

5002/5005 Bike Repair Guide

Version 2; Date: 10-26-04



5002 recumbent bike

5005 upright bike

Note: Electronics in 5002 and 5005 are basically the same, but displays differ.

Unique Technical Features of 5002/5005 Bikes

- An alternator (in the flywheel) produces AC current.
- To replace an alternator, replace the whole flywheel.
- There is no optic sensor; speed is calculated based on Hz from the alternator.
- If the alternator produces power but no steps-per-minute value appears on the display, replace the drive board.

Resistance – “Eddy Current System” – electro-magnet

Battery – 6 VDC – Supplies power to display when alternator is not operating

Display – Dot matrix – 5002 and 5005 displays are not interchangeable

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Note: Section headings are shown in bold.

Version 1: May 2003

Version 2: Oct. 26, 2004 – corrections were made; pages were renumbered.

Operation Overview

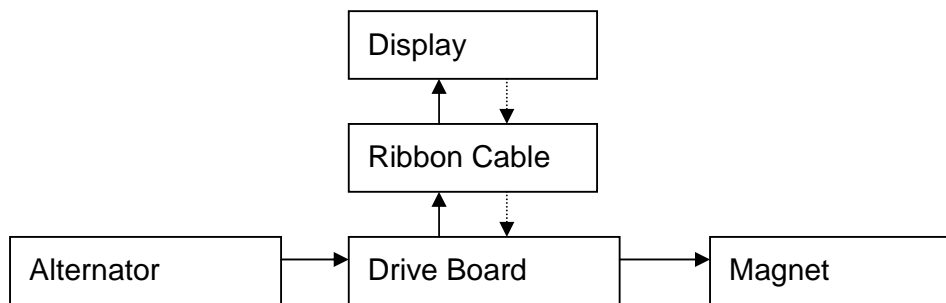


Diagram Key: Power \longrightarrow
 Signal $\cdots\longrightarrow$

- 1) User pedals the bike. The alternator supplies AC voltage.
- 2) Drive board converts AC voltage to DC voltage. DC voltage from the drive board powers the display.
- 3) User presses display key or remote key. Signal travels from the display to the drive board.
- 4) Drive board supplies DC power according to signal from the display for magnet operation.

Alternator Power Up Process

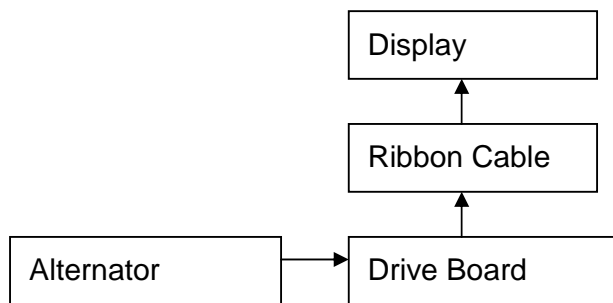


Diagram Key: Power \longrightarrow
 Signal $\cdots\cdots\longrightarrow$

Explanation

- 1) Exercise on the bike. The flywheel spins.
- 2) The alternator produces AC voltage.
- 3) Power conducts across the yellow wires from the alternator to the drive board.
- 4) The drive board converts AC voltage from the alternator to DC voltage and sends 5 VDC up the ribbon cable to the display board.
- 5) The display receives 5 VDC power supply and lights up.
- 6) The drive board uses the Hz cycle from the alternator as a speed signal, which it sends to the display.
- 7) The display IC calculates rotations per minute based on the speed signal from the drive board. The speed value appears as RPMs on the display.

