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I. General Information

Purpose

This manual provides information for the servicing of **SCIFIT PROII®** series cordless all-body ergometers. It uses systematic troubleshooting procedures to address problems that may arise with the cordless PROII® series. The actions taken to resolve problems must be performed in the order stated. Deviating from this sequence may cause damage to the equipment, lead to unnecessary repairs, and/ or void the warranty.

Technical Support

For further assistance in the service of **SCIFIT** products, please call **(800) 745-1373 or (918) 359-2000, ext 3**. We can also be reached by fax at **(918) 359-2045** or by e-mail at **service@scifit.com**. The Product Support department is staffed from 7 AM to 6 PM CST Monday through Friday. A voicemail service is available 24 hours daily for recording messages to request technical support and to order replacement parts. Our mailing address is **5151 S. 110th E. Avenue, Tulsa, OK 74146**.

Please have the following information prior to calling product support:

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

SCIFIT Statement of Warranty

SCIFIT warranties new products against defective workmanship and/ or materials under normal and proper use subject to the following limitations:

1. SCIFIT's obligation to the original purchaser shall apply to both parts and cost of labor required to replace or repair a defective product for a period of one (1) year from the user purchase date as documented by the warranty card. If the customer fails to return the warranty card, the date of shipment from the factory is used. Thereafter, for a period of two (2) years, such obligation shall extend only to the supply of replacement parts or products with any labor costs associated with such replacement or repair to be at the Buyer's expense.
2. SCIFIT's obligation shall be limited to repairing or replacing defective parts. ***No allowance shall be granted for repairs made by Buyer without SCIFIT's prior written approval.*** The decision to replace or repair shall be solely at SCIFIT's election.

3. SCIFIT's warranty does not apply to parts requiring replacement or repair due to abnormal wear and tear, improper use, corrosion (perspiration), improper maintenance, improper rated grounded or dedicated electrical circuits, or improper storage, nor does it apply where all or part of the product has been altered from its original state.
4. **THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, ARISING BY LAW OR OTHERWISE INCLUDING WARRANTY OR MERCHANTABILITY OF FITNESS FOR PARTICULAR PURPOSE, AND IS IN LIEU OF ALL OTHER LIABILITIES OF SCIFIT INCLUDING DIRECT, INDIRECT, SPECIAL AND CONSEQUENTIAL DAMAGES OR PENALTIES EXPRESSED OR IMPLIED WHETHER ARISING OUT OF CONTRACT, NEGLIGENCE, OR OTHER TORT.**
5. Certain wear items are excluded from warranty coverage unless determined to be defective. These items include, but are not limited to:
 - Rubber Grips
 - Seat
6. The following items are covered for a period of one (1) year only:
 - Adjustable and Fixed Crank Systems
 - Contact Heart Rate Grips
 - Heart Rate PCB/ Transmitter

Freight and Shipping

SCIFIT is NOT responsible for the repair or replacement of any unit or part damaged during transit or installation. Fire, flood, and acts of God are NOT covered under this warranty. The customer is responsible for pursuing all freight damage claims with the appropriate transit company.

If the customer signs for freight-damaged goods without noting the damage on the bill of lading, the customer is solely responsible for the cost of repair or replacement for such freight damage.

Parts Supply

During the first 30 days, warranty parts will be shipped via next day overnight delivery, excluding international shipments. Determination must be made before 2:00 p.m. CST on any given weekday for next day delivery. After 30 days, parts will be shipped via ground shipment. The customer is welcome to request overnight or second day parts shipping at the customer's expense. If requested, SCIFIT will charge the customer's UPS or Federal Express account, or COD the difference in freight cost between ground shipment and overnight or second day.

Return Parts

In order to research problems and ensure they do not reoccur, the rapid return of defective parts is our biggest help! Thank you in advance for your assistance.

On electronics orders, a \$100.00 core charge is assessed to each printed circuit board. This amount will be credited once the boards have been received by SCIFIT. All defective parts must be returned to the SCIFIT factory within 20 days of receipt of replacement part for invoice credit. Otherwise, SCIFIT will expect payment on the core charge net 30 days.

Please follow these three (3) easy steps for returning parts:

Step 1: Keep the box and packing material in which the new parts arrived. Locate the enclosed prepaid UPS return label. The return label is only for the parts that need to be returned as denoted on the picking ticket.

Step 2: Wrap the defective part and place in the box for a safe return. Include a copy of the picking ticket that came with the replacement part.

Step 3: When the parts have been packaged, place the prepaid UPS return label on the outside of the box. Drop the package at any UPS service center or hand the package to any UPS driver.

When all of the parts are received and inspected at the factory, a credit will be issued for the original parts invoice. **Attention service companies: Warranty labor invoices will NOT be paid until required defective parts are returned to the factory.**

Installation

SCIFIT is NOT responsible for the repair or replacement of any unit or part damaged during installation. The customer is responsible for inspection of each unit and part for damage at the time of installation. The customer is responsible for pursuing all damage claims with the installer.

Service Labor

Where applicable, SCIFIT Product Support will arrange a local field service technician to provide field support. Every effort will be made to schedule service during the two (2) working days following notification of a problem or as soon as repair parts are available to the field service technician. Where possible, parts will be supplied in advance of the field service technicians so that the product is repaired with one (1) call. ***All jobs to be performed under labor warranty must have SCIFIT's prior written approval or they will not be paid.***

Preventative Maintenance

After training, always wipe down your SCIFIT exercise product. Perspiration that continuously settles on the frame, upholstery, casings, and control panels may eventually cause rust or damage. Damage resulting from lack of maintenance will NOT be covered under warranty.

Preventative maintenance, completed according to the schedule below, will keep your SCIFIT elliptical functioning properly. We realize your time is valuable and have kept these maintenance items to a minimum. This preventative maintenance schedule assumes the equipment is utilized 6 to 8 hours per day. If the equipment is utilized to a greater extent, the maintenance schedule must be adjusted accordingly.

Machine	Weekly	Monthly	6 Months	Yearly
Cordless PROII®	Clean exterior. See Note 1	Lube cranks. See Note 2.	Lube chains. See Note 3. Inspect drive belt for cracking or fraying. Clean interior. See Note 4.	

Note 1: Clean the console with a damp cloth. Use mild soap and warm water. Dry with a clean towel. The rest of the machine can be cleaned using common household cleaners.

Note 2: We use Super Lube ® synthetic grease (item no. 82328). Any high quality industrial grease will do.

Note 3: We use Energy Release ® clear gear and chain lube (item no. P018). Any high quality chain lube will do.

Note 4: Clean the interior using a damp cloth. Use mild soap and warm water. Dry with a clean towel.

II. Theory of Operations

The following is a theory of operation that encompasses all the electrical components, their functions, and how they interact with each other.

Independent electrical components found in SCIFIT's Cordless product line:

1. Lower PCB (Power Supply)
2. Upper PCB (Display)
3. Generator/Electromagnetic Brake
4. 12 Volt Battery
5. Wall Pack Receptacle
6. Hand Grip Heart rate PCB (HG HR)
7. Wireless Heart rate PCB (Polar)

Component Functions

1. Lower PCB (Power Supply)
 - A. Converts the 12 to 400 volts AC from the generator into 12 volts DC using switching power supply technology.
 - B. Provides 12 volts DC to upper PCB.
 - C. Accepts 12 volts DC from either the battery or wall pack transformer if unavailable from the generator
 - D. Receives Pulse Width Modulation (PWM) signal from the upper PCB for brake control.
 - E. Contains Hi-power MOSFET circuitry that controls the brake.
2. Upper PCB (Display)
 - A. Accepts commands from a user.
 - B. Displays information to the user.
 - C. Regulates 12 volts DC from lower PCB down to 8 volts DC and 5 volts DC.
 - D. Operates the 8 and 5 volt DC serial communications (c-safe and cardio-key)
 - E. Provides 5 Volts DC to the contact and wireless heart rate jacks.
 - F. Receives signals from the contact and wireless heart rate PCB's.
 - G. Contains 5 volt DC display (LED) drivers.
 - H. Contains the 5 volt DC memory and processor components.
 - I. Provides PWM signal to lower PCB for brake control.
3. Generator/Electromagnetic Brake

Generator:

 - o A three (3) phase generator that produces 0 to 400 volts AC depending on the RPM's.
 - o Provides AC voltage to the lower PCB.

Electromagnetic Brake

- o An eddy current transformer that uses rising and collapsing electromagnetic fields to slow down the generator magnet traveling through its field.
- o Controlled by the lower PCB.

4. 12 Volt DC Battery

- A. 12 volt sealed lead acid 1.3 Amp Hour Battery.
- B. Provides 12 Volts DC to lower PCB during:
 - o Pause mode
 - o Between intervals
 - o Provides power for 15 seconds after generator stops.

