ViBRA

GZ II Series

Service Manual

SHINKO DENSHI CO., LTD.

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(Figure 1-1)

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(Figure 1-2)

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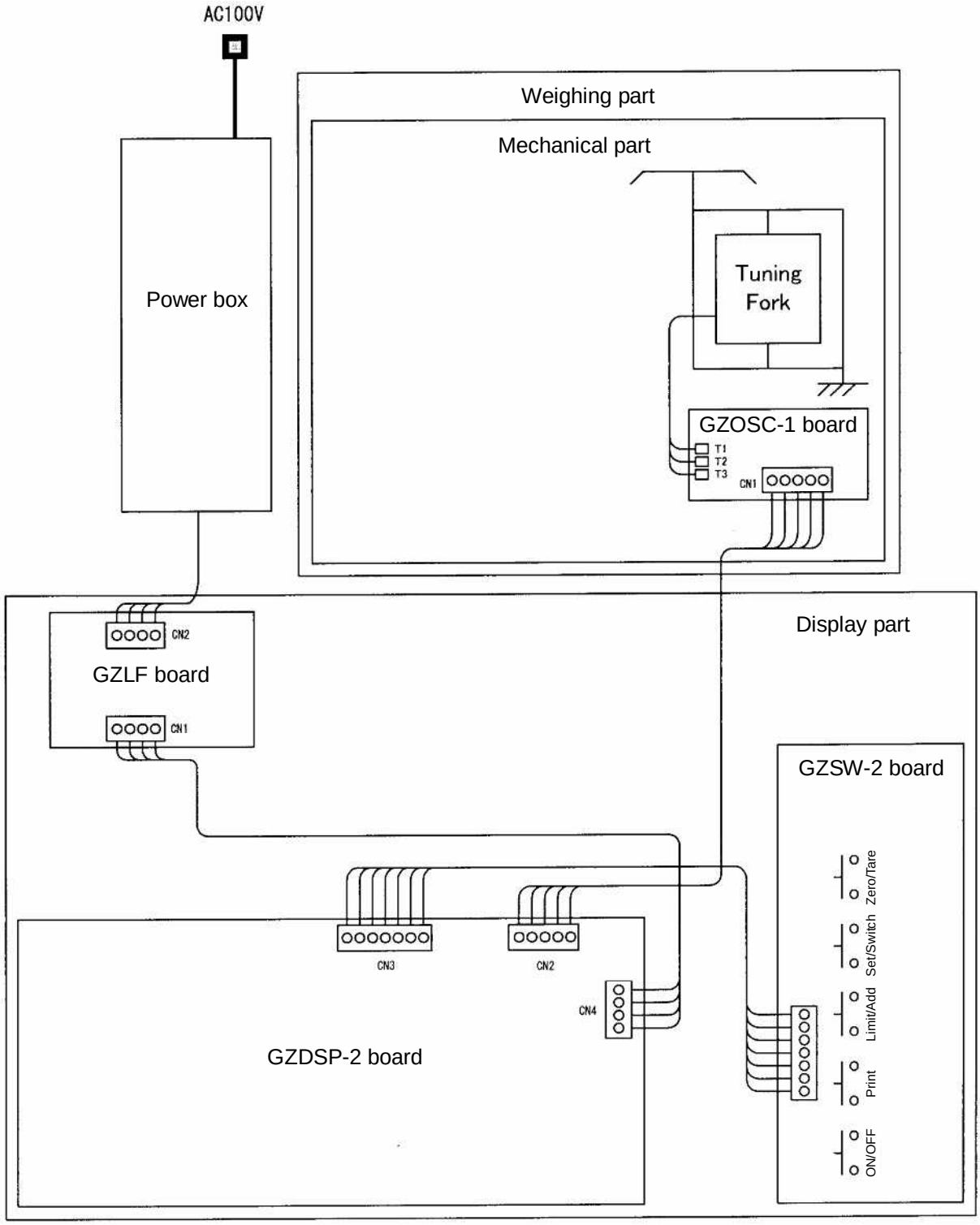
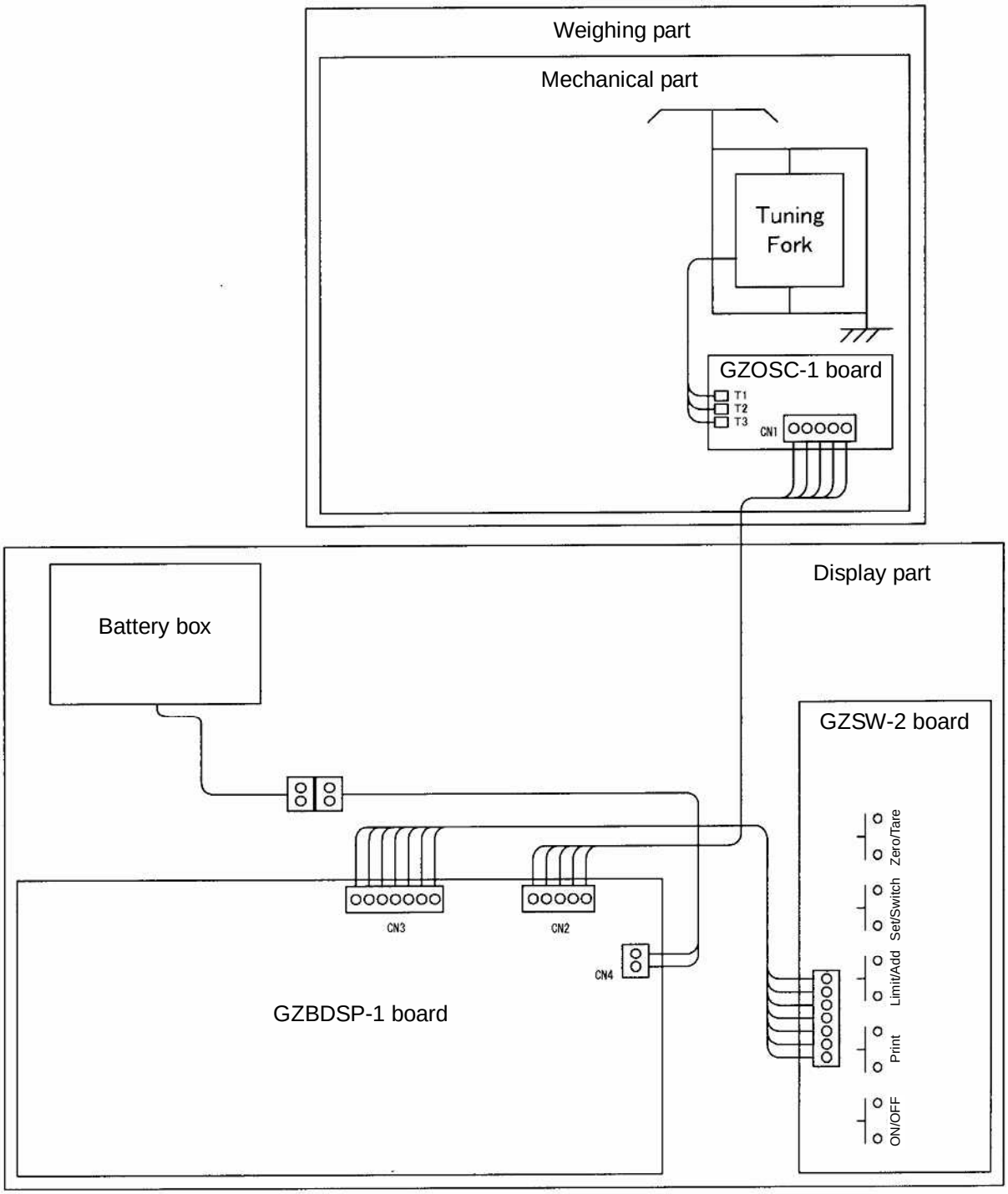
(1) Power Box Type



(Figure 2-1)

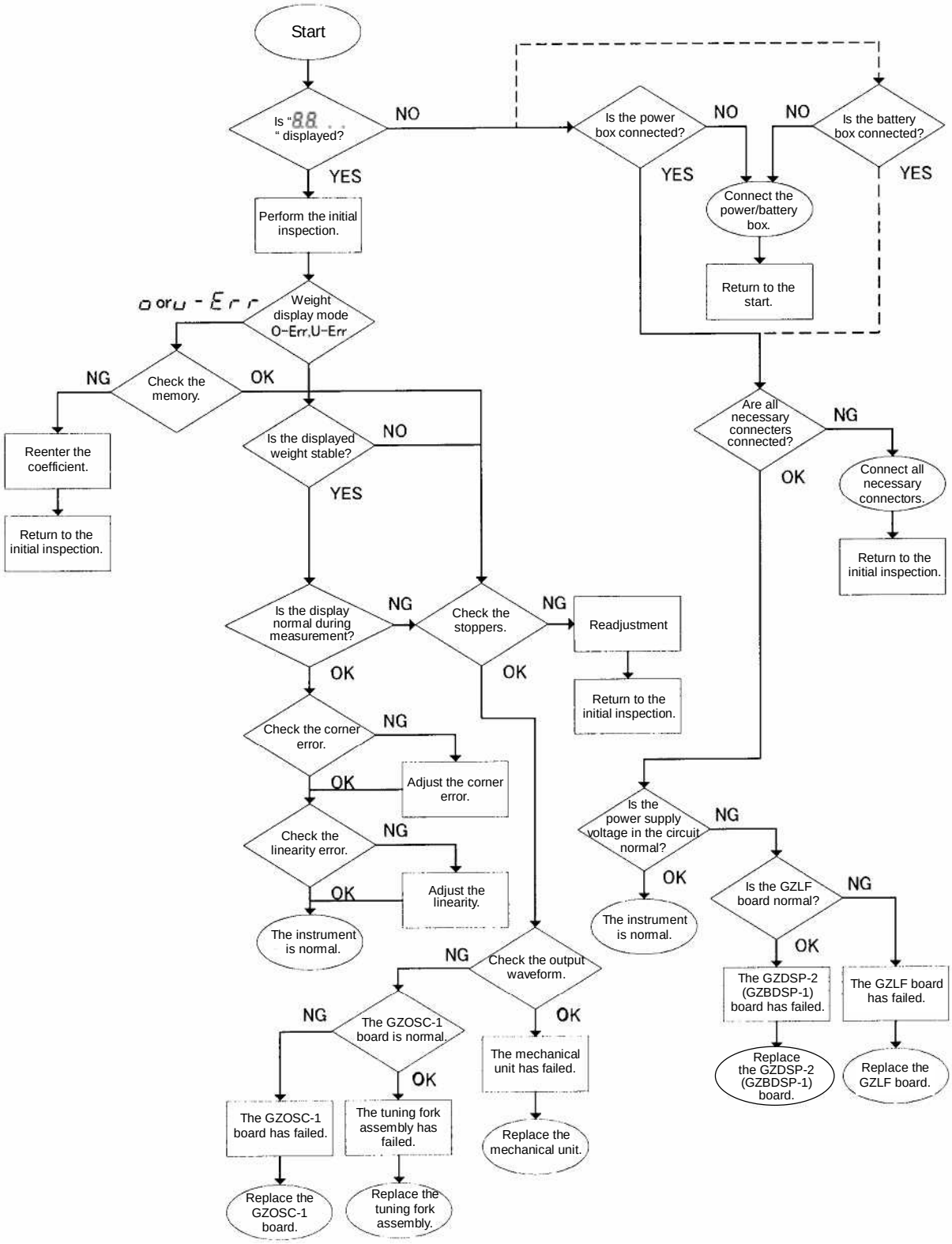
(2) Battery Type



(Figure 2-2)

Chapter 3 Troubleshooting

3-1 Inspection Procedure



(Figure 3-1)

3-2 Quick Reference Guide for Troubleshooting

Symptoms	Probable causes	Remedies
• Noting is displayed.	1. The GZDSP-2 (GZBDSP-1) board has failed. 2. The power/battery box has failed. 3. The connection cables inside the balance are incorrectly connected. 4. The dry-cell batteries have run out (battery box type).	1. Replace the GZDSP-2 (GZBDSP-1) board. 2. Replace the power/battery box. 3. Check the connection of the cables. 4. Replace the dry-cell batteries.
•After "8.8.•••" is displayed, "u-Err" or "o-Err" is displayed.	1. The wrong kind of pan is being used. 2. The tuning fork assembly or mechanical unit has failed. 3. The GZDSP-2 (GZBDSP-1) board has failed. 4. The coefficient data is improperly set (when the data was entered). 5. The coefficient has changed due to static electricity or noise.	1. Check the pan. 2. Replace the tuning fork assembly or mechanical unit. 3. Replace the GZDSP-2 (GZBDSP-1) board. 4. Check the coefficient data. 5. Check the coefficient data.
• The displayed value is unstable. • Poor repeatability. • The zero point changes.	1. Something is in contact with the stopper. 2. Something is in contact with the calibration weight unit. 3. Something is in contact with the pan (or pan base). 4. There is foreign matter in the balance. 5. The tuning fork assembly or mechanical unit has failed. 6. The balance is being affected by wind or vibration, etc. 7. The GZOSC-1 board has failed.	1. Check the mechanical stopper. 2. Check the area around the calibration weight unit. 3. Check the area around the pan. 4. Check the area around the balance's mechanical part. 5. Replace the tuning fork assembly or mechanical unit. 6. Check the area around the balance. 7. Replace the GZOSC-1 board.
• "o - Err" is displayed before the weighing capacity is reached.	1. The tare is too heavy. 2. The coefficient data is improperly set. 3. The coefficient has changed due to static electricity or noise. 4. Span adjustment has been made with erroneous weights. 5. Something is in contact with the calibration weight unit.	1. Check the tare weight. 2. Check the coefficient data. 3. Check the coefficient data. 4. Check the adjustment weights. 5. Check the area around the calibration weight unit.
• The span is significantly incorrect.	1. The tuning fork assembly or mechanical unit has failed. 2. The GZDSP-2 (GZBDSP-1) board has failed. 3. The coefficient data is improperly set (when the data was entered). 4. The coefficient has changed due to static electricity or noise.	1. Replace the tuning fork assembly or mechanical unit. 2. Replace the GZDSP-2 (GZBDSP-1) board. 3. Check the coefficient data. 4. Check the coefficient data.
• Poor linearity	1. The tuning fork assembly or mechanical unit has failed. 2. The coefficient data is improperly set. 3. The coefficient has changed due to static electricity or noise. 4. Span adjustment has been made with erroneous weights. 5. The GZOSC-1 board has failed.	1. Replace the tuning fork assembly or mechanical unit. 2. Check the coefficient data. 3. Check the coefficient data. 4. Check the adjustment weights. 5. Replace the GZOSC-1 board.

(Table 3-1)

Symptoms	Probable causes	Remedies
• Improper corner error	1. The mechanical section has failed. 2. Something is in contact with the pan (or pan base).	1. Replace the mechanical unit. 2. Check the area around the pan.
• The display turns off during measurement.	1. The GZDSP-2 (GZBDSP-1) board has failed. 2. The power/battery box has failed. 3. The batteries have run out.	1. Replace the GZDSP-2 (GZBDSP-1) board. 2. Replace the power/battery box. 3. Replace the batteries.
• "1 - Err" is displayed.	1. When span adjustment is performed with external weights, the reference weights are less than 50% of the weighing capacity.	1. Set reference weights so that they weigh 50% or more of the weighing capacity.
• "3 - Err" is displayed.	1. During semi-auto span adjustment, adjustment was made with something placed on the pan.	1. Remove the object on the pan.
• "4 - Err" is displayed.	1. The tuning fork assembly or mechanical unit has failed.	1. Replace the tuning fork assembly or mechanical unit.
• "b - Err" is displayed.	1. The internal coefficient has inadvertently been changed.	1. Check the coefficient data.
• "t - Err" is displayed.	1. During addition operation, the additions are overlapped. 2. During addition operation, a 0 (zero) or negative value was added.	1. Adhere to correct operating procedures. 2. Check the added weight.

(Table 3-2)

3-3 Initial Inspection

- Make sure the balance is not being affected by wind or vibration.
- Make sure the pan base and pan are properly in place.
- Make sure no foreign objects are present under the pan (or pan base).
- Make sure the right kind of pan is used.
- Make sure the balance is placed on a stable surface.
- Make sure the balance is property leveled.
- Make sure the power/battery box is properly connected.

3-4 Inspection of the Electrical Components

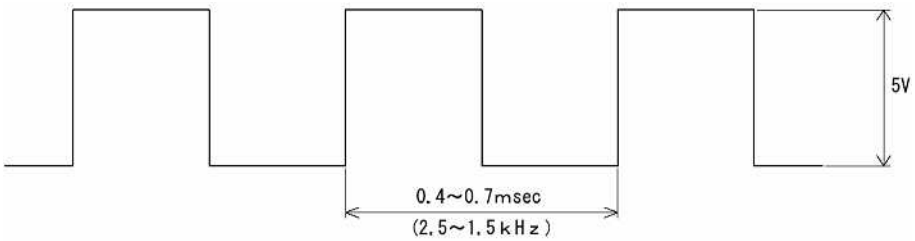
* The value of Type B is only different in CN-4.
In other check points, the value is shared between Type B and Type D.

