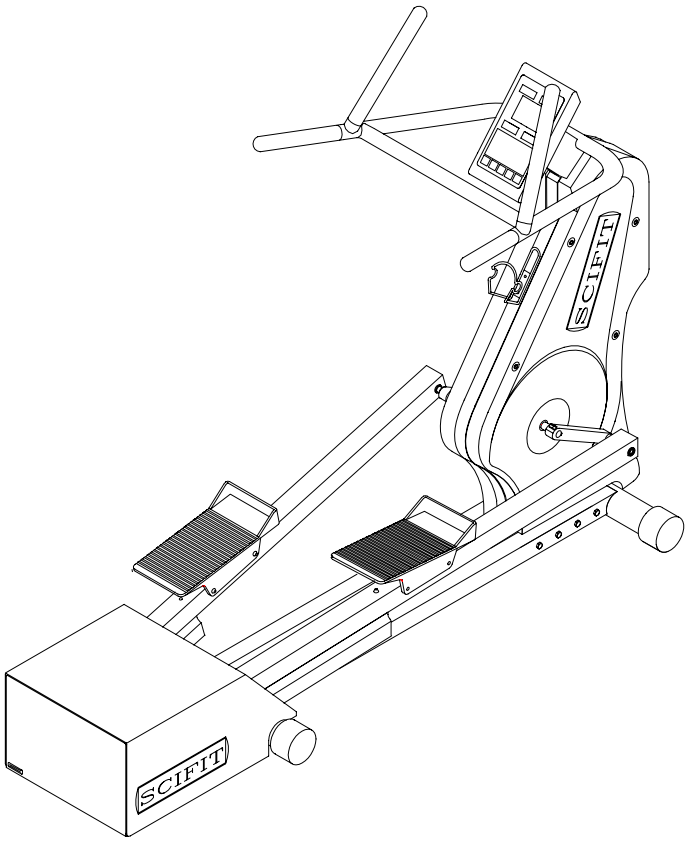

SX1000

Service Manual

SALES: 800-278-3933
CUSTOMER SERVICE: 800-745-1373

Revision: August 1999

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I. Overview

Purpose.

This manual is designed to assist in service of **SCIFIT** SX1000 elliptical exercise machines. The manual is divided into sections to diagnose and isolate problems. Troubleshooting tables and procedures, along with drawings, are provided to aid technicians in servicing equipment. The Item Numbers given in the parts list in Section V can be used to determine the location of various parts in Figures 1 and 2.

When troubleshooting, the actions taken to resolve problems should be performed in the order stated. Deviating from this sequence may cause damage to the equipment and lead to unnecessary repairs.

Technical Support.

For further assistance in service of **SCIFIT** products, please call **(800) 745-1373**, extension **21**. The technical support department is staffed from 8 AM to 5 PM C.S.T. Monday through Friday. A voicemail service is available 24 hours daily for recording messages to request technical support and to order replacement parts.

Please have the following information prior to calling technical support:

- Model number of equipment
- Serial number of equipment
- Point of contact name and phone number
- Detailed description of symptoms encountered.

II. Troubleshooting Tables

Table 1 – Electrical Troubleshooting

Problem	Possible Reasons	Solutions
1.1 The machine appears to be off when plugged in and switched "on".	Faulty power supply board.	If buttons on the control display beep when pressed, replace power supply board. See Procedure 1. Otherwise, check power supply board. See Procedure 2.
	Faulty fuse.	Check and replace fuse if needed. (See Fig. 3)
	Loose cable connection.	Check wire connections at power supply and display boards.
1.2 Upper control panel lights are dim.	Power supply board is faulty.	Replace power supply board. See Procedure 1.
1.3 Upper board accepts commands but pedaling resistance does not change.	Dip switch setting is incorrect.	Set dip switch to 01.
	Power supply board is faulty.	Check and replace power supply board as needed. See Procedure 2.
1.4 LED's on upper board blinking off/on, then go dead.	Ribbon cable connections are loose.	Check and replace accordingly. Unplug and re-plug machine to reset.
	Faulty power supply board.	Check and replace power supply board as needed. See Procedure 2.
	Display board is faulty.	Replace display board.

1.5 Heart rate displays zero (0) in window	Chest strap and transmitter improperly worn. Loose sensor lead connection at display board. Faulty receiver.	Verify that they are being properly worn. Check and adjust as needed. If there is no audible signal, replace receiver.
1.6 Unit keeps blowing fuses.	Too many units are daisy-chained together. Faulty power supply board.	Do not daisy-chain more than 3 units together. Check and replace power supply board as needed. See Procedure 2.
1.7 The upper display resets after starting a program.	Ribbon cable connection is loose. Power cord is loose. Display board is faulty.	Check cable connection at power supply and display boards. Check and adjust as needed. Replace display board.
1.8 Program stops, lines of dots shoot across screen.	Ribbon cable connection is loose. Display board is faulty.	Check and adjust cable connection as needed. Replace display board.
1.9 Machine shuts down in programs but works in manual.	Display board is faulty.	Replace display board.
1.10 Can't select program or enter information and no beep when buttons are pressed.	Membrane is faulty.	Replace membrane.

