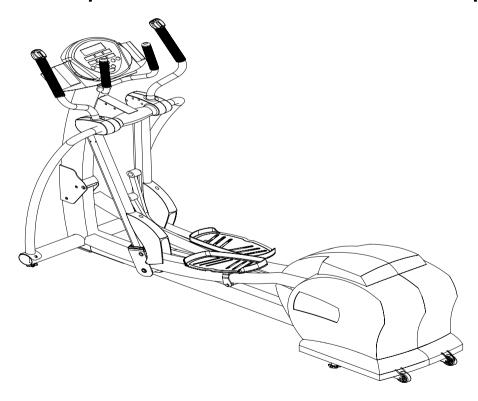
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8300 and E8300 Elliptical Trainer – Mechanical Repair Guide



Version 2.1. Revised 03-18-05

E8300 and 8300 Elliptical Trainer Mechanical Repair Manual

This troubleshooting manual was made through the cooperation of SportsArt personnel in the USA and Taiwan.

Our goal is to provide clear, useful troubleshooting information for technicians in the field. If you have questions, comments or suggestions, please contact Bob Baumgartner at SportsArt America. Thank you.

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E8300 and 8300 Elliptical Trainer Mechanical Repair Manual

Version I: December 31, 2003

Version 2: September 28, 2004 - Minor organizational changes were made

Version 2.1: March 18, 2005 – Part list removed due. Please see product blowups and part lists on our web site.

Notes:

(I) Some parts of this manual refer to the 8300 Elliptical Trainer and no reference to the E8300 is made. Mechanically, the 8300 and E8300 are the same. No effort was made to include the word E8300 on every page.

(2) Part numbers listed in this manual are factory part numbers – not part numbers used by SportsArt America – and are subject to change. Please see the website, www.sportsartamerica.com, for updates.



8300 and E8300 Elliptical Trainer - Mechanical Repair Guide - Contents

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2-2-1 Stride Motor Removal and Installation

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Version 2.1, Revised 03-18-05



8300 and E8300 Elliptical Trainer – Mechanical Repair Guide

Chapter I – Blowup Diagram and Part List I-I-I Blowup Diagram and Part List

CONTENTS REMOVED 03-18-05;
PLEASE REFER TO BLOWUP DIAGRAMS AVAILABLE ON THE WEB SITE.

Version 2.1 Revised 03-18-05

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8300 Elliptical Trainer – Mechanical Repair Guide

Chapter 2 - Component Removal and Installation Procedures

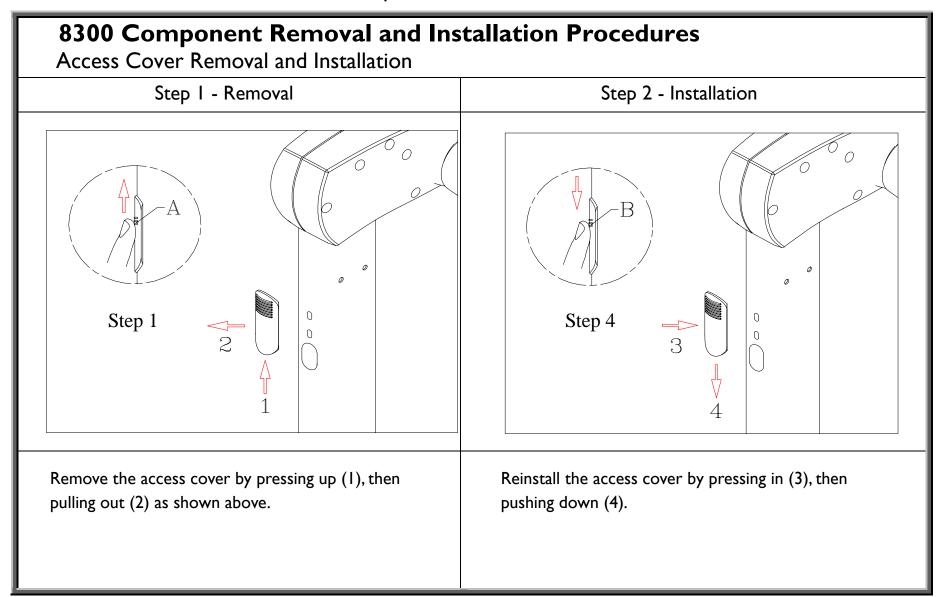
2-I-I Access Cover Removal and Installation

2-2-1 Stride Motor Removal and Installation

2-3-1 Flywheel Removal and Installation

2-4-1 Flywheel Washer Removal and Installation

Version 2 Revised 09-28-04



8300 Component Removal and Installation Procedures Stride Motor Removal and Installation Step 2 Step I Press the stride key on the display or the stride switch until Use these instructions when calibrating or replacing the the display stride window shows 650mm (26in). Continue to stride motor sets. exercise on the unit. After the stride linkage reaches its destination, remove the stabilizing arms by removing the mushroom-head hex screws.

8300 Component Removal and Installation Procedures Stride Motor Removal and Installation Screw Types in the Shoulder Cover Step 3 Tape Use tape to secure the inner cover (A). Remove the six Remove the screws in this order: (I) Remove the mushroom-top Phillips-head pointed screws; (2) Remove the screws that secure the outer cover (B). mushroom-top Phillips-head metal screws.

8300 Component Removal and Installation Procedures Stride Motor Removal and Installation Step 5 Step 4 Remove the stride linkage bushing cover (B). Remove the First, loosen the mushroom-head Phillips screw (C) that holds inner hex head bolt (A). Detach the stride linkage. the sleeve (A) in place. Remove the sleeve (A). Remove the C-clip (B). Pull the stride support assembly out slightly. (Do not pull it off the axle.) Disconnect the VR, motor, and switch wires. Set them out of the way, and pull the stride motor up and out of the stride support arm.

8300 Component Removal and Installation Procedures Stride Motor Removal and Installation Step 6 Step 7 Remove the mushroom-head Phillips screws shown above First, remove the protective bracket on the stride motor set. (A). Pull the stride motor set upward to remove it. Apply bearing grease to the worm gear and rollers. Then insert the stride set into the stride support arm. Note: In removing the stride motor set, push up on the Note: Do not change the relationship of the brass stem to the stride motor connection pin. Do not pull on the wires on motor; ERR7 may result. Also, do not change the worm gear position; The stride height may become uneven or jam. top.

8300 Component Removal and Installation Procedures Stride Motor Removal and Installation Step 8 Step 9 Motor Connector Zirc fitting

In installing the stride motor set, note that the stride linkage connector must face the stride linkage.

Note on alignment: The zirc fitting faces forward and the stride linkage connector faces inside.

Use the stride linkage connector to guide the stride motor set into place in the stride support arm. Then attach the mushroom-head Phillips screws as shown. (Hex head screws were later used in this spot.)

Note: In adjusting the stride motor set position in the support arm, do not pull the wires; the VR circuit board might break.

8300 Component Removal and Installation Procedures Stride Motor Removal and Installation Step 10 Step 11 В Before installing the stride support assembly, put the washers Connect the VR, motor, and switch wires, then stuff the in place on the pedestal shaft, with the regular washer on the connectors into the stride support arm. inside and the Teflon washer facing the stride support assembly. Note: Make the Teflon side face the stride support assembly. Note: If the tape on the shoulder cover becomes detached, wrap the wires around the shaft once, pushing them forward, then under and up.

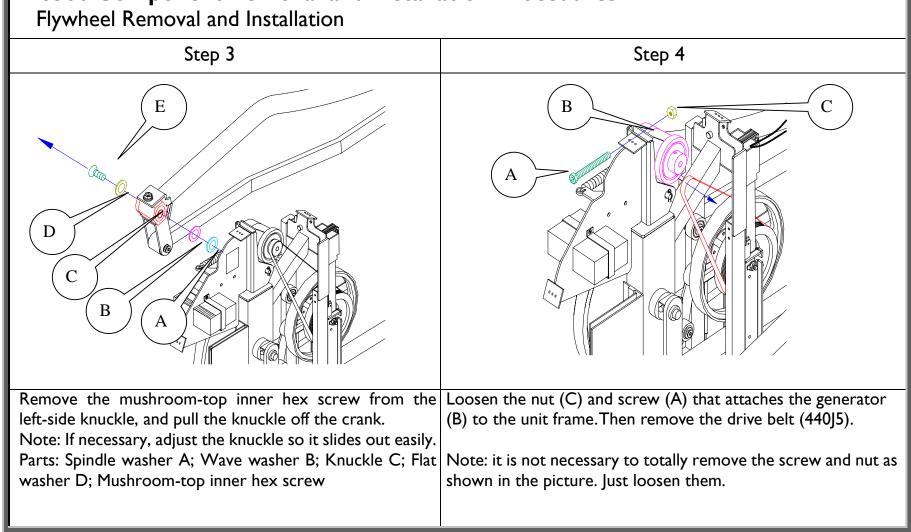
8300 Component Removal and Installation Procedures Stride Motor Removal and Installation Step 13 Step 12 Tape A В D E Put the stride support assembly in place. Put on washers as Put the outer cover in place. Screw in the five screws. And follows: Teflon washer (A), Teflon side facing the stride remove the tape. support assembly, black washer (B), wave washer (C), black washer (B), and C-clip (D). Finally, put the sleeve (E) in place, then tighten the screw (F).

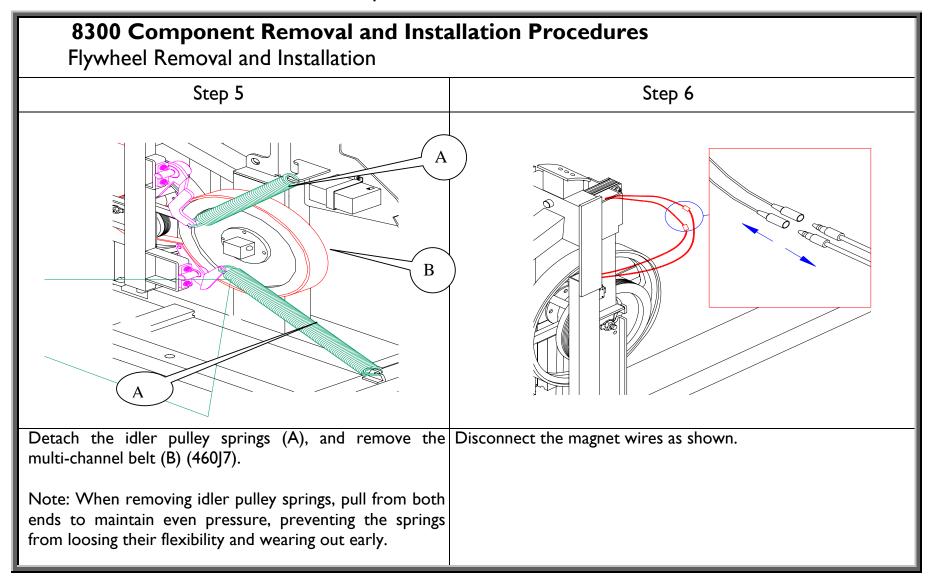
8300 Component Removal and Installation Procedures Stride Motor Removal and Installation				
Outer Cover Screws	Step 14			
	A A C C			
First screw in the metal screws (2), then the sharp screws (1).	Install the stride linkage as shown. Put the flat washer (B) on the stride linkage screw (A), and tighten down the screw. Then put cover (C) in place.			

8300 Component Removal and Installation Procedures 8300 Stride Motor Removal and Installation Step 15 Put support arms in place. Then tighten support arm screws to complete the job. A. Mushroom-head hex screws (5/16"*L19) Support washer (D18*d8.5*t2); support washer (D20*d7*t2.0) C. Mushroom-head inner hex screw (1/4"*L3/4")

8300 Component Removal and Installation Procedures Flywheel Removal and Installation Step 2 Step I Remove the 14 mushroom-top Phillips-head screws (A) Remove the mushroom-top Phillips-head metal screws (A) from the rear cover, and remove the cover from the unit as from the guard panel (A) and remove the finger guard as shown. shown.

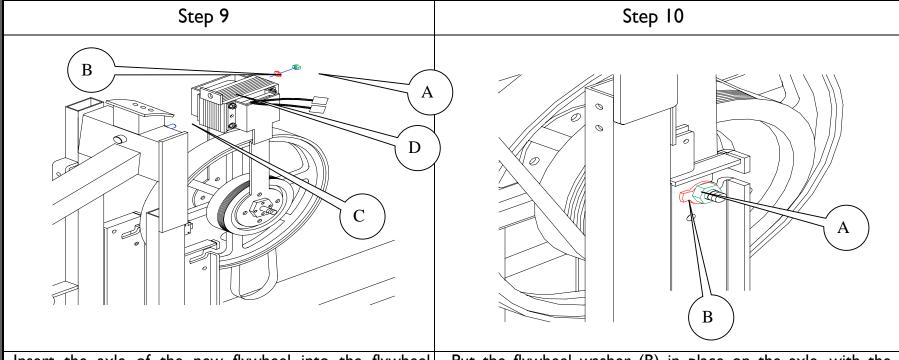
8300 Component Removal and Installation Procedures





8300 Component Removal and Installation Procedures Flywheel Removal and Installation Step 8 Step 7 В В Remove the flywheel nut (B) and washer (A). Remove the nut (B) and washer (C) that secures the flywheel in place. Then remove the flywheel. Note: Be careful not to hit the optic sensor (A) when removing the flywheel.

8300 Component Removal and Installation Procedures Flywheel Removal and Installation



Insert the axle of the new flywheel into the flywheel bracket on the frame. Lift the magnet (D) up into the flywheel attachment screw (C). Install flywheel washer (B) and nut (A) to the screw.

Put the flywheel washer (B) in place on the axle, with the washer protrusion facing back, then hand-tighten nut (A) into place. Press the flywheel toward the back of the unit. Make sure that the flywheel fits well at the attachment point by the magnet and at the axle. Tighten the nuts on both sides of the flywheel and at the attachment screw by the magnet.

8300 Component Removal and Installation Procedure Flywheel Removal and Installation Step 12 Step 11 В Connect magnet wires as shown. Put the drive belt (B) (440]5) in place, making sure that it meshes well on the drive pulley. Then gradually tighten nut (C) onto the generator screw (A). Note: Tighten nut (C) just to the point that the belt doesn't jump or shudder when the flywheel rotates forward or backward.

8300 Component Removal and Installation Procedures 8300 Flywheel Removal and Installation Step 14.1 Step 13 Put belt (C460J7) onto the wheel and adjust the idler pulleys Inspect the Installation (A) so the belt sits well. Rotate the flywheel (C) so the belt I. Turn the crank arm: Inspect the flywheel movement. meshes, then put idler pulley springs (B) in place. If not normal, adjust the belt and idler pulleys. Note: Pull both ends of the spring to keep the pressure even and prevent it from losing flexibility.

8300 Component Removal and Installation Procedures Flywheel Removal and Installation Step 14.3 Step 14.2 Inspect the Installation Inspect the Installation 2. Rotate the crank and press the LEVEL up key on the 3. Rotate the crank and inspect whether a steps-per-minute value appears on the display. If not, adjust the distance display. Inspect whether resistance increases. If not, inspect whether wires are properly installed and connected. between the optic sensor and the sticker on the flywheel to within 3 mm (1/4 inch).

SportsArt Industrial

8300 Component Removal and Installation Procedures

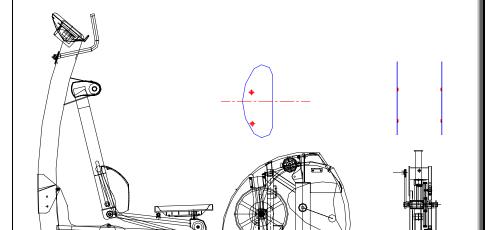
Flywheel Removal and Installation

Step 15

D C B A

Install washer (A) and wave washer (B) onto the crank arm. Then install the left side of the knuckle (C) onto the crank arm. Finally, put on the flat washer (D), and tighten the mushroom-head inner hex screw (E).

Note: If the glide rail does not install easily, jiggle the knuckle.



Step 16

Put the guard panels in place and screw in their mushroom-top Phillips-head metal screws.

Note: The flat surface faces the rear; The screw hole protrusions face the inside of the unit; Screw holes are toward the lower part of the panel. If installed incorrectly, the unit covers cannot be installed.

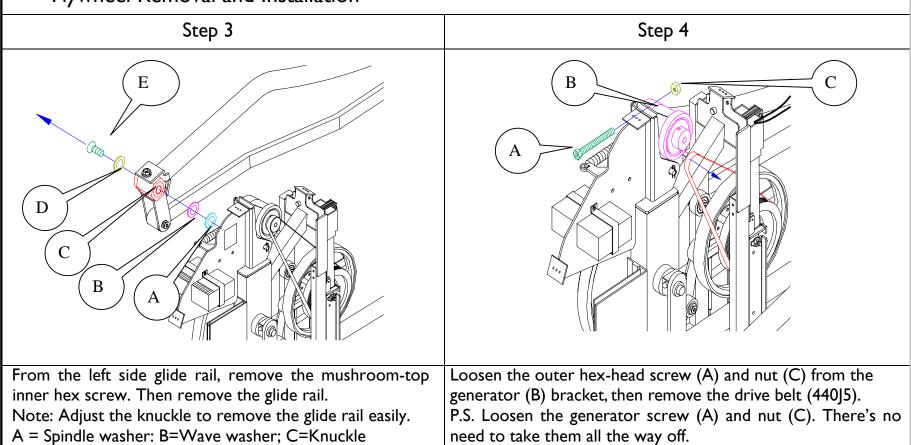
8300 Component Removal and Installation Procedures Flywheel Removal and Installation Step 17 Install rear covers onto unit. Tighten the mushroom-head Phillips screws to complete the job. Note: The cover attachment plate on the unit frame has three holes in it, making it easy to screw the cover onto the wrong hole. As a rule, use the screw hole on the right.

8300 Component Removal and Installation Procedures 8300 Flywheel Washer Removal and Installation Step 2 Step I Remove the mushroom-top, Phillips-head metal screws (A) Remove the 14 mushroom-top, Phillips-head screws (A) from the cover, then remove the cover as shown. from the finger guard (B). And remove finger guards from both sides as shown.

8300 Component Removal and Installation Procedures

Flywheel Removal and Installation

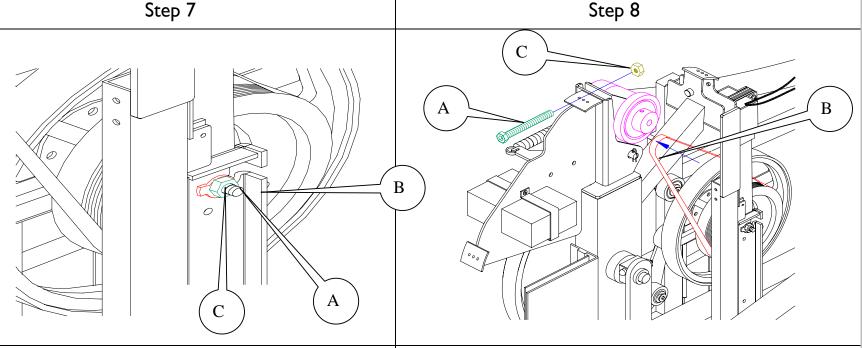
D=Flat washer; E=Mushroom-top inner hex screw.



8300 Component Removal and Installation Procedures Flywheel Washer Removal and Installation Step 5 Step 6 From the left side, remove the idler pulley springs (A) and Remove the nut (B) and flywheel washer (A). the multi-channel belt B(460J7). P.S. Pull springs from the ends to keep pressure even and preserve spring life.

8300 Component Removal and Installation Procedures

Flywheel Washer Removal and Installation



Put the flywheel washer (C) in place on the spindle (B), inserting the protruding part of the washer toward the rear of the unit. Then hand-screw the nut (A) in place. Push the flywheel toward the rear of the unit. Make sure that the washer meshes into the bracket in the frame. Tighten the nut.

Put generator belt B(440J5) in place. Rotate the flywheel to make sure that the belt channels mesh in the grooves. Gradually tighten nylon lock washer (C) onto the bolt (A) with an inner hex head.

Note: Tighten until the flywheel rotates smoothly in both directions without jumping.

8300 Component Removal and Installation Procedures

Step 9	Step 10.1	
A B		
Install the multi-channel belt (C460J7) onto the flywheel. Adjust the idler pulleys (A) so that the idler pulleys ride on the outside of the belt. Rotate the flywheel to make sure that the belt and flywheel mesh well. Then put springs (B) into place. Note: Pull springs from the ends to maintain even pressure	Inspect the work: I.Turn the crank. Inspect whether the multi-channel belt rotates smoothly. If not, adjust the multi-channel belt and idler pulleys.	

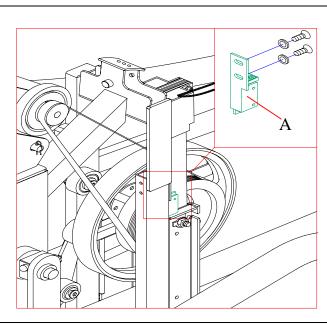
8300 Component Removal and Installation Procedures Flywheel Removal and Installation

Inspecting the Installation

2. Turn the crank and operate the display. Inspect resistance operation.

If there is no resistance, inspect the wire connections.

Step 10.2



Step 10.3

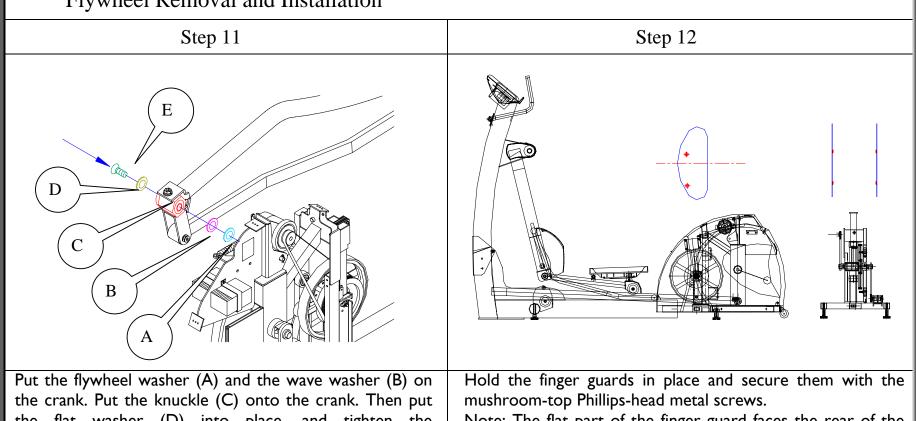
Inspecting the Installation

3. Turn crank and operate the display. Inspect whether the optic sensor (A) detects movement.

If not, adjust distance between optic sensor and the flywheel sticker to within 3 mm (1/4 inch).

8300 Component Removal and Installation Procedures

Flywheel Removal and Installation



the flat washer (D) into place, and tighten the mushroom-top inner hex head screw (E).

Note: If the glide rail does not install easily, adjust the knuckle.

Note: The flat part of the finger guard faces the rear of the unit. The protruding screw holes face the inside of the unit. Screw holes are low on the finger guard. If finger guards are installed incorrectly, the covers won't install correctly.

8300 Component Removal and Installation Procedures Flywheel Removal and Installation				
Step 17				
Install covers and fasten them with the mushroom-top, Phillips-head screws, to complete flywheel installation procedure. Note: In installing covers, because the cover attachment				
plates on the frame have three screw holes, it is easy to make a mistake. As a rule, use the hole on the right.				

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8300 Elliptical Trainer – Mechanical Repair Guide

Chapter 3 - Troubleshooting

3-I-I Pulsating Vibration

Version 2 Revised 09-28-04

8300 Troubleshooting: Pulsating Vibration

Problem: Exercise on the unit. There's a pulsating vibration felt especially in the feet.

Г		I		I
Order	ltem	Reason for Abnormality		Inspection Procedure
I	(4 60J7)	Some belts are longer than others due to spec issues or stretching after use. Longer belts allow the idler pulley to travel further. When the idler pulley slaps back onto a loose belt, it produces a vibration.		a. Inspect the flywheel belt for signs of damage.b. Inspect whether the flywheel washer shown below is installed on the unit.
Flywhee	el belt (460J7)		Flywheel Washer	
		460J7		Flywheel Washer

Troubleshooting: a. If the belt (460J7) is worn, replace it. (Please refer to 2-3-1, Flywheel Removal and Installation.) b. If the belt length allows excessive vibration, replace the flywheel washer. The new washer holds the flywheel back slightly, making the belt tighter. (Please refer to 2-4-1, Flywheel Washer Removal and Installation.)