1. Power supply voltage check
   CN4①-② … +11 to +13 V (Type B: +6.00 to +10.32 V)

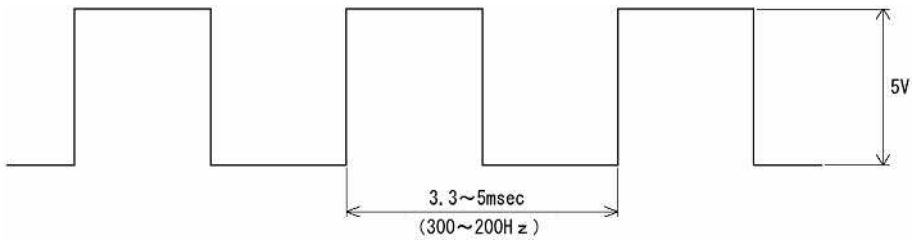
2. In-circuit power supply voltage check
   CN2①-② ….. +4.88 to +5.12 V
   CN2③-② ….. −4.88 to −5.12 V

3. Signal waveform check

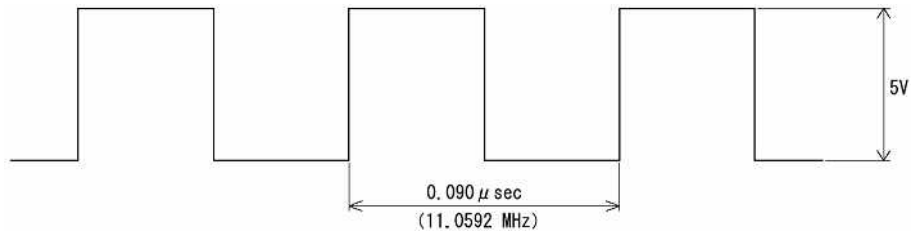
TP0-CN2④ (tuning fork waveform input)



TP0-CN2⑤ (temperature waveform input)

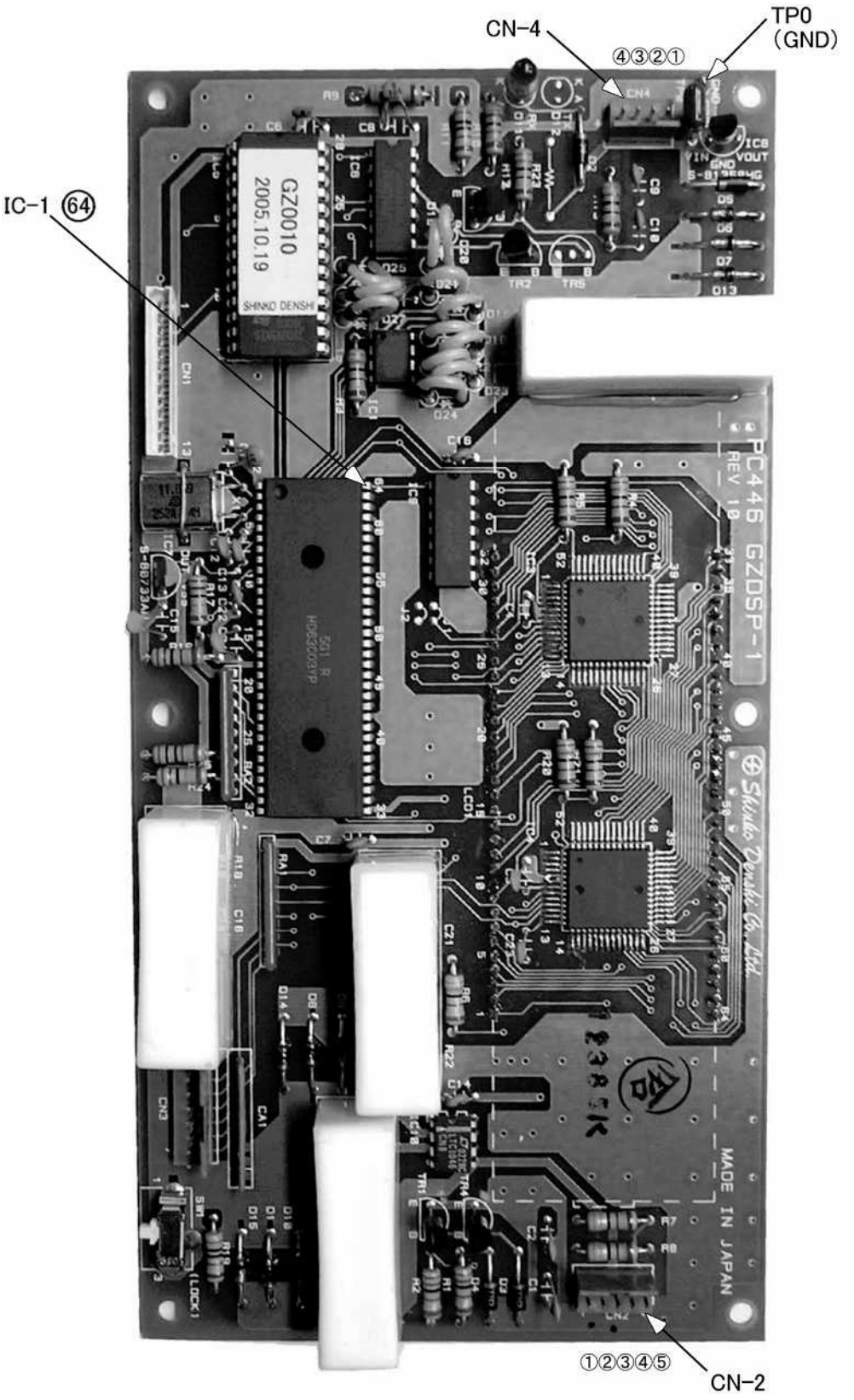


TP0-IC1㊹ (main clock)



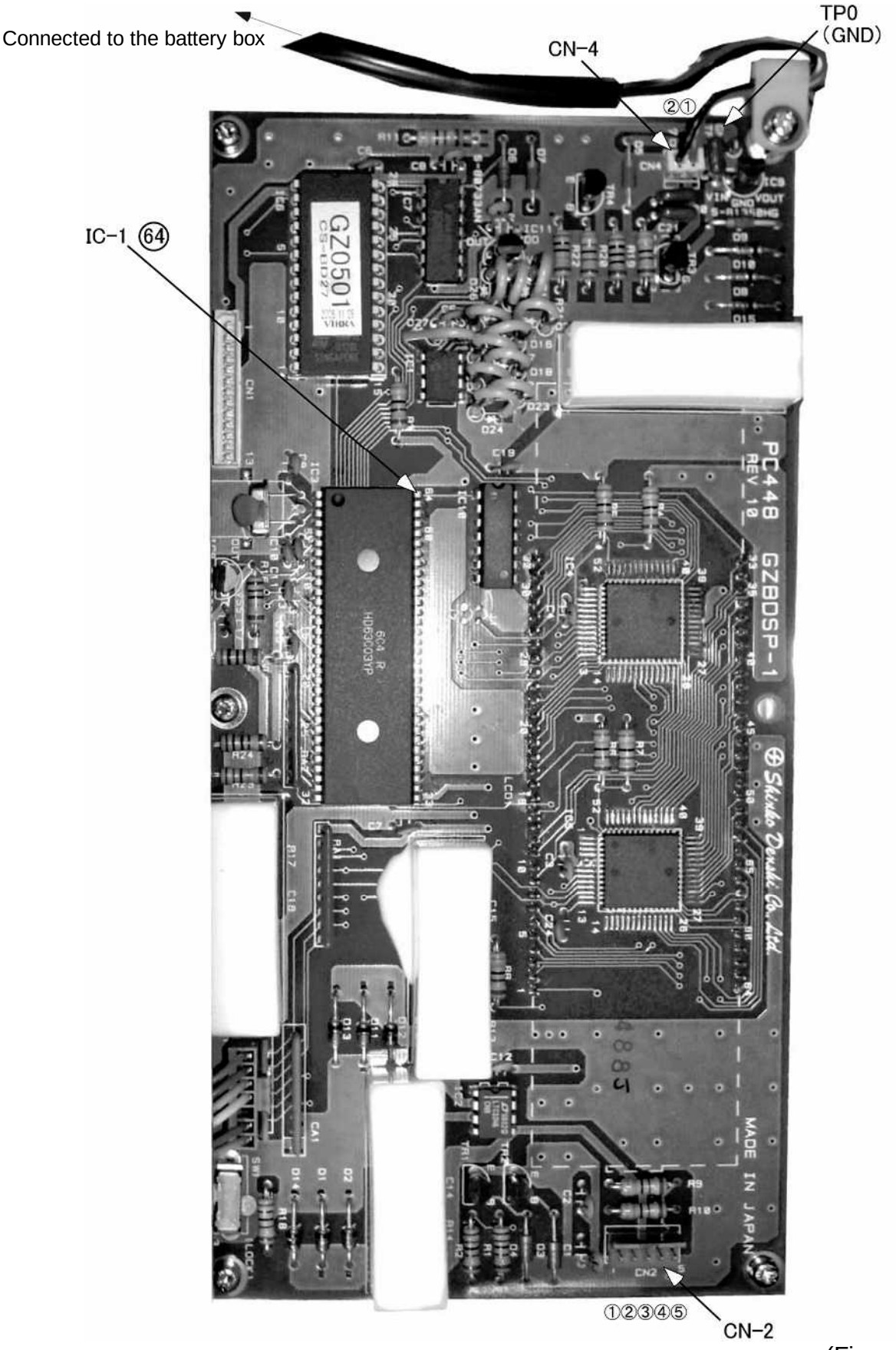
(Figure 3-2)

Inspect the following parts of the GZDSP-2 board.



(Figure 3-3)

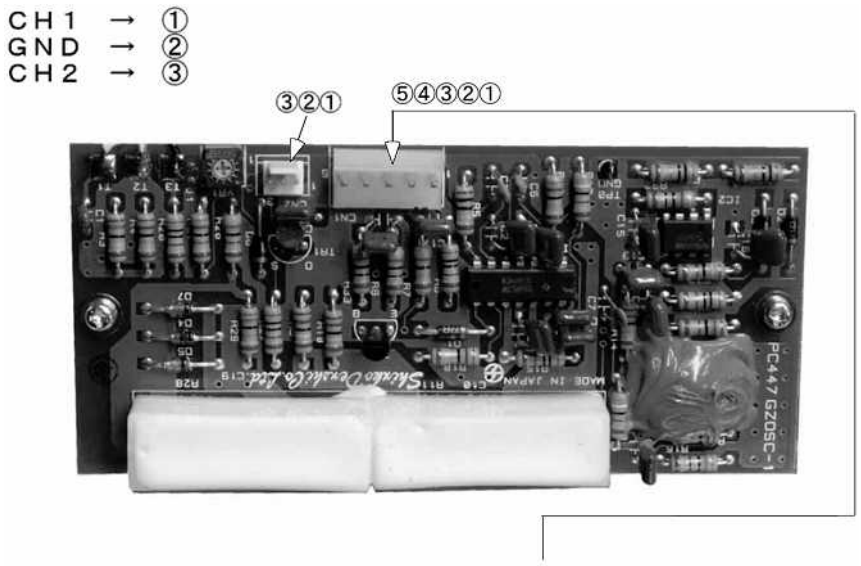
Inspect the following parts of the GZBDSP-1 board.



(Figure 3-4)

GZOSC-1 board check

1. Check preparation
   Set up an oscilloscope and power off the balance. Touch the probe to the CN2 pins.



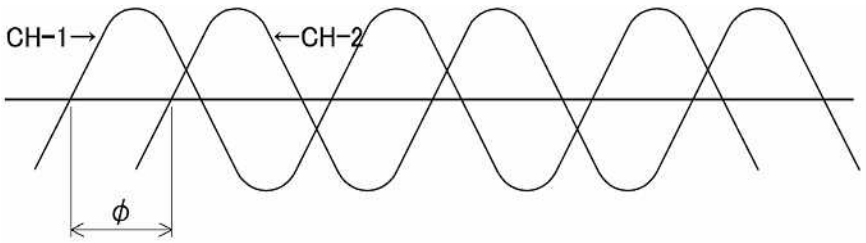
Voltage and frequency ranges of the oscilloscope

- Voltage range
  CH1: 0.1 to 0.5 V/DIV
  CH2: 1 V/DIV
- Frequency range
  0.2 msec/DIV

(Figure 3-5)

2. How to check

   (1) Oscillate within three seconds after powering on the balance (in the case of a recheck, wait for 10 seconds or more after powering off the balance).
   (2) Place a load that is half the weighing capacity and check the amplitudes and phase differences of CH-1 and CH-2.
   - Amplitude (P-P) … CH-1: 150 mV or more (average: 750 mV)
     CH-2: 700 mV or more (average: 3.5 V)



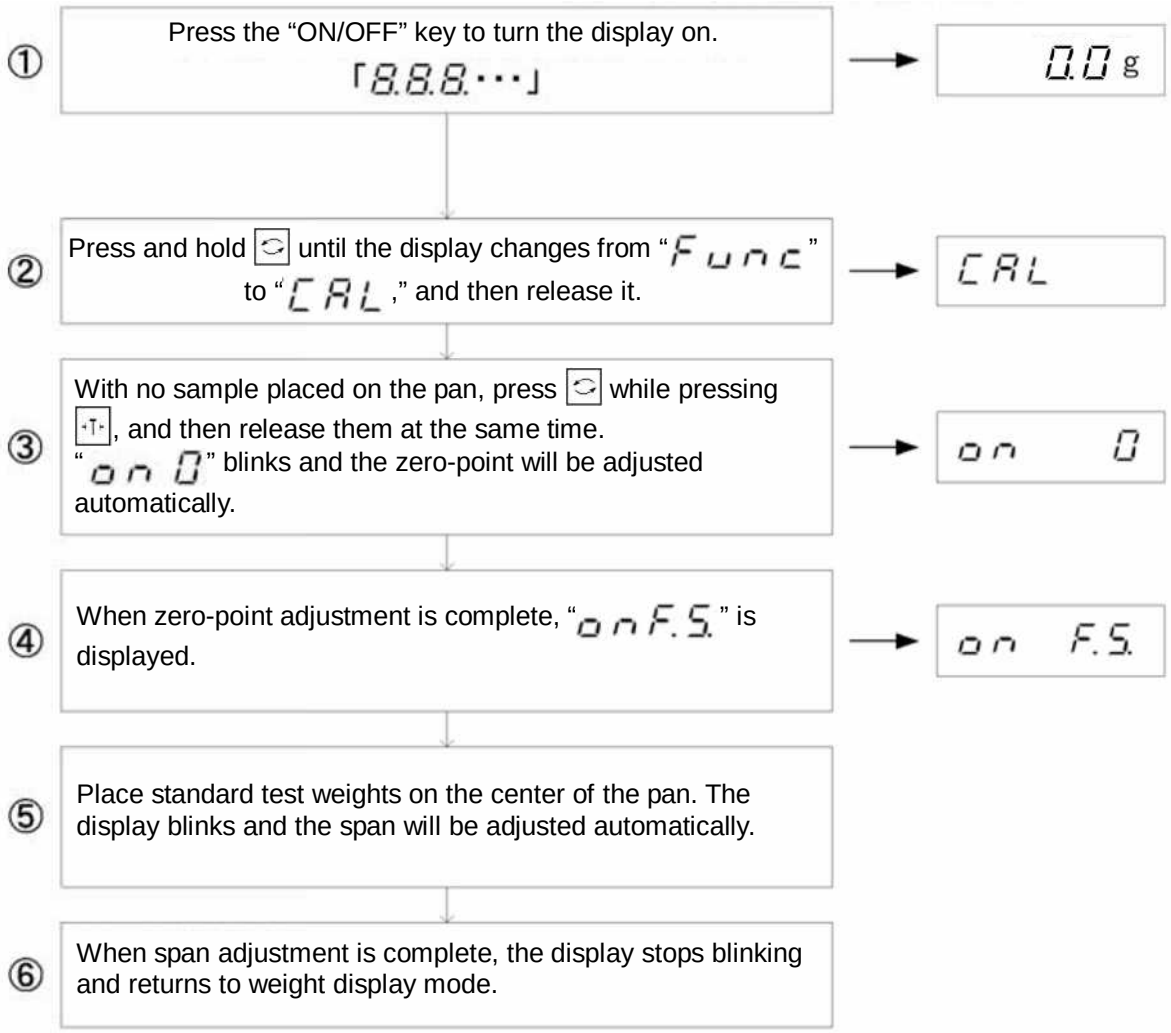
(Figure 3-6)

   - ϕ (Phase difference) … 50 to 120°/Time base: scale mark 0.3 to 0.8 (0.2 msec/DIV)

Chapter 4 Adjustment and Setting Procedures

4-1 Span Adjustment (CAL)

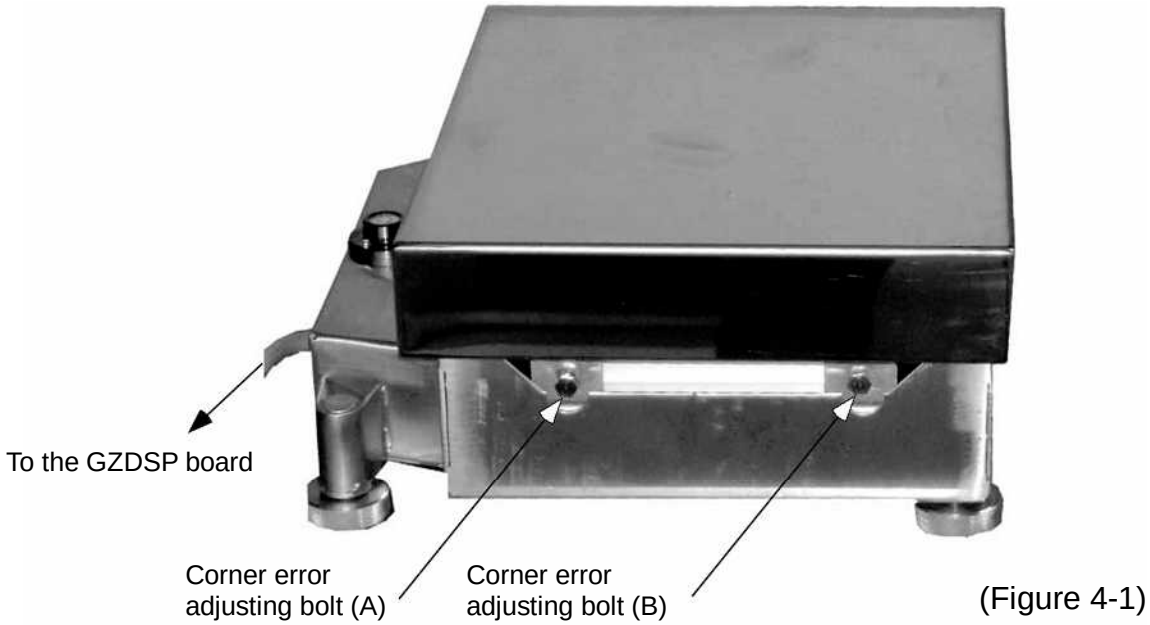
* [⇆] = “Set/Switch” key
[→T←] = “Zero/Tare” key



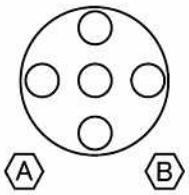
1. The span can be adjusted when the weight of standard test weights is half the weighing capacity or more. However, the weight of standard test weights should be as close to the weighing capacity as possible.
2. To cancel span adjustment, press the “set” key. The display will then return to weight display mode.
   “0 - Err”: The weight of standard test weights exceeds the weighing capacity.
   “1 - Err”: The weight of standard test weights is less than half of the weighing capacity.
   “2 - Err”: The error of the displayed weight exceeds 1%.

4-2 Corner Error Adjustment

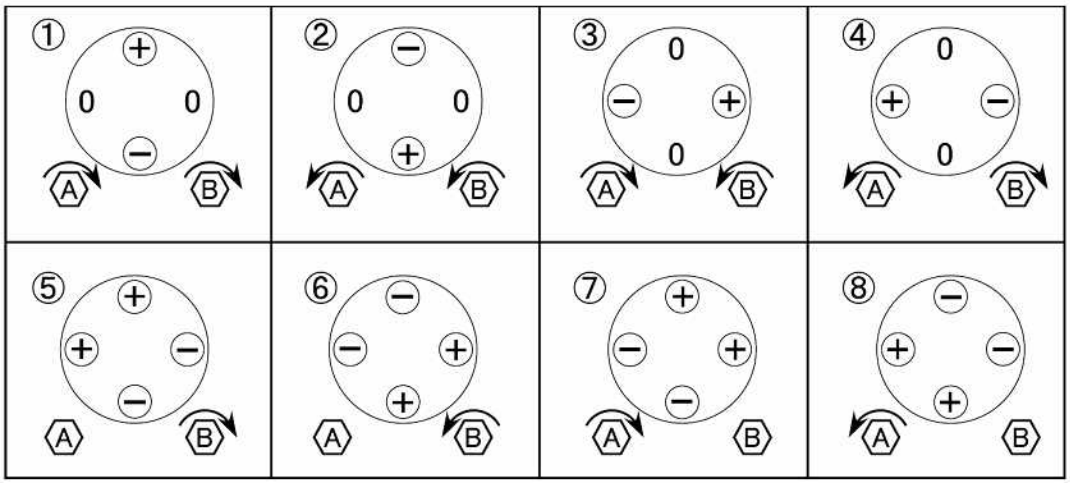
(1) Remove the unit cover (Refer to Figure 5-1).
(2) Replace the pan and pan base and adjust the adjuster so that the balance is horizontal.
(3) Adjust the corner error according to the following corner error adjustment table.