Table 2 – Mechanical Troubleshooting

Problem	Possible Reasons	Solutions
2.1 Rails lock up while operating.	Power supply board is faulty. Brake is bad.	Unplug power cord. If rails move, replace power supply board. If rails do not move with power cord unplugged, replace brake. See Procedure 4.
2.2 Squeaking noise external to machine drive assembly	Rails are not aligned properly. Spindle bearings are faulty.	Check and adjust rail alignment accordingly. See Procedure 5. Spray a Teflon- or silicone-based penetrating lubricant, such as WD40® on spindle bearings. See Fig. 5. If noise goes away but returns soon after, replace spindle bearings.
2.3 No resistance on pedals when in a program.	No speed signal Wires going to brake are disconnected. Power supply board is faulty.	Check and adjust the speed sensor as needed. See Procedure 3. Check that brake wires are properly connected. Check and replace power supply board as needed. See Procedure 2.

2.4 Very little resistance at any level.	Speed sensor improperly adjusted. Bad speed sensor connection with power supply board.	Check and adjust the speed sensor as needed. See Procedure 3. Check voltage at power supply board. See Procedure 2.
2.5 Belt is slipping	Not enough tension on the brake drive belt.	Tighten the belt to ¼" deflection at 10 lb of force.

III. Maintenance Procedures

Procedure 1 - Removing the Power Supply Board

1. Unplug the unit from the power source.
2. Lay it on its side.
3. Locate the power supply board access plate under front of unit. Refer to item 31 in Fig. 2.
4. Remove the four (4) screws. Be careful when pulling down the power supply board because of the plastic ties and brake wires.
5. Cut all the plastic ties.
6. Before disconnecting any of the wires, make note of the wiring sequence. Refer to the wiring diagram, Fig. 4.
7. Disconnect the following:
   a. The two (2) white (110 V) and two (2) black (24 V) transformer wires. These are all the wires from J4 on Fig. 4.
   b. The black and white wires from the power entry module – total of two (2). These are the wires at terminals ACIN1 and ACIN2 on the LCB.
   c. The two (2) red brake wires.
   d. The one (1) speed sensor plug – J5 on Fig. 4.
   e. The one (1) ribbon cable.
8. Reinstallation is the reverse of removal.
9. After reinstalling the power supply board, perform the following procedure to test correct reinstallation.
   a. Plug into power source and turn on.
   b. The message “SCIFIT FOR SCIENTIFIC SOLUTIONS” should be scrolling across upper display board. If not, see troubleshooting table.
   c. Press the start button.
   d. Turn the crankshaft in a forward motion.
   e. Verify that values are being displayed in the rpm/Watt window.
   f. Press the up arrow key to increase the resistance. It should become more difficult to turn the crankshaft. In not, consult the troubleshooting table.
   g. Press the up arrow and hold until level 22. After 3-5 seconds of turning, the resistance should be at its maximum level. If not refer to the troubleshooting table. If brake loaded up to maximum setting, then the job is complete.

Procedure 2 - Checking voltage at the Power Supply Board

1. Follow steps 1-4 in Procedure 1.
2. Use a voltmeter to measure the DC voltage across the speed sensor pins on the power supply board. Measure the voltage across the pin with the red wire (+) and either one of the center pins (-). The voltmeter should measure 4-5 volts DC.
3. If there is no voltage, replace the power supply board.

Procedure 3 – Checking and Adjusting the Speed Sensor

1. Turn machine on and press start.
2. Turn crank arms at 1 revolution per second. The RPM window should display around 60 $\pm$10 rpm.

3. If the RPM window is displaying a reading outside of the specified range, proceed to the next step to adjust the speed sensor.
4. Remove the hood.
5. The air gap between the brake flywheel and speed sensor should be 1/8" – 3/16".
6. The speed sensor must be pointed directly at the flywheel so the eyes of the sensor will intersect the center of the axis of the brake. Adjust as needed.
7. Rotate the crank arm again at 1 rev. per second. If the RPM window displays a number greater than zero (0) but not within 60 ±10 rpm, repeat steps 1 - 6. If a reading of zero (0) is displayed, proceed to step 7.
8. Use a voltmeter to measure the DC voltage across J5 pin 1 (+) and J5 pin 2 (-) on the power supply board. Refer to Fig. 4. The voltmeter should read 4-5 VDC.
9. If there is no voltage, replace the power supply board. If 4-5 volts are present, replace the speed sensor.