5. Wall Pack Receptacle

- A. 12 volt DC input receptacle that accepts voltage from a DC wall pack.
- B. Provides 12 volts DC to lower PCB when a wall pack is connected to it.
- C. Aids in battery charging.

6. Hand Grip (Contact) Heart Rate (HG HR) PCB

- A. Outputs a square wave to the upper PCB.
- B. Equipped with right and left grip inputs.
- C. Power and ground is provided by the upper PCB.

7. Wireless Heart rate PCB

- A. Outputs a square wave to the upper PCB.
- B. Has a 30" range and position is critical.
- C. Power and ground is provided by the upper PCB.

System Functions

Starting the Machine

- A. Pedaling the machine rotates the generator, which generates a current to power the electronics. A minimum of 13 RPM or 10 FPM must be maintained to keep machine powered up.
- B. The generator provides AC voltage to the lower PCB. The lower PCB then provides DC voltage to the upper PCB.
- C. The User controls the resistance by selecting a level on the display. The display sends a PWM signal which varies, depending on the level selected. The signal travels through the ribbon cable to the lower PCB. The lower PCB sends a square wave signal to the transformer on the brake which is proportionate to the amount of resistance commanded.
- D. The brake LED on the lower PCB, labeled D38 on older units and D19 on newer units, will illuminate any time braking is applied. The intensity of the LED is proportional to the level of resistance.

- E. The battery is charged anytime there is more than 13 RPM's present.

Stopping the unit

- A. When pedaling is discontinued, the brake continues to spin.
- B. The battery will engage once the actual RPM's dip below 13.
- C. The battery remains active for 15 seconds and then a transistor that connects the battery to the rest of the lower PCB is unlatched. The transistor will remain unlatched until the unit sees an rpm value above 13 rpm's.

Using the Wall Pack

- A. Using the wall pack will allow the machine to be powered up without pedaling. Quick Start or any other program can be selected without have to pedal first. The machine will be powered up constantly when the wall pack is in use.

III. Mechanical Troubleshooting

A. Mechanical Troubleshooting Table

Problem	Possible Reasons	Solutions
Hand cranks wobble when cranks are rotated.	Handle shaft is loose or stripped.	Tighten or replace handle shaft, if threads are damaged.
	Arm crank threads are stripped.	Replace arm crank.
	Igus bearings in the handle are worn out.	Replace Igus bearings.
	Igus bearings in hub are worn out.	Replace Igus bearings.
	Cotter pins through inner hubs are not tight.	Tighten or replace cotter pins.
	Upper axle bearings are worn out.	Replace upper axle bearings.
Foot cranks wobble when pedaled.	Pedal is loose or stripped.	Tighten or replace pedal, if threads are damaged.
	Foot crank threads are stripped.	Replace foot crank.
	Igus bearings in hub are worn out.	Replace Igus bearings.
	Cotter pins through inner hubs not tight.	Tighten or replace cotter pins.
	Lower axle bearings are worn out.	Replace lower axle bearings.

Mechanical Troubleshooting Table (cont.)

Problem	Possible Reasons	Solutions
Hand crank or foot crank assembly has side-to-side play.	Cotter pin through the inner hub is not tight enough. Snap ring is not in snap ring groove on axle.	Tighten or replace cotter pin. Install snap ring back into snap ring groove.
Cranks lock up while operating.	Chain is too loose or out of alignment. Brake bearings are bad. Brake drive pulley bearings are bad. Upper axle bearings are bad.	Tension or align the chains. Replace brake assembly. Replace bearings or brake drive pulley assembly. Replace upper axle bearings.
Grinding, rubbing, or scraping noise while rotating cranks.	Belt is rubbing against the brake. Brake bearings are bad. Bearings in brake drive pulley assembly are bad.	Realign belt. Replace brake assembly Replace bearings or brake drive pulley assembly.
Internal squealing noise occurs when cranks are rotated but not when freewheeling.	Igus bearings in the idler are worn out. Upper axle bearings are bad. Lower axle bearings are bad.	Replace Igus bearings in the idler or idler assembly. Replace upper axle bearings. Replace lower axle bearings.
Internal squealing noise occurs when cranks are rotated, as well as when unit is freewheeling.	Belt is out of alignment. Belt is over-tensioned. Brake bearings are bad. Brake drive pulley assembly bearings are bad.	Realign belt. Re-tension belt. Replace brake. Replace bearings or brake drive hub assembly.

Mechanical Troubleshooting Table (cont.)

Problem	Possible Reasons	Solutions
Clunking noise from inside the unit when cranks are being rotated.	User is over-speeding brake and brake drive pulley because work load too low.	Increase the work load or decrease rpms.
	Brake pulley is loose.	Fix pulley or replace brake assembly.
	Brake drive pulley bearings are bad.	Replace bearings or brake drive pulley assembly.
Unit slips when cranks are rotated.	Belt is too loose.	Tension belt.
	Lower PCB is bad.	Replace lower PCB.
Clunking noise heard or felt in one handle or foot when at the top or just past the top of the rotation.	Popper pin not seating properly.	Fix or replace popper pin.
	Cotter pin through inner hub is not tight enough.	Tighten or replace cotter pin.
Crunching noise is heard when cranks are rotated.	Chains are out of alignment.	Realign chains.
	Brake bearings are bad.	Replace brake assembly
	Bearings in brake drive pulley assembly are bad.	Replace bearings or brake drive pulley assembly.

IV. Electrical Troubleshooting

A. Electrical Troubleshooting Table

Problem	Possible Reason	Solution
No lights are showing on the upper PCB at idle.	Unit is not in use.	Start rotating cranks (at least 13 RPMs). Unit stays lit for 15 seconds after use unless a wall pack is in use.
No lights on upper PCB when unit is pedaled.	Faulty lower PCB.	See flowchart.
	Faulty upper PCB.	See flowchart.
	Bad Telco or ribbon cable connection.	See flowchart.
	Brake is shorted to the frame.	See flowchart.
Lights on upper PCB are dim.	Faulty lower PCB.	Replace lower PCB.
Lights on upper PCB are frozen.	Faulty upper PCB.	Replace upper PCB.
Lights on upper PCB flicker and then go dead.	Bad Telco or ribbon cable connection.	Fix connection or replace cable.
	Faulty lower PCB.	Replace lower PCB.
	Faulty upper PCB.	Replace upper PCB.
Lights on upper PCB go out as soon as you stop pedaling or go to change direction.	Battery is weak.	Charge battery with wall pack. If problem continues, replace battery.
	Bad brake to lower PCB connection.	Fix connection.
“PAUSED” is displayed in top display window.	The PAUSE/CLEAR button has been pressed during program.	Press START to resume program or PAUSE/CLEAR to return to start up screen.
Display resets after starting program.	Bad Telco or ribbon cable connection.	Fix connection or replace cable.
	13 RPMs not maintained.	Maintain 13+ RPMs to keep the upper PCB lit.
	Faulty upper PCB.	Replace upper PCB.

Electrical Troubleshooting Table (cont.)