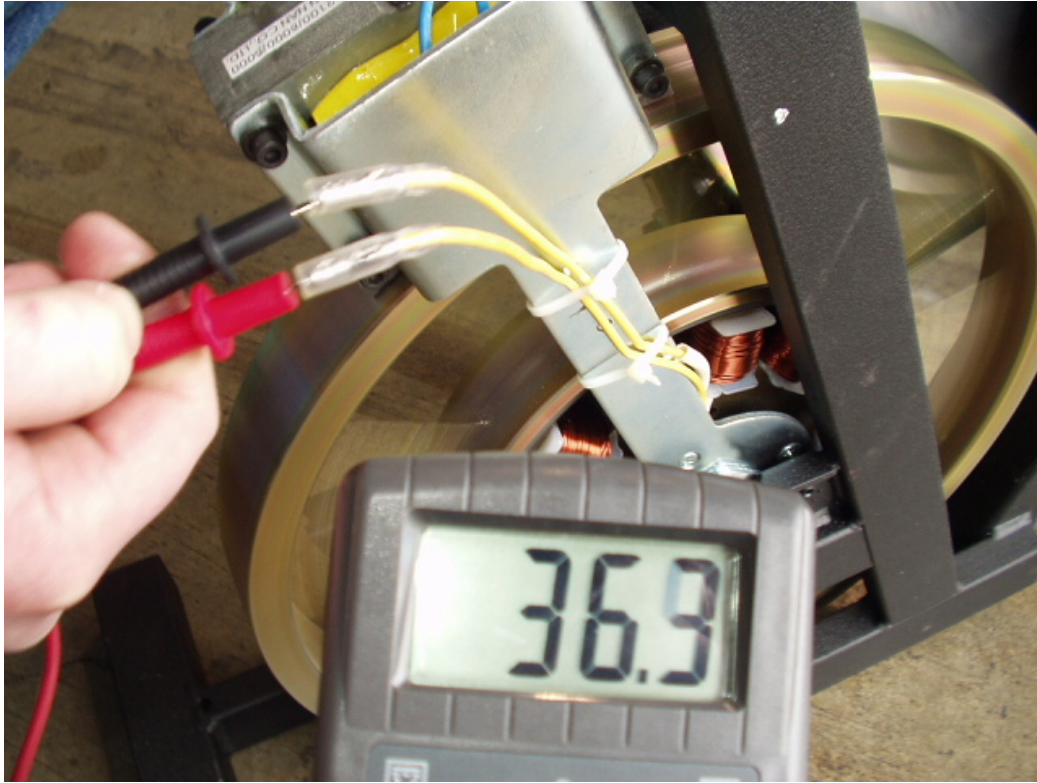
Symptom of Alternator Malfunction

Exercise on the unit. Display does not light up. There is no power from the alternator. Press the display ON key; the display lights up.

Troubleshooting

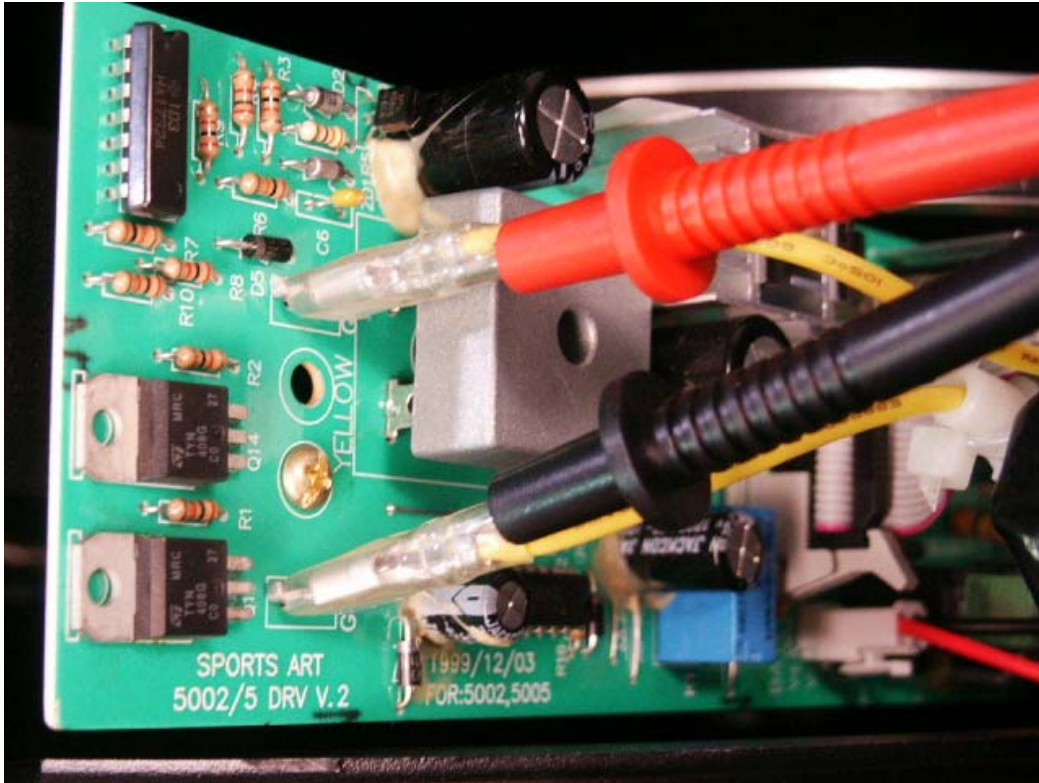
- 1) Inspect 3-amp alternator fuse. Replace if necessary.
- 2) Test alternator output. See page 2.1 and 2.2.

