

# **SportsArt** *FITNESS*

## S770 Electronic Repair Manual



# S770 Electronic Repair Manual Contents

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1-1. Full Unit Picture - S770

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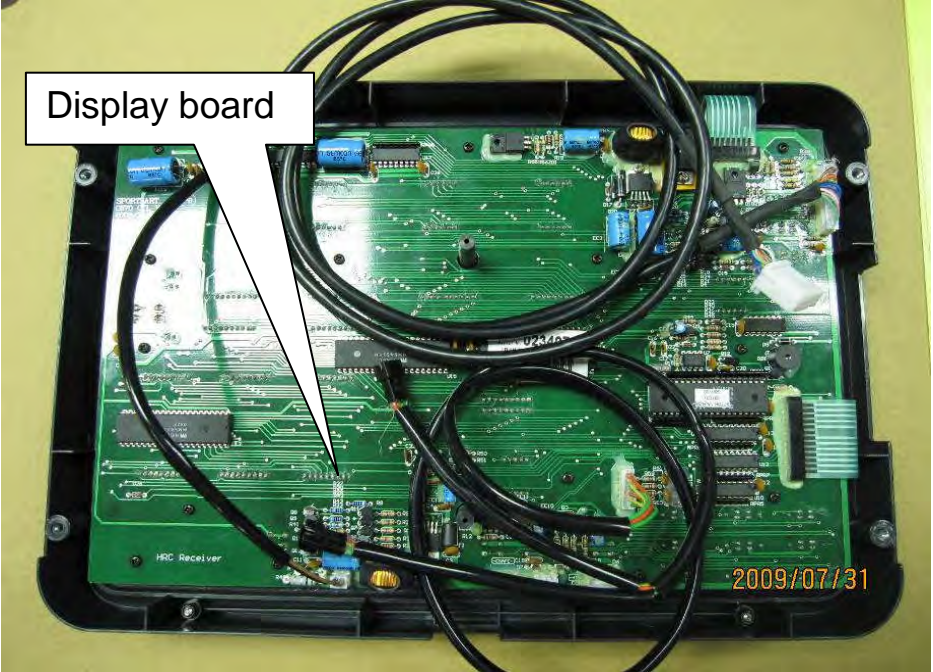
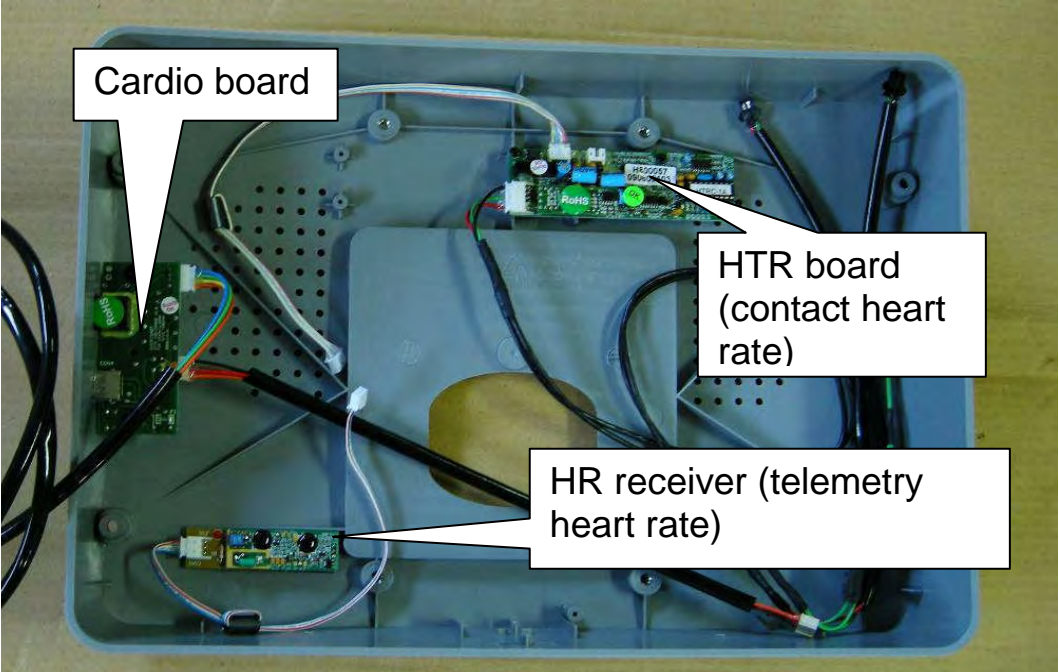


