charder®

MS-3500

SERVICE MANUAL

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PRECAUTIONS

READ the service manual BEFORE operating or servicing this equipment.
FOLLOW the instructions carefully.
Keep this manual for future reference.
Don't allow untrained personnel to operate, clean, inspect, maintain, service or tamper with this equipment.
ALWAYS DISCONNECT this equipment from the power source before cleaning or performing maintenance.
Note: If the unit has been stored or transported to below freezing temperature, let the unit to warm up to room temperature before turning on power.

PAY SPECIAL ATTENTION TO ALL "WARNING" SYMBOLS

 IMPORTANT  ELECTRICAL WARNING

GENERAL INFORMATION

Before connecting or disconnecting any internal electronic components or interconnecting wiring between electronic components, always remove power and wait at least 30 seconds. Ignoring any of these precautions could damage or cause destruction to the equipments.

GENERAL INSPECTION

Inspect the scale assembly by checking the following:

- Are there any unusual wear points, paths, or marks on the weighing Surface?
- Is the instrument cable damaged or binding the scale?
- Has any debris or material built up under or around the platform that could inhibit movement?
- Visually inspect the load cells and levelling feet for signs of unusual wear.

TROUBLESHOOTING

GENERAL:
If the scale does not operate properly, find out as mush as possible about the problem.

Determine whether the problem is constant or intermittent. Be aware that problems can be caused by mechanical or electrical influences.

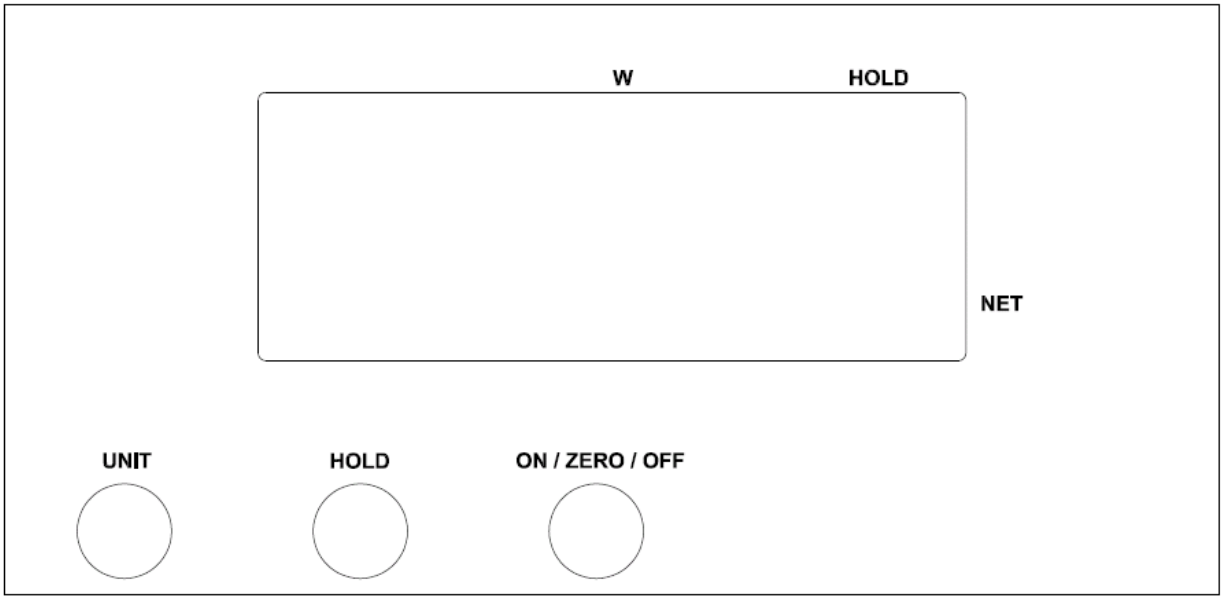
While troubleshooting MS3500 scale, check for the following:

- Water
- Corrosive materials
- Uneven floor
- Strong vibrations or wind currents
- Physical damage to the scale platform or housing.

SPECIFICATION

MODEL#	MS3500
Capacity /Division	20kg 5~10kg * 5g 10~20kg * 10g
Tray	YES
Units of Measure	kg/lb
Function keys	ON/ZERO/OFF, UNIT, HOLD
Stabilisation Time	1-2 seconds
Operating Temp.	5°C / 35°C
Power supply	9V battery and AC adaptor
Indicator display	1.0” LCD display with 5 active digits
Dimensions (w x d x h)	Base: 340 x 330 x 50 mm Tray: 585 x 280 x 120mm

PANEL



ERROR MESSAGE

Error Message	Description	Solution
	Nothing appears on the display after pushing ON/OFF key.	1. Check display. 2. Disassemble indicator. 3. Check wires and switch key. (refer P.7 & P.9)
	Can't switch on scale using AA battery.	Battery housing wires are disconnected or broken. (refer P.7)
	Can't switch on scale using AC adaptor.	1. AC adaptor damaged. →Replace adaptor. 2. AC jack wires are disconnected. (refer P.7)
	Low battery indication.	1. Check battery voltage (>6V) and if needed replace new battery for operation. 2. If the problem still persists inspect soldering of controller PCB or replace the controller PCB.
	Scale zeroed under its initial balance.	1. Check the load cell and its wiring (refer P.7). 2. Replace load cell, then re-calibrate the scale. (for re-calibrating refer P.14)
	Scales zeroed exceed its initial balance.	1. Remove the weight from scale. 2. Check the load cell's resistance. (See P.10) 3. If you change the load cell, please re-calibrate the scale. (refer P.14)
	Overload	1. Remove the weight from scale. Overload: Maximum capacity + 9d
	EEPROM data incorrect.	1. Check IC3 is soldered or not. (Refer P.22 Bottom overlay) 2. Replace controller PCB. 3. Re-calibrate the scale. (refer P.14)

Error Message	Description	Solution
	No weighing.	1. Check the load cell wires are well and connected to the correct points. (refer P.7) 2. Check resistances of load cell. (refer P.9) 3. If you change the load cell, please re-calibrate the scale. (refer P.14)
	The scale shows non-complete segments when power on.	Check LCD pin. (refer P.7)
	Zero count is more than calibration range (i.e. 10%) while power on.	1. Make sure that the scale platform doesn't have any kind of weight on it. 2. Check the load cell wires are well connected to the correct points. (refer P.7) 3. Re-calibrate the scale. (refer P.14)
	Zero count is less than calibration range (i.e. 10%) while power on.	1. Make sure that there is no blocking object (like paper/plastic sheet or heavy layer of dirt/dust) between upper platform of the scale and the platform on which load cell is fitted. 2. Check the load cell wires are well connected to the correct points. (refer P.7) 3. Re-calibrate the scale. (refer P.14)