Alternator Output – at Flywheel



Put multimeter to the VAC setting. Insert probes into the yellow wire connectors near the flywheel. Pedal on the bike. Voltage will vary depending on speed. No voltage whatsoever indicates a bad alternator.

Alternator Output – at Drive Board



Put multimeter to the VAC setting. Place probes into the yellow wire connectors on the drive board. Voltage will vary depending on speed. No voltage whatsoever indicates a bad alternator.

Battery Power ON Process

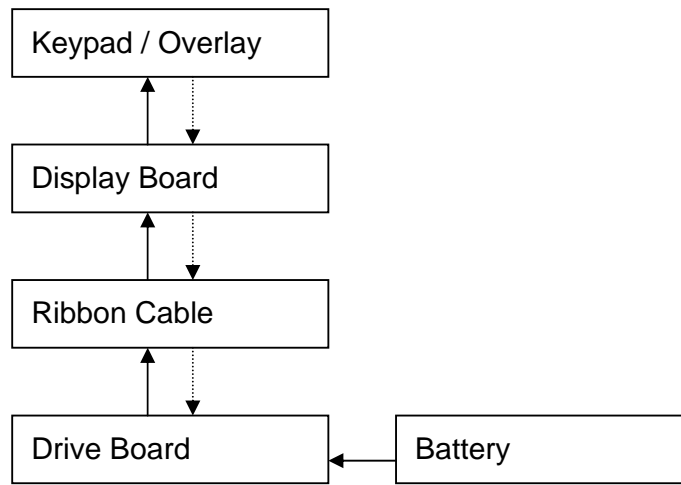


Diagram Key: Power \longrightarrow
 Signal $\cdots\longrightarrow$

Explanation

- 1) Battery voltage lies waiting for action. Press the display ON key.
- 2) The signal travels from the keypad, to the display, to the drive board.
- 3) The battery supplies power through the drive board, via the ribbon cable, to the display. The display lights up.

Battery Recharge Process

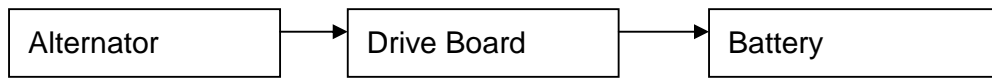




Diagram Key: Power 
 Signal 

Explanation

- 1) Exercise on the bike. The flywheel spins.
- 2) The alternator produces AC voltage.
- 3) Power from the alternator conducts across yellow wires to the drive board.
- 4) Drive board converts AC power to DC power and sends DC power to the battery.
- 5) The battery recharges, enabling it to power the unit.