(Figure 4-1)



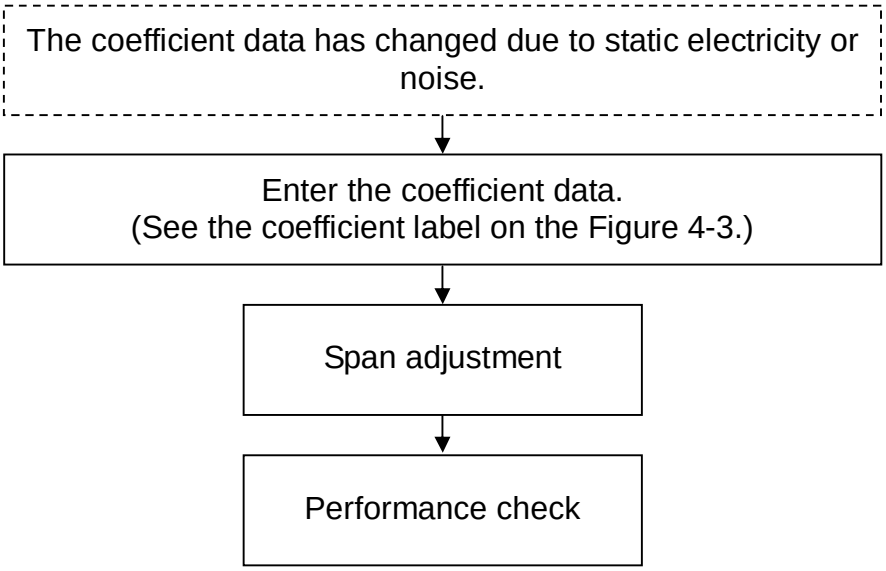
Symbols		Descriptions
⊕	:	Positive from the center
⊖	:	Negative from the center
	:	Turn the adjusting bolt counterclockwise.
	:	Turn the adjusting bolt clockwise.



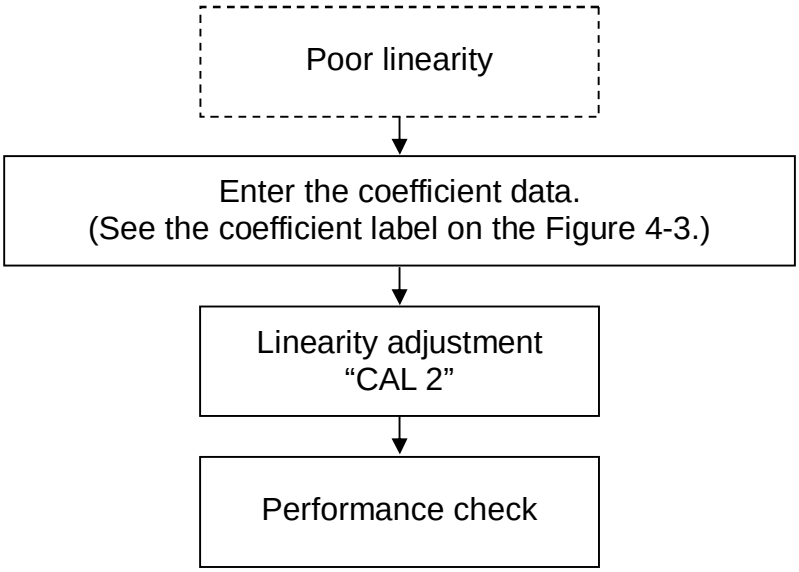
(Figure 4-2)

4-3 Coefficient Data Correction and Linearity Adjustment Procedures

(1) Coefficient data correction procedure



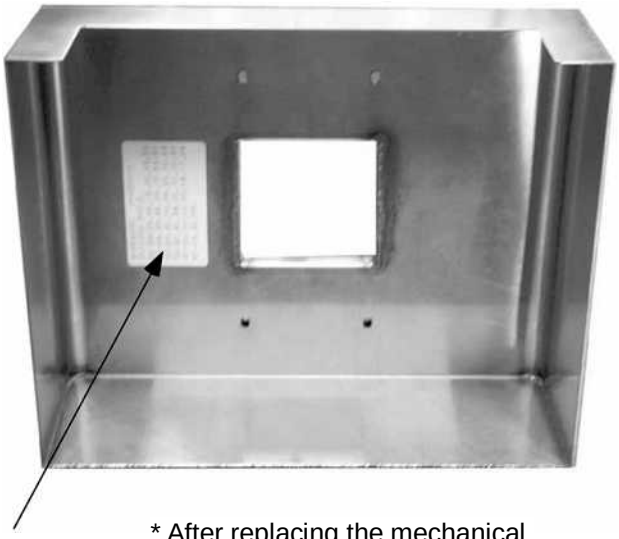
(2) Linearity adjustment procedure



4-4 How to Check (Enter) the Coefficient Data

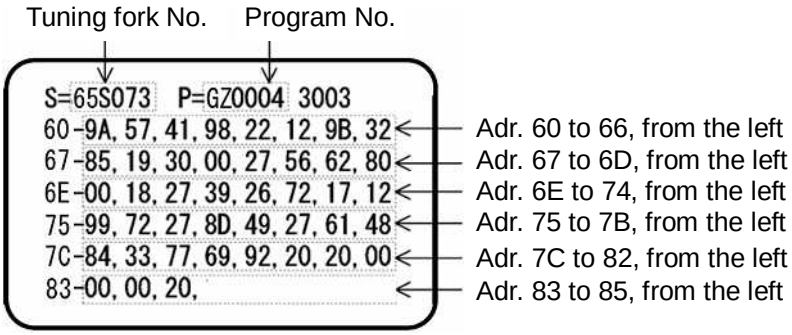
When the GZDSP-2 (or GZVDSP-1) board is replaced, or the coefficient data is lost due to static electricity, etc., reenter the coefficient data according to the following procedure.

1. Location of the coefficient data label



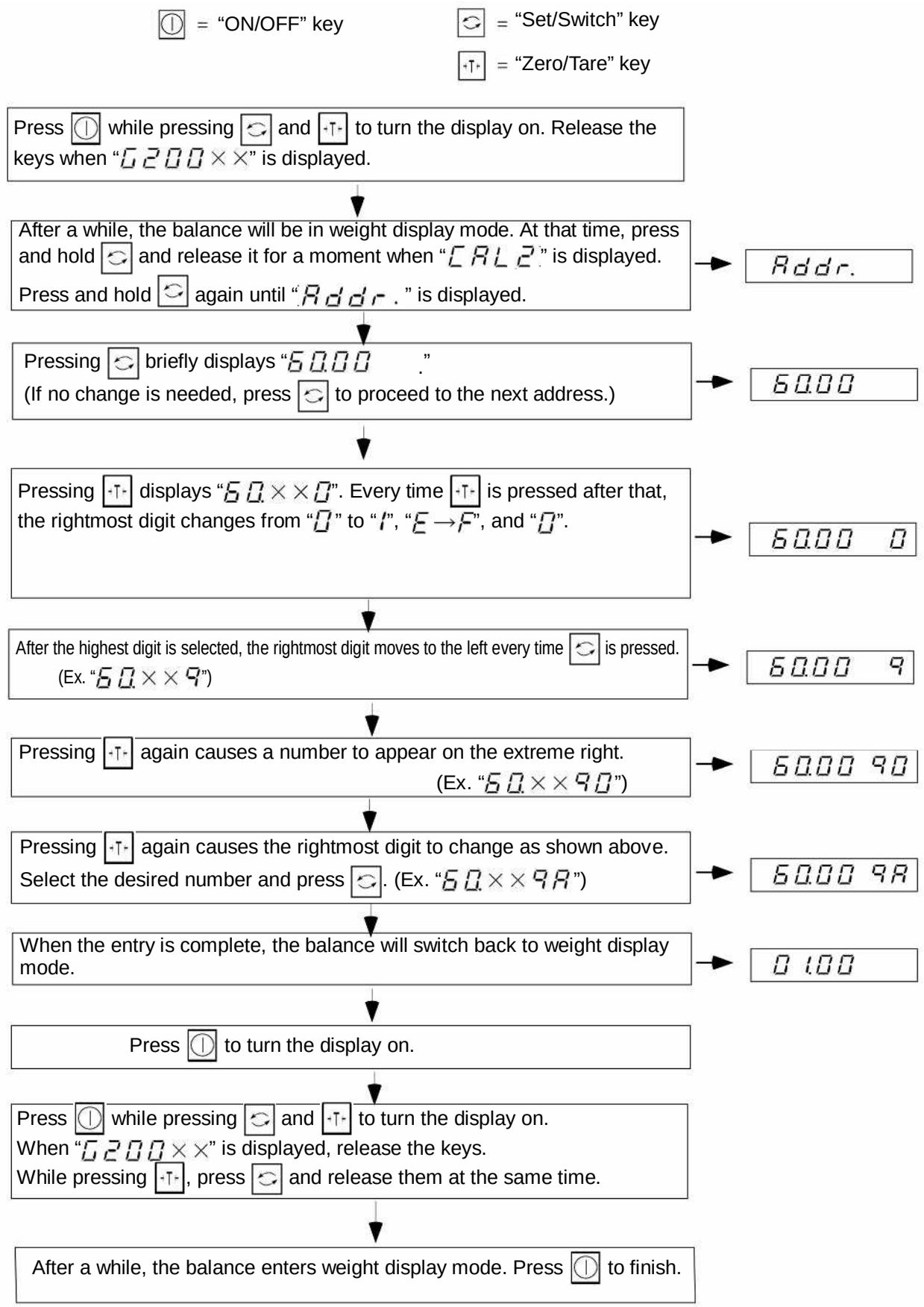
(Figure 4-3)

2. How to read the data sheet



(Figure 4-4)

3. How to Check (Enter) the Coefficient Data



4-5 Linearity Adjustment

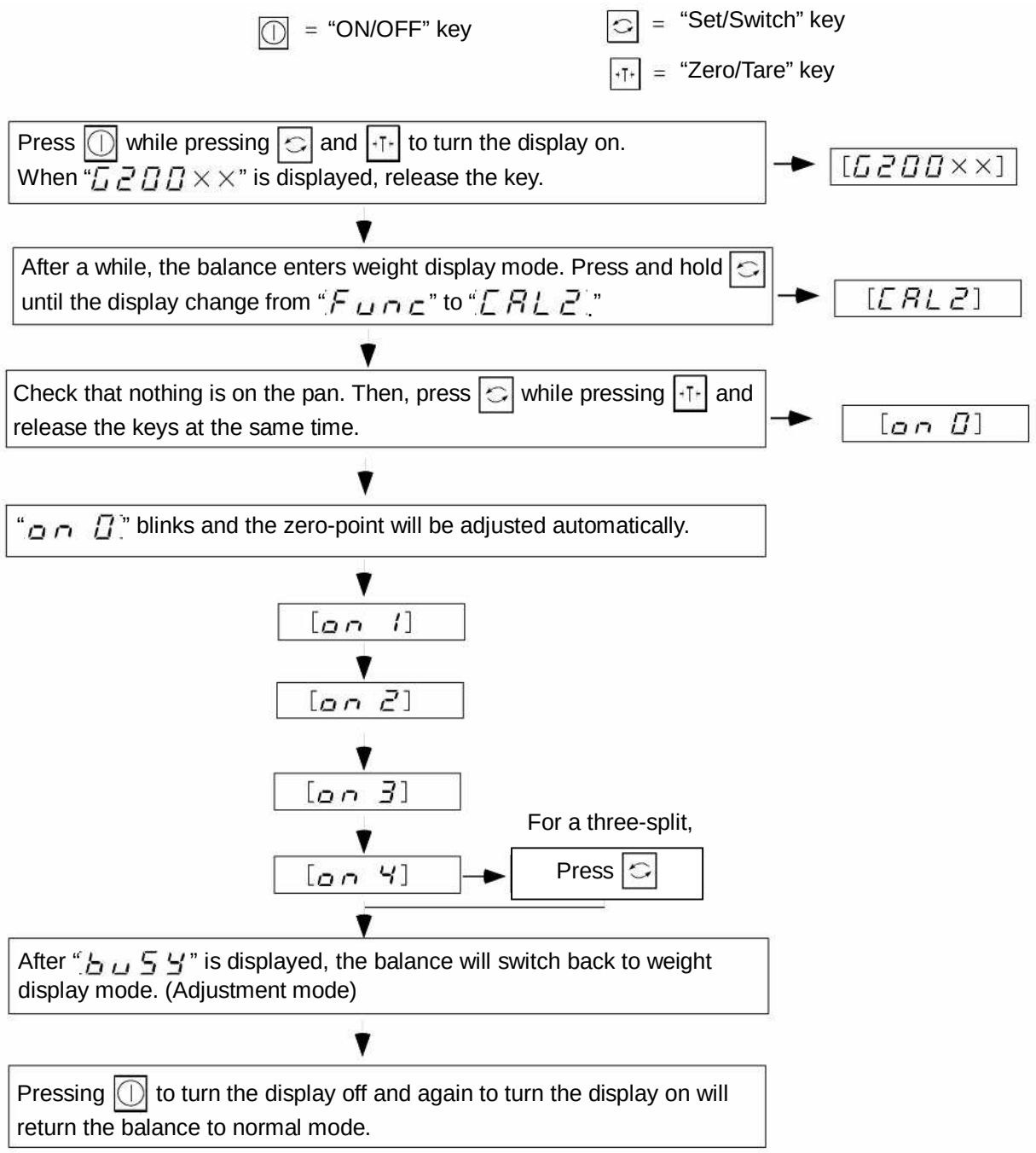


Table of Cumulative Weights for Linearity Adjustment

Display \ Type	1000	2000	6000	12000	15K
on 1	250g	500g	1kg	4kg	4kg
on 2	500g	1kg	3kg	8kg	7.5kg
on 3	750g	1.5kg	5kg	12kg	11kg
on 4	1kg	2kg	6kg	—	15kg
Weights to be used	250g*4	500g*4	1kg*6	4kg*3	3.5kg*2 4kg*2

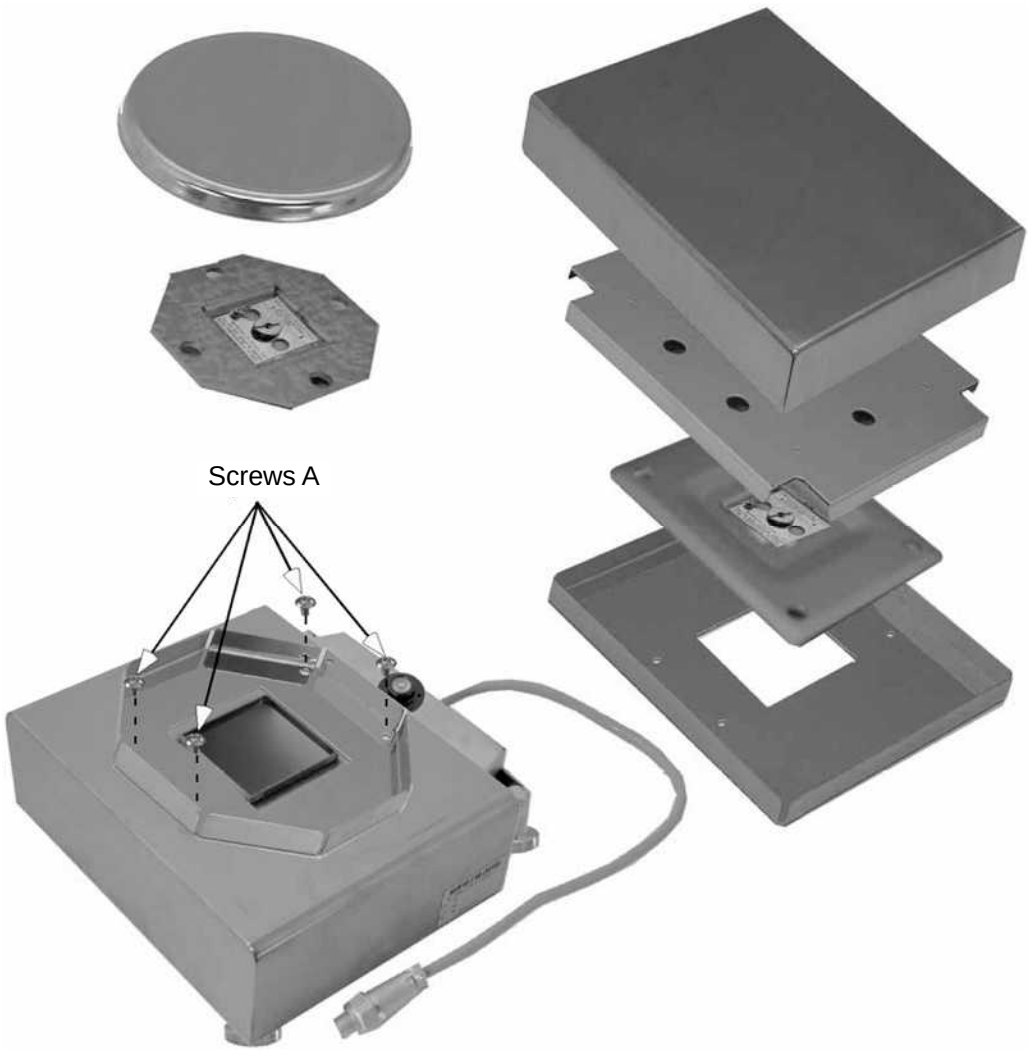
(Table 4-1)

Chapter 5 Replacement Procedures

5-1 Procedure for Replacing the Mechanical Sensor Assembly

1. How to Remove the Unit Cover

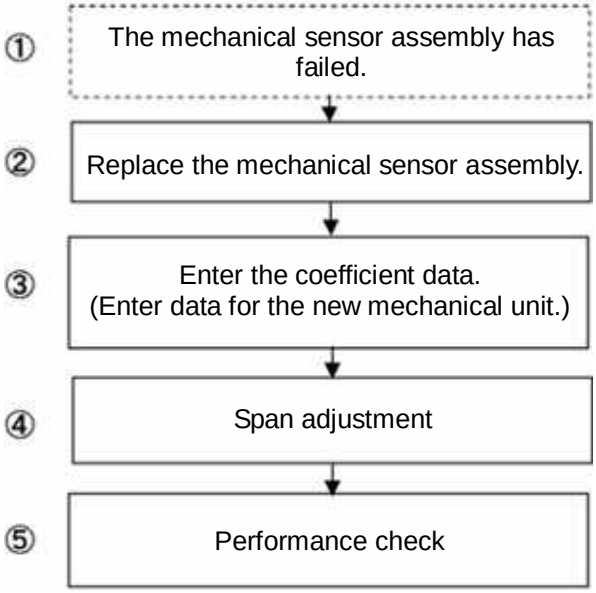
   (1) Power off the balance and remove the pan and pan base.
   (2) Remove the unit cover mounting screws A (4) with a Phillips-head screwdriver.
   (3) Remove the unit cover.