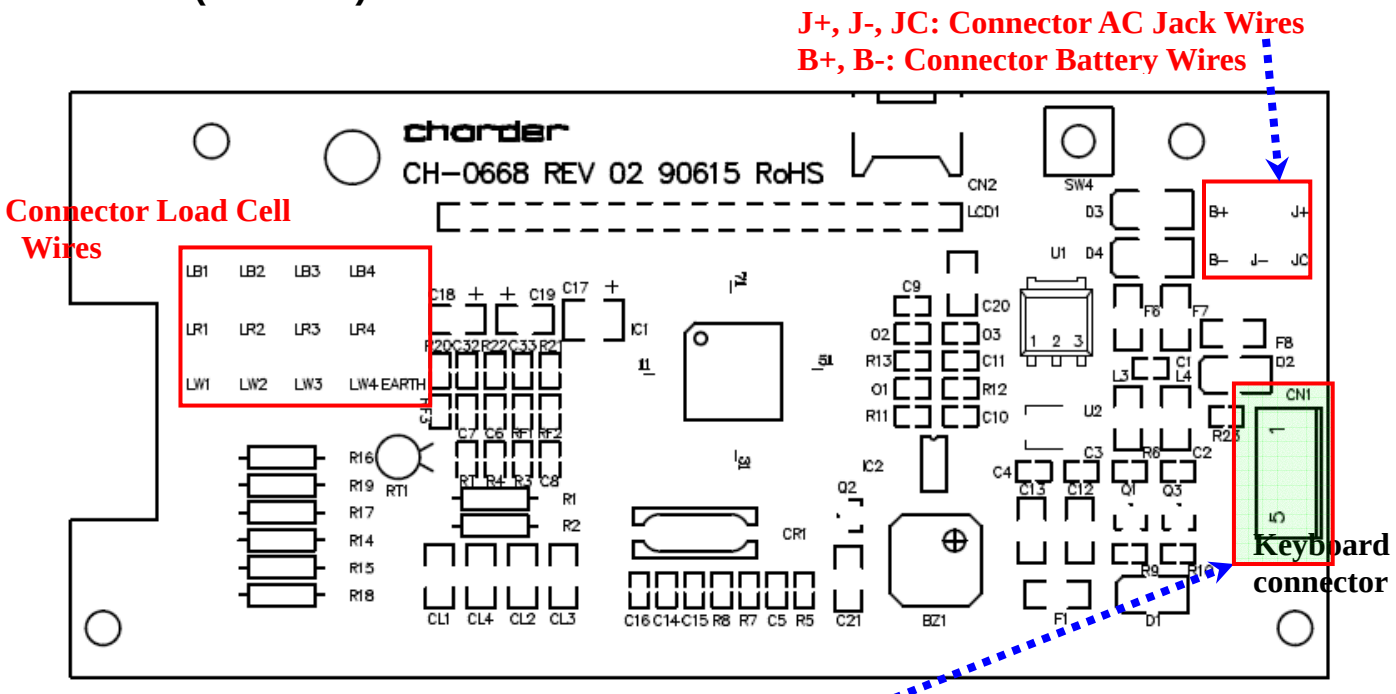
WIRING

ACTION:

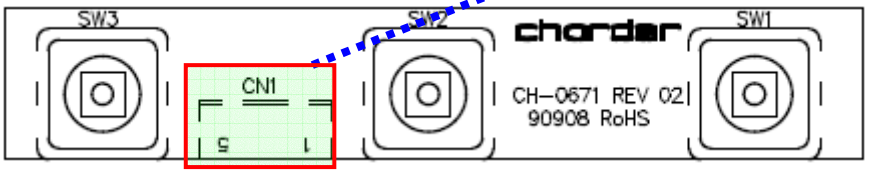
1. Remove battery from the scale.
2. Un-screw the lower housing.
3. Remove upper housing.
4. Make sure that all wire connectors are well and that no insulation material is touching the soldering contacts.
5. Make sure that all wires are connected to the correct points.

Wiring	Connector
Load cell wiring	RED (solder pad “LRx”)
	BLACK (solder pad “LBx“)
	WHITE (solder pad “LWx“)
Battery Wiring	Red (solder pad E+) Black (solder pad E-)
AC Jack Wiring	Red (solder pad J+) White (solder pad JC) Black (solder pad J-)

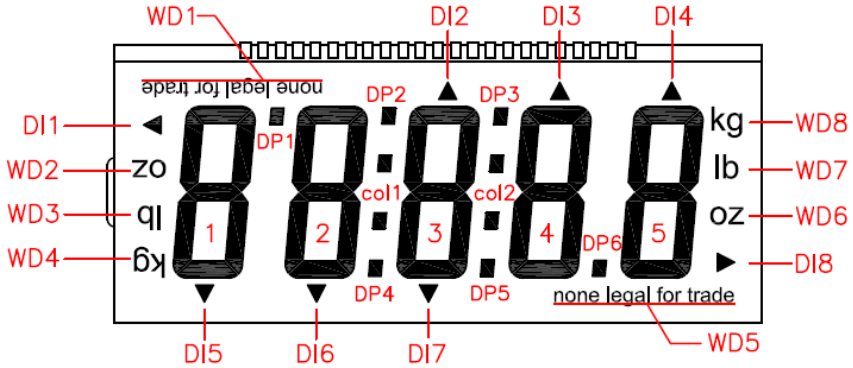
■ **Main Board (CH-0668)**



■ **Power Board (CH-0671)**



LCD FORMAT



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
COM1	DI1	1a	WD1	2a	DP1	DP2	3a	DI2	DP3	4a	DI3	5a	DI4	WD8	WD5	C1			
COM2	WD2	1f	1d	2f	2d	col1	3f	3d	col2	4f	4d	5f	5d	WD7	DP6		C2		
COM3	WD3	1g	1c	2g	2c	DP4	3g	3c	DP5	4g	4c	5g	5c	WD6	DI5			C3	
COM4	WD4	1e	1b	2e	2b	DI6	3e	3b	DI7	4e	4b	5e	5b	DIP8					C4

ACTION:

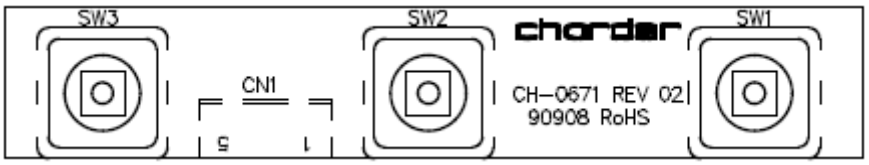
Problem- The scale shows non-complete segments when power on.