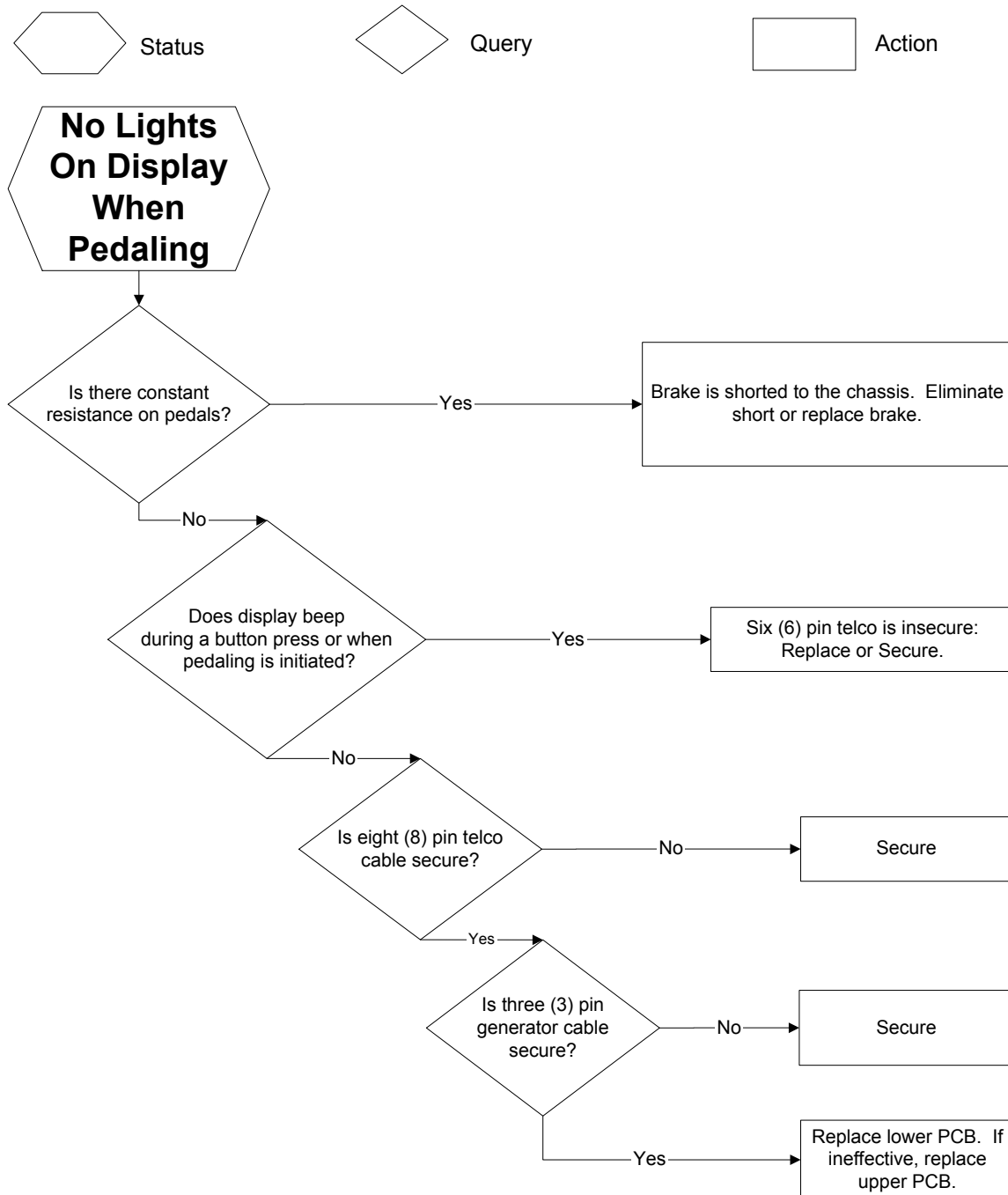
Problem	Possible Reason	Solution
Upper PCB won't light up without use of wall pack.	Bad brake to lower PCB connection.	Fix connection.
	Faulty lower PCB.	Replace lower PCB.
	Brake shorted to monocoque.	Fix short or replace brake.
Upper PCB is lit up but values don't change.	Faulty upper PCB.	Replace upper PCB.
	Overlay and buttons on upper PCB not making contact.	Secure overlay to upper PCB by tightening standoffs or Philips screws.
Machine shuts down in programs but works in manual mode.	Faulty upper PCB.	Replace upper PCB.
Can't select program or enter information and there is no beep when buttons are pressed.	Faulty upper PCB.	Replace upper PCB.
	Overlay and buttons on upper PCB not making contact.	Secure overlay to upper PCB by tightening standoffs or Philips screws.
Constant resistance.	Faulty lower PCB.	Replace lower PCB.
Intermittent resistance or spiking.	Bad brake to lower PCB connection.	Fix connection.
	Faulty lower PCB.	Replace lower PCB.
	Faulty upper PCB.	Replace upper PCB.
Resistance is different than when you received unit.	Defined unit type has been changed.	Redefine unit type. Call SCIFIT for procedure.
	Faulty lower PCB.	Replace lower PCB.
No resistance.	Bad brake to lower PCB connection.	See flowchart.
	Faulty lower PCB.	See flowchart.
	Faulty upper PCB.	See flowchart.

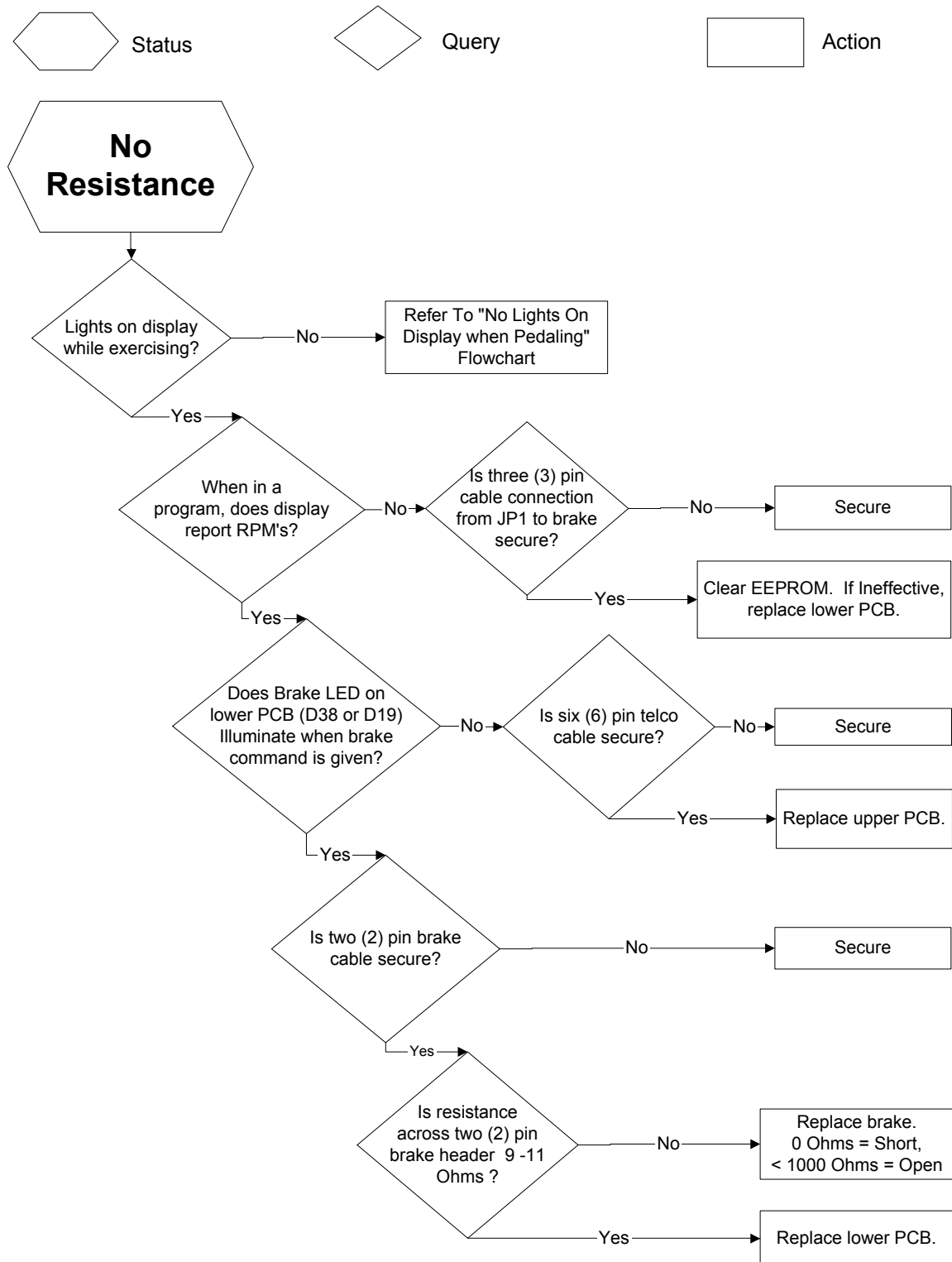
Electrical Troubleshooting Table (cont.)

Problem	Possible Reason	Solution
No heart rate displayed.	No chest strap worn. Faulty chest strap. Wireless heart rate PCB is not plugged in. Faulty wireless heart rate PCB. Faulty upper PCB.	Must wear chest strap. Verify chest strap works. Check and fix connection on back of upper PCB. Replace wireless heart rate PCB. Replace upper PCB.
Heart rate displayed is very high.	Is picking up FM frequency from radio / transmitter. Is picking up reading from another person's chest strap near the unit.	Move radio or transmitter. Make sure no one with a chest strap is standing next to your unit.
“---” then “No Heart Rate Detected” is displayed in top window while using Heart Rate Program.	No chest strap is worn. Faulty wireless heart rate PCB.	Heart Rate program requires use of a chest strap. Replace wireless heart rate PCB.

B. Troubleshooting Flowcharts

Although it is impossible to foresee every eventuality, the flowcharts on the following pages will cover the most common possibilities. If further assistance is required, please consult SCIFIT SYSTEMS, Inc.





C. User Setup (Use this procedure for PROII's thru serial number 650-005503.)

User Setup provides club owners and managers with certain information about their equipment and enables them to customize certain features.

Provide power to the console by either plugging the wall pack into the machine and outlet or working out at a low level on the machine. Press and hold SCAN and ENTER for three (3) seconds to enter User Setup.

Press ENTER to move from one parameter to the next parameter.