(Figure 5-1)

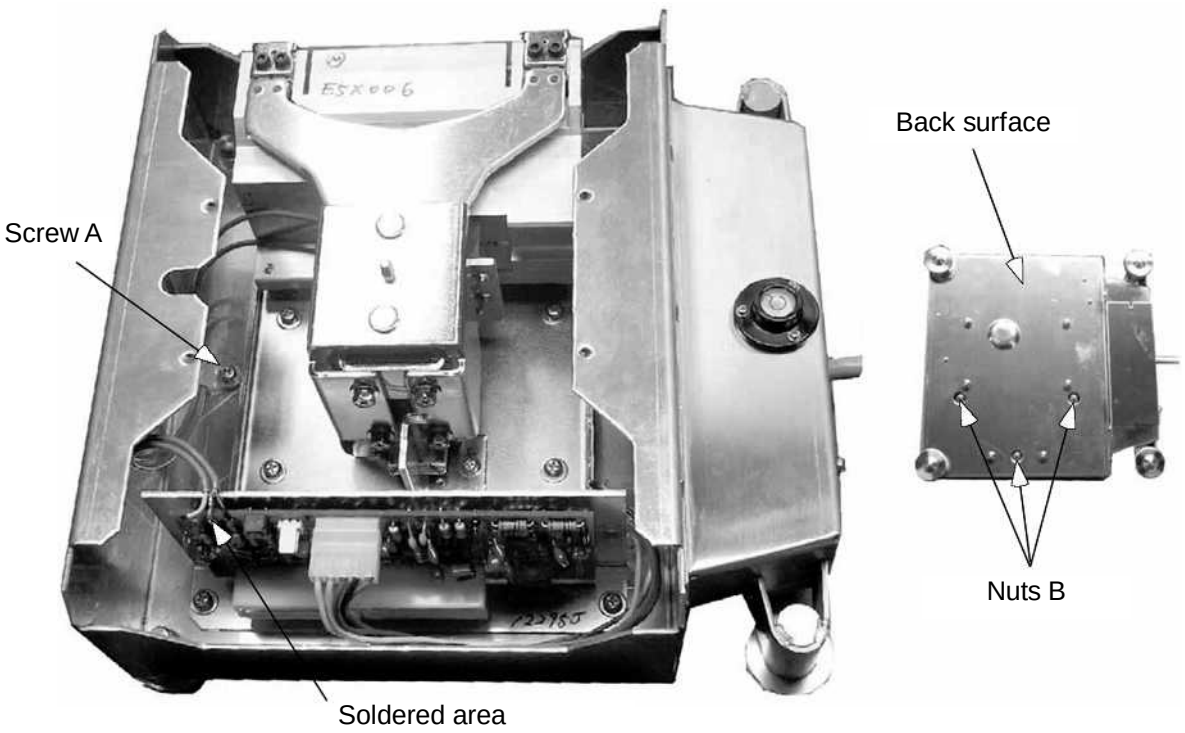
2. How to Install the Unit Cover

   (1) Reassemble the unit cover taking care not to catch connecting cords in between surfaces.
   (2) Install unit cover mounting screws A (4) with a Phillips-head screwdriver.
   (3) Put the pan base and pan in place.



3. How to Remove the Mechanical Unit

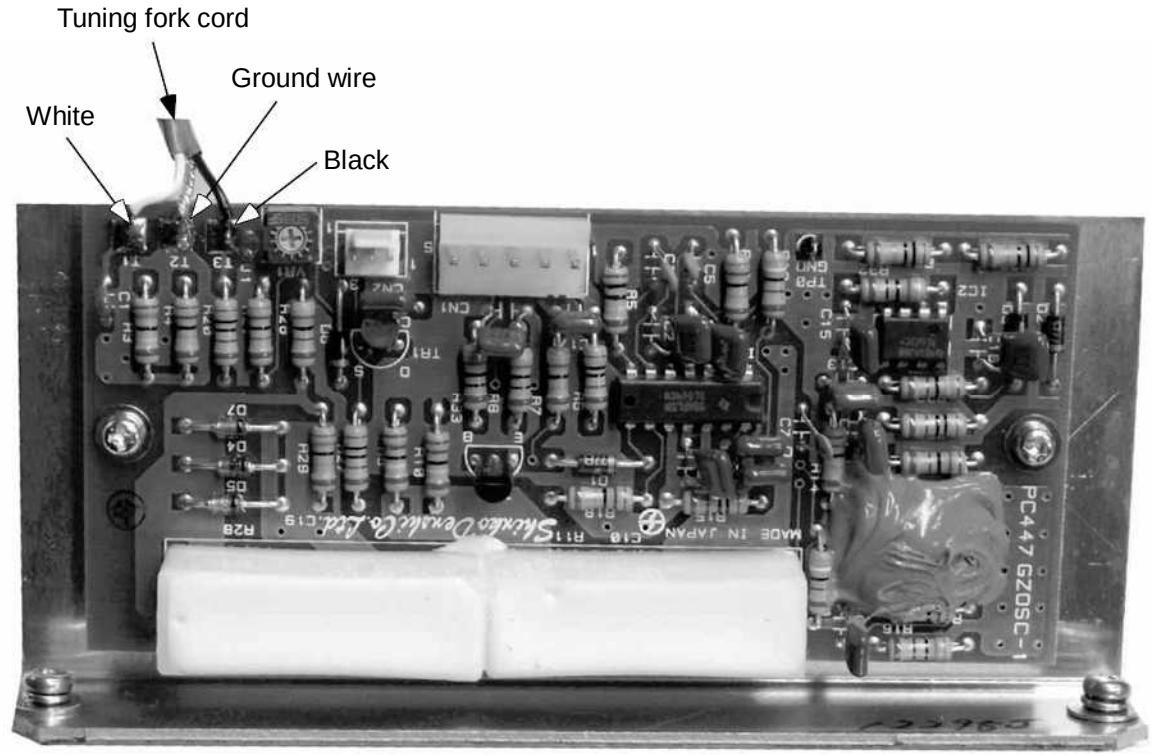
(1) Remove the unit cover. (Refer to Figure 5-1)
(2) Remove the tuning fork assembly cord from the GZOSC-1 board. (Unsolder the cord.)
(3) Remove screw A with a Phillips-head screwdriver and remove the GZOSC-1 board.
(4) Remove the mechanical unit mounting nuts B (3) with a (7 mm) box nutdriver.
(5) Remove the mechanical unit from the chassis.
(Take care not to catch anything under the mechanical unit.)



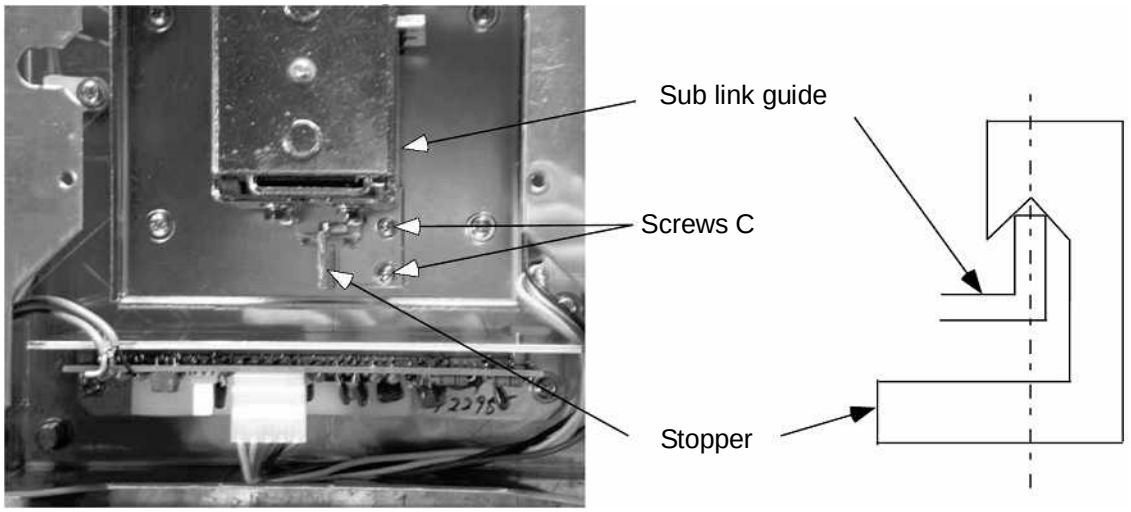
(Figure 5-2)

4. How to Install the Mechanical Unit

(1) Place the mechanical unit on the chassis and secure it with the mechanical unit mounting nuts B.
(2) Solder the tuning fork assembly cord to the GZOSC-1 board.
(3) Check the position of the stopper to the sub link guide.
(If misaligned, readjust the position by loosening screws C (2)).
(4) Place the unit cover on the balance. (Refer to Figure 5-1)

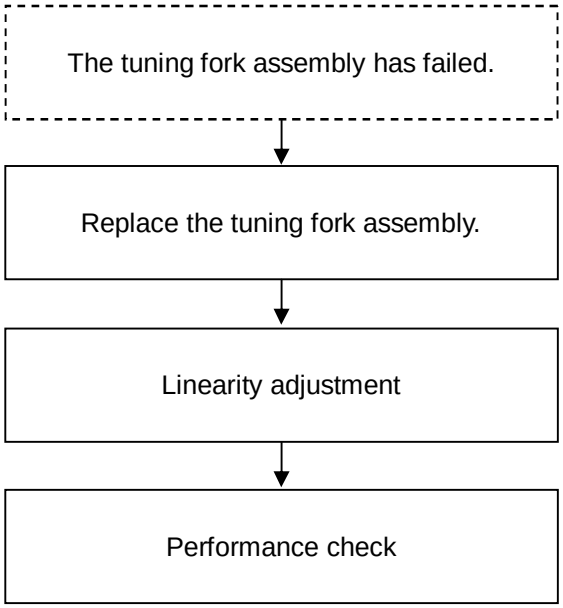


(Figure 5-3)



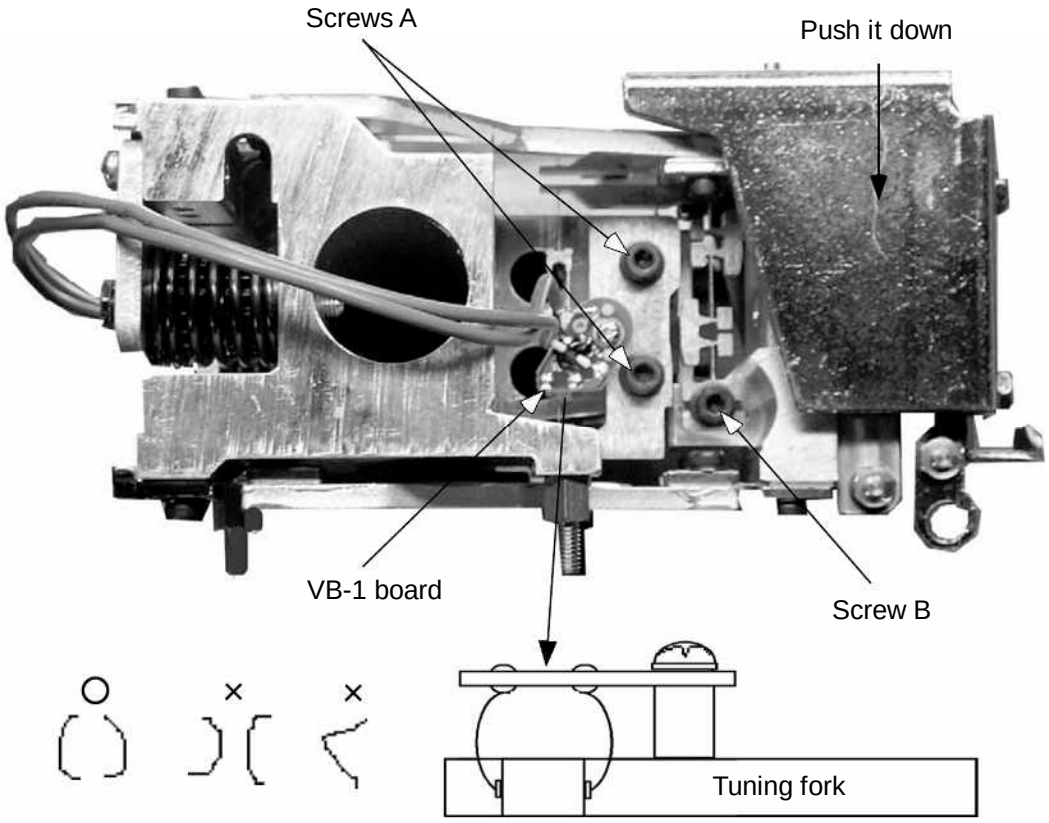
(Figure 5-4)

5-2 Procedure for Replacing the Tuning Fork Assembly



1. How to Remove the Tuning Fork Assembly

(1) While lightly pushing the guide link downward, remove flexure mounting screw B.
(2) Remove tuning fork mounting screw A.
(3) Remove the tuning fork assembly.



(Figure 5-5)

2. How to Install the Tuning Fork Assembly

(1) Temporarily secure the tuning fork assembly with screws A so that it is still allowed to move.
(At this time, check that the ribbon lines of the tuning fork assembly keep their normal shape and that there is no dust or foreign substances.)
(2) While pushing the guide link upward (until the guide link touches the stopper), temporarily secure screws A.
(3) While lightly pushing the guide link downward, secure flexure mounting screw B.
(Tightening torque: 2.45 N·m)
(4) Loosen screws A and align the flexure and the link plate so that they are parallel to each other, and then secure screws A.
(Tightening torque: 2.45 N·m)

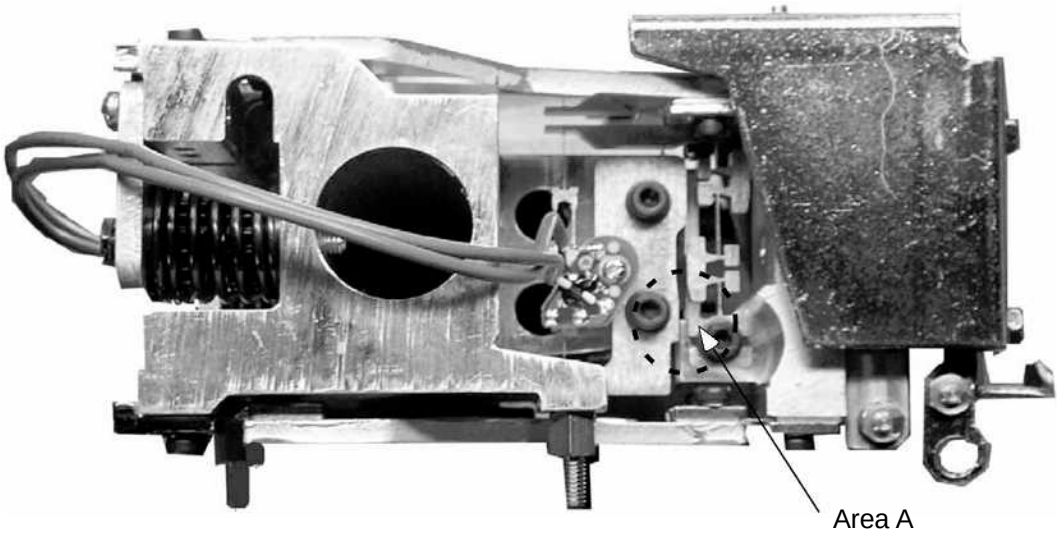
* Tuning fork assembly types and No. by weighing capacity

Type	1000	2000	6000	12000	15K
Tuning fork assembly	1K	2K	10K	15K	15K
Tuning fork No.	1****	2****	O****	E****	E****

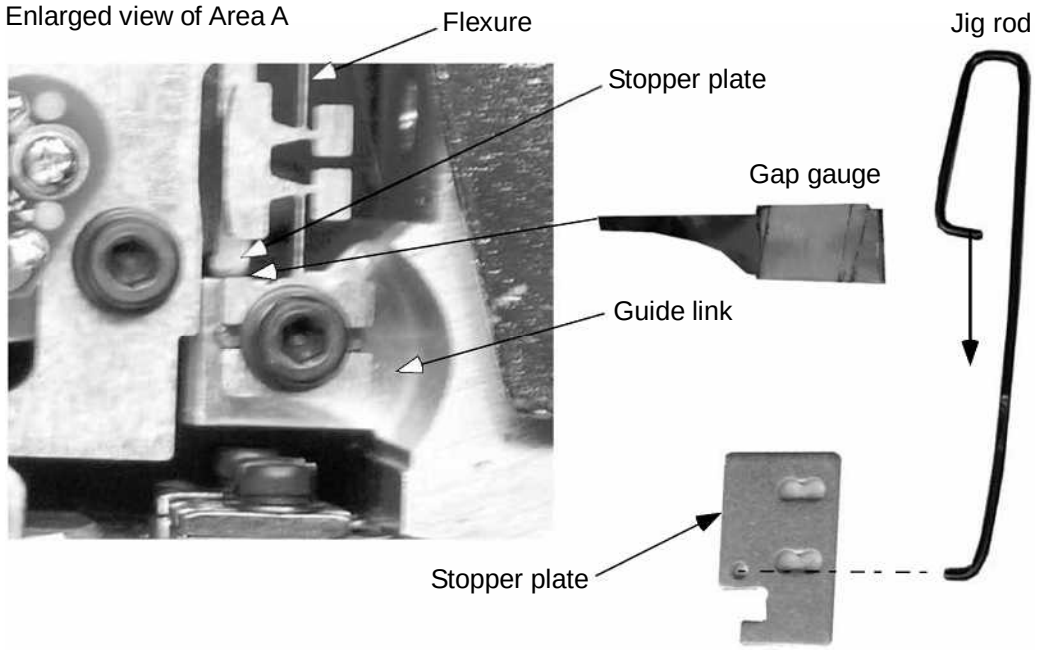
(Table 5-1)

3. How to Adjust the Stopper Plate

(1) Loosen the stopper plate mounting screws. After loosening the flexure part mounting screws of the tuning fork assembly by approximately half a turn while pushing the guide link downward, fasten them again. (Tightening torque: 2.45 N･m)
(2) Insert a gap gauge (0.05 t) between the stopper plate and the guide link, insert the jig rod into the hole provided on the edge of the stopper plate, and secure the mounting screws while holding the stopper plate.
(3) Remove the gap gauge. (Check that you feel a little resistance when pulling it out.)
(4) Tap the guide link upward to check the flexure of the tuning fork bends 1 mm or so.