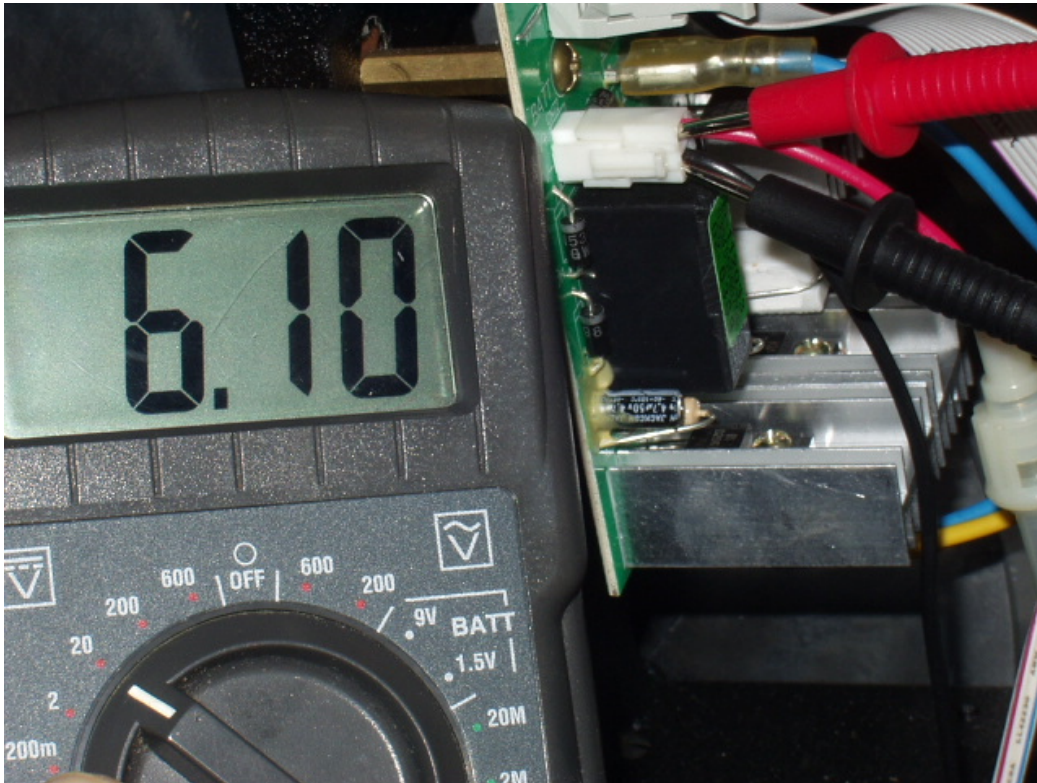
Symptom of Battery Malfunction

Do not exercise on the unit. Press the keypad ON key. The display does not light up.

Troubleshooting

- 1) Check 3-amp fuse on the battery wires. Replace if necessary.
- 2) Battery voltage test. See page 4.1.
- 3) Battery recharge test. See page 4.1.

Battery Voltage Test – at Drive Board



Put multimeter to the DC voltage setting. Put probes on the red and black wire connector on the drive board. Normal reading: 6 VDC. If there is less than 6VDC, try recharging the battery by exercising on the unit. Alternative test location: battery terminals.

Battery Recharge Test – at Drive Board

Test goal: to determine whether the alternator and drive board are supplying power to recharge the battery.

Keep multimeter probes as shown above. Put multimeter to the VDC setting. Exercise on the unit. Normal reading: 6.50 VDC. If the drive board doesn't supply voltage to recharge the battery, inspect the alternator, wires, and drive board. If the alternator and wires are OK but the drive board isn't supplying power to recharge the battery during operation, replace the drive board. If the battery receives 6.5 VDC for 15 minutes but doesn't hold the charge, replace the battery.