1-1-1

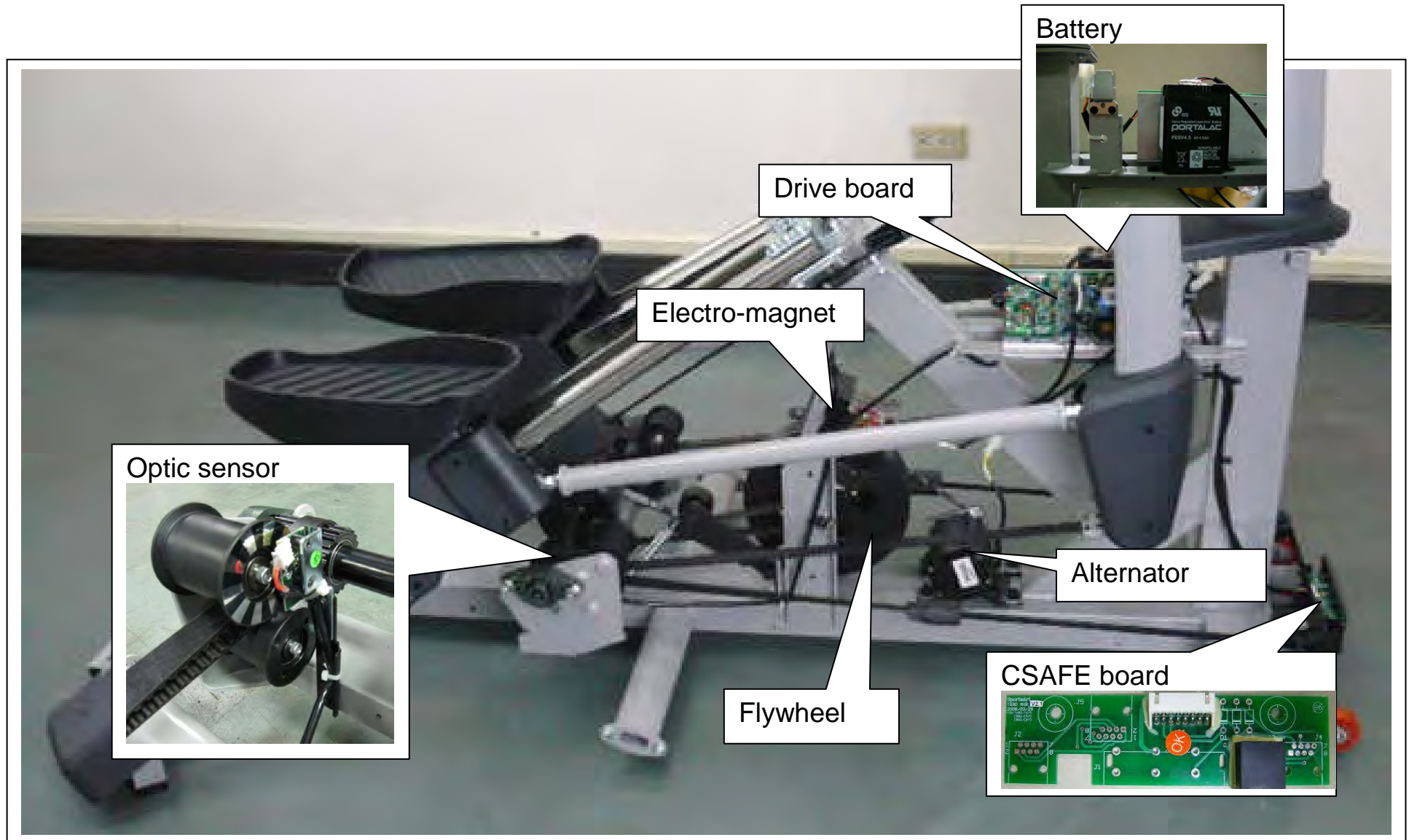
1-2. Overlay - S770



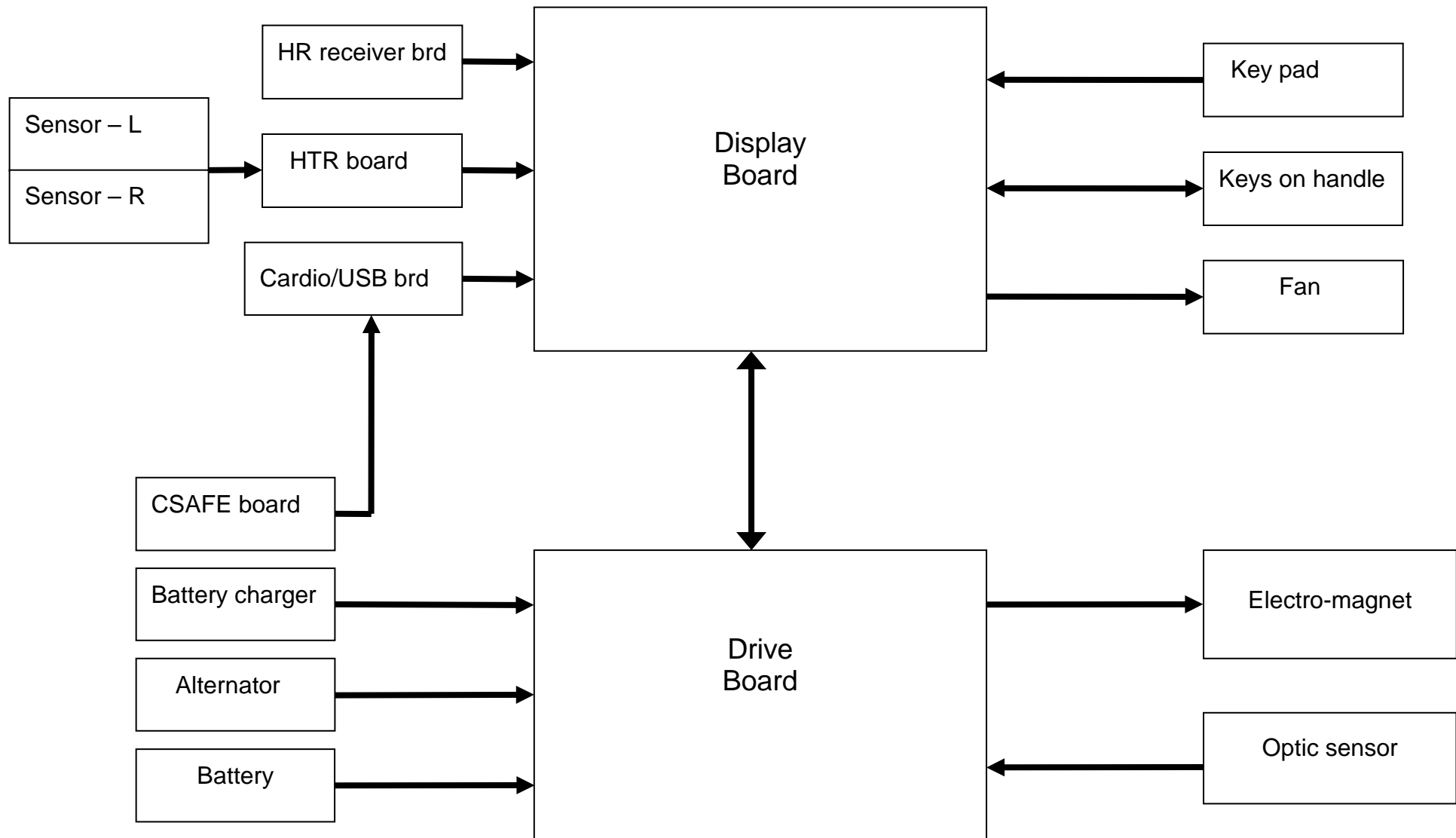
1-3. Component Placement - S770 Display



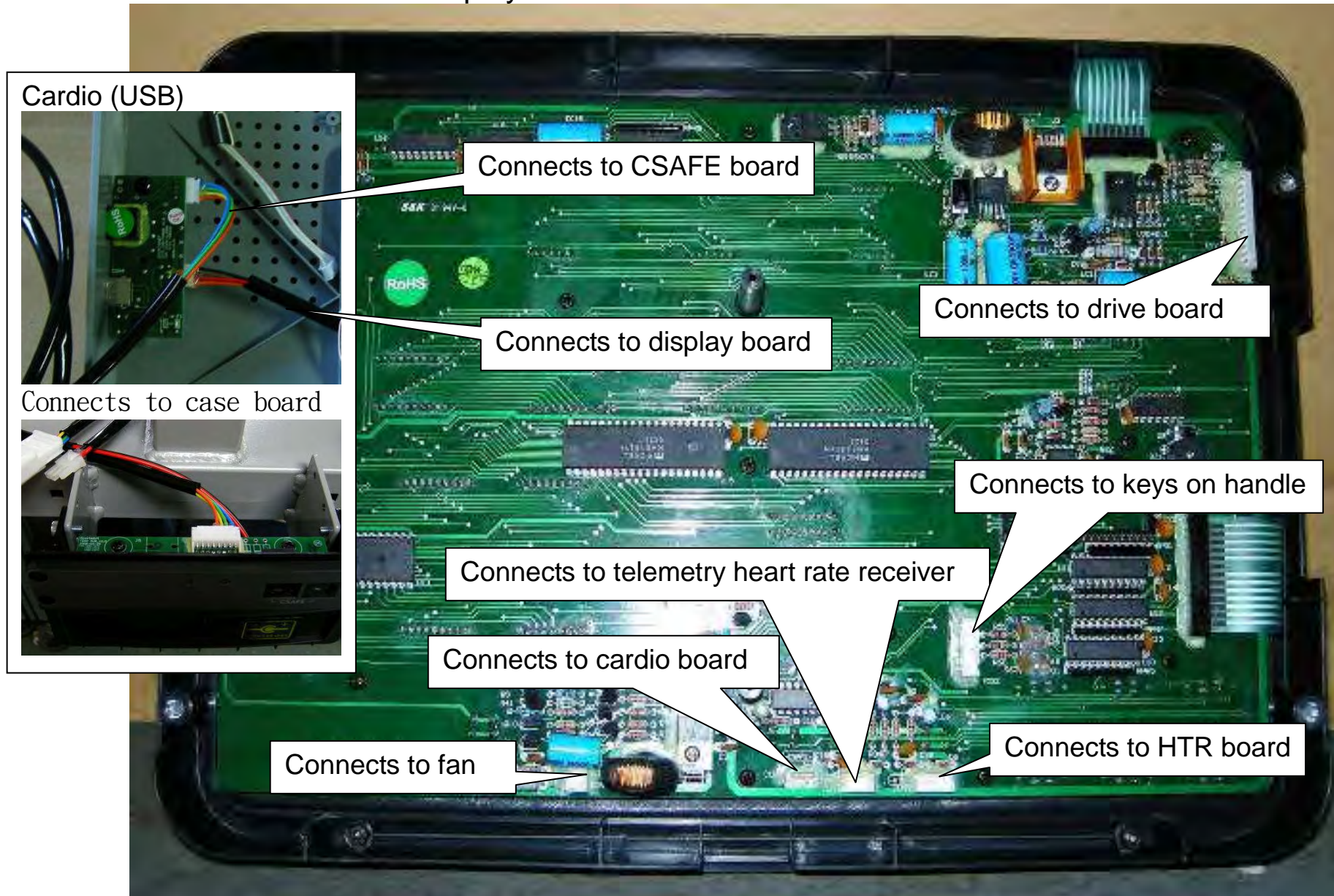
## 1-3. Component Placement - S770 Lower Body



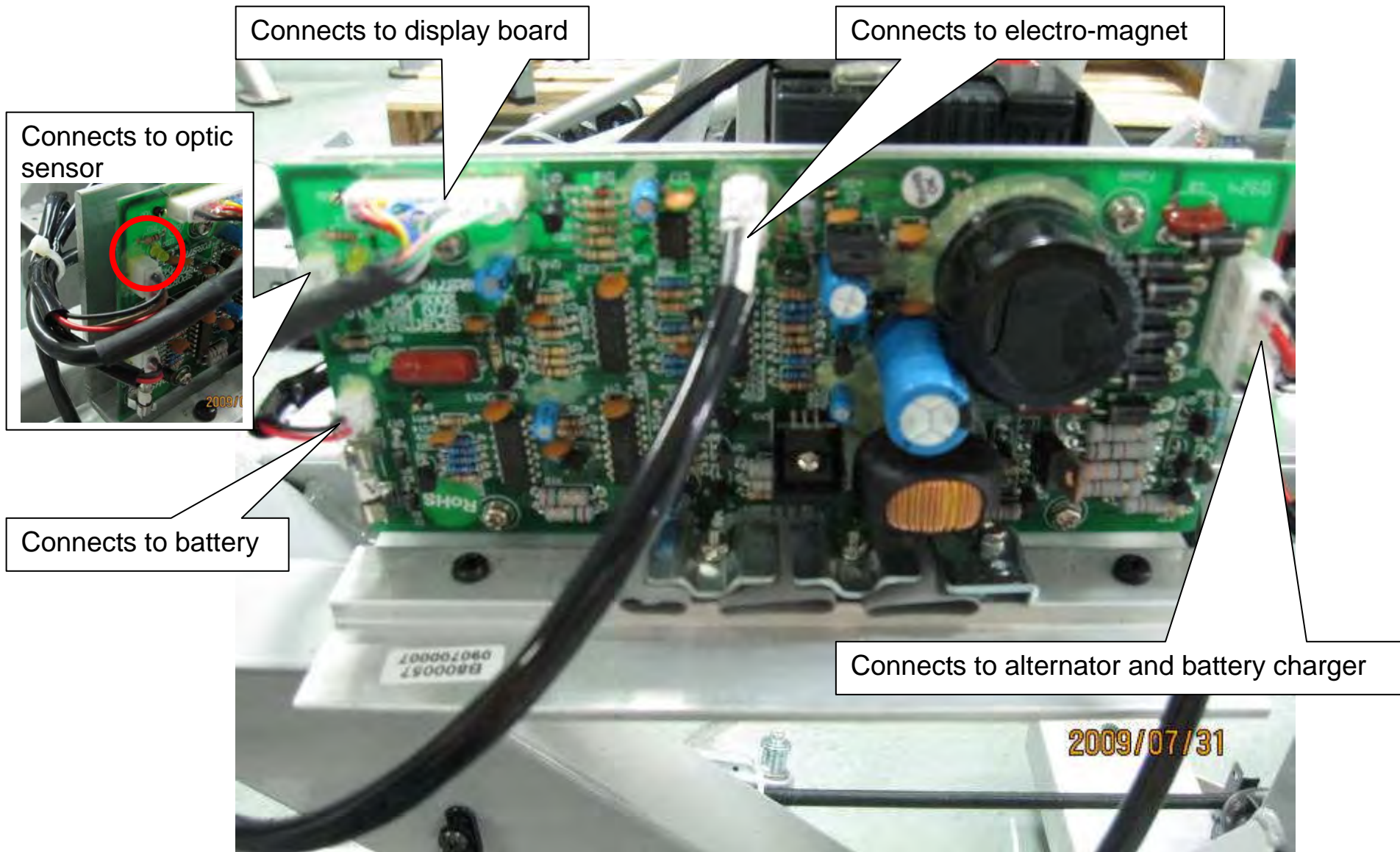
1-4. Block Diagram of Electronic Components



