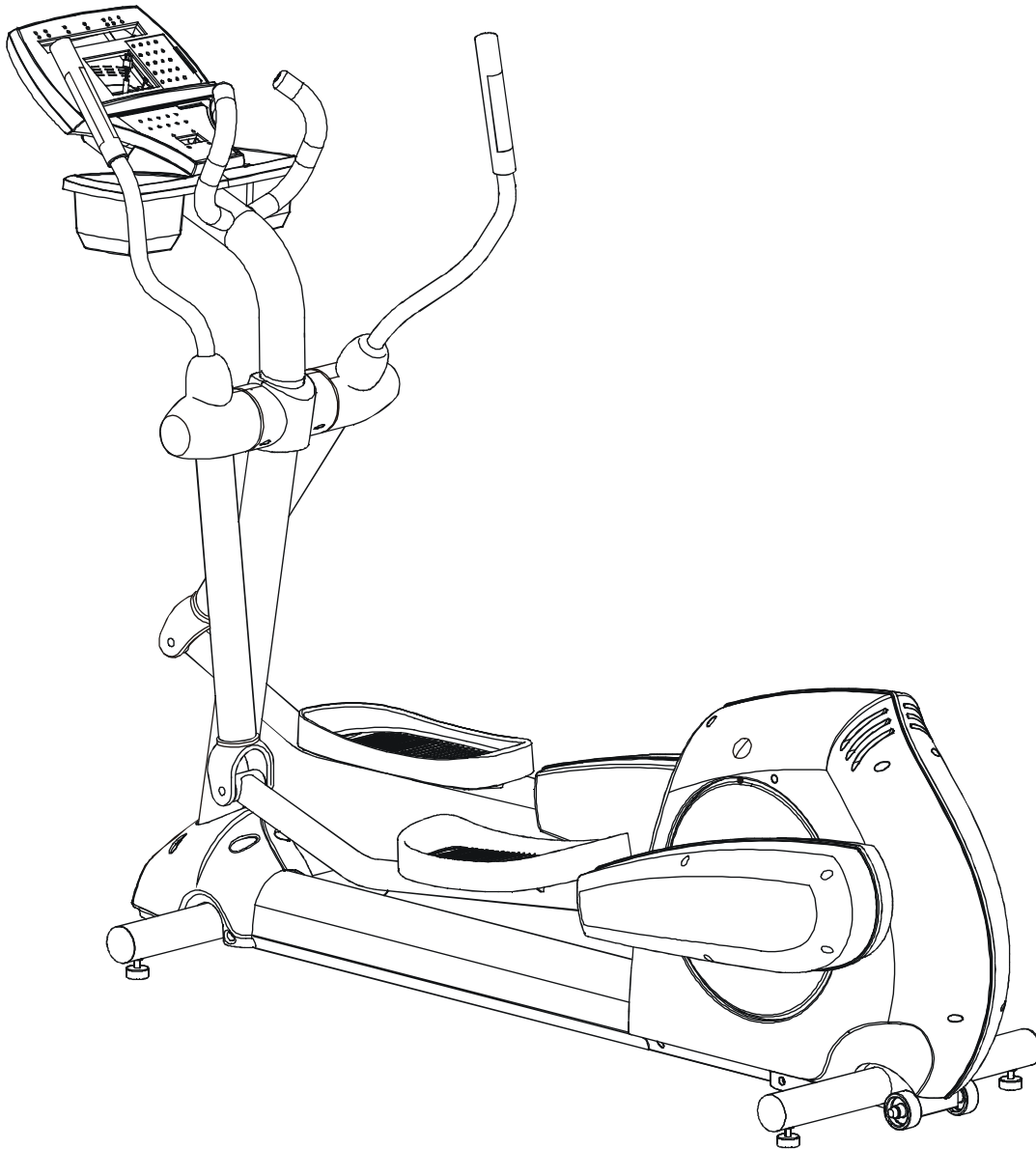


LifeFitness

**Models X9i, 8500, 9100, and 9500HR
Total Body Cross-Trainers with Rear Drive System**



**Customer Support Services
*SERVICE MANUAL***

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

INTRODUCTION

HOW TO USE THIS SERVICE MANUAL AND CONTACT CUSTOMER SUPPORT SERVICES

This service manual is applicable to Cross-Trainer Models X9i, CT8500, CT9100, and CT9500HR. Information in this manual represents typical configuration and may differ slightly from actual equipment. The Service Manual provides recommendations for safe and efficient approaches to service situations. The Table of Contents includes: Theory of Operation, Terminology, and Five Sections.

THEORY OF OPERATION

TERMINOLOGY

Section I

TROUBLESHOOTING

Section II

DIAGNOSTICS

Section III

"How To..."

Section IV

ELECTRONICS

WIRING DIAGRAMS

Section V

MISCELLANEOUS

When an operating problem occurs, refer to troubleshooting guides and diagnostic tests in an attempt to isolate the cause. Once you have pinpointed the source of the problem, refer to "How To..." guides for recommended service procedures and recommended Special Service Tools.

To order place a parts order or contact Life Fitness Customer Support Services call:

24 hrs. /day, 7 days/week by facsimile -

Monday - Friday from 8:00 AM to 7:00 PM by telephone

To speed Life Fitness Customer Support Services response to your needs, please be prepared to provide the following information to the phone technician.

1. Model number
2. Serial number consists of 3 letters and 6 numbers
3. Symptom of problem
4. Part name and number to order (if known)

Before installing a part, review "How To..." and follow the step by step procedures recommended to install the part safely and efficiently. If you have questions or comments, please telephone, FAX or write us:

LIFE FITNESS - CUSTOMER SUPPORT SERVICES
10601 Belmont Avenue; Franklin Park, IL 60131; U.S.A.
Telephone: 847.451.0036 or Toll Free 800.351.3737
FAX: 847.288.3702 or Toll Free 800.216.8893

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

THEORY OF OPERATION

The electronic system on the rear-drive crosstrainer is made up of three main sub-systems: 1) Console, 2) HR telemetry, and 3) Alternator, Power Control Board, and Load. In addition, the 9500 model has Lifepulse contact HR. The following is a description of each sub-system:

CONSOLE

The system voltage (6-7.5Vdc) enters on connector P2 pin 1 and is used to power the LEDs and provide a supply voltage for the 5V-regulator circuitry used to power the microprocessor section.

The Keypad entry (user's input), Lifepulse (9500HR only), and Telemetry are all processed by the microprocessor. The console outputs a PWM signal to the power control board to control the duty cycle of the load.

HR TELEMETRY

HR telemetry is implemented via a Polar receiver located in the mono-column cover at the front of the unit. The Polar receiver connects to the console at connector P7.

ALTERNATOR, POWER CONTROL BOARD, AND LOAD

Using the PWM signal from the console, the power control board switches the current on and off at the load via Q1. The control board also regulates the alternator voltage using the U1. Q3 and Q9 are used to sense the reed switch actuation (autostart feature).

LIFEPULSE (9500 ONLY)

The handlebar electrodes connect to the console board at connector P4. Pins 1 and 4 are signal, pins 2 and 3 are circuit reference.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

TERMINOLOGY

The following words and acronyms are commonly referred to throughout this manual. Take time to familiarize yourself with them.

Connectors	Electrical plugs used to connect wiring into electrical component.
Display Console Board	Electronic board for making settings and monitoring physical output.
EEPROM	Electrically erasable programmable read only memory.
EEROM	Electrically erasable read only memory.
LDC	Load duty cycle.
LED	Light emitting diode used to show a state of operation.
LifePulse	Heart rate sensors on hand grips.
PCB	Power control board regulates voltage to alternator, console, and battery.
Polar Receiver	A device directly in front of the operator that monitors heart rate.
Rear drive	The area where all the drive components reside.
RPM	A revolution per minute describes the amount of times something turns within a minute of time.

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SECTION I
TROUBLESHOOTING
GUIDES

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

Malfunction	Probable Cause	Corrective Action
Grinding, rubbing, knocking noises when pedal levers rotate under load.	Pulleys misalign.	<ol style="list-style-type: none"> 1. If intermediate pulley is not aligned, shim the second stage drive assembly. 2. If that is not enough, disassemble and check mounting surfaces for damage and replace intermediate assembly, if needed. 3. Move the 10 rib Kelvar belt to the grooves that will minimize misalignment. 4. Loosen the pillow block bearings, realign the pulleys, and retighten the pillow block bearings.
	Dirt built up in pedal tracks.	Clean and remove dirt build up.
	Rear roller wheels frozen.	Clean and lubricate with non-detergent oil.
	Link cover contacting rear cover.	Reposition rear cover(s) or replace.
		Check that the inner link cover threaded inserts and mounting screws are properly installed.
	Excessive disk wobble.	Make sure no weld interference occurs between the crankarm and the disk cover.
		Ensure that the crankshaft is flush with the crankarm and check for proper alignment. See How To...Replace the Crankarm Assembly.
	Faulty intermediate shaft assembly.	Replace intermediate shaft assy.
	Faulty pillow block.	Replace pillow blocks on crankshaft.
	Alternator.	Relieve tension on alternator, spin flywheel for smoothness. If thumping occurs, faulty alternator. Replace alternator.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

Malfunction	Probable Cause	Corrective Action
Grinding, rubbing, knocking noises when pedal levers rotate under load	Bearings at pivot points are out of position or dirty.	Clean all sleeves in the linkage pivot areas and lubricate with non-detergent oil. NOTE: Install the tie rod at the rear of the machine first, then at the front. See How To... Replace Tie Rod.
	Setscrews or crankarm bolt in crankarm assembly are loose.	Loosen setscrew and clamping screw in crankarm assembly. Apply blue Loctite® (242) on screw threads. Tighten setscrew first to set keyway, then tighten clamping screw. Crankarm bolt requires no Loctite.
	Small extension arm bolt loose.	Replace small extension arm kit.
	Faulty link bearings.	Replace link assembly.
	Link mounting loose.	Clean, lubricate, and retighten.
	Excessive end play in roller.	Adjust collar to .005" maximum clearance and ensure that the roller rotates freely. See How To...Replace the Crankarm Roller Assembly.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

Malfunction	Probable Cause	Corrective Action
Grinding, rubbing, knocking noises when pedal levers rotate under load.	Excessive end play in rocker arms.	Adjust collars as necessary to take out the end play. See How To Replace Rocker Arms.
	Pedal lever vibrates or squeaks during operation.	Align pedal lever. See How To Replace Pedal Lever.
	Pedal tape not adhering properly.	See How To Replace Pedal Lever
Drive Belt slipping.	Loose or worn belt.	Check belt tension using a J10 belt gauge (170 lb for a new belt and 160 lb for either belt.)
Upper Arms feel loose.	Bolts that connect the upper and lower arms are loose.	Remove bolts and ensure threads in the rocker arms are clean and free of paint. Adjust and tighten to a torque of 30-35 ft lb.
Front to back play in pedal lever.	Poly V-Pulley on intermediate shaft is loose.	Replace intermediate shaft assembly.
	Crankarm loose.	Loosen setscrews and clamping screw in Crankarm Assembly. Apply blue Loctite® 242 on screws. Tighten setscrews first and then tighten the clamping screw.
	Worn link bearings.	Replace link.
	Loose link mounting.	Clean, lube, and reassemble.
No Load.	Faulty cables, power console board, or alternator.	Enter diagnostic state 3, execute the field duty cycle, and increase the load. If load does not increase, replace alternator. Ensure console connector is fully seated.
No LED's on display.	Faulty display console, cable or power control board.	Using a voltmeter, verify 6Vdc on the 16 position Molex connector pins 4 (+) and pin 11 (GND) on the display console PCB. If voltage is present, replace display console. If not, replace power control board.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

Malfunction	Probable Cause	Corrective Action
Alternator belt slipping.	Belt is loose.	Retention to 65-70 lb using the J6 belt gauge.
No heart rate or erratic heart rate.	Pinched cable in Monocolumn cover.	Remove Monocolumn covers and inspect cables. Replace damaged cable.
	Defective chest strap or improperly positioned.	Replace chest straps or reposition it. Reset transmitter. Refer to Diagnostics state 3 to execute the heart rate test.
	No heart rate reading.	Execute Diagnostic Mode to verify performance of heart rate function.
	Faulty cable connection.	Verify heart-rate cable is properly connected. Using an ohmmeter, verify continuity at the main console cable.
	Malfunctioning user arm/Lifepulse (CT9500HR) Grip Assembly (include worn or damaged heart rate lead).	Replace user arm/Lifepulse (CT9500HR) Assembly.
	Life Pulse user arm defective.	Verify user arm is functioning. Wipe sensors dry. Using an ohmmeter, verify continuity between Lifepulse sensor and cable connection. Replace if defective.
	Loose or malfunctioning heart rate lead connection at Display Console.	Secure connection. Replace malfunctioning user arm/Lifepulse (CT9500HR) Grip Assembly.
	Malfunctioning Display Console.	Test with known good Display Console. Replace malfunctioning Display Console.
	Cross talk from telemetry and another transmitter or possible interference from other electronic devices.	Position Cross-Trainer at least 3 ft (1 m) from unit with telemetry or from other electronic devices.
	Bad connection. No heart rate reading.	Check for corrosion on connectors. Disconnect and reconnect telemetry receiver. Check hand sensors for dirt, and clean.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

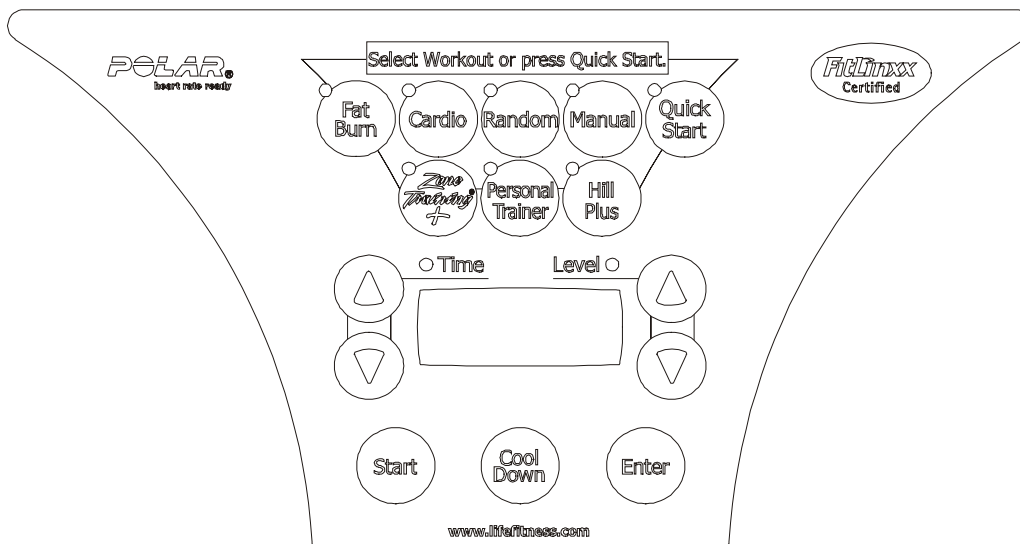
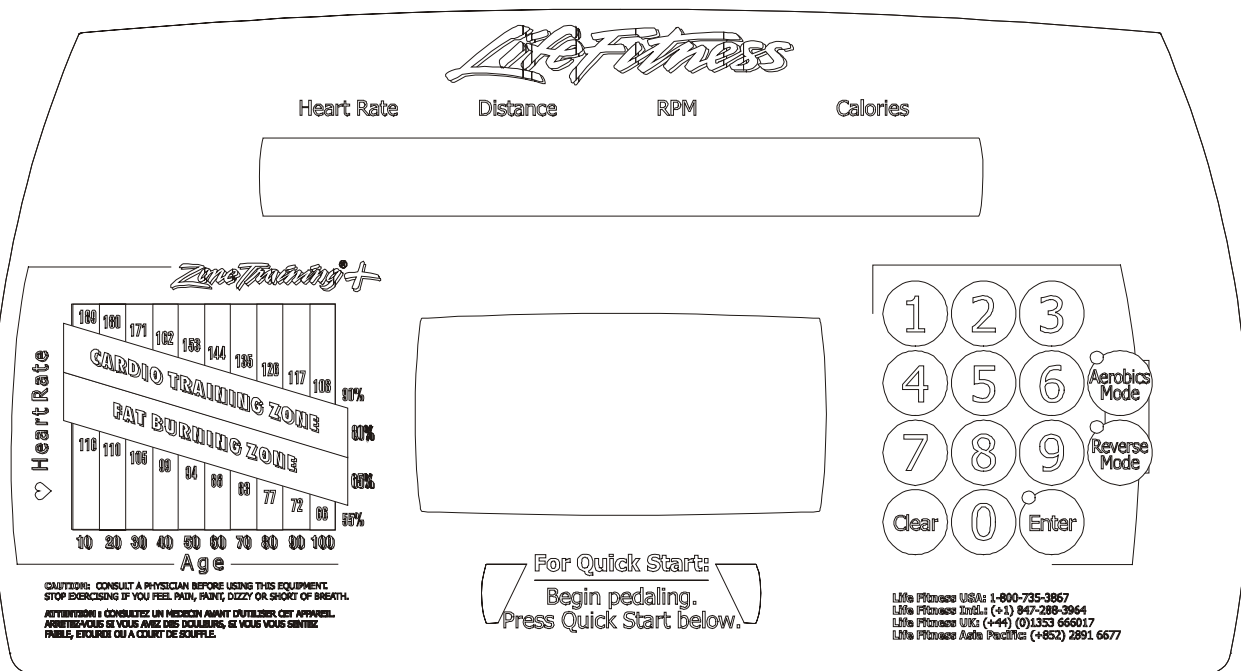
Malfunction	Probable Cause	Corrective Action
No LEDs or random LEDs lit.	Cable connection faulty.	Remove display console and verify cable is properly plugged into console.
	Main wire harness damaged.	Check for a damaged wire harness. Replace wire harness.
	Faulty Battery	Test battery voltage needs to be around 6.5 Vdc not below 5.7 volts DC
No RPM. Unit shuts off one minute into program.	Bad cable connection.	Verify cables connections at console to power control PCB, and power control PCB to alternator. Disconnect and reconnect cables. Using a voltmeter, verify cable continuity on console to power control PCB and power control PCB to alternator.
Auto start failure	No RPM	Operator must be pedaling unit for the auto start feature to activate.
	Battery	Battery voltage should be 6.5 – 5.7 Vdc. If not, replace the battery.
	Bad cable connection.	Verify cables connections at console, board, and reed switch are correct and connected properly.
	Magnet	Verify that magnet is on crank pulley. If magnet is not present, reinstall magnet.
	Faulty reed switch or board.	Perform a continuity test. Inspect reed switch for damage. If necessary, replace the switch. See How to in Section 3.
	Console Lights then fails	Faulty reed switch
	Battery failure	Test battery voltage. Needs to be around 6.5 Vdc not below 5.7 volts VDC

SECTION II

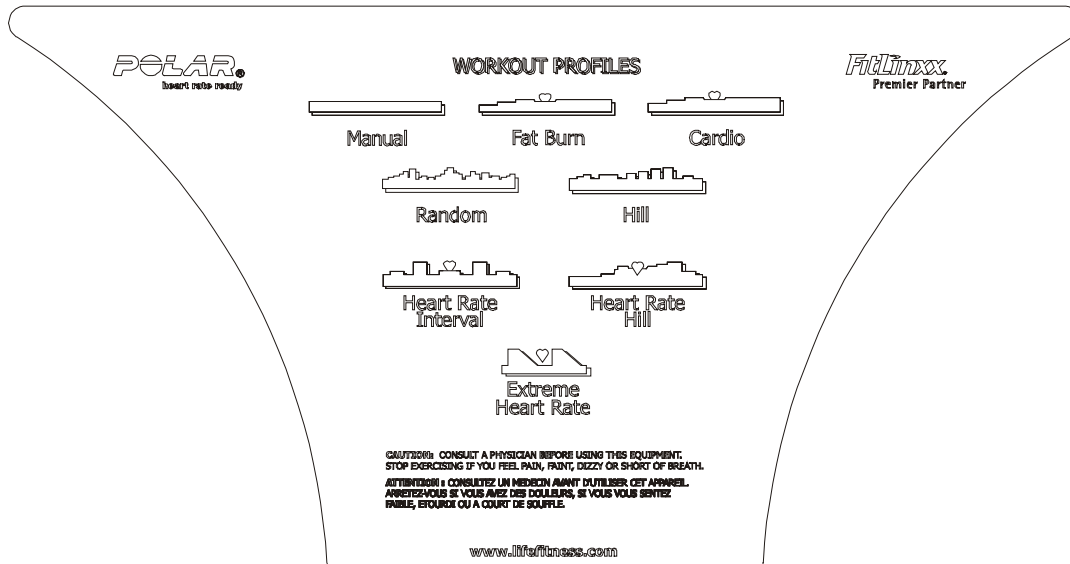
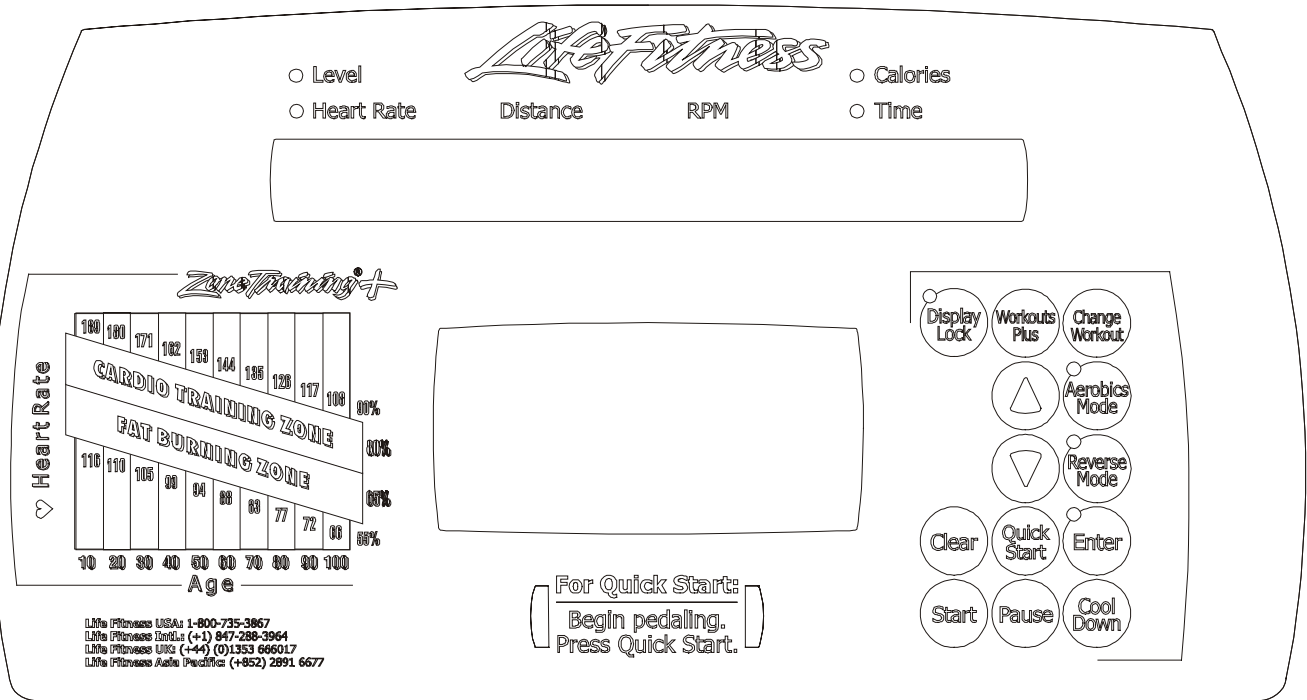
DIAGNOSTIC MODES

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

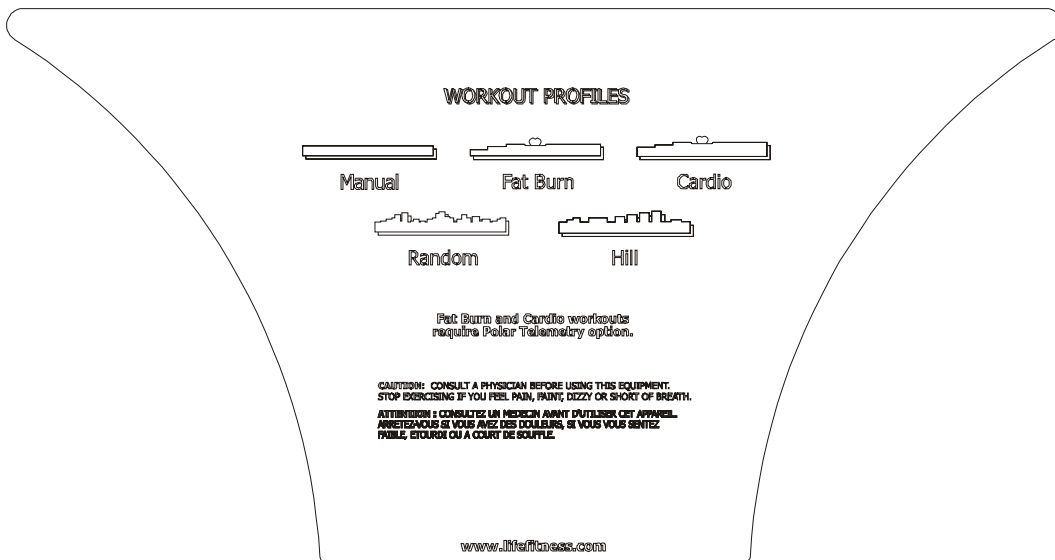
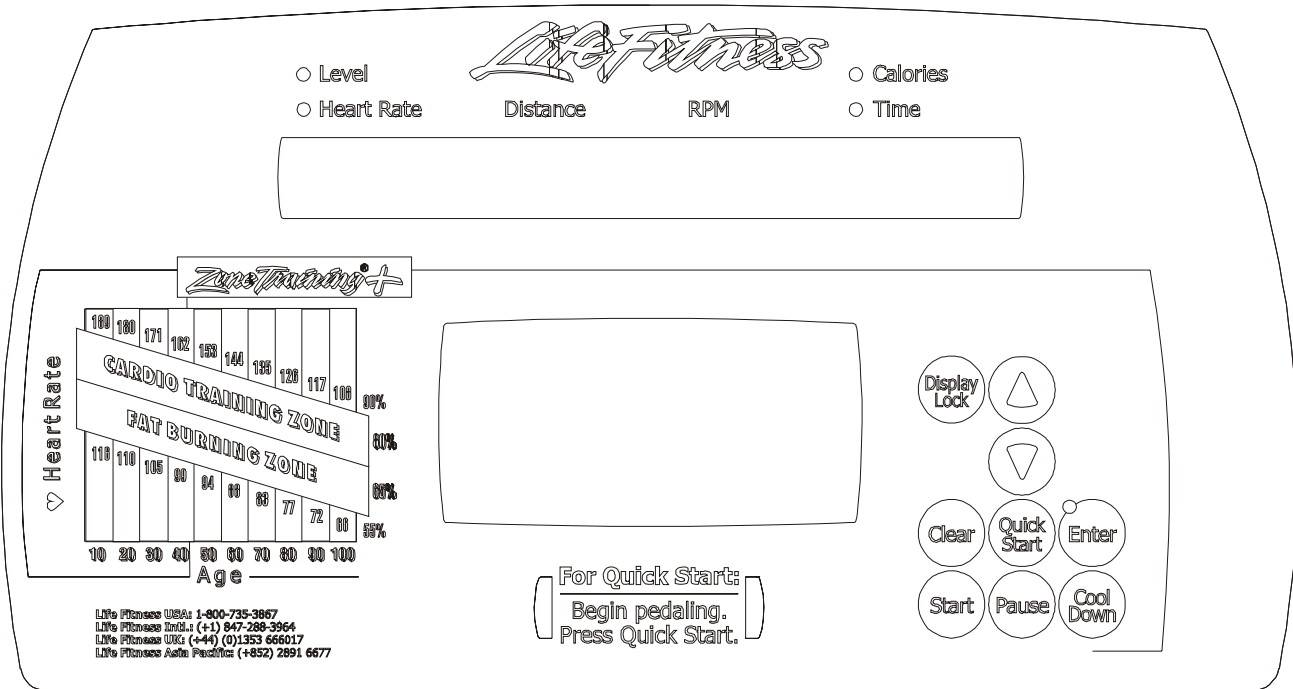
Display Consoles CT9500