1. Language: Toggles between English and German. Use the UP or DOWN keys to select the appropriate language.
2. Model: Displays the model of the machine that is set in the console. If the wrong model of machine is defined, the unit will not calculate resistance, watts, and distance correctly.
 - a. Version High: Displays the upper console's software version in the Time window.
4. Version Low: Displays the lower PCB firmware version in the Time window. If this version number is zero, no communication has been established between the upper and lower boards.
5. Unit of Measure: Toggles between metric and U.S. units of measure. Use the UP or DOWN keys to select the appropriate unit of measure.
6. Communications Mode: Toggles between Cardio Key and Csafe Comm. Use the UP or DOWN keys to select the appropriate communications mode.
7. Message: If a message has not been entered or is invalid, the upper display will show "**NO MESSAGE**". The TIME window will display the message screen number. The screen number range is ct1 through ct25. Each message screen has 10 characters so the total message can have up to 250 characters.

To enter a message, use UP and DOWN to select the appropriate character. Characters available include the entire alphabet, numbers 0 through 9, punctuation, and a few other symbols. Press PAUSE to move the cursor to the right and START to shift the cursor to the left. To enter a blank space, press PAUSE without using the UP and DOWN keys to select a character. Press ENTER to save a message and go to the next of the 25 screens. The only method of accessing

previous screens is to enter the User Setup again and move through all the parameters. Pressing ENTER for any message that is empty or invalid will tell the system that message number is the ending message and the scrolling will stop with the previously set message. Pressing ENTER on the 25th screen, the program will advance to the next parameter (Hour Meter) since that is the end of the available memory.

To edit an existing message, access the appropriate screen by pressing ENTER. When at the appropriate screen, press PAUSE to move the cursor to the right and START to shift the cursor to the left. Use UP and DOWN to change the character. Press ENTER to save a message and go to the next screen. Pressing SCAN while editing a message will clear an existing message.

8. Hour Meter: Displays the elapsed run time in days, hours, and minutes. Days are shown on the upper display. Hours and minutes are shown in the TIME window.

Press ENTER to exit User Setup.

D. User Setup (Use this procedure for PROII's with serial numbers 650-005504 and above.)

User Setup provides club owners and managers with certain information about their equipment and enables them to customize certain features.

Provide power to the console by either plugging the wall pack into the machine and outlet or working out at a low level on the machine. Press and hold SCAN and ENTER for three (3) seconds to enter User Setup.

Press ENTER to move from one parameter to the next parameter.

1. Language: Toggles between English and German. Use the UP or DOWN keys to select the appropriate language.
2. Model: Displays the model of the machine that is set in the console. If the wrong model of machine is defined, the unit will not calculate resistance, watts, and distance correctly.
3. Version High: Displays the upper console's software version in the Time window.
4. Unit of Measure: Toggles between US Units and Metric. Use the UP or DOWN keys to select appropriate measure.

5. Message: If a message has not been entered or is invalid, the upper display will show “**NO MESSAGE**”. The TIME window will display the message screen number. The screen number range is ct1 through ct25. Each message screen has 10 characters so the total message can have up to 250 characters.

To enter a message, use UP and DOWN keys to select the appropriate character. Characters available include the entire alphabet, numbers 0 through 9, punctuation, and a few other symbols. Press PAUSE to move the cursor to the right and START to shift the cursor to the left. To enter a blank space, press PAUSE without using the UP and DOWN keys to select a character. Press ENTER to save a message and go to the next of the 25 screens. The only method of accessing previous screens is to enter the User Setup again and move through all the parameters. Pressing ENTER for any message that is empty or invalid will tell the system that message number is the ending message and the scrolling will stop with the previously set message. Pressing ENTER on the 25th screen, the program will advance to the next parameter (Hour Meter) since that is the end of the available memory.

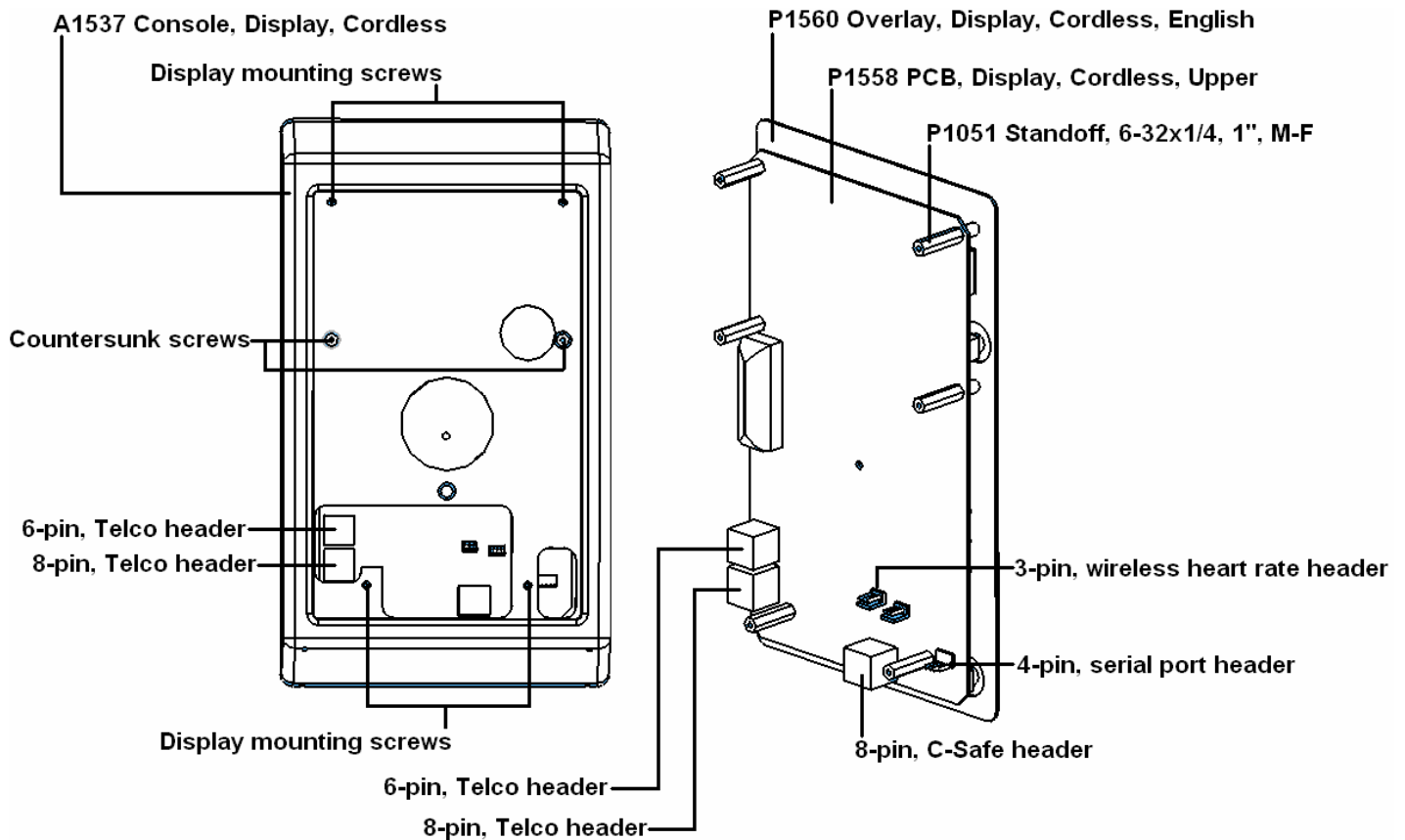
To edit an existing message, access the appropriate screen by pressing ENTER. When at the appropriate screen, press PAUSE to move the cursor to the right and START to shift the cursor to the left. Use UP and DOWN keys to change the next character. Press ENTER to save a message and go to the next screen. Pressing SCAN while editing a message will clear an existing message.

6. Hour Meter: Displays the elapsed run time in days, hours, and minutes. Days are shown on the upper display. Hours and minutes are shown in the TIME window.
7. Mets: Toggles between Mets On and Mets Off. Use the UP or DOWN keys to select the appropriate function.
8. Watts Multiplier: Displays the variable at which watts are multiplied. This is only for certified ergometer calibration.
9. Key: Toggles between Key On and Key Off. With the key turned on, the machine will only work when a FITKEY is inserted. Use the UP or DOWN keys to select the appropriate function.

Press ENTER to update and exit User Setup.