1-5. Cable Connections - S770 Display Board



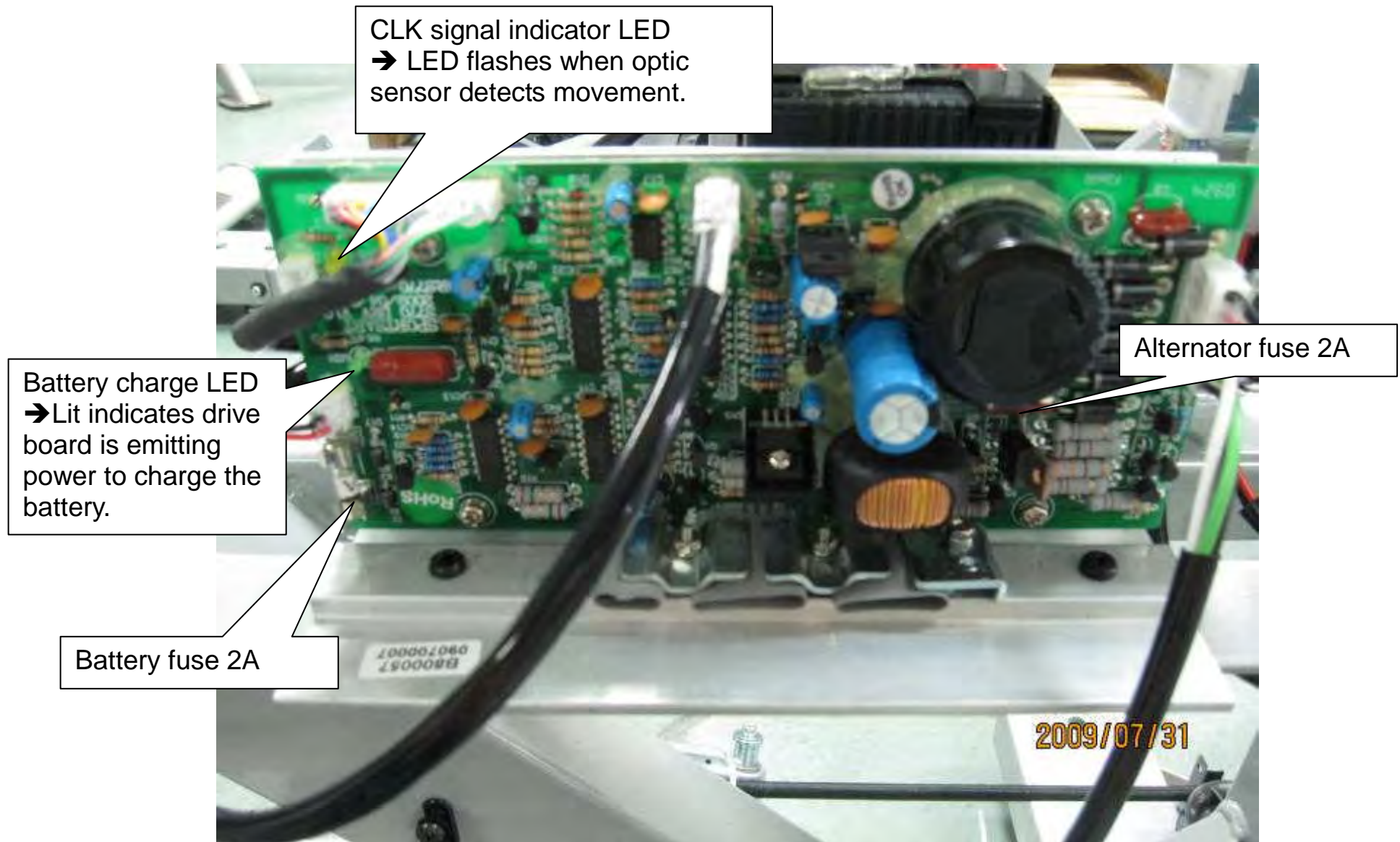
1-5. Cable Connections - S770 Drive Board



## 1-6. LED Indicators - S770 Display Board



## 1-6. LEDs Indicators - S770 Drive Board



## 1-7. S770 Electronic Specification Chart

Item	Specification	Notes
Power	AC alternator	
Backup power	Battery 6.4 VA Can recharge through product use or exterior battery charger	
Resistance	Electro-magnet control	
Speed Sensor	Infrared detection / Alternator circuit detection	
Resistance range	LEVEL 1 - LEVEL 20 LEVEL 1, specification current 0A LEVEL 20, specification current 1.0A	
Display method	Dot matrix and numeric LEDs	
Main window	Dot matrix	
Secondary windows	65% HR TARGET, Heart rate , 80% HR TARGET CALORIES / DISTANCE / TIME / STEPS CAL/HR / METS / WATTS / SPEED	
Workout programs	MANUAL / INTERVAL / WT LOSS MOUNTAIN / FAT BURN / CARDIO PLATEAU / FIT TEST / CUSTOMER HR	
Heart rate control program	WT LOSS, FAT BURN, CUSTOMER HR	
Heart rate	Wireless heart rate (telemetry) / contact heart rate (HTR)	
Fan	High, medium, low, stop – four segments	
Output interface	CSAFE	
Other	1. If there is no movement for 15 seconds, unit enters power saving mode. If there is no movement for two seconds, unit automatically turns off. 2. Handles have level keys.	

## 2-1. Electronic Malfunction Troubleshooting Chart - S770

Malfunction	Circumstance	Points for inspection and testing	Components to replace	Notes
No start (Alternator)	Display is not lit; Exercise on unit; display shows no reaction and does not light up.	<ol style="list-style-type: none"> <li>1. Inspect all cable connections.</li> <li>2. Inspect alternator belt tracking.</li> <li>3. Inspect drive board fuse.</li> <li>4. Inspect drive board CLK indicator.</li> <li>5. Inspect the display power supply indicator.</li> </ol>	<ol style="list-style-type: none"> <li>1. drive board fuse</li> <li>2. drive board</li> <li>3. alternator</li> </ol>	
No start (Battery)	Display does not light when the exerciser stops exercising.	<ol style="list-style-type: none"> <li>1. Inspect all cable connections.</li> <li>2. Inspect the battery fuse on the drive board.</li> <li>3. Measure battery voltage. Battery voltage should be 5.3V or more.</li> <li>4. If battery voltage is under 5.5V, exercise on the unit at 50 steps per minute or faster to replenish the battery.</li> <li>5. If battery voltage is under 2.0 and there is no way to recharge the battery, replace the battery.</li> </ol>	<ol style="list-style-type: none"> <li>1. battery fuse on the drive board</li> <li>2. battery</li> </ol>	
No step count	Start exercising on the unit; the display shows no reaction; values on the display do not change.	<ol style="list-style-type: none"> <li>1. Speed sensor signal allows the display to determine unit usage.</li> <li>2. Alternator current is transformed directly on the drive board to become the CLK signal for the detection of speed.</li> <li>3. Inspect whether the alternator belt is out of place. The steps signal comes from the alternator rather than the speed sensor.</li> <li>4. Inspect all cable connections and the bridge board.</li> <li>5. Replace the drive board as a test.</li> <li>6. Inspect the display IC pin connections.</li> </ol>	<ol style="list-style-type: none"> <li>1. speed sensor</li> </ol>	

## 2-1. Electronic Malfunction Troubleshooting Chart - S770, (Continued)

No resistance	Exercise on the unit; press resistance up or down keys; resistance values change on the display; but there is no resistance.	<ol style="list-style-type: none"> <li>1. Inspect all cable connections.</li> <li>2. Inspect the STEP value. Does it change? If there is no STEP signal, there will be no resistance.</li> <li>3. Inspect whether the alternator will turn on the unit. If the alternator cannot turn on the unit, there will be no resistance.</li> <li>4. Inspect the electro-magnet and its cable connections.</li> <li>5. Inspect the electro-magnet voltage from the drive board. LEVEL 1 current specification: 0 A; Level20 current specification 1.0A. Often, this issue relates to the drive board.</li> </ol>	1. drive board	
Wireless (telemetry) heart rate malfunction	Wireless (telemetry) heart rate malfunction	<ol style="list-style-type: none"> <li>1. Inspect the heart rate transmitter and its battery. Replace the battery if necessary.</li> <li>2. Inspect the telemetry heart rate receiver board.</li> <li>3. Test or replace the heart rate receiver board.</li> <li>4. Inspect for environmental interference, such as speakers and lights.</li> </ol>	<ol style="list-style-type: none"> <li>1. heart rate transmitter</li> <li>2. heart rate receiver</li> </ol>	
Contact heart rate (HTR) malfunction	Contact heart rate (HTR) malfunction	<ol style="list-style-type: none"> <li>1. Inspect the HTR cable connection on the bridge board.</li> <li>2. Inspect the HTR LED indicators.</li> <li>3. Replace the HTR board.</li> </ol>		
Key malfunction	Key does not operate or operates continuously.	<ol style="list-style-type: none"> <li>1. Replace key switches on the display.</li> </ol>	display key switch	
Key malfunction	Press keys on left side of the display; keys do not operate.	<ol style="list-style-type: none"> <li>1. Replace soft keys.</li> </ol>	soft key switch	
Key malfunction	Press keys on handles; display shows no reaction.	<ol style="list-style-type: none"> <li>1. Inspect the cable connection on the handle keys.</li> <li>2. Replace the handle keys.</li> </ol>	handle key switch	