Procedure 4 – Removal and Replacement of the Brake Assembly

1. Remove each rail from its crank arm spindle. First, remove the snap ring at the spindle outer edge; then slide the rail outward and upward off the machine.
2. Remove the two screws holding the bottle cage below the handlebars. Remove the single screw located just above the power entry module.
3. Remove the five screws from side of the left cover. Position the left crank arm pointing backward and parallel to the base frame. Pull the front edge of the cover and slide it inward and backward to clear crank arm.
4. Repeat step 3 on right side.
5. Disconnect the two red wires on the right side of brake.
6. Remove the ½" nuts and lockwashers from both brake studs.
7. Remove the 10-32 allen-head screw on the right side of brake.
8. Remove the tensioning screws at the top center of the brake on each side of the sheet metal frame.
9. Remove the V-belt from the plastic pulley by wedging a screwdriver blade between the belt and pulley while rotating the brake slowly downward to work the belt off the pulley. Take care not to damage pulley.
10. Lift the brake upward to clear frame and pull the speed sensor bracket off the left brake stud. Remove the brake from the machine and set aside to return to SCIFIT (request a UPS call tag by phone).
11. Hoist the replacement brake above the frame mounting slots and wrap V-belt around brake hub. Position V-belt hanging behind the idler pulley.
12. Put the speed sensor bracket on the left brake stud. Note: If old brake has a smaller diameter (7" vs. 9") a replacement speed sensor bracket must be used. Remove the single screw holding the speed sensor to the old bracket and attach the sensor,

with the same orientation, to the new bracket. Refer to Procedure 3, if needed.

13. Slide the brake studs and speed sensor bracket inside and to the bottom of the frame mounting slots.
14. Connect the two red wires to the brake.
15. Loosely attach the lockwashers and nuts to the brake studs.
16. Rotate the stator of brake to align the screw hole on the right side of brake with sheet metal frame. Loosely attach the 10-32 screw to this hole.
17. Slip the V-belt over the plastic pulley while slowly turning the brake downward to install and center the belt on the pulley.
18. Insert the left tensioner screw and finger-tighten. Repeat this process on the right side.
19. Tighten the left-side tensioner screw with an allen wrench until the angle brackets begin to bend inward. Repeat this process on the right.
20. Position the speed sensor bracket vertically.
21. Snugly tighten the brake stud nuts until the lock washers compress. Do not over-tighten to avoid breaking the studs.
22. Tighten the 10-32 screw on the right side of brake.
23. Rotate the brake assembly to verify the V-belt is centered in the idler pulley. If misaligned, wedge a screwdriver blade between the face of the brake and the belt while turning Assembly to align belt to center of idler pulley.
24. Attach speed sensor tape to the left edge of the brake armature. First peel off tape backing on the end with the wide silver band and stick on the brake surface hanging down. Slowly rotate the brake upward and wrap tape around the circumference of the brake.
25. Perform the following steps 25 through 29 and perform the alignment (Procedure 3), if indicated results are not attainable.
26. Plug in and turn on machine but don't press any buttons. The display will be scrolling the message, "SCIFIT…" Slowly rotate the crank arm assembly and the message will change to a programming prompt. The following values will be displayed: [20.00] in TIME, [0] in RPM, and [4] in LEVEL. If the display doesn't default to these values, perform Procedure 3.
27. Press the START/STOP button once and press the SCAN/HOLD button to hold the RPM function. Press and hold the DOWN ADJUST arrow until 0.0 is displayed in the LEVEL window.
28. Rotate the crank arms at one revolution per second and ensure display accurately reads about 60 RPM.
29. Press and hold the UP ADJUST arrow button to the maximum, level 22. Rotate the crank arms as rapidly as possible. Brake resistance should become increasingly difficult momentarily.
30. Replace the covers and rails in the reverse order of steps 1 through 4.

Procedure 5 – Checking the Rail Alignment

1. Remove the rear rail cover (item 85).
2. Check alignment of the guides (item 58) on the rollers (item 40) by moving the rail assemblies (item 57) forwards and backwards and making sure that the rollers run in the flat center section of the roller guides. If the guides are not tracking correctly, see Procedure 6.