Resistance – “Eddy Current System”

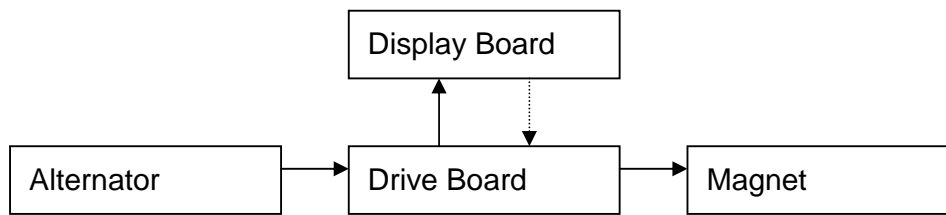


Diagram Key: Power \longrightarrow
 Signal $\cdots\cdots\longrightarrow$

- 1) Alternator supplies voltage to the drive board.
- 2) User presses display LEVEL up or down key. Signal travels via the ribbon cable from the display to the drive board.
- 3) The drive board provides voltage for the magnet according to the display board level signal.

The higher the voltage supplied to the magnet, the more resistance, the more difficult it is to pedal. The lower the voltage supplied to the magnet, the less resistance, the easier it is to pedal.

Symptom of Magnet Malfunction

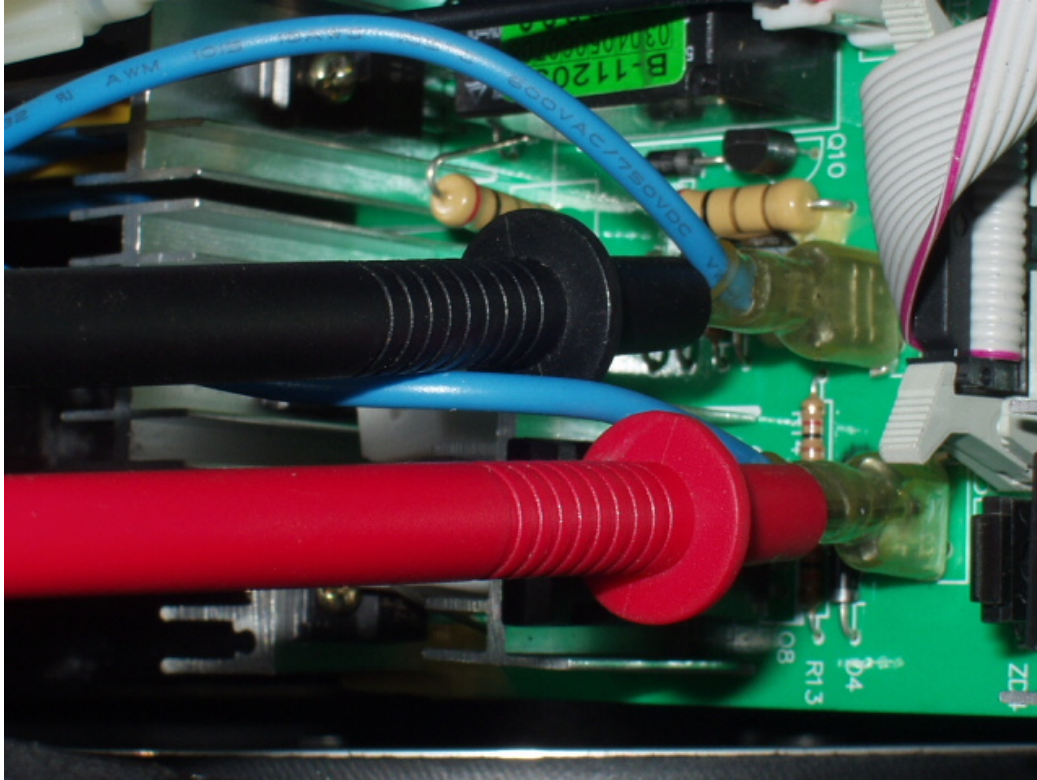
- 1) Exercise on the unit. Press LEVEL up; there is no resistance.

Troubleshooting

- 1) Drive board resistance voltage test. See page 5.1.
- 2) Magnet OHM test. See page 5.2.