V. Adjustments and Parts Replacement

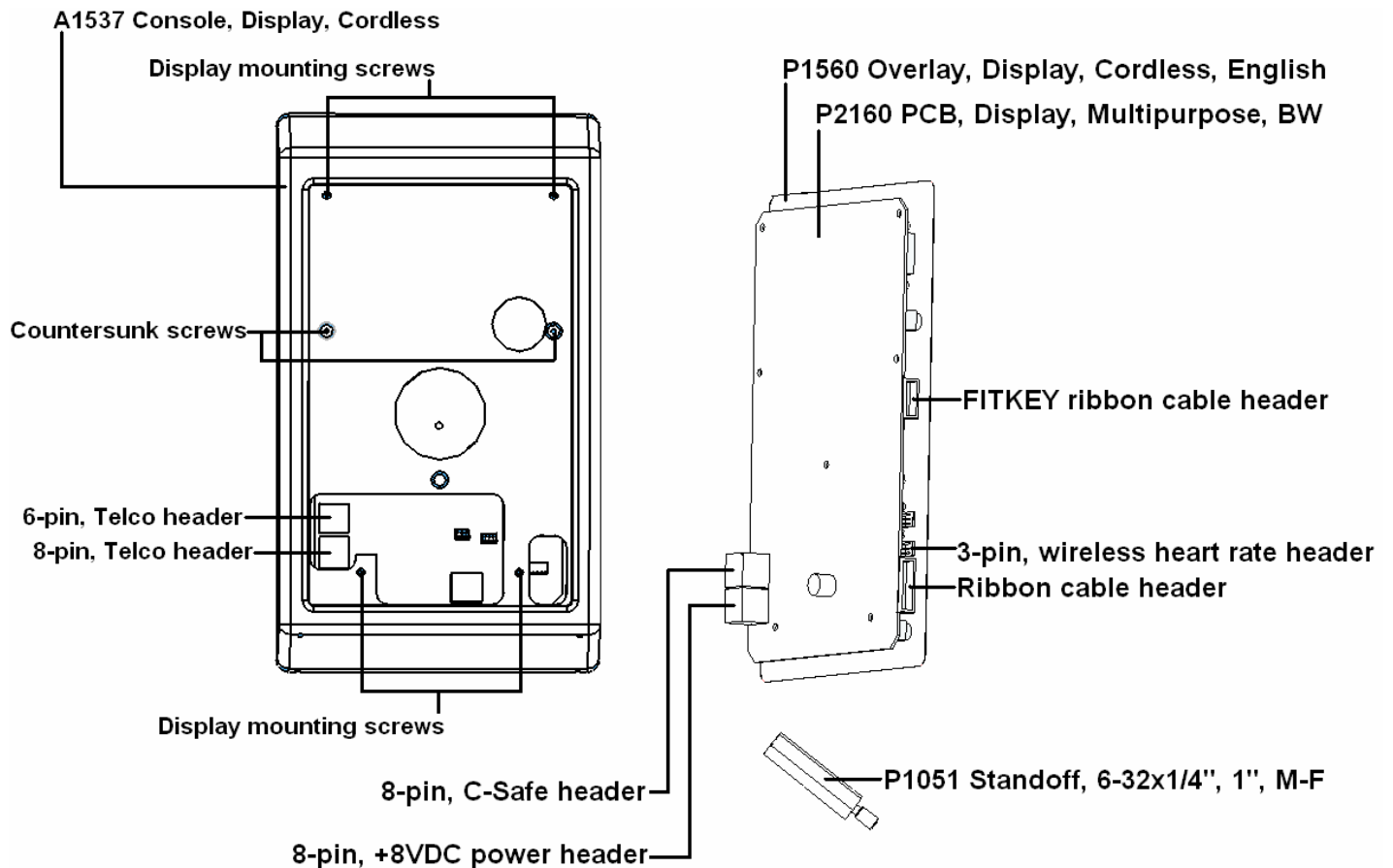
A. Upper (Display) PCB Replacement (Use this procedure for PROII's thru 650-005503.)



1. Using a Philips screwdriver, remove the four (4) display mounting screws on the back of the display mounting plate.
2. Disconnect all cables running to the upper PCB (P1558) and remove the upper console assembly from the unit. **Make sure the cables do not fall into the neck of the unit.**
3. Remove the two (2) outer countersunk screws in the back of the plastic console (A1537), using a Philips screwdriver. This will free the upper PCB and overlay (P1560) from the plastic console. **Do not touch any components on the PCB. Touching components could cause static damage.** If the wireless heart rate receiver is still plugged into the upper PCB, unplug it now.
4. Remove the six (6) standoffs from the upper PCB. This may require the use of a 5/16" nut driver or socket. The upper PCB will separate from the overlay.

5. Install the new upper PCB and replace standoffs. If your unit had two (2) plastic standoffs, these need to be placed back at the bottom of the new upper PCB.
6. Plug the wireless heart rate receiver back into the upper PCB. It plugs into the centermost, 3-pin Molex header.
7. Reinsert the upper PCB assembly into the front of the console.
8. Reinstall the two (2) outer countersunk screws in the back of the plastic console.
9. Reconnect all cables to the upper PCB.
 - When looking at the back of the upper PCB, the Telco cables plug in along the left edge. The 6-pin plugs into the top plug and the 8-pin plugs into the bottom plug.
 - If your unit has Cardio Key, the cable plugs into the serial port, which is the 4-pin Molex header lower right corner.
 - If your unit has Broadcast Vision, Cardio Theater, etc., the cable connects to the 8-pin header located at the bottom center of the upper PCB.
10. Place the display assembly back onto the mounting plate and install the four display mounting screws.
11. The model of machine must be defined. (You must rotate the cranks to power up the upper display to perform this next procedure.) When the display lights up, see if "**ELLIPTICAL**" appears in the top window. If so, press the UP arrow one time to display "**PRO**". Once "**PRO**" is displayed, press ENTER to save. If no unit type appears in the top window upon power up, the display has probably been preset at the factory. To verify this, hold the SCAN, SELECT, and PAUSE for three seconds until a type of machine appears, then release. ***Do not continue to hold keys once the type of unit appears.*** If "**PRO**" appears in the top window, press ENTER to save and exit, unless the unit is equipped with Cardio Key. If "**PRO**" doesn't appear in the top window, press and hold SELECT and the UP or DOWN arrow until "**PRO**" does appear. For units with Cardio Key, when "**PRO**" appears, press ENTER sixteen times until the top window shows either "**C-SAFE COMM**" or "**CARDIO KEY**". If "**CARDIO KEY**" is displayed, press ENTER three times to exit the mode. If this screen shows "**C-SAFE COMM**", press the UP or DOWN arrow to display "**CARDIO KEY**" in the top window, then press ENTER three times to exit the mode.

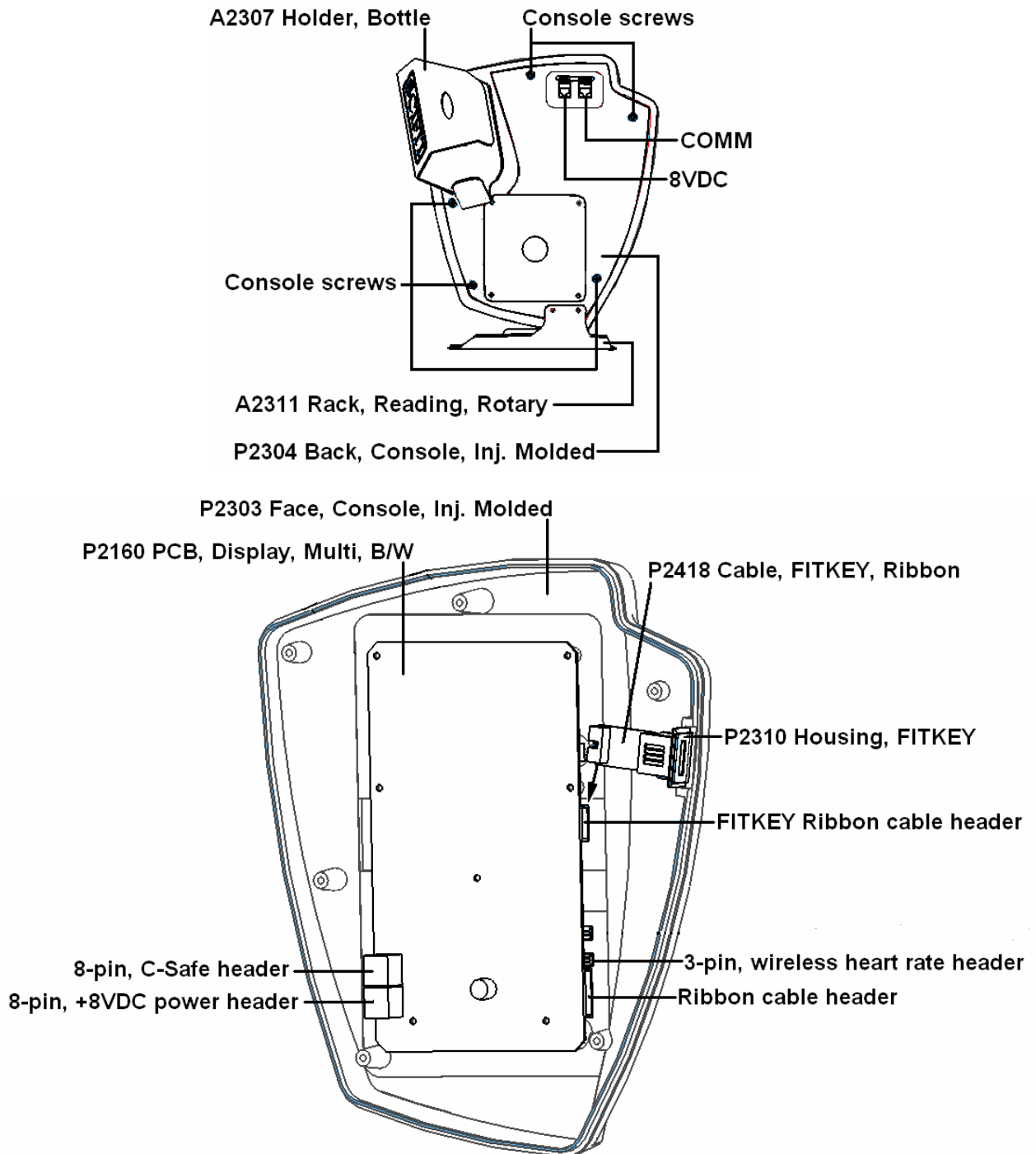
B. Upper (Display) PCB Replacement (Use this procedure for PROII's with serial numbers 650-005504 thru 650-005636.)