Procedure 6 – Adjusting the Rail Alignment

1. Remove both rail assemblies (item 57).
2. Remove the left crank arm (item50) and Woodruff key (item 102).
3. Remove the left and right side covers (items 81 and 80, respectively). Note: this may be done without removing the right crank arm.
4. Reinstall the left crank arm at the same angle as the right crank arm. Do not use the Woodruff key when putting the crank arm on. Secure the left crank with the pinch bolts.
5. Reinstall the rail assemblies.
6. Partially loosen the nuts and bolts holding the crank shaft bearings (item 73) and flangettes (item 72). Leave enough tension on the bolts to hold the bearings in place, but will allow bearings to be moved.
7. Check alignment of the roller guides (item 58) on the rear rollers (item 40). The flat section of the roller guides should be centered on each roller. If the guides are not centered, grab the ends of the rail assemblies and move them sideways until the guides are centered on the rollers. The crank shaft bearings and flangettes should move slightly when the rail assemblies are moved.
8. Retighten the crank shaft bearing bolts and nuts in their new position.
9. Check alignment of the guides on the rollers by moving the rail assemblies forwards and backwards and making sure that the rollers run in the flat center section of the roller guides. If the guides are not tracking correctly, repeat steps 6-8 until satisfactory alignment is achieved. Note: if one or both rail assemblies cannot be made to track on flat center section of the roller guide, there may be a problem with the rail itself. If this is the case, please contact SCIFIT Service at 800-745-1373. Also, check the chain tension. The chain should be tight enough to eliminate backlash, but not so tight as to bind and cause excessive noise.
10. Remove the rail assemblies.
11. Remove and reinstall the left crank arm at a 180° orientation from the right arm. Put removable threadlocker (blue LOCTITE®) on the pinch bolts and tighten.
12. Reinstall the side covers.
13. Reinstall the rail assemblies.