Resistance Voltage Test – at Drive Board

Put multimeter to the VDC setting. Back probe on the two blue wire connectors on the drive board. See picture below.

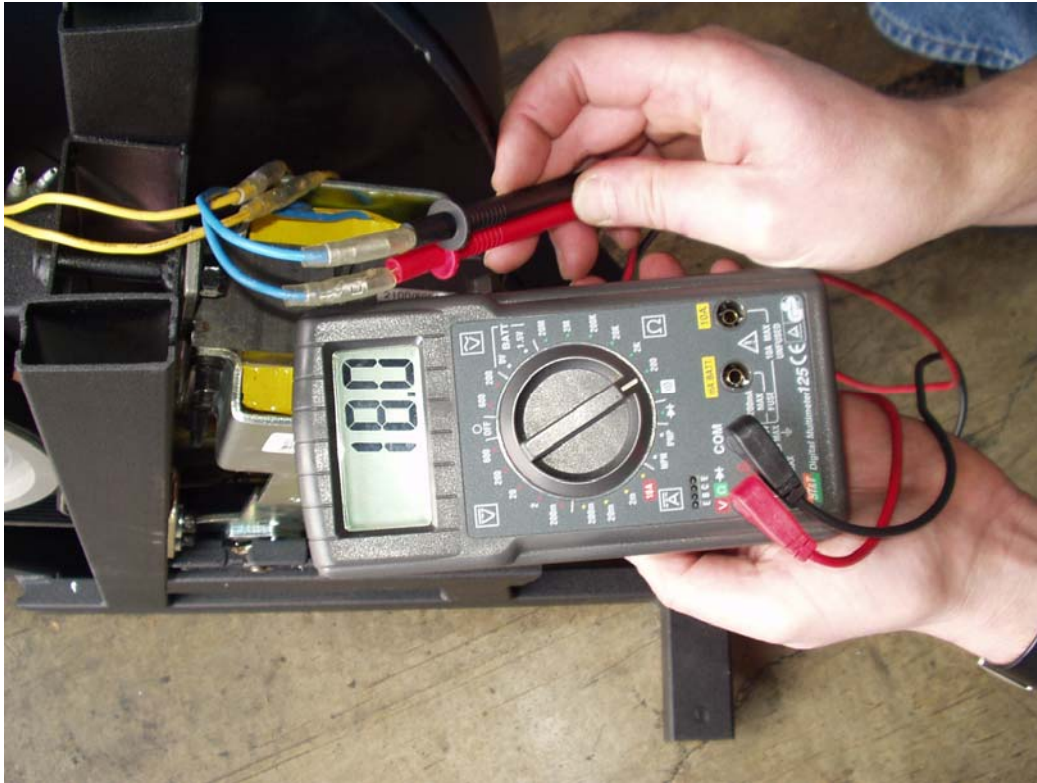


Press LEVEL up key while exercising on the bike. Readings will vary but an approximate guide follows.

RPM	LEVEL	VDC
30	1	2.3
30	5	6
30	10	10
30	14	12

If readings are similar to those shown above, then the drive board is providing voltage for the magnet. The drive board is OK. If the voltage reading is normal, inspect the magnet. See 5.2.

Magnet Ohm Test



Detach magnet wire connections at the drive board. Put multimeter to the ohm setting. Place meter probes on the blue wire ends that lead to the magnet. Normal reading: 20 ohm, +- 20%. If less than 17 ohm, replace the electro-magnet.

Remote Control (5002 Only)



Diagram Key: Power \longrightarrow
 Signal $\cdots\longrightarrow$

Explanation

- 1) Press a key on the remote control handle.
- 2) Remote transmitter sends its signal to the receiver.
- 3) The remote receiver receives the signal from the transmitter.
- 4) The receiver sends signals through the wires labeled "remote" to the drive board.
- 5) The signals travel the ribbon cable to the display.
- 6) The display board sends signals (commands) to the drive board.
- 7) The drive board supplies power for magnet operation.
- 8) Magnet operates according to voltage supplied.