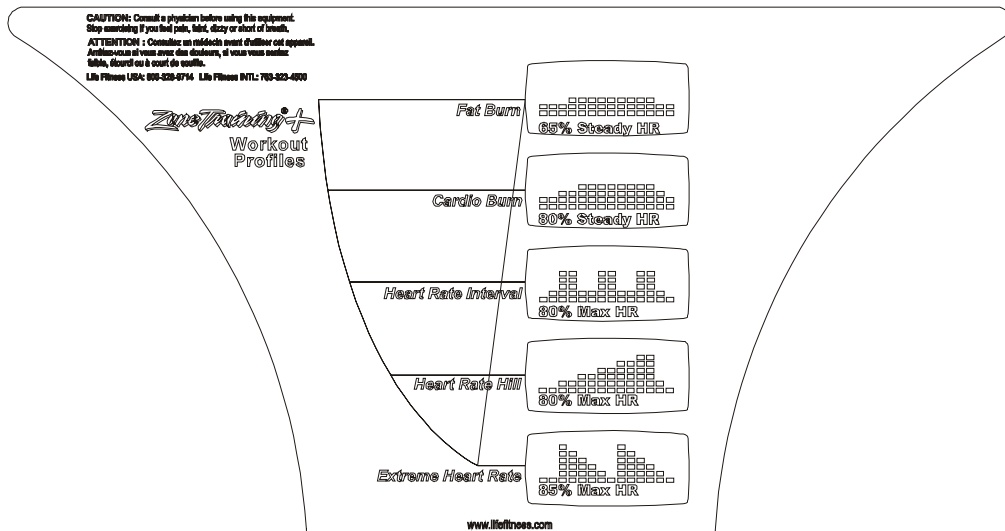
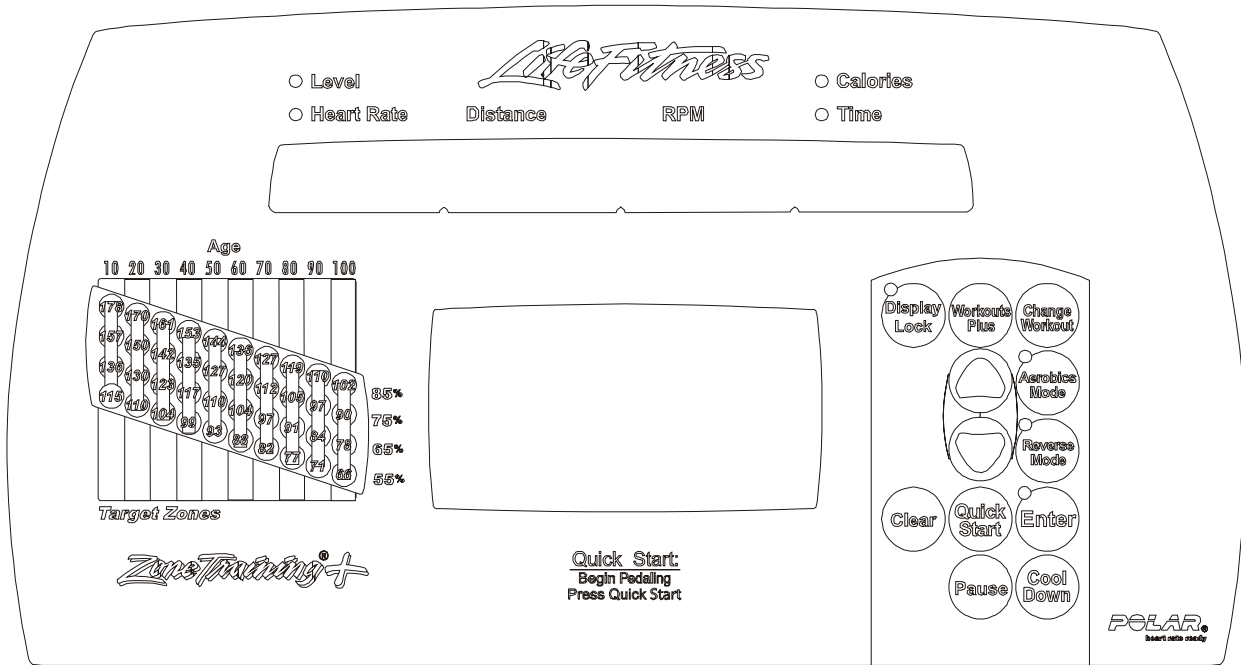
DISPLAY CONSOLE CT9100



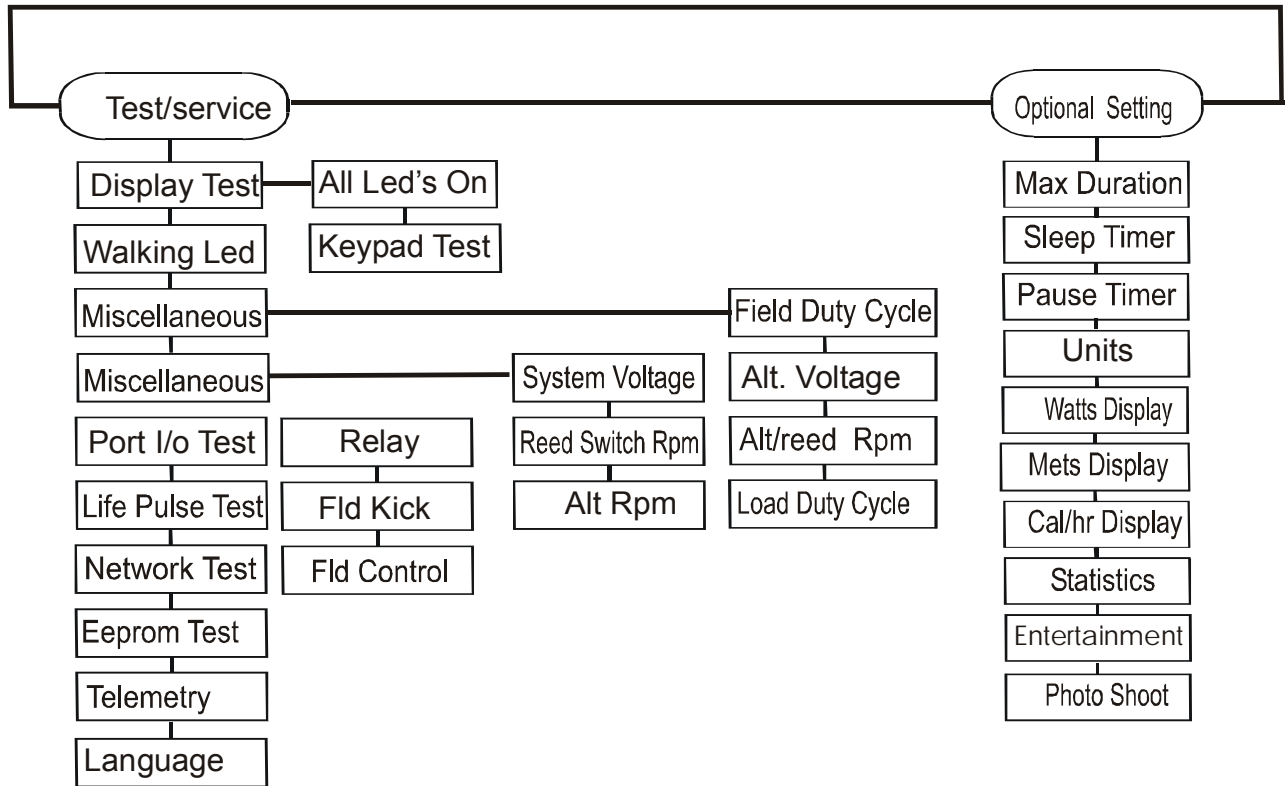
DISPLAY CONSOLE CT8500



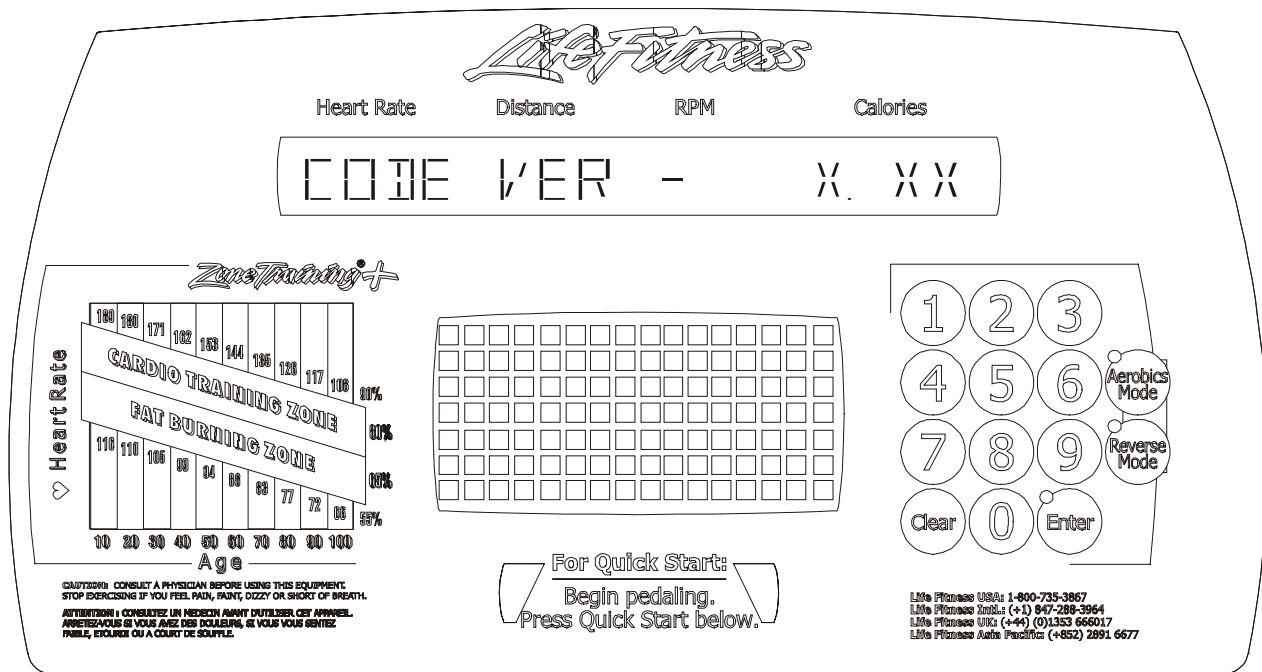
DISPLAY CONSOLE X9i



MAP



ENTRY LEVEL



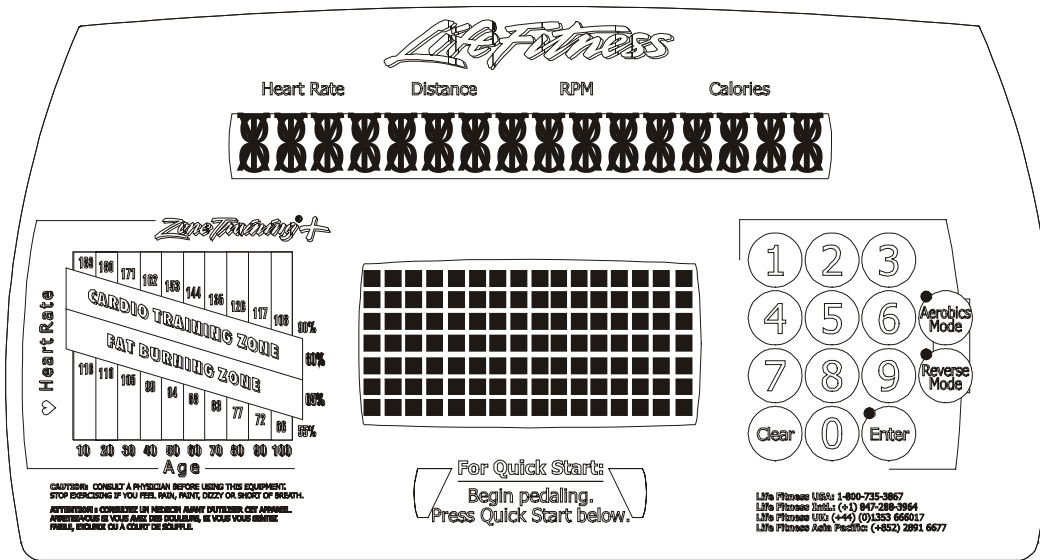
Hold down the number 5 key (9500) or the UP ARROW key on (non-9500 units), then the press the CLEAR key twice. Press the up ARROW key. The display menu will show after each press:

CODE VERSIONex: CODE VER - X.XX
 CSAFE VERSIONex: Csafe ver-- X.XX.XX
 PART NUMBERex: XXXX-- XXXXX--0000
 BOOT LOADER VERSION.....ex: BOOT VER -- X

Press ENTER for entry into the **OPTIONAL SETTINGS**.

Press and hold COOL DOWN, and then press ENTER for entry into the **TEST/SERVICE MENU**.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
TEST/SERVICE ALL LEDS AND KEYPAD TEST

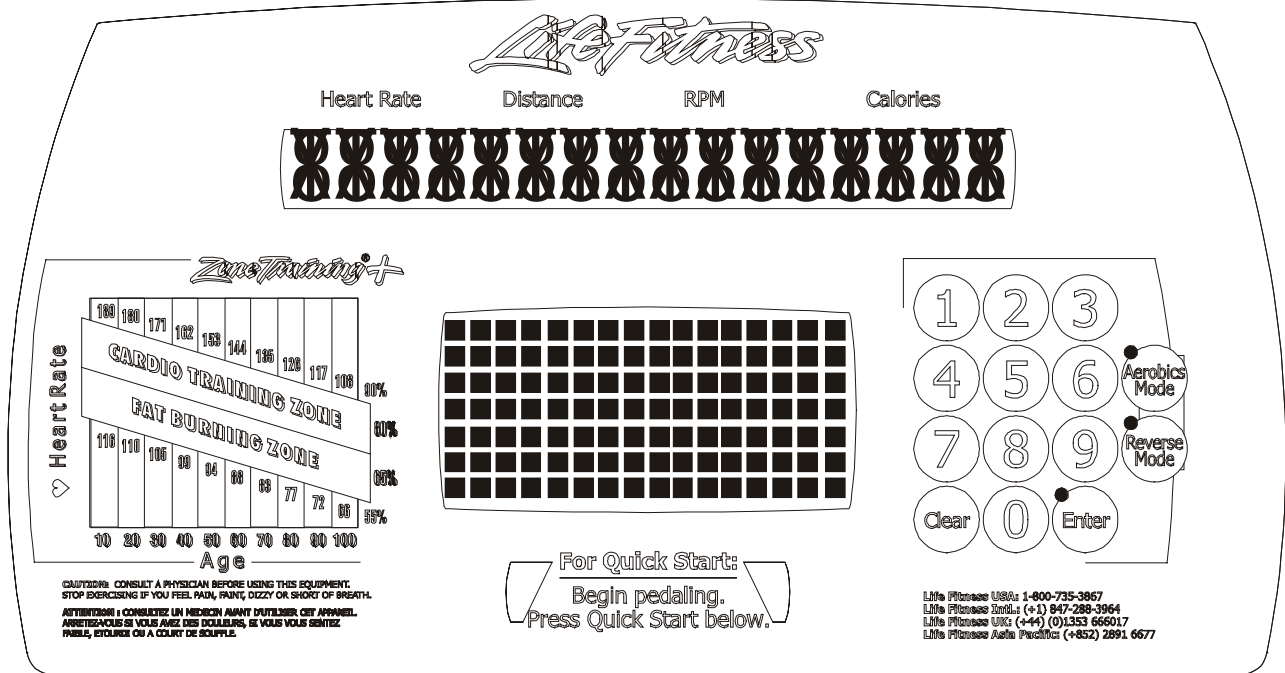


On entry to this state, all of the LEDs will turn ON. Pressing the keys will result in a beep sound for all but the START, ENTER and CLEAR keys, a character repeated across the message center will be displayed.

KEYS	DISPLAYED CHARACTER	KEYS	DISPLAYED CHARACTER
0	0	Display Lock	L
1	1	Workouts Plus	K
2	2	Change Workout	W
3	3	Up arrow	U
4	4	Down Arrow	D
5	5	Aerobics Mode	B
6	6	Reverse Mode	A
7	7	Quick Start	Q
8	8	Start	S
9	9	Pause	P
TIME UP	U	Cool down	--
TIME DOWN	D		
LEVEL UP	▲		
LEVEL DOWN	▼		
AEROBICS MODE	B		
REVERSE MODE	A		
FAT BURN	F		
CARDIO	C		
RANDOM	R		
MANUAL	M		
QUICK START	Q		
ZONE TRAINING	Z		
PERSONAL TRAINER	T		
HILL PLUS	H		
COOL DOWN	--		

Press the ENTER key to advance to the next diagnostic state. Press the CLEAR key to the previous diagnostic state, or repeated pressing to exit diagnostics.

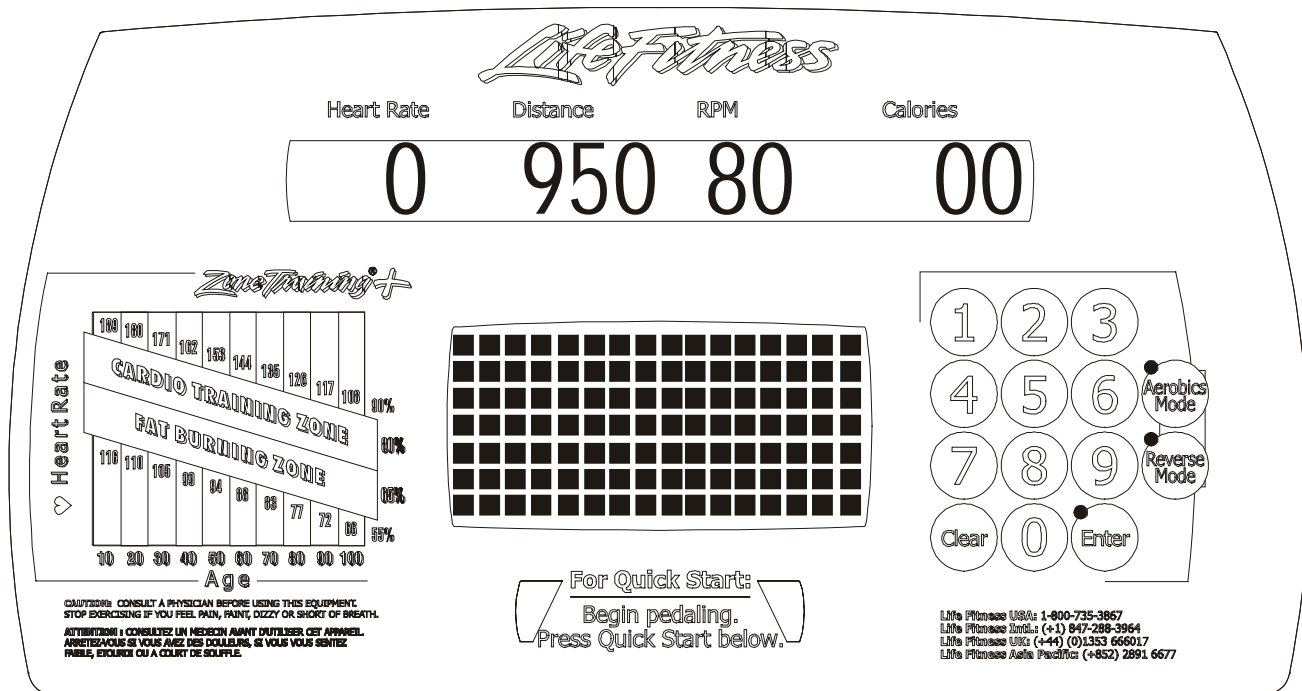
Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
TEST/SERVICE - WALKING LED TEST



On entry to this state, the LED segments in the MESSAGE CENTER and the PROFILE WINDOW will give the animated effect of moving, henceforth, 'Walking LED.'

Press the ENTER key to advance to the next diagnostic state. Press the CLEAR key to the previous diagnostic state, or repeated pressing to exit diagnostics.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
TEST/SERVICE - MISCELLANEOUS 1 TESTS



- Press the ENTER key to advance to the next diagnostic state. Press the CLEAR key to the previous diagnostic state, or repeated pressing to exit diagnostics.
- The present Field Duty Cycle being applied to the alternator is displayed in the Heart Rate Window. This value ranges from 0-255 (not in X9i).
- The alternator Output Voltage is displayed in the Distance Window (not in X9i).
- The present alternator RPM will be displayed in the RPM window.
- The present Load Duty Cycle applied to the alternator will be displayed in the Calories window. Load duty cycle ranges from 0-250 for all models. This value can be adjusted using the Time Up and Time Down arrow keys on the CT9500 console, and the UP and DOWN arrow keys on all other models.

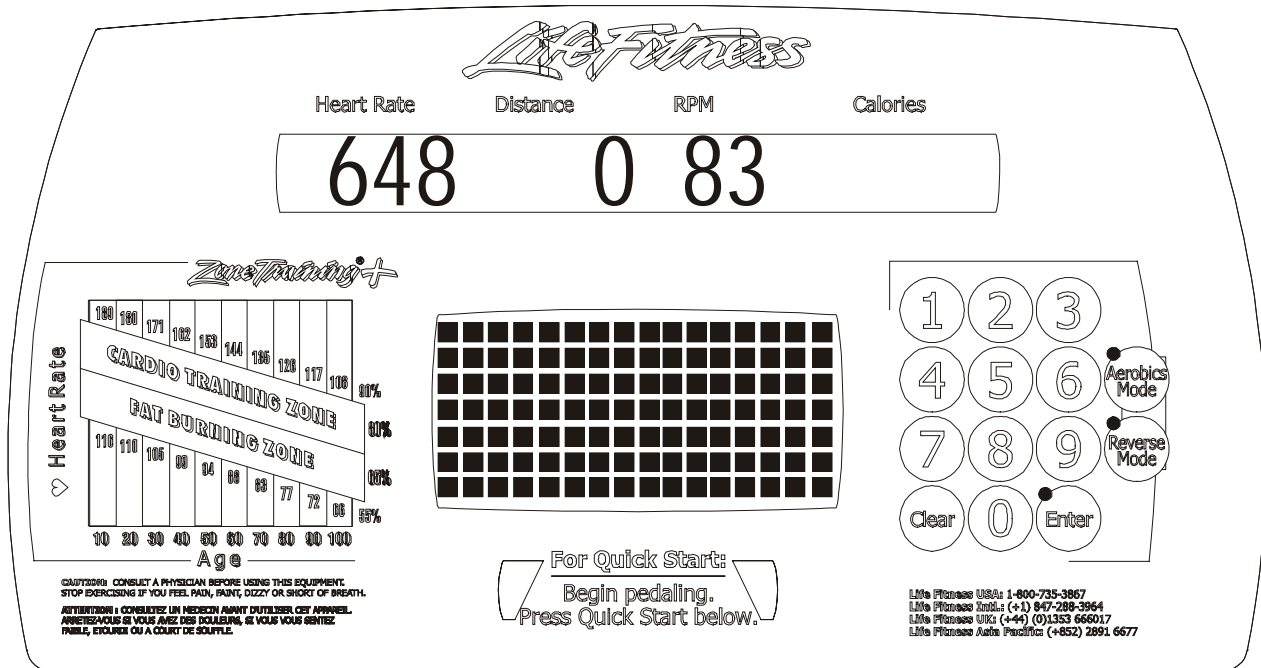
Pressing the Aerobics Mode key will toggle the speaker ON and OFF.

Pressing the '0' key (9500 only) will toggle the RPM display between the alternator RPM and Reed Switch RPM. The Enter LED will be ON when alternator RPM is displayed. RPM from the reed switch will not display when the alternator is running.

Pressing the '5' key (9500 only) will toggle the alternator ON and OFF.

Press the ENTER key to advance to the next diagnostic state. Press the CLEAR key to the previous diagnostic state, or repeated pressing to exit diagnostics.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
TEST/SERVICE - MISCELLANEOUS 2 TESTS



Under Heart Rate, console voltage will be displayed.

Under Distance, the reed switch RPM will be displayed when pedaling under 30 RPMs.