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8300 Elliptical Trainer – Mechanical Repair Guide

Chapter 4 – Design Change Record

4-1-1 Changes Due to Rust Issue

4-2-1 Change to Prevent Foam from Sliding Down

Version 2 Revised 09-28-04

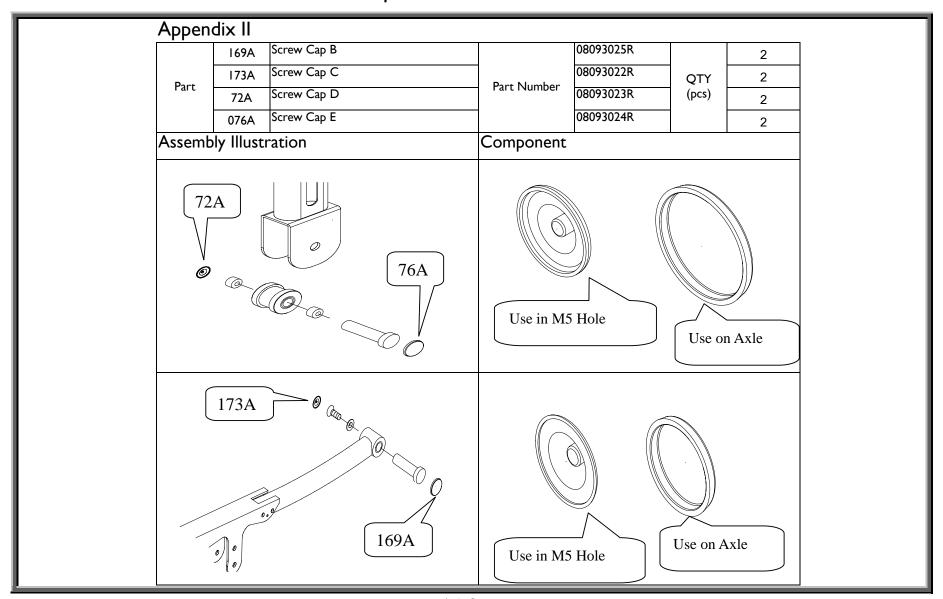
8300 Design Change Record: Changes Due to Rust Issue

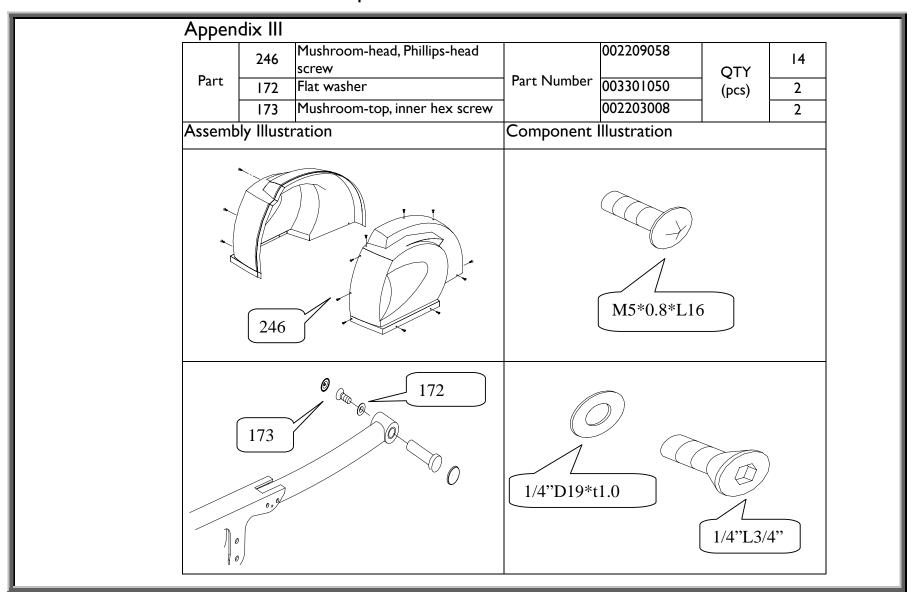
Problem: Unit frame, frame support, stride support arm, glide rail, and external screws rusted. Resolution:

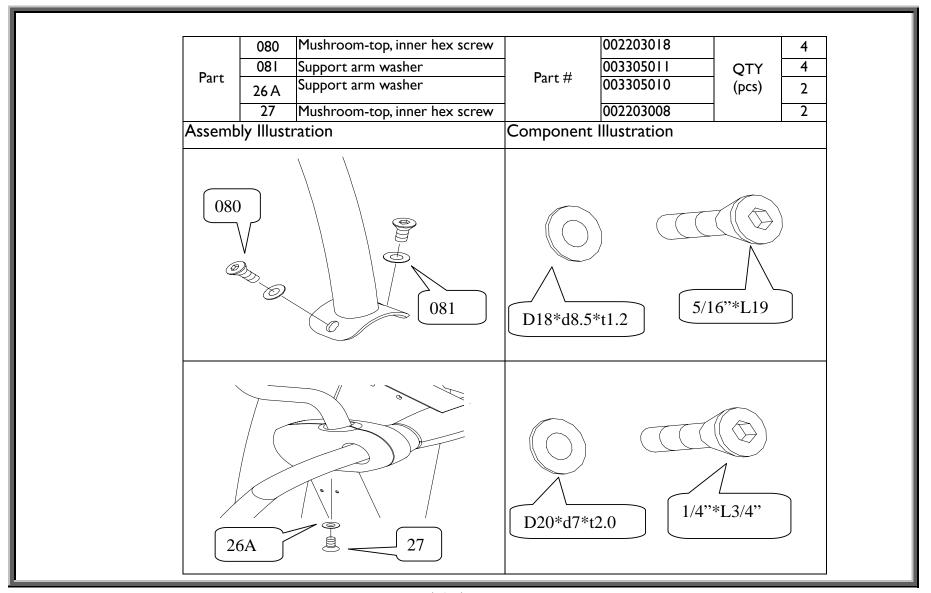
- A. Added covers to prevent water from entering the stride support arm. (Appendix I)
- B. Added caps to screws in the stride support arm. (Appendix II)
- C. Improved the plating on the glide rails and added a silver paint to prevent rust.
- D. Strengthened the ability of the paint to adhere.
- E. Changed material of external screws to stainless steel. (Appendix III)

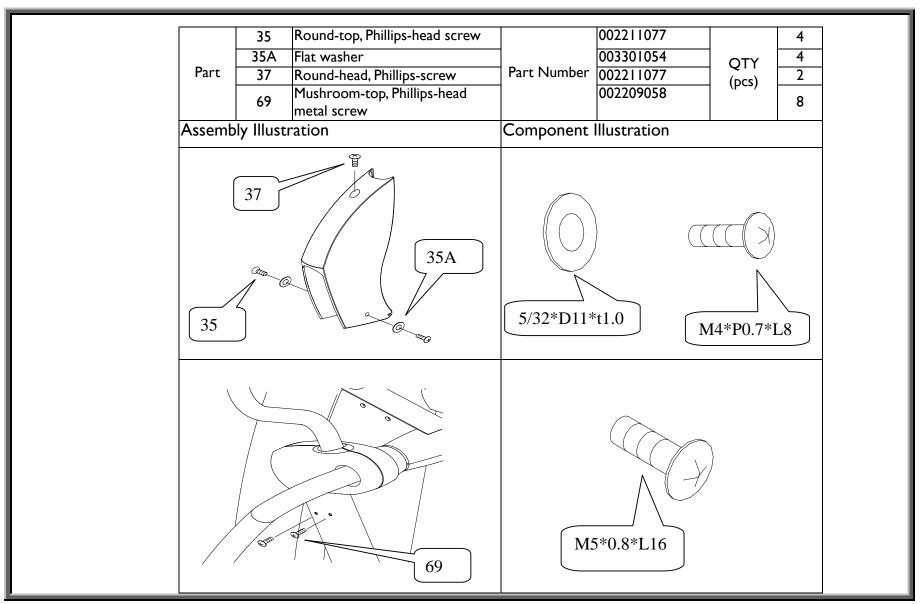
Appendix I

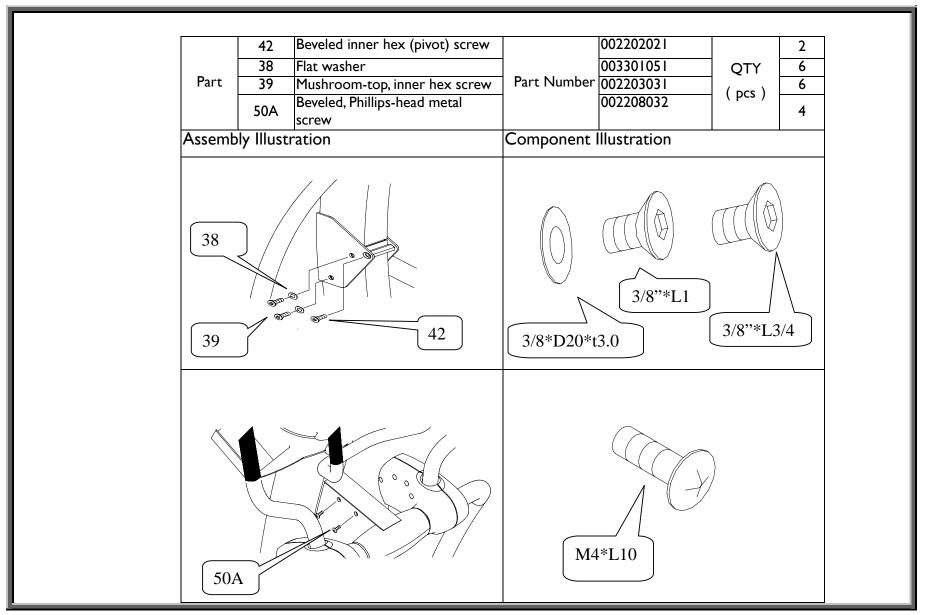
Abcurdix	` '					
	321	Stride support arm anti-rust covers A	Part Number	08093020R		2
Part	322	Stride support arm anti-rust covers B		08093021R	QTY (pcs)	2
	320	Mushroom-top, Phillips-head metal screws		002212045		4
Assemb	Assembly Illustration					
32	321	322		M3*L	12	

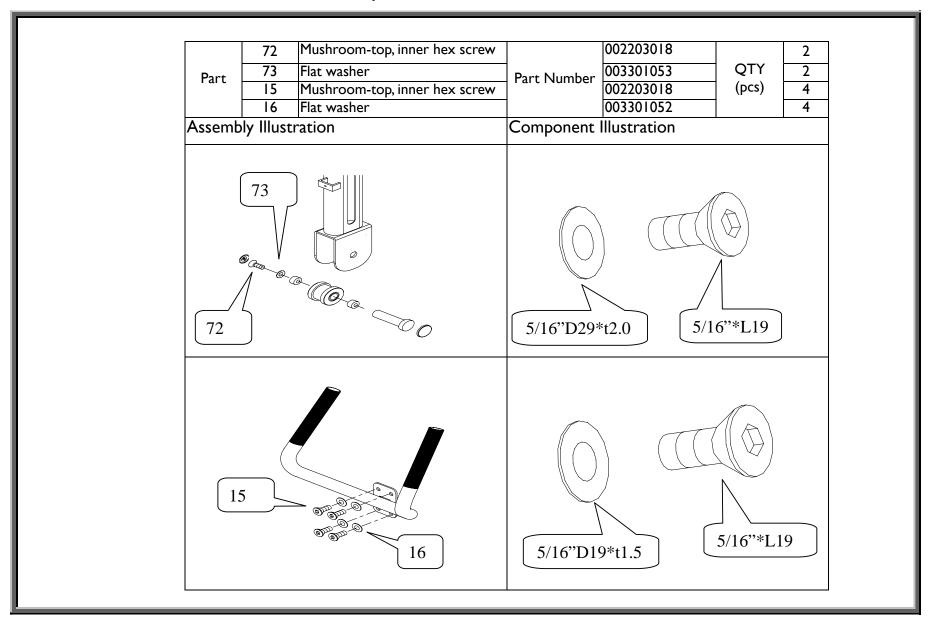








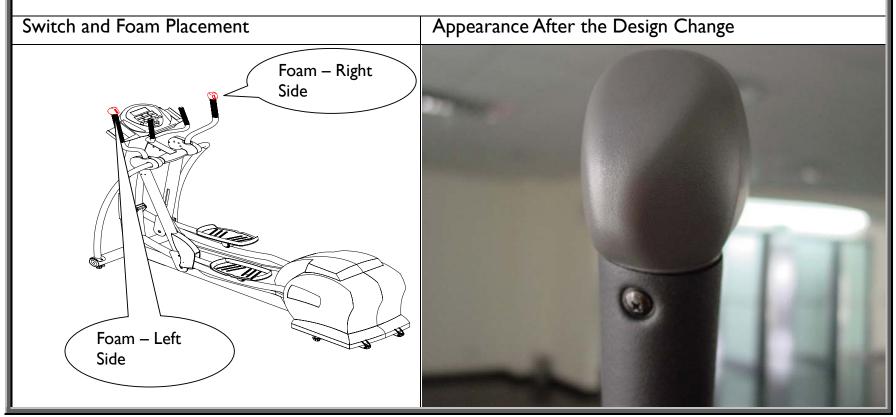




8300 Design Change Record: Change to Prevent Foam from Sliding Down

Problem: The foam under stride/level switches slid down and was difficult to get back in place. Resolution:

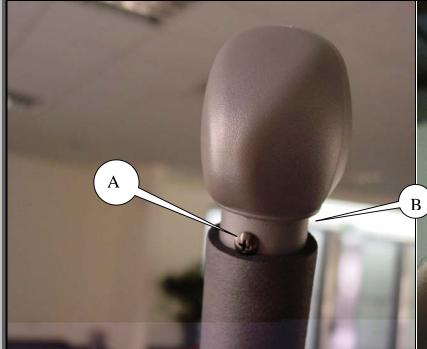
- A. Mechanism to attach the foam to the unit was changed. (See Appendix I.)
- B. A flat washer was added to each side.



Appendix I

If the foam below stride/level adjusters slips down, secure it back in place as follows.

Step I Step 2



Remove the mushroom-top, Phillips-head screw (A) behind the grip. Secure the screw (B) that faces the user.

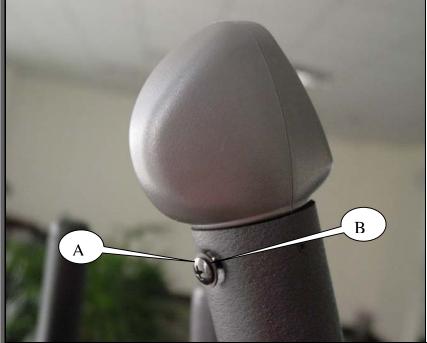


Push from the bottom to slide the foam (A) back into place. Do not spray hairspray into the space between the foam and metal, as it promotes rusting. Blowing compressed air from the bottom can help in getting the foam in place.

Appendix I

Step 3

Step 4



Insert screw (A) into washer (B) and fasten onto unit as shown. First measure the position of the hole, so you can find it when you are attaching the screw from the outside.



Roll up a small part of the foam, and squirt a dab of quick-dry glue (Cyanoacrylate Adhesive), then put the foam back in place.

Appendix I Step 5:The Finished Product

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8300 and E8300 Elliptical Trainer Repair Manual (Electronics)



USA Version 2 09-13-04

8300 Repair Manual (Electronics)

This troubleshooting guide was made through the cooperation of SportsArt personnel in the USA and Taiwan. Our goal is to provide clear, useful troubleshooting information for technicians in the field. If you have questions, comments or suggestions, please contact Bob Baumgartner at SportsArt America. Thank you.

E-mail: bob@sportsartamerica.com

Tel: 866 709 1750 ext. 115

8300 Elliptical Trainer Troubleshooting Manual

Version 1: April 2002

Version 2: September 13, 2004 - Minor changes were made to reflect the new E8300.

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Reference

REF.01 – Voltage Specs – Display and Drive Boards

REF.02 - Voltage Specs - Drive Board CN1 Connector (Generator, Optic Sensor, Magnet), Magnet Tests

REF.03 - Stride Set Voltages at the Shoulder Joint, Stride Set Voltages at CN2 Connector

REF.04 – Generator and Magnet Voltages (Voltage Observations under Various Conditions)

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Introduction

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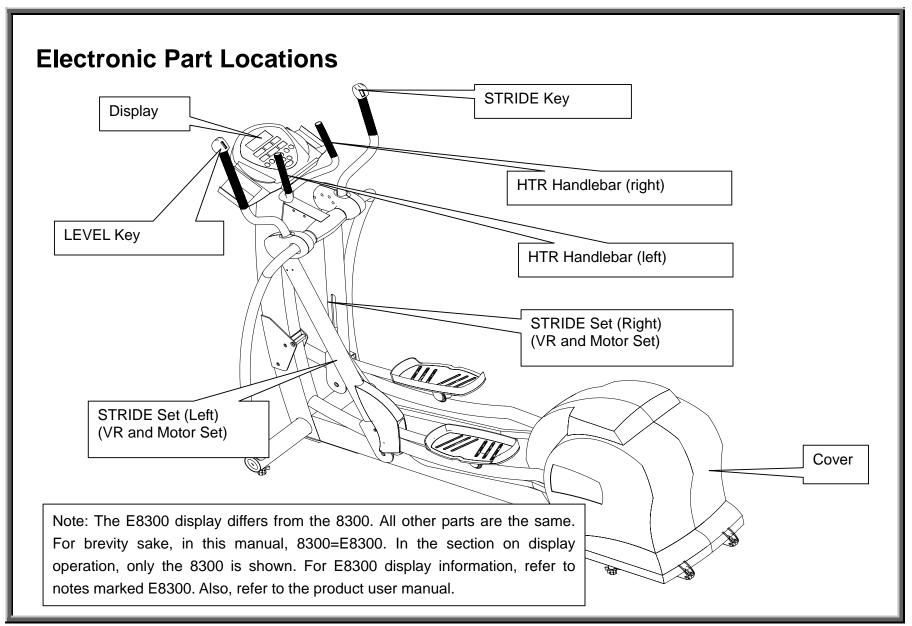
INTRO.05 - Programs

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INTRO.07 - Component Relationships

INTRO.08 – Power Parts

INTRO.09 - General Operation, Stride and Level Keys, Programs/Intervals, Battery, Stride VR



Main Features

The 8300 Elliptical Trainer is one of the first adjustable stride elliptical trainers on the commercial market. Features include adjustable resistance level, calorie count, heart rate control, 12 exercise programs and two interval programs. The E8300 incorporated an improved dot-matrix display and some added setting functions.

Power Supply

Generator-powered unit must be operated at 25 steps per minute or more to get stride function. STEP TO START appears on display if exercise speed is too slow for generator operation.

Start Up

There are two ways to start the 8300 Elliptical Trainer: (1) Generator Start: Exercise on the unit; (2) Battery Start: Press display ON key.

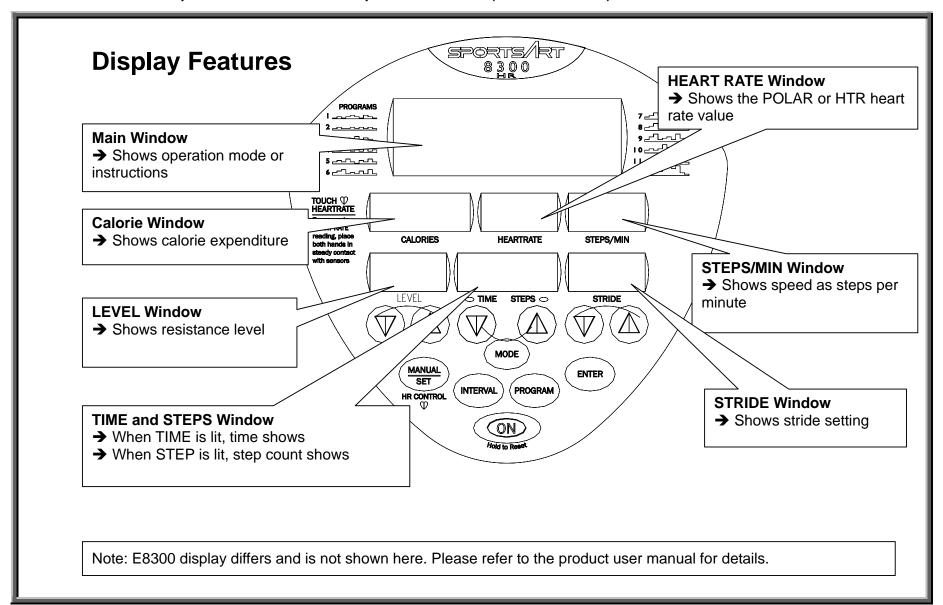
Turn Off

There are two ways to turn off the unit:

- (1) Automatic Don't exercise on the unit. Within 80 seconds, display shuts off.
- (2) Manual 8300: Simultaneously press MODE DOWN and STRIDE DOWN keys on the display for three seconds. Display shuts off. E8300: Simultaneously press STOP/PAUSE, ENTER, and resistance DOWN keys for three seconds.

KG/LB - Metric or American Standard

On 8300, simultaneously press MODE UP and DOWN keys. The display shows KG or LB. Press MODE key once. Press Mode UP or DOWN keys to toggle between the two choices, then press ENTER to confirm your selection. On E8300, at the startup screen ("E8300" appears), simultaneously press LEVEL UP and DOWN keys. "PRESS TO SELECT MODIFY HRC TARGET HR, PRESS ENTER" scrolls across the dot matrix window. "YES" or "NO" appears in the heart rate window. Press UP or DOWN keys to toggle between choices. Pressing the "YES" key allows you to change the heart rate setting beyond the preset range. Press the ENTER key to confirm your choice. "PRESS UP DOWN TO SELECT LB/KG" scrolls across the display. LB or KG appears. Press UP or DOWN keys to toggle. Press the ENTER key to confirm your choice.



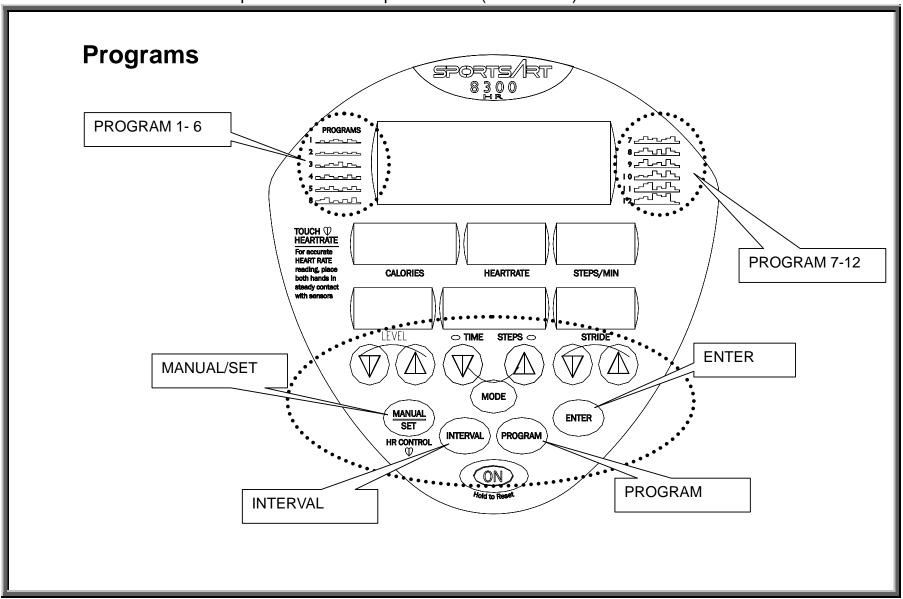
Feature Overview

The 8300 Elliptical Trainer features adjustable stride and resistance levels, provides user feedback including calorie count, step count, heart rate, time in use, and offers three control modes including manual, exercise programs and interval programs.

Features	Operation	Specifications
	press handlebar STRIDE switch. Requires 25 SPM to operate. If under 25 SPM, message	17-26 inches (450-650 cm). At 17 inches, black stride linkage is in lowest position on the stride support assembly; stride length is smallest. At 26 inches, black stride linkage is in highest position on the stride support arm; stride length is largest.
	Press LEVEL UP/DOWN keys on display or press LEVEL switch on handlebar.	1-20 resistance levels. 1 is least resistance; 20 is highest resistance.

Feedback	Operation
Calorie Count	Appears automatically (TIME, LEVEL, WEIGHT, STRIDE used as factors; See SET mode.)
Step per Minute (SPM)	Appears automatically (If under 25 SPM, display shows "STEP TO START.")
Time in Use	Time value appears in Time/Steps window when TIME indicator lights. Press MODE key to toggle
	between TIME and STEP modes. For time count down, in TIME mode press TIME UP and DOWN
	keys simultaneously. At 0, display "beeps" once.
Step Count	Step count appears in Time/Steps window when STEP indicator lights. To toggle between TIME and
	STEP, press MODE key. For step count down, in STEP mode press STEP UP and DOWN keys
	simultaneously. At 0, display "beeps" once.
Heart Touch Rate (HTR)	Hold onto heart touch rate handlebar; HTR value appears in 30 seconds.
POLAR Heart Rate	Strap on POLAR transmitter; Heart rate value appears in 30 seconds.

SportsArt - 8300 Repair Manual (Electronics) - Introduction

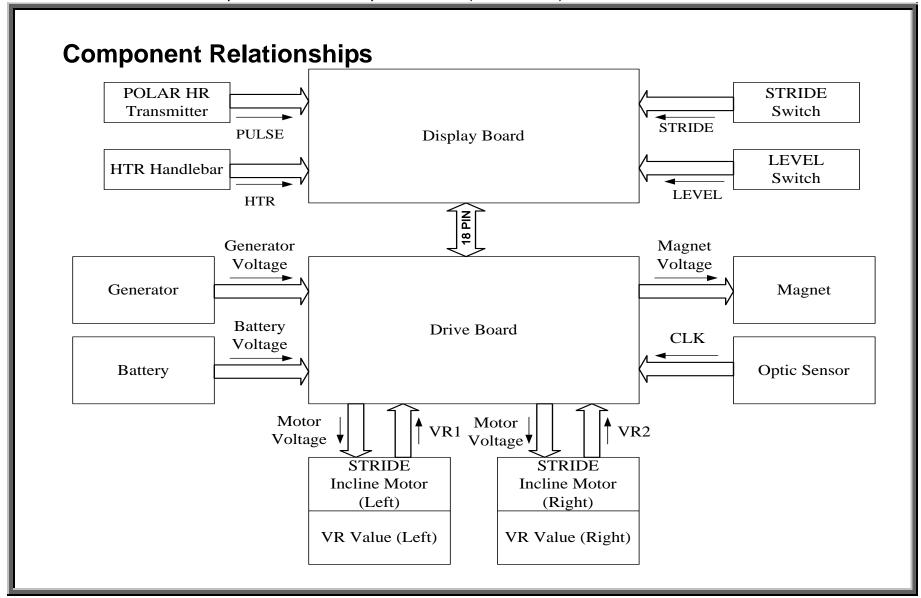


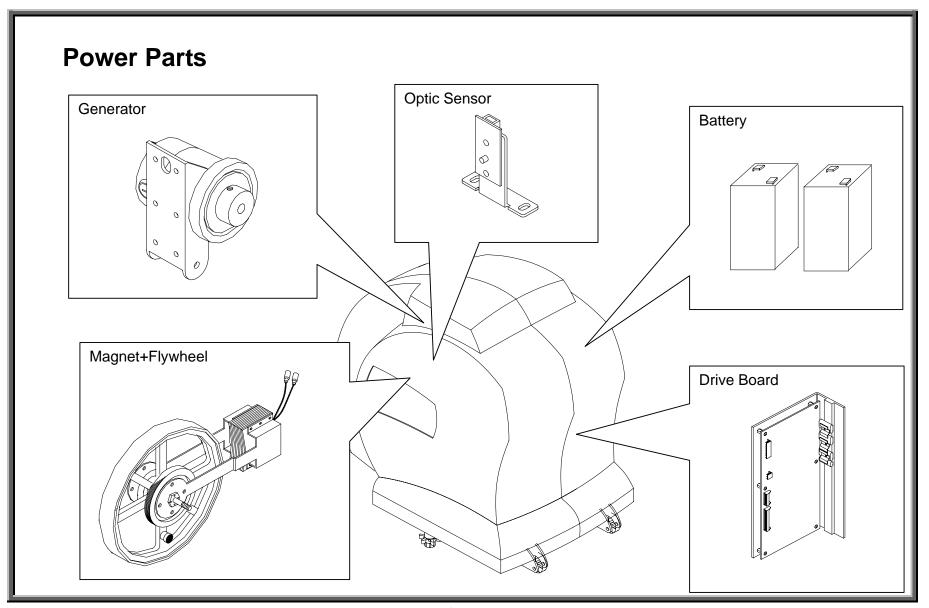
Control Modes

Press MANUAL/SET key to toggle between MANUAL, SET and HRC prompts. Press ENTER to confirm your choice.

Control Modes	Operation
Manual (default)	In MANUAL mode, press display keys or handlebar switches to directly set STRIDE and LEVEL values.
Heart Rate Control	Heart Rate Control provides an optimum workout by automatically adjusting stride and level functions to maintain a workout at the user's heart rate target.
	Press UP/DN keys to toggle between FAT/CARDIO modes. Press ENTER to confirm your selection. Follow prompts. Press UP/DOWN keys to input information, then press ENTER to confirm your selection.
Set	Press UP/DOWN keys to select weight, then press ENTER to confirm your selection. Weight is used in calorie calculations.

Program	Operation
Program 1-12	Press PROGRAM key repeatedly to toggle to exercise programs 1-12. Press ENTER to confirm your selection.
(previously set	Follow prompts: press UP/DN keys to locate options, then press ENTER to confirm your choice.
courses)	
INTVL	Press INTERVAL key to toggle between INTV1 and INTVL2. Press ENTER to confirm your choice.
(user-made	INTVL1 has REST and WORK modes, with TIME, LEVEL and STRIDE settings.
courses)	INTVL2 has eight segments, with LEVEL and TIME settings.
	Follow prompts to input information. Press UP/DOWN keys to locate your preferences, then press ENTER to
	confirm your choice.





General Operation

- 1) Exercise on the unit. The flywheel spins.
- 2) Flywheel movement makes the generator produce power.
- 3) Flywheel movement makes the reflective sticker on the flywheel move.
- 4) The optic sensor detects the movement and sends its signal to the drive board.
- 5) The drive board sends its signal to the display.
- 4) The display shows steps per minute.

Stride and Level Keys (Manual Control)

- 1) The user presses a display or handlebar STRIDE or LEVEL key.
- 2) The signal travels from the display board down the 18-pin cable to the drive board.
- 3) The drive board distributes power to the stride motor or magnet.
- 4) Power to the stride motor causes it to operate up or down. Power to the magnet creates pull on the flywheel, producing resistance.

Programs / Intervals (CPU Control)

Basically operate the same as above, except that the CPU sends commands to the drive board, which then produces power for the stride motor or magnet.

Battery

Provides temporary power supply, so that when the user presses the display ON key, the display operates. Power from the generator, through the drive board, recharges the battery during use.

Stride VR

As the stride motor operates, the variable resistor (VR) gear turns. Gear movement changes voltage. The voltage signal travels to the drive board and up the 16-pin cable to the display. When the VR voltage matches the display setting, the CPU cuts off the power signal to the drive board, which then shuts off voltage for motor operation.