Symptom of Malfunction

Press remote control keypad keys. Display does not beep or respond to signal.

Troubleshooting

- 1) Change batteries in the remote control transmitter on the handlebar. Transmitter requires two AAA 1.5 VDC batteries. See picture on page 6.1.
- 2) Inspect the overlay on the transmitter. Are keys cracked? If so, replace the overlay. See picture on page 6.2.
- 3) Clean the receiver (black square) at the base of the unit in front of the user's right foot. Inspect the floor. Put a shiny magazine on the ground in front of the receiver. (Sometimes the signal doesn't bounce off dark or carpeted surfaces well.)
- 4) Replace the transmitter.
- 5) Replace the receiver.

5002 Remote Control – Battery Location



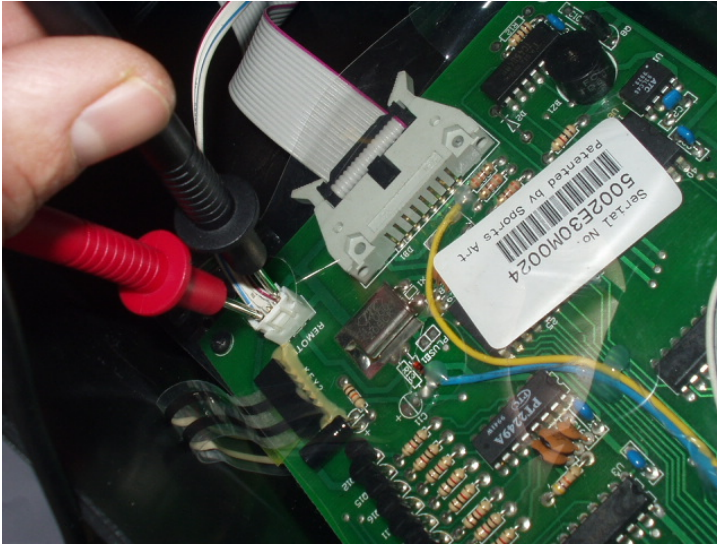
Remote control batteries are under the transmitter.

5002 Remote Control Overlay



Remote control and overlay

Remote Control Power Supply Test



Put multimeter to the VDC setting. Place probes on the two outside wires on the remote control wire connector. Turn on bike power. Normal reading: 5 VDC. A normal reading indicates that the drive board is supplying power to the remote receiver.

Remote Control Signal Test



Leave one probe in place. Put the other on the inside wire as shown. Operate the remote. Normal condition: When the signal goes through, the voltage jumps suddenly, and the display beeps once.

Tips for Troubleshooting Mechanical Issues

1) Resistance slips when pedaling forward.

Inspect: drive pulley. Remove the belt and pull the drive pulley to the side. If it wobbles, replace the drive pulley.

2) You can pedal backward but not forward.

Inspect: flywheel. To inspect the bearings, remove the belt and pull the flywheel to the side. If it wobbles, replace the drive pulley.

3) Unit makes odd sounds.

Thump on 5002. Inspect the leveler in the middle of the 5002. If it is set too high, the unit will rock back and forth, making a “thump, thump” sound.

Belt noises. Inspect belt grooves for wear. Replace belts if necessary. For a quick fix, spray belt dressing on the belt. If the noise disappears, consider replacing the belt anyway, because once the dressing dries, the noise will probably reappear.

Others. Trace the sound to its origin. Realign, repair, or replace the part.

4) Crank arms fall off.

Inspect the axle and crank arm nut threads. If they are good, retighten. If threads are stripped, replace the part. Reinstall the crank arm. Reseat by tightening the crank arm nut. Then tap the crank to see if it will seat better. Tighten crank arm nut using full force.

5) Pedals fall off.

Inspect pedal and crank threads. If stripped, replace the part. If not, reinstall. Tighten well.