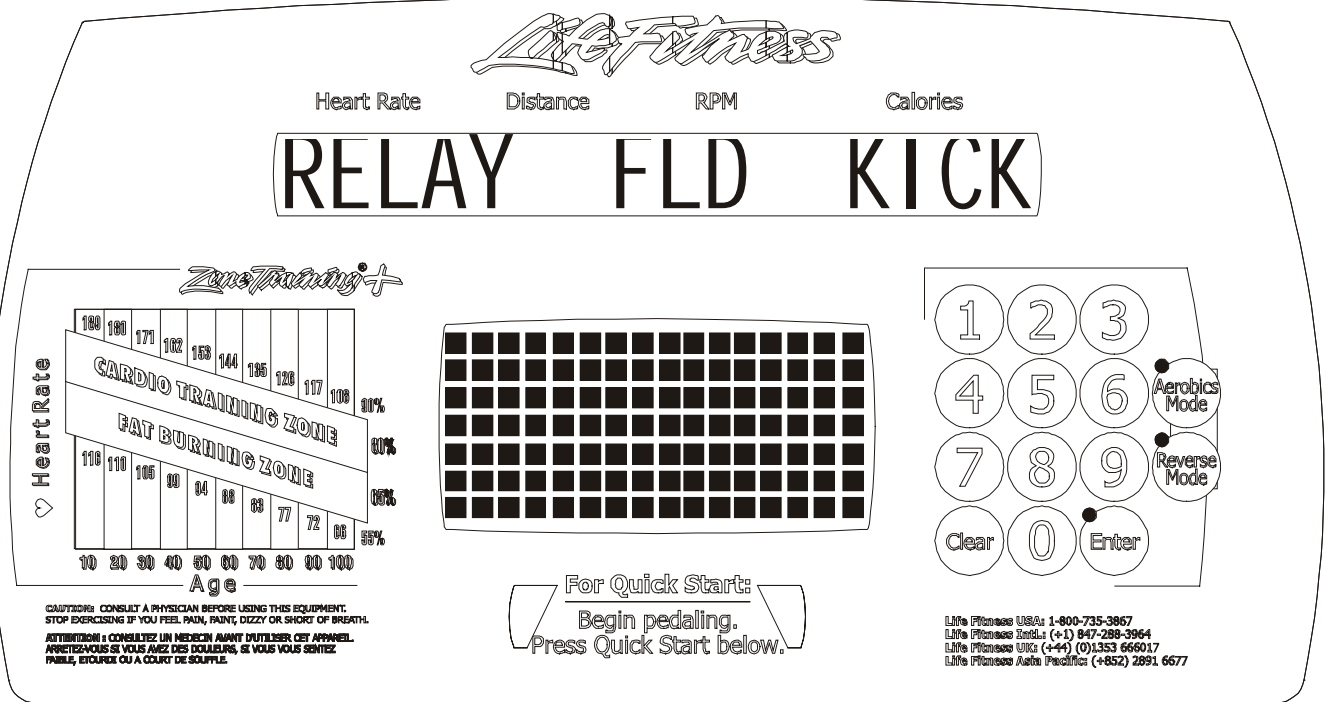
Under RPM, the alternator RPM will be displayed.

Press the ENTER key to advance to the next diagnostic state. Press the CLEAR key to the previous diagnostic state, or repeated pressing to exit diagnostics.

- The present system voltage (Vsys) supplied to the console is displayed in the Heart Rate Window.
- The present Reed Switch RPM (except X9i) is displayed in the Distance Window. The Reed Switch RPM will not display when the alternator is running.
- The present alternator RPM will be displayed in the RPM window.

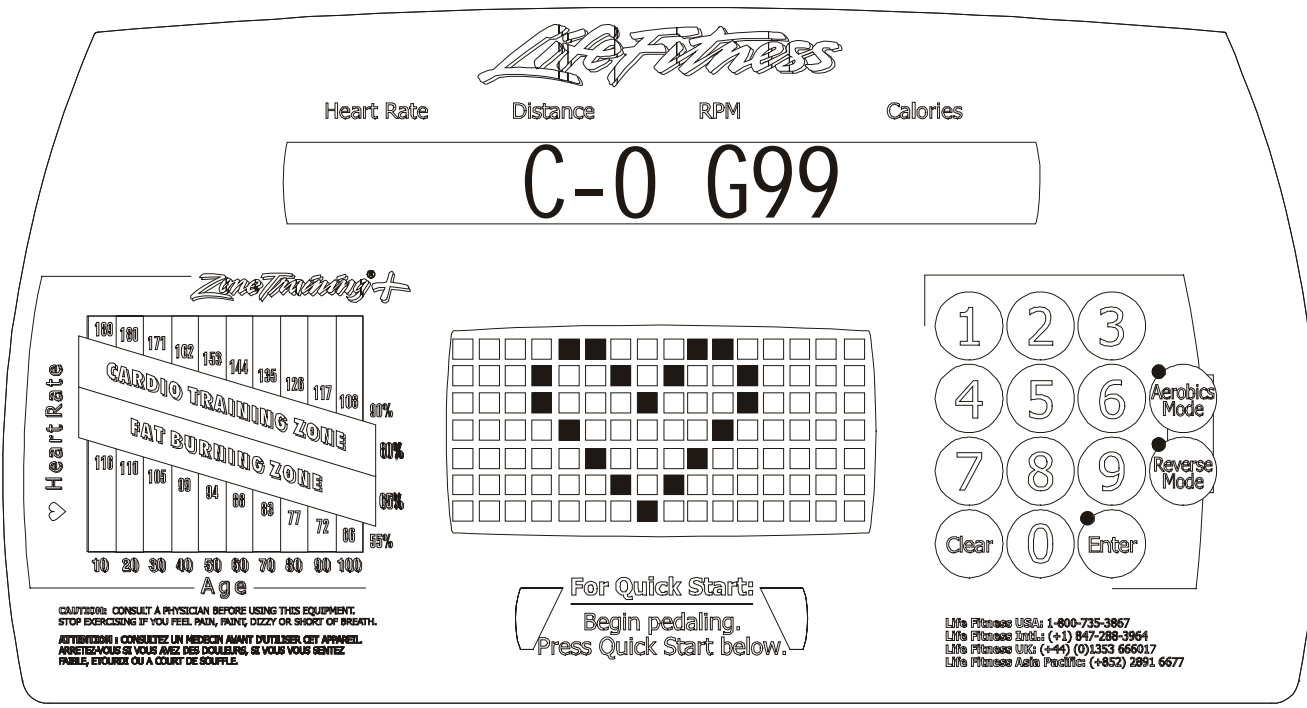
Pressing the '5' key (9500) or the DOWN Arrow key (others) will display the value of Vsys at startup (before the alternator is turned ON). This is useful because you can get an indication of the battery voltage of the 6V battery. Note: This voltage will be lower than if you read the voltage of the 6V battery directly from its terminals, since it goes through several drops.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
TEST/SERVICE - PORT I/O TEST



Press the ENTER key to advance to the next diagnostic state. Press the CLEAR key to the previous diagnostic state, or repeated pressing to exit diagnostics.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
TEST/SERVICE - LIFE PULSE TEST



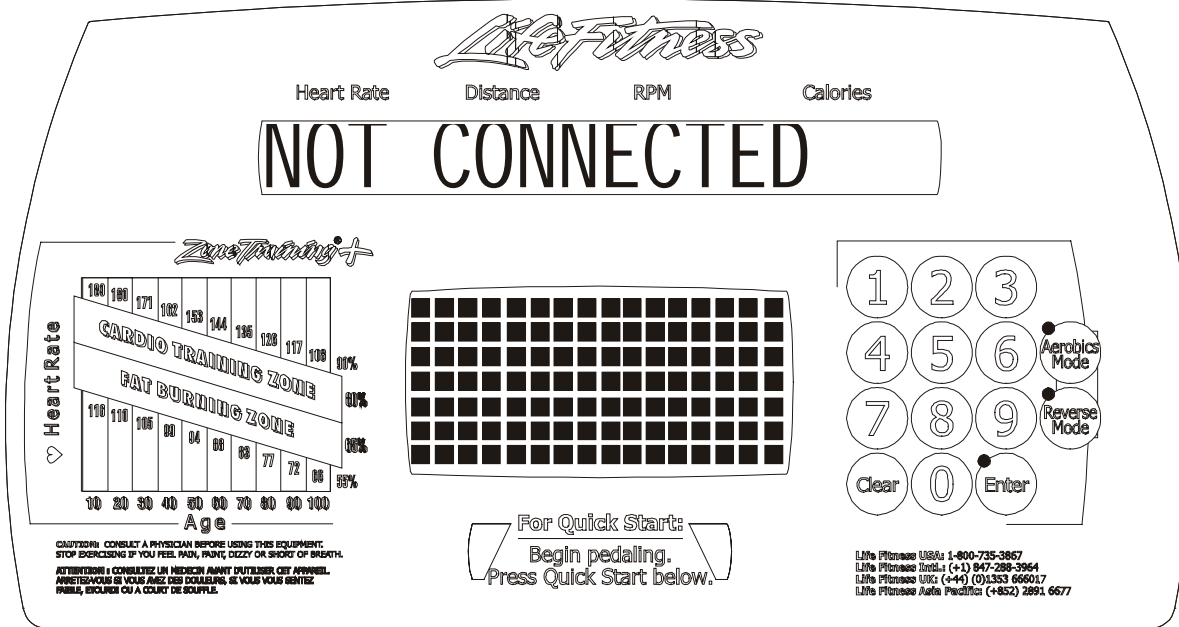
Upon initial entry to this test, a heart will be displayed in the profile window along with two messages in the message center. The first indicates the lifepulse software version number. The second is a message concerning the configuration of the lifepulse communication system being ON or OFF. This setting enables external communications for lifepulse development only and should be left OFF. Following these messages, the display will change to a mode to display diagnostic information (described below) and the lifepulse system will be ready to be manually tested.

The and/or right hands on circuitry can be individually tested by grasping the pair of electrodes on that side. When the left sensor detects that a hand is in contact with both electrodes, or when the right sensor detects that a hand is in contact with both electrodes, and 'L' or 'R' respectively will be displayed in the profile window with the heart.

Two timers will begin counting from the time both the left and right hands on condition occurs. The first timer, located on the upper console message center display, will stop counting when lifepulse computes and displays an initial peak detected heart rate reading. The second timer, located on the lower console display window, will continue counting until lifepulse can reliably display the users heart rate. These timer readings are used for reference only.

The gain value of the heart rate signal is shown following the 'G' in the message center display window. The value ranges from 0-99. A gain value of 99 is considered high and undesirable. A gain value of 0 is considered to be low and undesirable. Gain values between 15-40 are considered normal depending on whether the user is exercising or standing still during the test.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
TEST/SERVICE - CSAFE NETWORK TEST



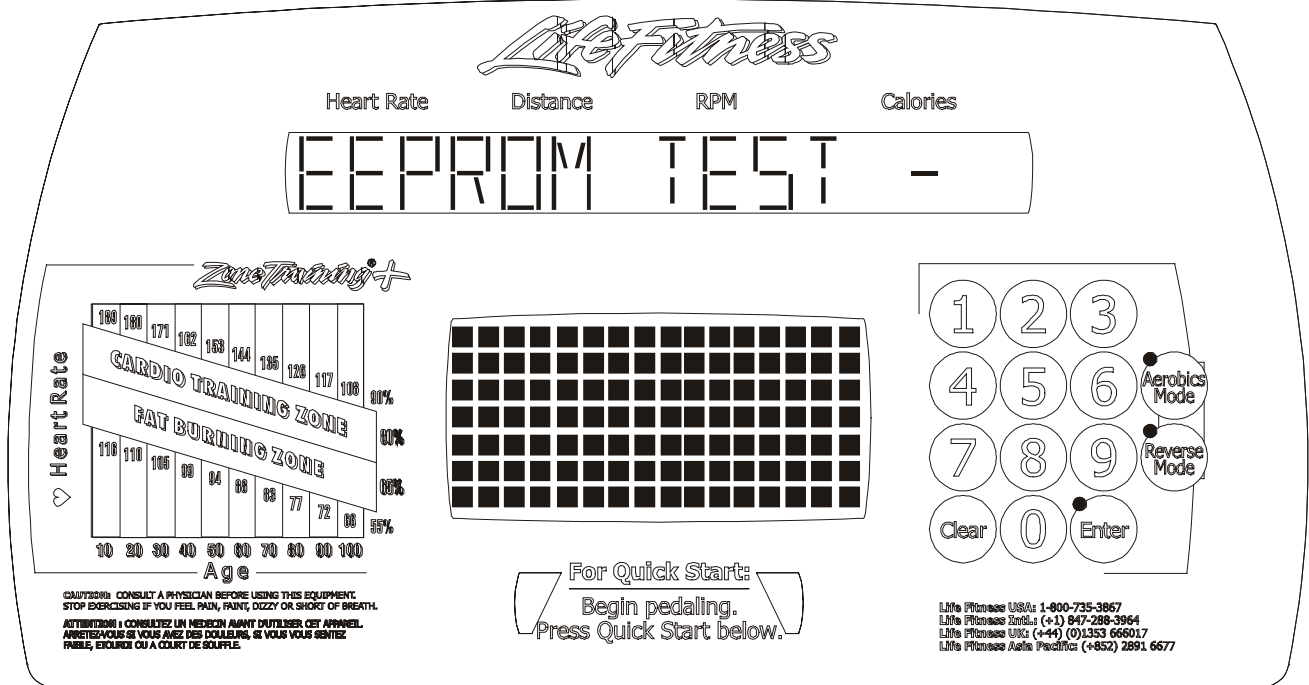
Within this state, the CSAFE network can be tested.

This is how you can check to see if you're receiving any communications from the network system.

- 1) Remain in the CSAFE Test Mode above (by not exiting out of it).
- 2) Make sure the network cable is plugged in.
- 3) Press the COOLDOWN key. This will reset the console and send out the standard power up message to the network. The console should display "RESETTING NETWORK". The power up message sent to the network is the same one the console sends every time it is turned on (or anytime it is used by a user on self-powered products).
- 4) If the network has received the CSAFE communication packet from the console and the network sends configuration communication packet to the console the console will display "RECEIVING..."
- 5) If the console has been properly configured by the network and is allowed to accept user ID's then the console would show "GETID MODE XX". The "GETID" message means were in the get ID mode. This is the mode the network must put the console in, before it will ask the user to enter in their ID's. If the console is not put in this mode then the console will not ask for ID's.
- 6) If the network does not respond to the console then the console will display a "NOT CONNECTED" message. This indicates there is a problem with the network cable or network itself. This means the console has not received any valid CSAFE communications from the network.

Press the ENTER key to advance to the next diagnostic state. Press the CLEAR key to the previous diagnostic state, or repeated pressing to exit diagnostics.

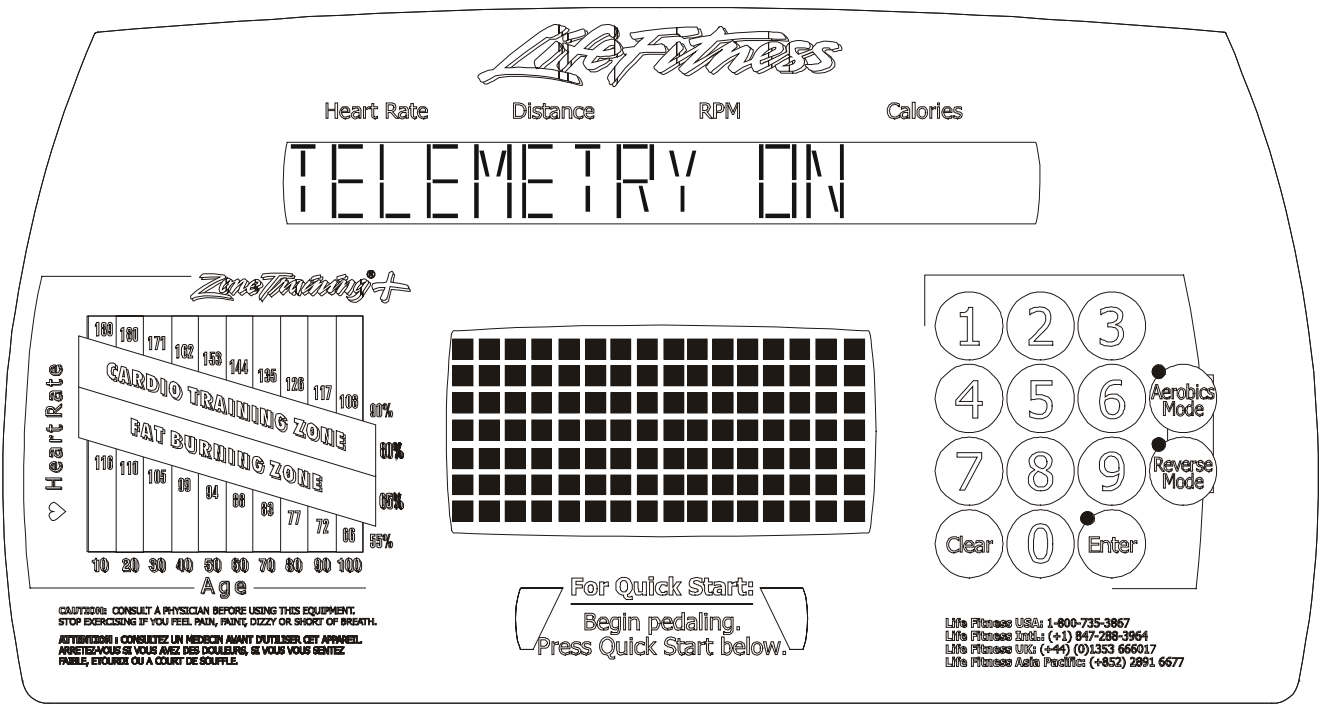
Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
TEST/SERVICE - EEPROM TEST



This diagnostic state tests the Display Console EEPROM by reading, writing, and replacing all used locations in the Display Console EEPROM. The EEPROM location being tested will appear in the display message center. Pressing the DOWN ARROW will initiate the EEPROM test. If the test completes successfully, the message EEPROM GOOD will appear. If the test fails, the message EEPROM BAD AT XX will display with the bad EEPROM location.

Press the ENTER key to advance to the next diagnostic state. Press the CLEAR key to the previous diagnostic state, or repeated pressing to exit diagnostics.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
TEST/SERVICE - TELEMETRY ENABLE/DISABLE



Within this state, the TELEMETRY can be turned ON or OFF. If a telemetry heart rate is detected, it will be displayed when telemetry is set to ON.

By default, the cross-trainer will have TELEMETRY ON.

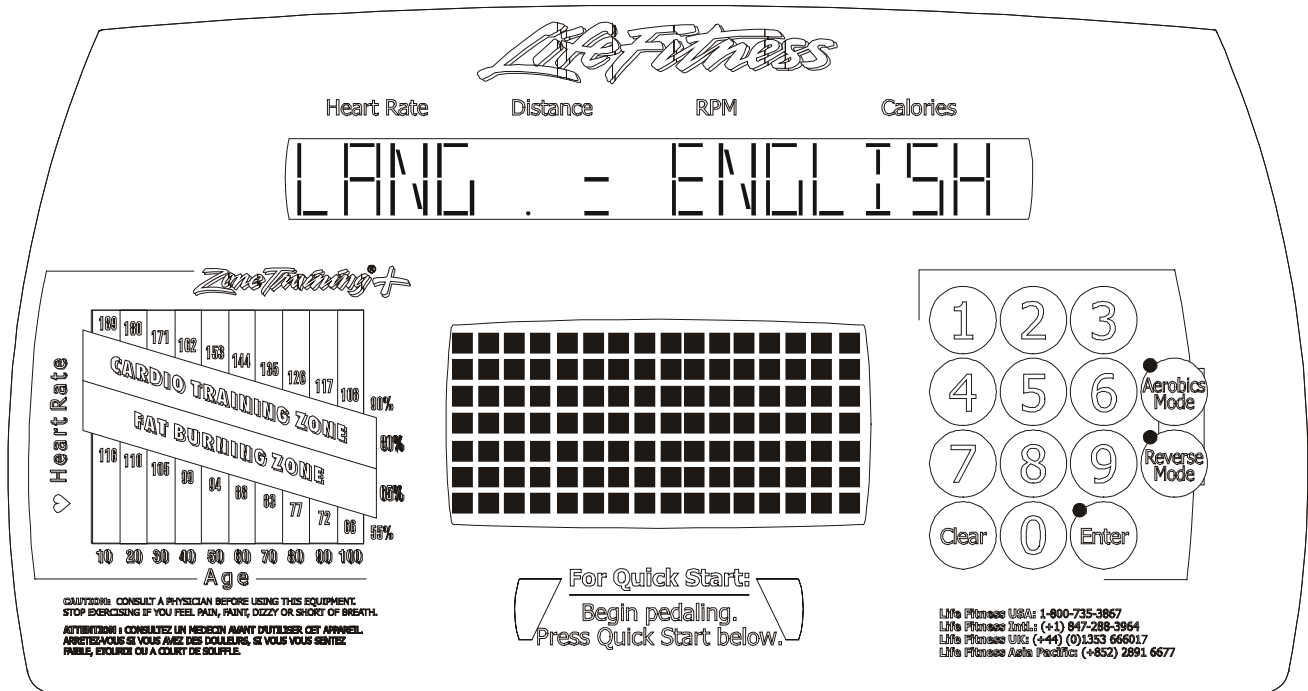
The DOWN ARROW will turn OFF the telemetry.

The UP ARROW will turn ON the telemetry and display a heart shape in the program profile window.

The ENTER key LED indicates when the value is at the default setting of TELEMETRY ON. This value is stored in EEPROM and is kept when the unit is not in use.

Press the ENTER key to advance to the next diagnostic state. Press the CLEAR key to the previous diagnostic state, or repeated pressing to exit diagnostics.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
TEST/SERVICE - LANGUAGE



Within this state, one of seven languages can be selected to include: English, German, French, Italian, Dutch, Spanish or Portuguese.

The UP ARROW, when pressed, displays the next language in the list.

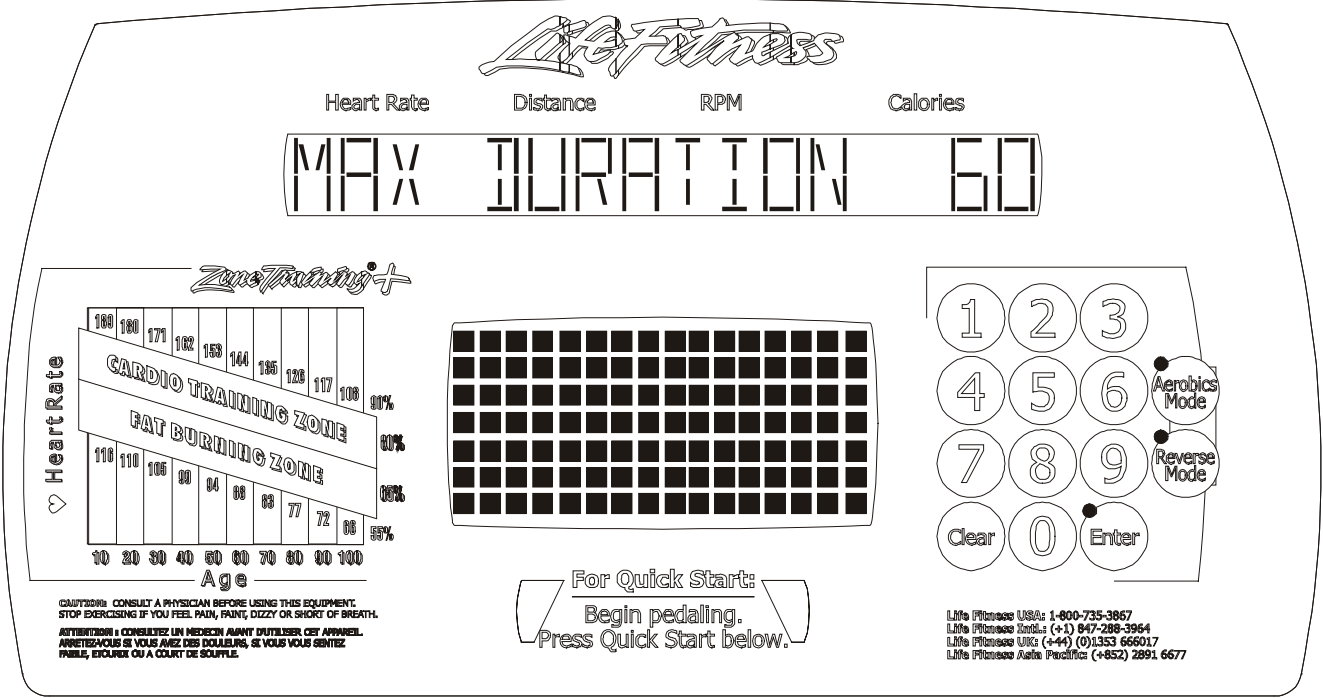
The DOWN ARROW, when pressed, displays the previous language in the list.

The ENTER key LED indicates when the language is set to the default of ENGLISH.

This value is stored EEPROM and is kept when the unit is not in use.

Press the CLEAR key to the previous diagnostic state, or repeated pressing to exit diagnostics.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
OPTIONAL SETTINGS - MAX PROGRAM DURATION



Within this state, the MAXIMUM PROGRAM DURATION is displayed and can be adjusted from a range of 1-99 minutes (X9ii 1-99 minutes on all other models 10-99 minutes).

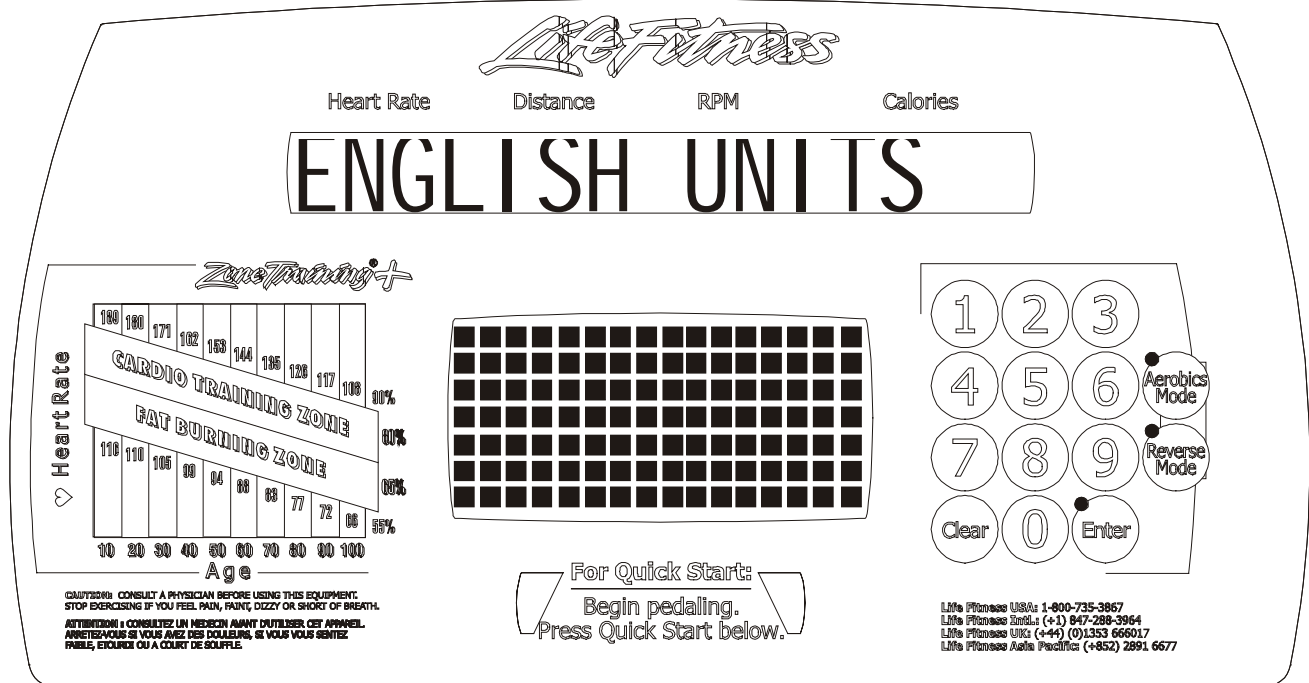
The DOWN ARROW will decrease the value by 1 minute. Key will Auto-Repeat if held.