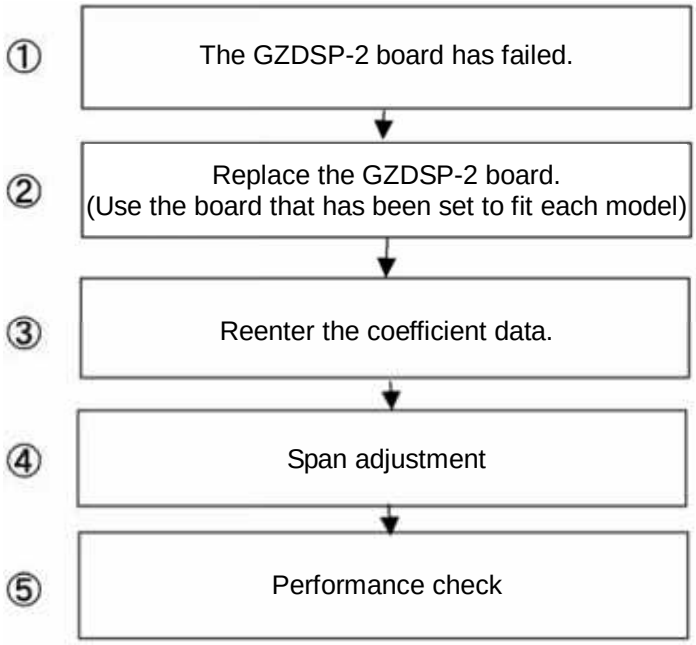


(Figure 5-6)



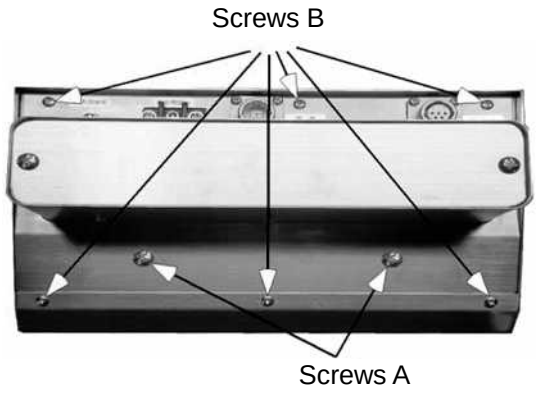
(Figure 5-7)

5-3 Procedure for Replacing the GZDSP-2 Board

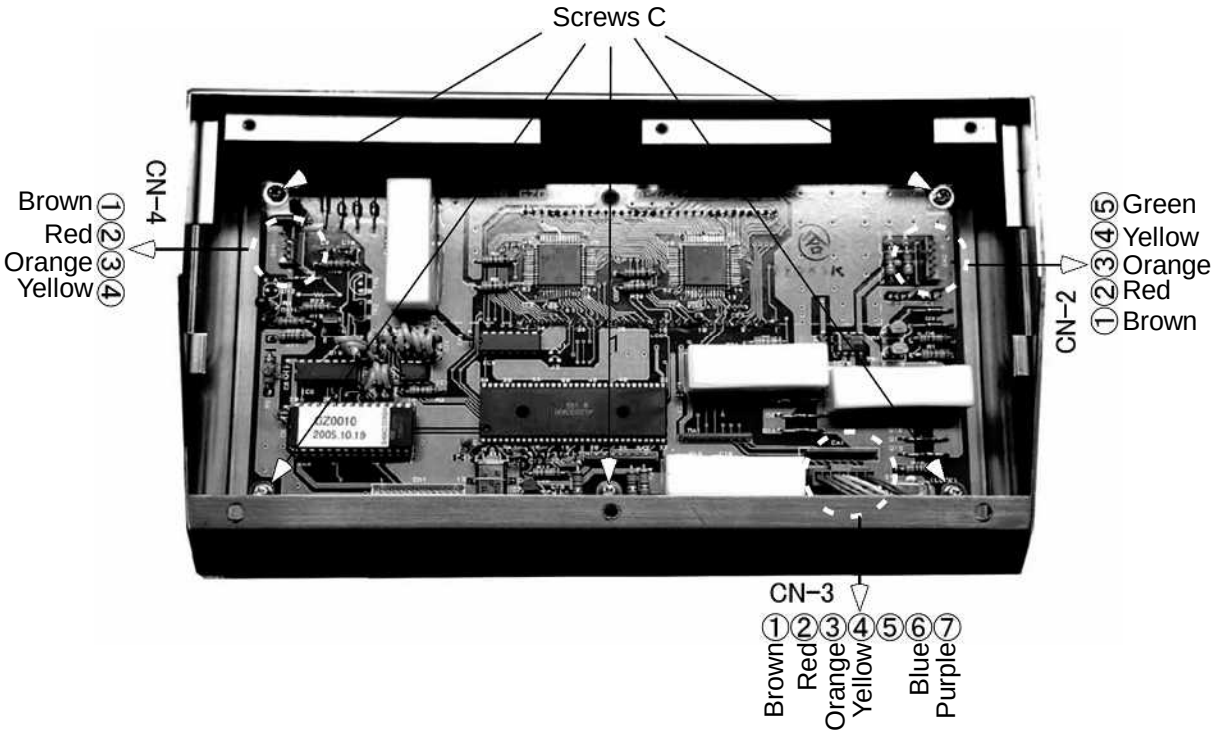


1. How to Remove the GZDSP-2 Board
(Power box type)

(1) Remove screws A (2) on the backside of the GZ II display assembly and separate the assembly from the stand assembly.
(2) Remove the GZ II rear case assembly mounting screws B (6).
(3) Remove the CN2, CN3 and CN4 connectors on the GZDSP-2 board.
(4) Remove the GZDSP-2 board mounting screws C (5).



(Figure 5-8)



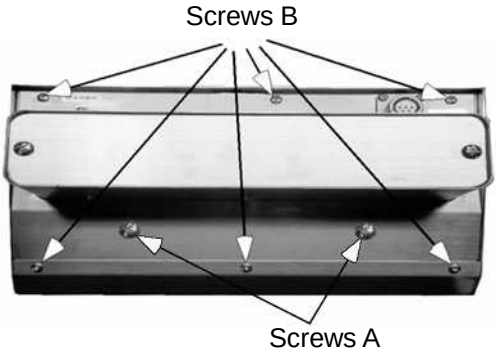
(Figure 5-9)

2. How to Install the GZDSP-2 Board

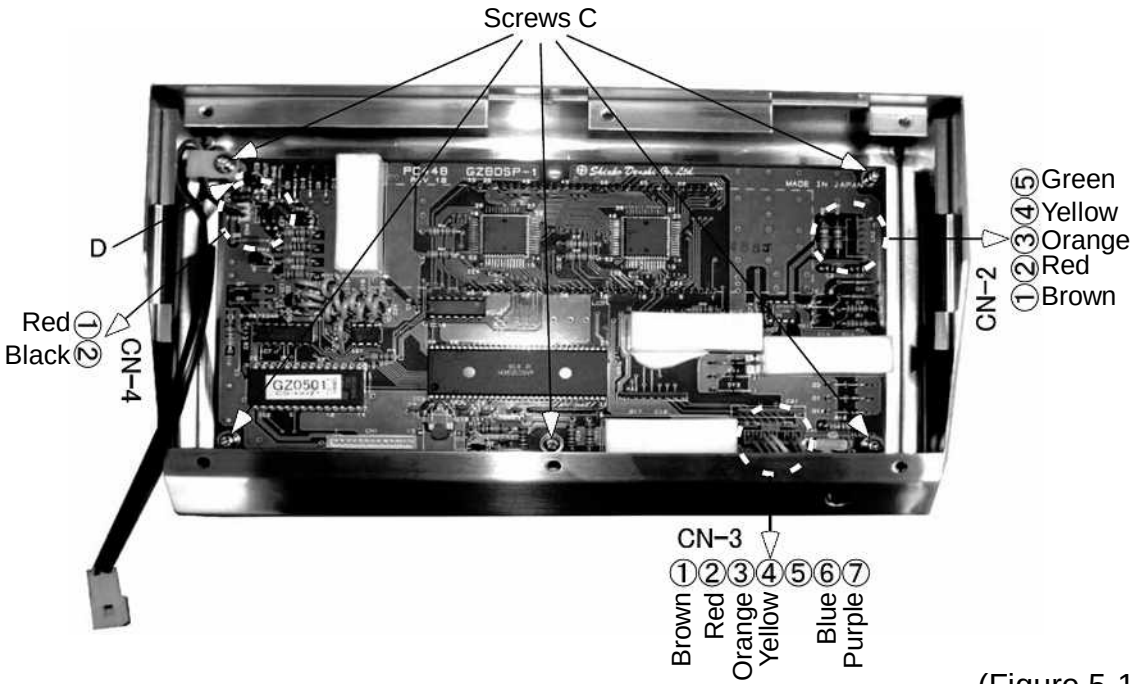
(1) Connect the GZSW-2 board connector to the CN2 of a new GZDSP-2 board.
(2) Temporarily secure the GZDSP-2 board mounting screws C (5) and after adjusting the inclination of the LCD tube, secure the screws.
(3) Connect the connectors of the GZ II rear case assembly to the CN3 and CN4 of the GZDSP-2 board.
(4) Install the GZ II rear case assembly mounting screws B (6).
(Take care not to let the cable get caught.)
(5) Install the screws A (2) on the backside of the GZ II display assembly to connect the assembly to the stand assembly.

3. How to Remove the GZBDSP-1 board
(Battery box type)

(1) Remove screws A (2) on the backside of the GZ II display assembly and separate the assembly from the stand assembly.
(2) Remove the GZ II rear case assembly mounting screws B (6).
(3) Remove the CN2 and CN4 connectors and the battery box assembly connector on the GZBDSP-1 board.
(4) Remove the GZBDSP-1 board mounting screws C (5).
(5) Remove hexagonal spacer D.



(Figure 5-10)



(Figure 5-11)

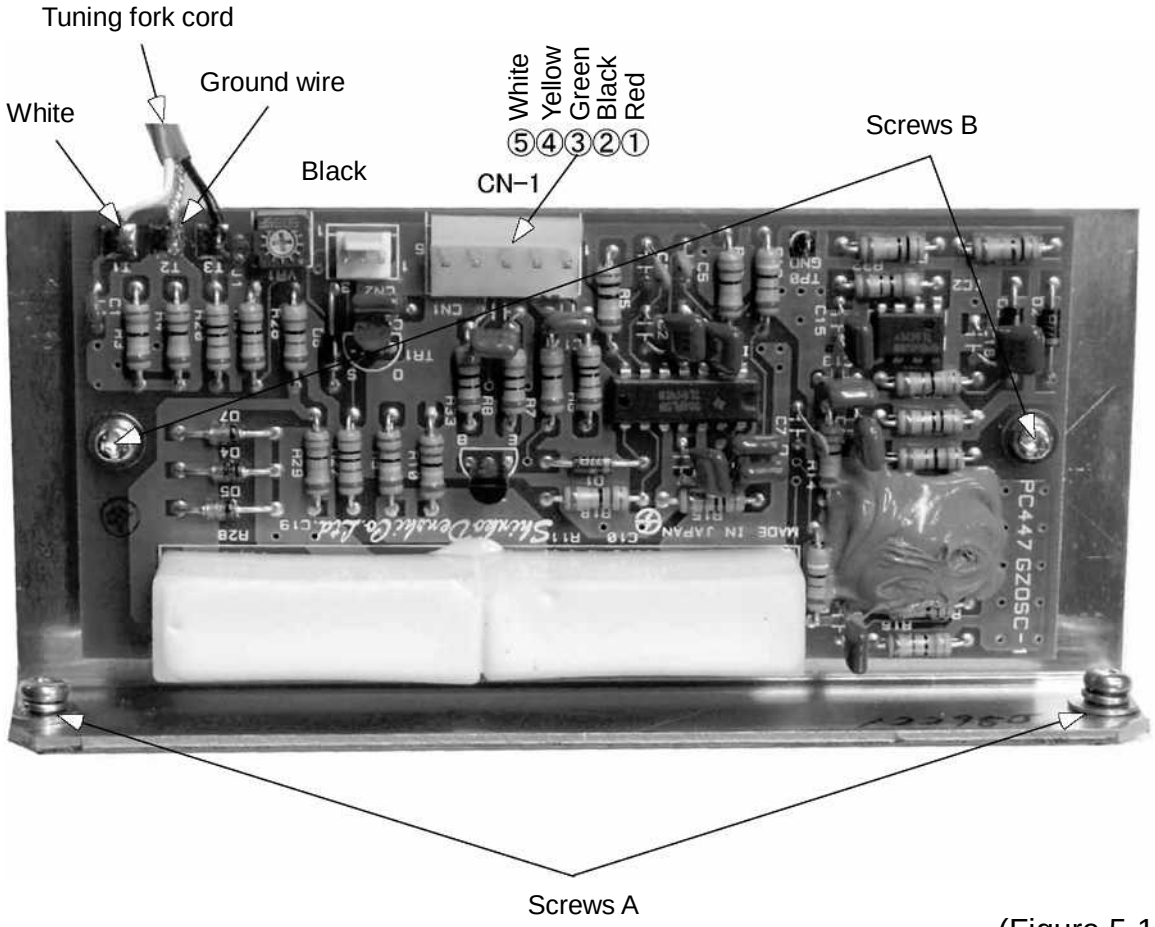
4. How to Install the GZBDSP-1 Board

(1) Connect the GZSW-2 board connector to the CN2 of a new GZBDSP-1 board.
(2) Temporarily secure GZBDSP-1 board mounting screws C (4) and the hexagonal spacer, and after adjusting the inclination of the LCD tube, secure the screws and the spacer.
(3) Secure the clamp for the red and black lines with the screw C (1) left over from (2).
(4) Connect the GZ II rear case assembly connector to the CN4 of the GZBDSP-1 board, and connect the battery box assembly connector to the connector for the red and black lines.
(5) Install the GZ II rear case assembly mounting screws B (6).
(Take care not to catch the cable.)
(6) Install the screws A (2) on the backside of the GZ II display assembly to connect the assembly to the stand assembly.

5-4 Procedure for Replacing the GZOSC-1 Board

1. How to Remove the GZOSC-1 Board

   (1) Remove the unit cover. (Refer to Figure 5-1)
   (2) Remove the tuning fork assembly cord soldered to the GZOSC-1 board.
   (3) Remove the CN1 connector from the GZOSC-1 board.
   (4) Remove the PC bracket mounting screws A (2).
   (5) Remove the GZOSC-1 board mounting screws B (2).



(Figure 5-12)

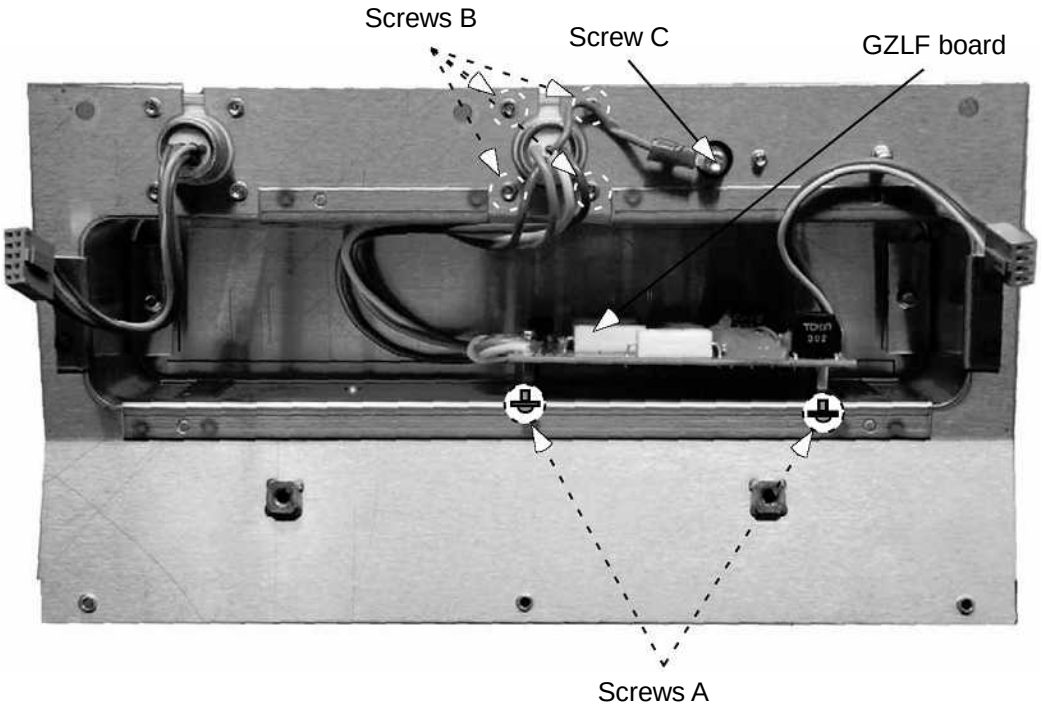
2. How to Install the GZOSC-1 Board

   (1) Install a new GZOSC-1 board with mounting screws B (2).
   (2) Solder the tuning fork assembly cord to a new GZOSC-1 board.
   (3) Connect the CN1 connector.
   (4) Install PC bracket mounting screws A (2).
   (5) Install the unit cover. (Refer to Figure 5-1)

5-5 Procedure for Replacing the GZLF Board

1. How to Remove the GZLF Board

   (1) Remove the GZ II rear case assembly. (Refer to Figure 5-7)
   (2) Remove GZLF board mounting screws A (2), metal connector mounting screws B (4), and ground wire mounting screw C (1).



(Figure 5-13)

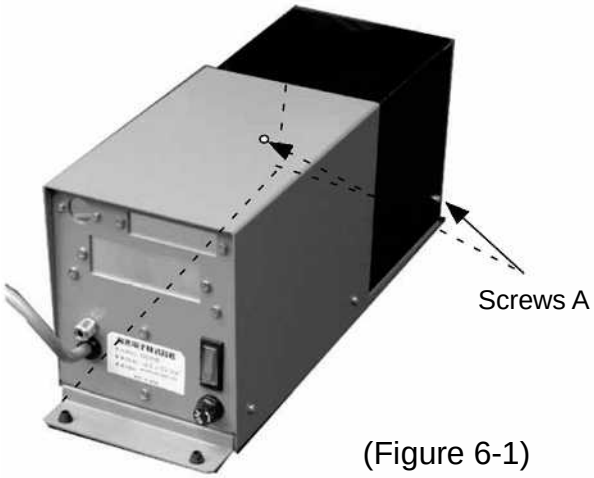
2. How to Install the GZLF Board

   (1) Install a new GZLF board with screws A, B and C.
   (Be careful of the orientation.)
   (2) Install the GZ II rear case assembly. (Refer to 5-3 2. (3) to (4))
   (Take care not to let the cable get caught.)