Solution:

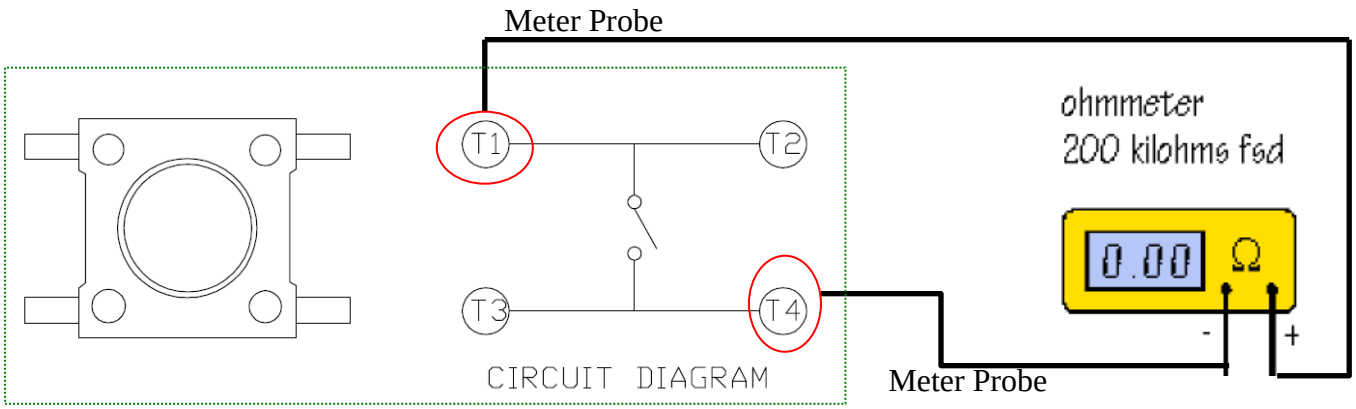
- Turn off the scale and take out the batteries from the scale.
- Check LCD pin. (Please refer to above LCD FORMAT)

  For instance, if the top left arrow (DI1) disappears, then check pin 1 and pin 16.
- Check whether LCD pins are soldered properly or not.

SWITCH KEY



1. Switch key damaged.
2. Use multi-meter to measure switch key resistance.



- Use meter probe touch T1 and T4, and press switch key at the same time.
- If the multi-meter “BEEP” means the switch key is good for use, if not, please change the switch key.

3. Make sure that no insulation material is touching the soldering contacts.

4. If problem persists, replace a new main board.

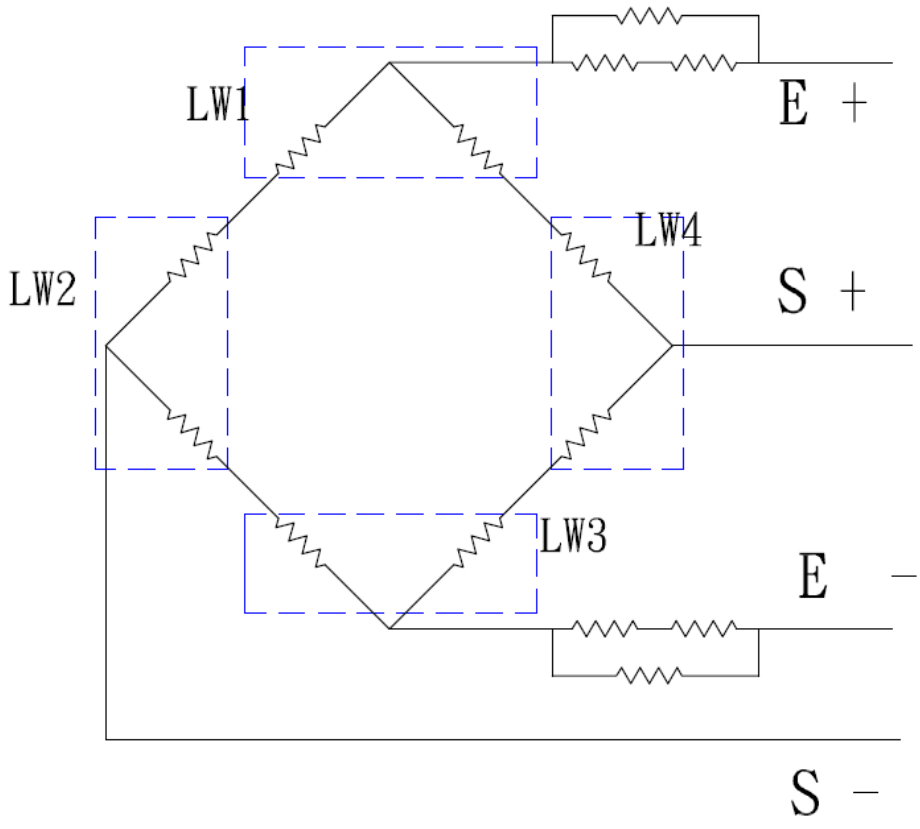
LOAD CELL

Check load cell for proper bridge resistances as below.