IV. Figures
Figure 1 – SX1000 Main Frame

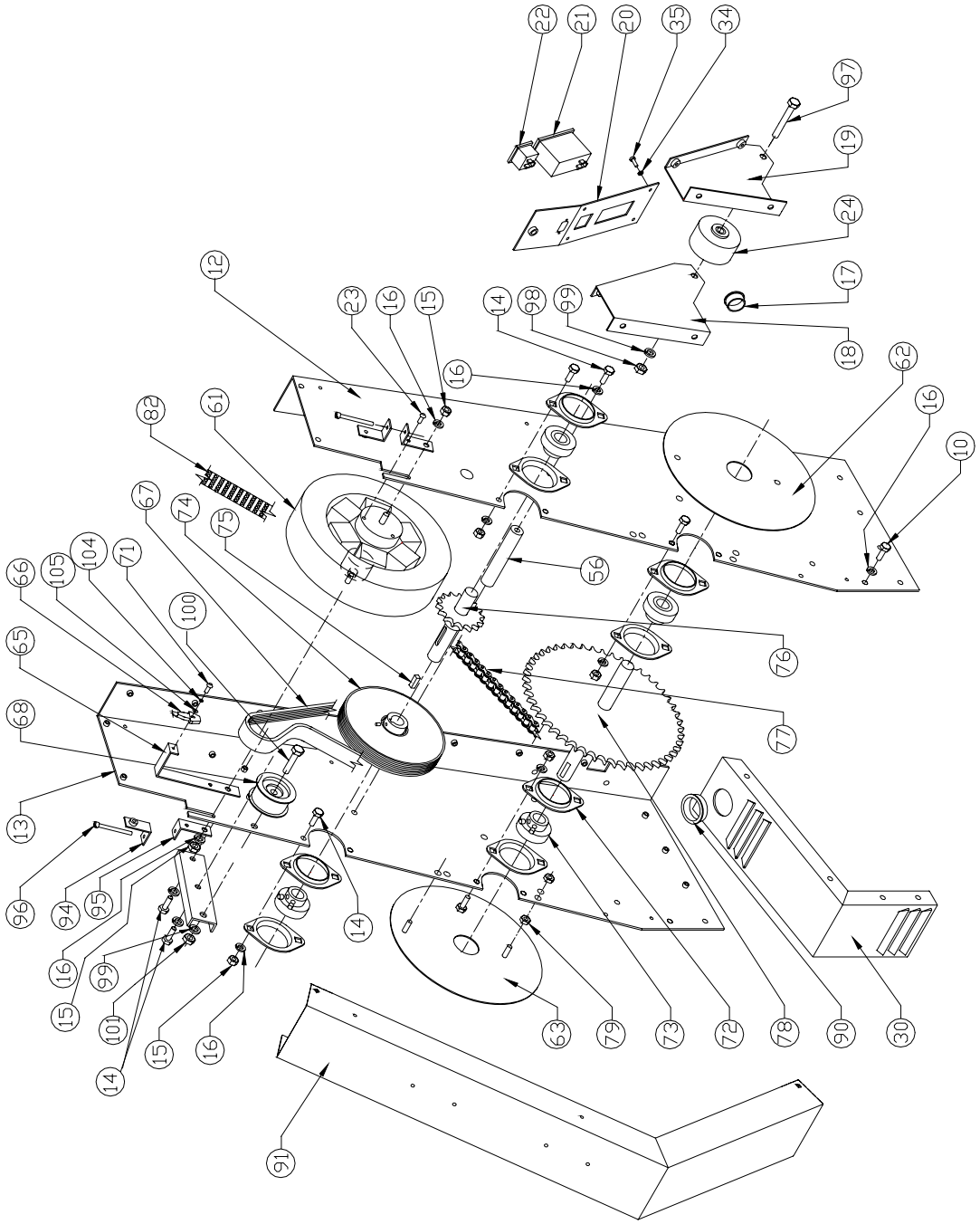


Figure 2 – SX1000 Total Assembly