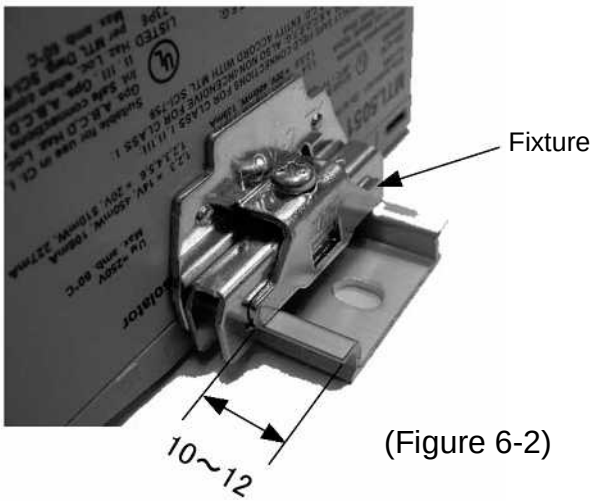
Chapter 6 Replacement Procedures for Options

6-1 Procedure for Replacing the Insulating Barrier

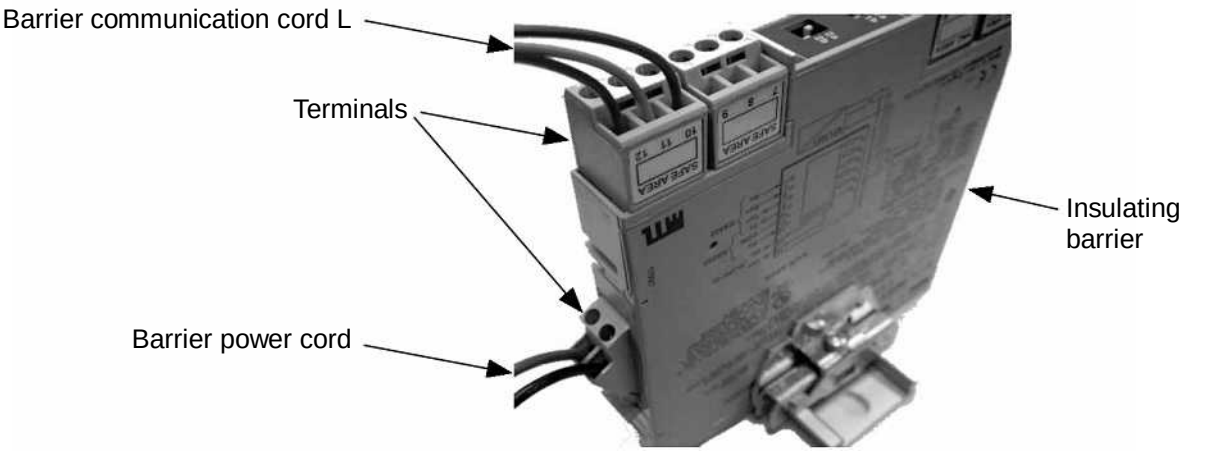
(1) Remove barrier cover fixing screws A (2) from the power box.
(2) Remove the cables from the insulating barrier terminals.
(3) Loosen the screw of one side of the fixture and replace the insulating barrier.
(4) Connect barrier communication cord L to terminal 3P and the barrier power cord to 2P.
(No.10 = brown, No. 11 = orange, No. 12 = red) (No. 13 = black, No. 14 = red)
(5) Install the barrier cover.



(Figure 6-1)



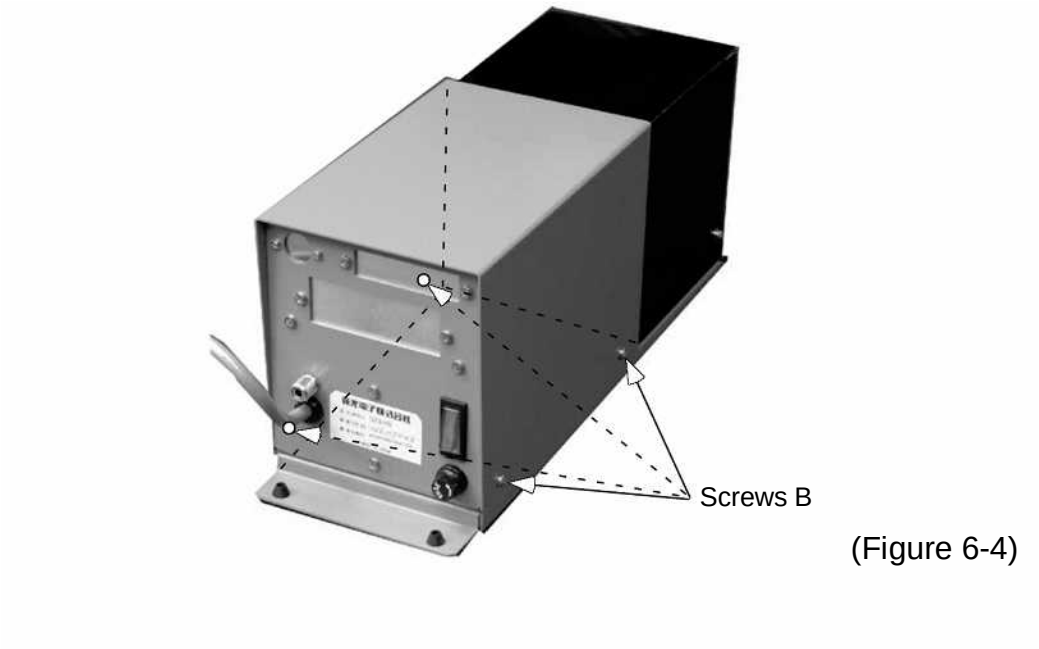
(Figure 6-2)



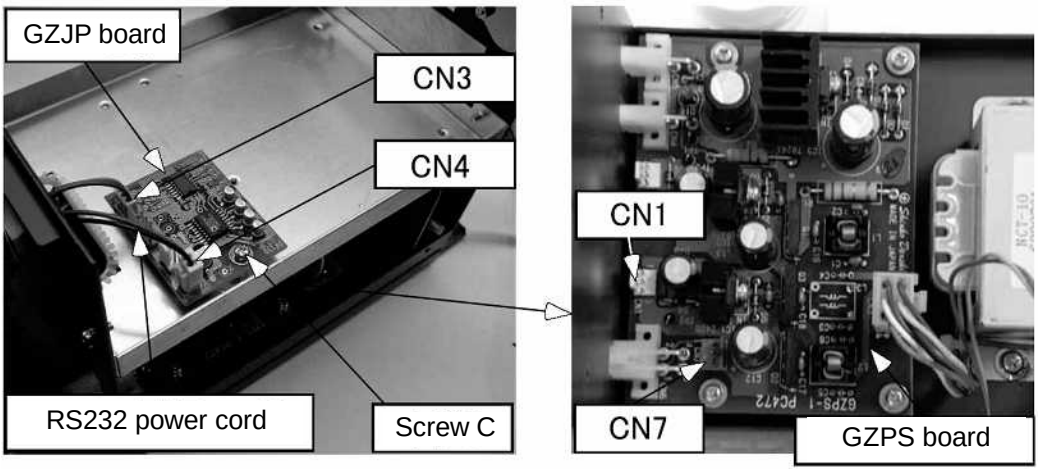
(Figure 6-3)

6-2 Procedure for Replacing the GZJP Board

(1) Remove IS box cover fixing screws B (4) from the power box.
(2) Remove the connector (CN4) of the GZJP board and the connector (CN7) of the GZPS board.
(3) Remove fixing screws C from the GZJP board and replace it.
(4) Connect the CN3 of the GZJP board to the CN7 of the GZPS board, and connect the RS232 power cords to the CN4 and CN1 of the GZJP and GZPS boards, respectively.
(5) Install the IS box cover.



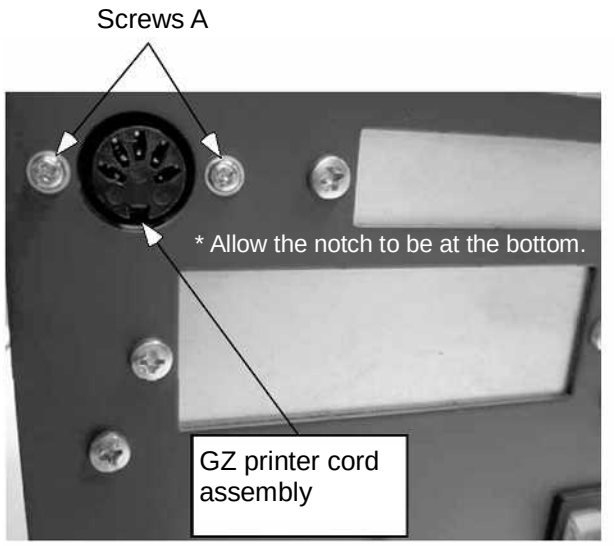
(Figure 6-4)



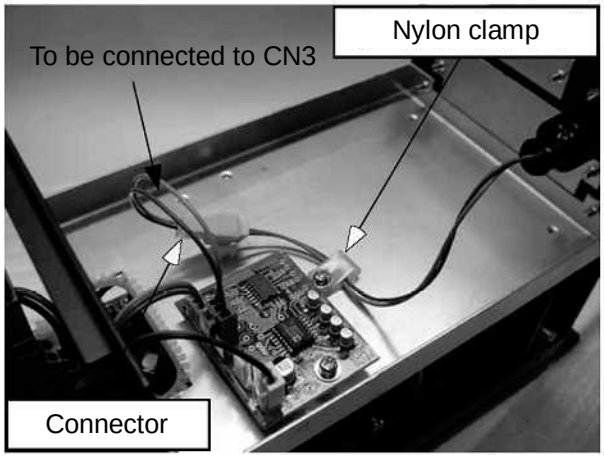
(Figure 6-5)

6-3 Procedure for Replacing the GZ Printer Output (R1)

(1) Remove IS box cover fixing screws B (4) from the power box. (Refer to Figure 6-4)
(2) Remove GZ printer cord assembly fixing screws A (2).
(3) Remove the nylon clamp and the connector, and replace the assembly.
(4) For more information on connector connection, refer to Figure 6-8.
(5) Install the IS box cover.

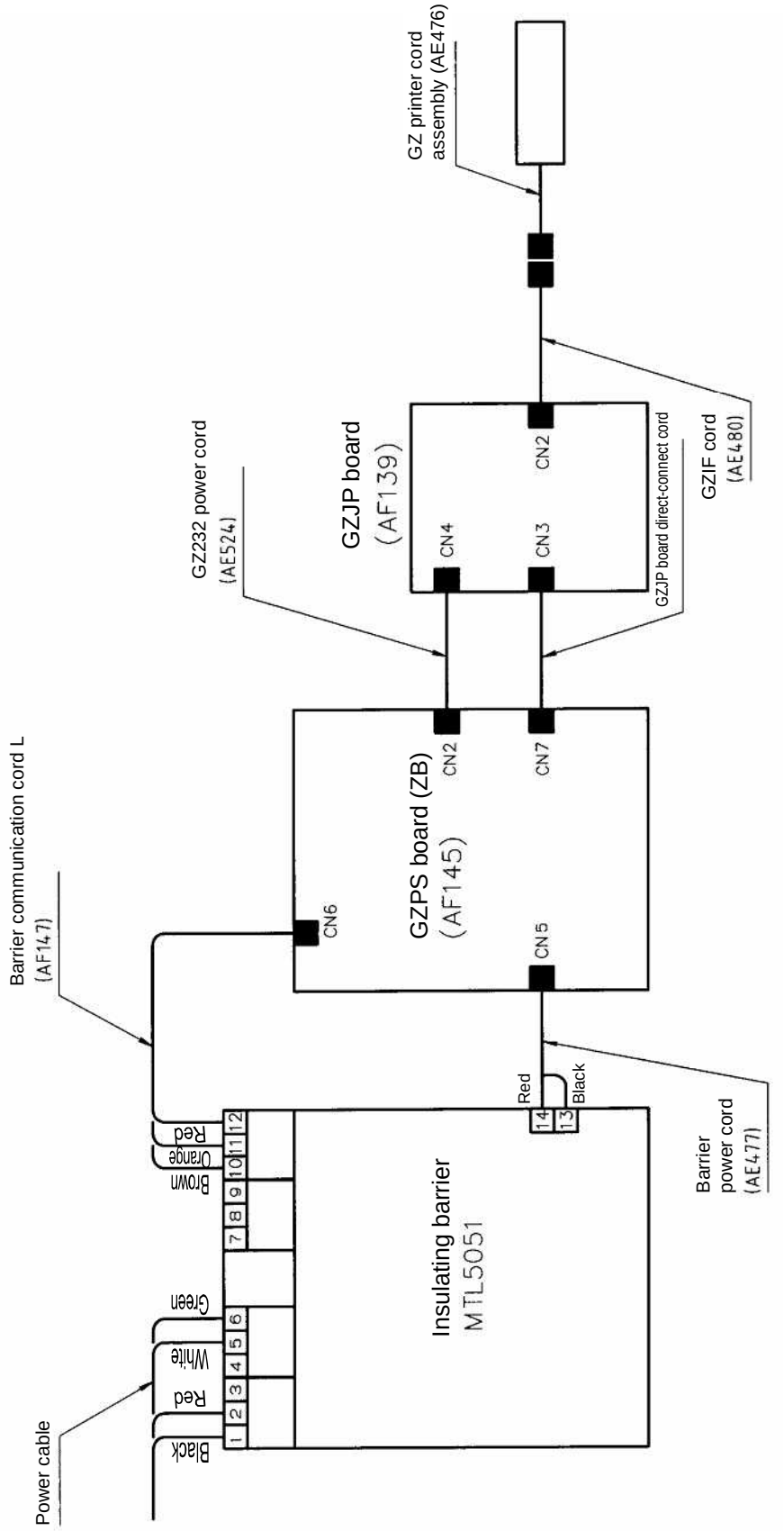


(Figure 6-6)



(Figure 6-7)

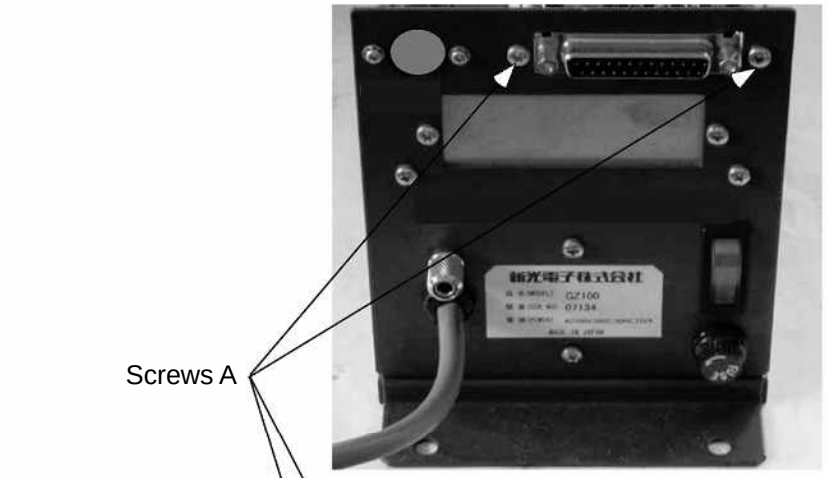
GZ II-DR1 Block Diagram



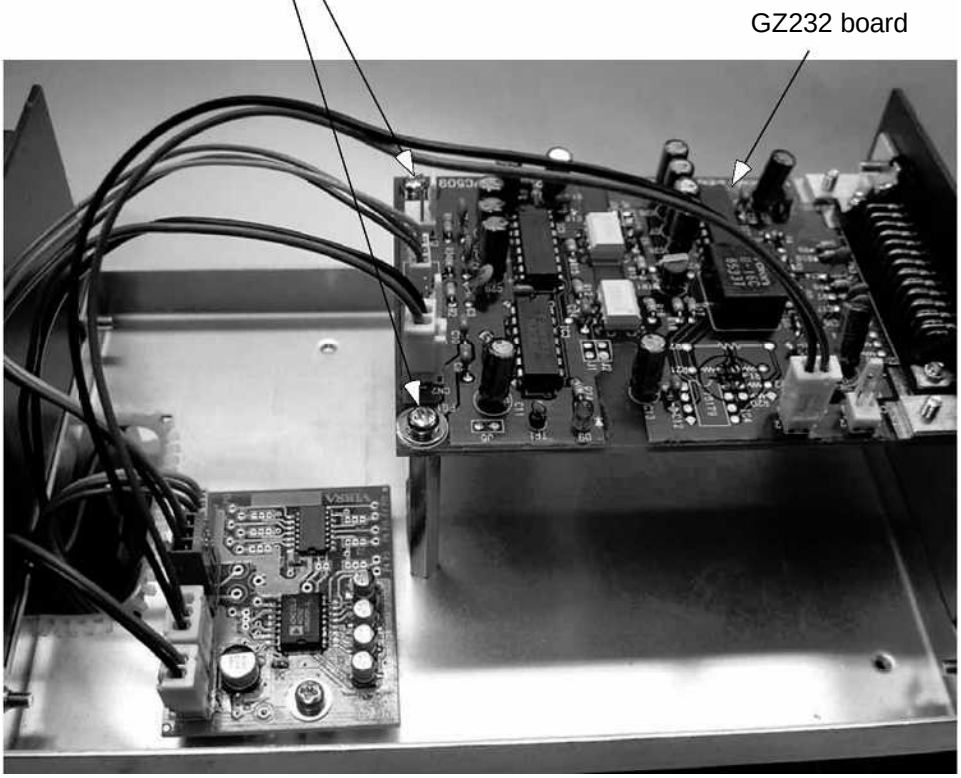
(Figure 6-8)

6-4 Procedure for Replacing the GZRS232C Output (R2)

(1) Remove IS box cover fixing screws B (4) from the power box. (Refer to Figure 6-4)
(2) Remove GZ232 board fixing screws A (4).
(3) Remove the connectors and replace the board.
(4) For more information on the connection of each connector, refer to Figure 6-11.
(5) Install the IS box cover.