## 2-1. Electronic Malfunction Troubleshooting Chart - S770, (Continued)

No fan function	Press fan keys; fan does not operate.	<ol style="list-style-type: none"> <li>1. Inspect the cables on the display board.</li> <li>2. Inspect output voltage to the fan. Replace the display board if there is no power to the fan.</li> </ol>	display	
Excessive resistance	Exercise on the unit; resistance is excessive.	<ol style="list-style-type: none"> <li>1. Inspect all cable connections. Inspect whether screws have pierced cables.</li> <li>2. Rotate the flywheel with your hand. Inspect whether the electro-magnet scrapes the flywheel.</li> <li>3. Inspect whether drive board components have an electrical short, sending maximum voltage to the flywheel, making excessive resistance.</li> </ol>	1. drive board	
Battery does not recharge	Battery has no power. Exercise on the unit. Battery voltage does not recharge. Exterior battery charger also fails to replenish the battery.	<ol style="list-style-type: none"> <li>1. Inspect battery voltage. If battery voltage is below 2.5V, replace the battery.</li> <li>2. Exercise on the unit at 50 steps per minute or faster to recharge the battery.</li> <li>3. Inspect whether the battery charge LED lights when someone exercises on the unit.</li> <li>4. Inspect the drive board fuse.</li> <li>5. Replace the drive board.</li> </ol>	<ol style="list-style-type: none"> <li>1. battery</li> <li>2. drive board</li> </ol>	
KPH/MPH selection		<ol style="list-style-type: none"> <li>1. Press the &lt;ENTER&gt; key for three seconds. Follow prompts to change KPH/MPH setting.</li> <li>2. Inspect the total distance/time/display board.</li> </ol>		
Power saving mode		1. Do not press any key. Stop exercising on the product. In 15 seconds, the energy saving mode begins. The display shows “— — — —” .		
Automatic shut off		Do not exercise on the unit for two seconds. The display automatically shuts off.		
Manual shut off		1.SPEED=0. Press the < FAN> key three seconds. The unit shuts off.		

## Troubleshooting

Model: S770

Malfunction: No start up (alternator)

Circumstance: Exercise on the unit. The display does not light.

Possible cause: 1. Poor cable connections

2. Malfunctioning drive board

Troubleshooting: 1. Inspect all cable connections.

2. Inspect alternator belt tracking and cable connections.

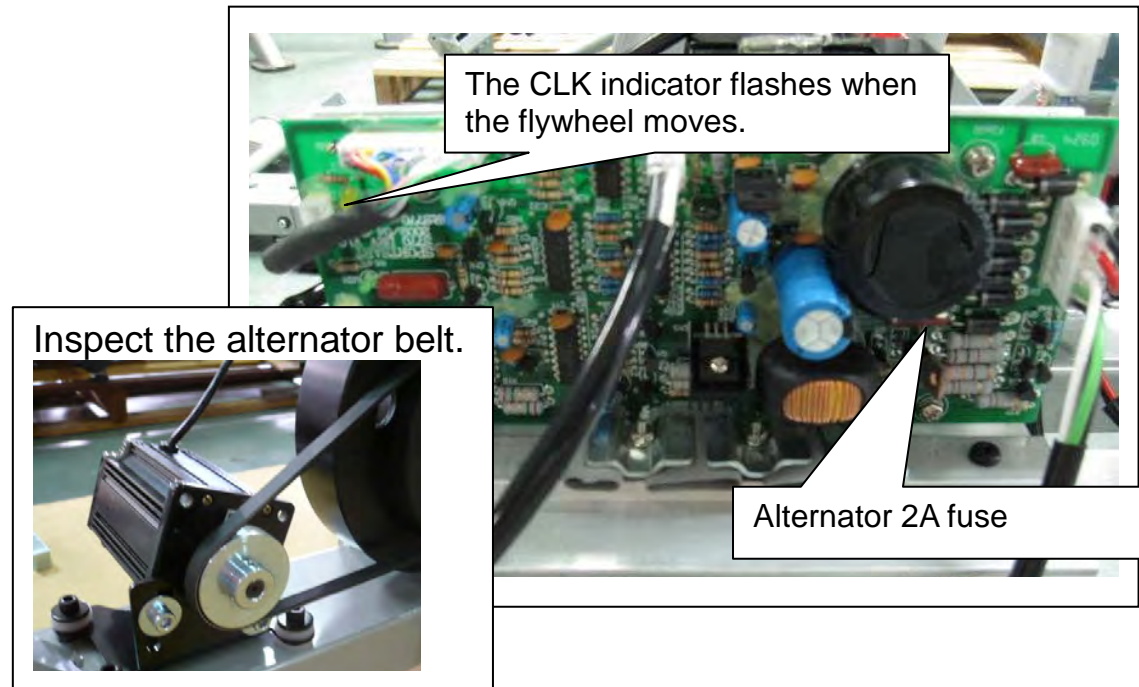
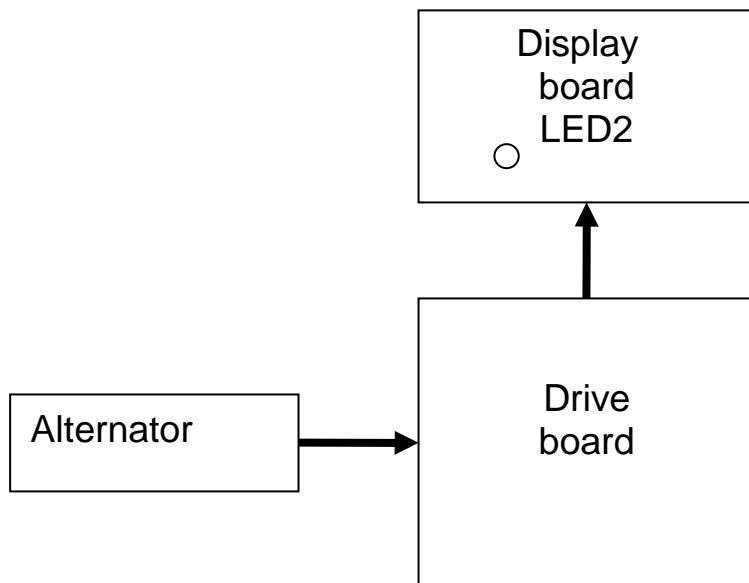
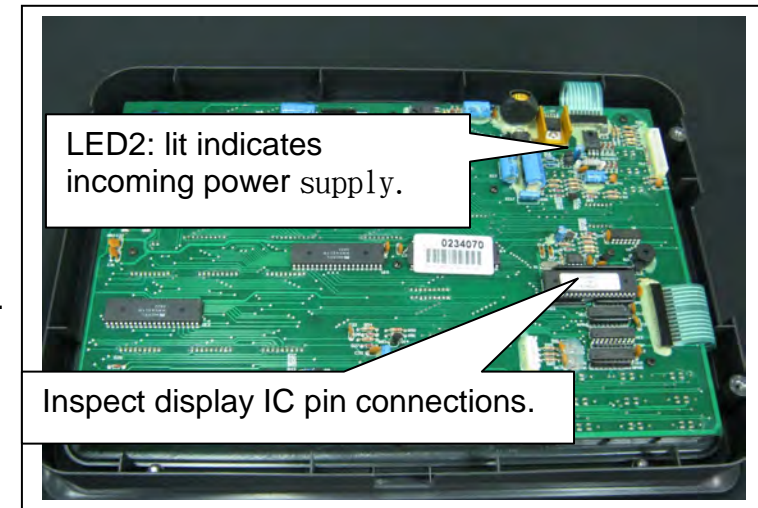
3. Inspect the alternator fuse 2A on the drive board.

4. Inspect whether the CLK indicator on the drive board flashes.

5. Replace the drive board as a test.

6. Inspect whether the LED2 power supply indicator lights on the display board. Lit is normal. Inspect the display IC.

Not lit indicates the drive board is malfunctioning. Replace it.



## Troubleshooting

Model: S770

Malfunction: No start up (battery)

Circumstance: Stop exercising; display shuts off immediately.

Possible cause: 1. Cables are not connected properly.