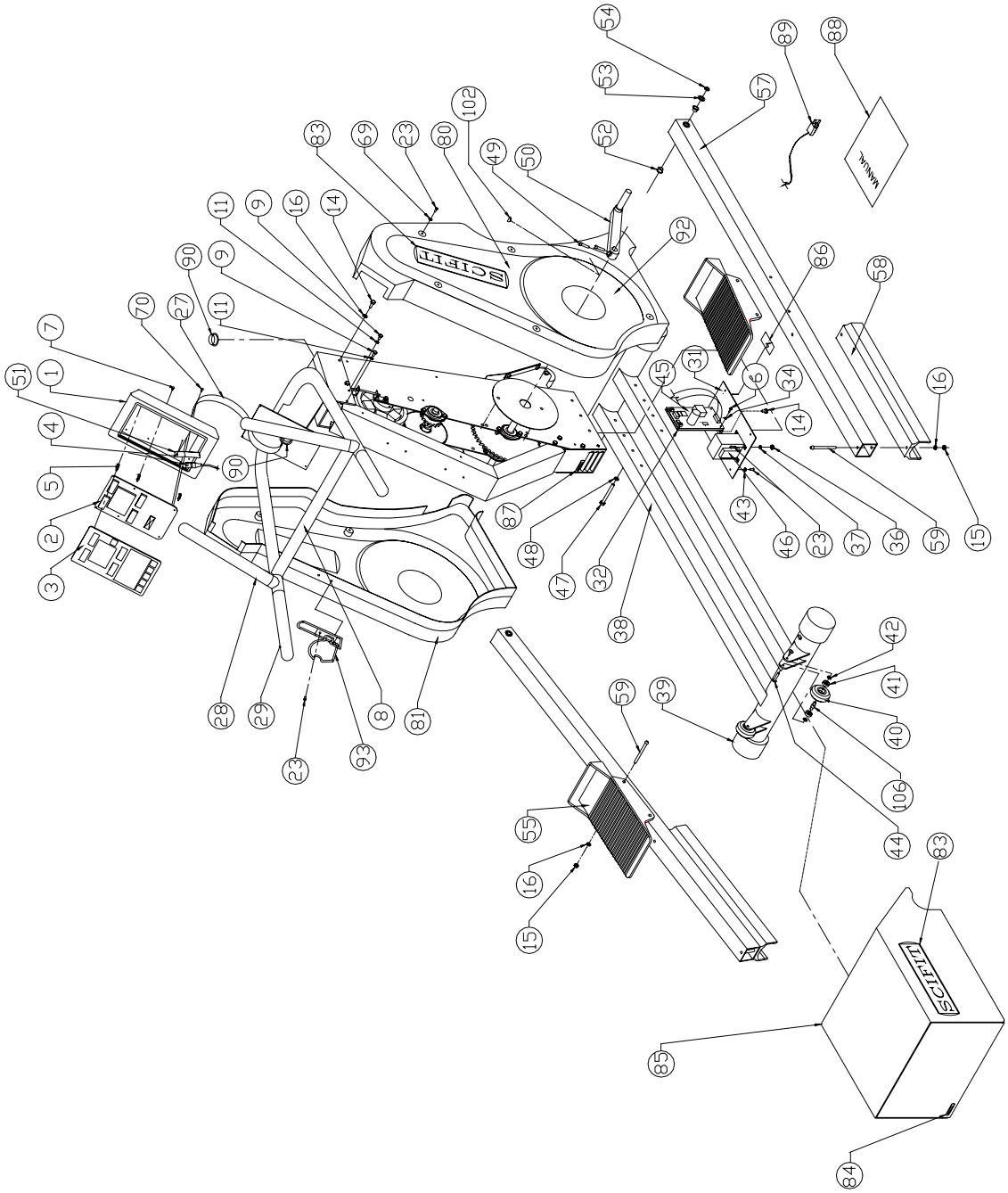


Figure 3 – Power Entry Module with Fuse Holder

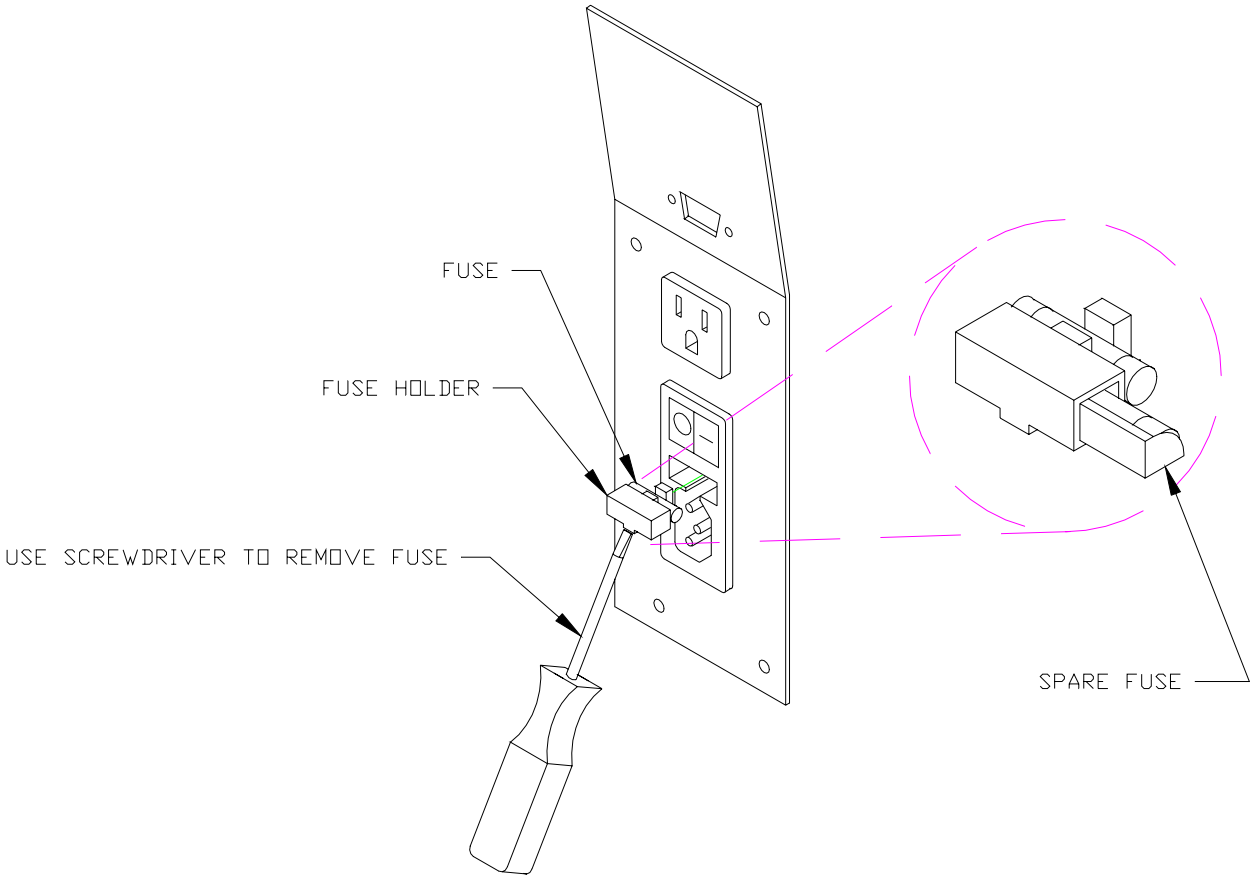