The UP ARROW will increase the value by 1 minute. Key will Auto-Repeat if held.

The ENTER key LED indicates when the value is at the default of 60 minutes. This value is stored in EEPROM and is kept when the unit is not in use.

Press the ENTER key to advance to the next diagnostic state. Press the CLEAR key to the previous diagnostic state, or repeated pressing to exit diagnostics.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
OPTIONAL SETTINGS - ENGLISH/METRIC UNITS



Within this state, ENGLISH or METRIC units can be selected.

The DOWN ARROW will select METRIC units.

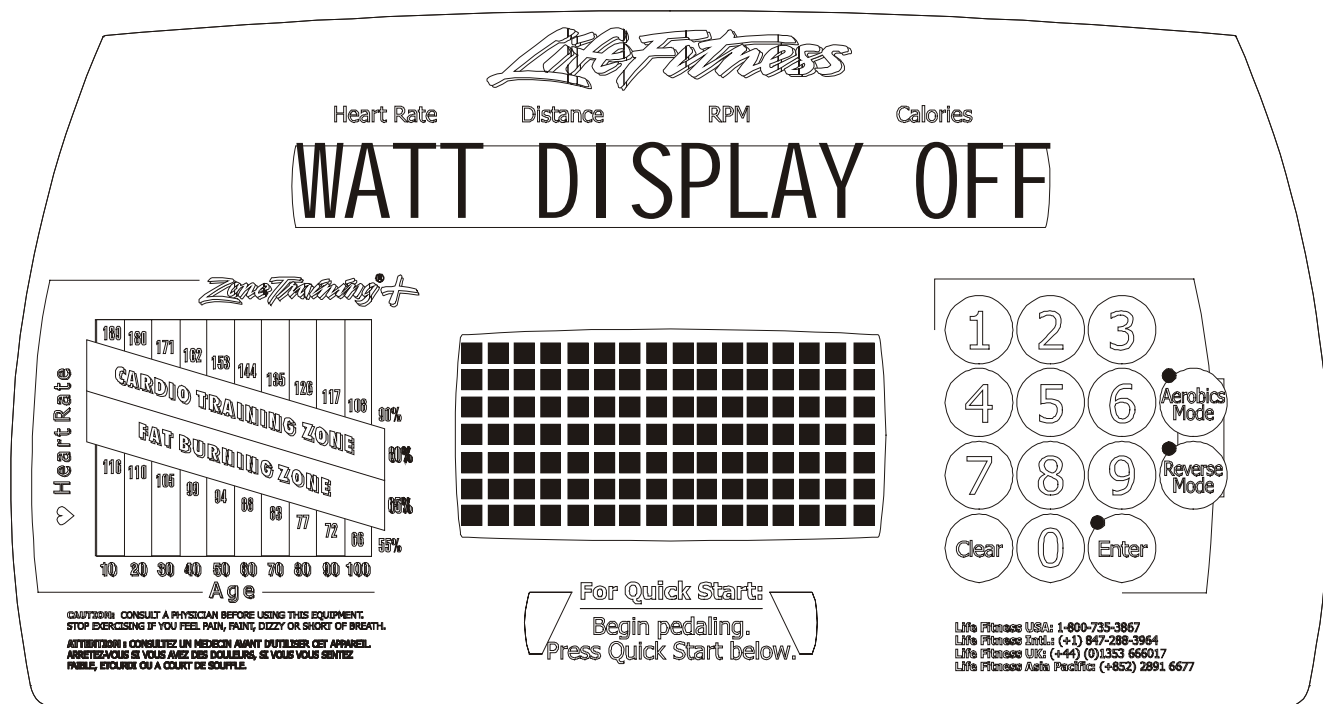
The UP ARROW will select ENGLISH units.

The ENTER key LED indicates when the value is at the default setting of ENGLISH UNITS.

This value is stored in EEPROM and is kept when the unit is not in use.

Press the ENTER key to advance to the next diagnostic state. Press the CLEAR key to the previous diagnostic state, or repeated pressing to exit diagnostics.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
OPTIONAL SETTINGS - WATTS DISPLAY ENABLE/DISABLE



If this option is enabled, the MESSAGE CENTER displays the Watts equivalent of the workload. This message will only be displayed after a level change.

The DOWN ARROW will turn OFF the WATTS PROGRAM.

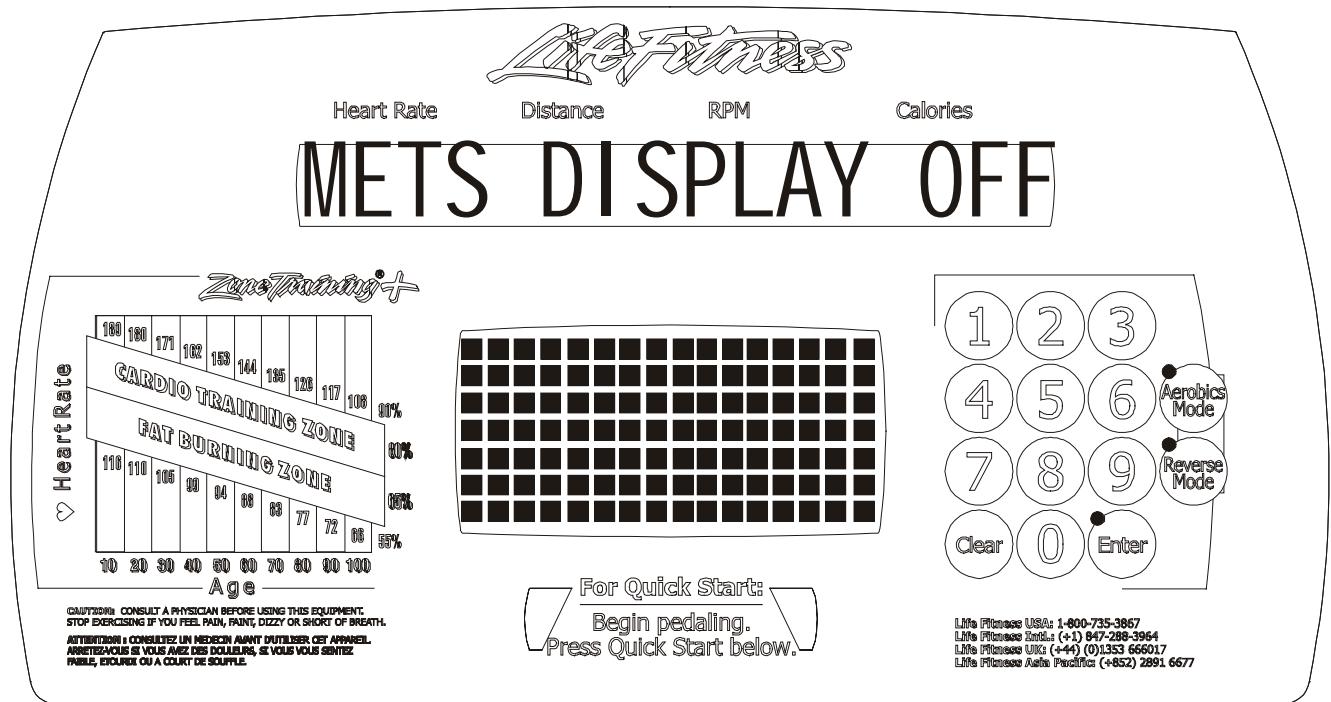
The UP ARROW will turn ON the WATTS PROGRAM.

The ENTER key LED indicates when the value is at the default setting of WATTS PROGRAM ON.

The value is stored in EEPROM and is kept when the bike is not in use.

Press the ENTER key to advance to the next diagnostic state. Press the CLEAR key to the previous diagnostic state, or repeated pressing to exit diagnostics.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
OPTIONAL SETTINGS - METS DISPLAY ENABLE/DISABLE



If this option is enabled, the MESSAGE CENTER displays the METs equivalent of the workload. This message will only be displayed after a level change.

The DOWN ARROW will turn OFF the METS PROGRAM.

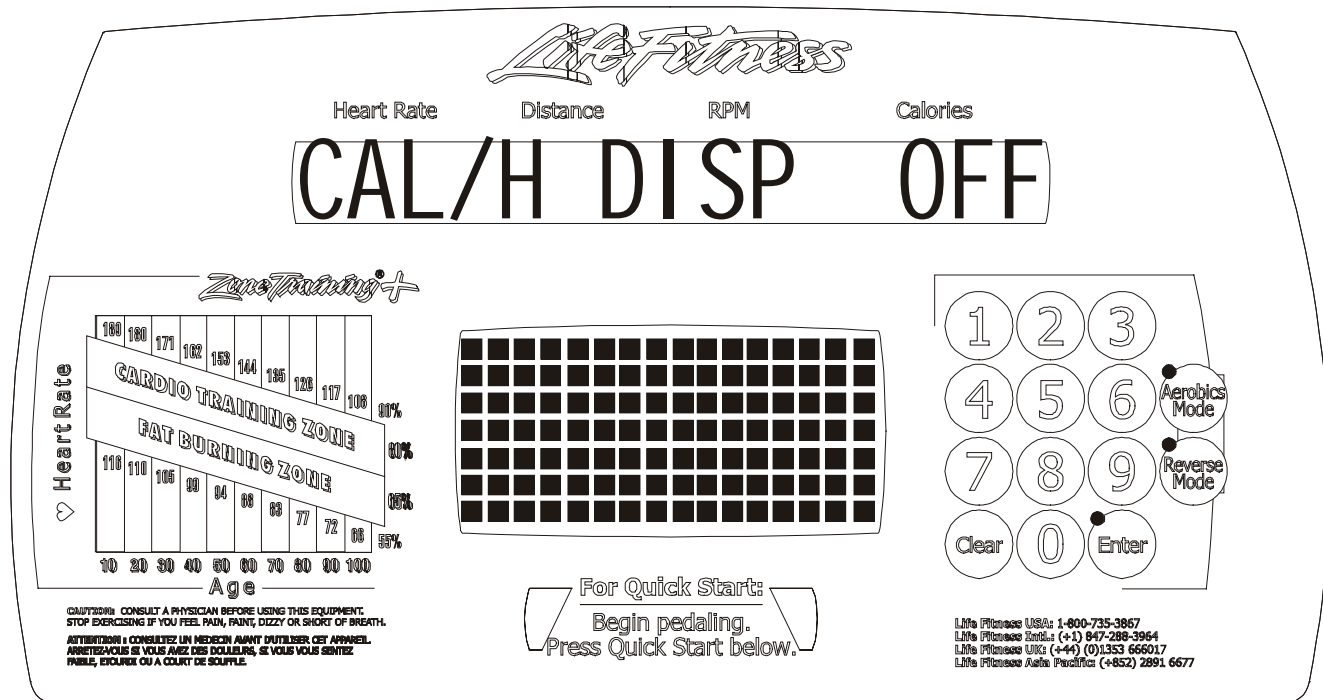
The UP ARROW will turn ON the METS PROGRAM.

The ENTER key LED indicates when the value is at the default setting of METS PROGRAM ON.

The value is stored in EEPROM and is kept when the bike is not in use.

Press the ENTER key to advance to the next diagnostic state. Press the CLEAR key to the previous diagnostic state, or repeated pressing to exit diagnostics.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
OPTIONAL SETTINGS - CAL/HR DISPLAY ENABLE/DISABLE



If this option is enabled, the MESSAGE CENTER displays the Calories/Hour equivalent of the workload. This message will only be displayed after a level change.

The DOWN ARROW will turn OFF the CAL/H program.

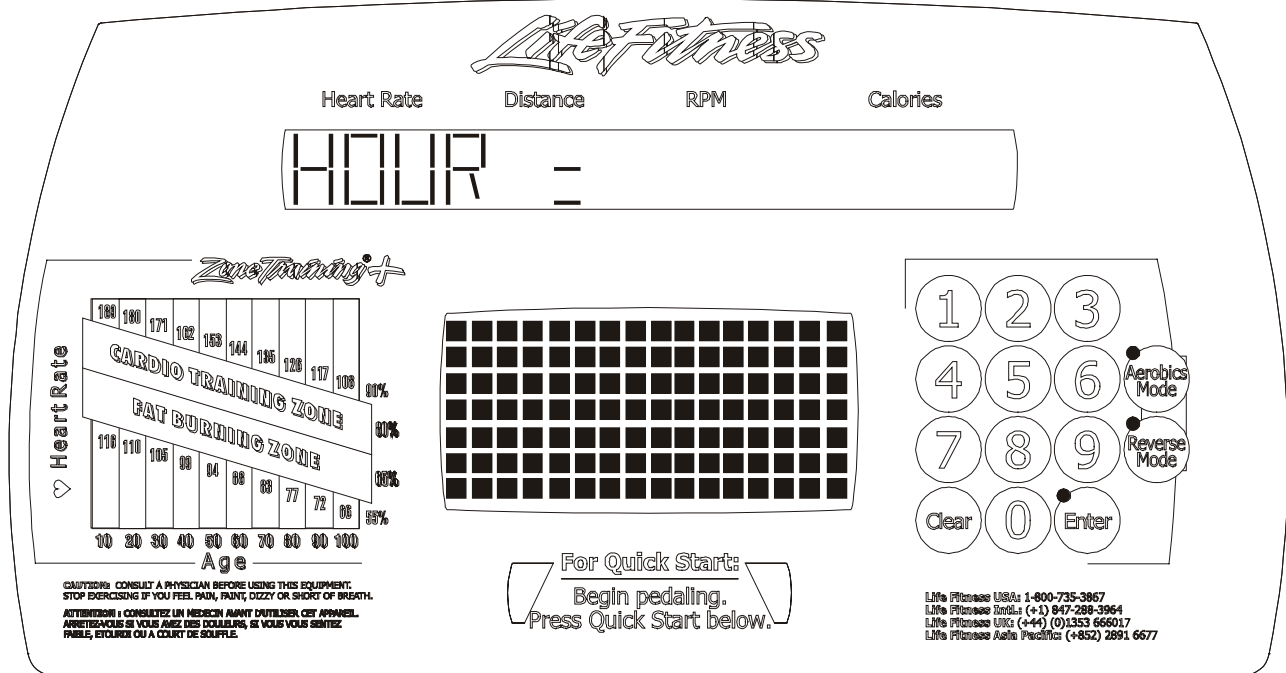
The UP ARROW will turn ON the CAL/H program.

The ENTER key LED indicates when the value is at the default setting of CAL/H PROGRAM ON.

The value is stored in EEPROM and is kept when the bike is not in use.

Press the ENTER key to advance to the next diagnostic state. Press the CLEAR key to the previous diagnostic state, or repeated pressing to exit diagnostics.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
OPTIONAL SETTINGS - TOTAL HOURS AND STATISTICS



Upon entry to this state, TOTAL HOURS are displayed.

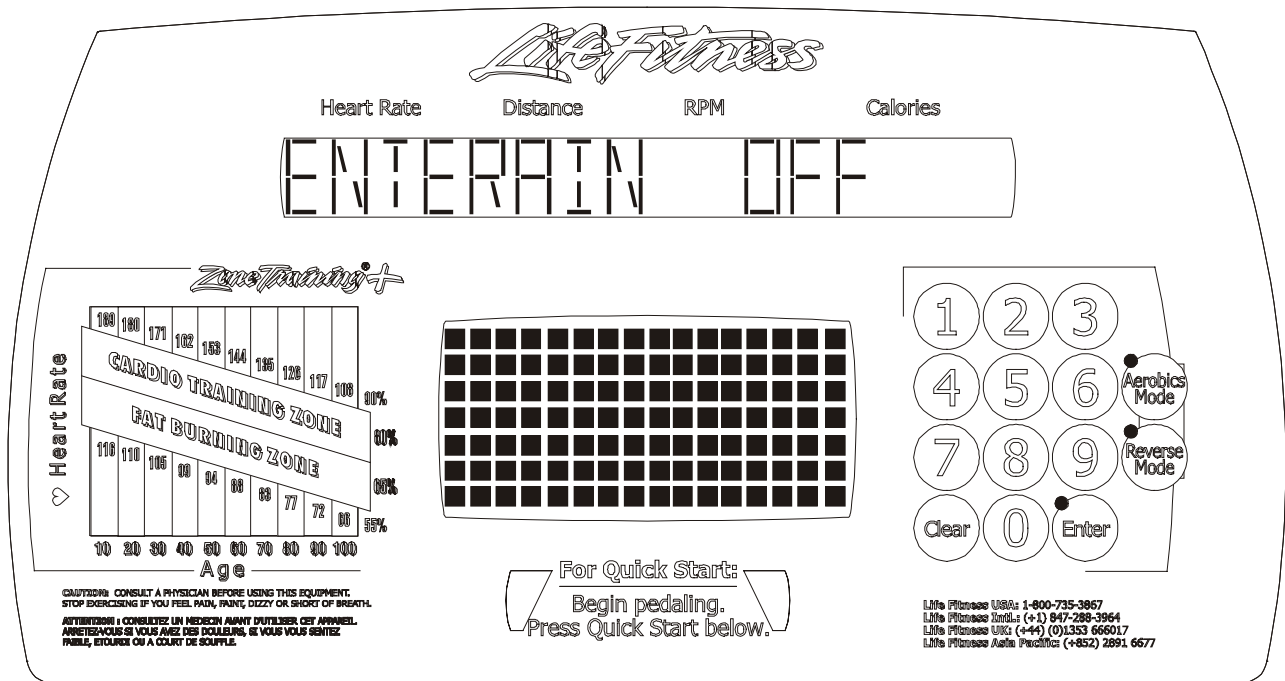
STATISTICS can be displayed using the UP and DOWN arrow keys. The UP ARROW allows scrolling through the available programs and shows the number of times each program has been selected. The DOWN ARROW backs up through the list of available programs and back to the total hours displayed.

The Programs are:

- HOUR = Total hours on the console
- DIST = Total distance in miles on the console
- HILL
- RANDOM
- MANUAL
- FAT
- CARDIO
- AEROBICS
- X-REV
- QUICK
- HEART HILL
- HEART INT
- HEART EXT
- PRE SET
- CUSTOM

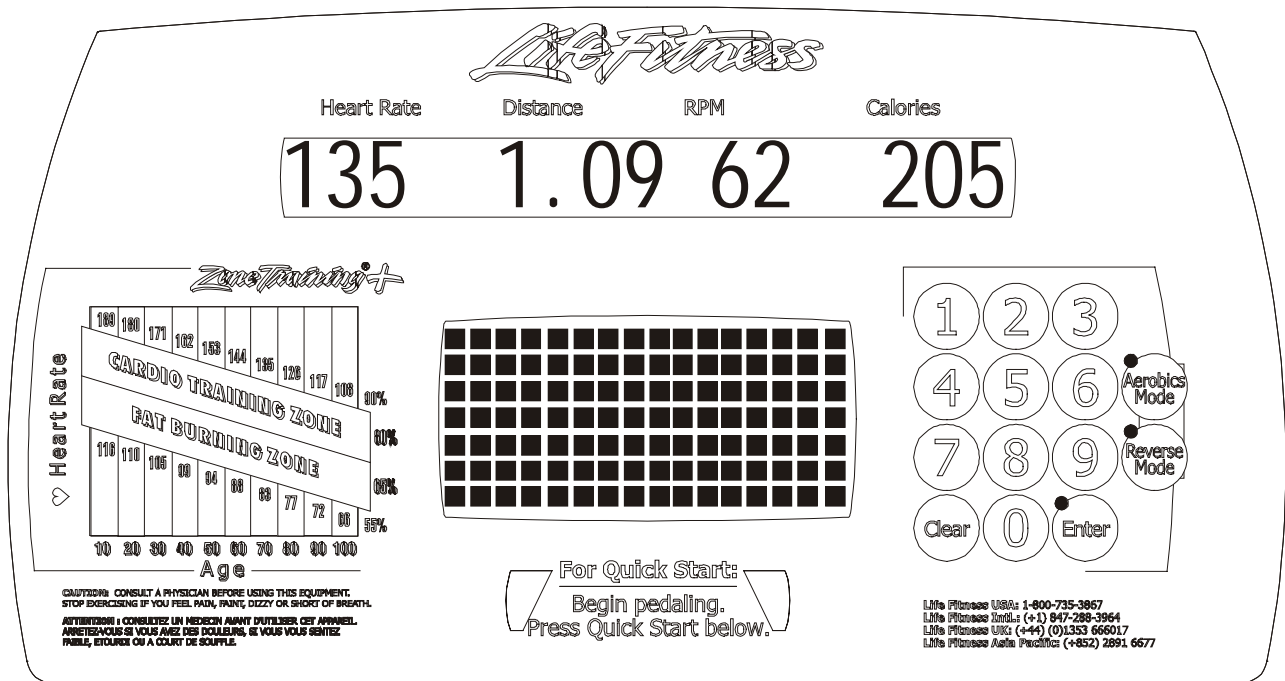
Press the ENTER key to advance to the next diagnostic state. Press the CLEAR key to the previous diagnostic state, or repeated pressing to exit diagnostics.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
OPTIONAL SETTINGS - ENTERTAINMENT CONTROLS ON/OFF



The ENTERTAINMENT setting. Using the arrow keys will turn ON or OFF channel and volume controls for third party entertainment system (such as cardiotheatre. Off is the default setting.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers
OPTIONAL SETTINGS - PHOTO SHOOT



Data displayed in the message center is non-functional and intended only to simulate values for photographic sessions.

Press the CLEAR key to the previous diagnostic state, or repeated pressing to exit diagnostics. Hold down QUICK key then press CLEAR key will exit diagnostics.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

NOTES:

SECTION III

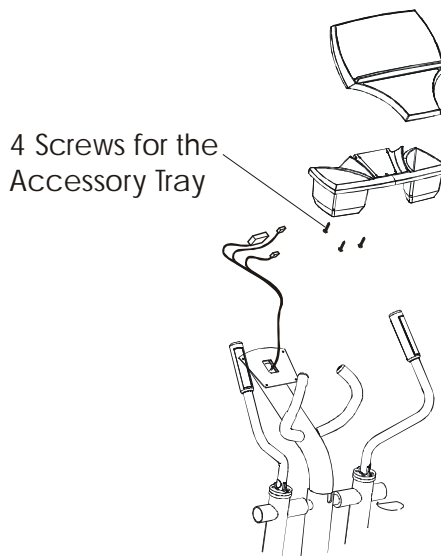
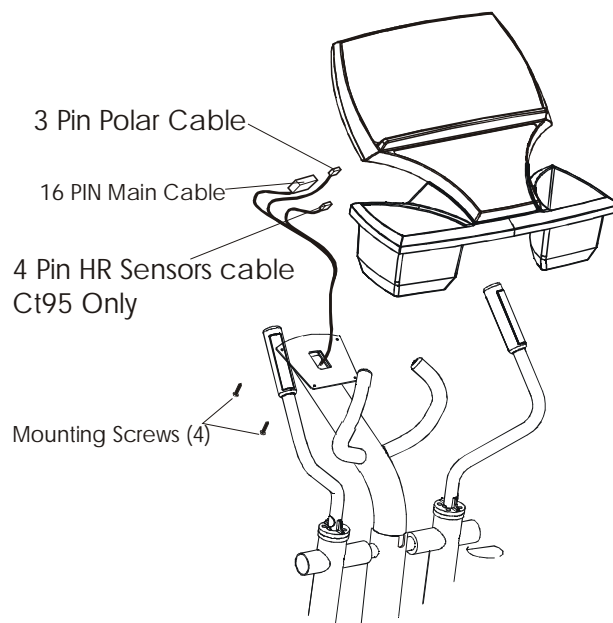
“How To...” SERVICE AND REPAIR GUIDE

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace the Display Console and Accessory Tray

Tools required: Phillips screwdriver

1. Remove the (4) MOUNTING SCREWS from under the CONSOLE, Connecting the console to the post.
2. Lift the console up enough to disconnect the 16-pin and the 3-pin and 4-Pin connectors (on the CT9500).
3. Lift the console and remove.
4. If equipped, remove the accessory tray from the console. This is standard on CT95/91 and X9i and optional on CT85.
5. Install new console in reverse order.

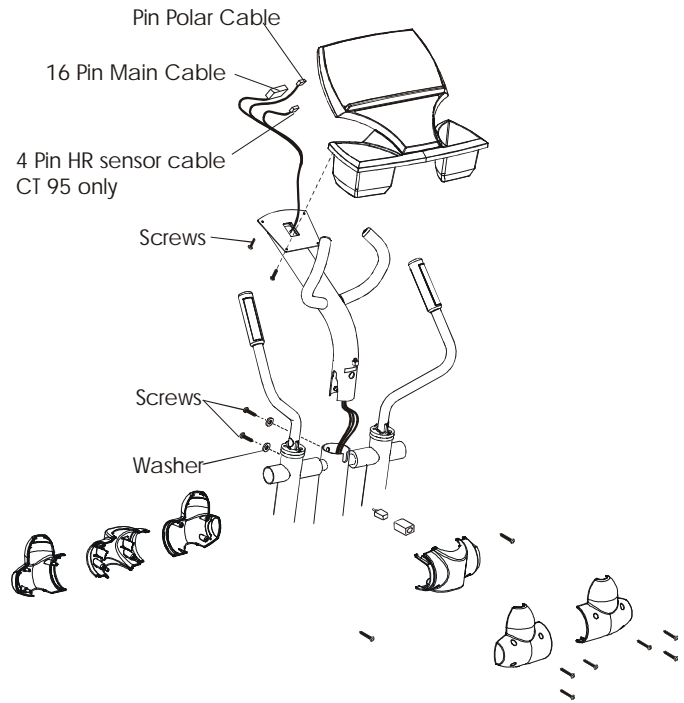


Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace the Display Console Support Assembly

Tools required: Phillips screwdriver and Allen wrench set

1. Remove the console and accessory tray. See "How To."
2. European CT91/85 models, remove the end cap, pull out the cable and remove the ferrite.
3. Remove the MONOCOLUMN COVER (ALL MODELS) and ROCKER ARM COVERS (9500).
4. Remove the POLAR RECEIVER.
5. Remove the two (2) HEX HEAD CAPSCREWS and FLAT WASHERS securing the CONSOLE SUPPORT ASSEMBLY.
6. Lift the CONSOLE POST out of the MONOCOLUMN while guiding the wire harness out.
7. Install new console support in reverse order.

