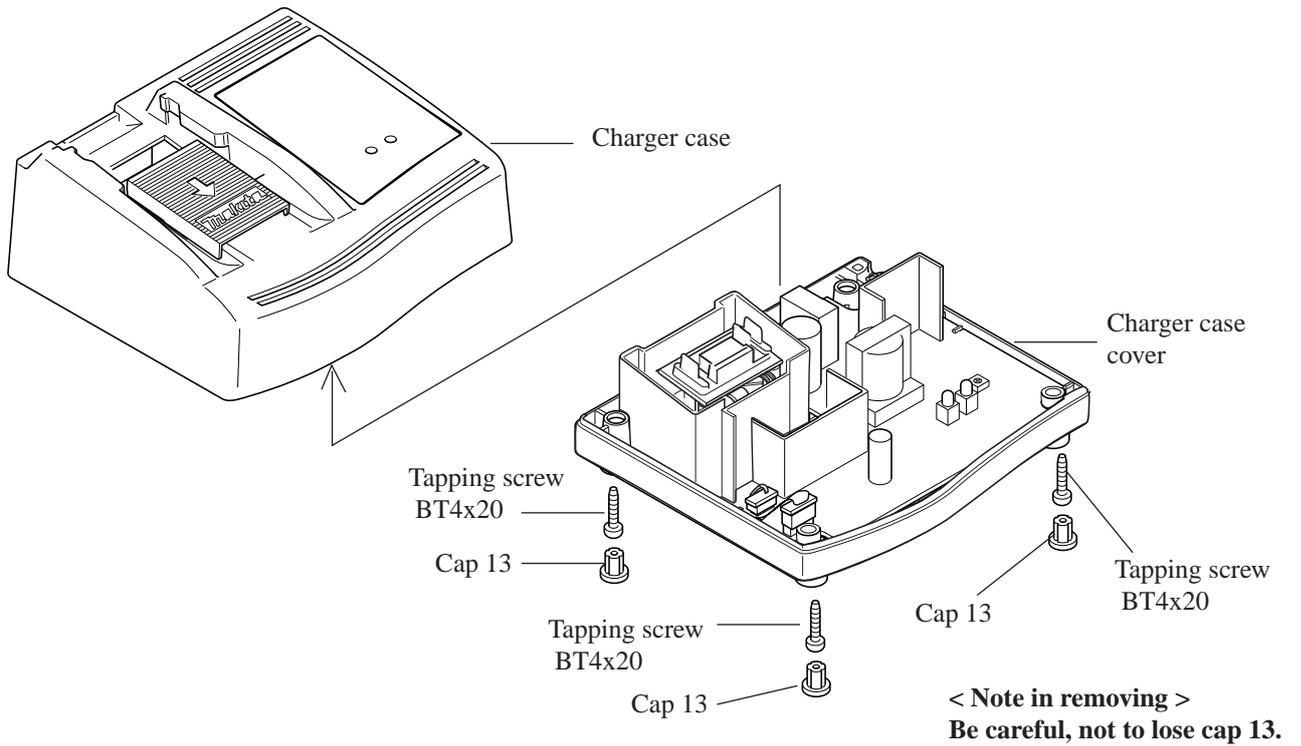


Fig. 1

< 2 > Removing terminal unit

Disconnect the connectors and remove the lead wires from the lead holder of charger case cover. Then, terminal unit can be removed as illustrated in Fig. 2.