1. Using a Philips screwdriver, remove the four (4) display mounting screws on the back of the display mounting plate.
2. Disconnect all cables running to the upper PCB and remove the upper console assembly from the unit. **Make sure the cables do not fall into the neck of the unit.**
3. Remove the two (2), outer countersunk screws in the back of the plastic console, using a Philips screwdriver. This will free the upper PCB and overlay from the plastic console. **Do not touch any components on the upper PCB. Touching components could cause static damage.** If the wireless heart rate PCB is still plugged into the upper PCB, unplug it.
4. Remove the six (6) standoffs from the upper PCB. This may require the use of a 5/16" nut driver or socket. The upper PCB will separate from the overlay.
5. Install the new upper PCB and replace standoffs.
6. Reconnect all cables to the upper PCB.

- Plug the wireless heart rate PCB back into the upper PCB. It plugs into the bottom 3-pin header on the right side of the upper PCB (as shown above).
 - The ribbon cable plugs into the bottom ribbon cable header on the right side of the upper PCB.
 - If your unit has Broadcast Vision, Cardio Theater, etc., the cable connects to the 8-pin, +8VDC power header. When looking at the upper PCB from the front, this header is located on the lower right backside corner of the upper PCB (as shown above).
7. Reinsert the upper PCB assembly into the front of the console.
 8. Reinstall the two (2), outer countersunk screws in the back of the plastic console.
 9. Place the console assembly back onto the mounting plate and install the four (4) display mounting screws.
 10. The model of machine must be defined. (You must rotate the cranks to power up the upper display to perform this next procedure.) When the display lights up, see if “**UNDEFINED**” appears in the top window. If “**UNDEFINED**” appears, press the UP arrow one time to display “**PRO**” or “**PRO 2**”. Once “**PRO**” or “**PRO 2**” is displayed, press ENTER to save. If no unit type appears in the top window upon power up, the display has probably been preset at the factory. To verify this, hold the SCAN, SELECT, and PAUSE for three seconds until “**FACTORY SETTINGS**” appears, then release. ***Do not continue to hold keys once this appears.*** Press ENTER once. If “**PRO**” or “**PRO 2**” appears in the top window, press ENTER eight (8) times until “**UPDATING**” appears. If “**PRO**” or “**PRO 2**” doesn’t appear in the top window, press and hold SELECT and the UP or DOWN arrow simultaneously until “**PRO**” or “**PRO 2**” does appear.
 11. Verify operations of the unit by using different programs.

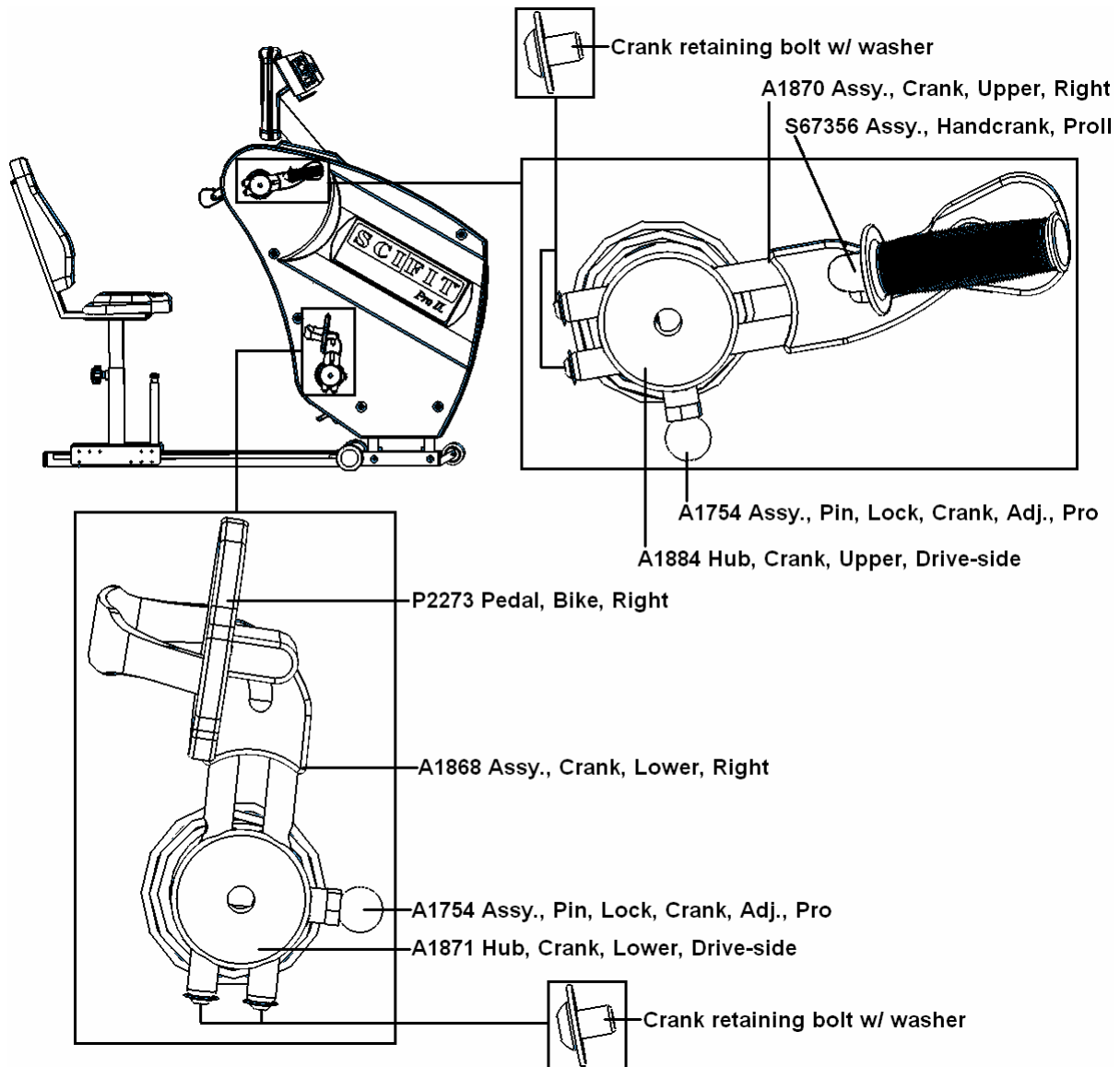
C. Upper (Display) PCB Replacement (Use this procedure for PROII's with serial numbers 650-005637 and above.)