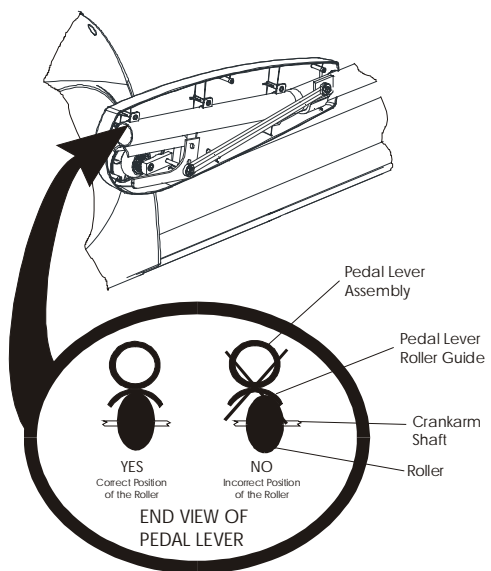
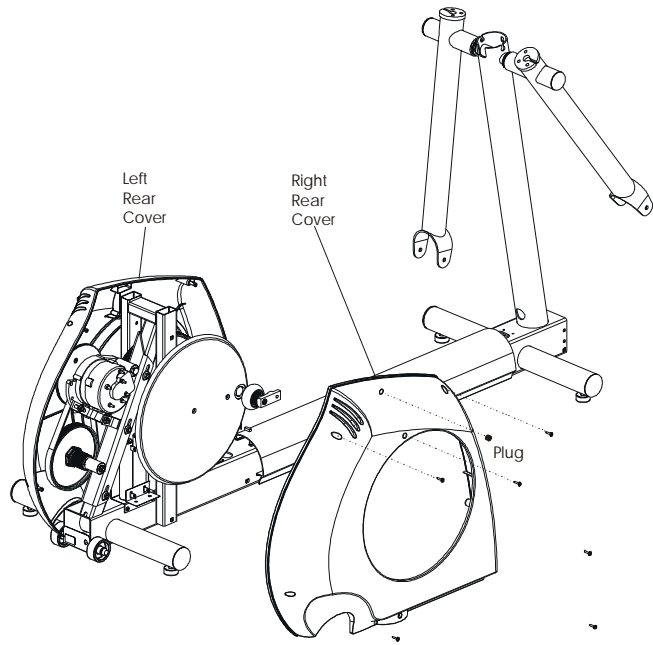
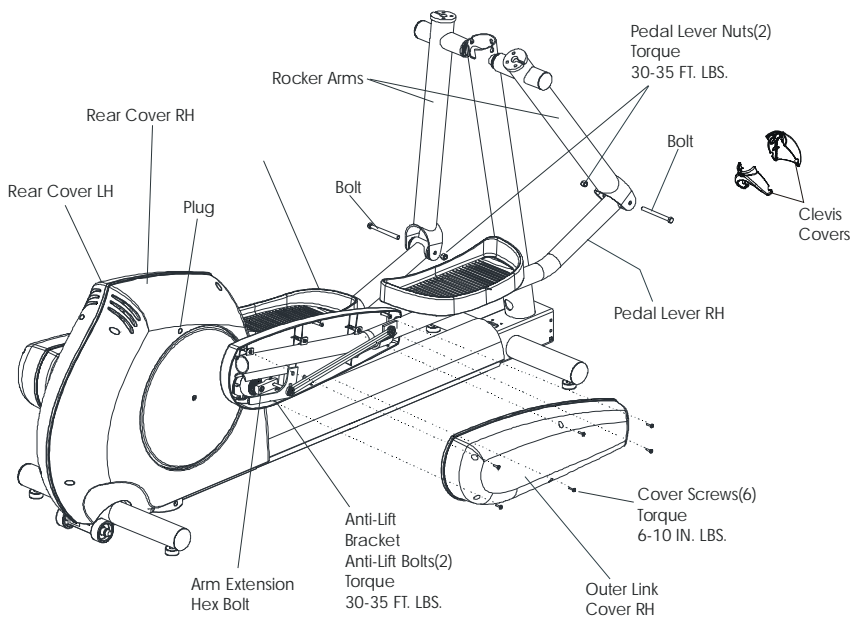


Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace The Rear Covers

Tools required: Phillips magnetic screwdriver #2, Allen wrench set, 3/8" Socket set, and Standard wrench set

1. Remove the OUTER LINK COVER by removing six(6) mounting screws from each OUTER LINK COVER.
2. Remove the ANTI-LIFT BRACKET by removing two(2) mounting bolts from each bracket.
3. Remove the clevis cover from each pedal lever.
4. Remove the PEDAL LEVER by removing the mounting bolt and nut at each ROCKER ARM joint and the hex bolt from each ARM EXTENSION.
5. Remove the PLUG from the LEFT and RIGHT COVERS.
6. Remove the REAR COVER by removing three(3) screws from the LEFT REAR COVER then seven(7) screws from the RIGHT REAR COVER.
7. Install rear covers in reverse order. Make sure that each pedal-lever roller guide is centered over the roller. If not, loosen the pedal lever assembly mounting bolt and recenter the pedal lever so that it is centered on the roller, then retighten the mounting bolt.

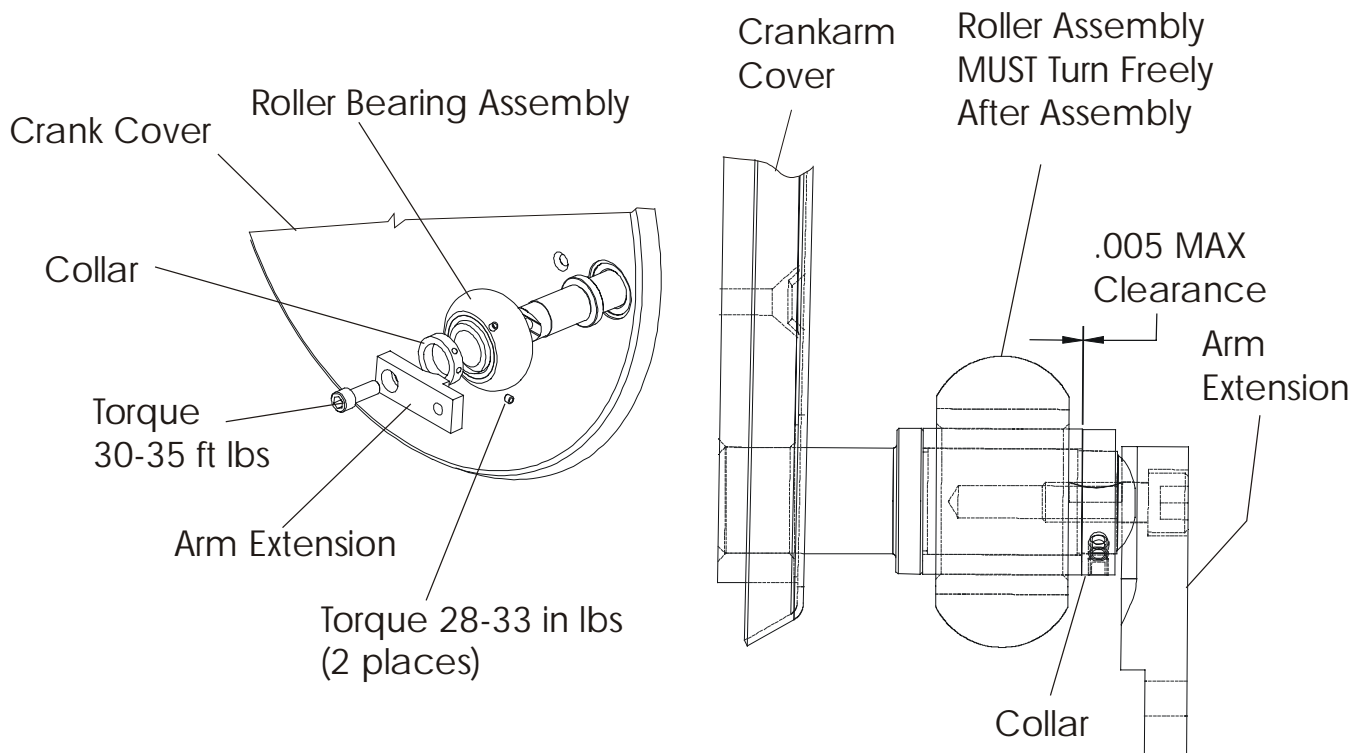


Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace The Crankarm Roller Assembly

Tools required: Allen wrench set, and Phillips screwdriver

1. Remove the outer link covers.
2. Remove the ALLEN-HEAD CAPSCREW from the end of the ARM EXTENSION.
3. Remove the setscrew and collar, then remove the roller bearing assembly.
4. Install the ROLLER BEARING in the reverse order. Make sure that a maximum of .005" clearance is maintained between the ROLLER BEARING and the COLLAR. Ensure that the roller can rotate freely.

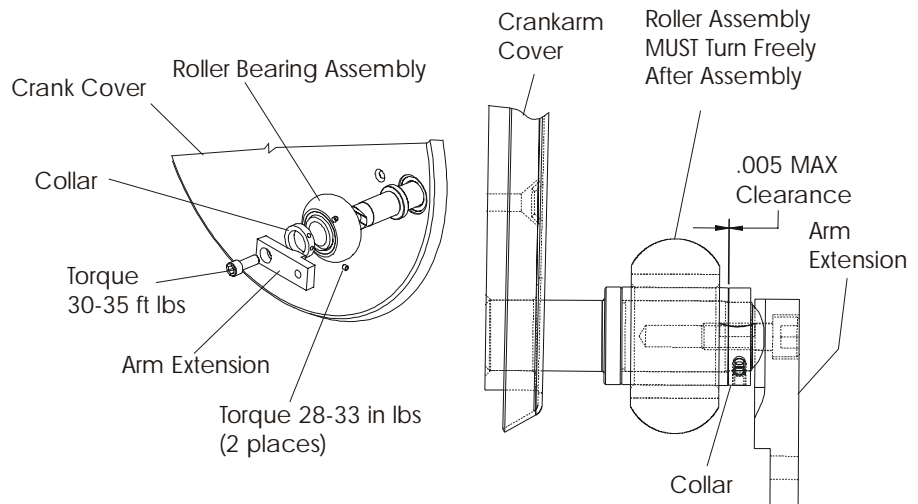


Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace The Crankarm Assembly

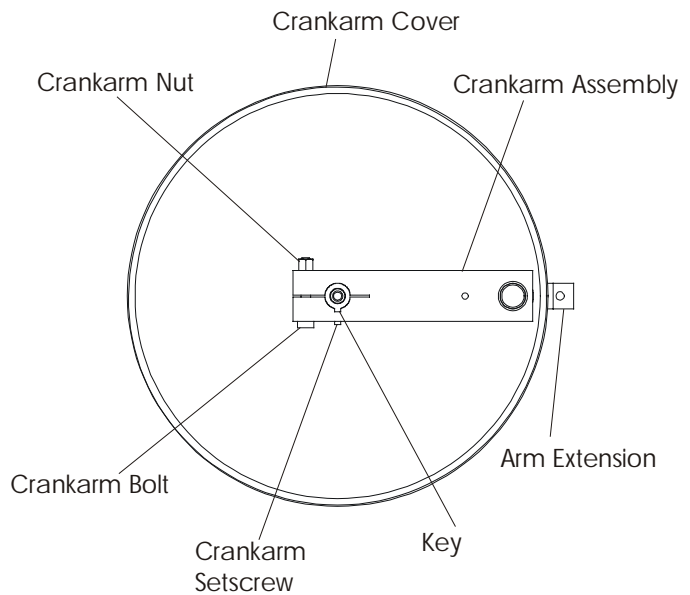
Tools required: Allen wrench set, and Phillips screwdriver

1. Remove the REAR COVERS. See How To... Remove Rear Covers.
2. Remove the ALLEN-HEAD CAPSCREW from the end of the ARM EXTENSION.
3. Remove the SETSCREW and COLLAR, then remove the roller bearing assembly.
4. Remove the two(2) countersunk screws securing the crankarm cover to the crankarm, and remove the CRANKARM COVER.



5. Remove the NUT and BOLT from the CRANKARM.
6. Remove the SETSCREW and KEY from the CRANKARM.
7. Remove the CRANKARM off the shaft.
8. Install the CRANKARM flush with end of crankshaft. Use new setscrews with patch or blue Loctite 242. Tighten setscrews first, then tighten clamping screw.
9. Install the crankarm cover and roller bearing in the reverse order. Make sure that a maximum of .005" clearance is maintained between the roller bearing and the collar. Ensure that the roller can rotate freely.

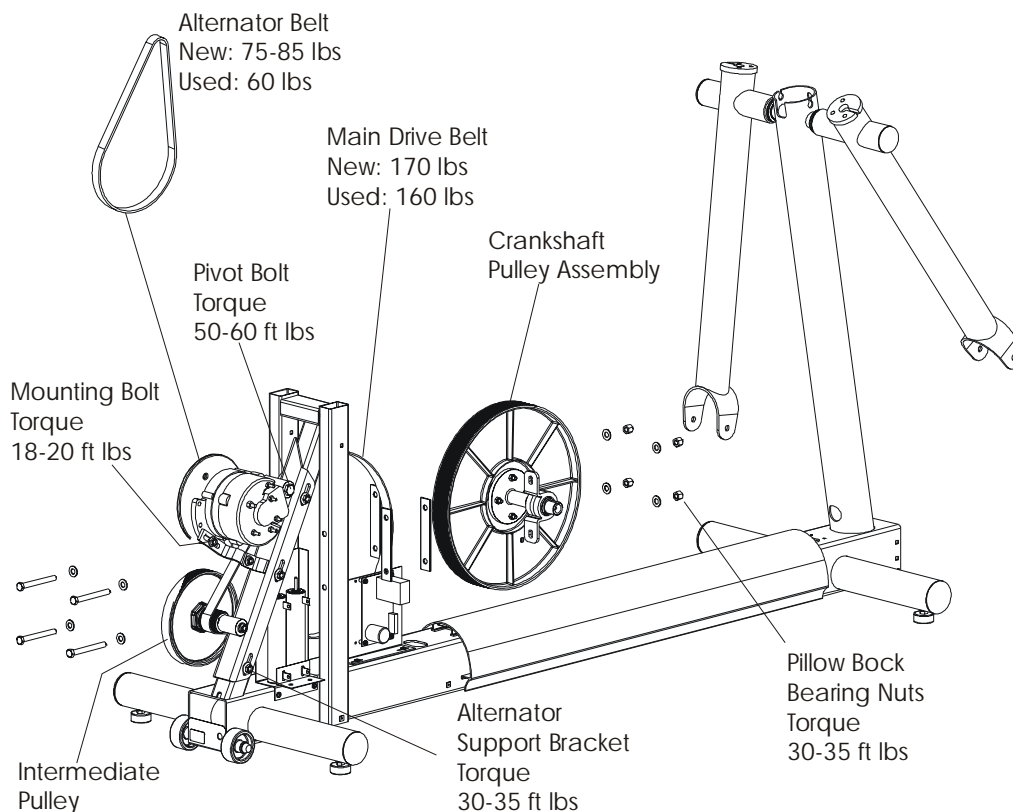
NEW STYLE



BACKSIDE VIEW

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers How To... Replace The Drive Belt and Alternator Belt

Tools required: 3/8" Socket set and Standard wrench set, and Phillips screwdriver



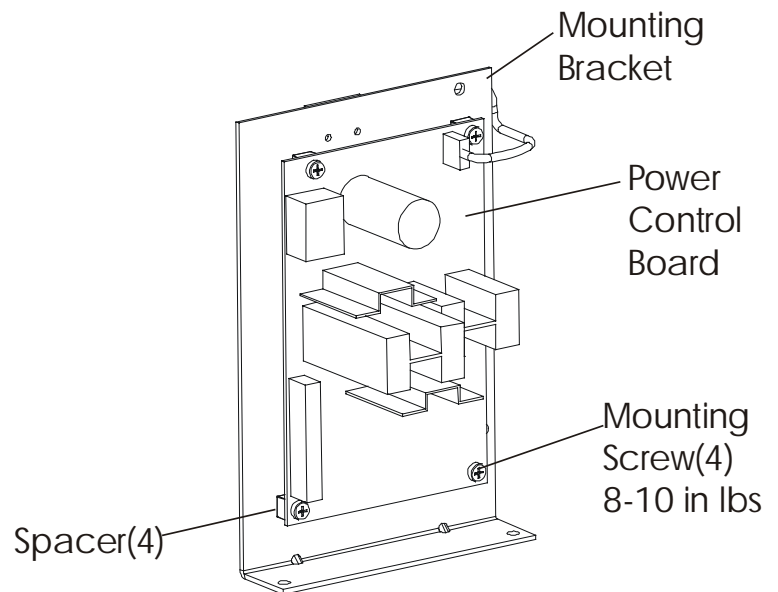
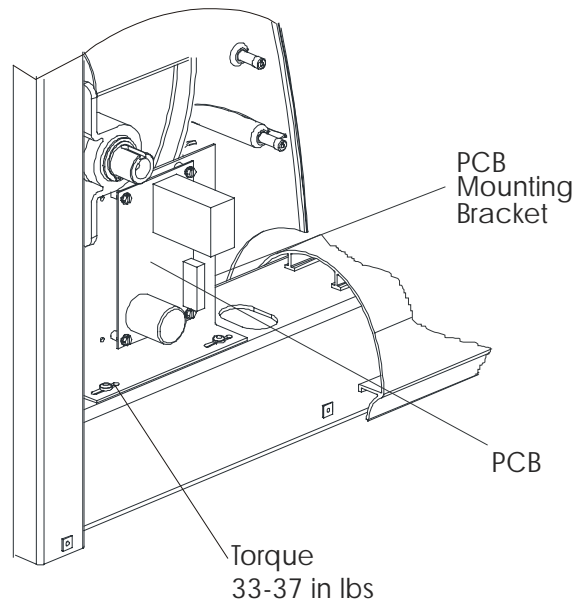
1. Remove the both REAR COVERS. See How To...Remove Rear Covers.
2. Loosen the ALTERNATOR PIVOT BOLT and release tension on the alternator belt, then remove the ALTERNATOR BELT off the INTERMEDIATE PULLEY.
3. Loosen the five(5) mounting bolts on the ALTERNATOR BRACKET and move the bracket upward and remove the DRIVE BELT off the crankshaft pulley assembly.
4. Remove the CRANKSHAFT PULLEY ASSEMBLY by removing four(4) mounting bolts at the PILLOW BLOCK BEARINGS.
5. Remove and discard the DRIVE BELT.
6. Install new 10-rib Kevlar drive belt and alternator belt in reverse order.

Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To...Remove Power Control Board Assembly

Tools Required: Slotted head screwdriver and Phillips screwdriver

1. Remove the right REAR COVER. See How To...Remove Rear Covers.
2. Remove the two securing the mounting bracket to the frame, and lift out the bracket with board.
3. Disconnect the 12, 13, and 3-Pin Connectors on the PCB.
4. Remove the PCB from its mounting bracket.
5. Install new PCB in reverse order.

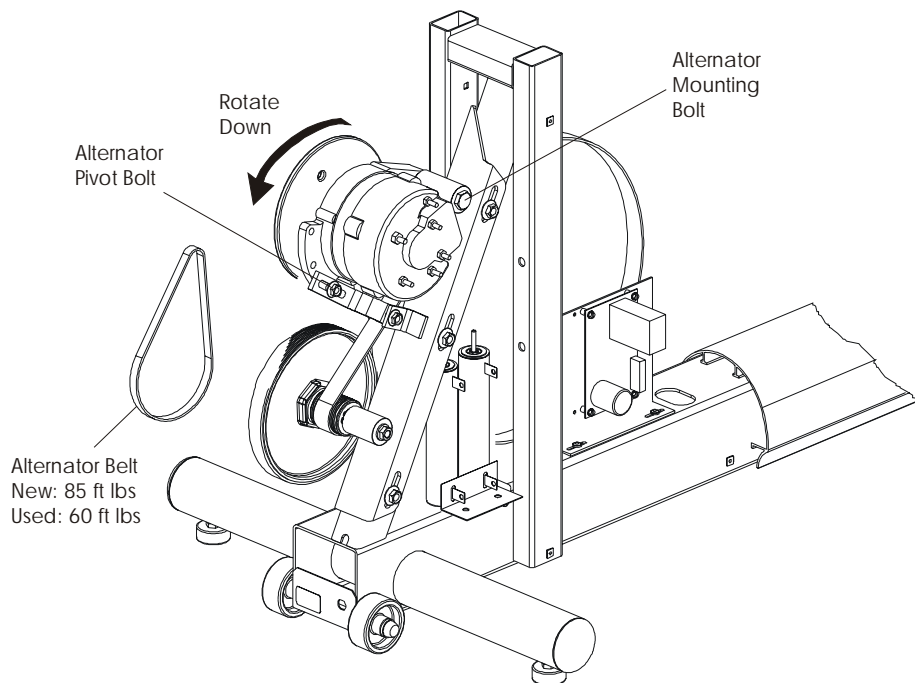


Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To...Replace Alternator Belt

Tools Required: 3/8" Socket set and Standard wrench set, and Phillips screwdriver

1. Remove the REAR COVERS.
See How To...Remove Rear Covers.
2. Loosen the ALTERNATOR PIVOT BOLT and its MOUNTING BOLT.
3. Rotate the alternator down to release belt tension, then remove the ALTERNATOR BELT.
4. Install new alternator belt in reverse order.



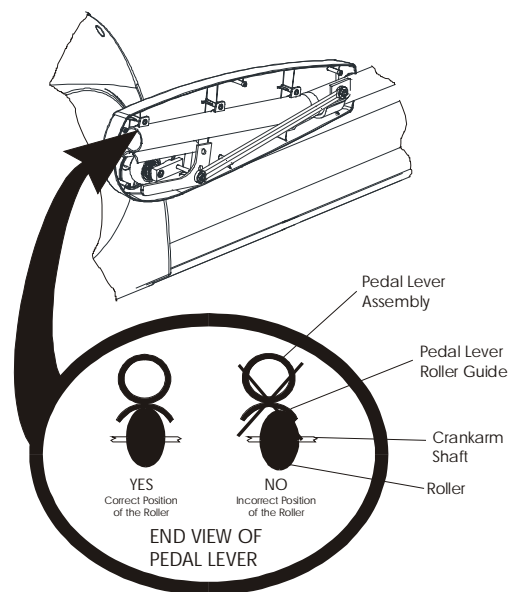
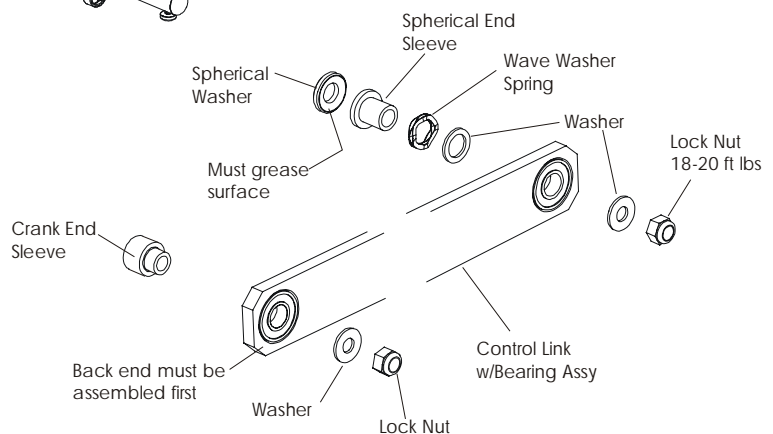
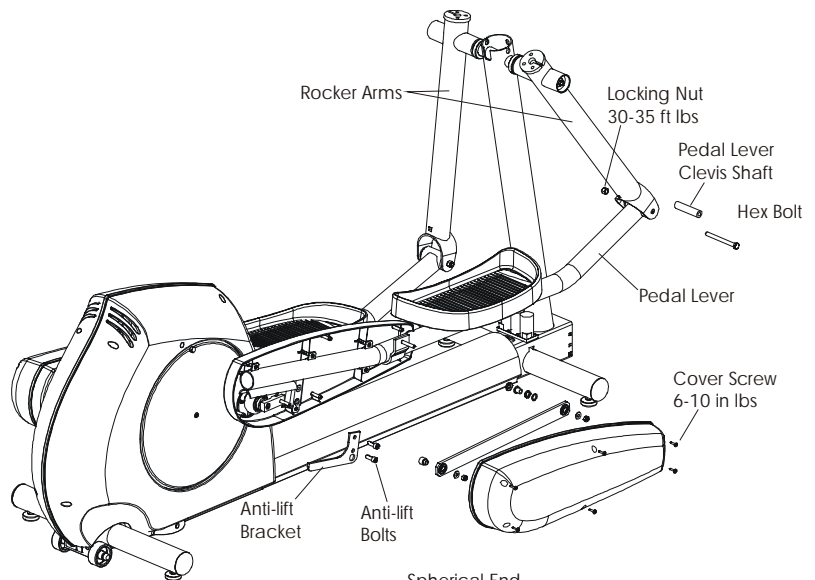
Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace Pedal Lever Assembly - 8500, 9100, and 9500HR

Tools required: Phillip screwdriver, Allen wrench set, 3/8" Socket set, and Standard wrench set

1. Remove six(6) screws from the OUTER LINK COVER and remove cover.
2. Remove the TIE ROD.
3. Remove the CLEVIS COVER from each pedal lever.
4. Remove the ANTI-LIFT BRACKET and lower the PEDAL LEVER ASSEMBLY.
5. Remove the nut and bolt securing the pedal lever to the ROCKER ARM, and remove the pedal lever.
6. Remove the inner link cover screws(4) and remove the inner link cover.
7. Install new pedal lever in reverse order except as follow:

- A) When tightening the clevis to the pedal lever bolt, the pedal lever track must be resting on the roller on the crankarm. See illustration below.
- B) The identificaion mark on the tie rod must be forward.
- C) An identification mark on the tie rod must face towards the front of the machine. Using a small amount of grease between the inner race of the bearing and sleeve, attach the tie rod at the rear of the machine first, then at the front.
- D) Use a small amount of grease between the spherical washer and the spherical end sleeve.