**< Note in removing >
Be careful, not to lose Compression spring 4.**

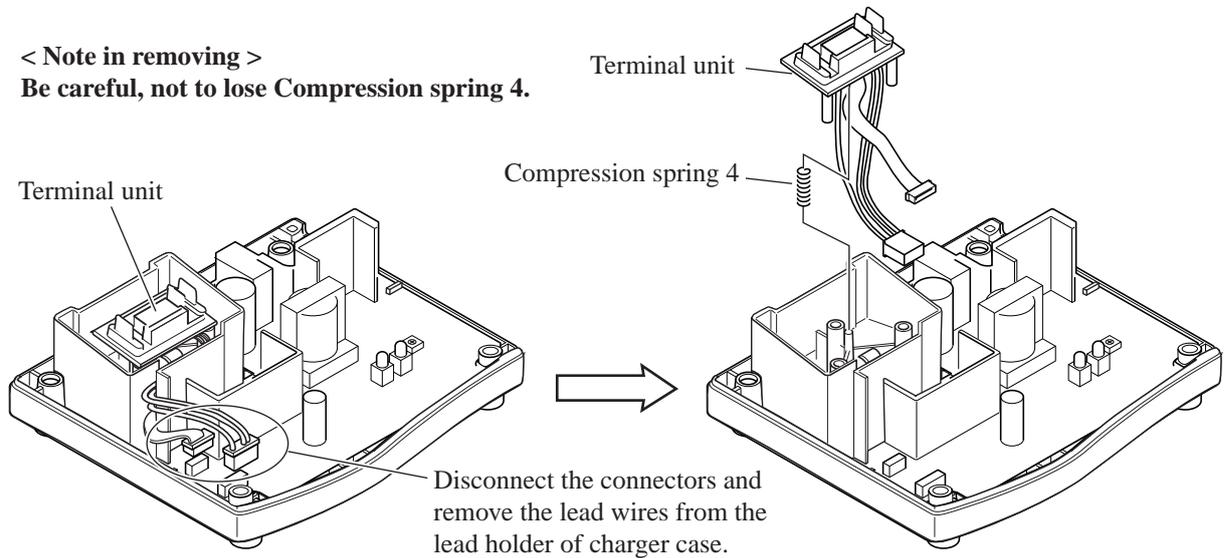
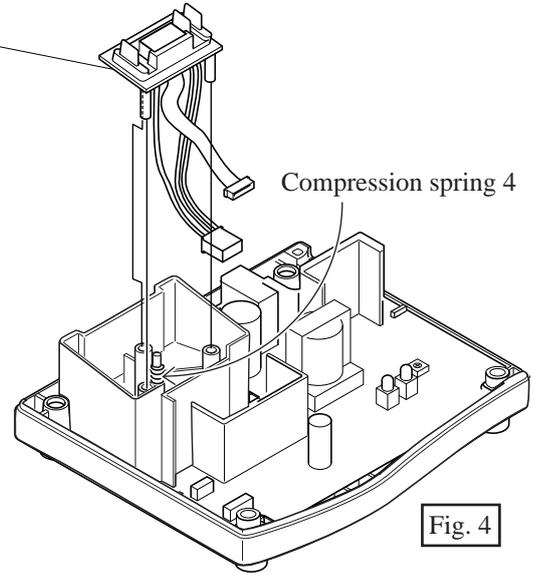
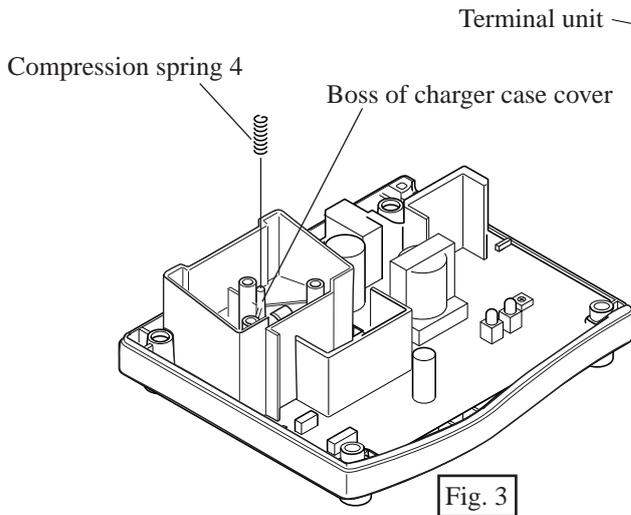