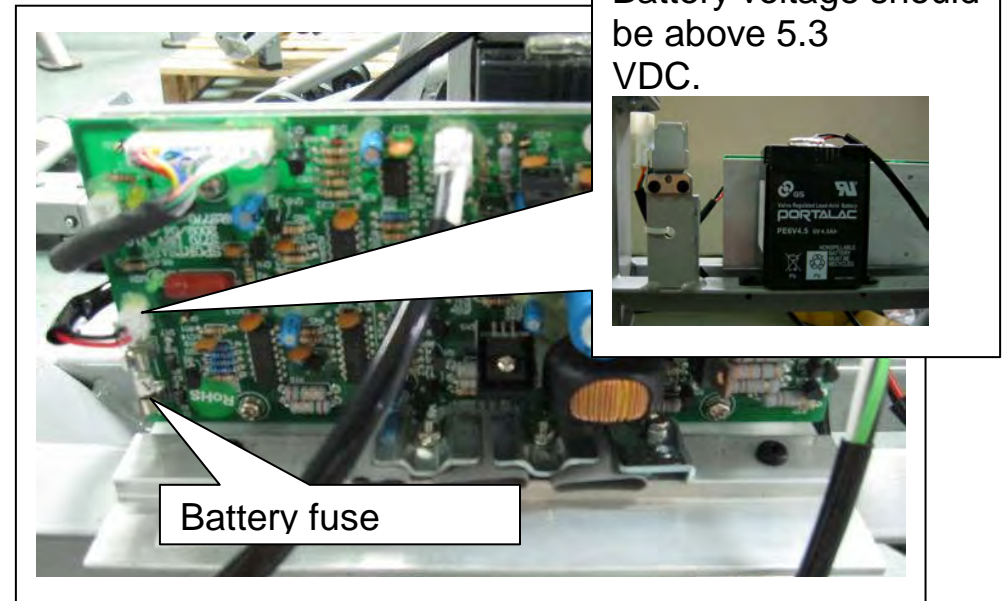
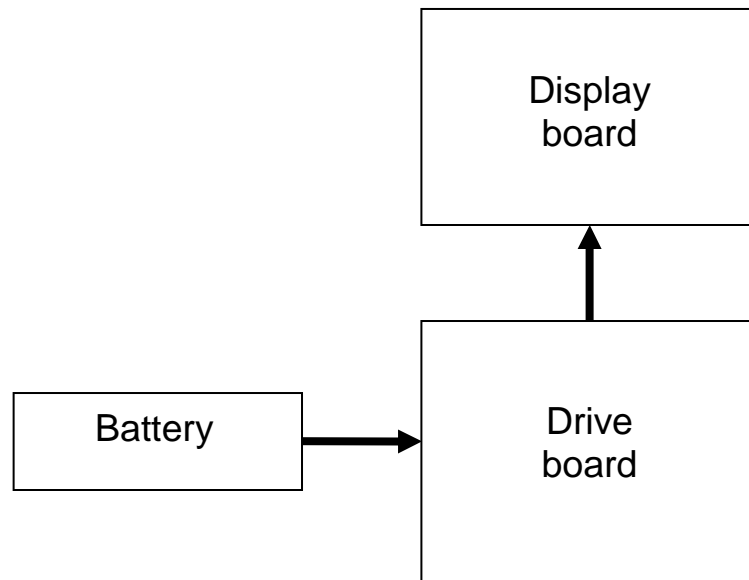
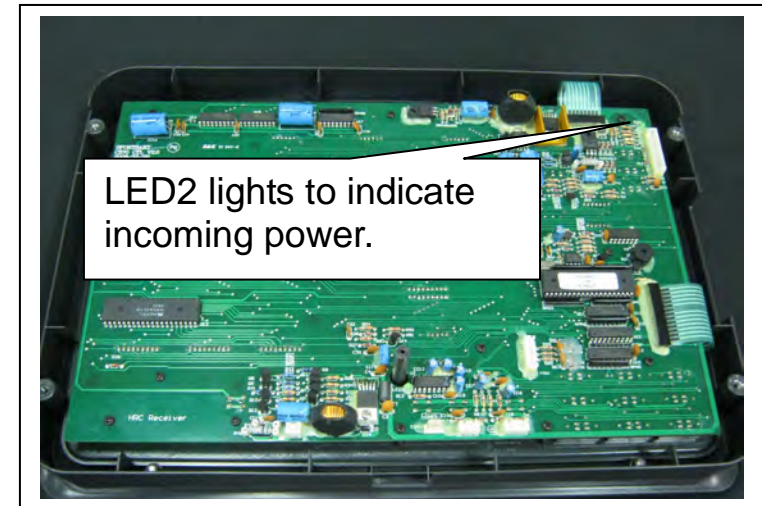
2. Battery voltage is too low.

Troubleshooting: 1. Inspect cable connections, including adapter cables.

2. Measure battery voltage. Normal: above 5.3 VDC.

3. Inspect the battery fuse on the drive board.

4. If the battery voltage is below 5.5V, exercise on the product at 50 steps per minute or more to recharge the battery.



## Troubleshooting

Model: S770

Malfunction: No STEP value

Circumstance: 1. No STEP value appears on the display.

2. Exercise on the unit. The display shows no reaction.

Possible causes: 1. Alternator belt is off track. There is no power production.

Notes: The optic sensor only provides a motion start/stop signal to the display IC.

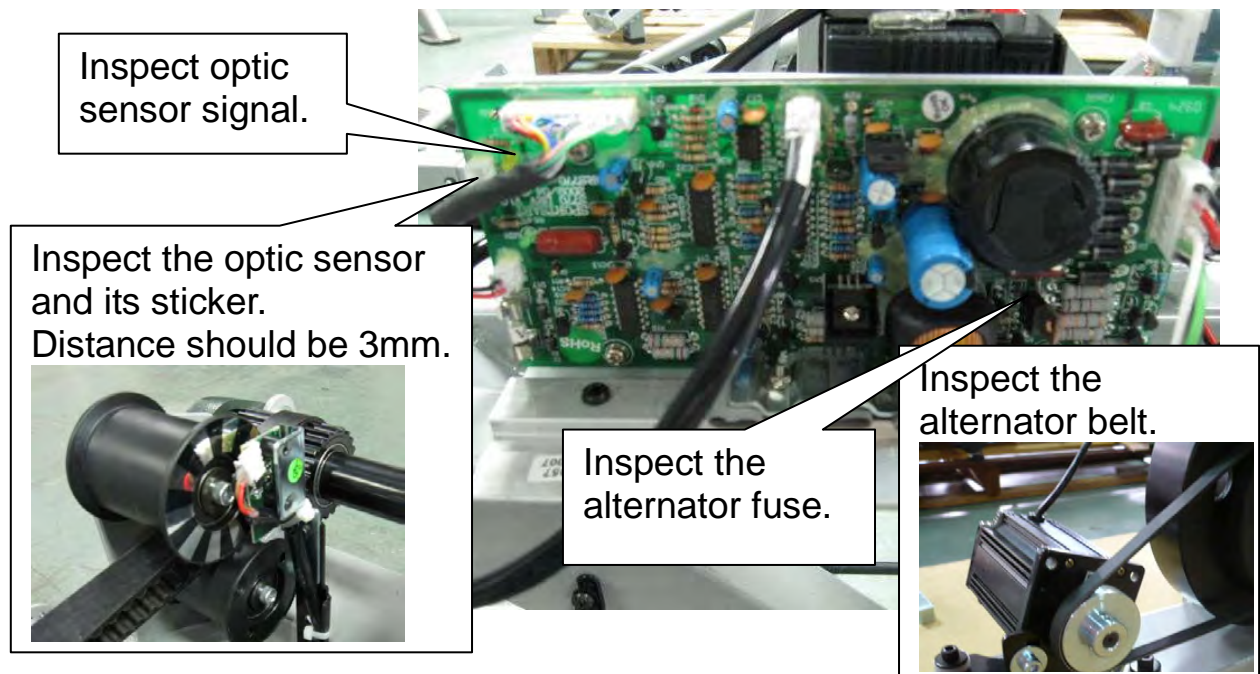
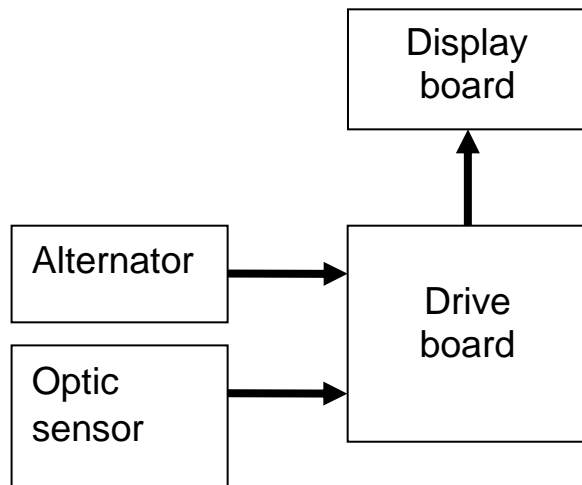
The speed signal comes directly from the drive board's processing of the alternator signal, not from the optic sensor.

2. The drive board is malfunctioning.

Troubleshooting: 1. Inspect alternator belt tracking.

2. Inspect the optic sensor and its reflective sticker for dirt. Clean it.

3. Inspect the alternator fuse or replace the drive board.



## Troubleshooting

Model: S770

Malfunction: No resistance

Circumstance: Exercise on the unit. There is no resistance.