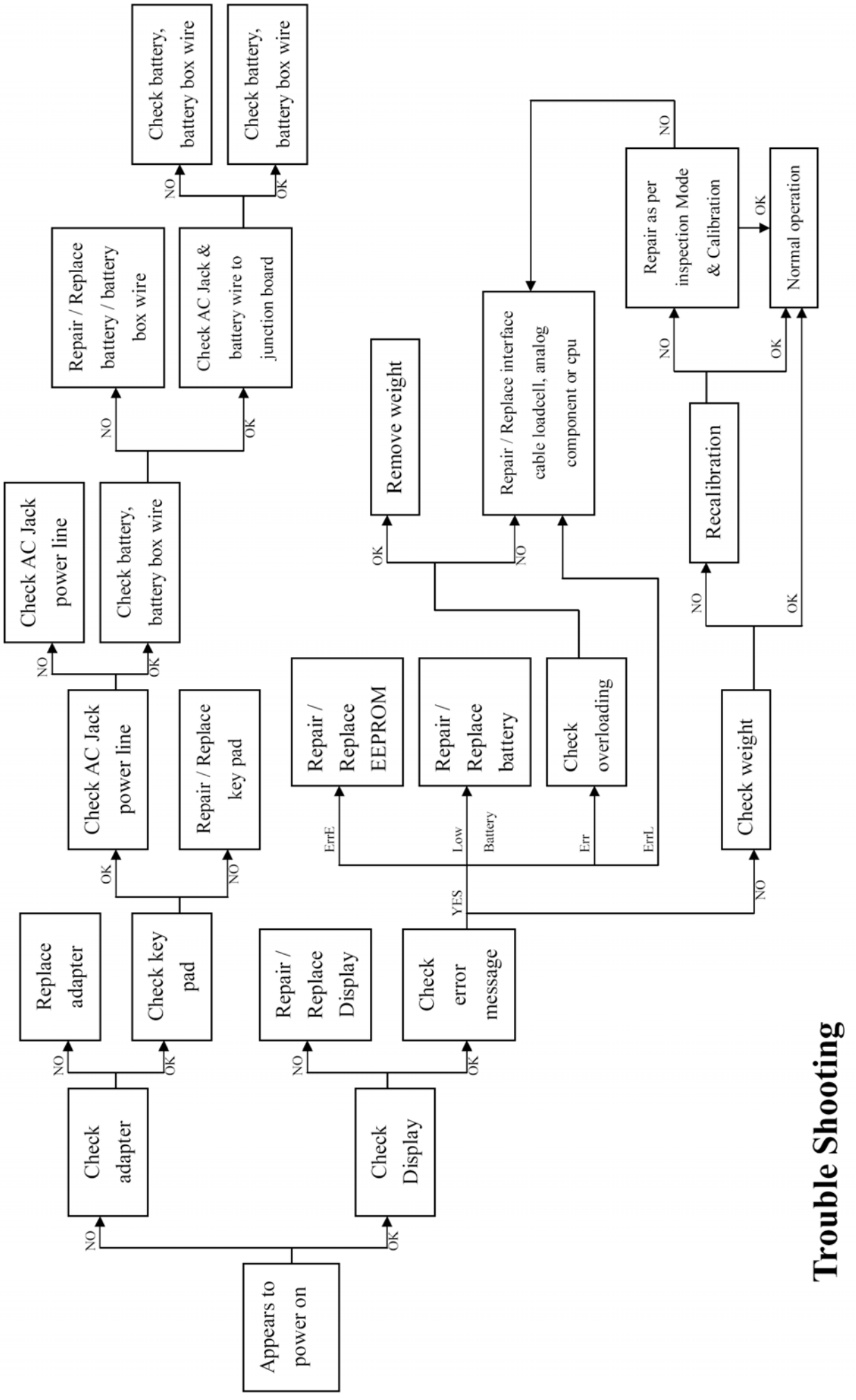
MODEL	MEASURING POINTS	RESISTANCE	REMARK
AL-8160	E+ (RED) to E- (BLACK)	350 ± 5 ohms	Each resistant on load cell should be same and the tolerance < 355 ohms.
	S+ (GREEN) to S- (WHITE)	350 ± 5 ohms	

ACTION:

1. Remove power (adaptor pin) from the system, check load cell for proper resistances.
2. If load cell fails the above tests, replace load cell.
3. If load cell passes the above tests and has no visible damage, please re-calibrate the scale.