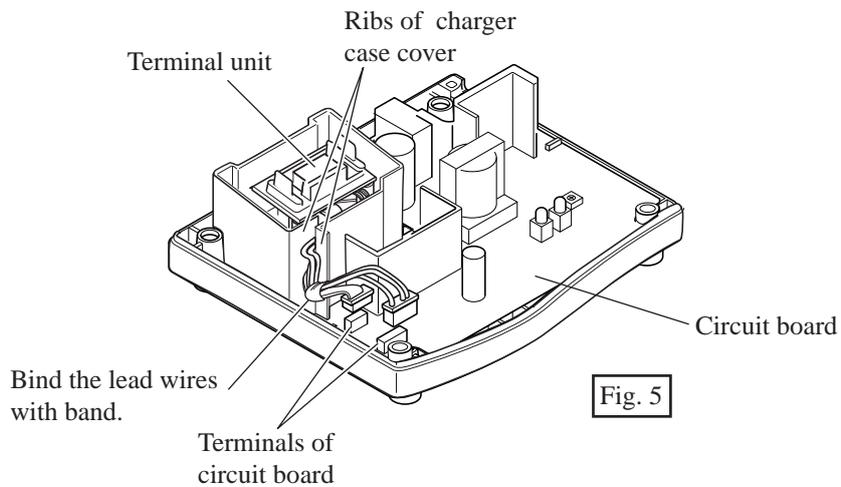
Fig. 2

< 3 > Mounting terminal unit

- (1) Mount compression spring 4 to the boss of charger case firmly as illustrated in Fig. 3.
- (2) Mount the terminal unit to charger case cover firmly by inserting the 3 bosses of terminal unit into the 3 holes of charger case cover as illustrated in Fig. 4.

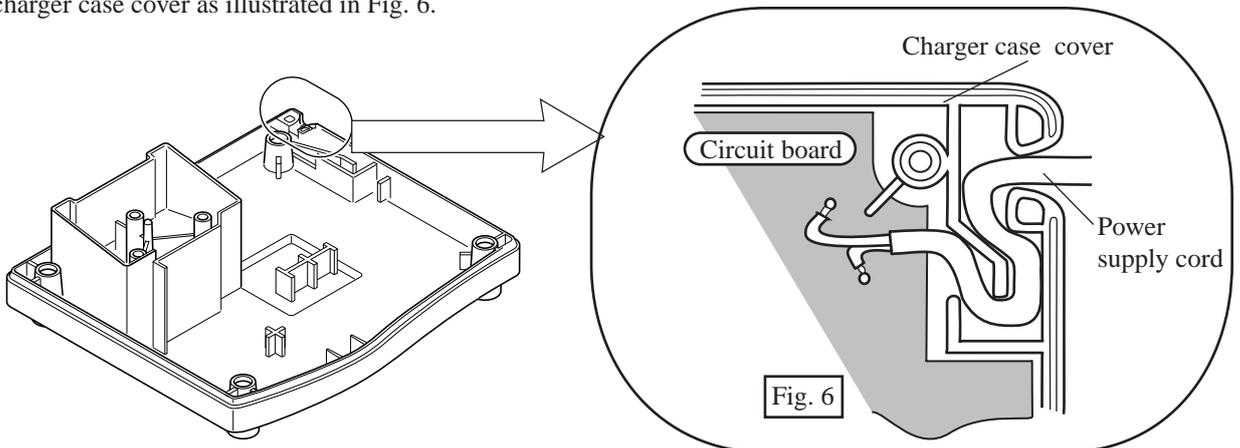


- (3) Bind the lead wires with band and pass them through the ribs of charger case cover. And then, connect the connectors with the terminal of circuit board. See Fig. 5.



< 4 > Setting power supply cord

After connecting the power supply cord with circuit board, set the power supply cord in the labyrinth portion of charger case cover as illustrated in Fig. 6.



< 5 > Mount Charger case and fasten it with 4 pcs. of tapping screws BT4x20. Mount 4 pcs. of caps 13 as illustrated in Fig. 7.