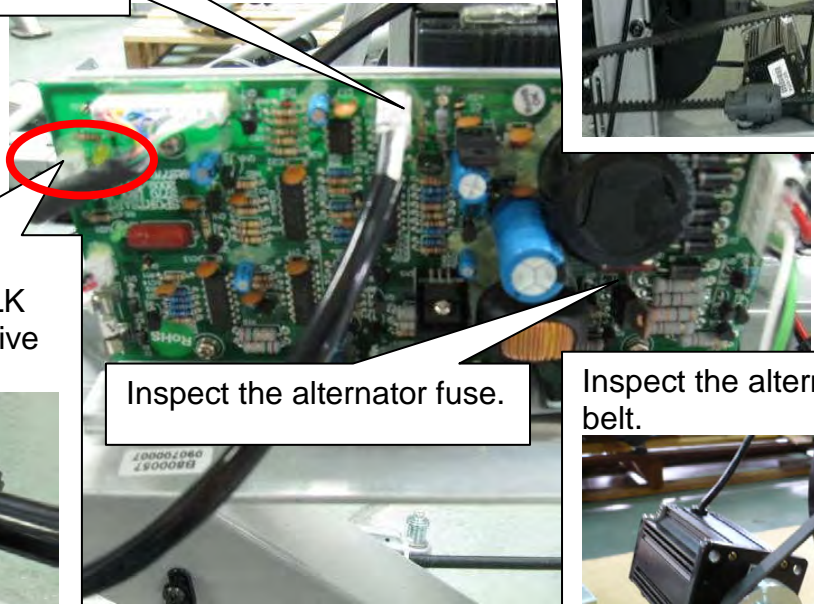
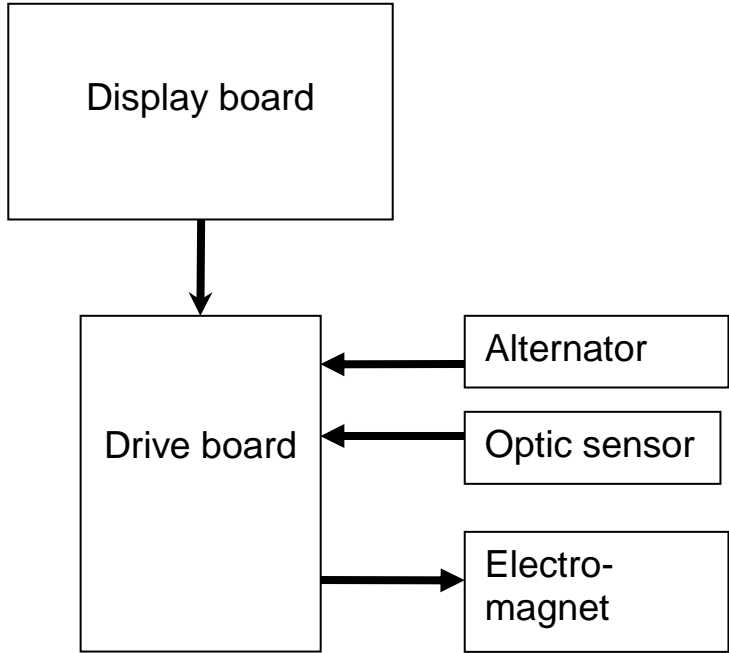
Notes: 1. There must first be power from the alternator, plus the optic sensor signal before the display will emit the resistance signal to the drive board before the drive board will emit voltage to the electro-magnet.

- Troubleshooting:
1. Inspect the cable connections.
  2. Inspect the alternator fuse on the drive board and the alternator.
  3. Inspect the CLK indicator on the drive board.
  4. Inspect the display STEP value for change.
  5. Measure current from the drive board to the electro-magnet.  
Level 1=0A, LEVEL 20 =1.0A



Inspect cable connections.

Current specification:  
Level 1 =0A,  
Level 20=1.0A



Inspect the optic sensor and the CLK indicator on the drive board.



Inspect the alternator fuse.



Inspect the alternator belt.

## Troubleshooting

Model: S770

Malfunction: Resistance is too strong.

Circumstance: Exercise on the unit. Resistance is too heavy.

Possible cause: 1. Inspect cables for an electrical short.

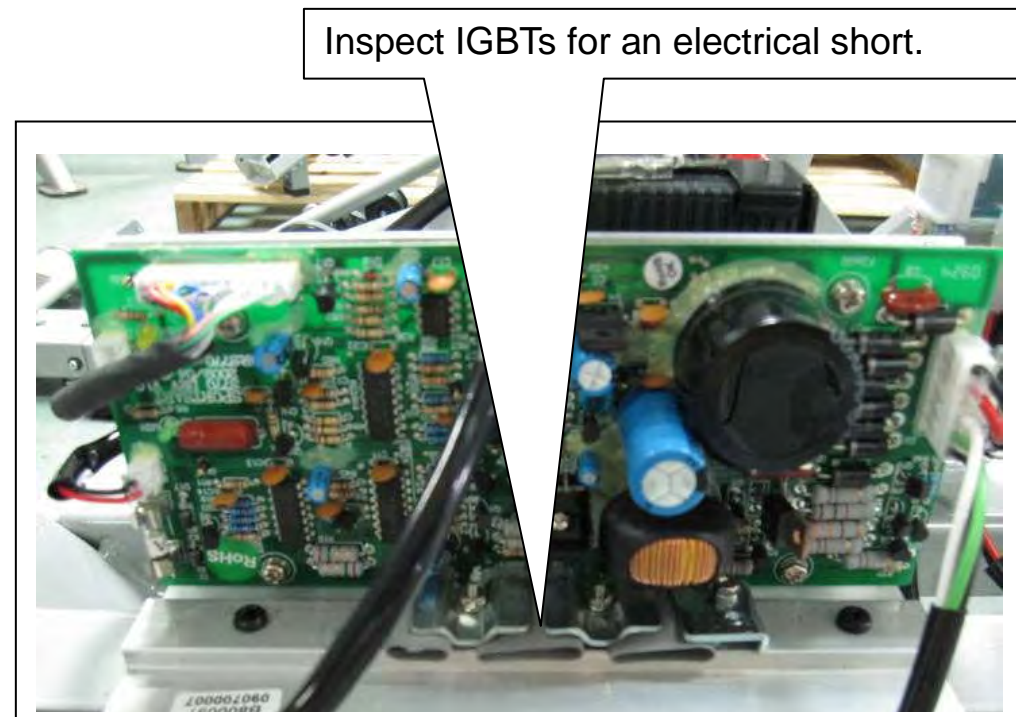
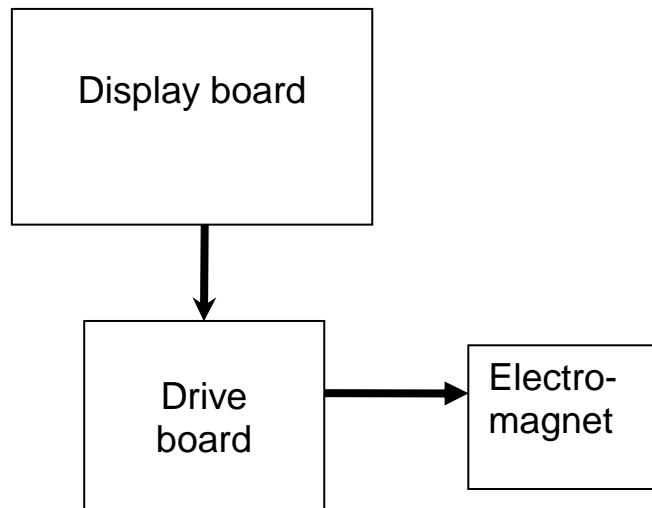
2. Drive board components have an electrical short.

3. Display is frozen.

Troubleshooting: 1. Inspect all cable connections. Inspect cable insulation for tears.

2. Inspect IGBTs for an electrical short.

3. Replace the drive board.



## Troubleshooting

Model: S770

Malfunction: Wireless (telemetry) heart rate malfunction

Circumstance: Wireless (telemetry) heart rate does not operate.

Possible cause: 1. Telemetry transmitter strap battery voltage is too low.

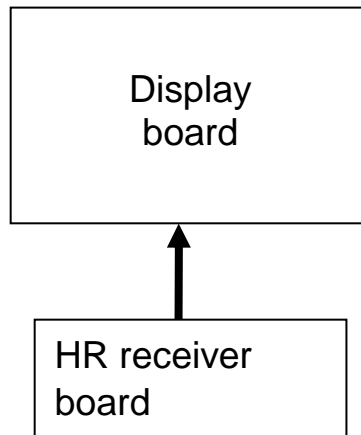
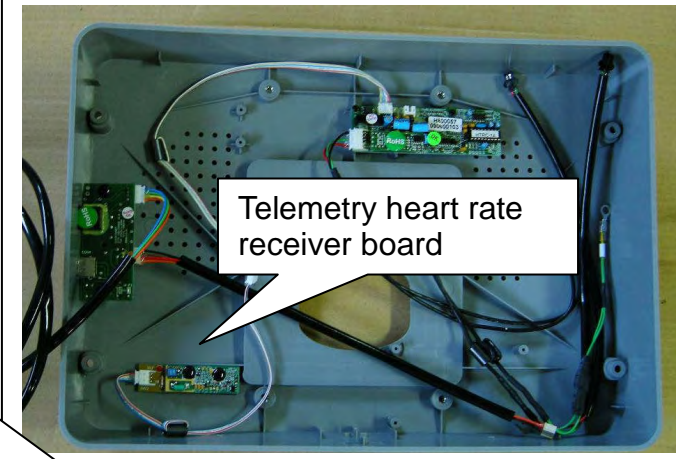
2. Heart rate receiver board is malfunctioning.

3. There is environmental interference, such as that from lights and speakers.

Troubleshooting: 1. Replace the heart rate transmitter or its batteries.

2. Inspect the telemetry heart rate receiver cables.

3. Inspect the HTR board LED indicators.



Heart rate transmitter  
(battery location)



## Troubleshooting

Model: S770

Malfunction: Contact heart rate (HTR) malfunction

Circumstance: Hold contacts. Heart rate values are incorrect.