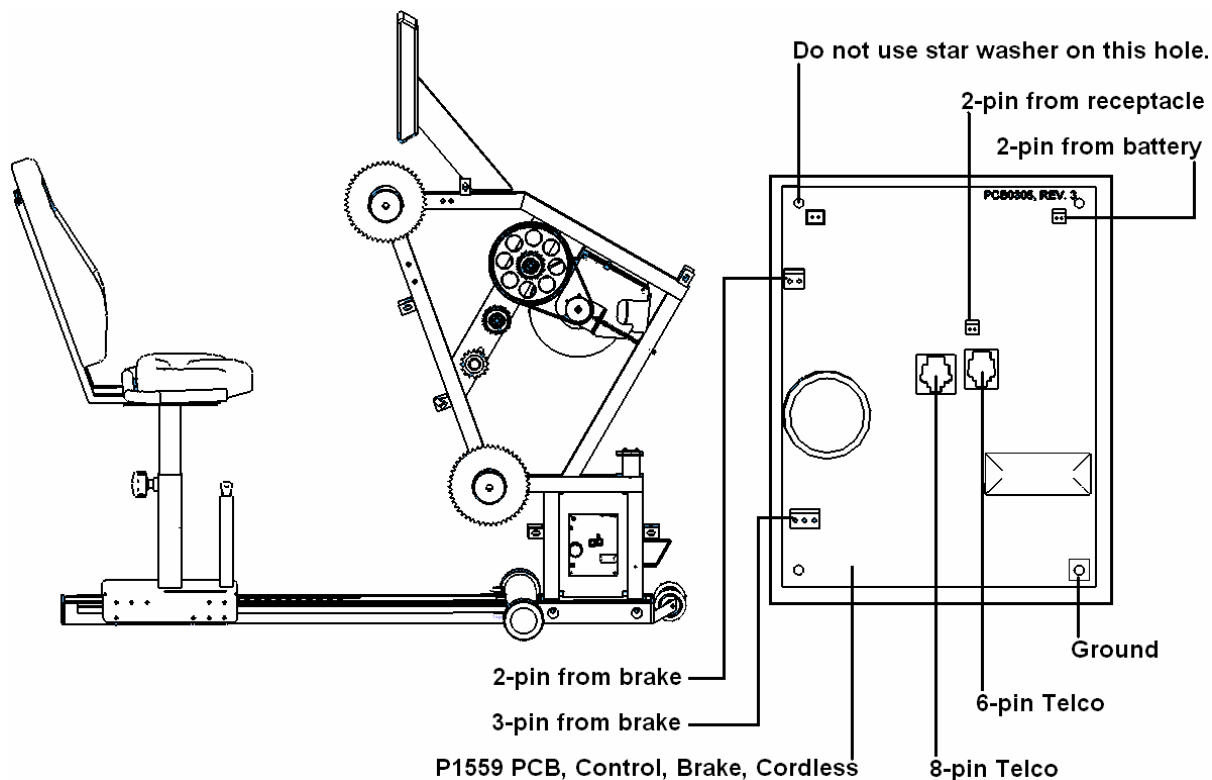
1. Remove the five (5) console screws in the console back (P2304), using a Philips screwdriver.
2. Disconnect all cables running to the display PCB (P2160) and remove console face (P2303) from the unit. ***Make sure the cables do not fall into the neck of the unit.***
3. Remove the six (6) screws holding the display PCB to the console face. This will free the display PCB and overlay from the plastic console. ***Do not touch any components on the PCB. Touching components could cause static damage.***
4. Install the new display PCB.
5. Reinsert the six (6) screws through the display PCB and into the console face. Tighten.
6. Reconnect all cables to the display PCB.
 - Plug the wireless heart rate PCB back into the display PCB. It plugs into the bottom 3-pin header on the right side of the display PCB (as shown in the drawing).
 - The contact heart rate PCB has a cable coming up from the neck of the unit. This plugs into the top, 3-pin header on the right side of the display PCB, above the wireless heart rate header (as shown in the drawing).
 - The ribbon cable plugs into the bottom ribbon cable header on the right side of the display PCB (as shown in the drawing).
 - The FITKEY ribbon cable (P2418) plugs into the FITKEY ribbon cable header on the display PCB. This header is located just above the contact heart rate header (as shown in the drawing).
 - There are two (2) gray Telco cables. The cable from the 8VDC jack affixed to the console back connects to the 8-pin, +8VDC power header on the display PCB. The other cable from the COMM jack affixed to the console back connects to the 8-pin, C-Safe header.
7. Verify connections.
8. Match the console and face up to each other and install the console screws, using a Philips screwdriver.
9. The model of machine must be defined. (You must rotate the cranks to power up the upper display to perform this next procedure.) When the display lights up, see if “**UNDEFINED**” appears in the top window. If “**UNDEFINED**” appears, press the UP arrow one time to display “**PRO**” or “**PRO 2**”. Once “**PRO**” or “**PRO 2**” is displayed, press ENTER to save. If no unit type appears in the top window upon power up, the display has probably been preset at the factory. To verify this, hold the SCAN, SELECT, and PAUSE for three seconds until “**FACTORY SETTINGS**” appears, then release. ***Do not continue to hold keys once this appears.*** Press ENTER once. If “**PRO**” or “**PRO 2**” appears in the top window, press ENTER eight (8) times until “**UPDATING**” appears. If “**PRO**” or “**PRO 2**” doesn’t appear in the top window, press and hold SELECT and the UP or DOWN arrow simultaneously until “**PRO**” or “**PRO 2**” does appears.

10. Verify operations of the unit by using different programs.

D. Lower PCB Replacement (Use this procedure for PROII's with serial numbers thru 650-005503.)

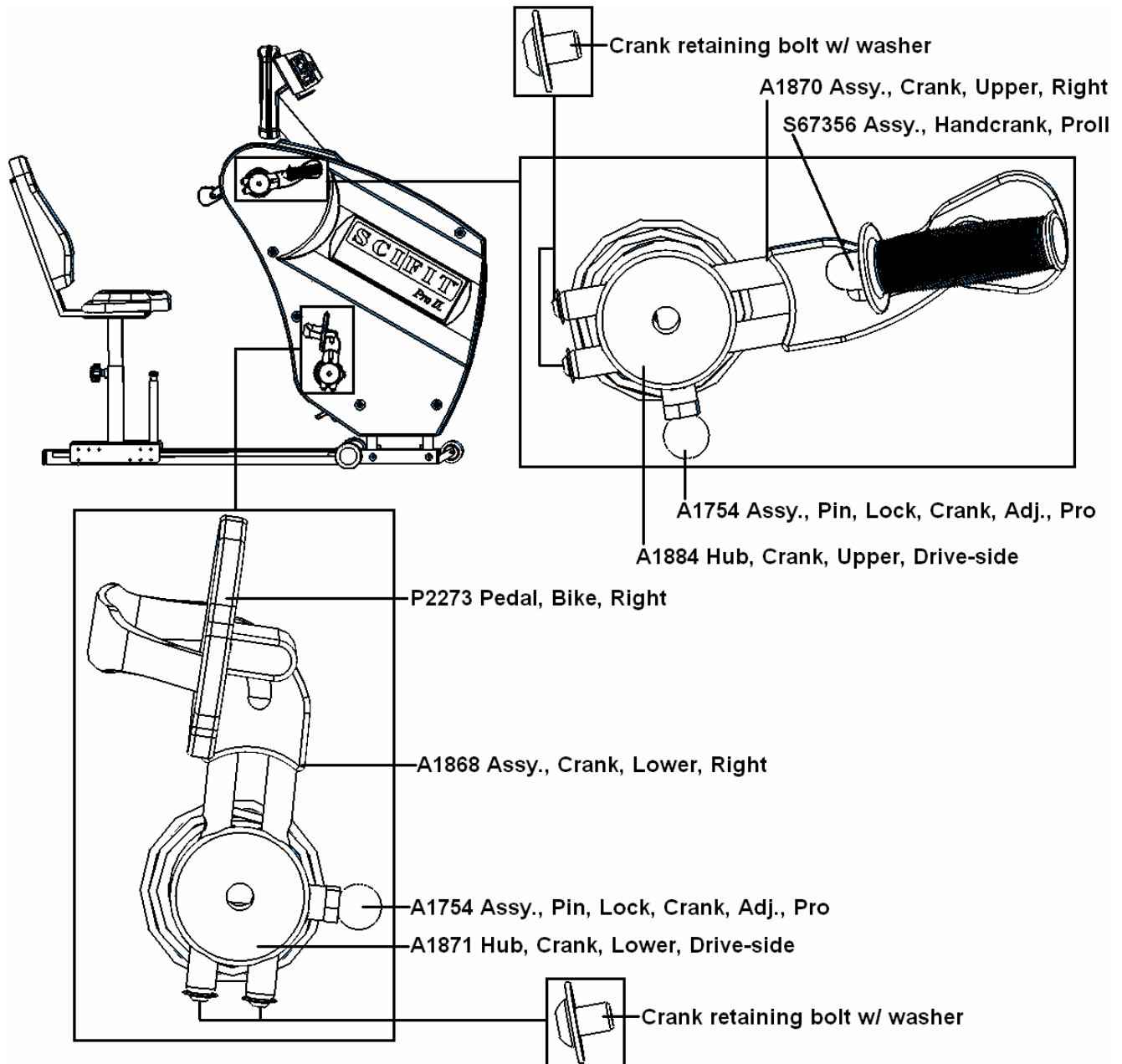


1. Remove crank retaining bolts and washers, using a 5/32" Allen wrench.
2. On the lower right side crank hub assembly (A1871), pull the black knob on the popper pin assembly (A1754) out and slide the crank assembly (A1868) out.
3. On the upper right side crank hub assembly (A1884), pull the black knob on the popper pin assembly and slide the crank assembly (A1870) out.
4. Remove the popper pin assembly by turning it counterclockwise with a crescent wrench.
5. Remove the six (6) cover screws and washers holding the right side cover in place, using a Philips screwdriver.