Generator

GEN.01 - Voltage and Signal Flow - General

GEN.02 - Power Part Illustration

GEN.03 - Generator Power Supply - Diagram

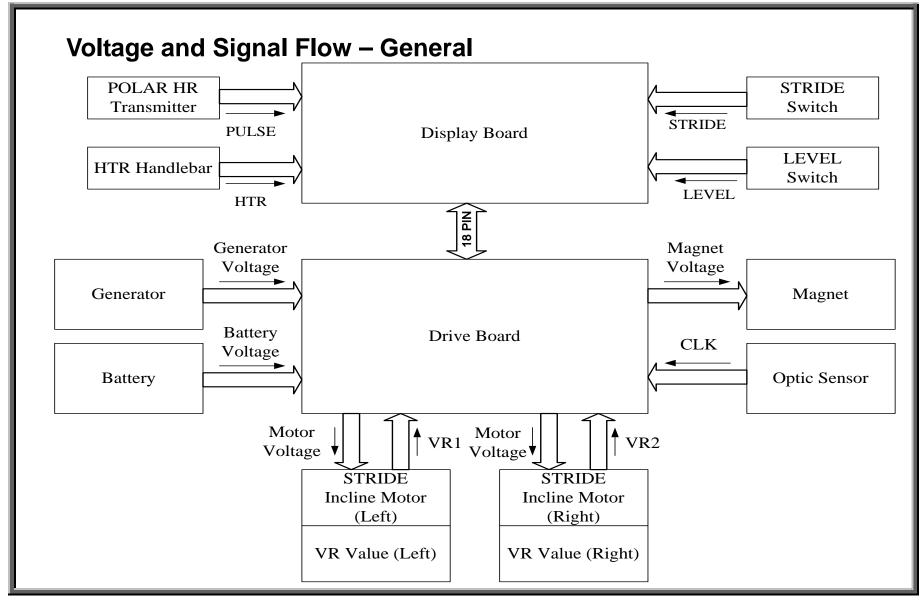
GEN.04 – Generator Power Supply – Illustration

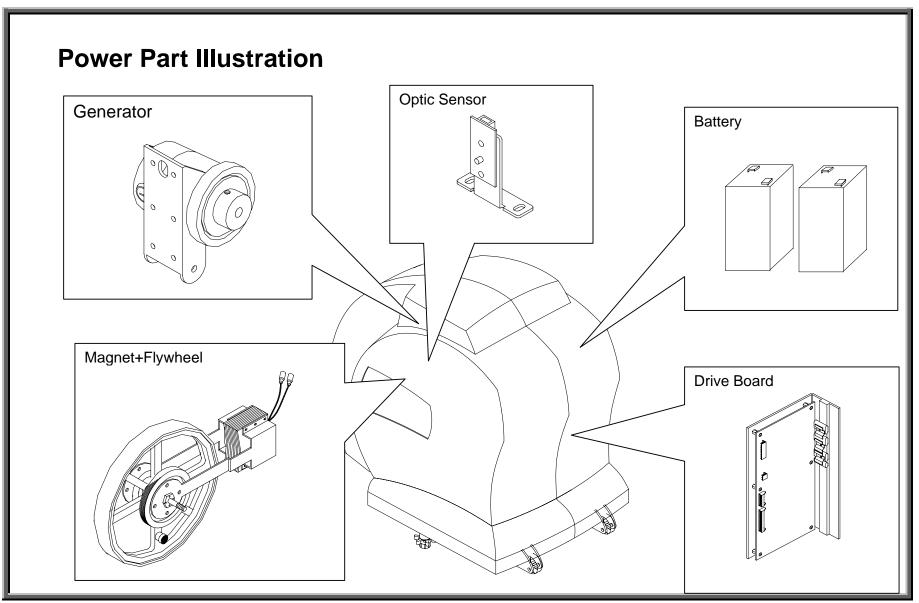
GEN.05 – Generator Power Supply and Start Up Process

GEN.06 – Generator Troubleshooting, Voltage Testing, Test Procedure

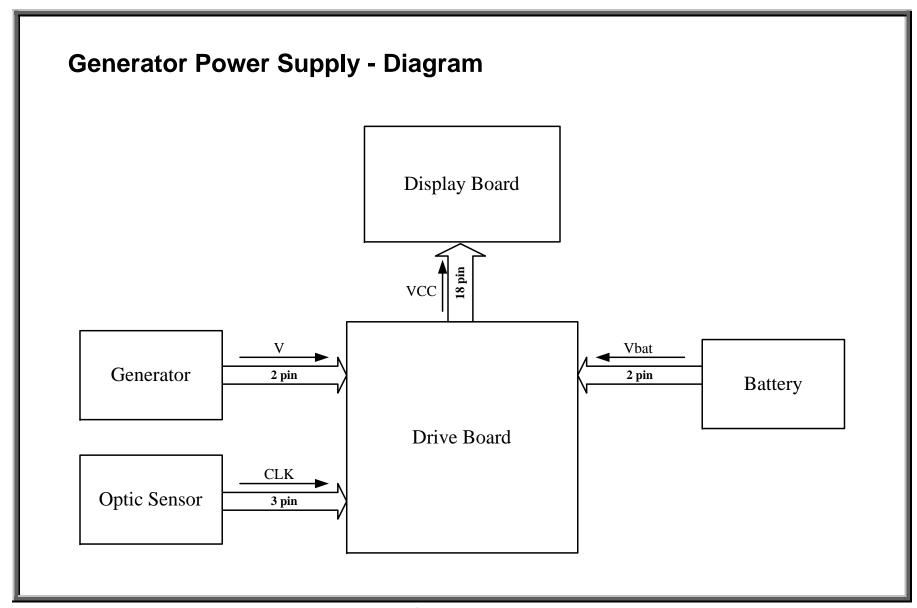
GEN.07 – Generator Voltage Test – Location: Drive Board Connector

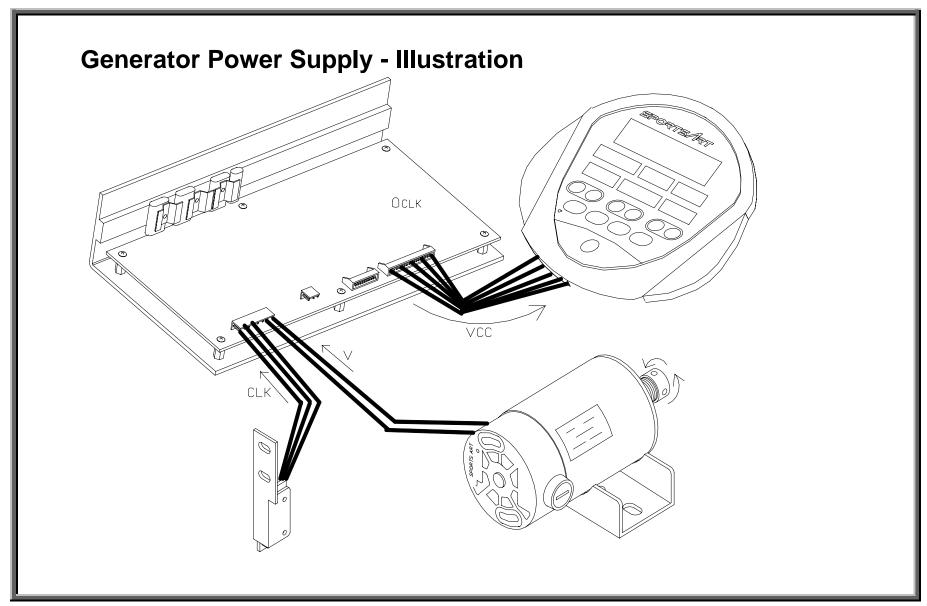
GEN.08 - Generator Voltage Test Process, Troubleshooting Tips, Generator Voltage Observations





SportsArt - 8300 Repair Manual (Electronics) - Generator





Generator Power Supply and Start Up Process

Order	Part	Operation			
1	Generator	1. Exercise on the unit. The flywheel rotates, driving the generator to produce power.			
2	Wires - GEN to	Generator voltage travels wires to the drive board.			
	DRV (Black and				
	White)				
3	Optic Sensor	1. As the flywheel turns, a reflective sticker on the flywheel rotates. The optic sensor			
		detects sticker movement and sends its signal to the drive board.			
4	Drive Board	The drive board converts generator voltage into stable VCC voltage.			
		2. After detecting the optic sensor signal, the drive board sends VCC voltage to the			
		display. NOTE: If the drive board doesn't receive the optic sensor signal, it does not			
		send VCC voltage to the display.			
		3. POWER LED on the drive board lights.			
5	18-pin Cable	1. VCC voltage travels the 18-pin cable from the drive board to the display board.			
6	Display Board	1. Once VCC voltage is supplied, the display "beeps" once. The main window shows			
		"MAN'L"; other windows show "0".			
		POWER LED on the display board also lights.			

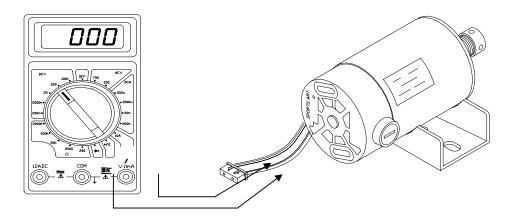
Generator supplies power for most functions, including the display board, drive board, optic sensor, battery recharging, etc. Battery voltage powers the stride motor.

Generator Troubleshooting

Possible generator malfunctions show the following symptoms.

- 1. Exercise on the unit. The display doesn't light up. No electronic functions operate. There is no resistance.
- 2. Generator F1 2-amp fuse on the drive board is blown.

Voltage Testing



Test Procedure

- 1. Disconnect the generator wire connector nearest the generator.
- 2. Put multimeter to the 200 VDC setting. Place probes as shown on the generator wires.
- 3. Exercise on the unit.
- 4. Normal reading: voltage varies depending on speed, up to about 120 VDC.

Generator Voltage Test – Location: Drive Board Connector \bigoplus 000 CN1 SPORTS ART 8300DRV V1 2001/08/16 For:8300 (\oplus) BLACK

Generator Voltage Test Process

- 1. Make sure all wires are connected. Do not detach any drive board wire connections.
- 2. Put the multimeter to the DC 200V setting.
- 3. Place multimeter probes on the drive board CON1 generator black and white wire connector points as shown.
- 4. Exercise on the unit. The display should "beep" once and light up.
- 5. Normal reading: voltage varies depending on speed, up to about 120 VDC.

Troubleshooting Tips

- 1.If there is voltage at the upper connector but none on the drive board, inspect the generator wire and its connections.
- 2.If there is no voltage at the upper connector and the wire is intact, replace the generator.
- 3.If there is voltage at the drive board connector but the display doesn't "beep" and light up, inspect the generator fuse F1 (2A) on the drive board. Replace it if necessary. Other check points include the POWER LEDs on the drive and display boards. The bad component is the one where voltage stops. Possible culprits would include the drive board, the 16-pin cable, and the display board.

Generator Voltage Observations

For reference, the following table shows voltage observations from a working generator. Expect voltage readings to vary depending on speed. This is presented to provide a rough guideline.

Record	Level	Steps Per Minute	Volts DC
1	1	80	140
2	1	70	130
3	1	60	100
4	1	50	90
5	1	40	70

Optic Sensor

OS.01 – Optic Sensor Operation Diagram

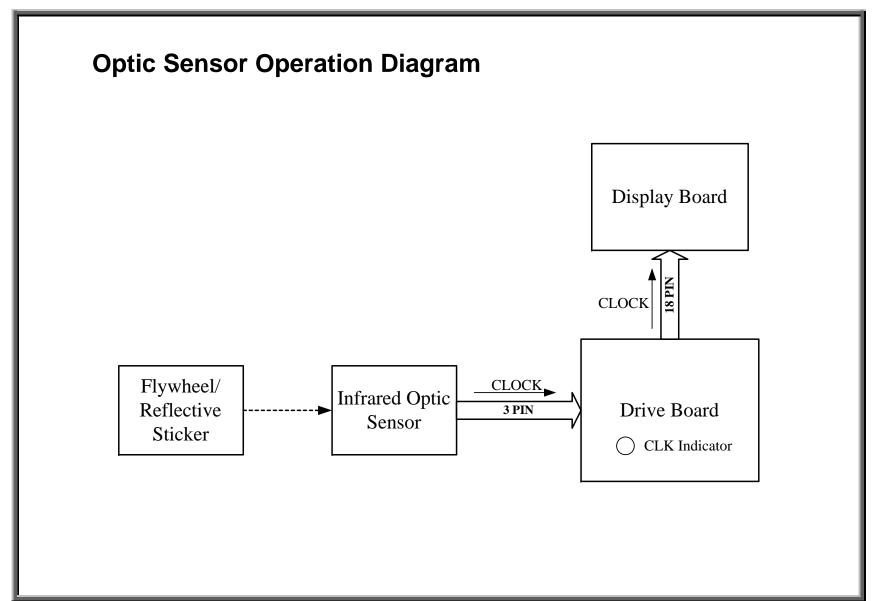
OS.02 - Optic Sensor Signal Illustration

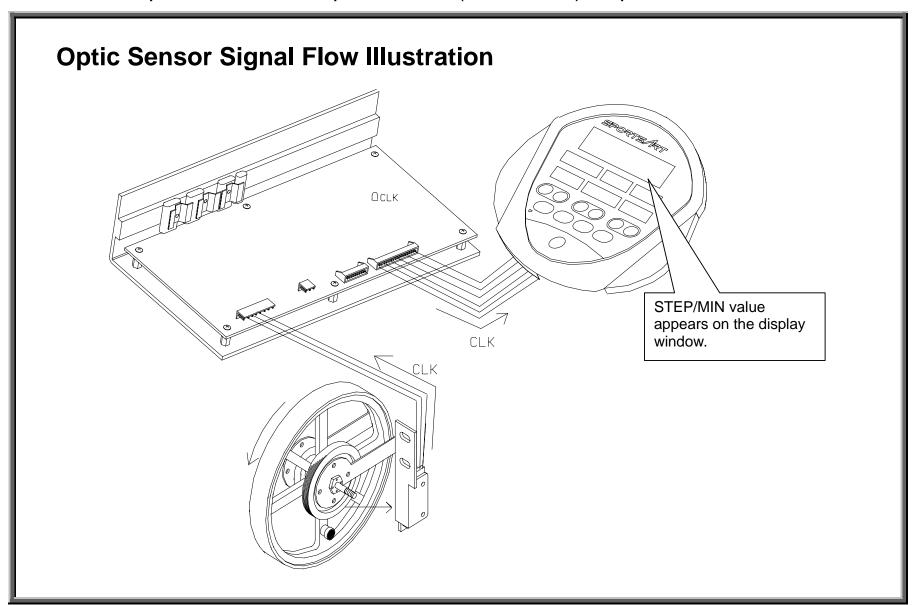
OS.03 - Optic Sensor Operation

OS.04 - Optic Sensor Test Illustration

OS.05 – Optic Sensor Signal and Voltage Test at Drive Board – Illustration

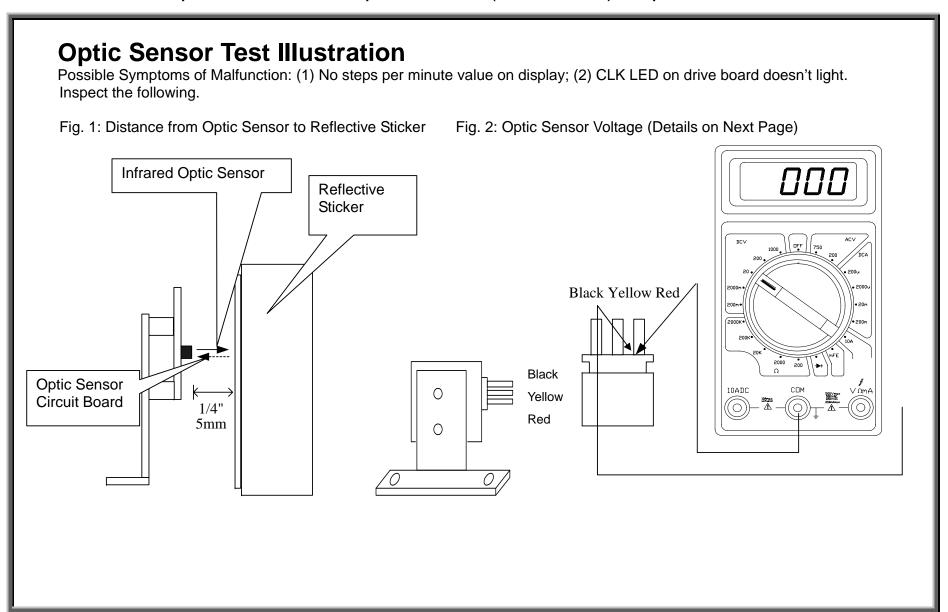
OS.06 - Inspection Points, Optic Sensor Voltage and Signal Test Summary



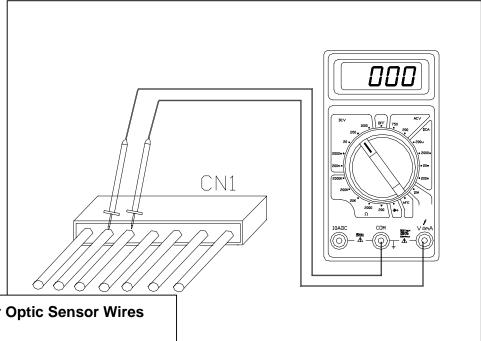


Optic Sensor Operation

Optic	Sociation Open			
Order	Part	Operation		
1	Flywheel	Exercise on the unit. Flywheel rotates. Reflective sticker on the flywheel rotates.		
2	Generator	Flywheel rotation drives the generator, making it produce power.		
3	Black and White (Generator) Wires	Power travels the generator wires to the drive board.		
4	Drive Board	Drive board processes the power.		
5	3-pin OS Cable	5V power supply travels the red and black wires to the optic sensor.		
6	Infrared Optic Sensor	The optic sensor detects flywheel sticker movement and emits its signal to the drive board.		
7	3-pin OS Cable Optic sensor signal travels the three-pin cable (yellow and black wind to the drive board.			
8	Drive Board	Drive board processes the optic sensor signal. Optic sensor CLK indicator on the drive board lights. Drive board sends the optic sensor signal to the display board.		
9	18-pin Cable	The optic sensor signal travels the 18-pin cable to the display board.		
10	Display	The CPU reads the optic sensor signal. The display STEPS/MIN window shows the speed value. When the STEP indicator lights, the display STEP window shows the step count.		



Optic Sensor Signal and Voltage Test at Drive Board – Illustration



Drive Board CN1 Connector Optic Sensor Wires

Black Yellow Red

Black to Red: 5 VDC

Black to Yellow: 1.5 to 3.5 VDC, depending on speed

Inspection Points

- 1. Distance: Optic sensor should be about 1/4 inch or 3-7mm from the reflective sticker.
- 2. Voltage to Optic Sensor: Put meter to the 20 VDC setting. Place probes on the red and black wire connector points. Normal reading: 5 VDC. At less than 4.5 VDC, the optic sensor would not be getting enough power. Inspect the optic sensor cable, its connections, and drive board.
- 3. Signal Output from Optic Sensor: Place probes on the yellow and black wire connector points. Normal reading: Varies depending on flywheel speed, about 1.5 to 3.5 VDC (CLK LED on the drive board should be lit too). If not, no optic sensor signal is arriving at the test location. Try testing closer to the optic sensor. If there is a signal at one location, but not further down, inspect the wires and connections. If there is power to the optic sensor but no output voltage, the optic sensor is bad.

Optic Sensor Voltage and Signal Test Summary

Test	Test Points	Normal Voltage	Abnormal Reading	Possible Malfunction if Abnormal
Voltage to Optic	Red & Black	5V (VDC)	Less than 4.5 VDC	OS wires, connectors; Drive board; Generator
Sensor				wires, connectors, generator
Signal From Optic	Yellow & Black	1.5-3.5 VDC	5 or 0 VDC	Wires, connectors, optic sensor
Sensor				·

Tip: If no generator power arrives at the drive board, the optic sensor will not operate; CLK LED1 on the drive board will not light, and steps per minute value and step count will not appear. Check generator operation, wires, and connectors.

Tip: Inspect optic sensor wire connectors. Wires can get stuck in a position where they do not make contact.

Battery

BAT.01 – Start Up Process – Diagram, Battery Start Up – Explanation

BAT.02 – Battery Operation Illustration

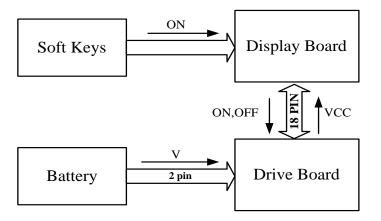
BAT.03 – Manual Shut Off Operation – Explanation, Automatic Shut Off Operation – Illustration and Explanation

BAT.04 – Message: Service Battery, Error Message Operation, Battery Signal Diagram

BAT.05 - Symptoms of Low Battery Voltage, Low Battery Voltage Simulation, Troubleshooting

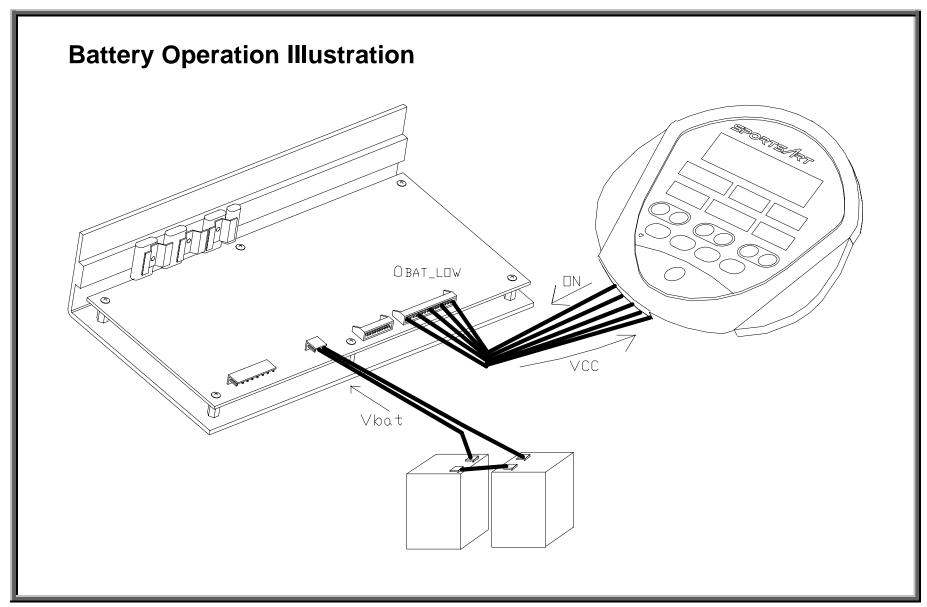
BAT.06 - Battery Voltage Test at Drive Board, Battery Test Procedure

Battery Start Up Process - Diagram



Battery Start Up - Explanation

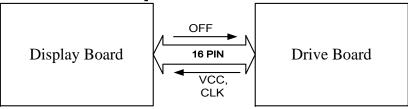
Order	Part	Operation		
-				
1	Battery	When the unit is not in use, the battery power supply lies ready.		
2	Soft Keys	1. When the display is not lit and someone presses the display "ON" key, the "ON" signal goes		
		to the display board.		
3	Display Board	1. The display board sends the "ON" signal to the drive board.		
4	18-pin Cable	1. The signal travels the 18-pin cable.		
5	Drive Board	1. The drive board stabilizes voltage from the battery; the drive board PWR LED lights.		
		2. Battery power, through the drive board, is sent back to the display.		
6	18-pin Cable	1. The voltage travels the 18-pin cable.		
7	Display Board	1. When the display board receives power, the display "beeps" once, display windows light up,		
		and the unit is operable. The display board power LED lights.		



Manual Shut Off Operation - Explanation

Order	Part	Operation		
1	Soft Keys	1. Simultaneously press the MODE<▼> and STRIDE<▼> keys.		
2	Display Board	1. The display board CPU reads the signal to turn off the unit.		
		2. The CPU sends the OFF signal to the drive board.		
3	18-pin Cable	1. The OFF signal travels the 18-pin cable from the display to the drive board.		
4	Drive Board	1. After the drive board receives the OFF signal, the drive board cuts off battery power.		
		2. The drive board PWR indicator shuts off. No power is sent to the display board.		
5	Display Board	1. The display board doesn't receive any power from the drive board.		
		2. The display shuts off.		

Automatic Shut Off Operation – Illustration and Explanation



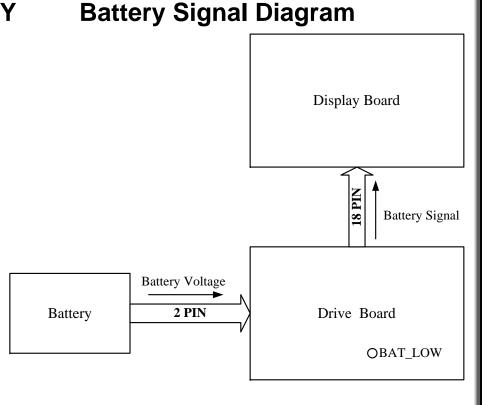
Order	Part	Operation
1	Display Board	1. The display board reads the optic sensor signal to determine whether the unit is in use.
		2. If there is no optic sensor signal for two minutes, the CPU emits an OFF signal to the drive board.
2	18-pin Cable	1. The OFF signal travels the 18-pin cable from the display to the drive board.
3	Drive Board	1. When the drive board receives the OFF signal, it shuts off the VCC voltage.
		2. When the PWR indicator extinguishes, no VCC voltage goes to the display.
4	Display Board	1. The display board doesn't receive any power from the drive board.
		2. The display shuts off.

Message: SERVICE BATTERY

If battery voltage falls below 22 volts, the BAT_LOW LED indicator on the drive board lights, and the display shows the message "SERVICE BATTERY".

Error Message Operation

- 1. Battery voltage travels the 2-pin wire to the drive board.
- 2. The drive board integrated circuit (IC) reads the voltage. If lower than 22 VDC, the BAT_LOW LED indicator on the drive board lights.
- 3. The drive board battery signal travels the 18-pin cable to the display board.
- 4. The display board IC reads the battery signal. "SERVICE BATTERY" appears.



Symptoms of Low Battery Voltage

- 1. Press the <ON> key. The display does not light up.
- 2. Press the <ON> key. The display lights up. "SERVICE BATTERY" appears.
- 3. Press the STRIDE <▲> or <▼> key. "SERVICE BATTERY" appears.
- 4. As soon as one stops exercising on the unit, the display turns off.

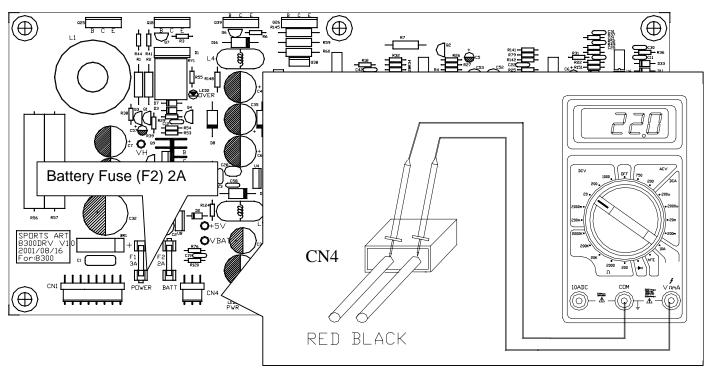
Low Battery Voltage Simulation

- 1. While the display is not lit and no one is on the unit, remove the battery 2-pin cable connection CN4 form the drive board.
- 2. Exercise on the unit. The display lights up.
- 3. BAT_LOW indicator on the drive board lights.
- 4. Press STRIDE UP or DOWN key. The display shows "SERVICE BATTERY".

Troubleshooting

	_			
Item	Part	Troubleshooting		
1	Battery	1. Inspect the battery wire connections. 2. Measure the voltage across the drive board battery wire connector CN4. 3. If less than 22V, exercise on the unit at over 50 steps per minute to recharge the battery use a battery charger to recharge the battery.		
2	Drive Board	 Inspect the battery wire CN4 connector on the drive board. Measure the voltage across the battery wire CN4 connector on the drive board. If the voltage is lower than 22V, the BAT_LOW indicator on the drive board lights. Inspect the battery fuse F4 on the drive board. Replace if necessary. Inspect the connection of CPU U14 pins on the drive board or replace CPU U14. 		

Battery Voltage Test at the Drive Board - Illustration



Battery Test Procedure

- 1. Don't detach any wire connections from the drive board.
- 2. Inspect whether the battery fuse F2 is broken. If so, replace the fuse.
- 3. Place probes on the battery wire connection.
- 4. Normal reading: 26 VDC is good; More than 22 VDC is acceptable.
- 5. If less than 22 VDC, recharge the battery by exercising on the unit at level 1 for at least thirty minutes.