Possible causes: 1. HTR cable connections

2. HTR board malfunction

3. Poor cable connections to the display

Troubleshooting: 1. Inspect the display cable connections.

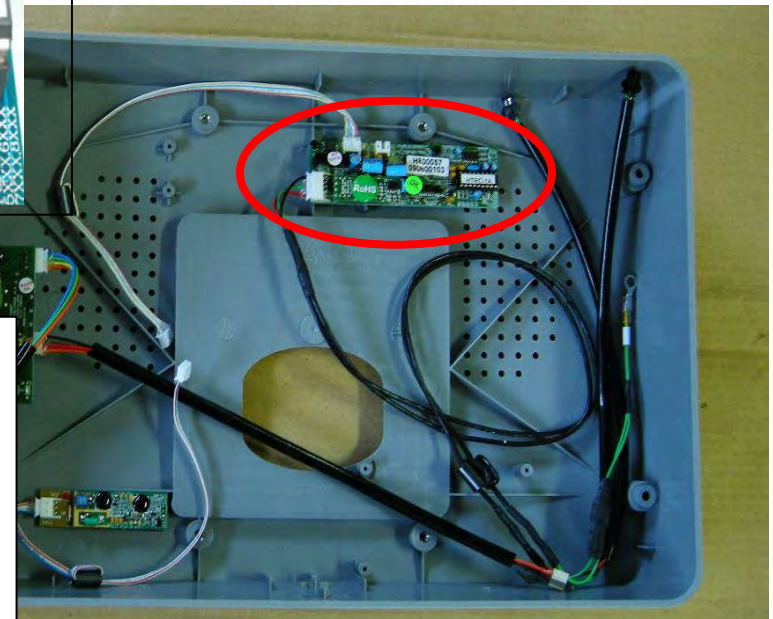
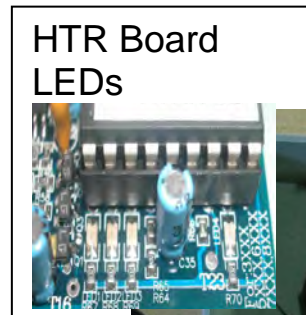
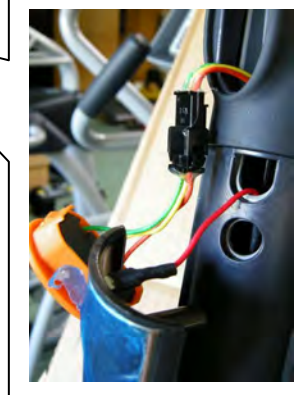
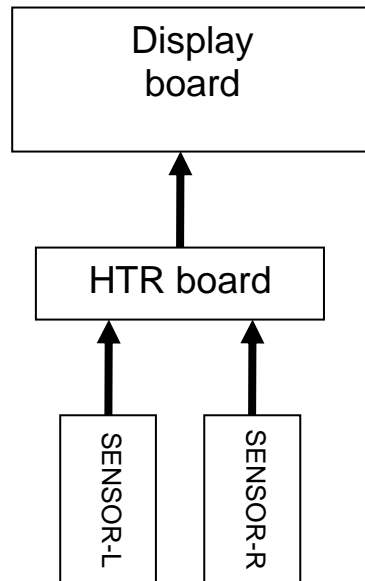
2. Inspect the bridge board HTR cable connection.

3. Inspect the contact heart rate cable connection.

4. Inspect the HTR board LED indicators.

5. Replace the HTR board.

Indicator	Name	Explanation
LED1	Telemetry heart rate indicator	Flashes to indicate incoming telemetry heart rate signal.
LED2	HTR contact indicator	Lights to indicate that someone is touching heart rate contact plates.
LED3	HTR heart rate signal indicator	Flashes to indicate incoming contact heart rate signal.
LED4	Heart rate signal output LED	Each flash represents an outgoing heart rate signal.



## Troubleshooting

Model: S770

Malfunction: Key malfunction – soft keys

Circumstance: Press display keys. There is no reaction.

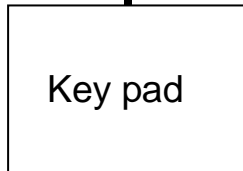
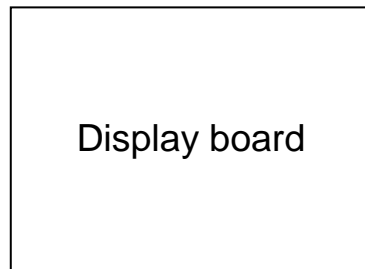
Or keys operate continuously.

Possible causes: 1. Poor soft key connection

2. Soft keys are defective.

Troubleshooting: 1. Inspect soft key connections as shown.

2. Replace the soft keys.



## Troubleshooting

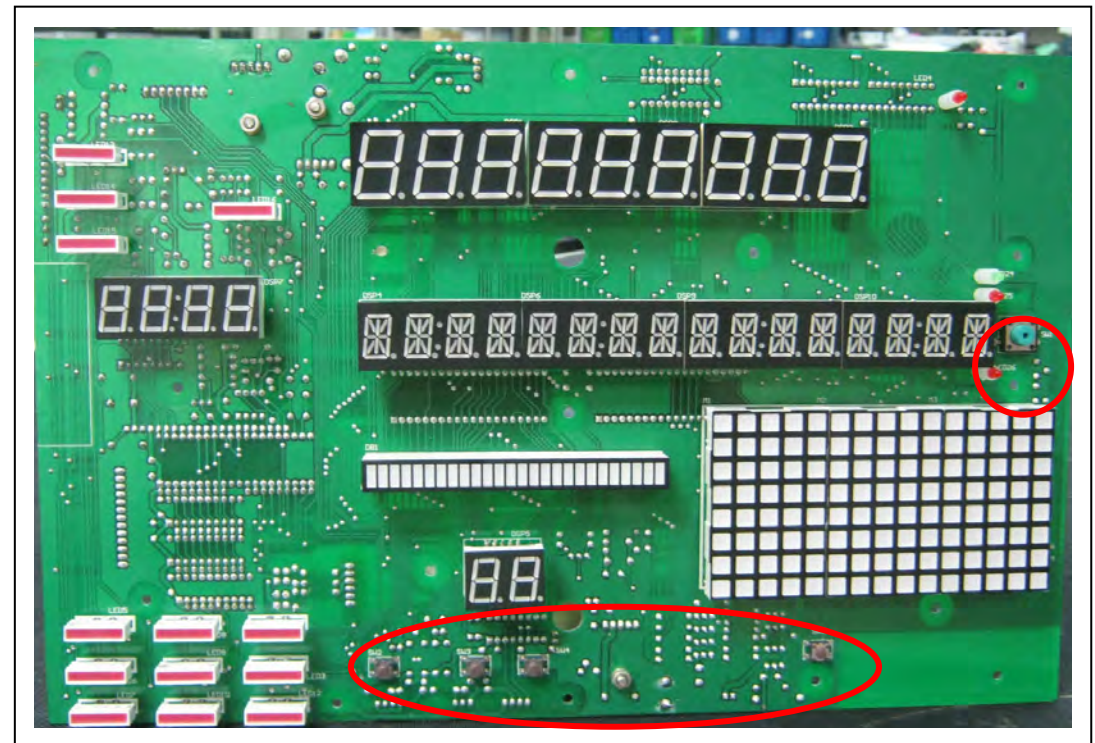
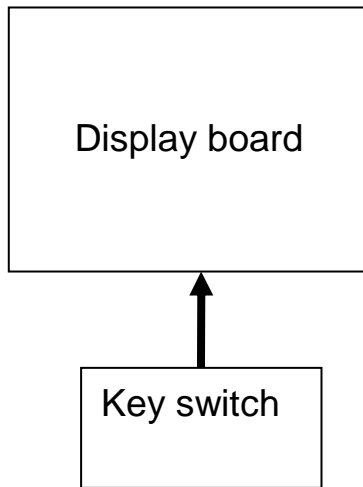
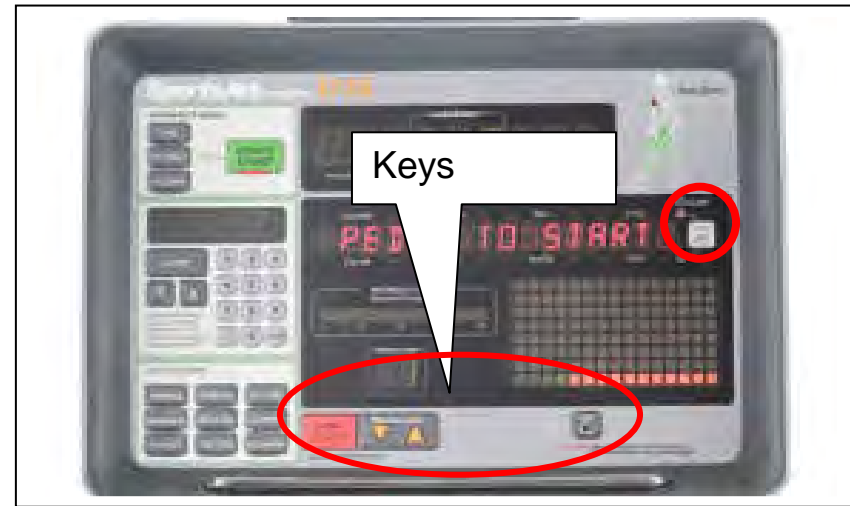
Model: S770

Malfunction: Key malfunction – key switches

Circumstance: Press keys. There is no reaction or keys operate continuously.