Figure 4 – SX1000 Wiring Diagram

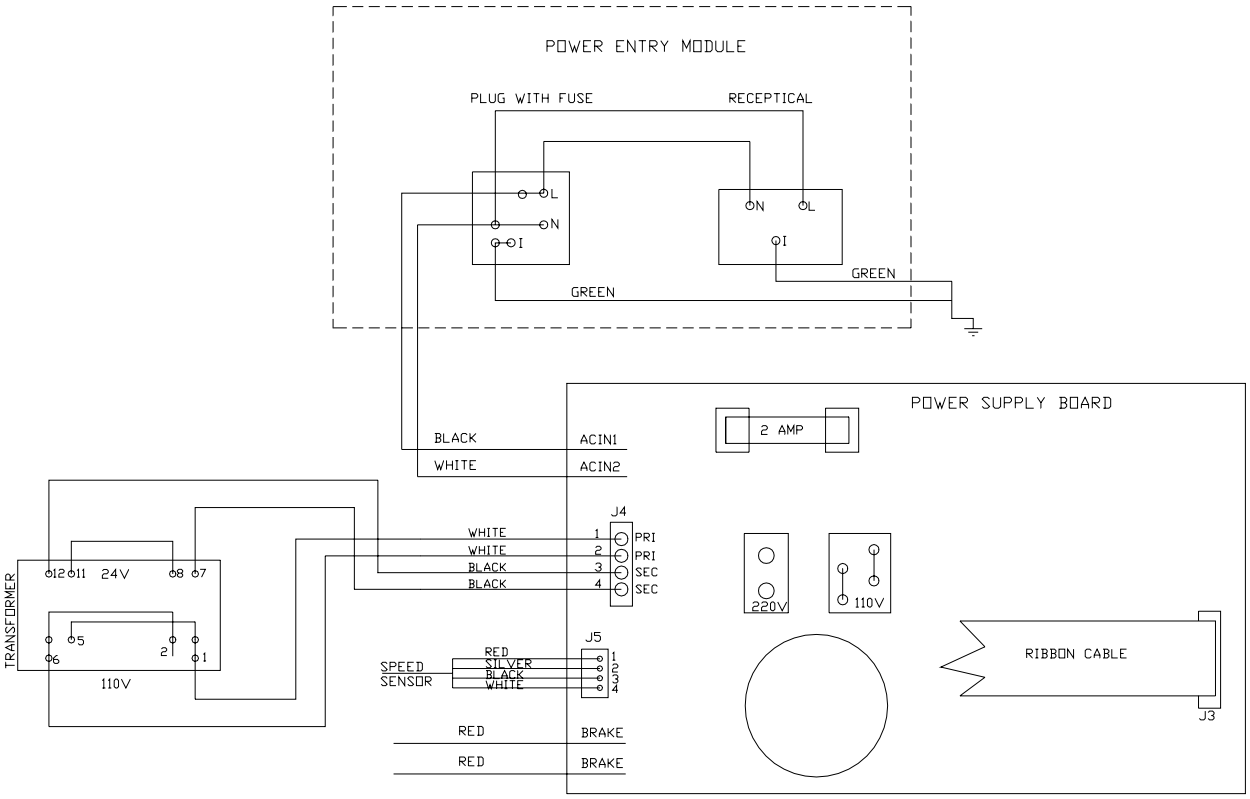
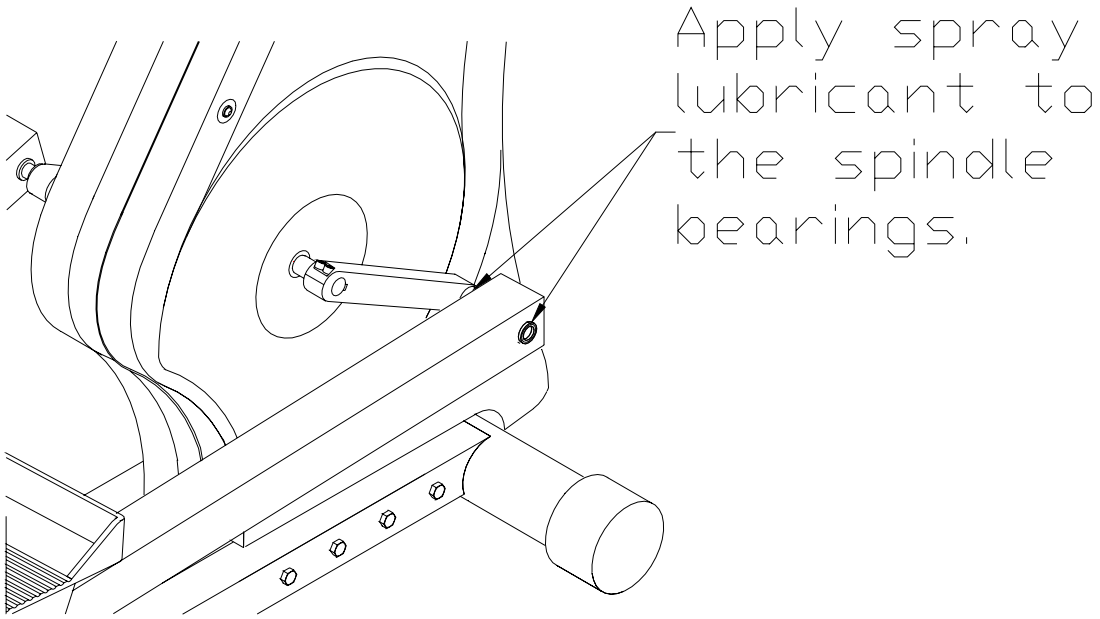