Display Wiring, Signal, Power

DIWSP.01 – Soft Key Signal Flow Diagram and Explanation

DIWSP.02 - Display Keypad and Handle Switch Signal Flow

DIWSP.03 – Wire Connections for Display Board with HRC + HTR

DIWSP.04 - Display Board HTR Board Wire Connections

DIWSP.05 - Display Wiring Connections to All Parts

DIWSP.06 - Display Board Main CPU Location

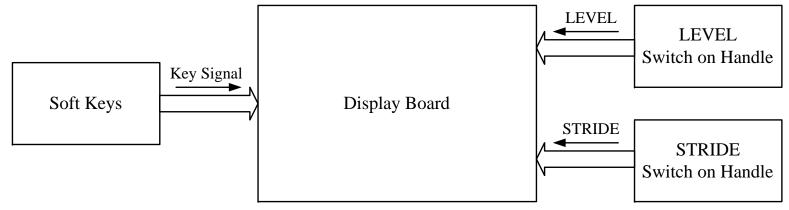
DIWSP.07 - Display Board LED Locations and Functions

DIWSP.08 - Display Board Power LED Location

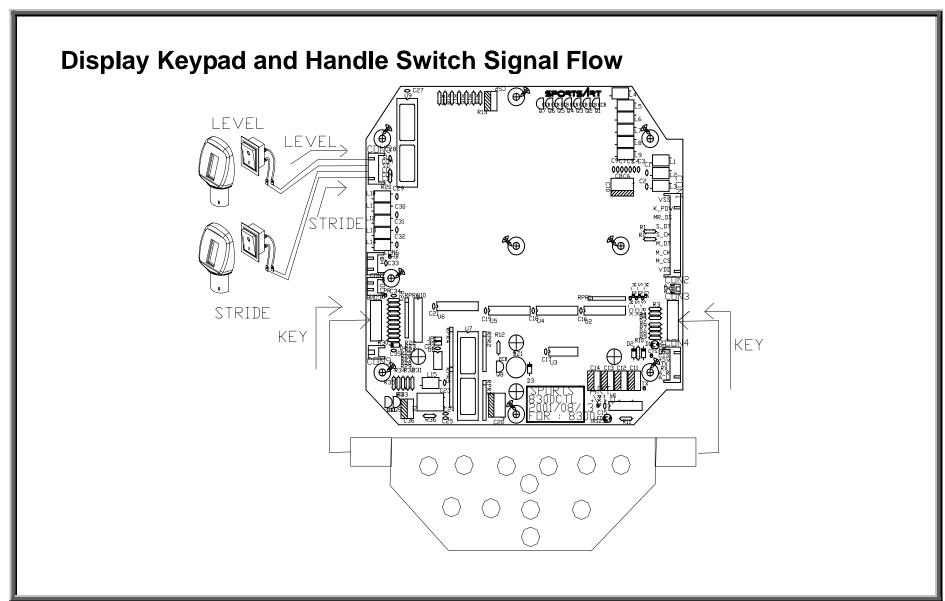
DIWSP.09 – Display Board VCC Voltage Test – Capacitor

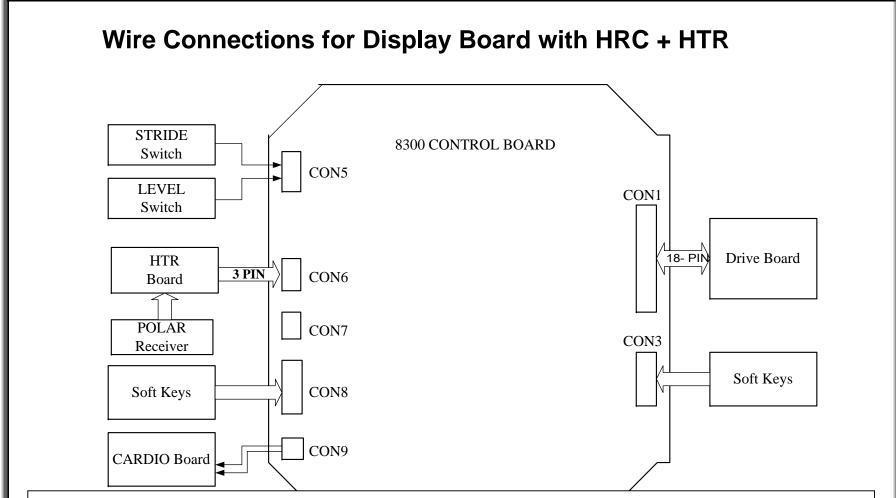
DIWSP.10 – Display Board Power Troubleshooting

Soft Key Signal Flow Diagram and Explanation

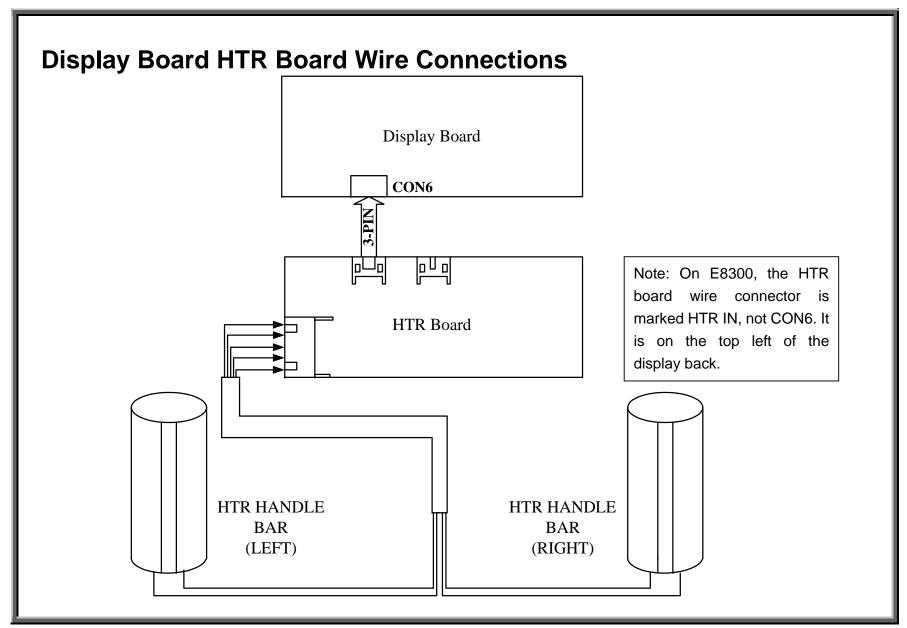


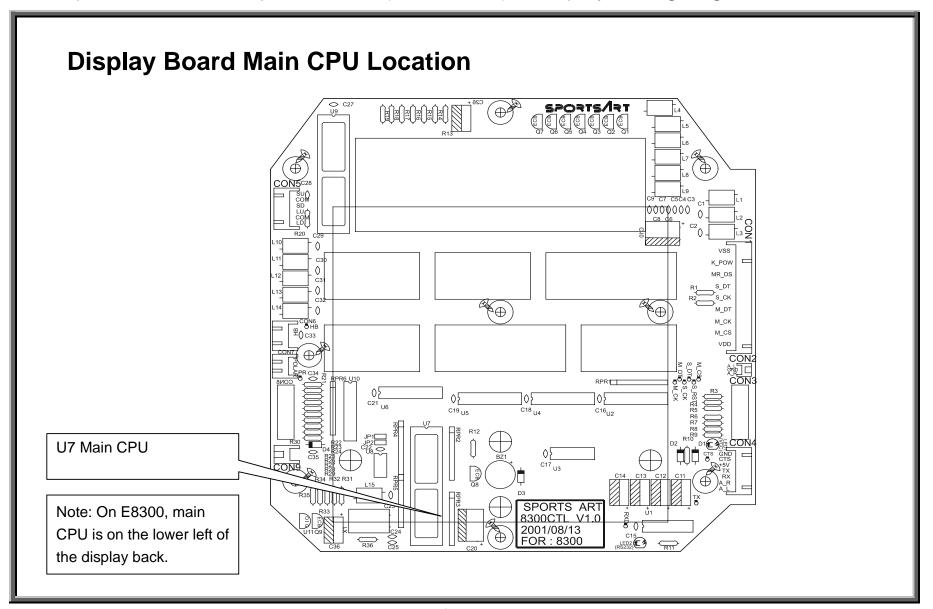
Order	Part	Operation		
1	Soft Kovo	1. Press the display keys.		
l	Soft Keys	The key signal is transmitted to the display board.		
2	LEVEL Switch on Handle	1. Press the LEVEL switch on the handle.		
		2. The signal is transmitted to the display board.		
2	STRIDE Switch on	Press the STRIDE switch on the handle.		
3	Handle	The signal is transmitted to the display board.		
		1. The central processing unit (CPU, the main IC) reads the key or switch		
4	Display Board	signal.		
		2. And the CPU carries out the signal command.		



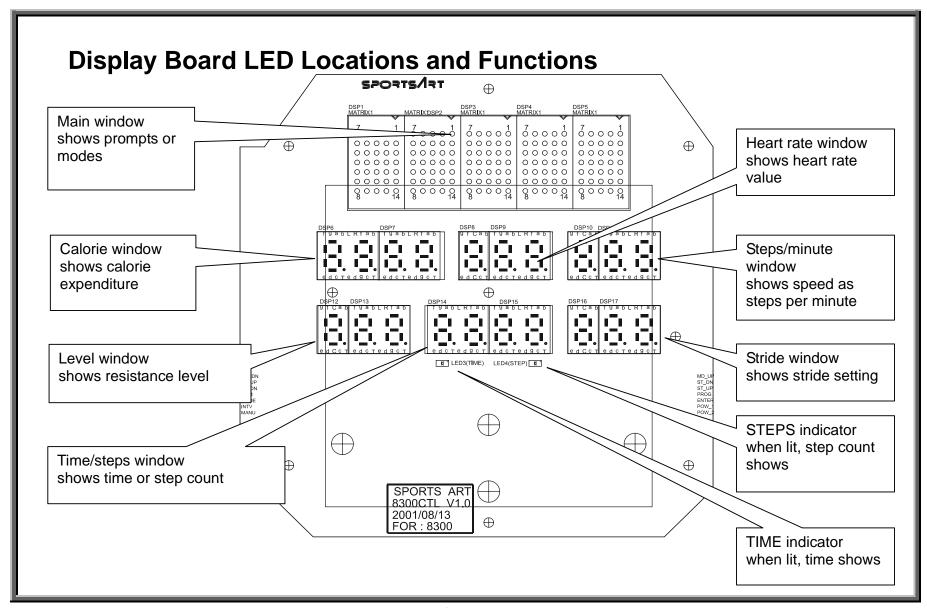


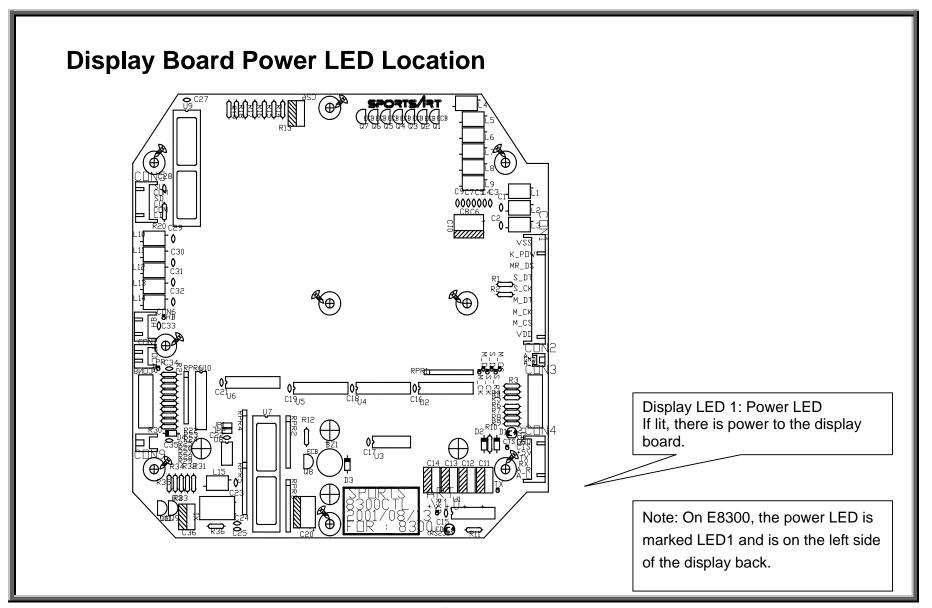
Note: On the E8300, the Polar receiver board wire plugs directly into the display board, rather than into the HTR board. The connector is marked POLAR IN and is on the lower right of the display back. Other connector locations also differ from those of the 8300. On E8300, CON1 is for the main data cable; CON2 is for Level and Stride switch wires.

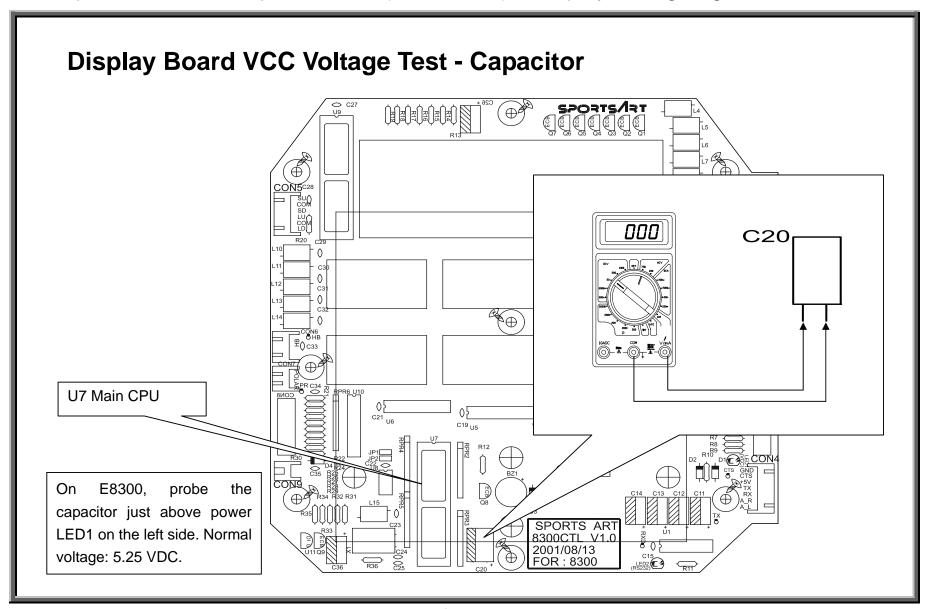




SportsArt - 8300 Repair Manual (Electronics) – Display Wiring, Signal, Power







Display Board Power Troubleshooting

Possible symptom of malfunction: Exercise on the unit or press the display "ON" key. Display doesn't light up.

Other points to inspect: Generator, battery, drive board, and wiring.

Display board inspection points:

- 1. Display power LED lights up if there is power to the display. See page DIWSP.08.
- 2. Capacitor voltage test. See below for details.

Capacitor test:

- 1. Put multimeter to the 20VDC setting. Press the display <ON> key. The display should "beep" once and show "MAN'L".
- 2. Place meter probes as shown on the two legs of the capacitor (Illustration DIWSP.9).
- 3. If the POWER indicator on the drive board is lit, the multimeter should read 5 VDC.
- 4. If there is 5 VDC across the capacitor legs, but the display doesn't light, press down on display board ICs to ensure good contact.
- 5. If there is not 5VDC across the capacitor legs, inspect whether the drive board has 5 VDC.

SportsArt - 8300 Repair Manual (Electronics) – Drive Board Wiring, LEDs, Power

Drive Board Wiring, LEDs, Power

DRWLP.01 - Drive Board Wire Connections

DRWLP.02 - Drive Board Component Placement

DRWLP.03 - Drive Board LED Indicators: Stride and Optic Sensor

DRWLP.04 - Drive Board LED Indicators: Stride and Battery

DRWLP.05 - Drive Board LED Indicators: Stride, CLK, Power

DRWLP.06 - Symptoms of a Drive Board Malfunction, Troubleshooting

DRWLP.07 - Drive Board Circuit Definitions, Circuit Voltage Specifications

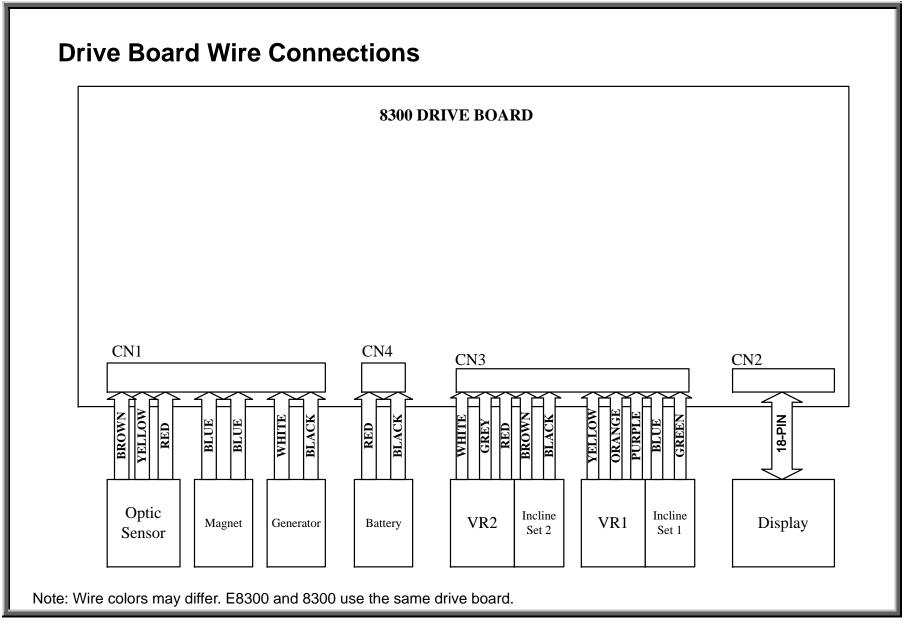
DRWLP.08 – Drive Board VH Voltage Test

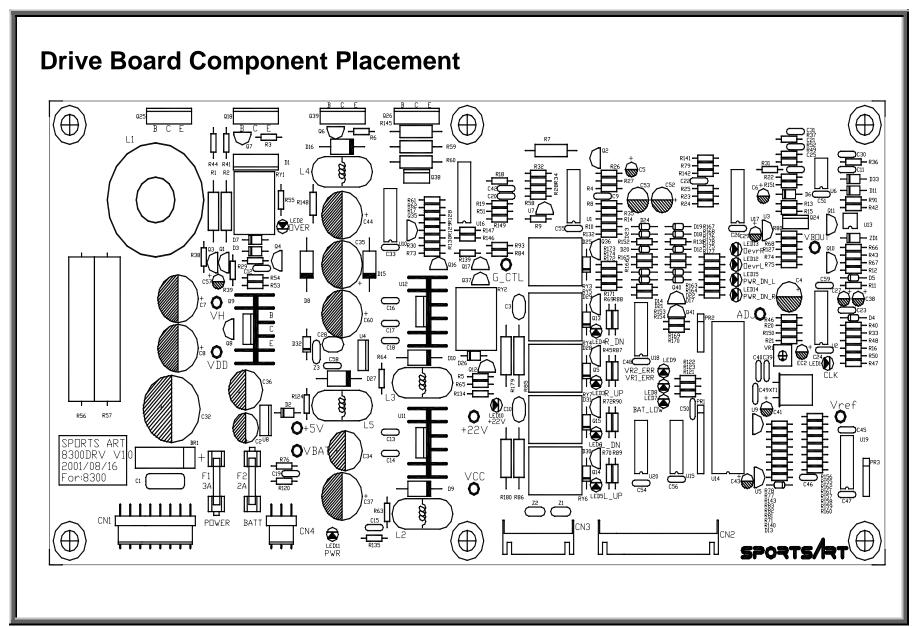
DRWLP.09 - Drive Board VDD Voltage Test

DRWLP.10 - Drive Board +5V Voltage Test

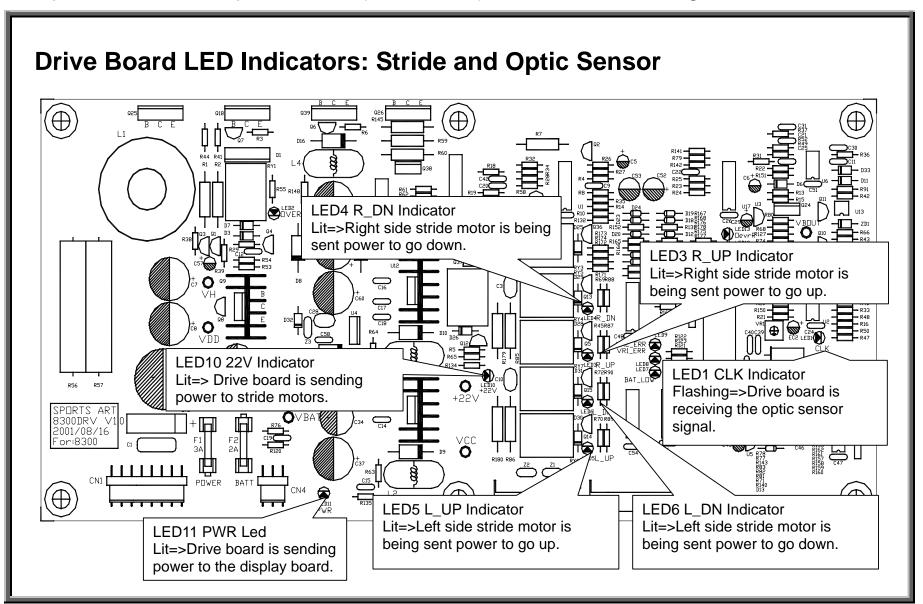
DRWLP.11 – Drive Board VCC Voltage Test

SportsArt - 8300 Repair Manual (Electronics) - Drive Board Wiring, LEDs, Power

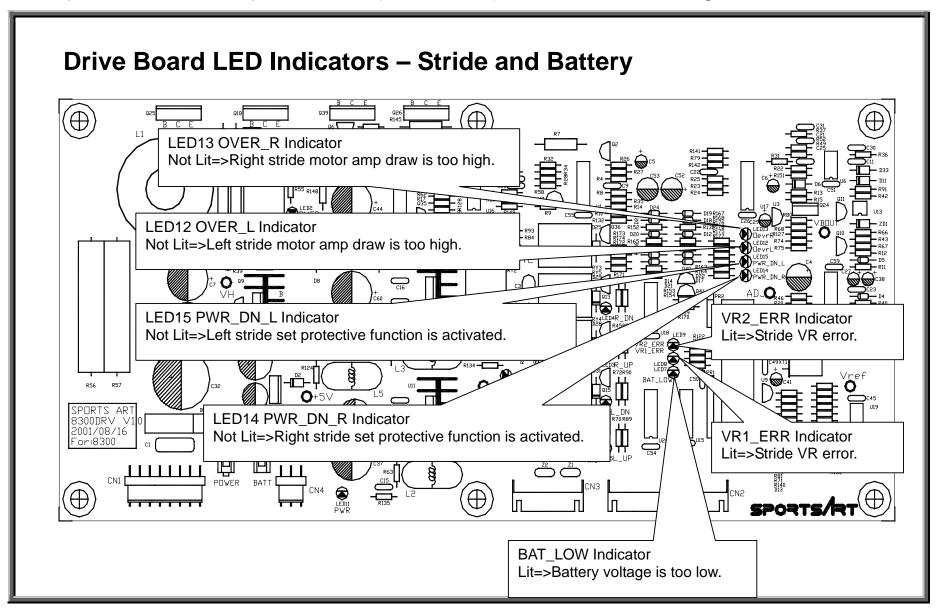




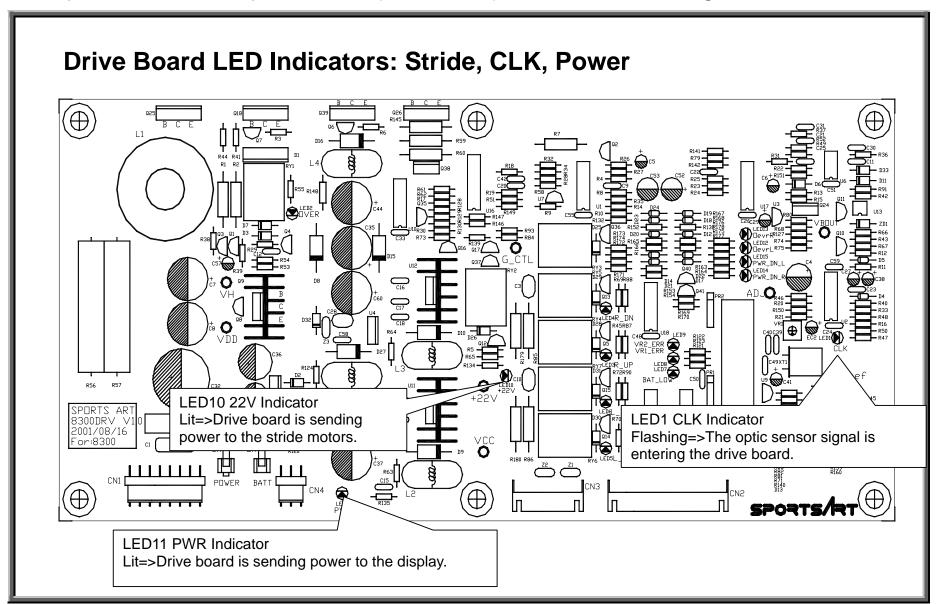
SportsArt - 8300 Repair Manual (Electronics) – Drive Board Wiring, LEDs, Power



SportsArt - 8300 Repair Manual (Electronics) – Drive Board Wiring, LEDs, Power



SportsArt - 8300 Repair Manual (Electronics) - Drive Board Wiring, LEDs, Power



SportsArt - 8300 Repair Manual (Electronics) – Drive Board Wiring, LEDs, Power

Symptoms of Drive Board Malfunction

- 1. User exercises on the unit, but the display does not light up.
- 2. User exercises on the unit, but there is no resistance.

Troubleshooting

Since symptoms above could also suggest generator or magnet issues, please refer to those sections as well.

- 1. Inspect drive board fuse F1 2A. Replace if necessary.
- 2. To ensure that the issue isn't related to the generator, test generator voltage at the drive board. Normal reading: 20 VDC.
- 3. Inspect drive board LEDs, and measure drive board power as follows.
- 4. If drive board voltage readings differ from specifications on the following page, replace the drive board.

SportsArt - 8300 Repair Manual (Electronics) – Drive Board Wiring, LEDs, Power

Drive Board Circuit Definitions

The 8300 drive board has test points for voltages that power various functions. Below is a list of these voltage names, along with an explanation of their duty. Measuring voltages at various test points is easy: Put the multimeter black probe on the CN1 ground pin. Put the red probe on the test ring mentioned.

Circuit Voltage Specifications

Test		Location	VDC	Note
VH	Provides unit operating power. Comes from generator.	VH test ring: left mid		Note: If generator isn't operating, there is no VH power.
VDD	Supplies power to the magnet for resistance.	VDD test ring: left mid		Note: Voltage can be measured here even if the resistance circuit is not activated. (Check)
+5V	Drive board 5V circuit power.	+5V test ring: left low	5	
VBAT	Supplies operating power. Comes from battery.	VBAT test ring: left low	22	
+22V	Provides power to stride motor.	+22V test ring: mid low		LED10 lights when stride operates. LED10 is in middle of the board.
VCC Test	Supplies drive and display board 5V power.	VCC test ring: mid low	5 VDC	

Other test points are beyond the scope of this manual.

G-CTL - Used to control the display power signal.

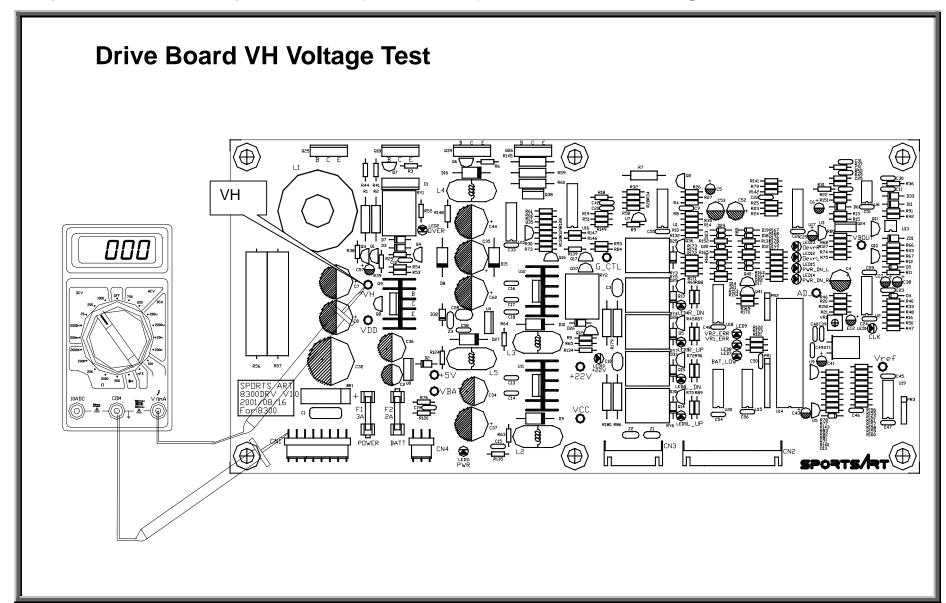
VBOUT - Battery recharge voltage. If Battery is too low, the VBOUT circuit opens to replenish voltage.