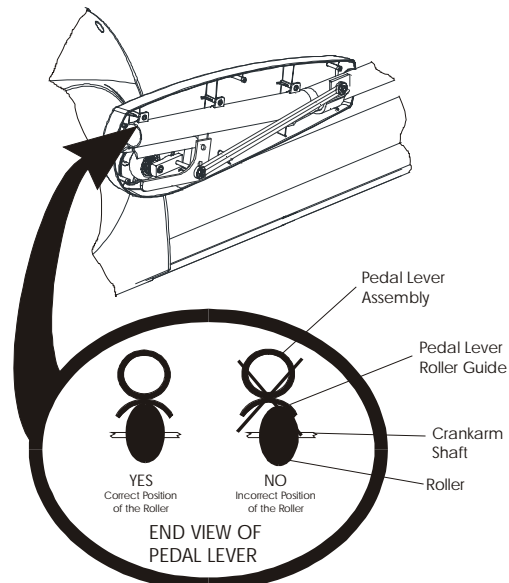
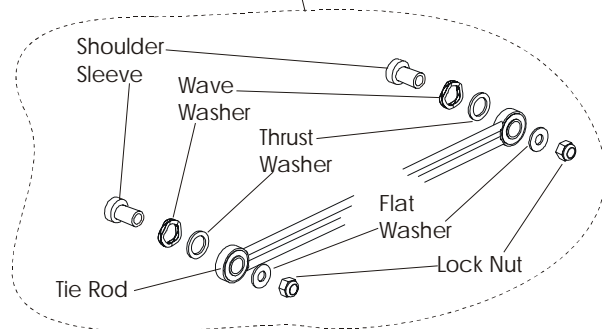
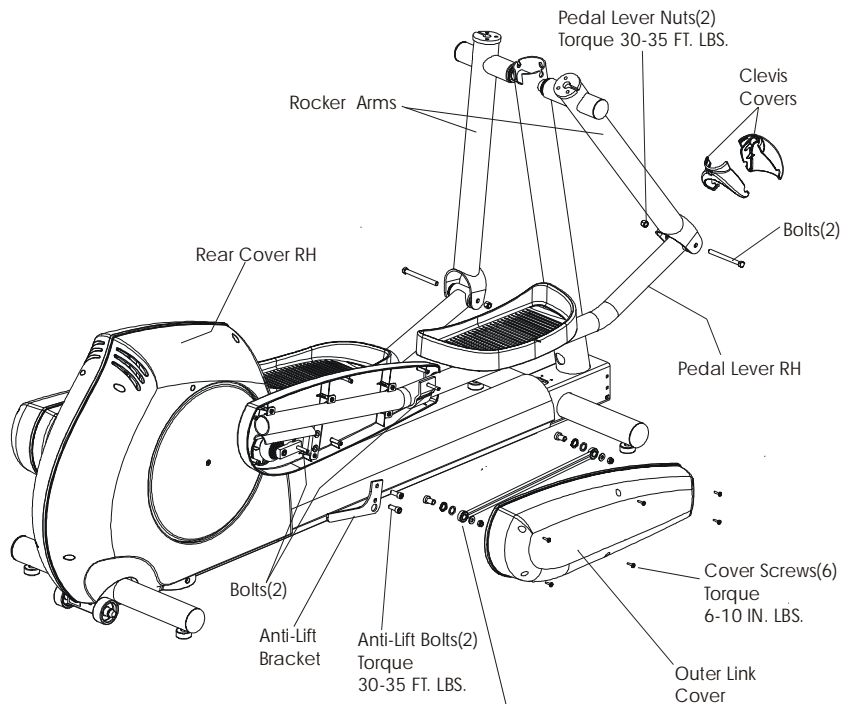


Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace Pedal Lever Assembly – X9i only

Tools required: Phillip screwdriver, Allen wrench set, 3/8" Socket set, and Standard wrench set

1. Remove six screws from the OUTER LINK COVER and remove cover.
2. Remove the TIE ROD.
3. Remove the CLEVIS COVER from each pedal lever.
4. Remove the ANTI-LIFT BRACKET and lower the PEDAL LEVER ASSEMBLY.
5. Remove the nut and bolt securing the pedal lever to the ROCKER ARM, and remove the pedal lever.
6. Remove the inner link cover screws(4) and remove the inner link cover.
7. Install new pedal lever in reverse order except as follow:
 - A) When tightening the clevis to the pedal lever bolt, the pedal lever track must be resting on the roller on the crankarm. See illustration below.
 - B) The identificaion mark on the tie rod must be forward.
 - C) An identification mark on the tie rod must face towards the front of the machine. Using a small amount of grease between the inner race of the bearing and sleeve, attach the tie rod at the rear of the machine first, then at the front.
 - D) Use a small amount of grease between the spherical washer and the spherical end sleeve.

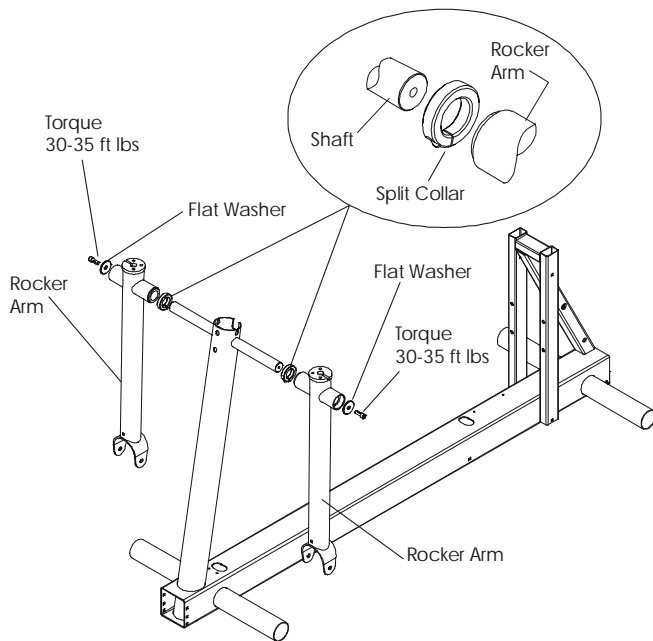
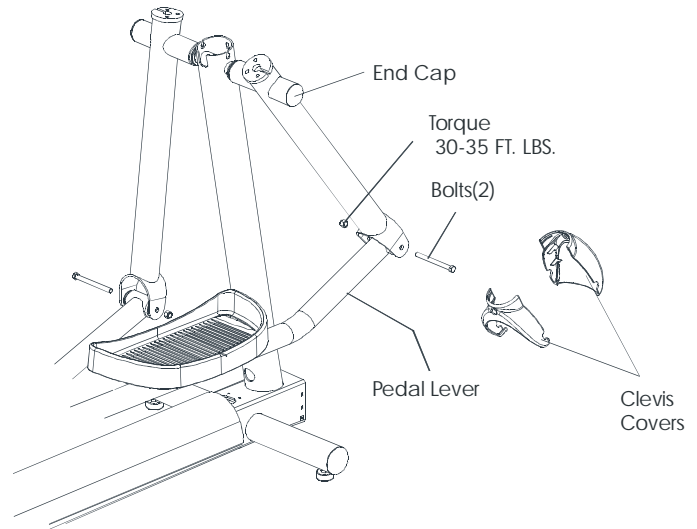


Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace Rocker Arms

Tools required: 3/8 Socket set and Standard wrench set

1. Remove the UPPER ARMS. See How To...Replace User Arms.
2. Remove the MONOCOLUMN COVERS and CLEVIS COVERS.
3. Remove the clevis cover from each pedal lever.
4. Remove the nut and bolt securing the PEDAL LEVER to the ROCKER ARM, and lower the pedal lever.
5. Remove the END CAP from the rocker arm (CT91, 85, and X9i).
6. Remove bolt and washer and slide-off the rocker arm.
7. Install new rocker arm in reverse order.
8. With the split collar positioned to within .005" gap of rocker arm, ensure that the rocker arm rotates freely.



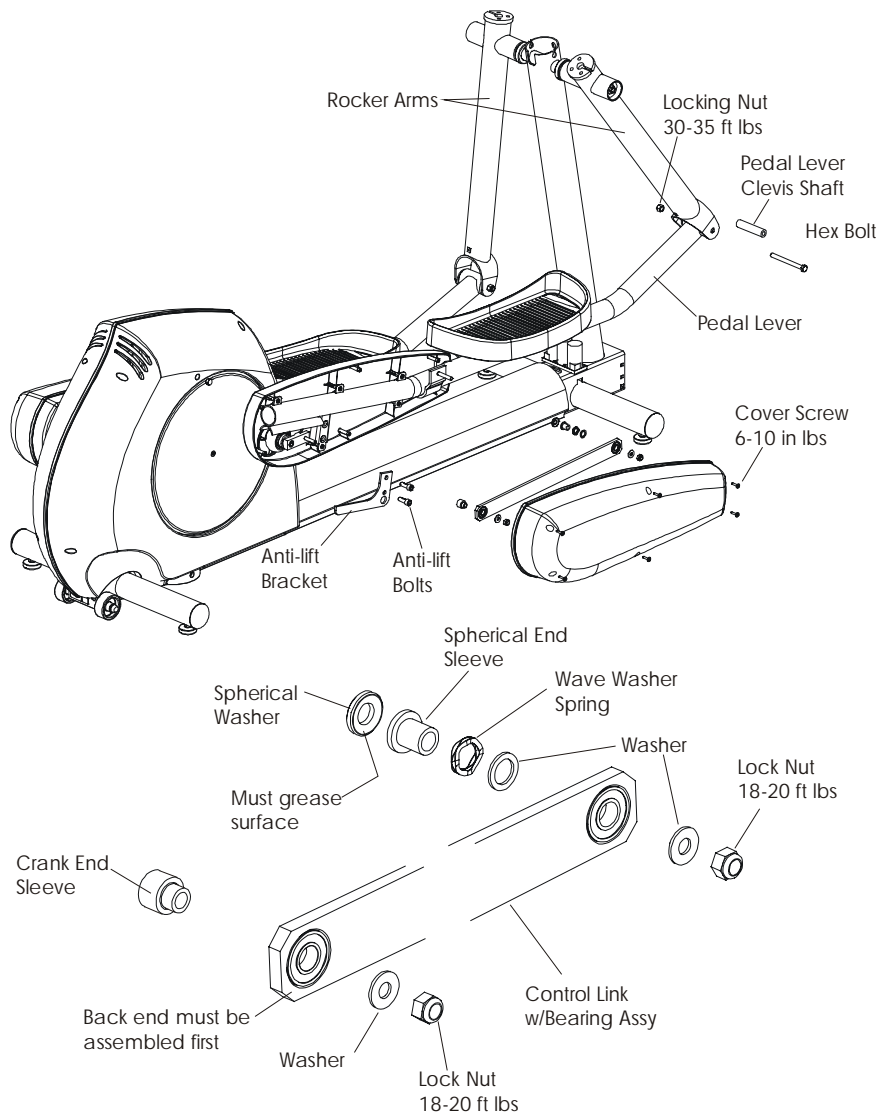
Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace Tie Rod for 8500, 9100, and 9500HR Cross-Trainers

Tools required: Phillips magnetic screwdriver #2 and 3/8 Socket set

1. Remove the OUTER LINK COVER by removing the six(6) mounting screws.
2. Remove the TIE ROD NUT from the ARM EXTENSION and PEDAL ARM.
3. Discard the tie rod and hardware.
4. Install new TIE ROD in reverse order.

NOTE: An identification mark on the tie rod must face towards the front of the machine. Using a small amount of grease between the inner race of the bearing and sleeve, attach the tie rod at the rear of the machine first, then at the front.



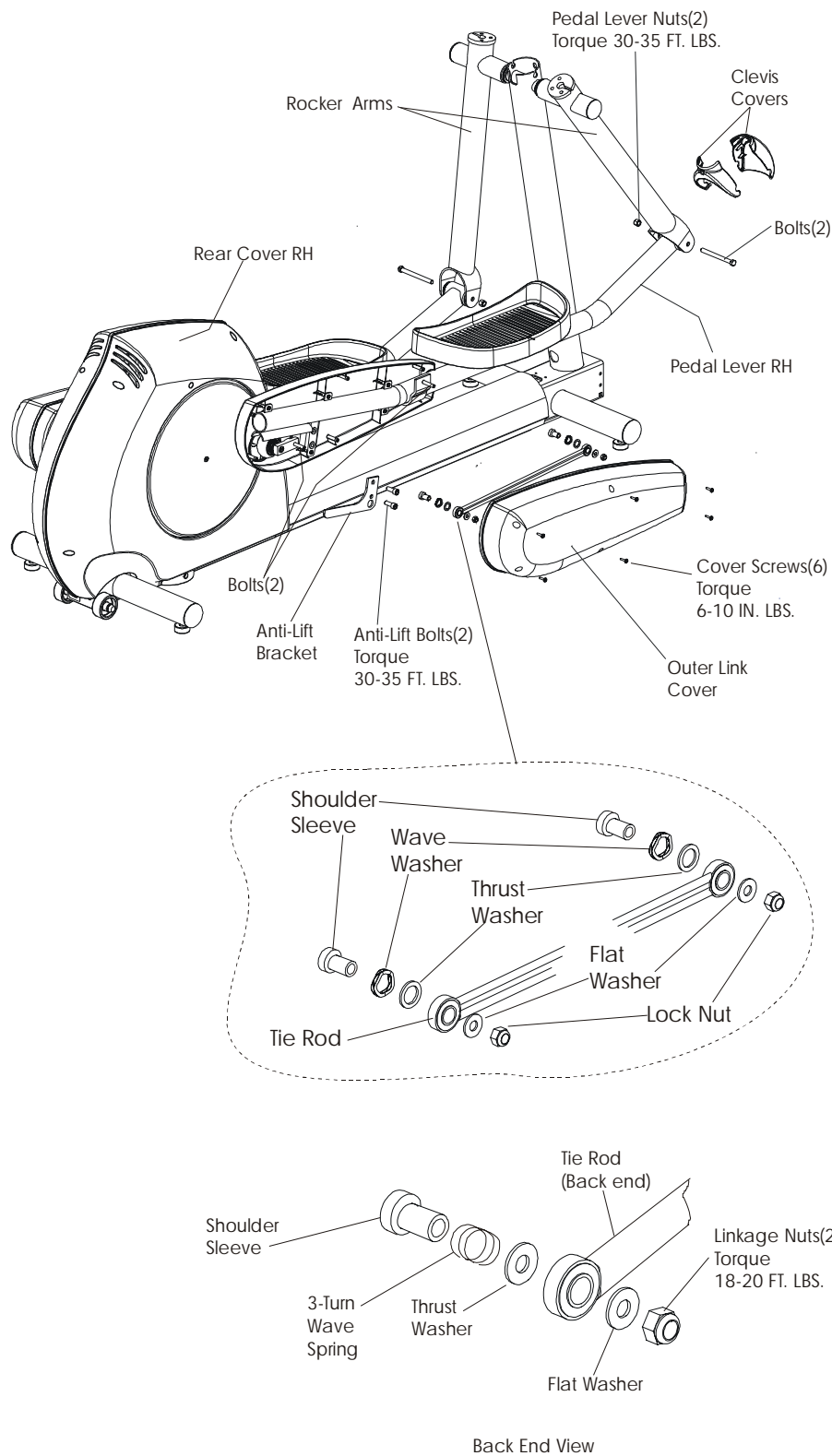
Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace Tie Rod for X9i

Tools required: Phillips magnetic screwdriver #2 and 3/8 Socket set

1. Remove the OUTER LINK COVER by removing the six(6) mounting screws.
2. Remove the TIE ROD NUT from the ARM EXTENSION and PEDAL ARM.
3. Discard the tie rod and hardware.
4. Install new TIE ROD in reverse order.

NOTE: An identification mark on the tie rod must face towards the front of the machine. Using a small amount of grease between the inner race of the bearing and sleeve, attach the tie rod at the rear of the machine first, then at the front.

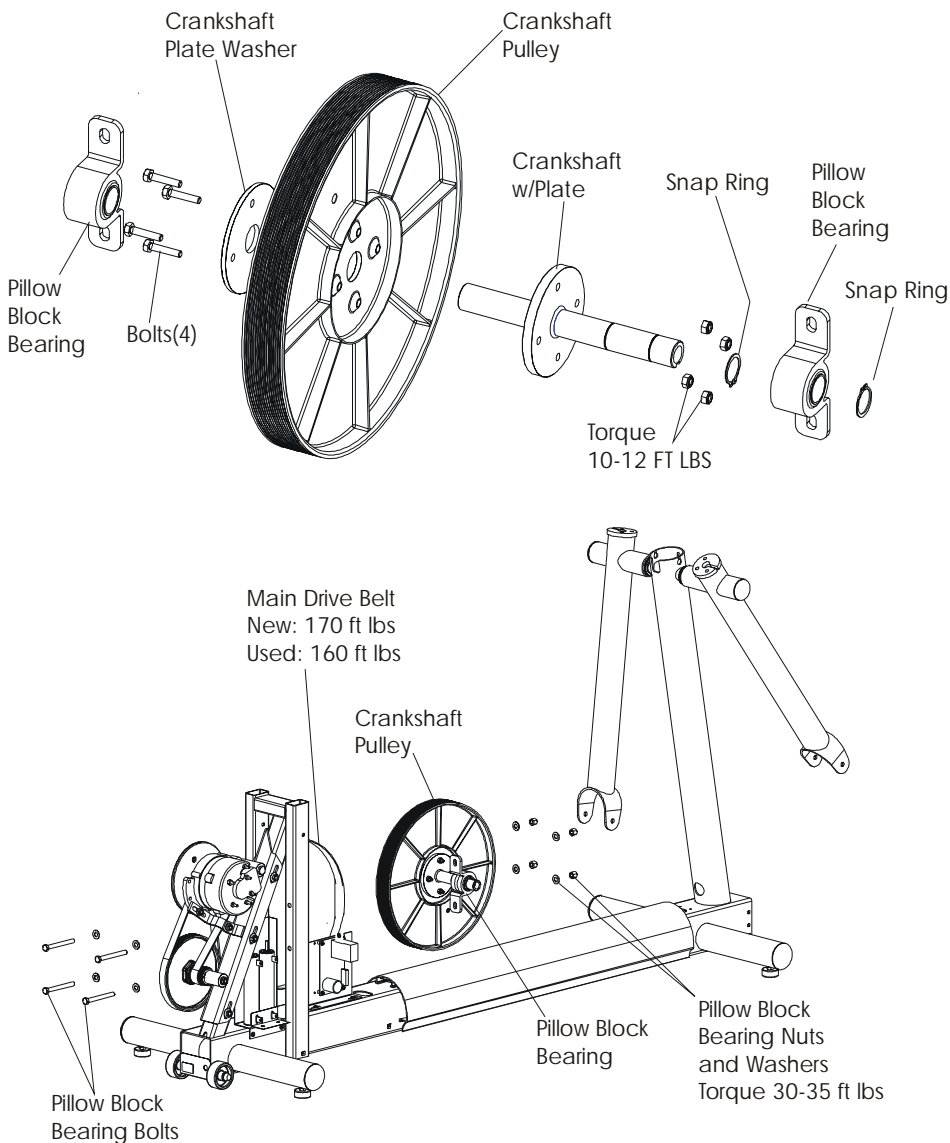


Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace Crankshaft Pulley Assembly - 8500, 9100, and 9500HR

Tools required: Allen wrench set, 3/8" Socket set, and Standard wrench set

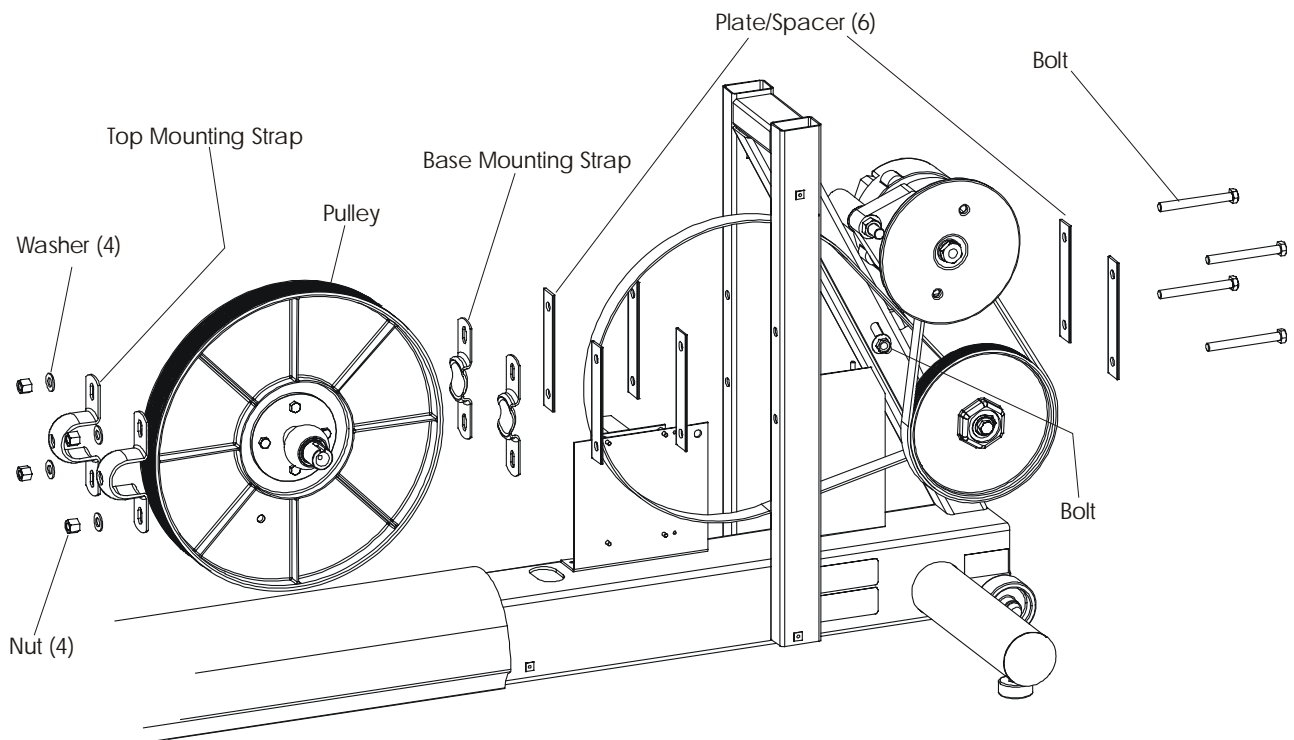
1. Remove the REAR COVERS. See How To...Remove Rear Covers.
2. Loosen five(5) mounting bolts on the ALTERNATOR SUPPORT BRACKET. Push this bracket up to remove tension on the DRIVE BELT, and remove the drive belt.
3. Remove four(4) bolts from the CRANKSHAFT PULLEY ASSEMBLY by removing four(4) mounting bolts at the PILLOW BLOCK BEARINGS.
4. Replace components on the crankshaft pulley assembly as necessary.
5. Install new crankshaft pulley in reverse order.



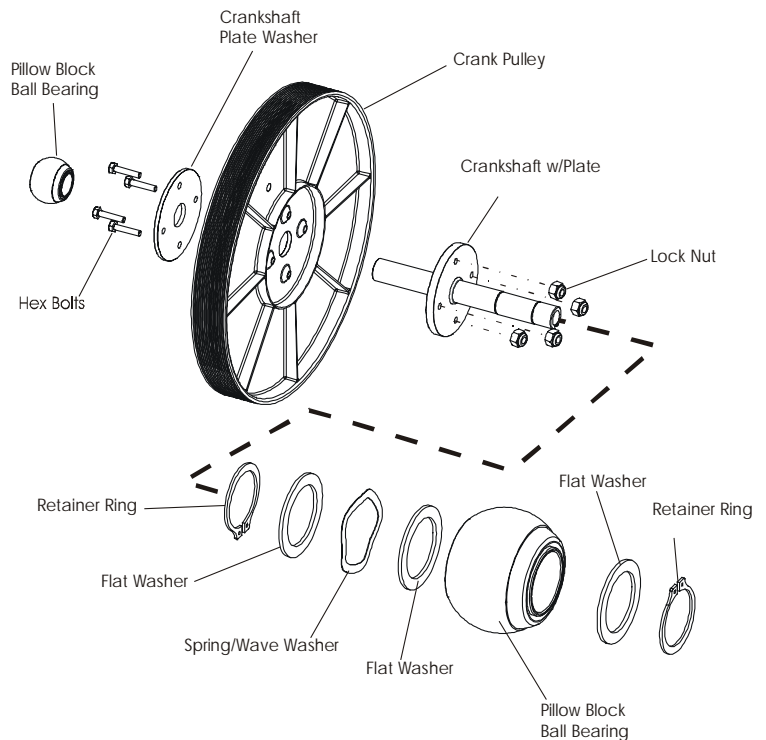
Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace Crankshaft Pulley Assembly for X9i

Tools required: Allen wrench set, 3/8" Socket set, and Standard wrench set



1. Remove the REAR COVERS. See How To...Remove Rear Covers.
2. Loosen five(5) mounting bolts on the ALTERNATOR SUPPORT BRACKET. Push this bracket up to remove tension on the DRIVE BELT, and remove the drive belt.
3. Remove the top mounting straps securing the pillow block ball bearings.
4. Remove retaining ring and pull off the pillow block ball bearing from the left and right sides.
5. Remove the bolts and nuts from the crank plates, and remove the crankshaft from the pulley.
6. Install new crank pulley and components as required.

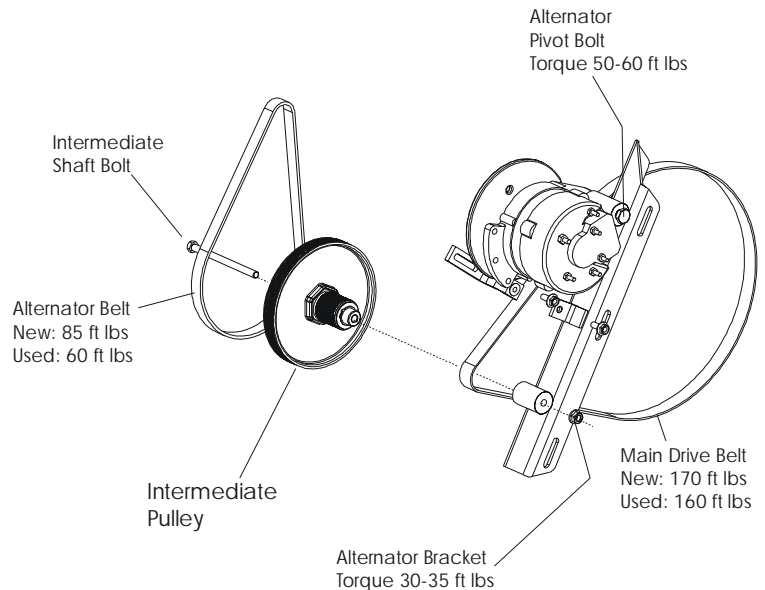
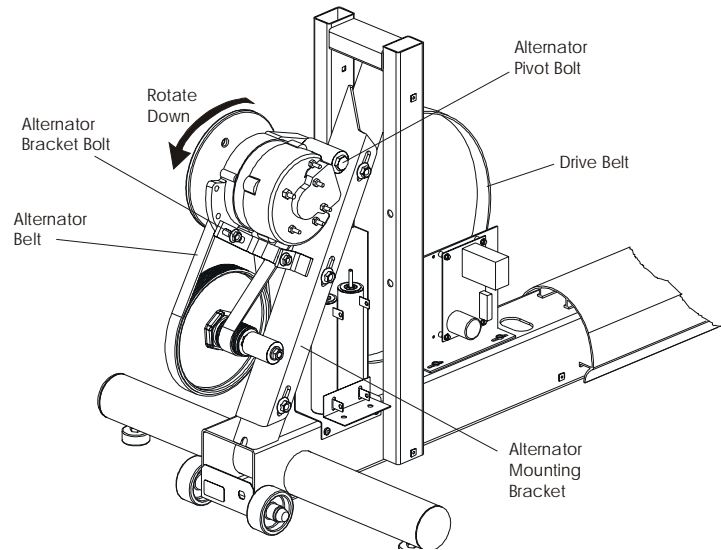


Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace The Intermediate Pulley

Tools required: 3/8" Socket set and Standard wrench set

1. Remove the REAR COVERS. See How To...Remove Rear Covers.
2. Loosen the ALTERNATOR PIVOT BOLT and rotate the alternator down to relieve belt tension.
3. Loosen the belt tension on the INTERMEDIATE PULLEY by loosening the five(5) bolts on the ALTERNATOR MOUNTING BRACKET.
4. Remove the INTERMEDIATE SHAFT BOLT and the INTERMEDIATE PULLEY.
5. Install new INTERMEDIATE PULLEY in reverse order.