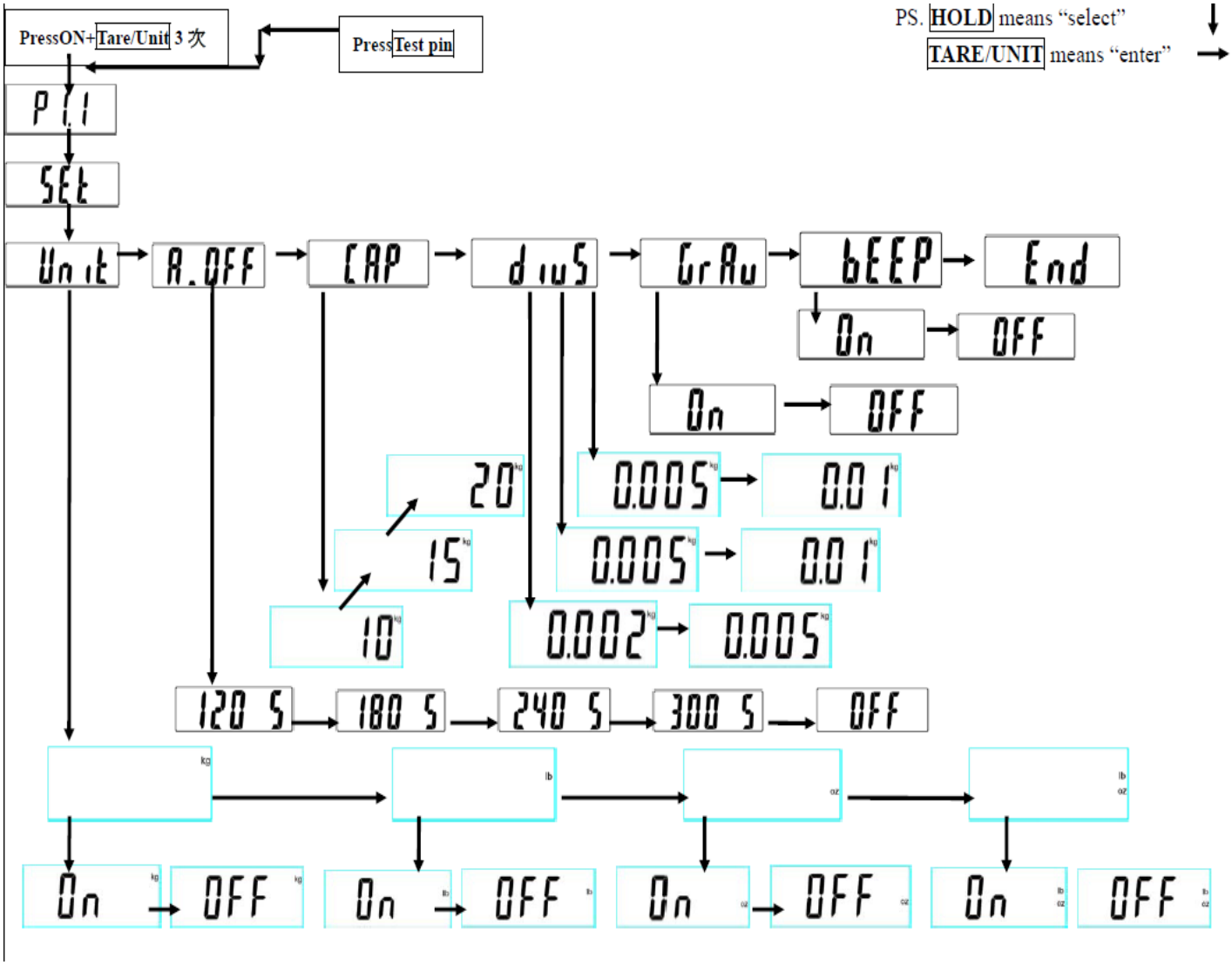


TROUBLESHOOTING TREE



MS3500 SERVICE MENU CONFIGURATION

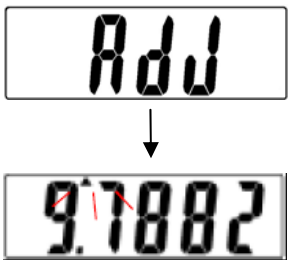
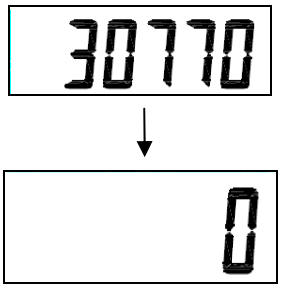
Please press test pin once, First SET will display on the screen, and then it will change to UNIT display automatically. Use HOLD key to move ⇩ direction and UNIT key to move ⇒ direction.



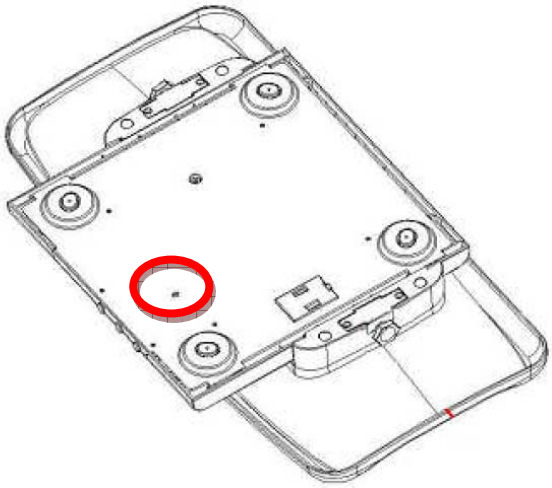
DEFAULT COMPANY SETTINGS

Function	Description	Default
	(Units): Kg, lb, oz, lb:oz	**Kg/ lb**
	(Auto off Time): 120 sec/ 180 sec/ 240 sec/ 300 sec/ OFF	
	(Capacity): 10kg/ 15kg/ 20kg	**By model**
	(division):0.002/0.005 or 0.005/0.01	**By model**
	(Gravity): on/off	**Off**
	(Beep): on/off	**On**

CALIBRATION PROCEDURE

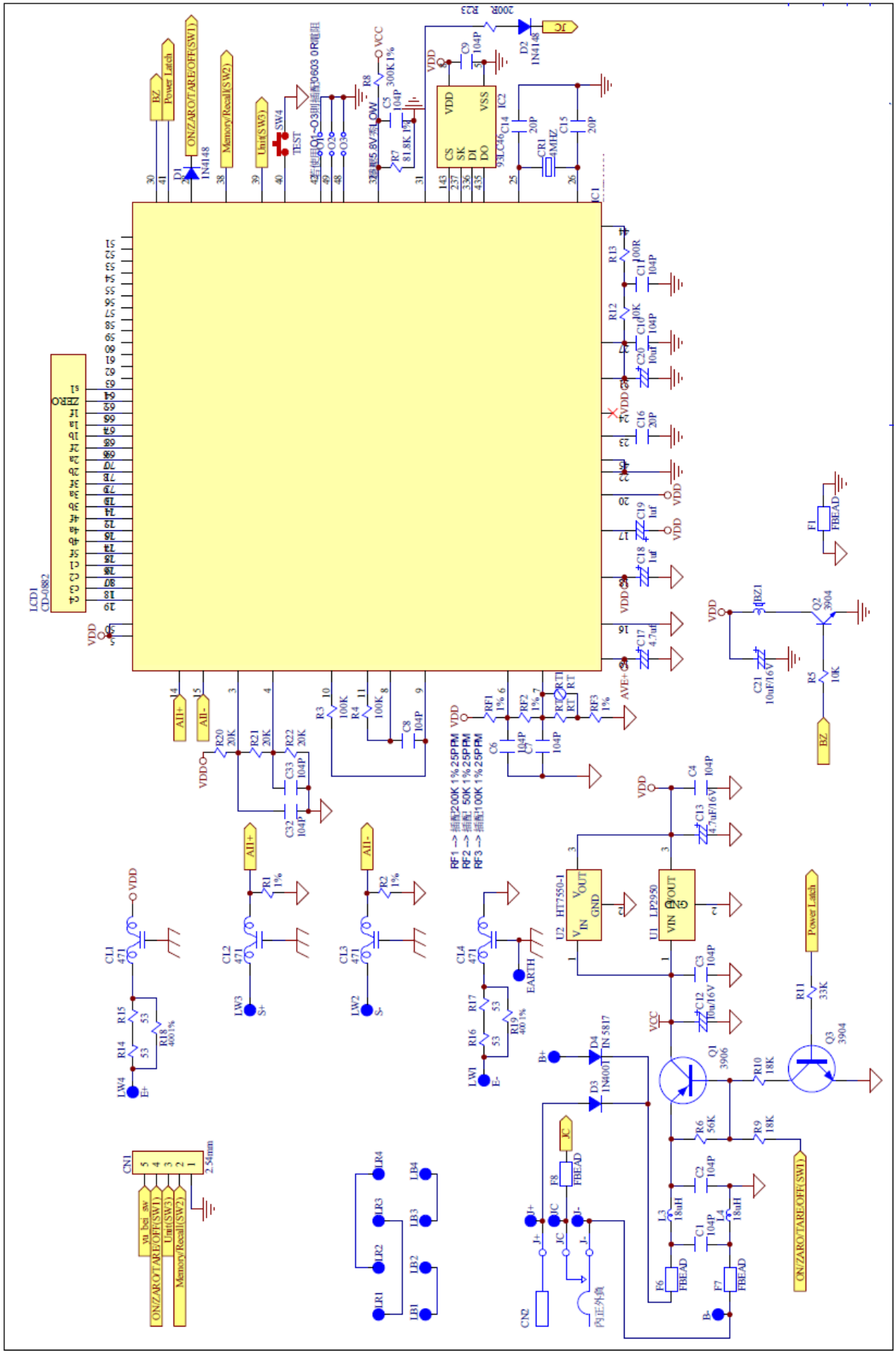
Operation	Display
Turn ON MS3500 using the ON/ZERO/OFF key.	
Press TEST PIN twice, First  and then the last origin gravity value and left hand side arrow will appear on the display. Set the gravity of the place where the calibration procedure is been carried out. (Setting gravity value: Press UNIT to move to next digit and press HOLD to increase the value)	
Press the ON/ZERO/OFF key the display will show the present ZERO Count value (23250 ~ 39250). Then press the ZERO key.	
Place the calibration weight (20kg) carefully in the centre of the scale plate, and the display will show SPAN Count value (5000-26000). Press the ZERO key. The adjustment process is started.	
When the adjustment is finished successfully, the scale is automatically switched over to the weighing mode again and the calibration weight value will be displayed. Remove the calibration weight. Re-power on, the instrument is in normal mode.	