ADJ - Used to adjust resistance voltage.

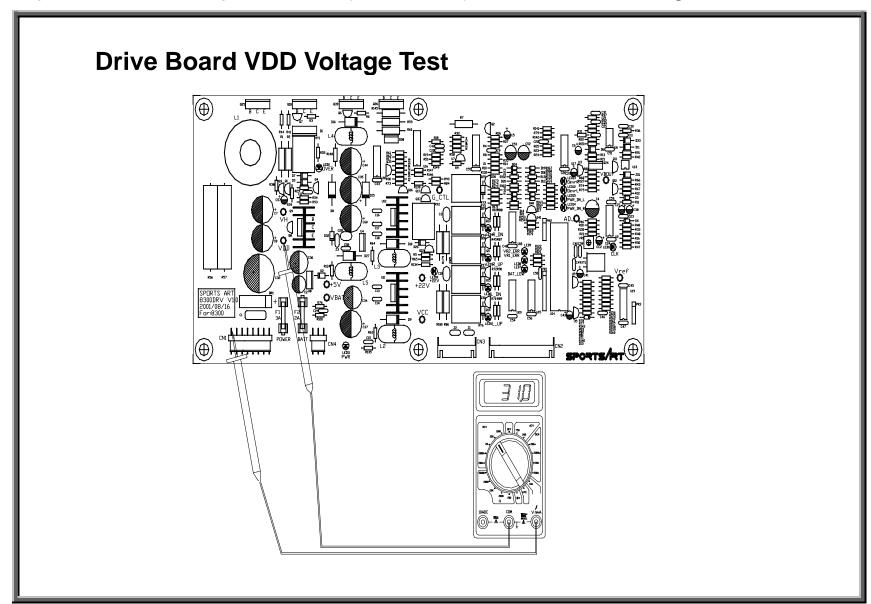
VREF – Used as a reference value in IC U14's transformation of AC to DC voltage.

OVER LED2 – This LED has no function in production units.

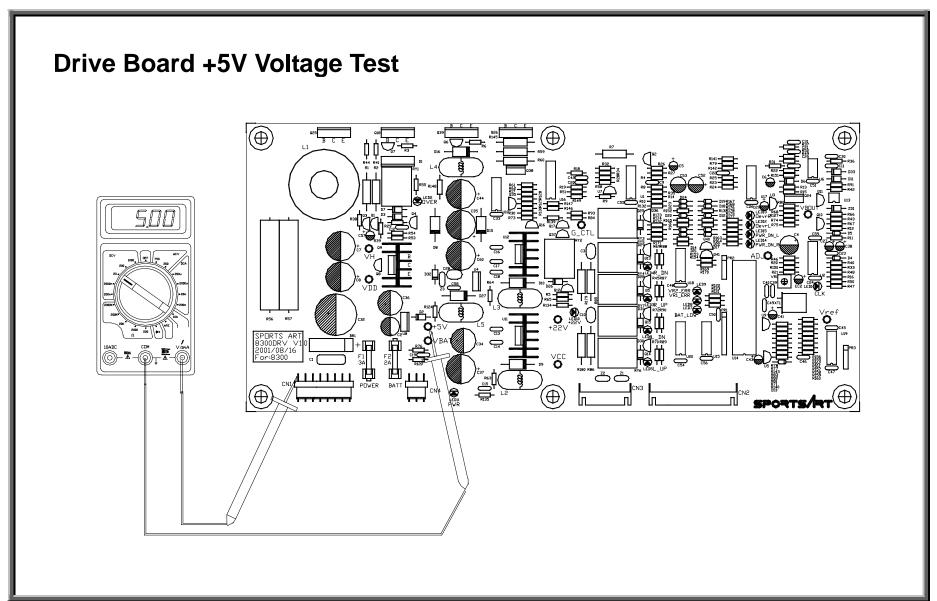
SportsArt - 8300 Repair Manual (Electronics) - Drive Board Wiring, LEDs, Power



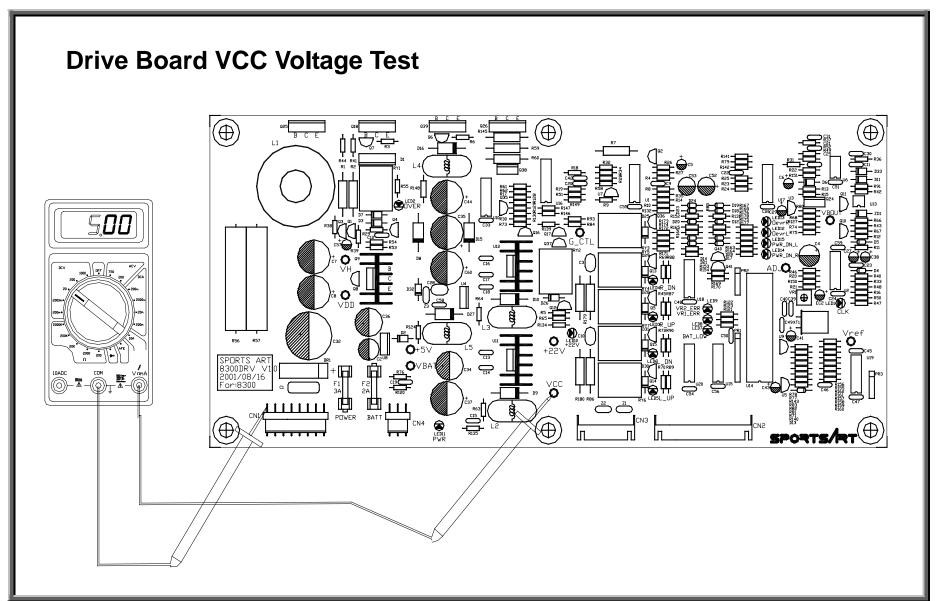
SportsArt - 8300 Repair Manual (Electronics) - Drive Board Wiring, LEDs, Power



SportsArt - 8300 Repair Manual (Electronics) – Drive Board Wiring, LEDs, Power

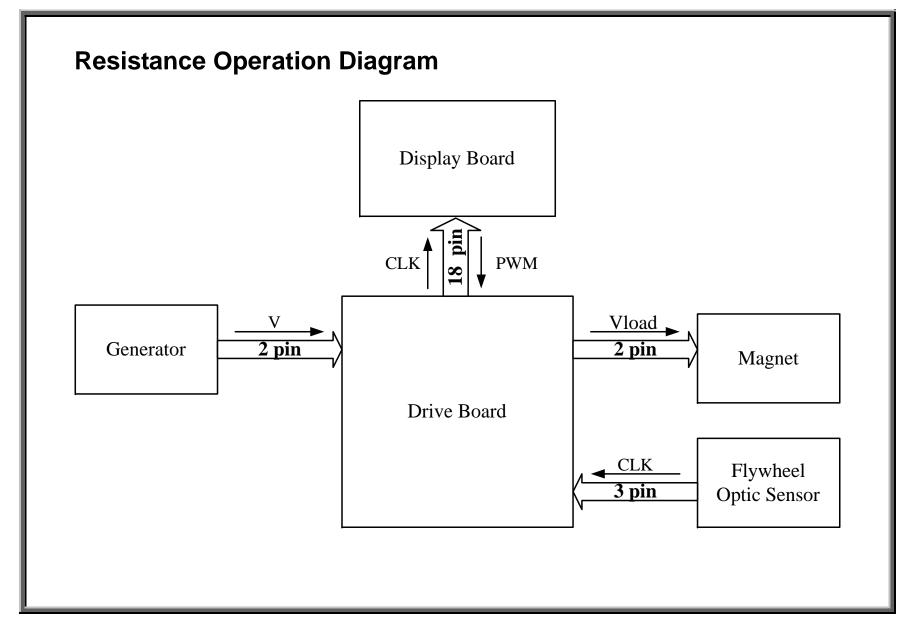


SportsArt - 8300 Repair Manual (Electronics) - Drive Board Wiring, LEDs, Power



Resistance

- RES.01 Resistance Operation Diagram
- RES.02 Resistance Operation
- RES.03 Resistance Operation Illustration
- RES.04 Symptoms of a Malfunction, Troubleshooting
- RES.05 Drive Board VDD (Resistance) Circuit Voltage Test
- RES.06 Resistance Voltage Test at Wires on Drive Board
- RES.07 Magnet Ohm Test

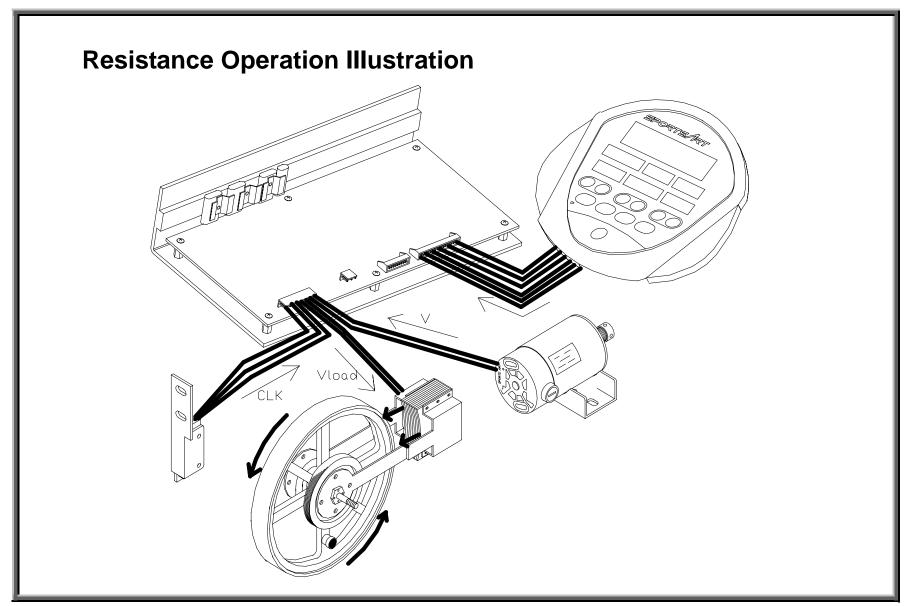


Resistance Operation

The following tells what happens when the user presses LEVEL< ${\color{red} \bullet}{\color{black}}{\color{black}}{\color{black}}$ or LEVEL< ${\color{red} \bullet}{\color{black}}{\color{black}}{\color{black}}$ while exercising.

Resistance Minimum: 1. Maximum: 20.

Order	Part	Operation
1		 Exercise on the unit. The flywheel rotates. The generator produces power for the drive and display board. For details, refer to generator operation.
2	Infrared	1. The optic sensor detects the flywheel speed. After processing by the drive board, the optic
3	Display Board	1. The display board detects the optic sensor signal. The STEPS/MIN window shows the speed. 2. The display CPU emits the PWM signal to the drive board to control the resistance level.
4	18-pin Cable	The display board PWM signal travels the 18-pin cable to the drive board.
5	II Iriva Board	 The drive board translates the PWM signal into load voltage. The drive board sends voltage to the magnet, producing resistance. The higher the voltage, the higher the resistance. The lower the voltage, the lower the resistance.
6	Magnet	 Voltage from the drive board produces magnetic pull on the flywheel, creating resistance. The higher the voltage, the stronger the magnetic pull on the flywheel, the slower the flywheel rotates.



Symptoms of a Malfunction

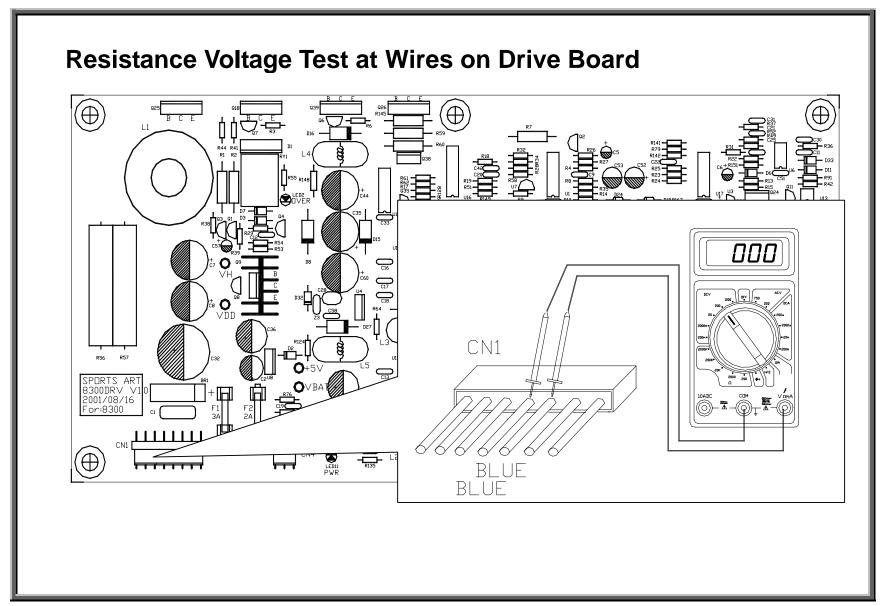
- 1. Exercise on the unit. Press LEVEL Up key. The display LEVEL value increases but there is no resistance.
- 2. Exercise on the unit. Drive board F1 2A fuse breaks.

Troubleshooting

Inspect four areas.

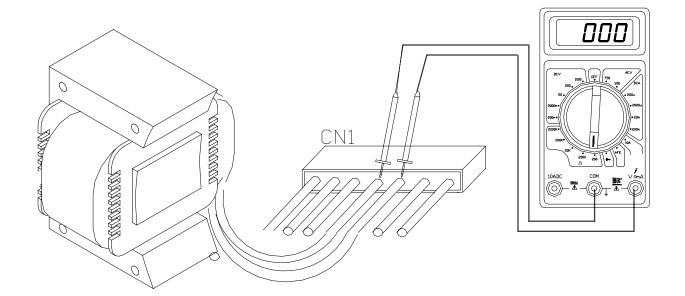
- 1. The drive board F1 2 Amp fuse. Replace if necessary.
- 2. Drive board VDD voltage. Put multimeter to the 200 VDC setting. Place the black probe on the CN1 connector ground pin on the drive board. Place the red probe on the VDD test point. Normal reading: 30-33VDC. See illustration on RES.05.
- 3. Drive board power to the magnet. Put multimeter to the 200 VDC setting. Place probes on the blue connector points. Press Level UP key. Normal reading: 0.5 to 20 VDC. Voltage varies according to the level setting. The higher the level, the higher the voltage. If the multimeter shows 25 VDC and no voltage fluctuation, there is full resistance. If the multimeter shows 0 VDC, the drive board is not sending voltage to the magnet. There will be no resistance. See illustration RES.06.
- 4. Magnet Ohm reading. Remove the CON1 wire connection from the drive board. Put multimeter to the 200 Ohm setting. Place probes on the blue wire connector points. Normal Ohm reading: 16 20 Ohms. If not as above, the magnet has either a short or an open (broken) circuit. See illustration RES.07.
- 5. Magnet Current leakage test. Remove the CON1 wire connection from the drive board. Put multimeter to the 200 Ohm setting. Place the red probe on the CN1 blue wire. Place the black probe on a screw or metal part of the unit. If the reading doesn't change whatsoever, the magnet has not shorted out on the unit. If the multimeter shows a number like 0.4 Ohm, the magnet wire is contacting the unit and there is a short. Sometimes this can be fixed by putting electrical tape on the magnet wire where it contacts the flywheel support bracket. Inspect CN2 blue wire in the same way.

Drive Board VDD (Resistance) Circuit Voltage Test



Magnet OHM Test

MAGNET



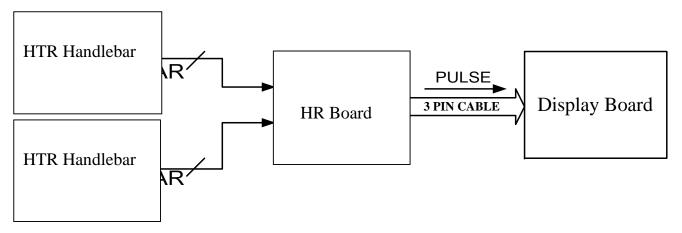
Note: Disconnect magnet wires from the drive board. Place probes on the two blue wires. Normal Reading: 16-20 Ohms. If not 16-20 Ohms, the magnet has a short or an open (broken) circuit.

SportsArt - 8300 Repair Manual (Electronics) - Heart Rate

HR.01 – Heart Touch Rate (HTR) Operation Diagram, Heart Touch Rate (HTR) Operation HR.02 – POLAR Heart Rate Operation Diagram, POLAR Heart Rate Operation Explanation HR.03 – Heart Touch Rate Board Diagram, Heart Touch Rate Board LED Indicator Definitions HR.04 – Error Message: ERR12, ERR 12 Troubleshooting Chart HR.05 – Possible Problems with HTR and Polar, Troubleshooting Chart

SportsArt - 8300 Repair Manual (Electronics) - Heart Rate

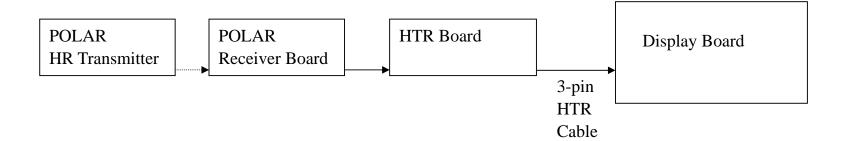
Heart Touch Rate (HTR) Operation Diagram



Heart Touch Rate (HTR) Operation

Order	Part	Operation
	HTR Handlebar	1.Place both hands on the HTR handlebars. The handlebars allow detection of the user's pulse.
1		2.The pulse signal travels from the handlebars, via wiring, to the HTR board.
		3.LED2 and LED4 on the HTR board light up when the user holds onto the handlebars.
2	HTR Board	1.The HTR board receives, processes, and transmits pulse signals.
		2.LED3 flashes each time an incoming pulse signal is received.
		2.LED4 flashes each time an outgoing pulse signal is sent to the display board.
		3. HTR board sends its heart rate signal to the display board.
3	3-PIN Cable	1. The heart rate signal travels the 3-pin cable from the HTR board to the display board.
4	Dioploy	1. The display board CPU detects the digital heart rate signal and determines the heart rate value.
	Display	2. The display PULSE window shows the heart rate value.

POLAR Heart Rate (HR) Operation Diagram

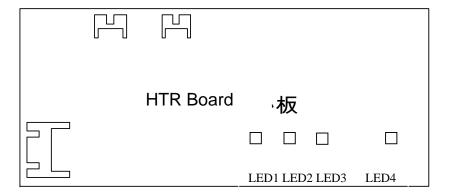


POLAR Heart Rate (HR) Operation Explanation

Order	Part	Operation	
1	HR	POLAR transmitter detects the user's heart rate.	
	Transmitter	Then it transmits the heart rate signal to the receiver.	
2	POLAK HK	 The POLAR receiver board receives the POLAR transmitter signal. The POLAR signal goes to the HTR board. After processing the heart rate signal, the HTR board sends it to the display board. 	
3	3-PIN Cable	1. The heart rate signal travels the 3-pin cable from the HTR board to the display board.	
4		 The CPU detects the heart rate signal. The display shows the heart rate value in the PULSE window. 	

SportsArt - 8300 Repair Manual (Electronics) - Heart Rate

Heart Touch Rate Board Diagram



Heart Touch Rate Board LED Indicator Definitions

HTR	LED1	LED2	LED3	LED4
Board				
HTR				Lights when HTR handlebars are held; Flashes when HTR signal is
		handlebars.		sent to display.
Polar	Flashes to indicate incoming POLAR signal.		•	Flashes when POLAR signal is sent to display.

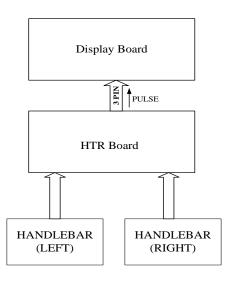
Error Message: ERR12

Note: ERR12 was eliminated from the programming in products made after Sept. 22, 2001. To troubleshoot ERR12, first check that there is no mechanical reason for ERR12 (below). Then replace the main program IC chip with an updated version.

Definition – The pulse signal arriving at the HTR board is too unclear to produce a heart rate reading on the display. Note: ERR12 can indicate a user error. Hold both hands firmly on the HTR handlebars and do not move them while exercising.

ERR12 Troubleshooting Chart

Part	Troubleshooting
HTR	1. Inspect whether the handlebar HTR wire is
Handlebars	broken or shorting out.
	2. Hold onto the HTR handlebar. Inspect whether
	HR board LED2 and LED4 light. If not, the HTR
	board or wire is bad.
HTR Board	1. Inspect the LEDs on the heart rate board for
	irregularities. See HR.03. For example, if LED2 and
	LED3 lights but LED4 never flashes, the HTR board
	is bad.
3-Pin HTR	1. Inspect whether the cable is connected firmly.
Cable	Inspect for break or short.
Display Board	1. Inspect the cable connection. Inspect U7 IC
	connection.



SportsArt - 8300 Repair Manual (Electronics) - Heart Rate

Possible Problems with HTR and Polar

Possible problems include the following:

(1) Hold onto the HTR handlebar or strap on a Polar heart rate transmitter. The display PULSE window shows no heart rate value. (2) PULSE window shows the heart rate value inappropriately -- when the unit is first turned on or when no one touches the HTR handlebar or no one wears the Polar strap. (3) Heart rate value appears during exercise when no one touches the HTR handlebar or no one is wearing a Polar strap. (4) Place hands on the HTR handlebar or wear the Polar strap. The display PULSE window value differs too much from the user's actual heart rate.

Troubleshooting Chart

Malfunction	Cause	Part in Question
LED1 (POLAR) not	POLAR receiver is not detecting a heart rate or the signal	POLAR transmitter, POLAR receiver board,
flashing	is not getting to the HR board.	wires
LED2 (HTR) not	HTR handlebar is not being held or there is no detection of	HTR handlebar, wire from HTR board to
lighting	a signal at the HR board.	handlebar
LED3 (HTR) not	Signal is not arriving from HTR handlebars.	HTR handlebar, cable, HR board
flashing		
LED4 (HTR+POLAR)	POLAR receiver or HTR is not emitting a heart rate signal	If all other HR board LEDs are normal,
not flashing	to the display.	replace the HR board.
Display Shows No	If HR board LEDs are normal, inspect the 3-pin cable, its	3-pin cable, connections, display board
HR Value	connections, and the display board	

Stride Operation

STRIDE.01 – Stride Operation Diagram

STRIDE.02 – Stride Operation Illustration

STRIDE.03 – Stride Power Operation

STRIDE.04 - Stride Indicators on the Drive Board

STRIDE.05 – Stride Up/Down Operation

STRIDE.06 - Stride Indicator LEDs on the Drive Board

STRIDE.07 - Stride VR Feedback Process

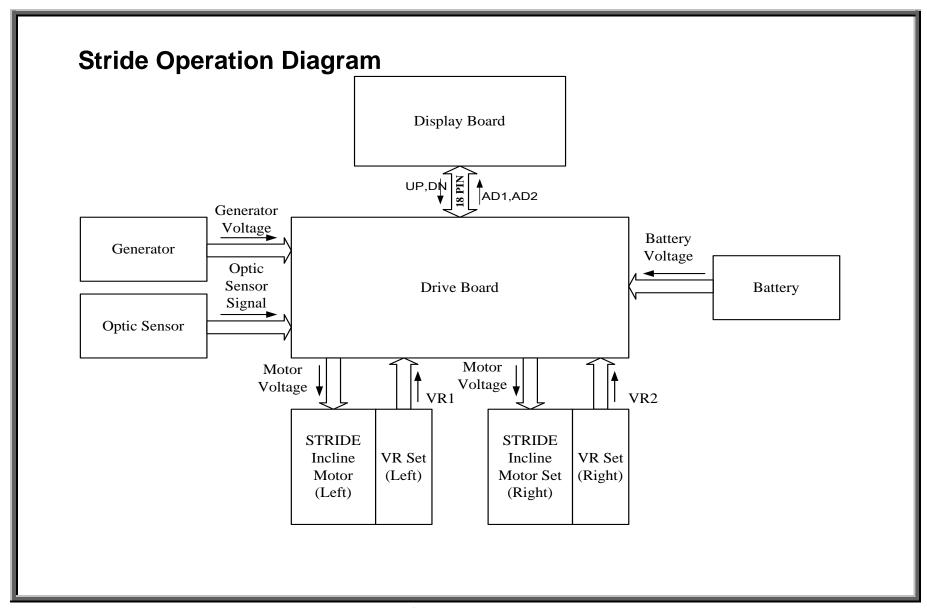
STRIDE.08 – Stride Motor Protective Function

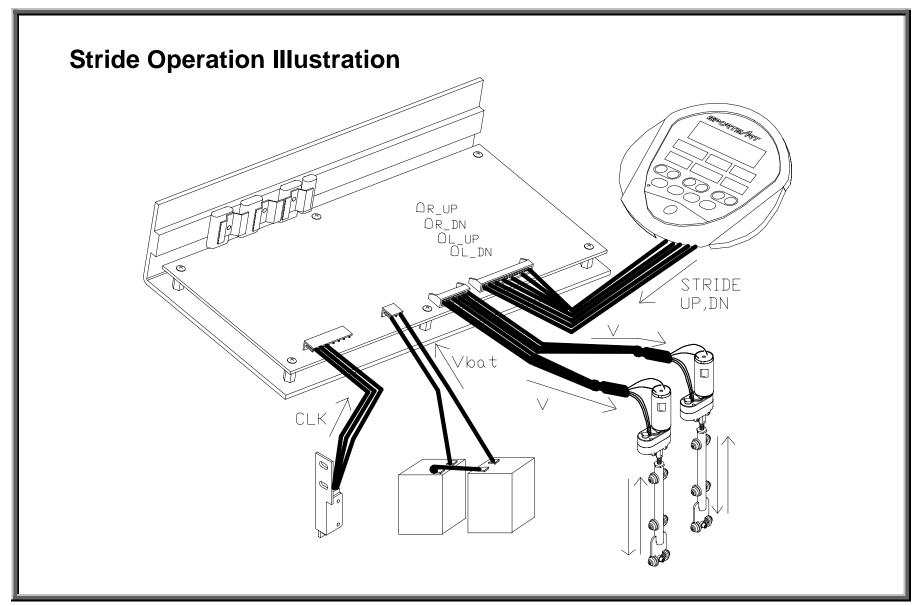
STRIDE.09 - Stride Motor Protective Function - Drive Board Indicators

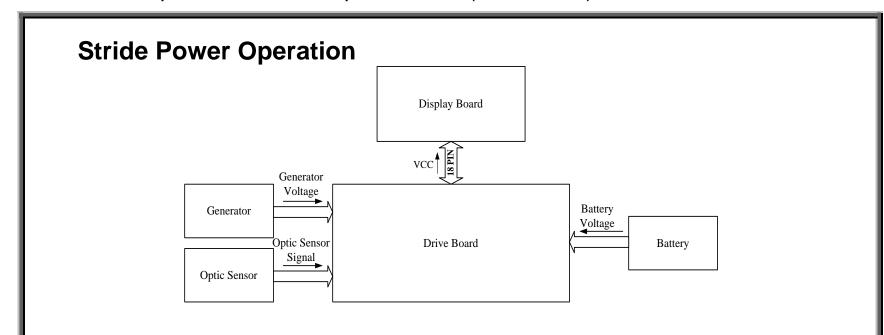
STRIDE.10 – Stride Protection LEDs Under Stride Malfunction