Figure 5 – SX1000 Spindle Bearing Lubricant Application



V. SX1000 Parts List

Item	Description	Part No.	Qty.
1	Console	65202	1
2	Display board	65110	1
3	overlay/switch panel	65112	1
4	heart rate pickup/cable, assy	A1066	1
5	standoffs, 1", 6-32	P1051	6
6	screw, 6-32x.5 b.h. pltd.	P1052	14
7	screws, 6-32x.250 f.h. pltd.	P1053	1
8	mount, display, weldment	B1020	1
9	bolts, 1/4-20 x 5/8 pltd.	P1054	6
10	bolt, 5/16-18 x 1/2 pltd.	P1057	22
11	lockwashers, 1/4	P1056	6
12	plate, side, drivetrain, right	C1013	1
13	plate, side, drivetrain, left	C1014	1
14	bolts, 5/16-18 x 5/8 pltd.		12
15	nuts, 5/16 -18 pltd.	P1058	10
16	lockwashers, 5/16	P1059	34
17	grommet, hole, 1" dia.,	P1060	1
18	bracket, wheel, left	A1015	1
19	bracket, wheel, right	A1016	1
20	plate, power entry	A1018	1
21	module, power entry	P1061	1
22	module, outlet, power	65177	1
23	screw, 10-32x.5, black, b.h., socket cap	P1062	18
24	wheel, front	P1063	1
27	cable, ribbon, assy	A1067	1
28	grip, 1 1/4 dia x 14"	P1068	2
29	grip, 1 1/4 dia x 10"	P1069	2
30	cover, electronics, lower	A1017	1
31	plate, mounting, electronics, lower	A1019	1
32	bracket, PCB, lower	A1047	1
34	lockwasher, #8		4
35	screws, 8-32 x 1/2, pan head, pltd.		4
36	nuts, 10-32, pltd.	P1073	4
37	lockwasher, #10,	P1074	4
38	frame, base, weldment	C1011	1
39	endcap, 3"dia	70330	4
40	roller, rail, urethane	P1075	2
41	bearing, roller, rail, urethane	P1128	4
42	washer, #10, flat		4
43	washer, #10, star		4
44	kit, bolt, roller, rail	P1077	2

45	PCB, supply, power	65150	1
46	transformer, supply, power	65180	1
47	bolts, 5/16-18 x 2 1/2, hex, pltd.	P1079	8
48	lockwasher, 5/16, black		8
49	1/4-20x1" Socket Cap		4
50	Crank, Machined, 205mm, assy.	A1172	2
51	Bracket, mounting, pickup, heart-rate	A1124	1
52	Bearing, flanged, 3/4 dia, 1/2 long, igus L280	A1180	4
53	Bearing, thrust, 3/4 dia, igus L280	P1179	2
54	ring, snap, 3/4 dia.		2
55	pedal, finished	A1028	2
56	Shaft, spacer	A1131	1
57	rail, weldment	B1109	2
58	guide, roller, extruded	A1110	2
59	bolt, 5/16-18 x 3 1/2P, button head, black	P1086	8
60	cap, 2 1/4 x 2 1/4, plastic, black	P1087	4
61	brake	A1331	1
62	cover, pedal, right	A1041	1
63	cover, pedal, left	A1042	1
65	Bracket, sensor, speed, brake, large	A1176	1
66	sensor, speed, cable, assy	A1089	1
67	belt, poly-V	P1090	1
68	idler	P1091	1
69	washer, cover, plastic, black	55	11
70	screws, 8-32 x 3/8 f. h. pltd.		4
71	screws, 4-40 x 1/2 p.h. pltd.		1
72	flangette, bearing	P1095	8
73	bearing,	P1096	4
74	pulley, poly-V, 6" dia	P1097	1
75	key, square, 1/4 x 1/4 x 1	P1098	1
76	shaft, jack, assy	A1050	1
77	chain, 1/2 pitch, per foot	P1072	2
78	Spindle, Crank, Assy.	A1048	1
79	nut, jam, 5/16-18, pltd.	P1099	8
80	cover, right	P1036	1
81	cover, left	P1035	1
82	Tape, pickup, speed, brake, large	A1190	1
83	decal, Scifit	P1100	4
84	decal, SX1000	P1101	1
85	cover, rail, rear, weldment	A1022	1
86	decal, warning, hi voltage	P1102	1
87	decal, serial number	P1103	1
88	manual, operator's	P1104	1

89	cord, power, AC	65169	1
90	grommet, hole, 1 1/2 dia.	P1105	3
91	support, cover	A1033	1
92	decal, plate, scuff	P1106	2
93	holder, bottle, water	P1092	1
94	bracket, tension, upper	A1116	2
95	bracket, tension, lower	A1117	2
96	socket head, 10-32x2.5, flat, d.h., pltd.		2
97	bolt, 3/8-24 x 2 1/2 hex, pltd.		1
98	nuts, 3/8-24		1
99	lockwashers, 3/8		2
100	bolt, 3/8-16 x 1 1/2 hex, pltd.		1
101	nut, 3/8-16		1
102	Key, #806 (1/4x3/4), Woodruff		2
104	washer, #4, flat, pltd.		1
105	washer, #4, split, pltd.		1
106	Spacer, bearing, roller	P1078	2