Test pin location



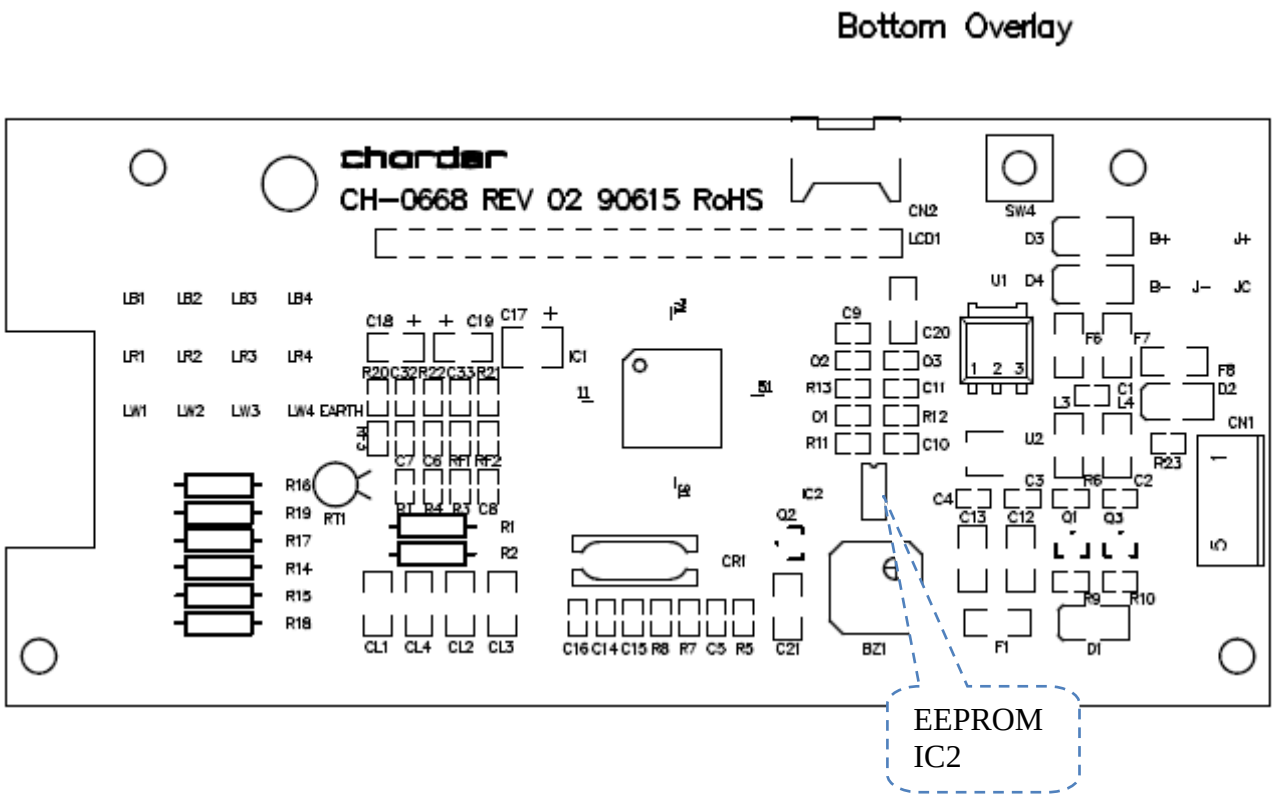
SCHEMATICS— MAIN BOARD CH-0733

MAIN BOARD CH-0668

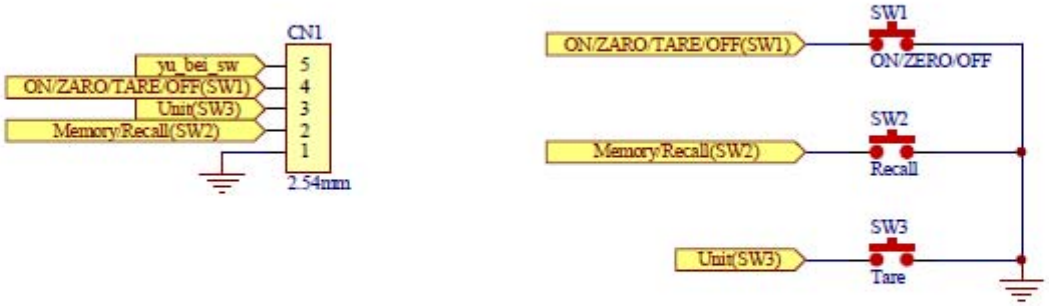


LAYOUT—MAIN BOARD CH-0668

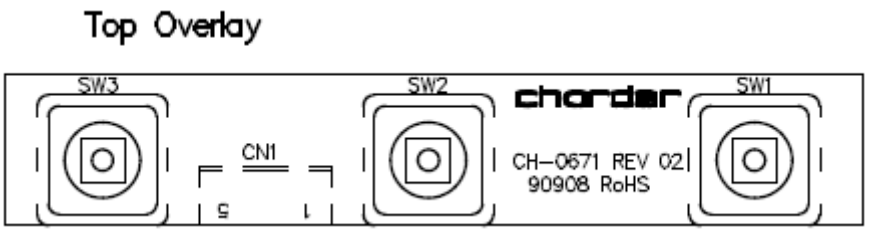
PRIMARY SIDE OF MAIN BOARD CH-0668



SCHEMATICS-POWER BOARD CH-0671

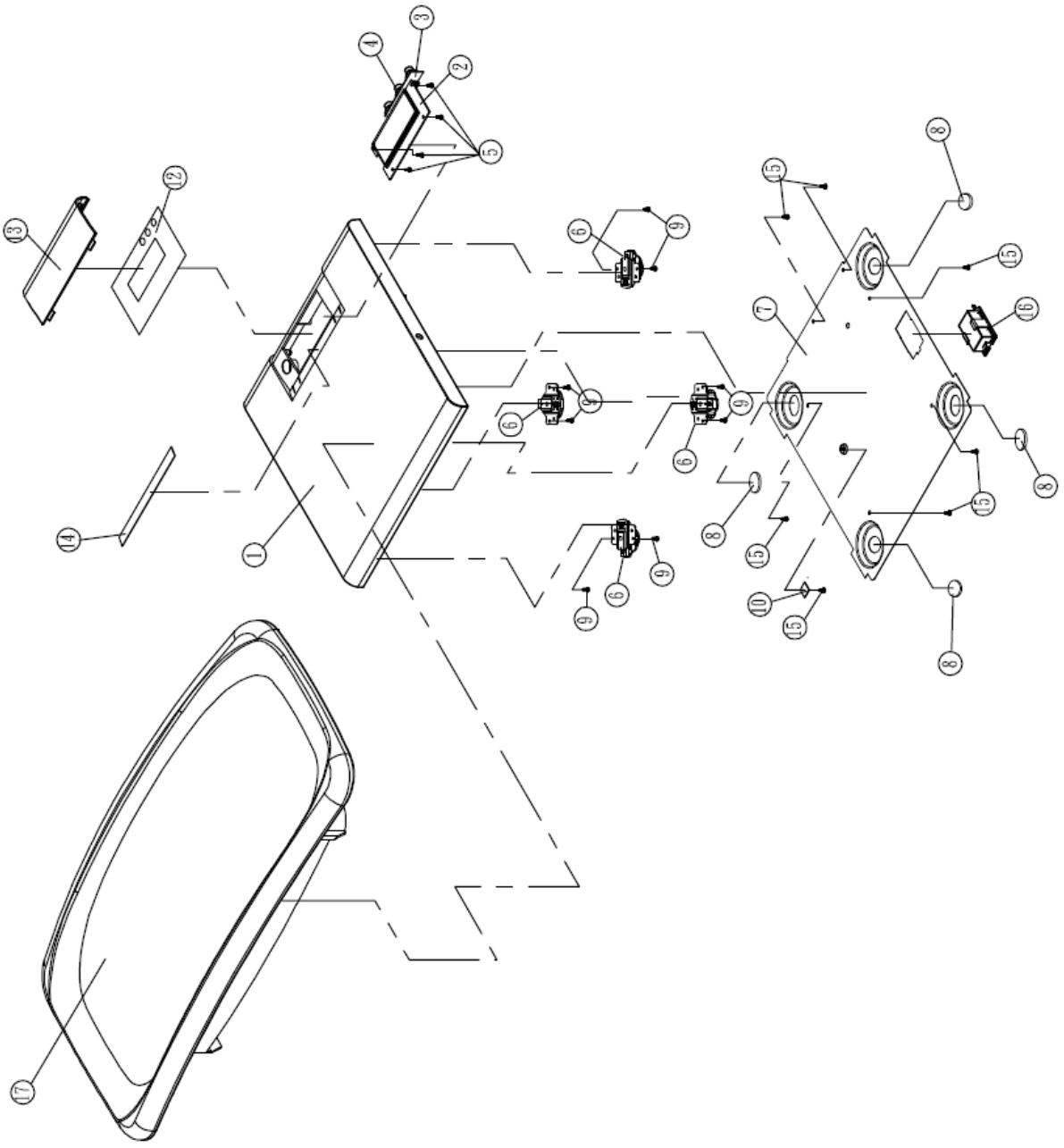


LAYOUT—KEY BOARD CH-0671



MS3500 PARTS & ASSEMBLY

No.	Item	Drawing No.	Q'TY
1	Plastic Cover	CR-8141(CR-2101)	1
2	Main Board	CH-0668	1