STRIDE.11 – Stride VR Protective Function

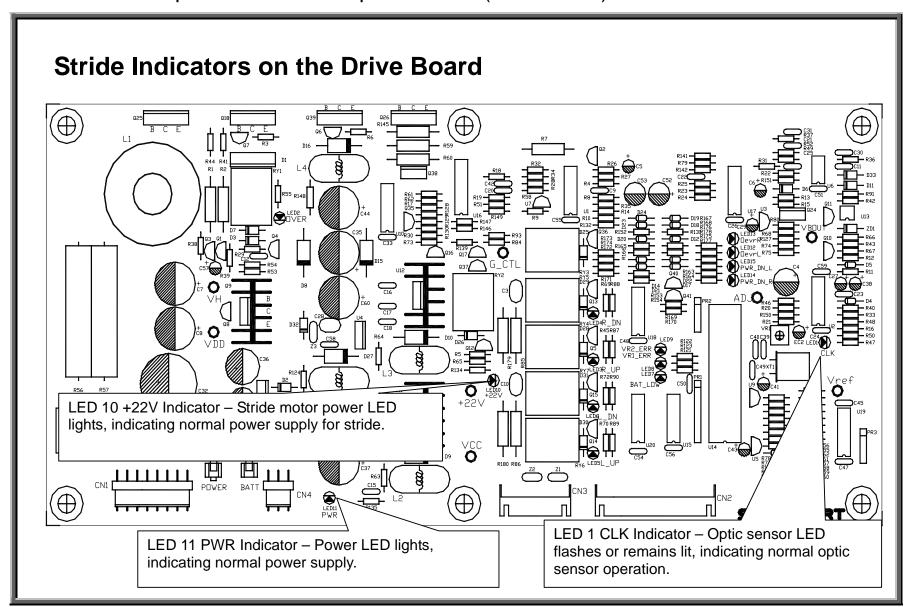
STRIDE.12 - Stride VR Protective Function LEDs





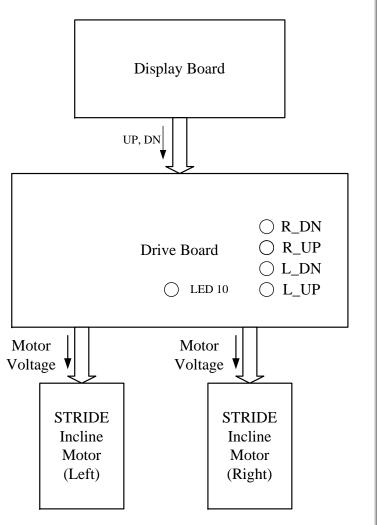


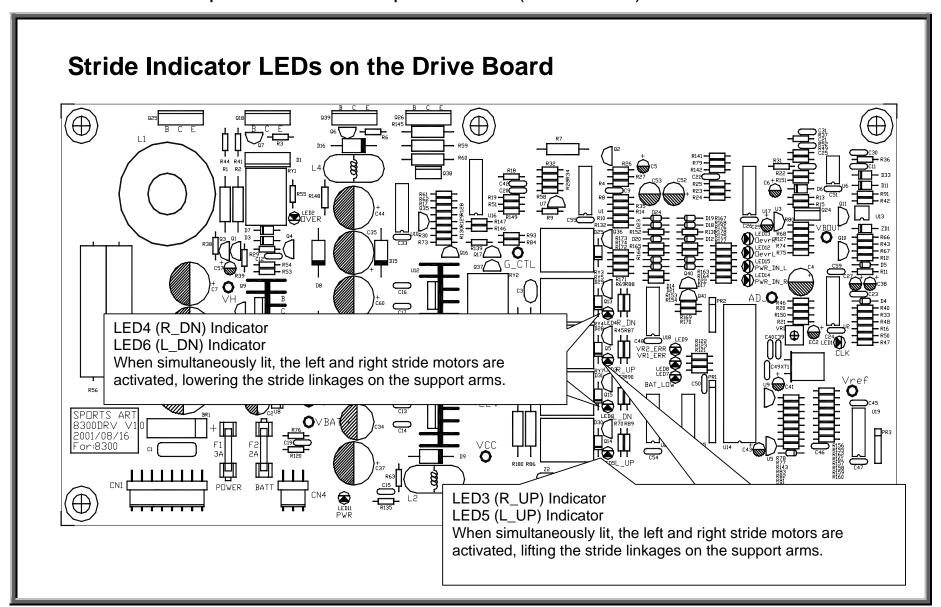
Order	Part	Operation
1	Generator	Exercise on the unit. The generator produces power for the drive board.
		2. Refer to the generator start up process
2	Optic	1. Exercise on the unit. The optic sensor detects the flywheel speed and transmits its signal to the
	Sensor	drive board and display board.
		Refer to the optic sensor operation process.
3	Battery	The battery provides the power for stride incline action.
4		After processing the generator power, the drive board PWR indicator lights, indicating that
		power is being provided to the drive and display boards.
		2. The optic sensor signal enters the drive board, the drive board CLK indicator flashes or
		remains lit, and the optic sensor signal travels the cable to the display board.
		3. After the battery voltage is processed, LED 10 lights, indicating that power is being provided to
		the stride motor (22 VDC).



Stride Up/Down Operation

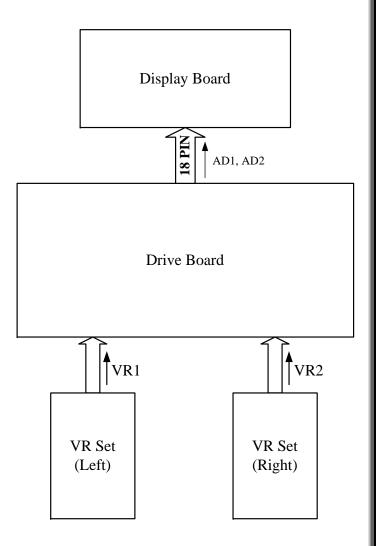
Order	Part	Operation
1	Display	 The CPU detects whether there is an optic sensor signal. If there is, then the STRIDE function is activated. The CPU reads the STRIDE keypad signal. The CPU emits the STRIDE up/down signal to the drive board.
2	18-PIN Cable	The STRIDE up/down signal travels the 18-pin cable from the display to the drive board.
3	Drive Board	 When the STRIDE operates up, the drive board L_UP and R_UP indicators light, indicating that the drive board is sending positive voltage to stride motors on both sides for UP action. When the STRIDE operates down, the drive board R_DN and L_DN indicators light, indicating that the drive board is emitting negative voltage to stride motors on both sides for DOWN action.





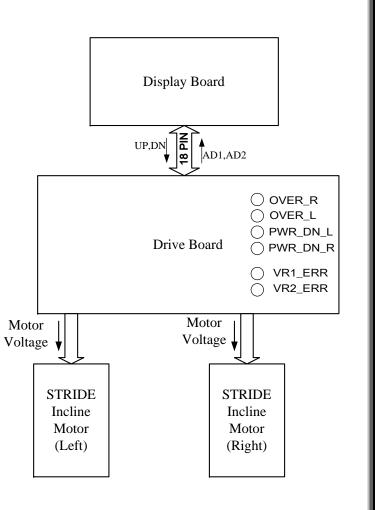
Stride VR Feedback Process

Order	Part	Operation
1	Left,	1. Left and right motor operation drives the VR set.
	Right	2. As the VR moves, the STRIDE incline VR value
	VR Set	changes. The VR value change is transmitted to the
		drive board.
2	Incline	1. The VR value signal travels this wire to the drive
	VR	board.
	Wire	
3	Drive	1. The drive board CPU reads the VR values from
	Board	both sides and transforms the VR values into AD1,
		AD2 values.
		2. The drive board sends the AD values to the
		display board.
4	18-pin	The STRIDE AD value travels the 18-pin cable
	Cable	from the drive board to the display board.
5	Display	1. The display board reads the STRIDE AD value,
	Board	thus detecting the position of the stride linkage on
		the stride support arm.
		2. If the STRIDE AD value and the display setting
		differ too much, the CPU stops emitting the STRIDE
		action signal, and the stride linkage stops moving.



Stride Motor Protective Function

#	Part	Operation
1	Display	 User presses stride UP or DOWN key.
		UP - Display board emits the stride UP signal, making the
		stride motor lift the stride linkage.
		DN - Display board emits the stride DN signal, making
		the stride motor lower the stride linkage.
2	Drive	1. When the drive board receives the stride UP signal,
	Board	the UP signal indicator lights, the drive board sends
		power to the incline motor, making it operate.
		2. When the drive board receives the STRIDE DN signal,
		the DN signal indicator lights, the drive board sends
<u> </u>		power to the incline motor, making it operate.
3	Stride	1. The stride motor operates.
	Motor	2. The stride length increases or decreases.
4	Drive	The drive board protective circuit tests the STRIDE
	Board	motor current.
		2. If the stride motor current is excessive (stuck), the
		drive board OVER_L or OVER_R indicator extinguishes.
		3. After 50 seconds, the PWR_ON_L or PWR_ON_R
		extinguishes. The drive board shuts off incline STRIDE
		motor voltage, stopping incline motor action.



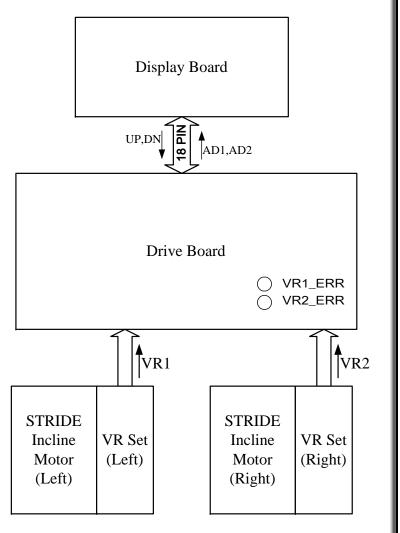
Stride Protective Function - Drive Board Indicators (\oplus) OVER_R, OVER_L 1. When the right stride motor is stuck, the drive board OVER R indicator extinguishes. 2. When the left stride motor is stuck, the drive board OVER_L indicator extinguishes. PWR DN R, PWR DN L 1. After the OVER_R indicator extinguishes 50 seconds, the PWR_ON_R indicator extinguishes, and the stride stops SPORTS ART 8300DRV V1 operating. 2. After the OVER_L indicator extinguishes 50 seconds, the 2001/08/16 or:8300 PWR_ON_L indicator extinguishes, and the stride stops operating.

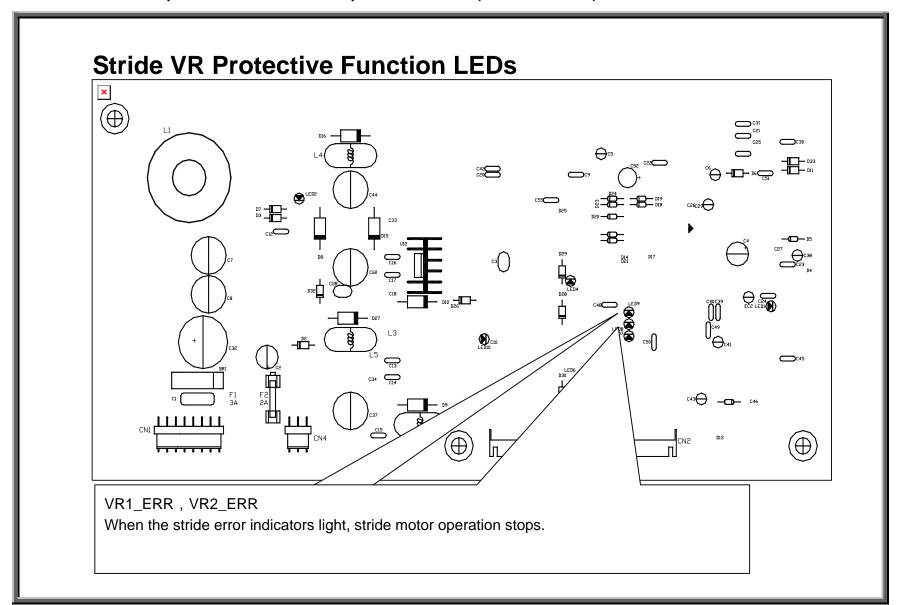
Stride Protection LEDs Under Stride Malfunction

Step	Operation
1	Exercise on the unit. Under normal conditions, drive board OVER_R, OVER_L, PWR_ON_R, PWR_ON_L
	indicators light.
2	Press the STRIDE UP or DOWN key to make the stride motor operate.
	Example of malfunction in right stride motor: Right stride motor gets stuck; the drive board OVER_R indicator extinguishes.
3	
	Example of malfunction in the left stride motor: Left stride motor gets stuck; the drive board OVER_L indicator
	extinguishes.
4	After 50 seconds, the drive board PWR_ON_R indicator extinguishes. Stride motor action stops.

Stride VR Protection Function

Part	Operation
VR set	1. Stride motor movement turns the VR gear, making the
	VR value change.
	2. When the stride motor operates up, the VR voltage
	increases.
	3. When the stride motor operates down, the VR voltage
1 12	decreases.
	1. The VR1, VR2 voltage travels the incline wire to the
	drive board.
	The drive board sends the VR1, VR2 signal to the display
	board.
•	1. The drive board VR1, VR2 voltage travels the 18-pin
	cable to the display.
Display Board	1. The CPU reads the VR1, VR2 value to determine the stride motor position.
	2. If the CPU detects that the VR1, VR2 voltage exceeds
	the range of 0.7V-4.5V, it sends an "off" signal to the drive board.
	3. If the CPU doesn't detect a VR1, VR2 voltage change
	when the motor is operating, ERR7 appears on the
	display.
Drive	1. Drive board receives the signal from the display. Drive
Board	board VR1_ERR, VR2_ERR indicator lights.
	2. The drive board shuts off power to the stride motor.
	Stride motor stop operating.
	Incline Set Wire Drive Board 18-pin Cable Display Board





SportsArt - 8300 Repair Manual (Electronics) – Stride Window Flashes

Stride Window Flashes

SWF.01 – Error Message: Stride Window Flashes, Diagram

SWF.02 – Stride Function Illustration

SWF-S.01 - Stride Window Flashes - Speed

SWF-S.02 - Optic Sensor and Battery Role in Stride Operation

SWF-S.03 – Stride Window Flashes – Speed – Operation Flow Chart

SWF-S.04 - Stride Window Flashes - Speed - Operation Flow Chart (Cont.)

SWF-S.05 - Speed Issue Troubleshooting

SWF-NSO.01 - Stride Window Flashes - No Operation

SWF-NSO.02 - No Stride Operation - Stride Window Flashes - Flow Chart

SWF-NSO.03 - No Stride Operation - Stride Window Flashes - Flow Chart (Cont.)

SWF-NSO.04 - No Stride Operation - Stride Window Flashes - Flow Chart (Cont.)

SWF-NSO.05 - No Stride Operation - Stride Window Flashes - Troubleshooting

SWF-VRER.01 - Stride Window Flashes - VR Error

SWF-VRER.02 - Stride Window Flashes - VR Voltage Exceeds Range - Illustration

SWF-VRER.03 – Stride Window Flashes – VR Voltage Exceeds Range – Explanation

SWF-VRER.04 – Stride Window Flashes – VR Exceeds Range – Flow Chart

SWF-VRER.05 – Stride Window Flashes – VR Exceeds Range – Flow Chart (Cont.)

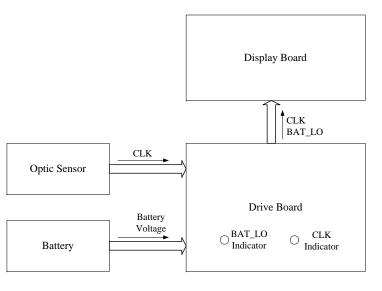
SWF-VRER.06 - Stride Window Flashes - VR Exceeds Range - Troubleshooting

SportsArt - 8300 Repair Manual (Electronics) - Stride Window Flashes - Speed

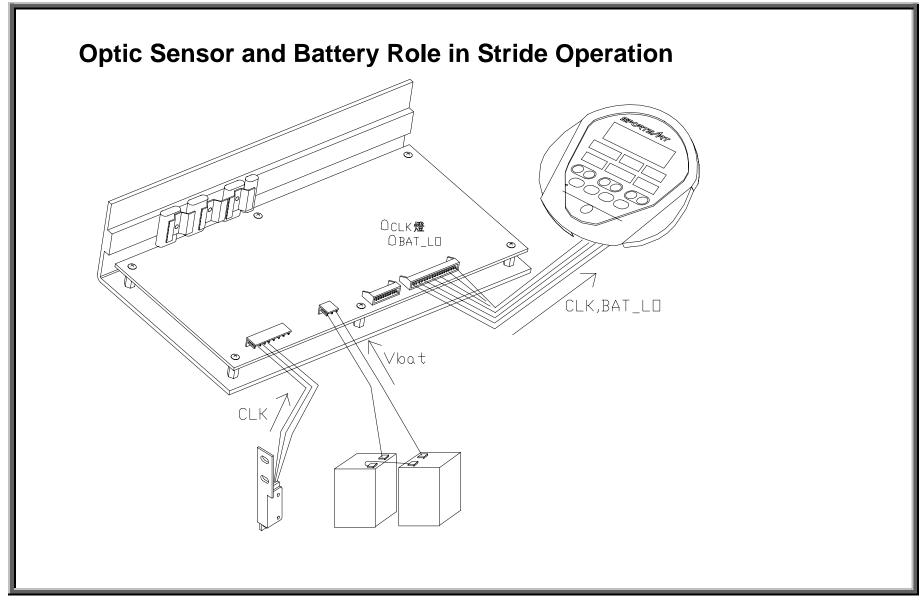
Stride Window Flashes – Speed

When the speed is under 25 steps per minute, or the drive board battery is low (BAT_Lo indicator is lit), and the stride key is pressed, the stride window flashes.

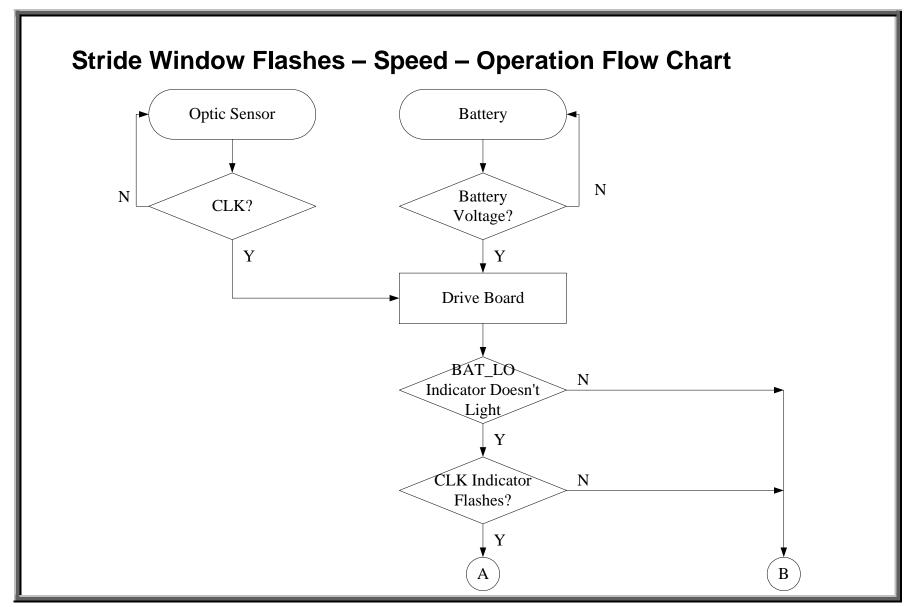
Order	Part	Operation
1	Optic Sensor	1. Exercise on the unit. The optic sensor detects the optic sensor speed change and transmits its signal to the drive board.
2	Battery	1. The battery provides STRIDE up/down motor voltage.
3	Drive Board	 After the drive board processes the optic sensor signal, the drive board CLK indicator flashes or remains lit, and the drive board sends the optic sensor signal to the display board. The drive board CPU detects the battery voltage. If the battery has less than 22 VDC, the drive board BAT_LO indicator lights. The drive board sends the BAT_LO signal to the display board.
4		1. The CLK and BAT_LO signals travel the 18-pin cable from the drive board to the display board.
5		1. The CPU reads the optic sensor CLK signal and shows the result in the STEP/MIN window. 2. The CPU reads the BAT_LO signal and then shows the "BATTERY SERVICE" message on the display. 3. When the user presses the STRIDE key, if the CLK speed is less than 25 steps per minute, or if the battery is low (the BAT_LO indicator is lit), the STRIDE window flashes, and the STRIDE function doesn't operate.



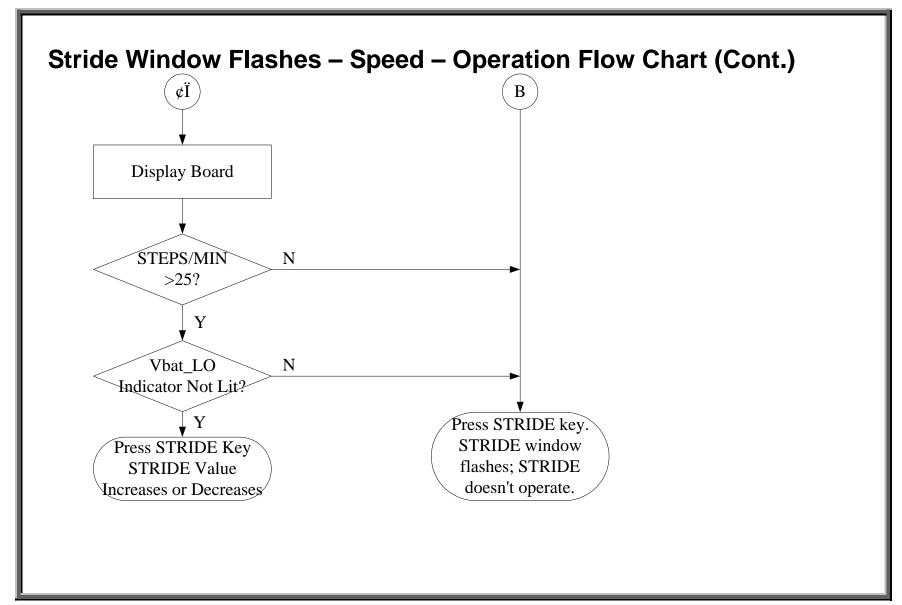
SportsArt - 8300 Repair Manual (Electronics) - Stride Window Flashes - Speed



SportsArt - 8300 Repair Manual (Electronics) - Stride Window Flashes - Speed



SportsArt - 8300 Repair Manual (Electronics) – Stride Window Flashes - Speed



SportsArt - 8300 Repair Manual (Electronics) - Stride Window Flashes - Speed

Speed Issue Troubleshooting

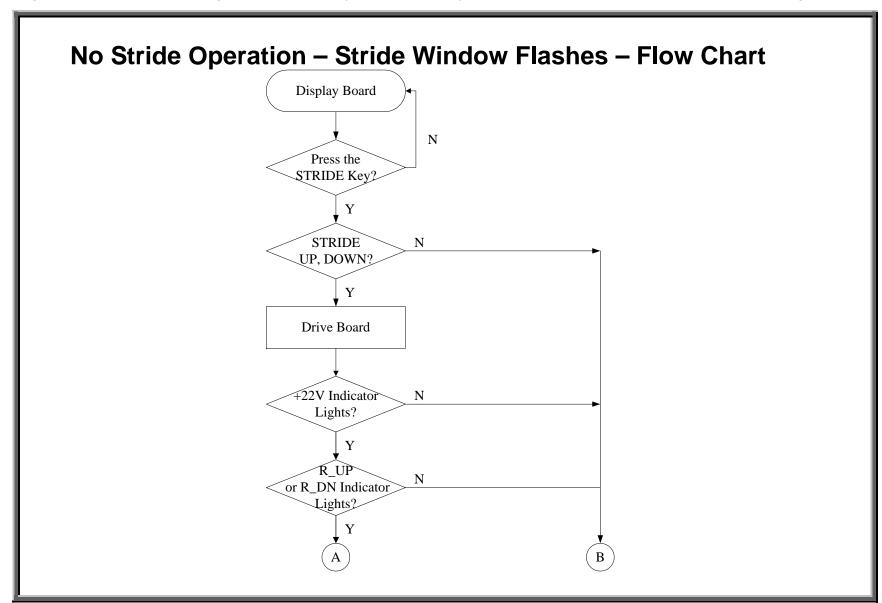
Item	Part	Troubleshooting		
		Exercise on the unit. Inspect whether the drive board CLK indicator lights.		
1	Concor	2. Take one step per second. The STEPS/MIN window should show 60.		
Serisc	0611301	3. If not as above, inspect the optic sensor.		
2 Batte		1. Inspect the BAT_LO LED on the drive board. If it lights, test whether the battery connection at the		
	Battery	drive board has 22 VDC or more. If not, recharge the battery by exercising on the unit at more than		
		60 steps per minute.		
3	Drive	1. See above.		
3	Board	Inspect whether the drive board IC is making good contact.		
4	Cable	1. Inspect the cable and connections from the drive board to the display board.		
		1. Exercise on the unit. The drive board CLK indicator should flash. Inspect whether the display		
		STEPS/MIN window shows the speed value. Take one step every second; the step per minute count		
5	Display	should be 60.		
5	Board	2. When the drive board BAT_LO indicator lights, the display shows "BATTERY SERVICE".		
		3. Inspect the wire connections.		
		4. Inspect the main program IC connection.		

SportsArt - 8300 Repair Manual (Electronics) - Stride Window Flashes - No Operation

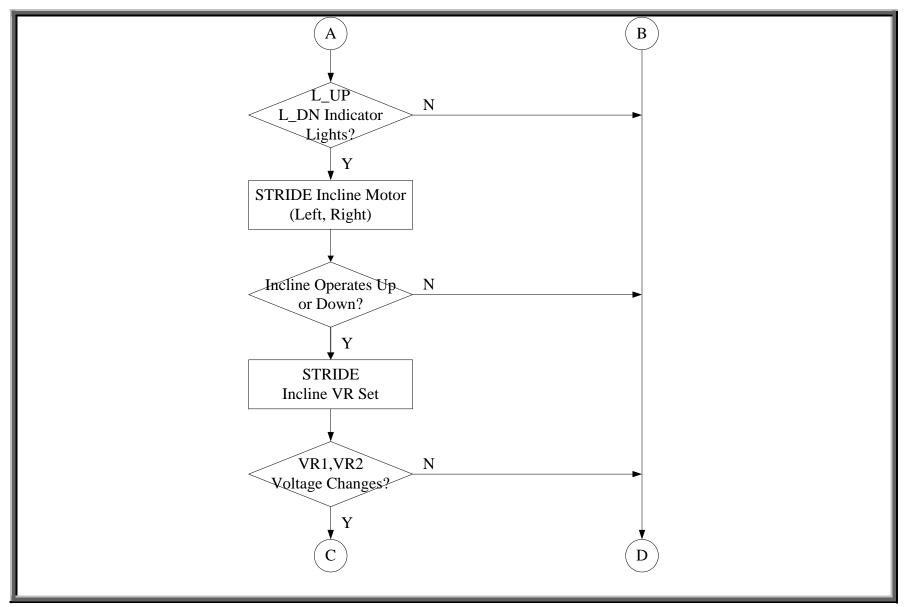
Stride Window Flashes – No Stride Operation

Order	Part	Operation
1	Daianai	1. Press the STRIDE<*> key. The display board sends the STRIDE_UP signal to the drive board. The drive board R_UP and L_UP indicators light. 2. Press the STRIDE<*> key. The display board sends the STRIDE_DOWN signal to the drive board. The drive board R_DN and L_DN indicators light.
2		 Press the STRIDE<*> key. The drive board R_UP and L_DN indicators light. Press the STRIDE Key. The drive board R_DN and L_DN indicators light. When the UP indicator lights, the drive board circuit sends out positive voltage, making the incline motor operate, lifting the stride linkage up. When the DN indicator lights, the drive board circuit sends out negative voltage, making the incline motor operate, lowering the stride linkage down.
3	Incline Motor	 When the drive board UP indicator lights, the incline motor operates, lifting the stride linkage up. When the drive board DN indicator lights, the incline motor operates, lowering the stride linkage down.
4	Incline VR	 When the STRIDE incline motor operates up, the VR voltage increases. When the STRIDE incline motor operates down, the VR voltage decreases.
5	Drive Board	1. The drive board program reads the STRIDE incline VR1, VR2 voltage and sends the VR value to the drive board.
6	Display Board	1. The CPU reads the STRIDE incline VR1, VR2 voltage. If the VR1 or VR2 voltage doesn't change, the STRIDE window flashes.