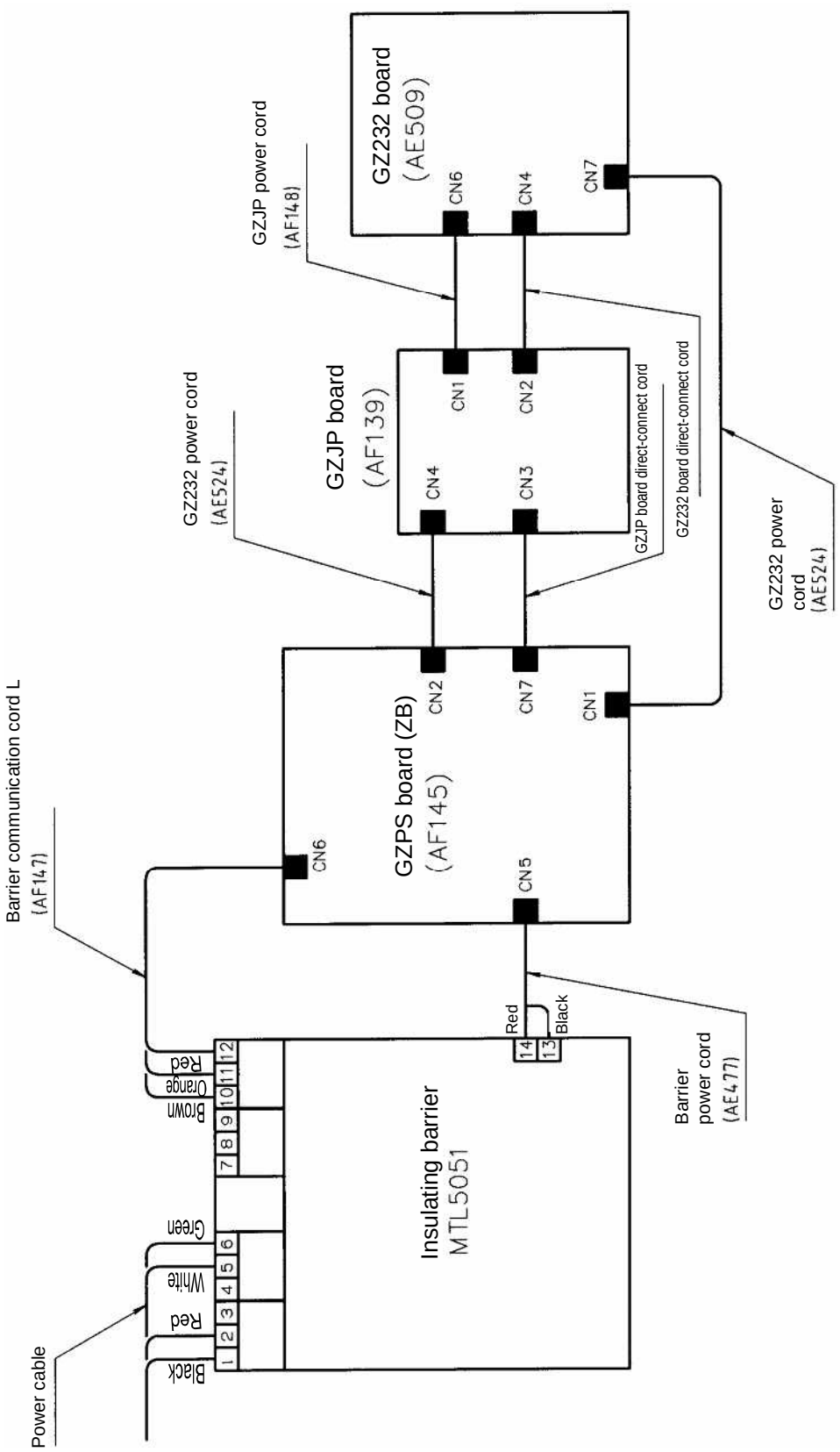


(Figure 6-9)



(Figure 6-10)

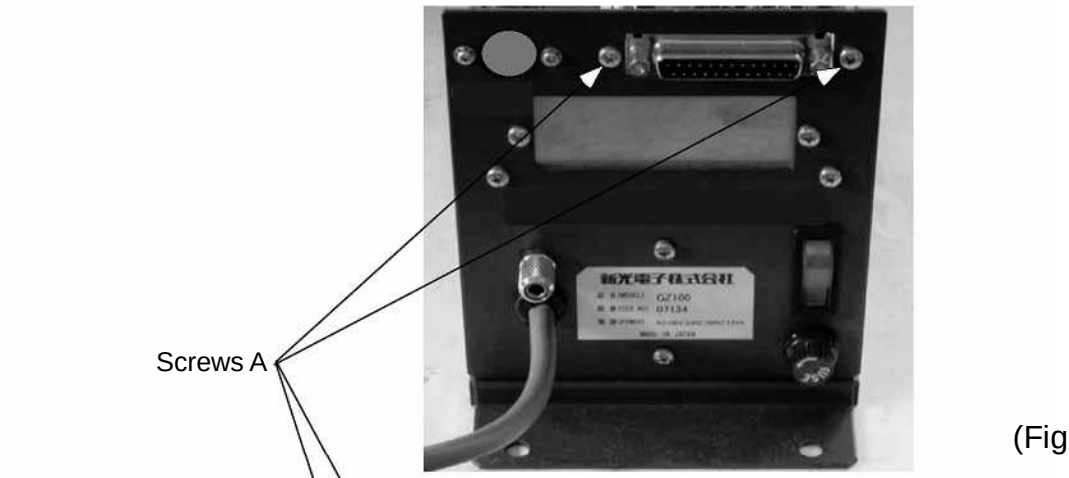
GZ II-DR2 Block Diagram



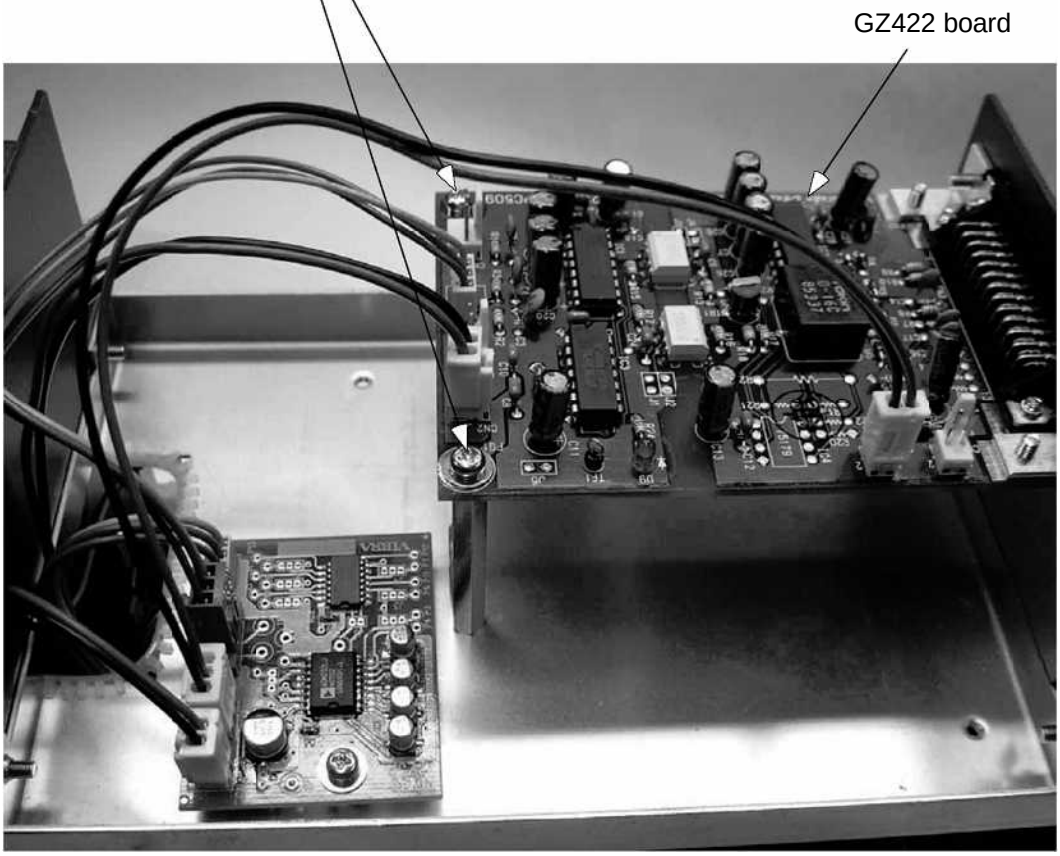
(Figure 6-11)

6-5 Procedure for Replacing the GZRS422C Output (R4)

(1) Remove IS box cover fixing screws B (4) from the power box. (Refer to Figure 6-4)
(2) Remove GZ422 board fixing screws A (4).
(3) Remove the connectors and replace the board.
(4) For more information on the connection of each connector, refer to Figure 6-14.
(5) Install the IS box cover.

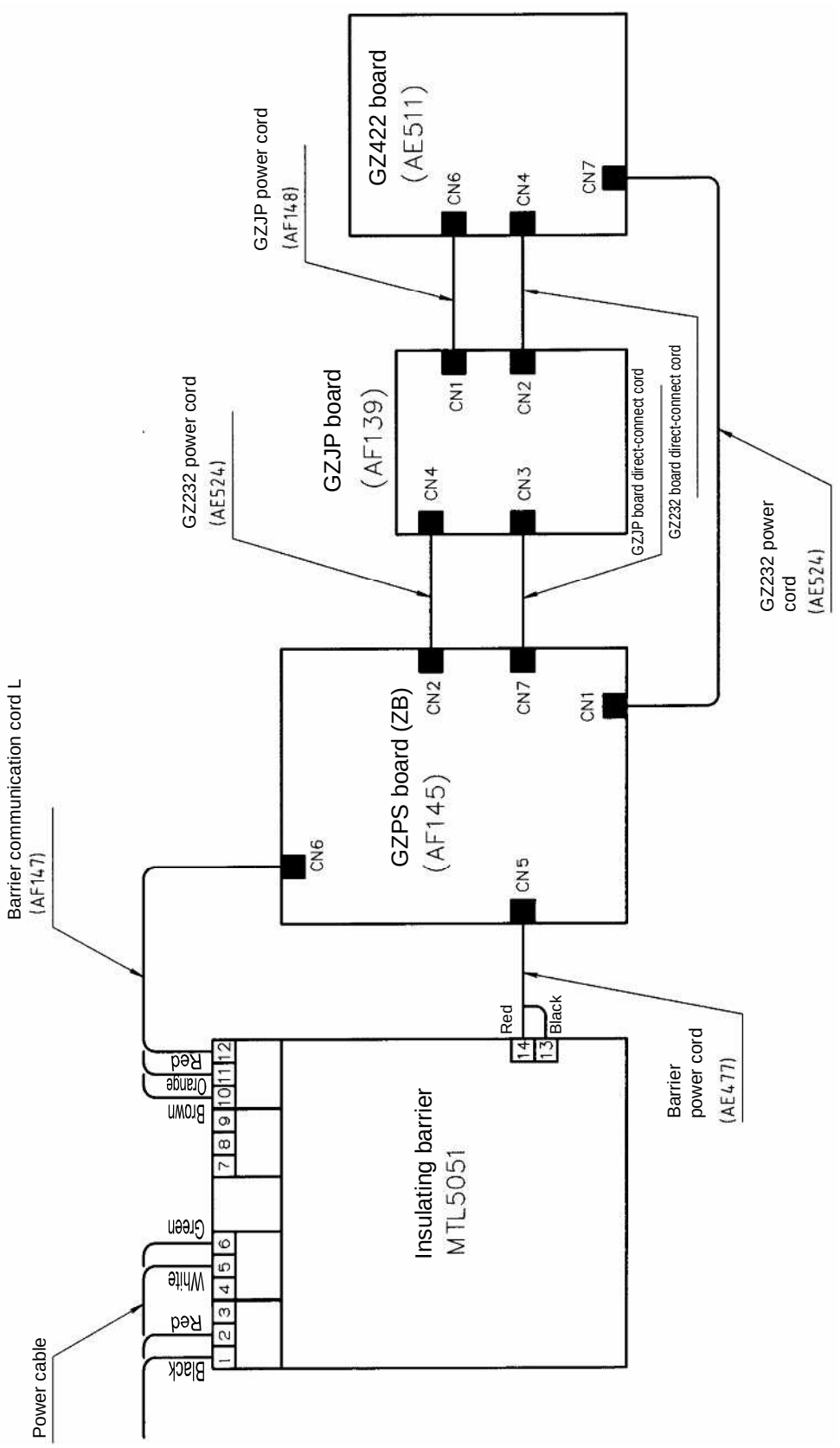


(Figure 6-12)



(Figure 6-13)

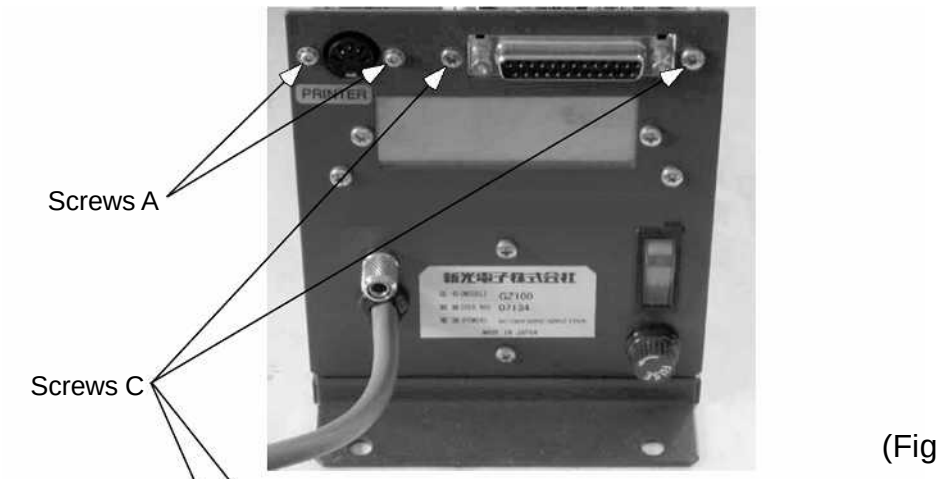
GZ II-DR4 Block Diagram



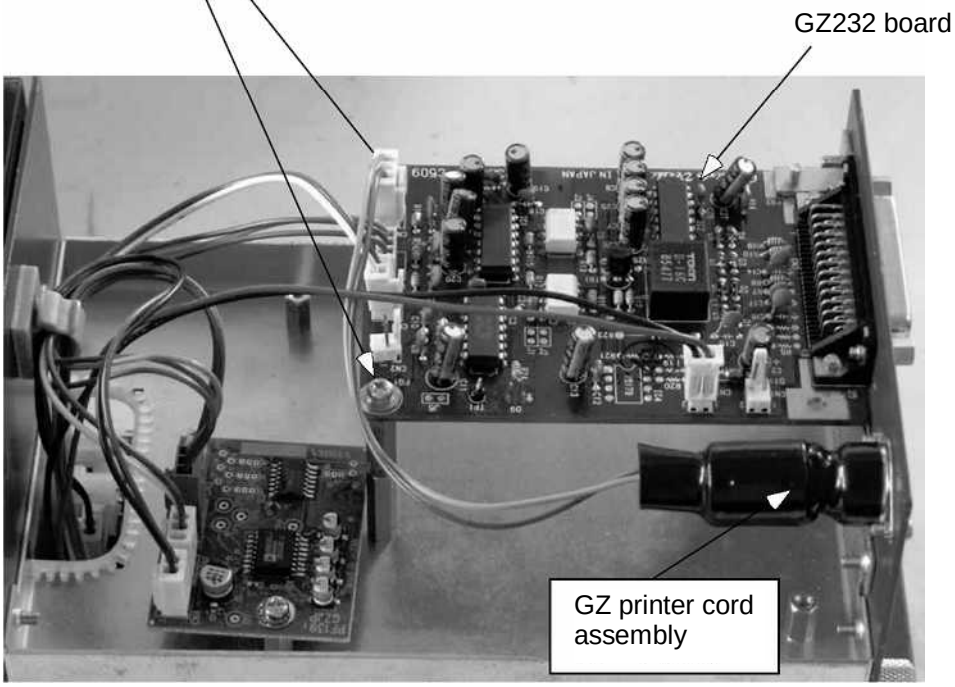
(Figure 6-14)

6-6 Procedure for Replacing the GZ Printer Output + GZRS232C Output (R5)

(1) Remove IS box cover fixing screws B (4) from the power box. (Refer to Figure 6-4)
(2) Remove GZ printer cord assembly fixing screws A (2) and GZ232 board fixing screws C (4).
(3) Remove the connectors and replace the board.
(4) For more information on the connection of each connector, refer to Figure 6-17.
(5) Install the IS box cover.

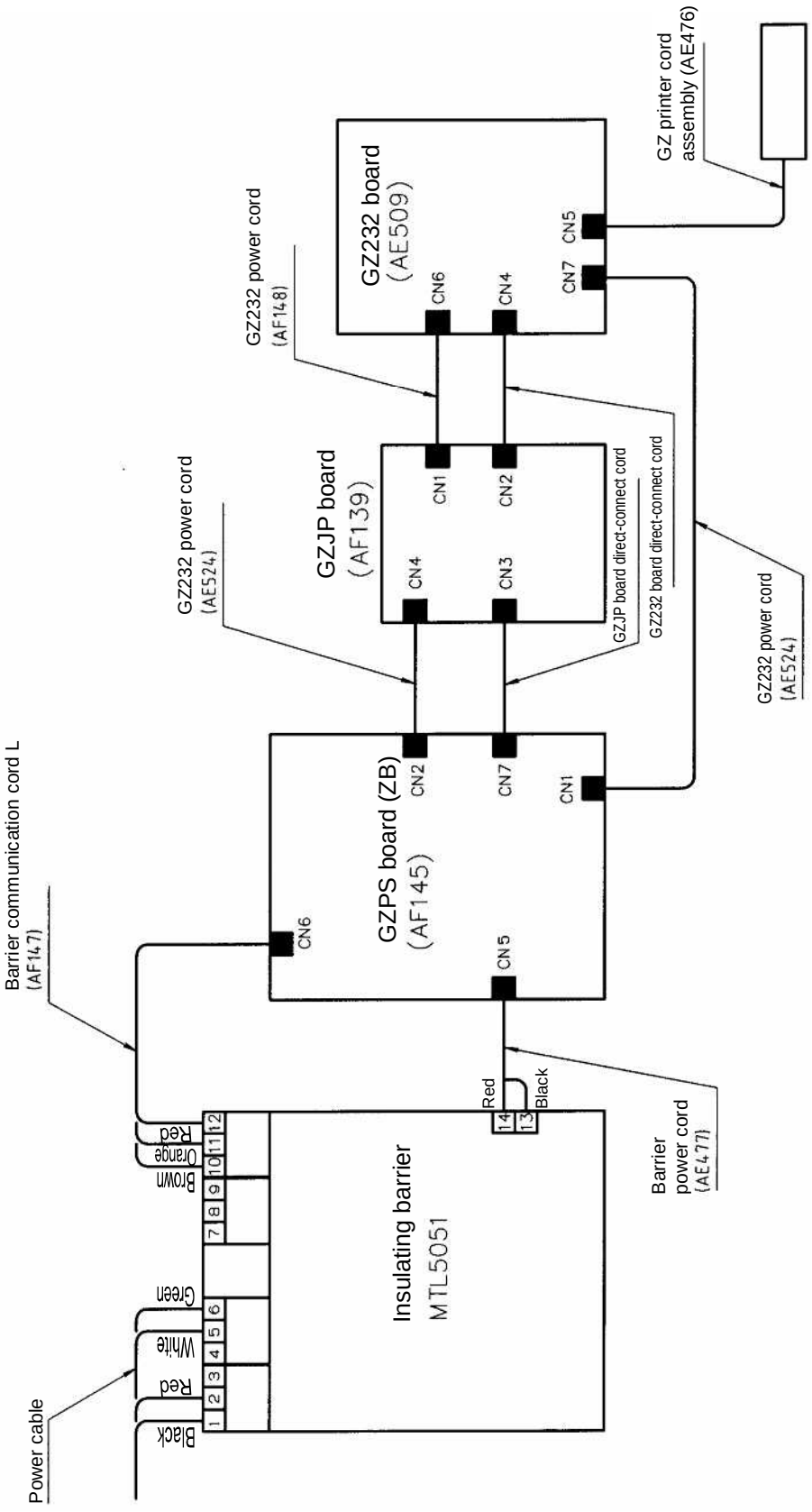


(Figure 6-15)



(Figure 6-16)