3	Key Board	CH-0671	1
4	Switch Cap	SW-8078(SW-1101)	3
5	Screw	M3*6	4
6	SENSOR	AL-8159(AL-2181)	4
7	Base	BM-8083(BM-1151)	1
8	Rubber Feet	SW-8079(SW-1471)	4
9	Screw	M4x0.7x8	8
10	Seal	GM-1217(GM-1027)	1
12	Overlay (1)	NP-8434(NP-3702)	1
13	LENS	LS-8056(LS-0921)	1
14	Overlay (2)	NP-8435(NP-3711)	1
15	Screw	M3 X 8	11
16	Battery cover	BT-0120	1
17	Tray	SM-2582	1

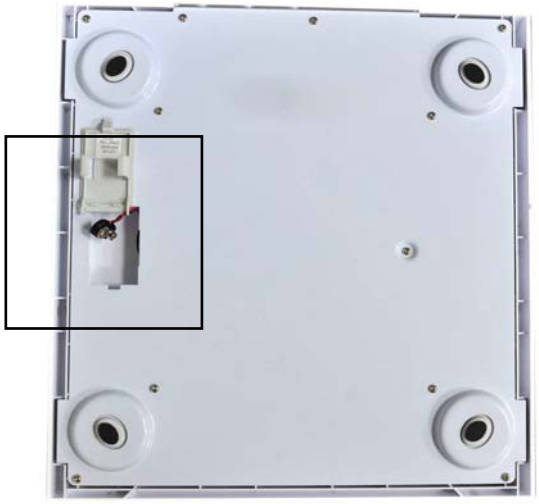


Please refer to next page for the list of spare parts.