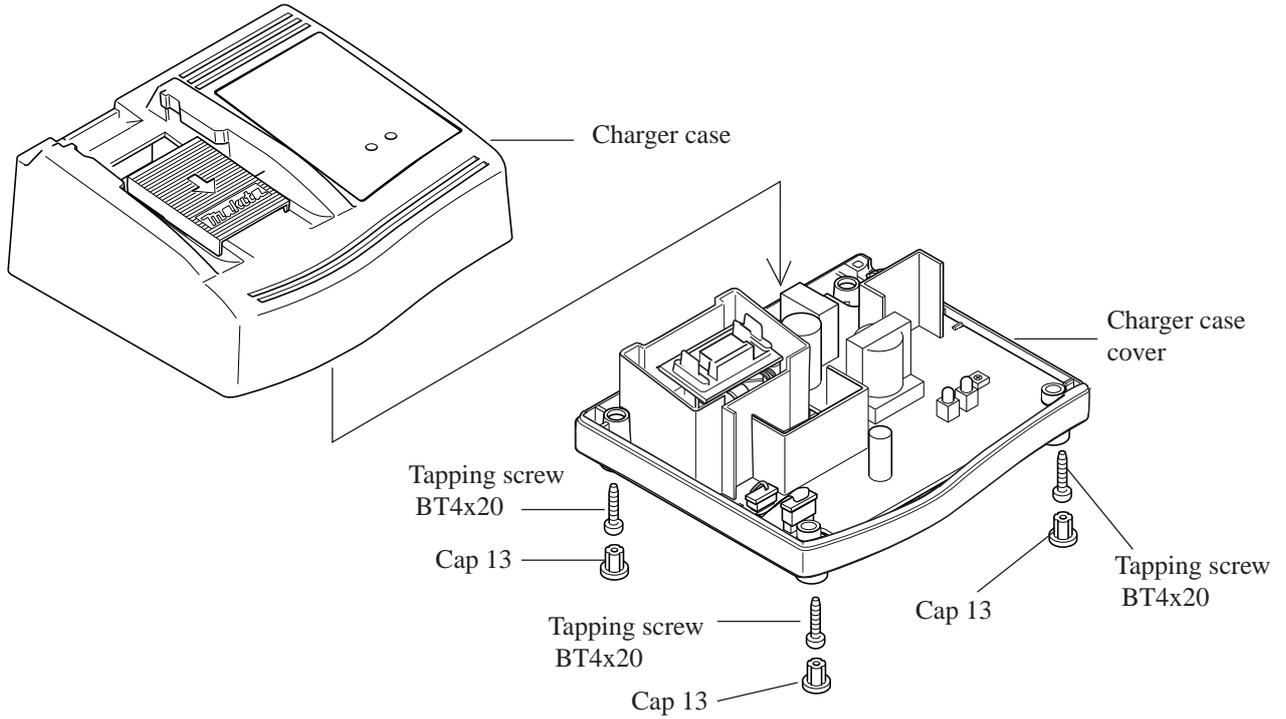


Fig. 7

< 6 > Removing terminal cover from charger case

- (1) Remove charger case as illustrated in Fig. 1 at page 3.
- (2) Take off tapping screw flange BT3x10. Then, terminal cover can be removed from charger case. Be careful, not to lose 2 pcs. of compression springs 4 in this step. See Fig. 8.

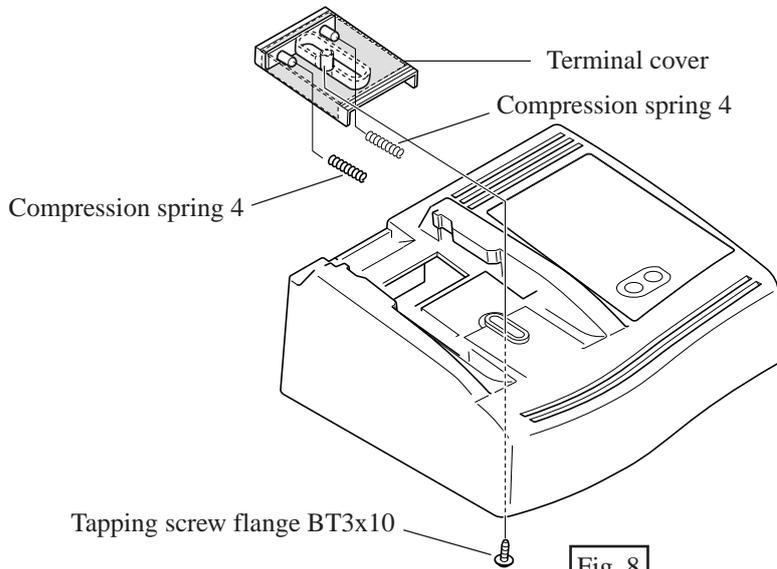


Fig. 8

▶ Repair

< 7 > Mounting terminal cover to charger case

(1) Mount 2 pcs. of compression springs 4 to the boss of terminal cover. See Fig. 9.