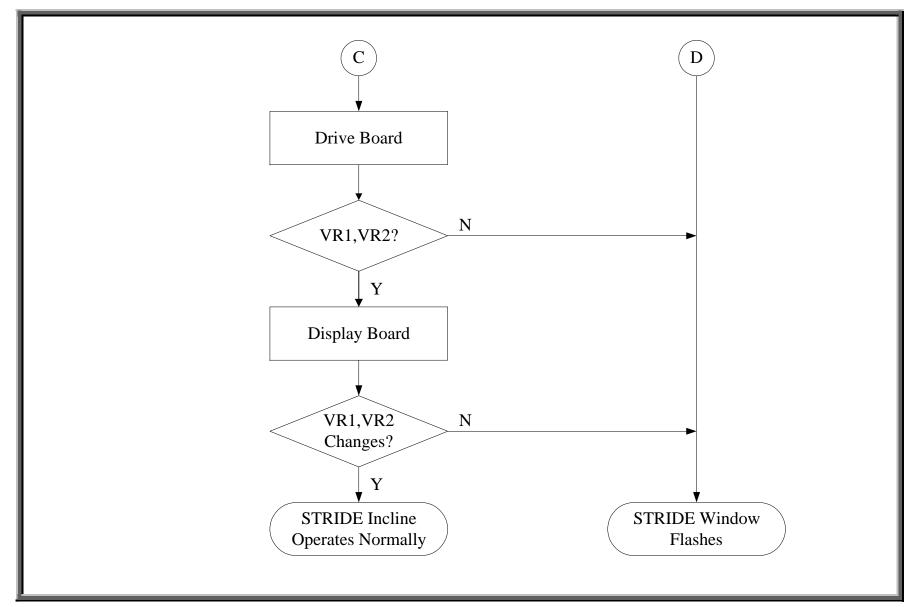
SportsArt - 8300 Repair Manual (Electronics) – Stride Window Flashes – No Operation



SportsArt - 8300 Repair Manual (Electronics) – Stride Window Flashes – No Operation



SportsArt - 8300 Repair Manual (Electronics) – Stride Window Flashes – No Operation

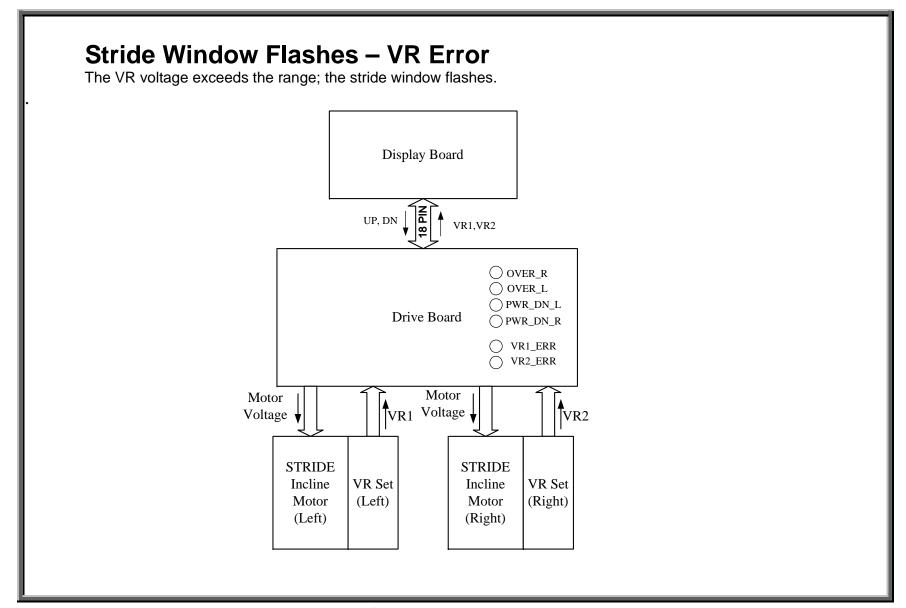


SportsArt - 8300 Repair Manual (Electronics) – Stride Window Flashes – No Operation

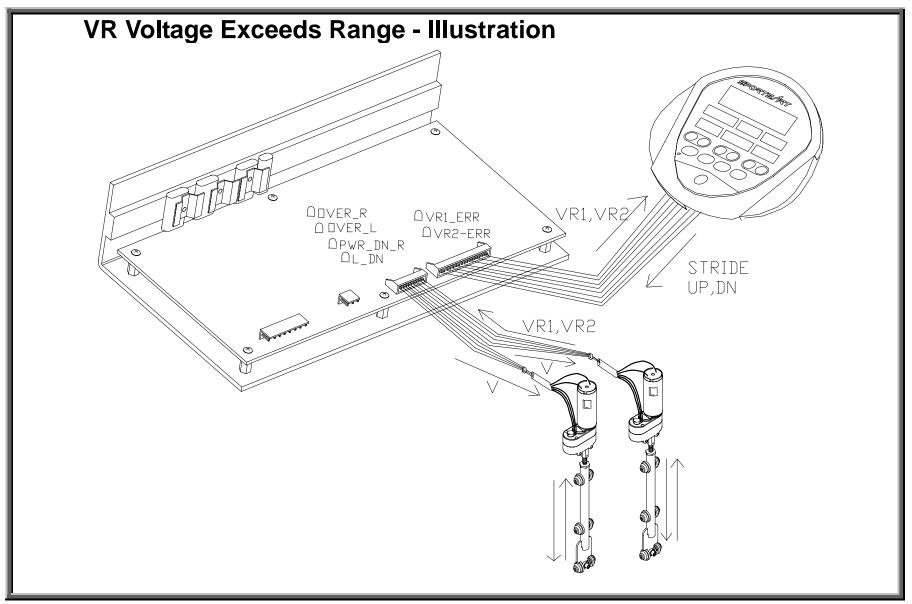
No Stride Operation – Stride Window Flashes - Troubleshooting

	Juliao	operation office williams i lastics incubicationing				
Item	Part	Troubleshooting				
		1. Press the STRIDE<▲> key. The drive board R_UP and L_UP indicator lights.				
1	Display	2. Press the STRIDE<▼> key. The drive board R_DN and L_DN indicator lights.				
		3. If not as above, press on the CPU and inspect the cable and its connections.				
2	18-pin Cable	. Inspect the 18-pin cable and its connections.				
		1. Press the STRIDE<*> key. When the R_UP, L_UP indicator lights, test whether the drive board CN3				
		orange and purple wires and gray and red wires have incline motor voltage.				
	Drive Board	2. Press the STRIDE<▼> key. When the R_DN, L_DN indicator lights, test the drive board CN3 orange and				
3		purple wires and gray and red wires have motor incline voltage.				
		3. If the indicators don't light, inspect the drive board IC connection.				
		4. If the indicators don't light, and there is no voltage, inspect whether the drive board relays, RY4, RY5,				
		RY6, RY7, click into action after changing the incline direction command. 5. If the drive board 22V indicator doesn't light, inspect whether the STRIDE protective feature is operating.				
	10-pin	1. Inspect whether the 10-pin cable is connected well.				
4	Cable	2. Inspect whether the 10-pin cable to the stride support arm is connected well.				
	STRIDE	1. Inspect whether the STRIDE incline is stuck at the highest or lowest point.				
	Incline	2. Test the STRIDE incline voltage.				
5	Motor	3. Test whether the STRIDE incline motor is malfunctioning.				
	(Left,					
	Right)					

SportsArt - 8300 Repair Manual (Electronics) - Stride Window Flashes - VR Error



SportsArt - 8300 Repair Manual (Electronics) – Stride Window Flashes – VR Error

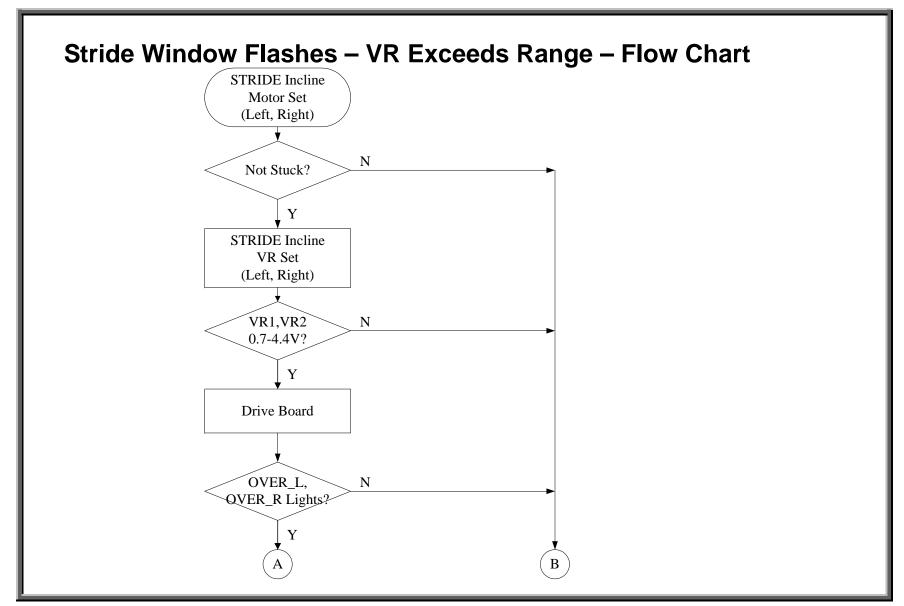


SportsArt - 8300 Repair Manual (Electronics) – Stride Window Flashes – VR Error

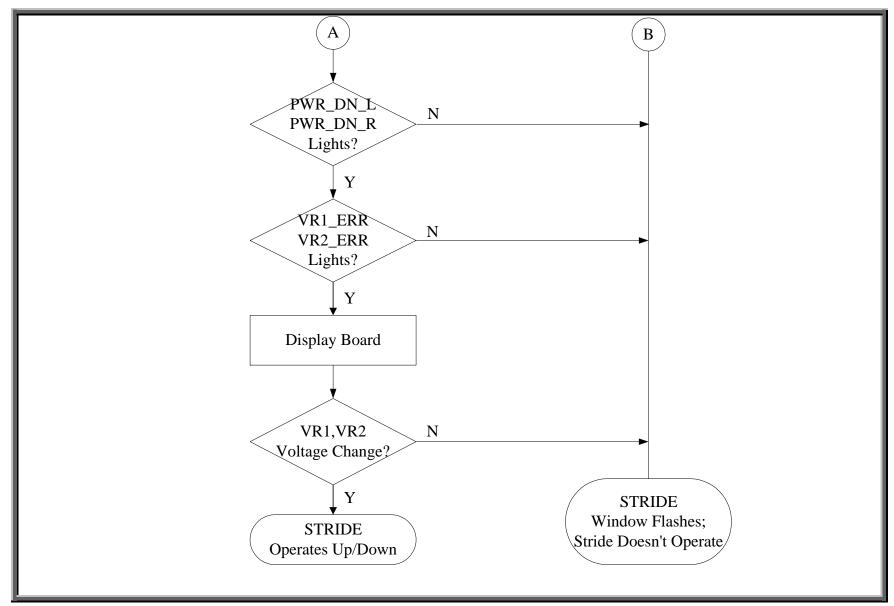
Stride Window Flashes – VR Voltage Exceeds Range – Explanation

Order	Part	Operation				
	STRIDE	1. In down operation, the drive board R_UP and L_UP indicators light.				
1	Motors Left,	2. In down operation, the drive board L_DN and R_DN indicators light.				
	Right					
2	STRIDE VR	1. The STRIDE incline set up/down operation changes the VR voltage.				
	Left, Right					
3	Drive Board	 The drive board program reads the VR1, VR2 voltage value. If it exceeds the range of 0.7-4.4 VDC, VR1_ERR and VR2_ERR indicators light. The drive board reads the STRIDE motor current. If the amp draw is too high (incline motor is stuck), incline OVER_L and OVER_R indicators extinguish. The stride protection function operates. PWR_DN_R and/or PWR_DN_L indicators extinguish, indicating that STRIDE incline protective function is operating. The drive board 22V indicator LED extinguishes. The drive board 22V indicator LED extinguishes, shutting off the incline power. The STRIDE incline motor does not operate. 				
4	Display Board	 The program reads the VR1, VR2 voltage. If VR1 and VR2 voltage exceeds the range, the STRIDE window flashes. 				

SportsArt - 8300 Repair Manual (Electronics) - Stride Window Flashes - VR Error



SportsArt - 8300 Repair Manual (Electronics) - Stride Window Flashes - VR Error



SportsArt - 8300 Repair Manual (Electronics) – Stride Window Flashes – VR Error

Stride Window Flashes – VR Exceeds Range - Troubleshooting

		<u> </u>
Item	Part	Troubleshooting
1	Display	1. Press down on the main program IC.
•	. ,	2. Inspect the 16-pin cable connection.
2	18-pin	1. Replace the 18-pin cable to test whether that alleviates the problem.
	Cable	
		1. Inspect whether OVER_L, OVER_R, PWR_DN_L, PWR_DN_R indicator lights have
	Drive Board	extinguished. If so, the STRIDE incline set is stuck. Recalibrate.
3		2. Inspect whether VR1, VR2 is lit. If lit, test whether the VR1, VR2 voltage is within the 0.7-4.4
		VDC range. If not, recalibrate.
		3. Reinstall the drive board IC.
	STRIDE	Inspect whether the STRIDE motor exceeds the range.
4	Motor (Left,	2. Inspect whether the STRIDE motor is stuck.
	Right)	3. Recalibrate the STRIDE incline motor and VR set.
	VR (Left,	1. When the STRIDE incline set is in operation, inspect whether the VR voltage changes.
5		2. Inspect whether the STRIDE incline VR voltage exceeds the 0.7-4.4 VDC range and the drive
3		board VR1, VR2 indicator lights.
	Right)	3. Recalibrate the STRIDE incline motor and VR set.

SportsArt - 8300 Repair Manual (Electronics) – ERR7

Error Message: ERR7 ERR7.01 – Error Message: ERR7, Circumstance of Malfunction ERR7.02 – VR Signal Operation Illustration ERR7.03 – ERR7 Operation Explanation ERR7.04 – ERR7 Operation Flow Chart ERR7.05 – ERR7 Simulation, ERR7 Troubleshooting

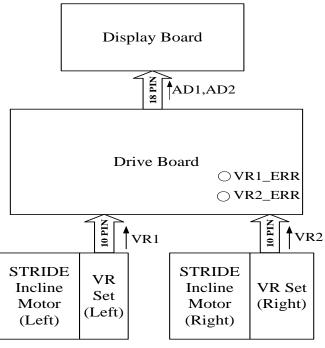
SportsArt - 8300 Repair Manual (Electronics) – ERR7

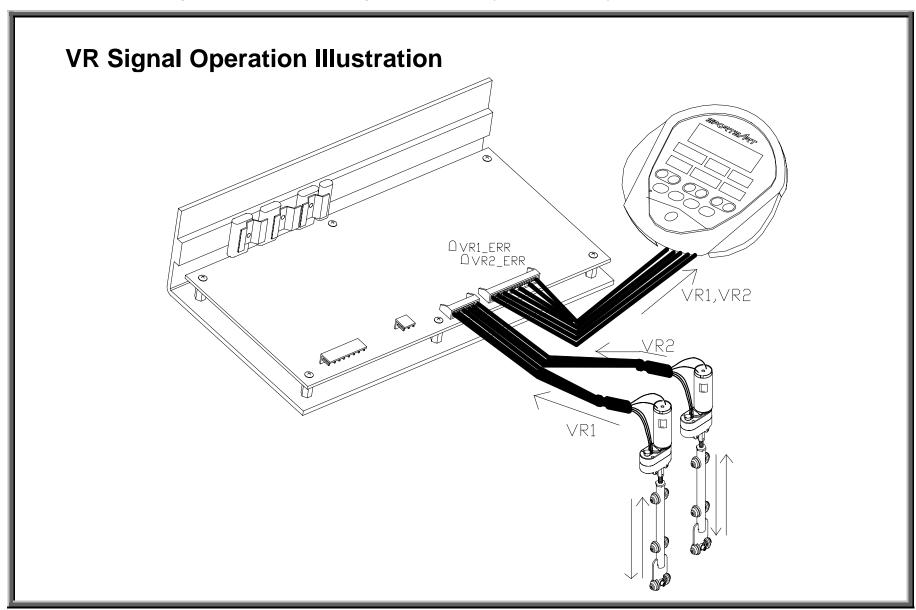
Error Message: ERR7

The display CPU has not read the stride incline VR1, VR2 voltage value. Or the display stride VR1, VR2 voltage value exceeds the set range.

Circumstance of Malfunction

- 1. Press the "ON" key. After the display lights up, ERR7 appears on the display.
- 2. When exercising on the unit, "ERR7" appears on the display.
- 3. When exercising on the unit, press the stride UP or DOWN key; ERR7 appears on the display. The stride function does not operate.

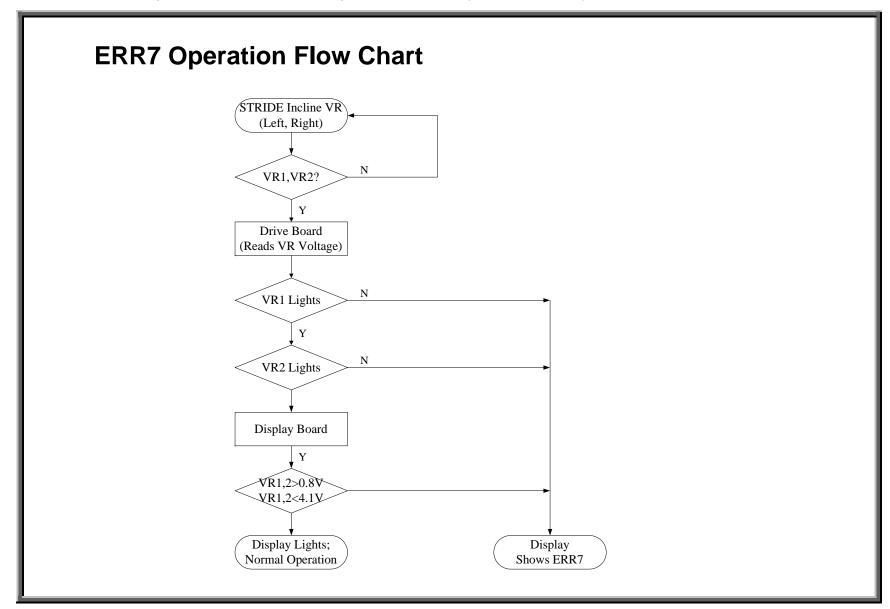




SportsArt - 8300 Repair Manual (Electronics) – ERR7

ERR7 Operation Explanation

Order	Part	Operation
1	Stride VR1, VR2	1. When the stride motor operates, VR1, VR2 voltage changes.
2	10-pin Cable	1. The VR1, VR2 voltage value travels the 10-pin cable to the drive board.
3	Drive Board	 The drive board CPU reads the VR1, VR2 voltage, transforms it into an AD1, AD2 signal, and sends the signal to the display board. If the VR1 voltage exceeds the range, VR1_ERR indicator lights. If the VR2 voltage exceeds the range, VR2_ERR indicator lights.
4	18-pin Cable	The drive board AD1, AD2 value travels the 18-pin cable to the display board.
5	Display Board	 After turning on the unit, the display CPU reads the AD1, AD2 value. If the CPU cannot read the AD1, AD2 value, ERR7 appears for five seconds. When the STRIDE<▲> or <▼> key is pressed, "ERR7" appears again for five seconds.



SportsArt - 8300 Repair Manual (Electronics) – ERR7

ERR7 Simulation

Order	Operation			
1	When the unit is off (the display is not lit), remove the 10-pin incline cable.			
2	2 Exercise on the unit. The drive board VR1_ERR,VR1_ERR indicator lights.			
3	After the display lights up, the main window immediately shows "ERR7" for five seconds, then "MAN'L" appears.			
4	Press the STRIDE<▲> or <▼> key. The display shows "ERR7" for five seconds. The stride function cannot be operated.			

ERR7 Troubleshooting - Recalibrate the stride set if VR voltage is out of range. See SRC.

		<u> </u>		
Order	Part	Troubleshooting		
1	STRIDE (VR1, VR2)	 Inspect the incline VRs on both sides. Normal: drive board VR1_ERR and VR2_ERR indicators are lit. Measure voltage at both sides: VR1(orange and purple wires); VR2 (gray and red wires). Normal voltage: 0.7-4.4. 		
		3. If not as above, inspect whether the VR wire has short circuited or broken.		
2	10-pin Cable 1. Inspect the cable connections.			
3	Drive Board	 Test whether voltage across CN3 orange and purple wire or the gray and red wire is 0.7-4.4 VDC. Inspect whether the drive board VR1_ERR or VR2_ERR indicator lights. Normal is lit. 		
		3. Inspect the drive board U14 CPU connections.		
4	18-pin Cable 1. Reconnect the cable and inspect whether the wires have shorted or broken.			
5	Display Board	 Inspect the display cable connection. Inspect whether the display board IC U7 is connected well. Change the IC U7. 		

Stride Test Points

STRDTST.01 - Drive Board +22V Circuit Test - Illustration

STRDTST.02 - Drive Board +22V Circuit Test - Instructions, Symptom of Malfunction

STRDTST.03 - Stride Motor Power at Drive Board - Motor 1

STRDTST.04 - Stride Motor Power at Drive Board - Motor 2

STRDTST.05 - Testing Stride Motor Power at the Drive Board, Symptom of Malfunction

STRDTST.06 – Stride Motor Voltage Test at the Shoulder - Illustration

STRDTST.07 – Stride Motor Voltage Test at the Shoulder - Instructions

STRDTST.08 - VR Output Test at the Drive Board - VR1

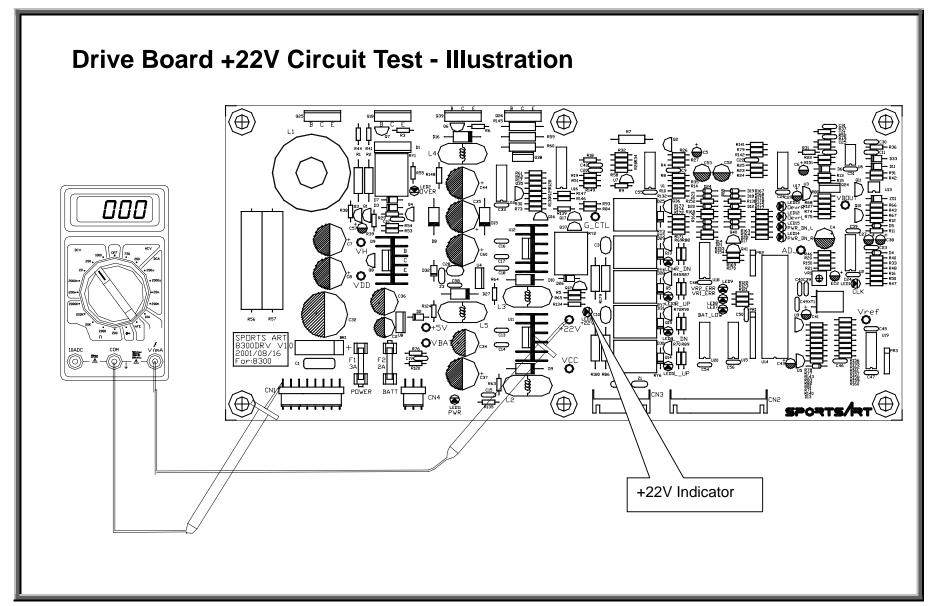
STRDTST.09 - VR Output Test at the Drive Board - VR2

STRDTST.10 - VR Output Test at Drive Board - Instructions, Symptom of Malfunction

STRDTST.11 – VR Output Voltage Test at the Shoulder - Illustration

STRDTST.12 – VR Output Voltage Test at the Shoulder - Instructions, Symptom of Malfunction

STRDTST.13 - Voltage Test Summary at the Shoulder, Test Procedure, Symptom of Malfunction



Drive Board +22V Circuit Test - Instructions

The drive board +22V circuit provides power for stride action. Inspect this circuit by checking the +22V LED. When the unit is in operation, the 22V circuit LED lights. The LED is in the middle of the drive board.

Measure power by placing a multimeter black probe on the drive board CN1 connector ground pin. Place the red probe on the +22V test point in the middle of the drive board. Do not remove any wire connections from the drive board. Normal voltage: 22 VDC.

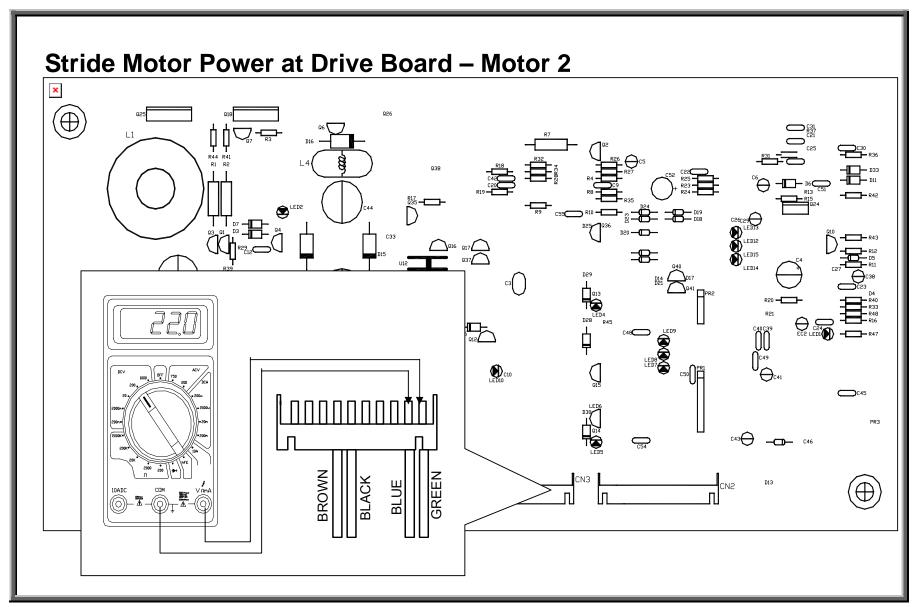
If the +22V indicator does not light, inspect:

- (1) whether the battery has adequate voltage;
- (2) whether the battery fuse has blown;
- (3) whether the drive board PWR_DN_R or PWR_DN_L indicator doesn't light.

Symptom of Malfunction

Exercise on the unit. Press the stride up or down keys. The stride motor doesn't operate. The display stride window flashes.

Stride Motor Power at Drive Board - Motor 1 \bigoplus 22.0 BLACK

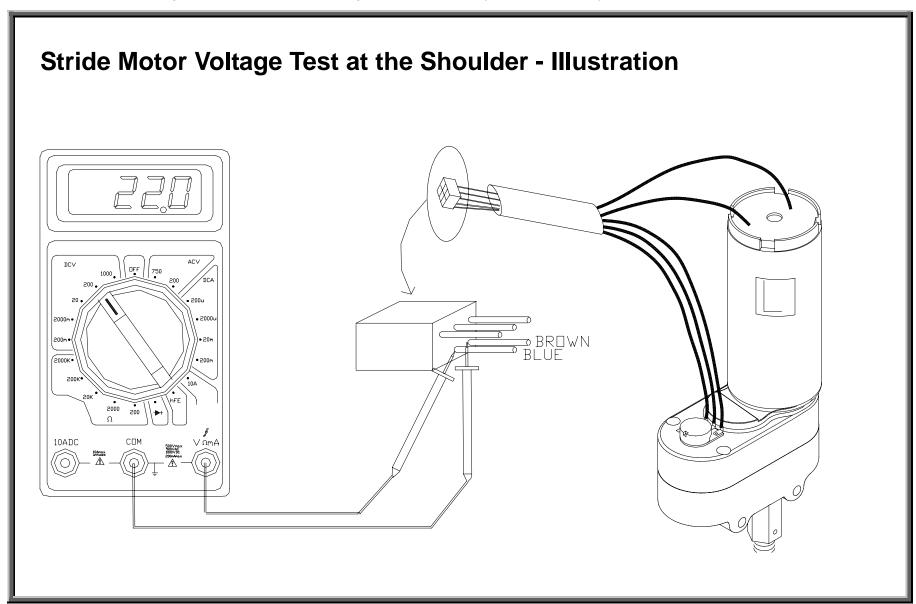


Testing Stride Motor Power at the Drive Board

- 1. Don't detach any wires from the drive board. Place probes as shown on STRDTST.03 and STRDTST.04. Note: Wire colors may vary but positions will not vary.
- 2. Exercise on the unit. The display lights up and shows "MAN'L".
- 3. Press the stride up or down key. The stride window stride value increases or decreases.
- 4. When the drive board R_UP and L_UP indicator lights, the multimeter shows +22V.
- 5. When the drive board R_DN and L_DN indicator lights, the multimeter shows -22V.
- 6. If not as above, inspect.
 - (a) Whether the drive board stride OVER_R, OVER_L, PWR_DN_R, PWR_DN_L indicators don't light;
 - (b) Whether the drive board 22V indicator doesn't light;
 - (c) Whether the drive board relay RY4, RY5, RY6, RY7 operates.