MS3500 SPARE PART LIST		
CEC P/N	Description	Drawing Nr.
0200180000387	Adaptor	AD-038A REV 007
060006000013	Battery Cover	BT-0120 REV 003
090013000376	Tray	SM-2582 REV 001
060014000750	Overlay (1)	NP-8434 REV 001(NP-3701)
060014000770	Overlay (2)	NP-8449 REV 001
060007000110	Lens	LS-8056(LS-0921) REV 001
0600100004243	Plastic Cover	CR-8141 REV 003(CR-2101)
060004000711	Switch key cap	SW-8078 REV 001(SW-1101)
090001000014	Load Cell Set	AL-8159 REV 001

INSTRUCTION FOR REPLACING BATTERY

Upside down to spot battery housing.



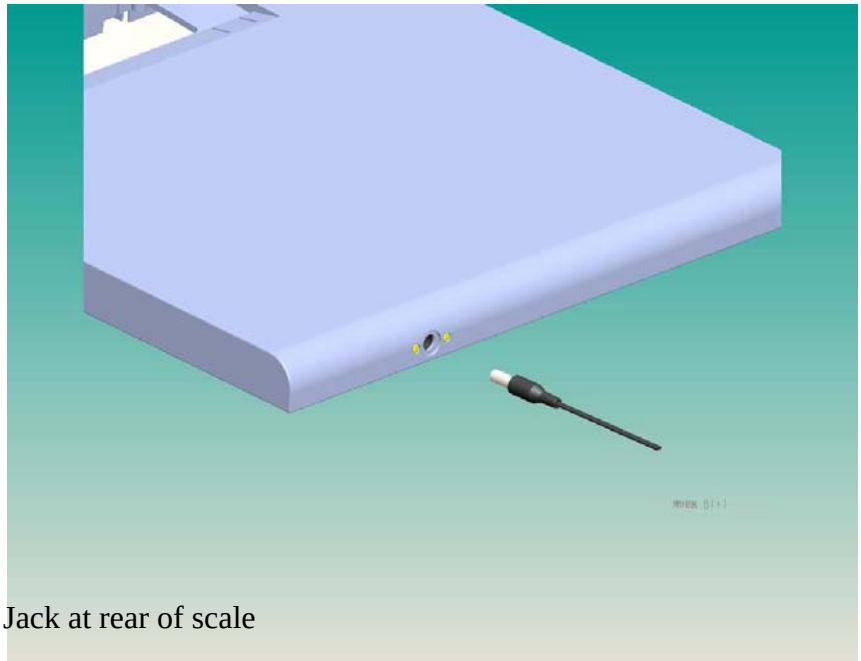
Take battery housing out of scale.

The scale uses 9V battery.

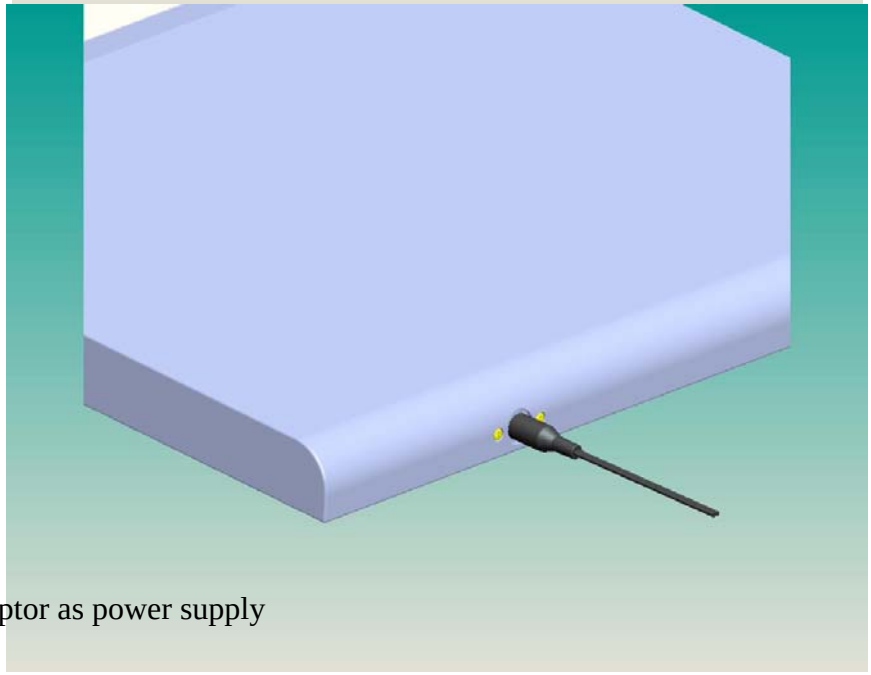
Intalling 9V battery

Put battery housing back to complete procedure.

POWER SUPPLY BY AC ADAPTOR



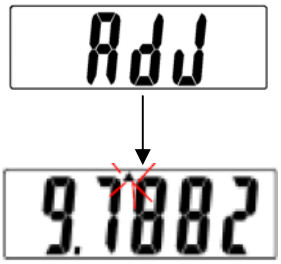
Locating AC Jack at rear of scale



Plug in AC adaptor as power supply

GRAVITY COMPENSATION PROCEDURE

Set the gravity value of the place for use.

Operation	Display
Before starting gravity compensation procedure make sure the "GrAu" feature is set to "on". *(Please refer p.11& 12)*	
Press and hold ON/ZERO/OFF, and then press HOLD key three times. To enter into gravity setting mode.	
First  and then the last using gravity value and the top left hand side arrow will appear on the display. Now set the gravity of the place where scale is going to be used. (Setting gravity value: Press UNIT key for moving to next digit, and press HOLD key to change numerical value)	
After setting the gravity value, press ON/ZERO/OFF key and the display will return to weighing mode.	

Note: If the scale has been moved to another city/country where the gravity is not the same with the place where the scale was originally calibrated, Please follow gravity compensation procedure.

But if the scale has been re-calibrated then TURN-OFF the Gravity. *(Please refer to 'Approval Scale Company setting')*

INDEX

3. Revision Sheet

Release No.	**Date**	**Revision Description**
Rev. 0	--	--