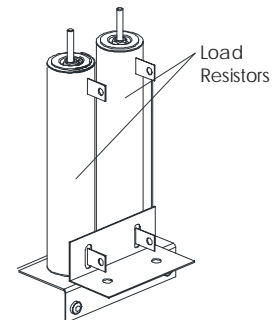
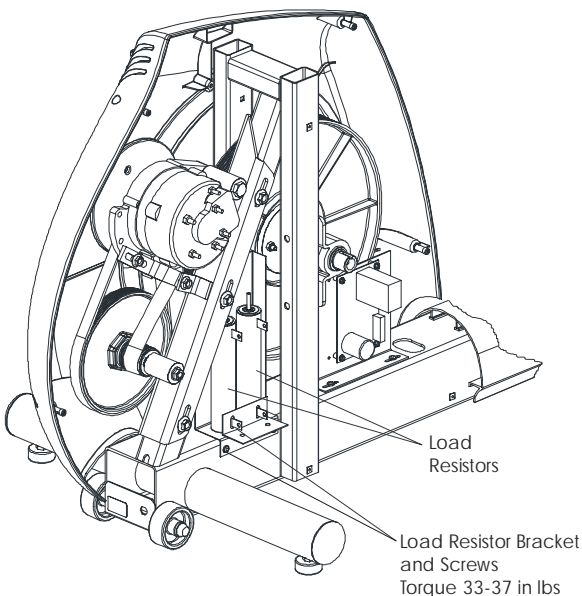


Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace Load Resistors

Tools required: Slotted screwdriver

1. Remove the right REAR COVER. See How To...Remove Rear Covers.
2. Disconnect wires at the LOAD RESISTORS.
3. Remove the LOAD RESISTORS by removing two(2) hex-head screws securing the load resistor to the frame.
4. Install new load resistors in reverse order.

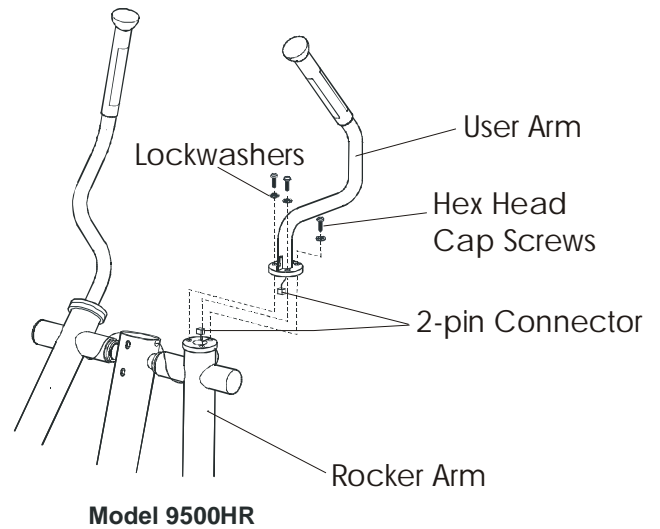
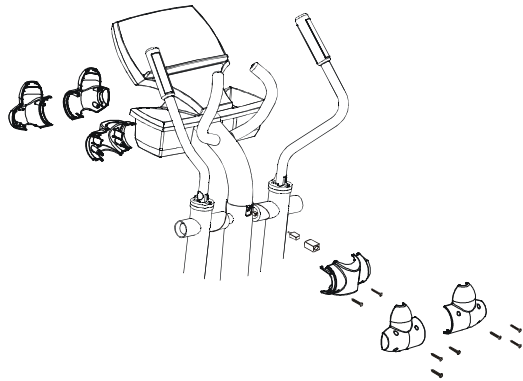
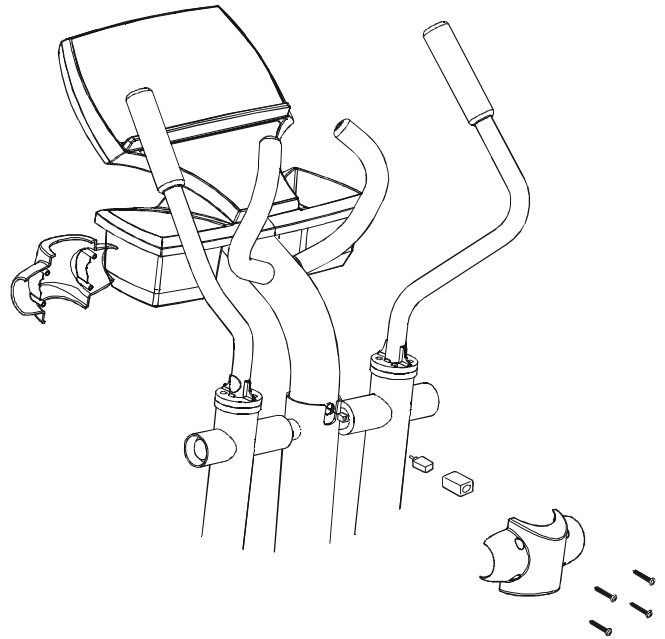


Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace The User Arms

Tools required: Allen wrench set and Phillips screwdriver

1. **MODELS 8500 and 9100:** Raise the BOOT COVERS on the UPPER ARMS.
MODEL 9500: Remove four(4) mounting bolts from the USER ARM REAR COVERS and remove these covers.
2. Remove three(3) MOUNTING BOLTS from each UPPER ARM and lift off the user arm. Units with Heart Rate, disconnect electrical connector.
3. Install new user arms in reverse order.



Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

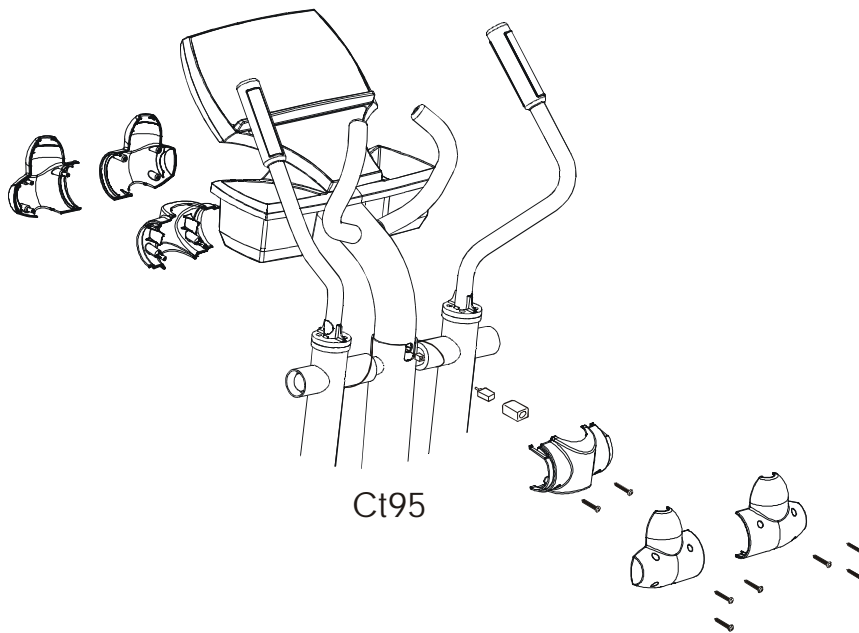
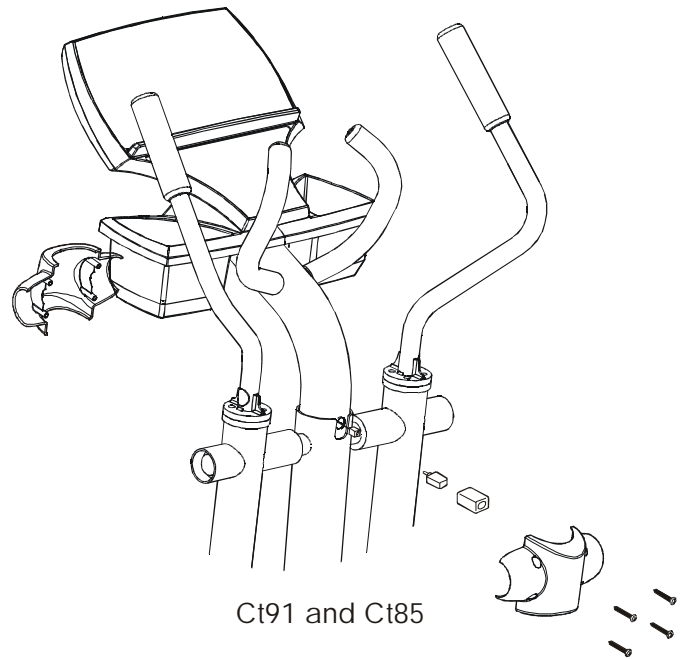
How To... Replace The Polar Receiver & Replace Monocolumn Cover

Tools required: Phillips screwdriver

1. **MODELS 8500 / 9100:** Remove four(4) mounting bolts from the two halves of the MONOCOLUMN COVER and separate.
2. **MODEL 9500:** Remove four(4) mounting bolts from each USER ARM REAR COVER(2). Then remove four(4) mounting bolts from the MONOCOLUMN COVERS and separate the two halves.
3. Locate the POLAR RECEIVER in the monocolumn and disconnect it from its jack.

Install a new POLAR RECEIVER in reverse order.

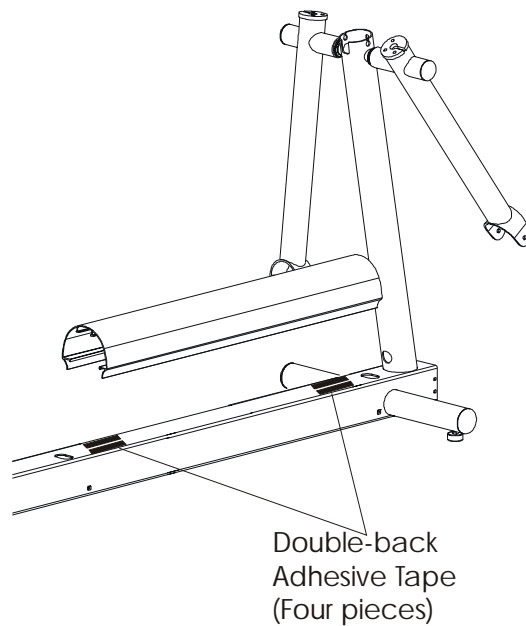
Note: Telemetry is optional on the domestic CT8500.



Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers **How To... Replace The Frame Cover**

Tools required: Phillips screwdriver, Standard screwdriver, Allen wrench set, 3/8" Socket set, and Wrenches

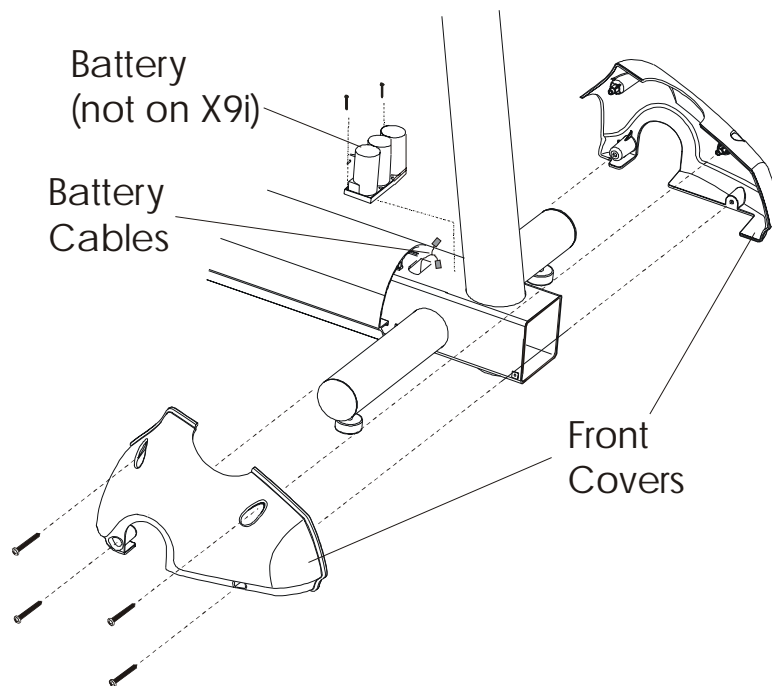
1. Remove the FRONT COVERS.
2. Remove the FRAME COVER which is adhered to the frame with double-back tape.
3. Clean the frame with alcohol and allow to dry.
4. Install four(4) pieces of tape to the underside of the cover, then install the FRAME COVER.



Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers How To... Replace The Battery - 8500, 9100, and 9500HR

Tools required: Phillips magnetic screwdriver #2

1. Remove the six FRONT COVER screws and separate the front cover halves.
2. Disconnect the BATTERY CABLES.
3. Remove the battery mounting screws(2) and lift out the BATTERY.
4. Install new battery in reverse order.

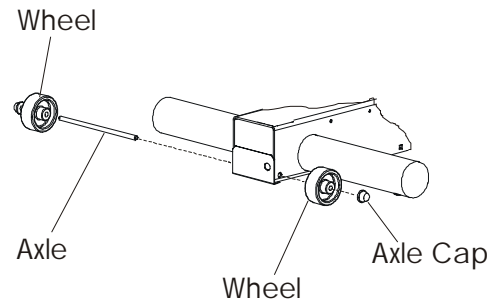
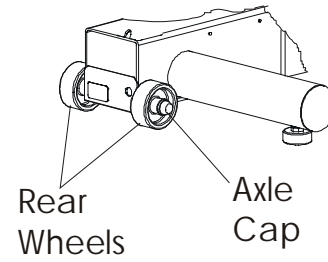


Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace The Rear Wheels and Axle

Tools required: Slotted screwdriver and Pliers

1. Remove the AXLE CAP from the WHEEL AXLE.
2. Remove the WHEELS and AXLE.
3. Install new wheels, axle, and axle cap in the reverse direction.

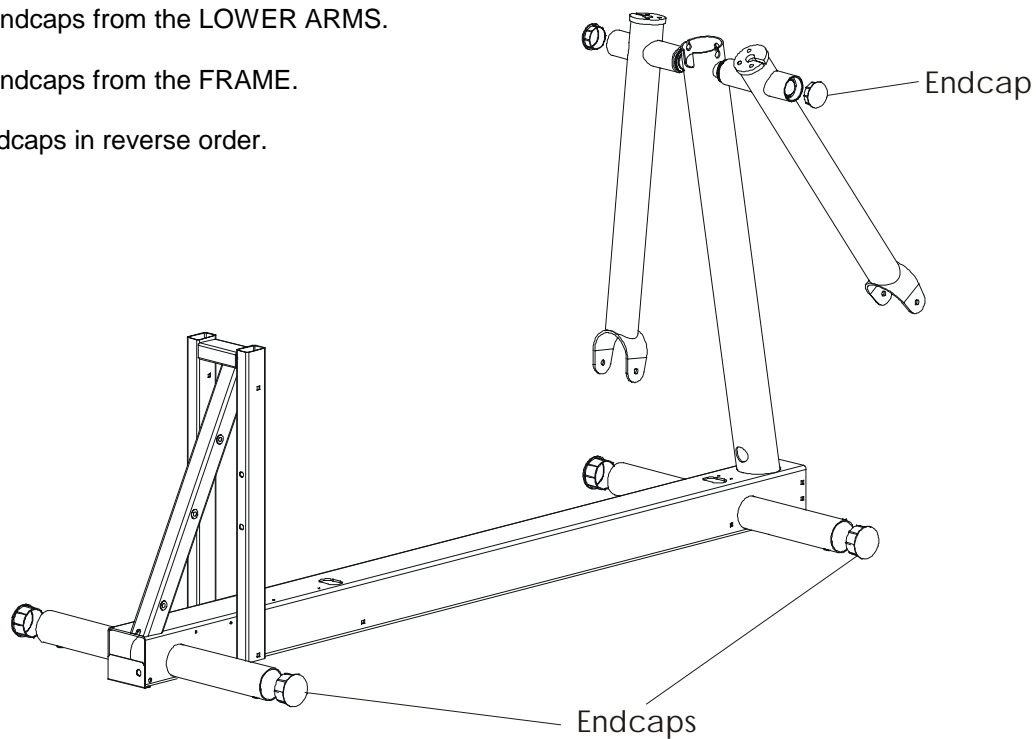


Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace The Endcaps

Tools required: Slotted screwdriver

1. Remove the endcaps from the LOWER ARMS.
2. Remove the endcaps from the FRAME.
3. Install new endcaps in reverse order.

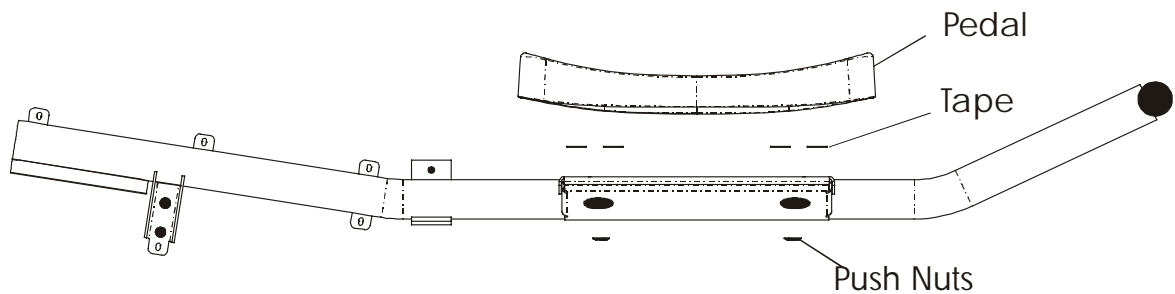
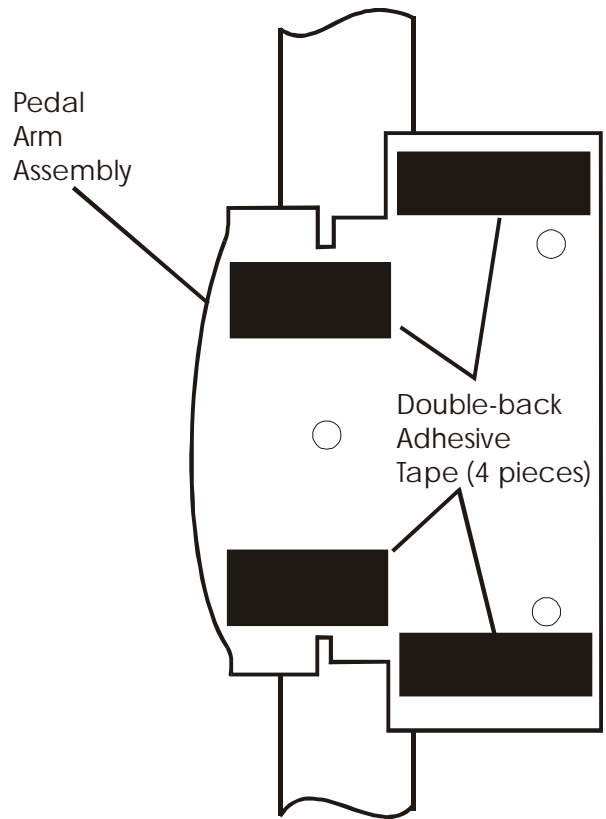


Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To... Replace Pedal

Tools required: Clean cloth, water, and isopropyl alcohol

1. Remove the pedals from the pedal arm assemblies.
2. Remove old tape.
3. Using a clean cloth, carefully clean the surface areas using a moisture of 50% water and 50% isopropyl alcohol. Make sure all adhesive is removed from the pedal and pedal arm assembly and make sure that surface areas are perfectly dried.
4. Apply four(4) pieces of double-back adhesive tape on the pedal arm assembly as shown.
5. Reinstall the pedal and apply 30-40 psi clamp pressure for approximately 60 seconds or longer.
6. Install the push nuts. A socket or nut driver works well to press them firmly in place.

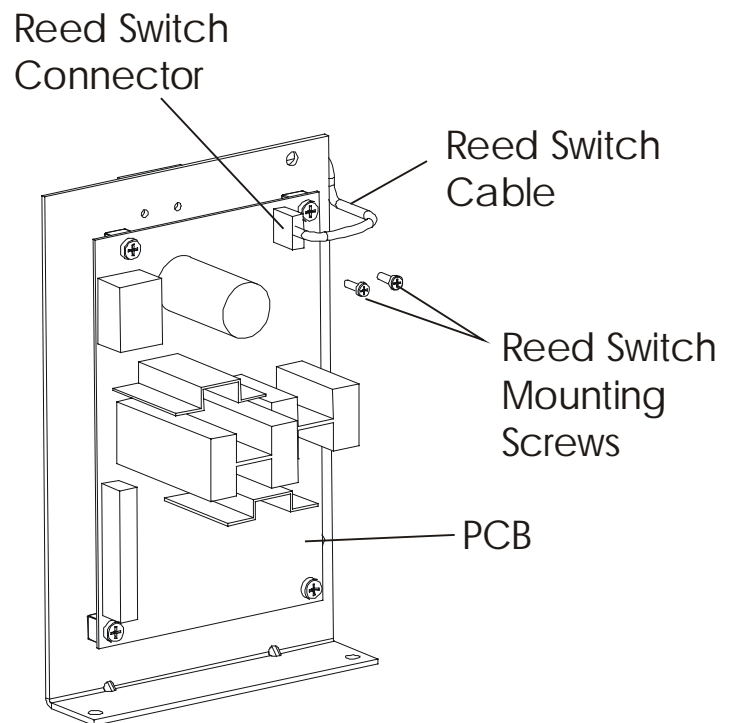
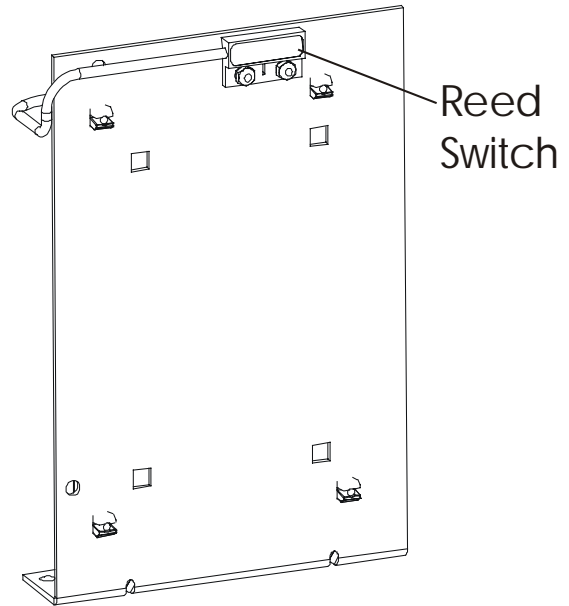


Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

How To...Replace The Reed Switch - 8500, 9100, and 9500HR

Tools required: Phillips Screwdriver

1. The reed switch is located on the back side of the PCB bracket (CT85/91/95 only).
2. Remove two screws from the bracket on the PCB side.
3. Disconnect the reed switch connector from the PCB and remove the reed switch assembly.



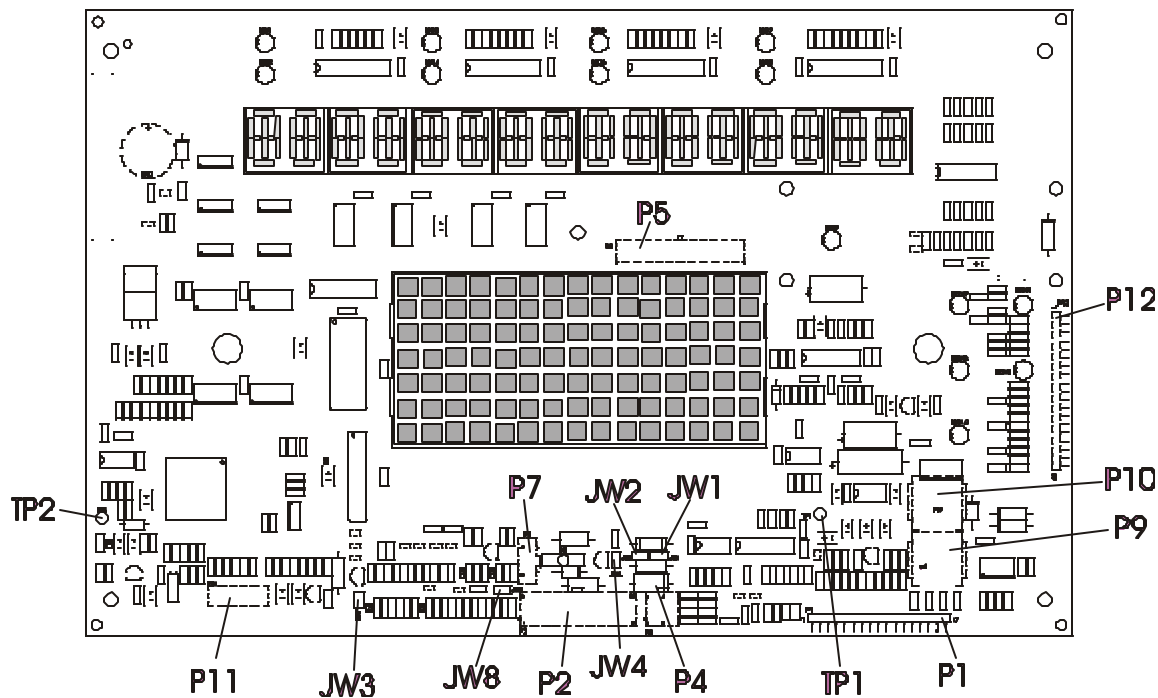
Life Fitness Models X9i, 8500, 9100, and 9500HR Cross-Trainers

NOTES:

SECTION IV

**ELECTRONICS OVERVIEW
AND
WIRING BLOCK DIAGRAMS**

Life Fitness Model X9i, 8500, 9100, and 9500HR Cross-Trainers
DISPLAY CONSOLE BOARD CT9500



Functional Description


The Display Console Board is designed to work in conjunction with the Alternator Control Board. It reads the keypad input for changes or updates by the user, and refreshes the status LEDs, data display, and profile display matrix.