Symptom of Malfunction

1. Exercise on the unit. Press the stride up or down key. The stride window flashes. The stride doesn't operate up or down.

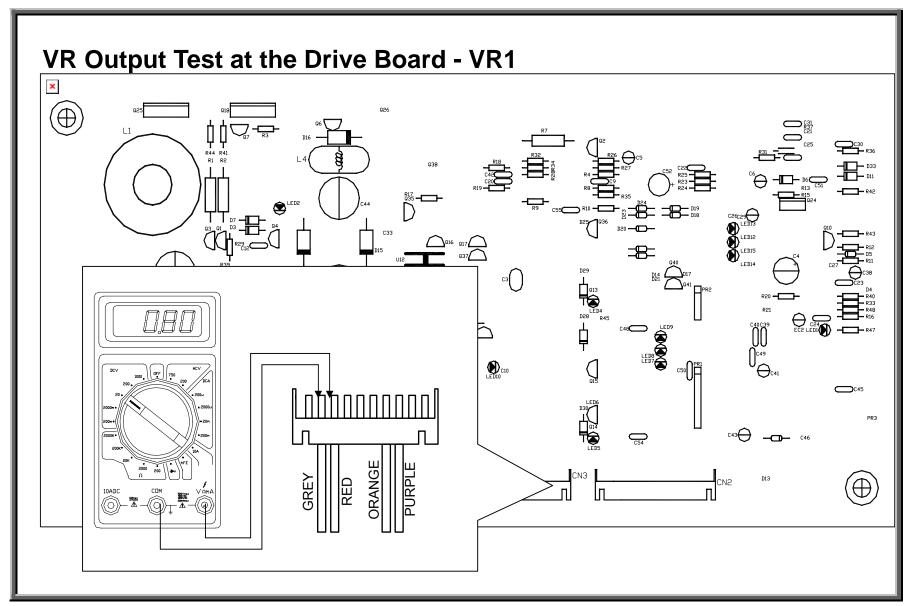


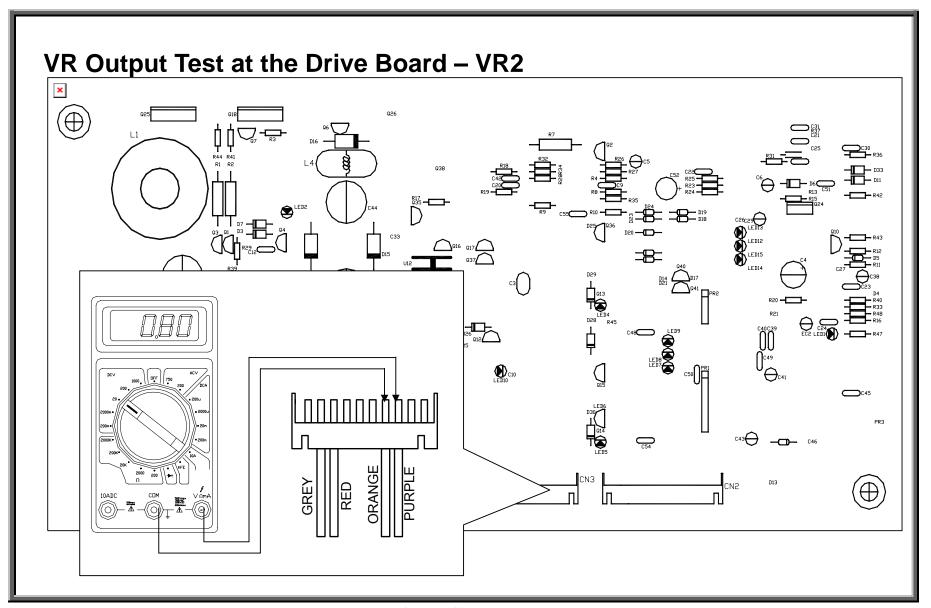
Stride Motor Voltage at the Shoulder – Instructions

- 1. Don't detach any wires from the drive board or shoulder.
- 2. Put multimeter to the 200 VDC setting. Back-probe at the brown and blue wire connectors as shown.
- 3. Exercise on the unit. Press the stride up or down key. The stride value increases or decreases.
- 4. The drive board UP or DN indicator lights. Normal reading: +22 or -22V. The stride motor operates.
- 5. If there is voltage but no stride motor action, the motor or wire is bad.

Symptom of Malfunction

1. Press the stride key. The stride doesn't operate. The display stride window flashes.



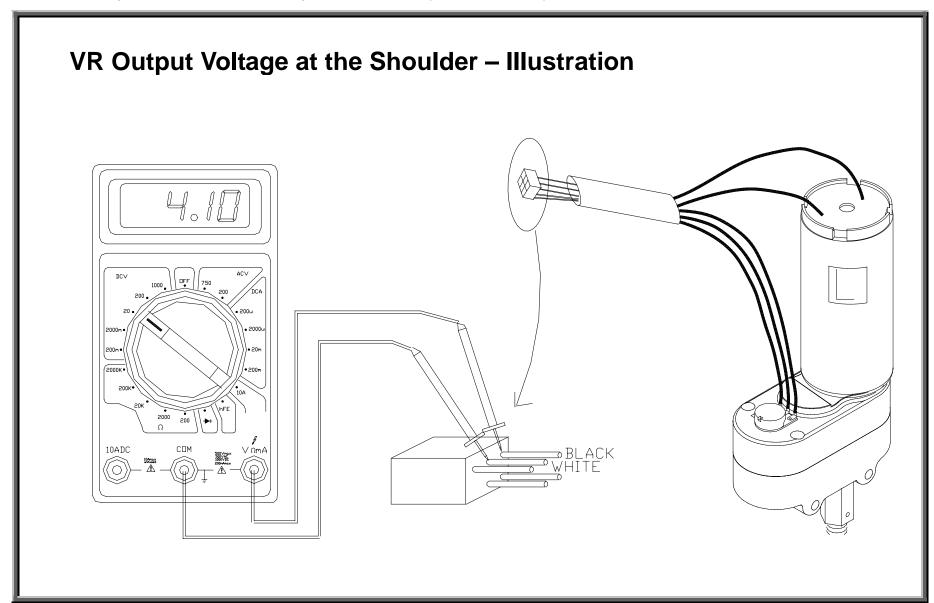


VR Output Test at Drive Board - Instructions

- 1. Don't detach any wire connections from the drive board.
- 2. Press the <ON> key to start up the unit.
- 3. Put the multimeter to the 20 VDC setting. Place probes as shown.
- 4. The multimeter shows the VR output voltage value. Normal reading: between 0.8-4.3V.
- 5. If the VR voltage is not between 0.8-4.3 VDC, the drive board VR1_ERR or VR2_ERR indicator lights and the stride window flashes. Recalibrate the stride motor and VR set.
- 6. If there is no meter reading whatsoever, inspect the stride incline 10-pin wire and its connection. Also inspect VR power supply from the drive board, STRDTST.11 and STRDTST.12.

Circumstance of Malfunction

1. Exercise on the unit. Press the stride up or down key. The stride window flashes.



VR Output Voltage Test at the Shoulder - Instructions

- 1. Don't detach any wires from the drive board or connector at the shoulder.
- 2. Put the multimeter to the 20 VDC setting. Place probes as shown.
- 3. Exercise on the unit. The display lights up.
- 4. Place probes on the ORANGE and BLACK wire connections (VR power supply). Normal reading: 5 VDC.
- 5. Place probes on the WHITE and BLACK wire connections (VR output voltage). Normal VR output voltage: 0.8-4.5 VDC.
- 6. If there is no voltage, inspect the wire and its connections from the drive board to the stride VR.
- 7. If the VR voltage exceeds the range of 0.8-4.5 VDC, recalibrate the stride motor and VR set.

Symptom of Malfunction

- 1. Exercise on the unit. After the display lights up, ERR7 appears.
- 2. Press the <ON> key. The display turns on. ERR7 appears.
- 3. Press the stride up or down key. Stride window flashes.

Voltage Test Summary at Shoulder ORANGEC) WHITE(VR) STRIDE INCLINE VR BLACKGND) TO DRV BROWN **STRIDE** BLUEM-) INCLINE MOTOR **Test Procedure**

Do not detach wire connections. Back-probe on wire connectors as indicated. Exercise on the unit. Operate stride function.

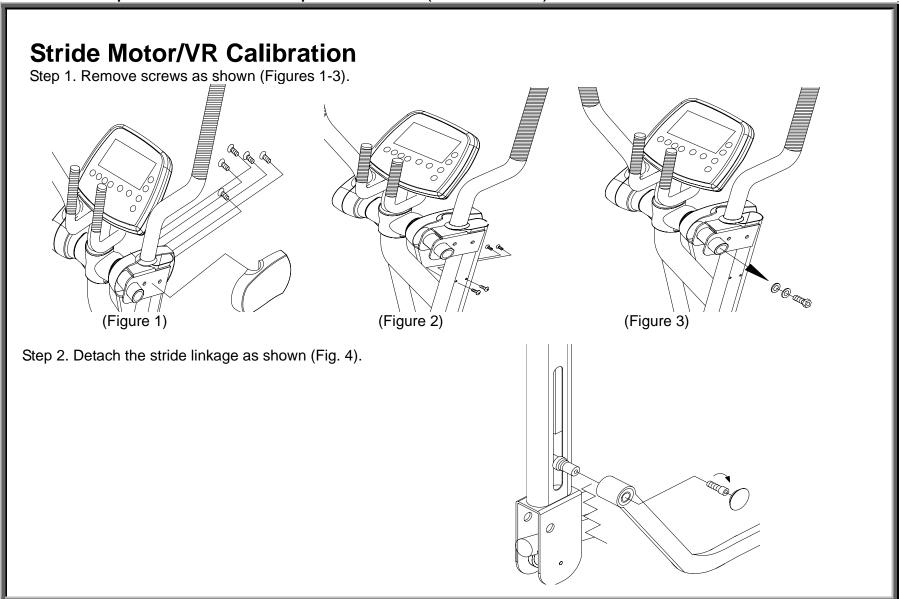
Wire Colors	Significance	Normal Voltage	If Not Normal, Inspect
Orange and Black	Voltage to the VR	5 VDC	Wires and connections, drive board
	-		voltage output to VR
White and Black	Output voltage from VR	0.8-4.5 VDC	Wires and connections, input voltage,
			recalibrate
Brown and Blue	Stride motor voltage input	Up: +22 VDC; Down: -22 VDC	Wires and connections, drive board
			voltage output to stride

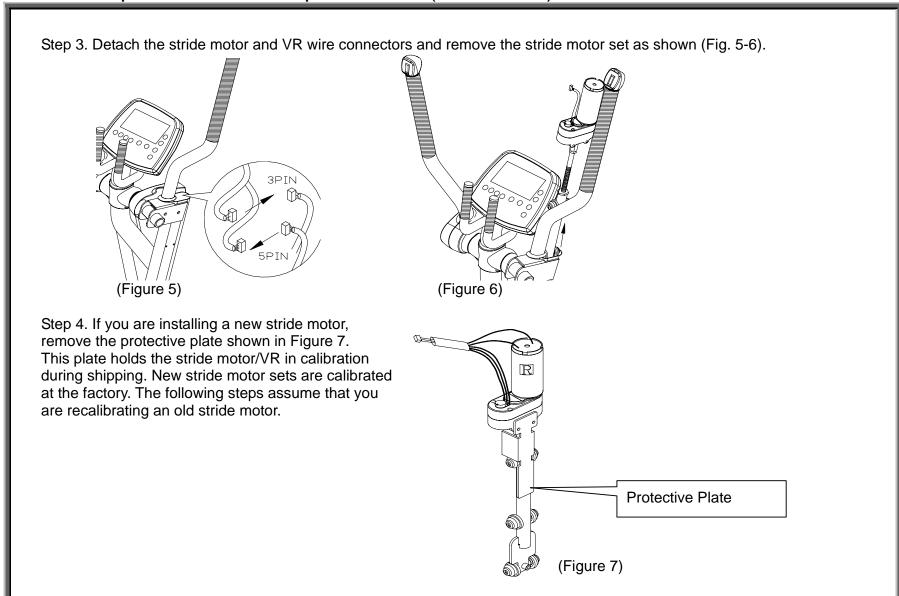
Symptom of Malfunction

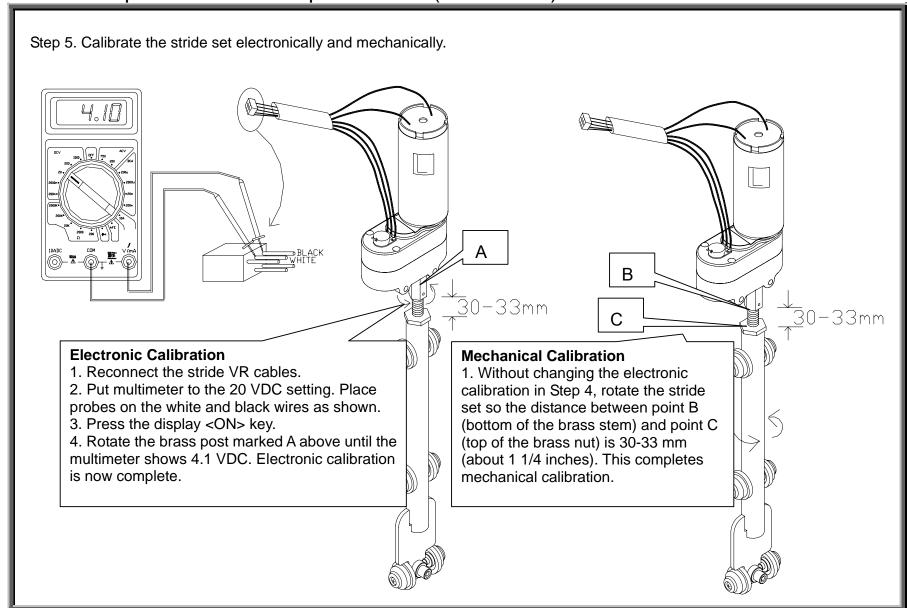
ERR7 appears after the user presses the ON key. Stride window flashes after user presses stride <▲> or <▼> key. Troubleshooting: Recalibrate if stride VR voltage exceeds the range of 0.8-4.5 VDC.

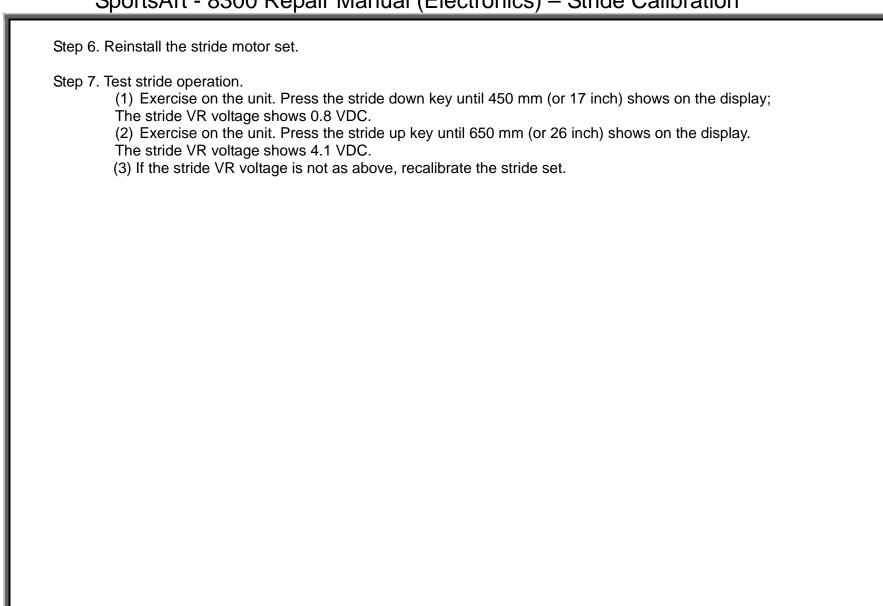
Stride Set Calibration

STRDCAL.01 – Stride Set Calibration, Steps 1-2 STRDCAL.02 – Stride Set Calibration, Steps 3-4 STRDCAL.03 – Stride Set Calibration, Step 5 STRDCAL.04 – Stride Set Calibration, Step 6-7









Reference

REF.01 - Voltage Specifications on the Display Board, Voltage Specifications on the Drive Board

REF.02 - Drive Board CN1 Voltage Specifications, Magnet Specifications

REF.03 – Stride Set Voltages at the Shoulder Joint, Stride Set Voltages at CON2

REF.04 – Generator Voltage Observations, Magnet Voltage Observations

REF.05 - Drive Board LEDs - Illustration

REF.06 - LED Quick Reference Chart

REF.07 – LED Quick Reference Chart (Cont.)

Voltage Specifications on the Display Board

Test	Test Method	Location	Test Method	Voltage	Significance
C20 Capacitor	Place one probe on	C20 capacitor on display	Place one probe on	5 VDC	Shows whether display board is
	each leg of the	board left of SportsArt	each leg of the		receiving power.
	capacitor.	Version sticker.	capacitor.		

Voltage Specifications on the Drive Board

Test	Test Method	Location	VDC	Significance
VH	Put black probe on CN1 ground pin and	CN1 ground pin: left low	20	Supplies operating power.
	red probe on VH test ring.	VH test ring: left mid		Comes from generator.
VDD	Put black probe on CN1 ground pin and	CN1 ground pin: left low	30-33	Supplies power to the magnet.
	red probe on VDD test ring.	VDD test ring: left mid		
+5V	Put black probe on CN1 ground pin and	CN1 ground pin: left low	5	Drive board 5V circuit power.
	red probe on +5V test ring.	+5V test ring: left low		
VBAT	Put black probe on CN1 ground pin and	CN1 ground pin: left low	22	Supplies operating power.
	red probe on VDD test ring.	VBAT test ring: left low		Comes from battery.
+22V	Put black probe on CN1 ground pin and	CN1 ground pin: left low	UP+22	Supplies power to stride motor.
	red probe on +22V test ring.	+22V test ring: mid low	DN-22	
VCC	Put black probe on CN1 ground pin and	CN1 ground pin: left low	5	Supplies drive and display
	red probe on VCC test ring.	VCC test ring: mid low		board 5 VDC power.

Drive Board CN1 Voltage Specifications

Test	Wire	Test Method	Normal	Significance
	Colors		VDC	
From	Black	Put black probe on CN1 BLACK wire connector	Varies	When flywheel turns, generator supplies 100+
Generator	and	and red probe on CN1 WHITE wire connector	~100	VDC to drive board. If no voltage, inspect
	White	point.	VDC	generator, wires, F1 fuse on drive board.
V. Input to	Black	Put black probe on CN1 BLACK wire connector	5 VDC	Power supply to optic sensor. If no voltage,
Optic	and	and red probe on CN1 RED wire connector		optic sensor doesn't have power.
Sensor	Red	point.		
Output from	Black	Put black probe on CN1 Black wire connector	1.5 –	Indicates that optic sensor signal is entering
Optic	and	and red probe on CN1 yellow wire connector	3.5 VDC	drive board. CLK indicator should also light.
Sensor	Yellow	point.		•
To Magnet	Blue	Put one probe on CN1 BLUE wire connector	0.5-20	Voltage to flywheel. The more voltage, the
	and	and the other probe on the other CN1 BLUE	VDC	higher the resistance. If 25V or more and no
	Blue	wire connector point.		variation, there's full resistance. If 0V, drive
				board malfunction.

Magnet Specifications

Test	Wires	Test Method	Normal	Significance
OHM	BLUE	Disconnect wires from drive board. Put probes	16-20	If not as above, magnet has a short or broken
	BLUE	separately on the two BLUE wire connectors.	Ohms	circuit.
Current	BLUE	Disconnect wires from drive board. Put red	No	If reading shows "0", the magnet and unit
Leakage	FRAME	probe on one BLUE wire connector. Put black	Reaction	have shorted out. Inspect wires and magnet.
		probe on a screw or metal part of unit.		
Incoming	Blue and	Put one probe on CN1 BLUE wire connector	0.5-20	The more voltage, the higher the resistance.
Power	Blue	and the other probe on the other CN1 BLUE	VDC	If 25V or more and no variation, there's full
		wire connector point.		resistance. If 0V, drive board malfunction.

Stride Set Voltages at the Shoulder Joint

Test	Wire	Test Method	Normal VDC	Note
	Colors			
Power to	BROWN	Back probe. Put red probe on blue wire		If no reading, there's no power to the
Motor	BLUE	connector. Put black probe on brown wire	-22 VDC DN	stride motor. Check drive board LEDs
		connector. Press stride UP or DN key.		and output voltages (CON2).
Power to	ORANGE	Back probe. Put red probe on orange wire	5 VDC	If no reading, there's no power to the
VR	BLACK	connector. Put black probe on black wire		VR. Check drive board LEDs and output
		connector. Press stride UP or DN key.		voltages (CON2).
VR Output	WHITE	Back probe. Put black probe on black wire	.8 to 4.5 VDC	Varies depending on incline position. If
	BLACK	connector. Put red probe on white wire		voltage exceeds range, recalibrate set.
		connector. Press stride UP or DN key.		

Stride Set Voltages at CON2

Note: Pins are counted from left to right.

Test	Pin #	Test Method	Normal VDC	Note
Lft. Stride	4 & 5	Black probe on 4; Red on 5. Press	+22 VDC UP	If no reading, there's no power to the stride motor.
Motor		stride UP or DN key.	-22 VDC DN	Check drive board LEDs.
Rt. Stride	9 & 10	Black probe on 9; Red on 10. Press	+22 VDC UP	If no reading, there's no power to the stride motor.
Motor		stride UP or DN key.	-22 VDC DN	Check drive board LEDs.
Left VR	2 & 3	Black probe on 2; Red on 3. Press	.8 to 4.5 VDC	Varies depending on incline position. If voltage
Output		stride UP or DN key.		exceeds range, recalibrate set.
Right VR	7 & 8	Black probe on 7; Red on 8. Press	.8 to 4.5 VDC	Varies depending on incline position. If voltage
Output		stride UP or DN key.		exceeds range, recalibrate set.
Power to	1 & 6	Place probes on pins.	5 VDC	Power to VR.
VR				

Voltages provided below are not exact specifications. They are meant for rough comparison only. Actual voltage readings will vary.

Generator Voltage Observations

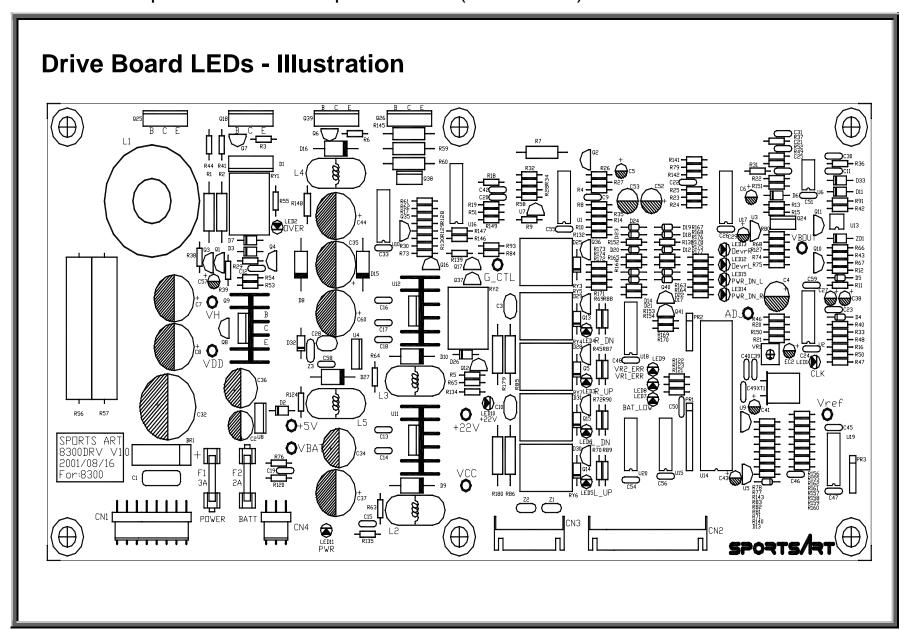
White and Black Wires

Order	Level	Steps Per Minute	Volts DC
1	1	80	140
2	1	70	130
3	1	60	100
4	1	50	90
5	1	40	70

Magnet Voltage Observations

Blue Wires

Test	Level	Steps Per Minute	Volts DC
1	20	60	11.7
2	15	60	10.0
3	10	60	8.0
4	5	60	5.4
5	1	60	1.9



LED Quick Reference Chart

LED	Marking (Location)	Normal - Indication	Abnormal or Not Activated (Indication)	Tip to Resolve Abnormal Condition
1	CLK (mid right)	received by drive board and being sent to display.	Not lit – No optic sensor signal at drive board.	Optic sensor only operates if generator supplies power.
2	OVER (mid left)	Lit –Stride VR voltage is normal; protective function is not activated.	Not lit - Stride VR voltage is too high; the protective function is activated.	Recalibrate stride motor.
3	R-UP (middle)	Lit when right stride motor is in UP action - Drive board is sending power for right stride motor UP operation.	Not lit when motor should operate – Drive board is not sending power for right stride motor UP operation.	If not lit, either no signal was received or the motor already reached its target and turned off.
4	R-DN (middle)	Lit when right stride motor is in DOWN action - Drive board is sending power for right stride motor DOWN operation.	Not lit when motor should operate – Drive board is not sending power for right stride motor DOWN operation.	If not lit, either no signal was received or the motor already reached its target and turned off.
5	L-UP (mid low)	for left stride motor UP operation.	Not lit when motor should operate – Drive board is not sending power for right stride motor DOWN operation.	If not lit, either no signal was received or the motor already reached its target and turned off.
6	L-DN (mid low)	Lit when left stride motor is in DN action - Drive board is sending power for left stride motor DOWN operation.		If not lit, either no signal was received or the motor already reached its target and turned off.
7	Battery Low (middle)	Not lit – Battery voltage is normal.	Lit – Battery voltage is too low. Under 22VDC.	Recharge or replace the battery.
8	VR1-ERR (middle)	Not lit – Normal stride motor VR operation.	Lit - VR1 value and display setting differ and are not being reconciled by motor operation.	Recalibrate stride set.

LED Quick Reference Chart (Cont.)

LED	Marking (Location)	Normal - Indication	Abnormal or Not Activated (Indication)	Tip to Resolve Abnormal Condition
9	VR2-ERR (middle)	Not lit – Normal stride motor VR operation.	Lit – VR2 value and display setting differ and are not being reconciled by motor operation.	Recalibrate stride set.
10	+22V (mid low)	Lit – Drive board 22V circuit has power for stride motor operation.	Not lit – Stride motor protective feature on drive board is activated, or drive board malfunction.	Inspect power supply. If good, replace drive board.
11	PWR (Ift mid low)	Lit – Drive board is activated, receiving power either from the battery or generator.		If exercising on unit, inspect the generator and wire connections. If display "ON" was pressed, inspect the battery and wires.
12	OvrL (top rt mid)	Lit – Left stride motor current is not excessive.	Not Lit – Left stride motor current is excessive. Stride motor is stuck.	Inspect and recalibrate stride set.
13	OvrR (top rt mid)	Lit – Rights stride motor current is not excessive.	1	Inspect and recalibrate stride set.
14	PWR_ON_R (top rt mid)	Lit – Drive board is sending power for right stride motor operation.	l	Inspect and recalibrate stride set.