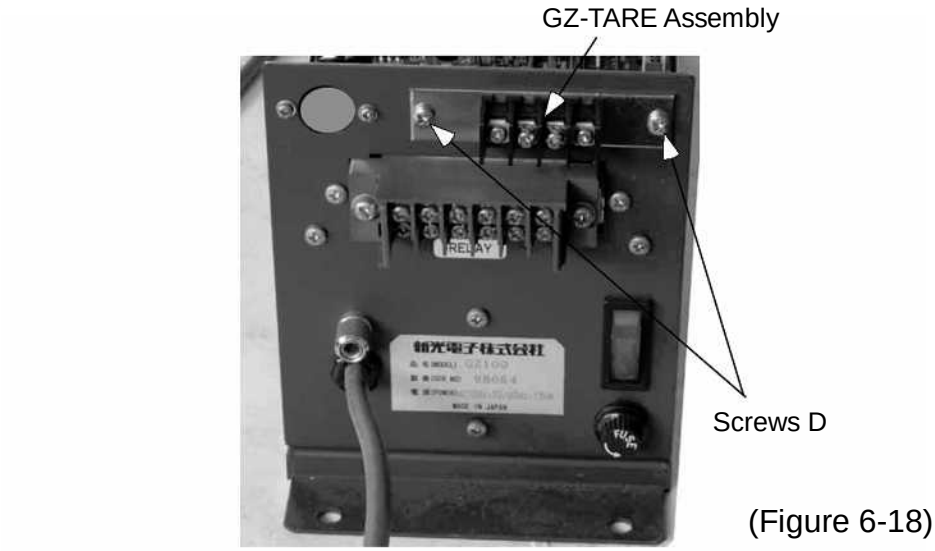
GZ II-DR5 Block Diagram



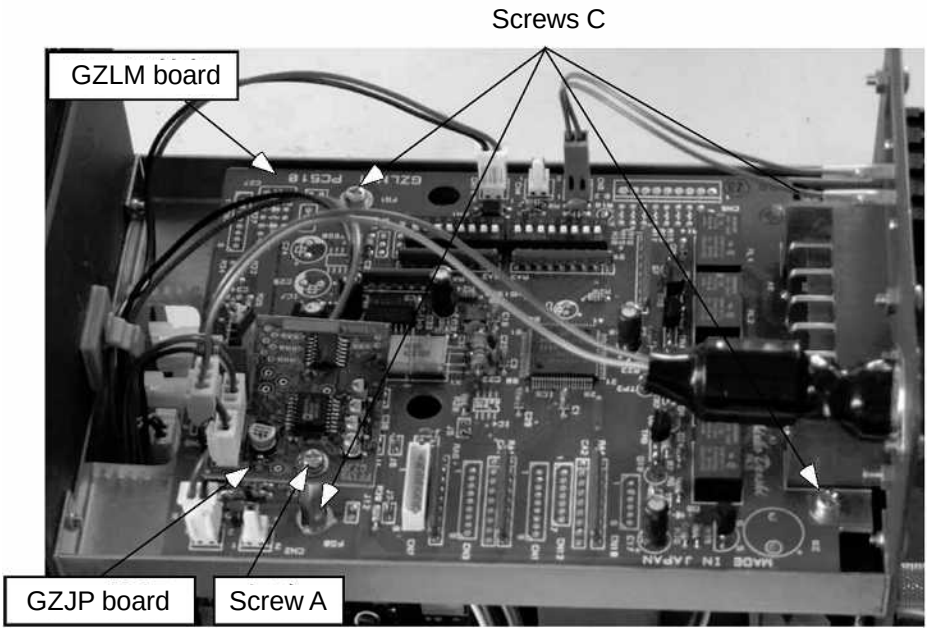
(Figure 6-17)

6-7 Procedure for Replacing the GZ Relay Contact Output + External Tare (LM1)

(1) Remove IS box cover fixing screws B (4) from the power box. (Refer to Figure 6-4)
(2) Remove GZJP board fixing screw A (1), GZLM board fixing screws C (4), and GZ-TARE assembly fixing screws D (2).
(3) Remove the connectors and replace the board.
(4) For more information on the connection of each connector, refer to Figure 6-20.
(5) Install the IS box cover.

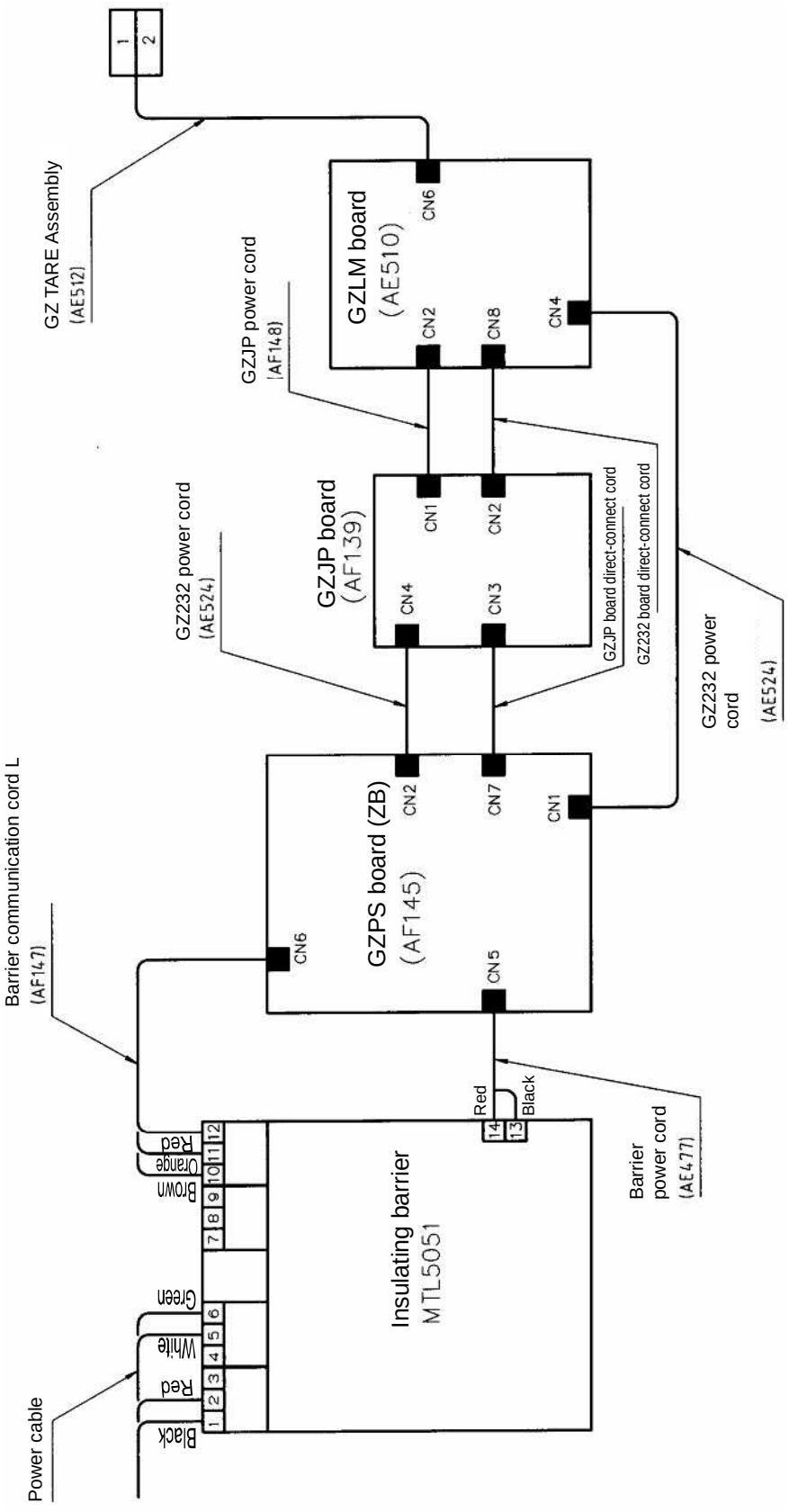


(Figure 6-18)



(Figure 6-19)

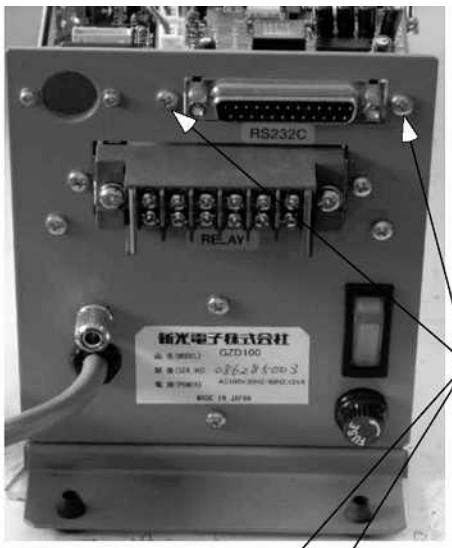
GZ II-DLM1 Block Diagram



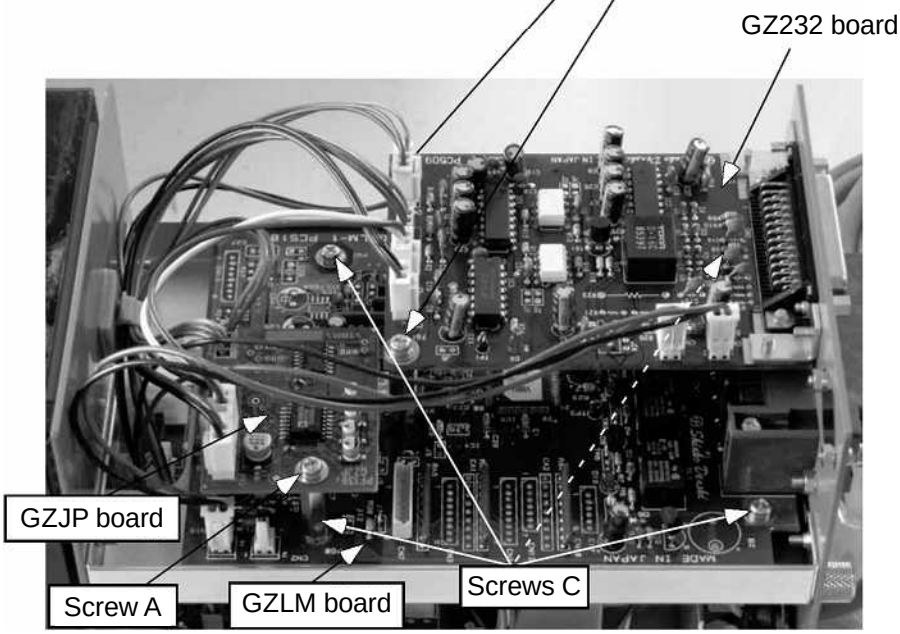
(Figure 6-20)

6-8 Procedure for Replacing the GZ Relay Contact Output + RS232C Output (LM3)

(1) Remove IS box cover fixing screws B (4) from the power box. (Refer to Figure 6-4)
(2) Remove GZJP board fixing screw A (1), GZLM board fixing screws C (4), and GZ232 board fixing screws D (4).
(3) Remove the connectors and replace the board.
(4) For more information on the connection of each connector, refer to Figure 6-23.
(5) Install the IS box cover.

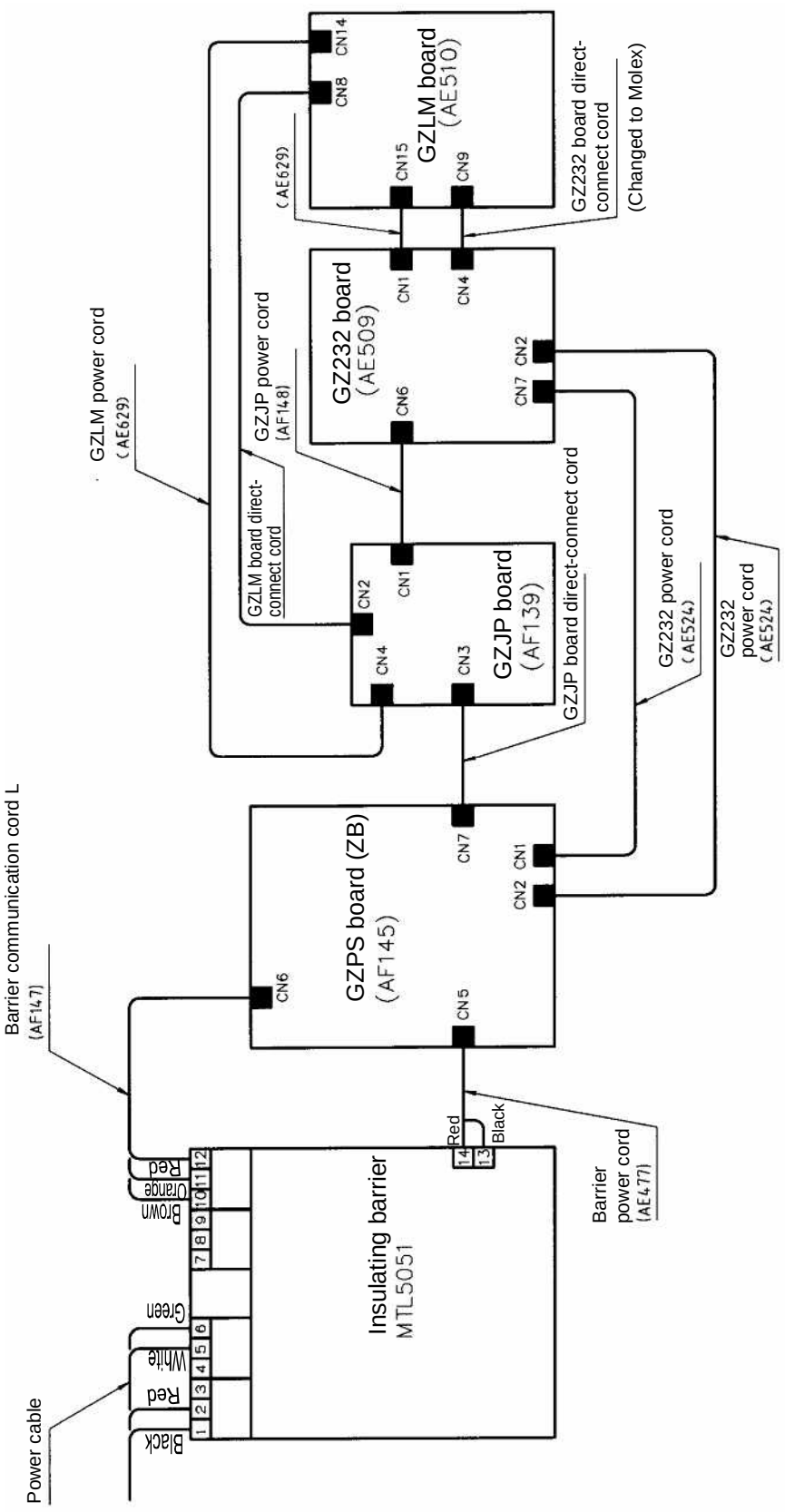


(Figure 6-21)



(Figure 6-22)

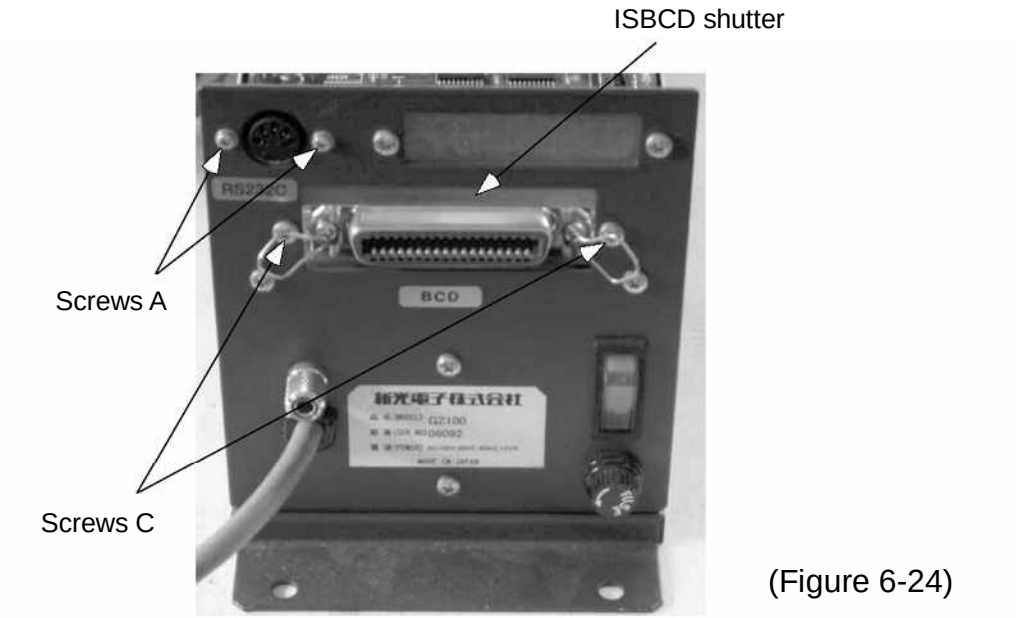
GZ II-DLM3 Block Diagram



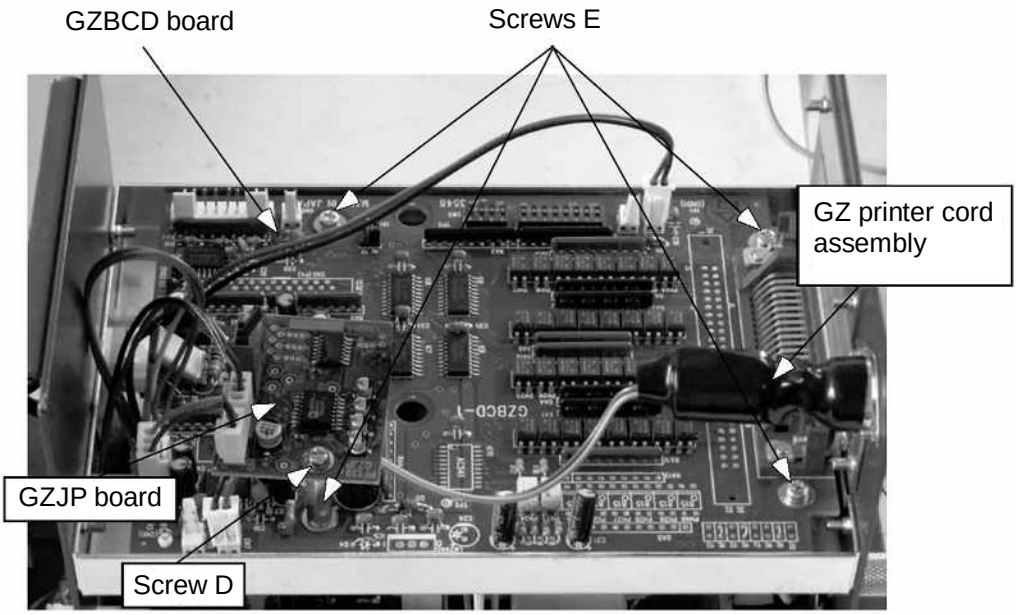
(Figure 6-23)

6-9 Procedure for Replacing the GZBCD Output

(1) Remove IS box cover fixing screws B (4) from the power box. (Refer to Figure 6-4)
(2) Remove GZ printer cord assembly fixing screws A (2), ISBCD shutter fixing screws C (2), GZJP board fixing screw D (1), and GZBCD board fixing screws E (4).
* For more information on how to install the GZ printer cord assembly, refer to Figure 6-6.
(3) Remove the connectors and replace the board.
(4) For more information on the connection of each connector, refer to Figure 6-26.
(5) Install the IS box cover.



(Figure 6-24)



(Figure 6-25)

GZ II-DBCD Block Diagram