Connector and Pin Descriptions

Connector	Location	Pin	Functional Description
<u>UPPER KEYPAD</u> P12 is a 19 pin ribbon connector that connects to the upper keypad switch membrane.		1	Ground
		2	Strobe 4
		3	Return 3
		4	Strobe 5
		5	Strobe 6
		6	Return 0
		7	Strobe 4
		8	Return 2
		9	Strobe 6
		10	Return 4
		11	Return 5
		12	Strobe 6
		13	Return 6
		14	Strobe 5
		15	Return 5
		16	Strobe 4
		17	Return 1
		18	Strobe 6
		19	Ground




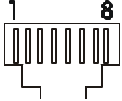

Life Fitness Model X9i, 8500, 9100, and 9500HR Cross-Trainers
DISPLAY CONSOLE BOARD CT9500

Connector and Pin Descriptions

Connector	Location	Pin	Functional Description
<p>LOWER KEYPAD P1 and 17 pin ribbon connector that connects to the lower keypad switch membrane.</p>		1	Ground
		2	Strobe
		3	Return
		4	Strobe
		5	Strobe
		6	Return
		7	Strobe
		8	Return
		9	Strobe
		10	Return
		11	Ground
		12	Strobe
		13	Strobe
		14	Return
		15	Strobe
		16	Return
		17	Ground

Life Fitness Model X9i, 8500, 9100, and 9500HR Cross-Trainers
DISPLAY CONSOLE BOARD - Model 9500

Connector and Pin Descriptions

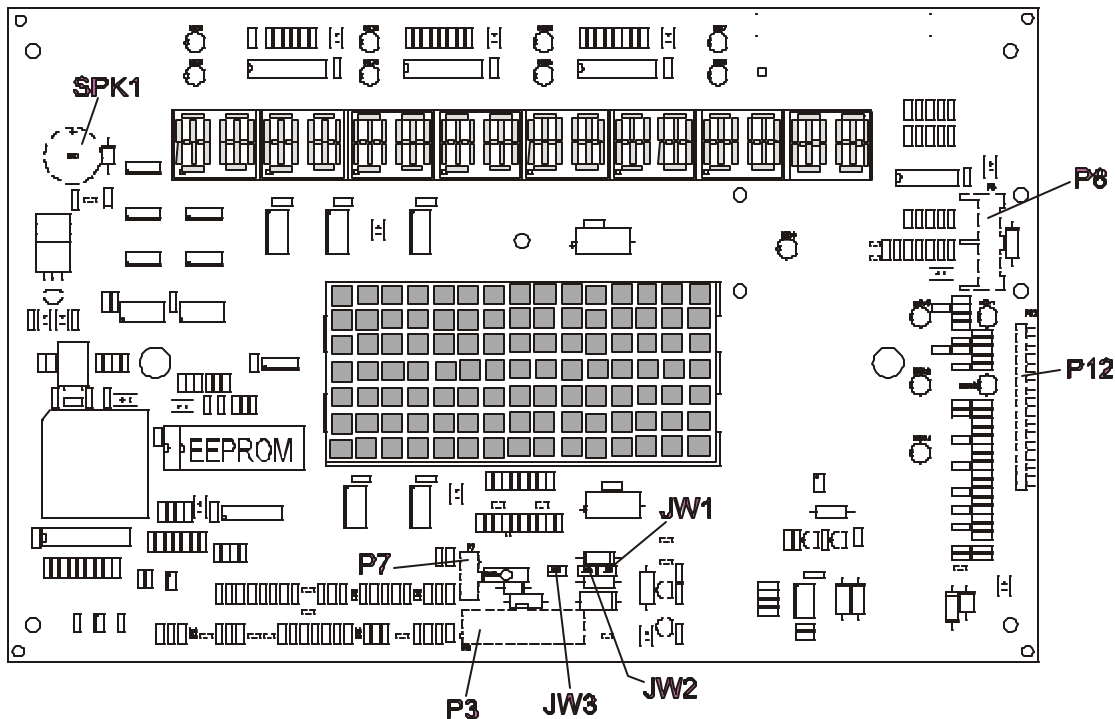
Connector	Location	Pin	Functional Description
P2 is a 16-pin connector that connects to the alternator control board.		1	N.C.
		2	GND (NOT USED)
		3	(NOT USED)
		4	VBAT
		5	RPM REED
		6	RPM ALT
		7	ASTART
		8	VALT.
		9	RELAY
		10	GND
		11	GND
		12	VBAT
		13	FIELD-KICK
		14	FIELD
		15	LOAD-CMD
		16	VSYS
P4 is a 4-pin connector that connects to the heart rate sensor.		3	LEFT +
		1	LEFT -
		2	RIGHT -
		4	RIGHT +
P7 is a 3-pin connector that connects to the polar signal.		1	+VCC (5VDC)
		2	POLAR SIGNAL
		3	GROUND
P9 and P10 are 8-pin connectors that connect to the CSAFE and Cardio Theater or broadcast vision interface.		1	N/U - not used
		2	N/U - not used
		3	Receive Data
		4	Transmit Data
		5	+8 Vdc
		6	CTS
		7	Ground
		8	N/U - not used
P11 is a 10-pin connector that connects to the background debug mode signals.		1	/DS
		2	/BERR
		3	Ground
		4	/BKPT /DSCLK
		5	Ground
		6	FREEZE/QUOT
		7	/RESET
		8	IPIPE1/DS1
		9	+5 Vdc
		10	IPIPE0/DS0

Life Fitness Model X9i, 8500, 9100, and 9500HR Cross-Trainers
DISPLAY CONSOLE BOARD - Model CT9500

Connector and Pin Descriptions

Connector	Location	Pin	Functional Description																																																																																				
P5 is a 24 pin connector that connects to the lower console display board.	<table border="1" style="border-collapse: collapse; text-align: center; width: 100%;"> <tr> <td style="width: 25px;">24</td> <td style="width: 25px;">23</td> <td style="width: 25px;">22</td> <td style="width: 25px;">21</td> </tr> <tr> <td>23</td> <td>22</td> <td>21</td> <td>20</td> </tr> <tr> <td>22</td> <td>21</td> <td>20</td> <td>19</td> </tr> <tr> <td>21</td> <td>20</td> <td>19</td> <td>18</td> </tr> <tr> <td>20</td> <td>19</td> <td>18</td> <td>17</td> </tr> <tr> <td>19</td> <td>18</td> <td>17</td> <td>16</td> </tr> <tr> <td>18</td> <td>17</td> <td>16</td> <td>15</td> </tr> <tr> <td>17</td> <td>16</td> <td>15</td> <td>14</td> </tr> <tr> <td>16</td> <td>15</td> <td>14</td> <td>13</td> </tr> <tr> <td>15</td> <td>14</td> <td>13</td> <td>12</td> </tr> <tr> <td>14</td> <td>13</td> <td>12</td> <td>11</td> </tr> <tr> <td>13</td> <td>12</td> <td>11</td> <td>10</td> </tr> <tr> <td>12</td> <td>11</td> <td>10</td> <td>9</td> </tr> <tr> <td>11</td> <td>10</td> <td>9</td> <td>8</td> </tr> <tr> <td>10</td> <td>9</td> <td>8</td> <td>7</td> </tr> <tr> <td>9</td> <td>8</td> <td>7</td> <td>6</td> </tr> <tr> <td>8</td> <td>7</td> <td>6</td> <td>5</td> </tr> <tr> <td>7</td> <td>6</td> <td>5</td> <td>4</td> </tr> <tr> <td>6</td> <td>5</td> <td>4</td> <td>3</td> </tr> <tr> <td>5</td> <td>4</td> <td>3</td> <td>2</td> </tr> <tr> <td>4</td> <td>3</td> <td>2</td> <td>1</td> </tr> </table>	24	23	22	21	23	22	21	20	22	21	20	19	21	20	19	18	20	19	18	17	19	18	17	16	18	17	16	15	17	16	15	14	16	15	14	13	15	14	13	12	14	13	12	11	13	12	11	10	12	11	10	9	11	10	9	8	10	9	8	7	9	8	7	6	8	7	6	5	7	6	5	4	6	5	4	3	5	4	3	2	4	3	2	1	1	DIGIT STROBE – S9B
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Life Fitness Model X9i, 8500, 9100, and 9500HR Cross-Trainers
DISPLAY CONSOLE BOARD - Model CT9100, 8500, and X9i



Functional Description



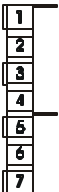
The Display Console Board is designed to work in conjunction with the Alternator Control Board. It reads the keypad input for changes or updates by the user, and refreshes the status LEDs, data display, and profile display matrix.

Connector and Pin Descriptions

Connector	Location	Pin	Functional Description
UPPER KEYPAD P12 is a 17 pin ribbon connector that connects to the upper keypad switch membrane.		1	Ground
		2	Strobe
		3	Return
		4	Strobe
		5	Strobe
		6	Return
		7	Strobe
		8	Return
		9	Strobe
		10	Return
		11	Ground
		12	Strobe
		13	Strobe
		14	Return
		15	Strobe
		16	Return
		17	Ground

Life Fitness Model X9i, 8500, 9100, and 9500HR Cross-Trainers
DISPLAY CONSOLE BOARD - Model CT9100, 8500, and X9i

Connector and Pin Descriptions

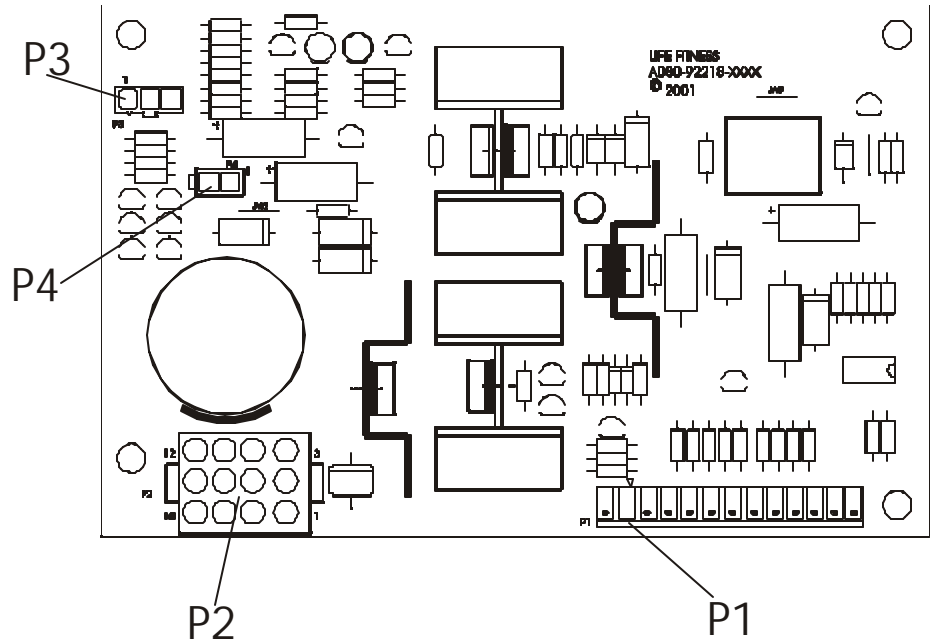
Connector	Location	Pin	Functional Description
P2 is a 16-pin connect that connects to the alternator control board.		1	N.C.
		2	GND (NOT USED)
		3	VSYSC (NOT USED)
		4	VBAT (NOT USED)
		5	RPM REED (NOT USED)
		6	RPM ALT
		7	ASTART
		8	VALT.
		9	RELAY
		10	GND
		11	GND
		12	VBAT
		13	FIELD-KICK
		14	FIELD
		15	LOAD-CMD
		16	VSYS
P7 is a 3-pin connector that connects to the polar signal.		1	+VCC (5VDC)
		2	POLAR SIGNAL
		3	GROUND
P8 is a 7-pin connector that connects to the network adapter board.		1	GND
		2	LEU
		3	TDO
		4	RDI
		5	CTS
		6	VCC
		7	V CARDIO

Life Fitness Model X9i, 8500, 9100, and 9500HR Cross-Trainers

Power Control Board

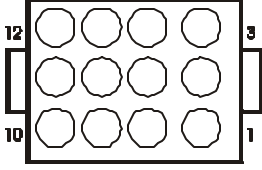
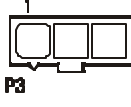

Functional Description

The Power Control Board is designed to regulate the alternator voltage by modulating the field current. It regulates the pass current (RPM signal) from the Alternator to the Console, and the pass current from the alternator to the load resistor while providing supply voltage for the console while charging the system battery.



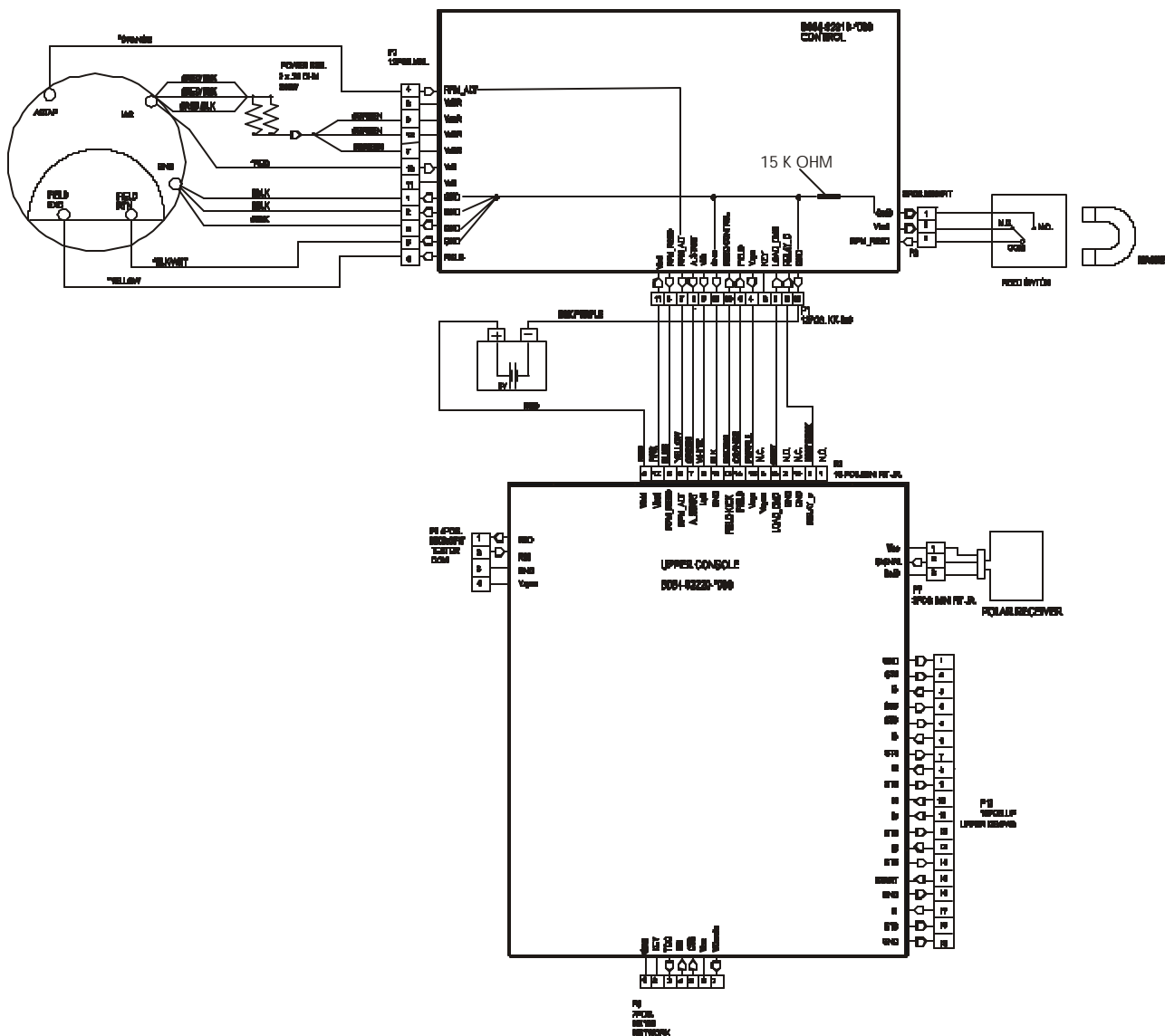
Connector	Location	Pin	Functional Description
P1 is a 13-pin connector that connects to the console and battery		1	A-START
		2	KEY
		3	RELAY-C
		4	Vsys
		5	LOAD-CMD
		6	FIELD
		7	RPM-ALT
		8	RPM-REED
		9	Valt
		10	Reed control
		11	VBAT
		12	GND (from Battery)
		13	GND

Life Fitness Model X9i, 8500, 9100, and 9500HR Cross-Trainers Power Control Board

Connector	Location	Pin	Functional Description
P2 Connector is a 12 pin Molex connector that connects to the Alternator.		1	GND
		2	GND
		3	GND
		4	RPM-ALT
		5	GND
		6	FIELD
		7	VALTR
		8	VALTR
		9	VALTR
		10	VALT
		11	Valt OPEN
		12	VALTR
Connector	Location	Pin	Functional Description
P3 is a 3 pin connector that connect to the reed Switch		1	GND
		2	Vbat
		3	RPM-REED
Connector	Location	Pin	Functional Description
P4 is unused on all cross-trainers.		1	9VDC
		2	GND

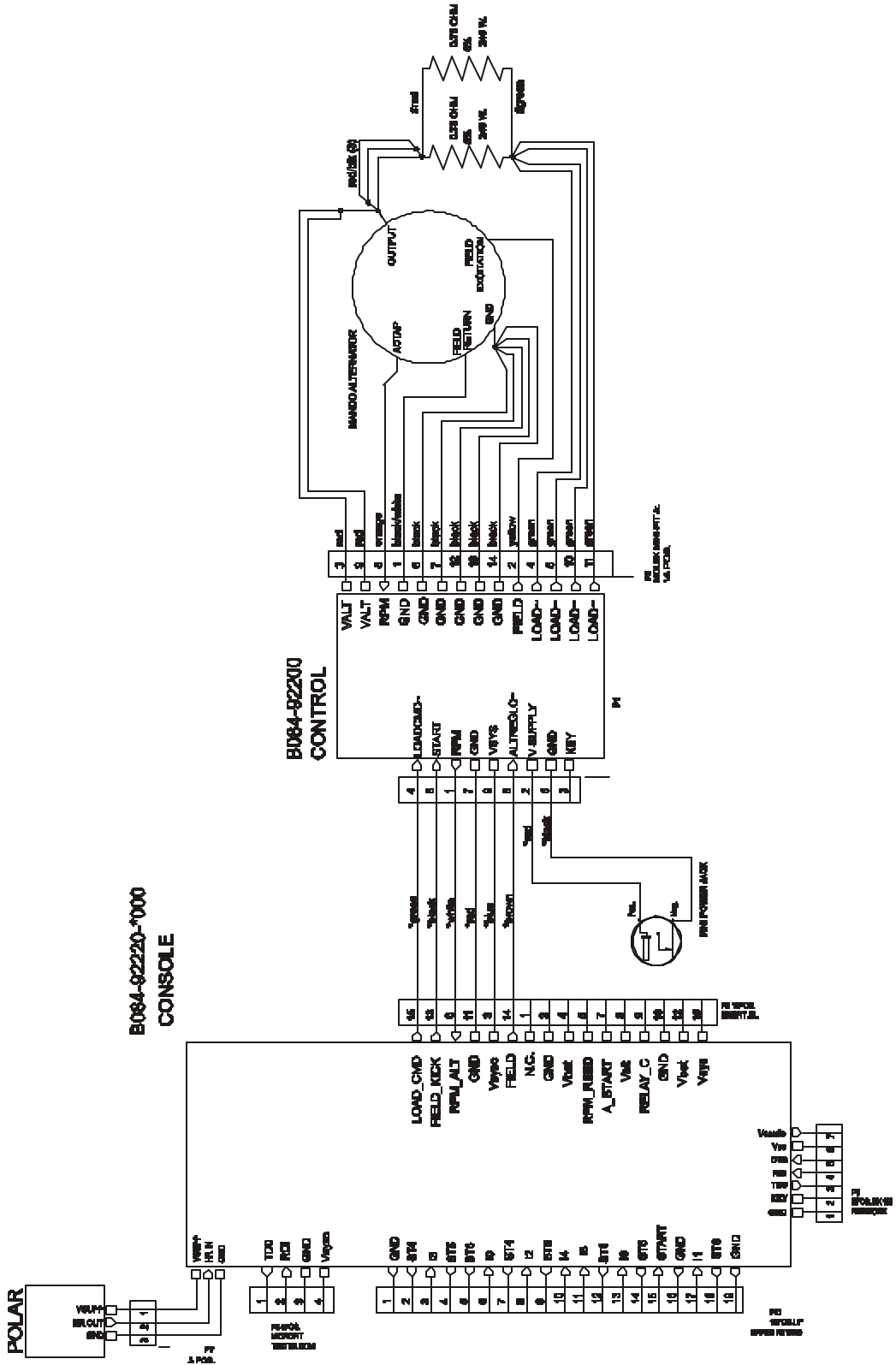
Life Fitness Model X9i, 8500, 9100, and 9500HR Cross-Trainers

WIRING BLOCK DIAGRAMS CT9100/8500



Life Fitness Model X9i, 8500, 9100, and 9500HR Cross-Trainers

WIRING BLOCK DIAGRAM X9i

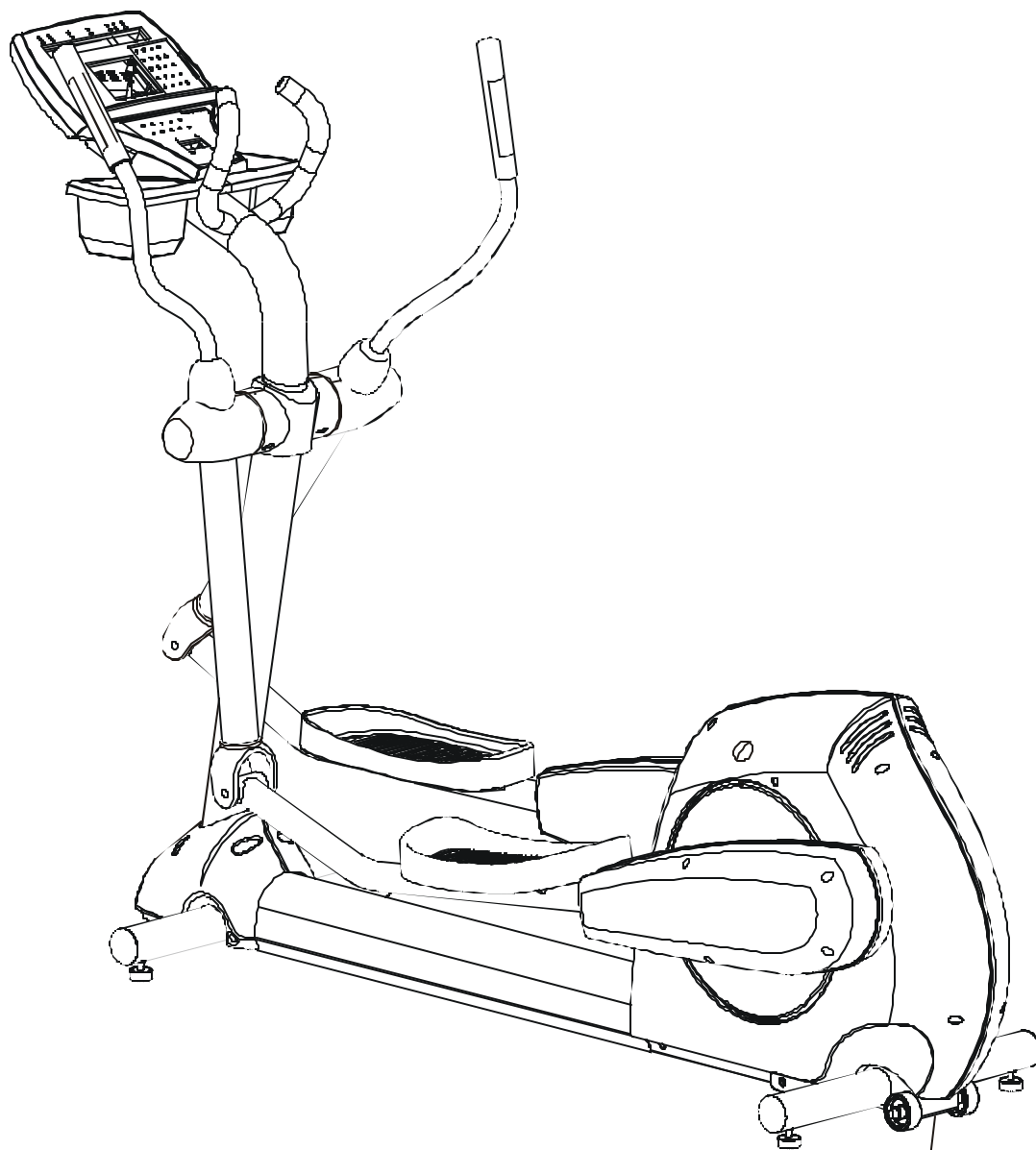


SECTION V

**MISCELLANEOUS INFORMATION
AND
SERIAL NUMBER LOCATION**

Life Fitness Model X9i, 8500, 9100, and 9500HR Cross-Trainers

MODEL IDENTIFICATION and SERIAL NUMBER LOCATION



Model and Serial Number

Life Fitness Model X9i, 8500, 9100, and 9500HR Cross-Trainers
PREVENTIVE MAINTENANCE TIPS

Preventive Maintenance Schedule

	DAILY	MONTHLY	BI-ANNUALLY
Housing			
Inside			Clean
Outside	Clean		
Power Control			
Heatsink			Clean
Connectors			Inspect
Board			Inspect
Console Assembly			
Overlay	Clean		
Mounting Bolts		Inspect	
Connectors			Inspect
Alternator			
Belt Tension			Inspect
Brushes			Inspect
Flywheel			Clean/Inspect
Mechanical			
Main Drive Belt		Inspect	
Oil Light Bearings			Inspect and lube with non-detergent oil
Pedals		Clean	
Drive Pulley			Clean/Inspect
Heart Rate			
Sensors	Clean	Clean	Clean

IMPORTANT SAFETY INSTRUCTIONS!

- ⇒ *DO NOT* locate the Cross-Trainer outdoors, near swimming pools, or in areas of high humidity.
- ⇒ *DO NOT* operate your Cross-Trainer if it has been dropped, damaged, or even partially immersed in water. Contact Life Fitness Customer Support Services at the number in the Operation Manual.
- ⇒ *DO NOT* locate the Cross-Trainer any closer than 30 inches (76 cm) to a television set.
- ⇒ *DO NOT* locate additional Cross-Trainers any closer than a minimum of 42 inches (107 cm) from center to center to avoid interference (cross talk) between Heart Rate monitors.
- ⇒ *DO* keep the area around your Cross-Trainer clear of any obstructions, including walls and furniture.
- ⇒ *DO* verify the contents of the delivery carton against the accompanying Parts Listing prior to setting the cartons and shipping material aside. If any parts are missing, contact Life Fitness Customer Support Services at the number listed in the Operation Manual. Save the shipping cartons in case of return.
- ⇒ *DO* read the entire Operation Manual prior to attempting to operate this machine as this is essential for proper use.

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