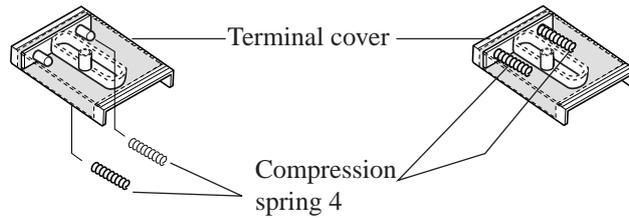
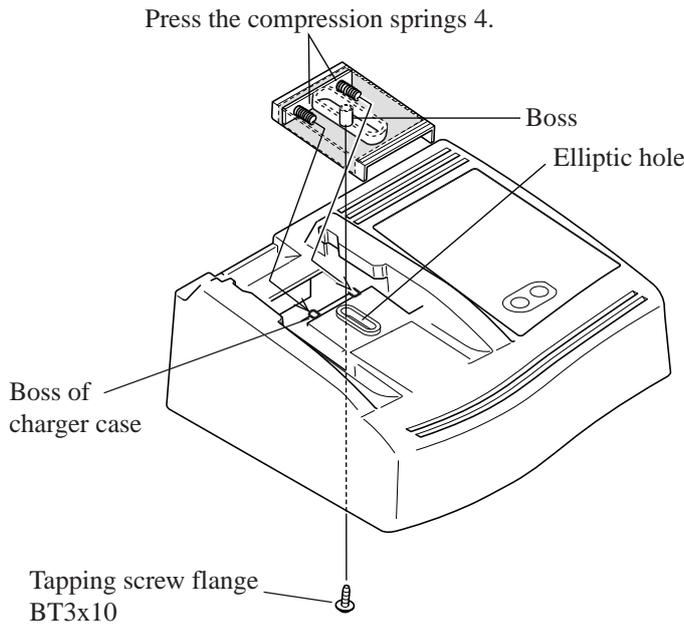


Fig. 9

(2) Pressing the compression spring 4, insert the boss of terminal cover into the elliptic hole of charger case. And mount the another end of compression springs 4 to the bosses of charger case as illustrated in Fig. 10. Fasten the terminal cover with tapping screw flange BT3x10. See Fig. 10.



< 8 > Replacing varistor and fuse

In case of damaged varistor or fuse, they can be replaced according to the following procedure without replacing the circuit board.

(1) How to find broken varistor

- In case that the surface of varistor has broken or has become black, and fuse has been cut, the varistor has been damaged.
- Varistor can be damaged easily, if the charger is plugged in a double voltage of the rating one.
- It is considered that the varistor has been broken for other reasons, if the fuse is broken while the surface of varistor is not damaged. In this case charging circuit complete has to be replaced.

(2) How to replace the broken varistor (Varistor for 220V - 240V)

Remove the broken varistor with the soldering iron. Sold the fresh varistor to the position illustrated in Fig. 10.

(3) How to replace the broken fuse (Fuse for 220V - 240V)

Remove the broken fuse with the soldering iron. Sold the fresh fuse to the position illustrated in Fig. 10.

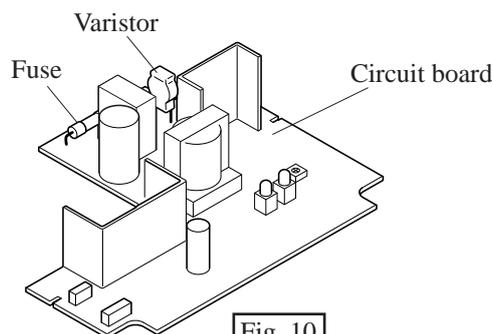


Fig. 10