Possible cause: 1. Key switch defect

Troubleshooting: 1. Inspect keys as shown on left.  
2. Replace key switches.



## Troubleshooting

Model: S770

Malfunction: Key malfunction – handle keys

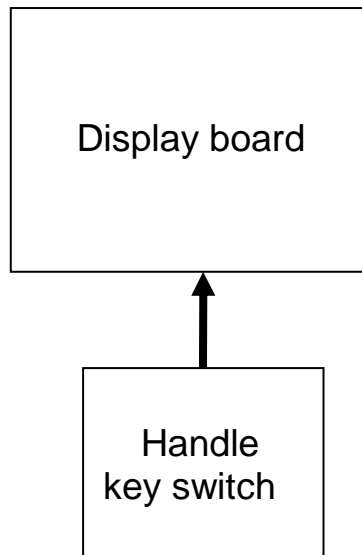
Circumstance: Press keys. There is no reaction.

Possible cause: 1. Poor cable connection

2. Handle key switch malfunction

Troubleshooting: 1. Inspect the handle key cable connection.

2. Replace the key switch.



## Troubleshooting

Model: S770

Malfunction: No fan operation

Circumstance: Press fan key. Fan does not operate.

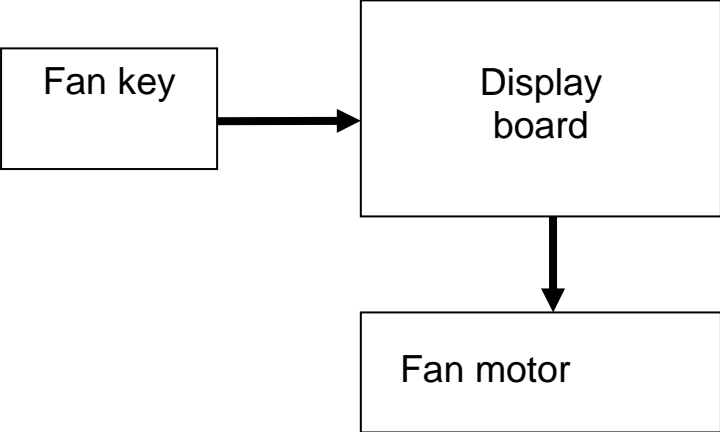
Possible cause: 1. RPM is below 50 RPM.

- 2. Fan motor malfunction
- 3. Fan has four settings: high, medium, low, off.

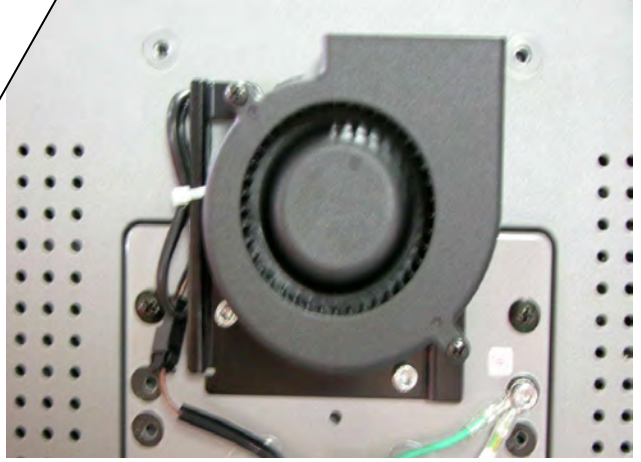
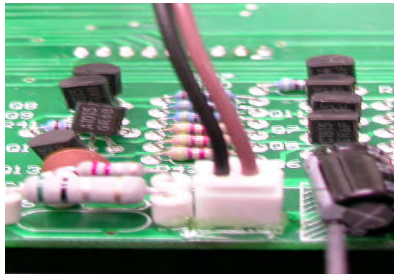
Troubleshooting: 1. Inspect whether RPM exceeds 50 RPM.

- 2. Inspect the fan board cable connection.
- 3. Inspect the fan board output voltage.  
If there is no output voltage, replace the fan board.  
If there is output voltage, replace the fan.

Display board



Fan voltage	
Fan setting	Voltage
HIGH	10V
MID	8.5V
LOW	6.5V



## Troubleshooting

Model: S770

Malfunction: Battery does not recharge.

Circumstance: Stop exercising on the product. The display immediately blacks out.

Possible reason: 1. When speed exceeds 50 RPM, the battery recharges. Recharge voltage from the drive board is 7-8 VDC.

2. Battery voltage of 2.5 VDC is too low; replace the battery.

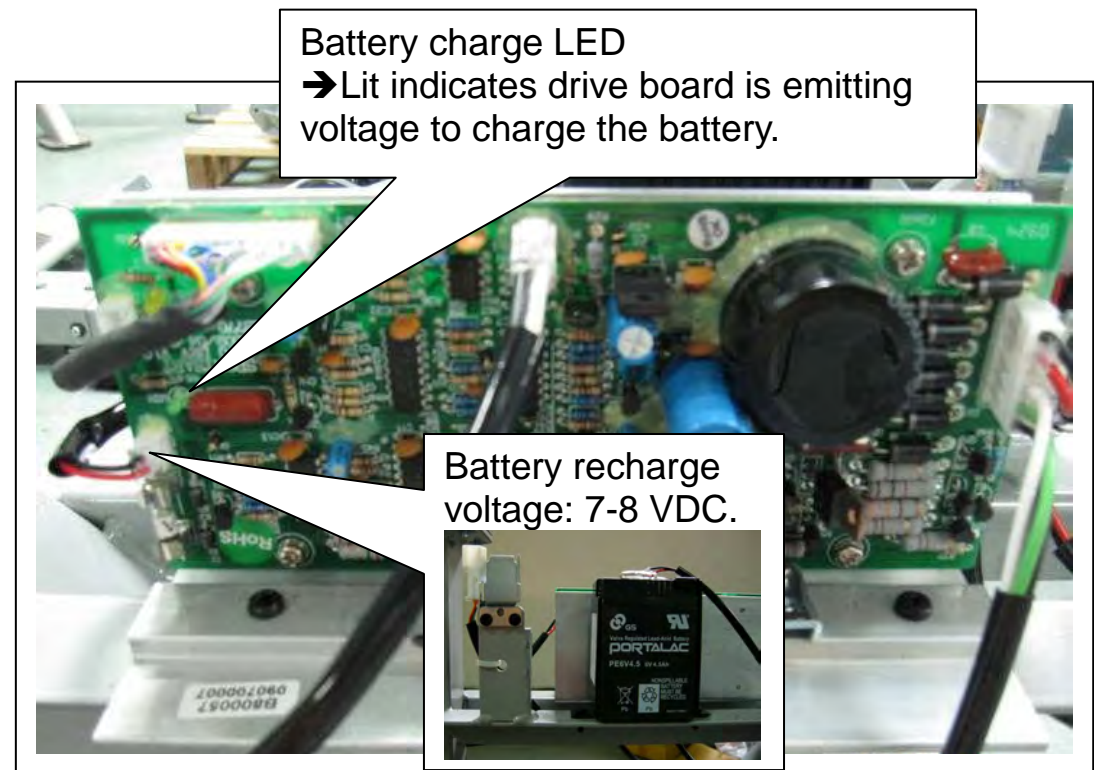
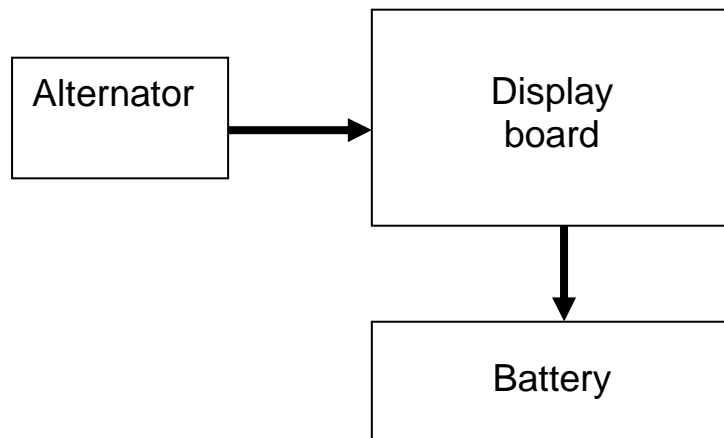
Troubleshooting: 1. Inspect whether RPM exceeds 50 RPM.

2. Inspect the battery fuse on the drive board.

3. Inspect the battery charge LED indicator on the drive board.

Measure battery charge output at the drive board. Normal: 7-8 VDC.

4. Replace the battery.



## Troubleshooting

Model: S770

Item: Basic parameter settings include KPH/MPH setting, total distance, total time, and display board IC version.

Method: 1. Press the <ENTER> key for three seconds to enter the basic parameter setting mode.

2. Metric/Imperial standard setting

Display shows either "UNIT-MPH" (Imperial) or "UNIT-KPH" (Metric).

Press the <▲> or <▼> key to select either MPH or KPH.

Press the <ENTER> key to confirm your choice.

3. Total distance

Display shows total distance as DIST-XXXXXXKM. Press the <ENTER> key to proceed to the next setting.

4. Total time

Display shows total time as TIME-XXXXXXHOUR. Press the <ENTER> key to proceed to the next setting.

5. Display program IC version

Display board IC version appears, for example, as CTL S770H-1A. Press the <ENTER> key to exit the basic parameter setting mode.