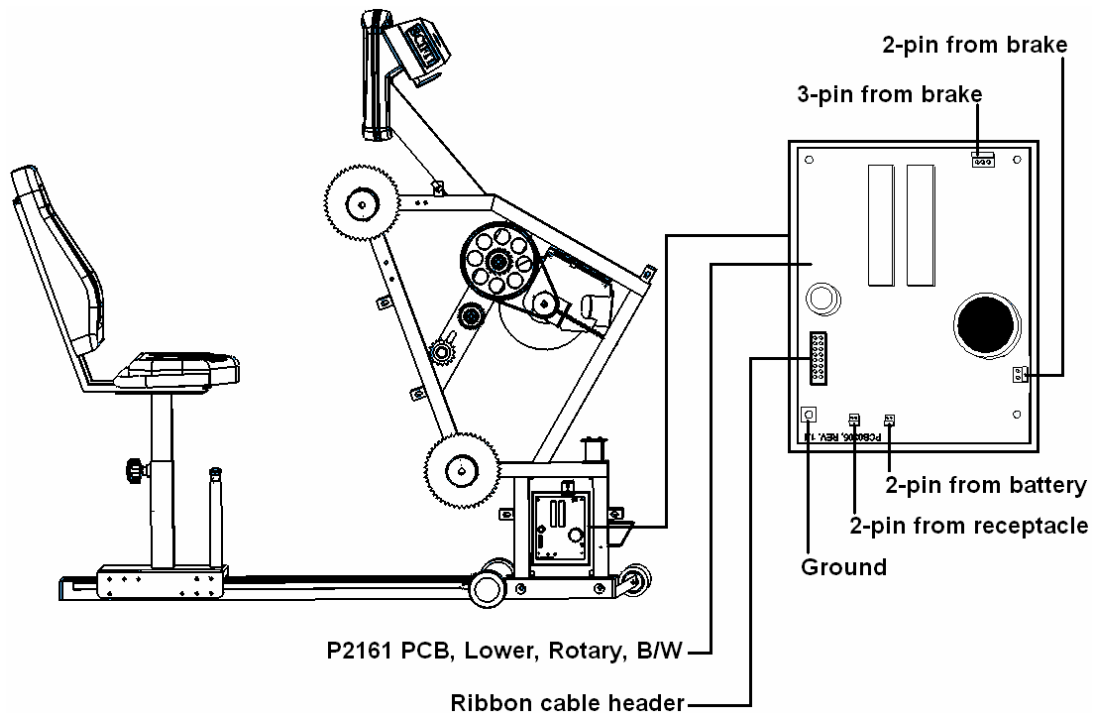


6. Locate the lower PCB (P1559).
7. Disconnect all cables to the lower PCB. **Make sure you are grounded when handling electronics. Do not touch any components on the lower PCB. Static damage can occur.**
8. Remove the four (4) screws mounting the lower PCB, using a Philips screwdriver.
9. Remove the lower PCB from the unit.
10. Install the new lower PCB in the exact same orientation as the old one.
11. Reconnect all cables to the new lower PCB. Confirm all connections to the lower PCB match those shown above.
12. Rotate the left upper crank arm to see if the upper display lights up.
13. If the upper display lights up, reinstall the right side cover. If the display doesn't light up, verify your connections again.
14. Reinstall the popper pins on both the upper and lower crank hubs. Use a dab of blue loc-tite on the threads when installing. **Do not torque these down very tight. Over-tightening will cause damage to the threads of the popper pin or crank hub assembly.**
15. Verify the popper pin is functioning properly. Pull the black knob out and then release. The black knob should return to its lowest position. If it doesn't, the popper pin is tightened down too far.
16. Once verified, reinsert the crank assemblies into their respective locations.
17. It is optional whether to reinstall the crank retaining bolts with washers.
18. Rotate cranks to light the upper display. If display lights up, do an operations test. Use different programs to verify unit is working correctly.

E. Lower PCB Replacement (Use this procedure for PROII's with serial numbers 650-005504 and above.)

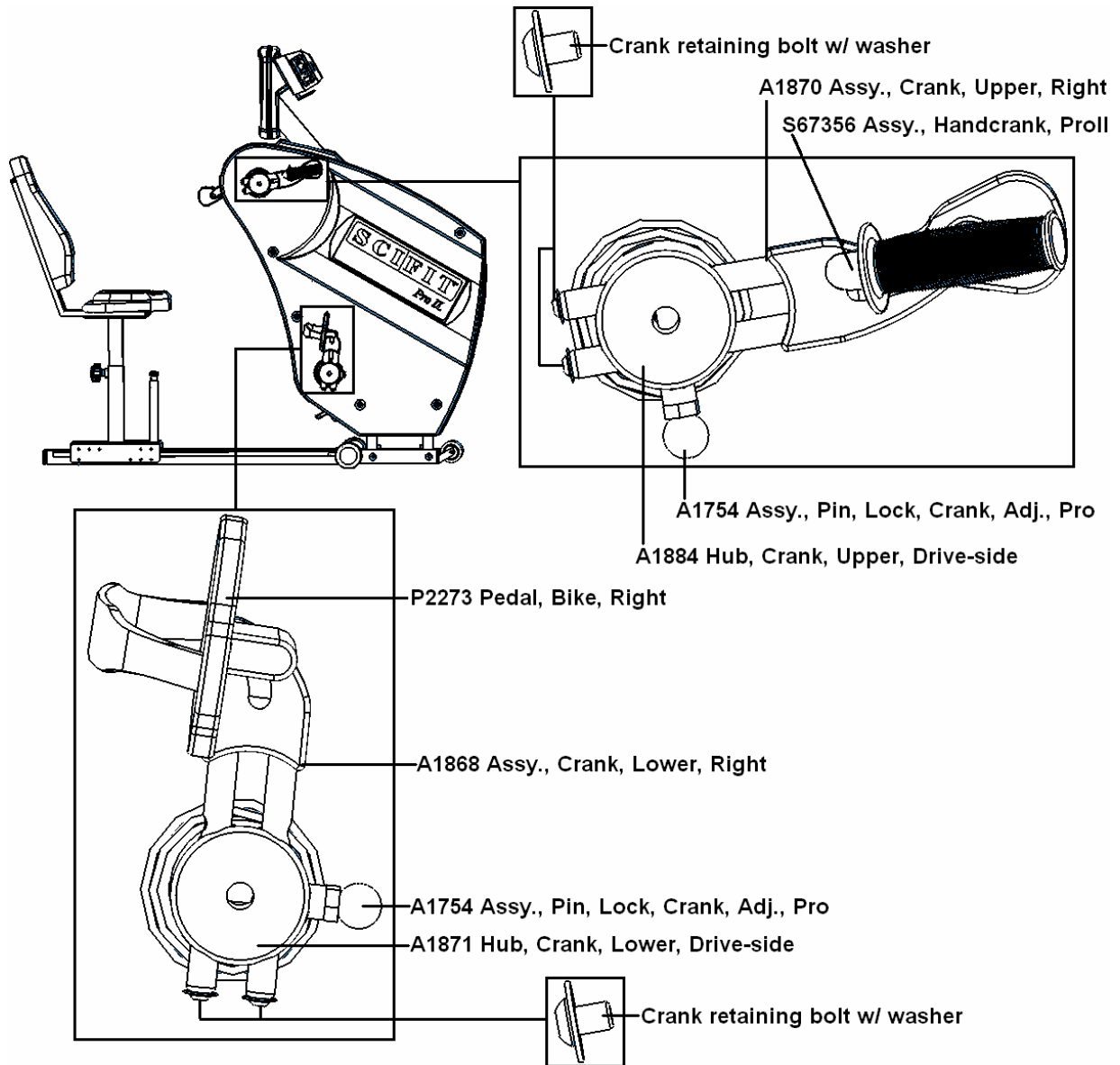


1. Remove crank retaining bolts and washers, using a 5/32" Allen wrench.
2. On the lower right side crank hub assembly (A1871), pull the black knob on the popper pin assembly (A1754) out and slide the crank assembly (A1868) out.
3. On the upper right side crank hub assembly (A1884), pull the black knob on the popper pin assembly and slide the crank assembly (A1870) out.
4. Remove the popper pin assembly by turning it counterclockwise with a crescent wrench.



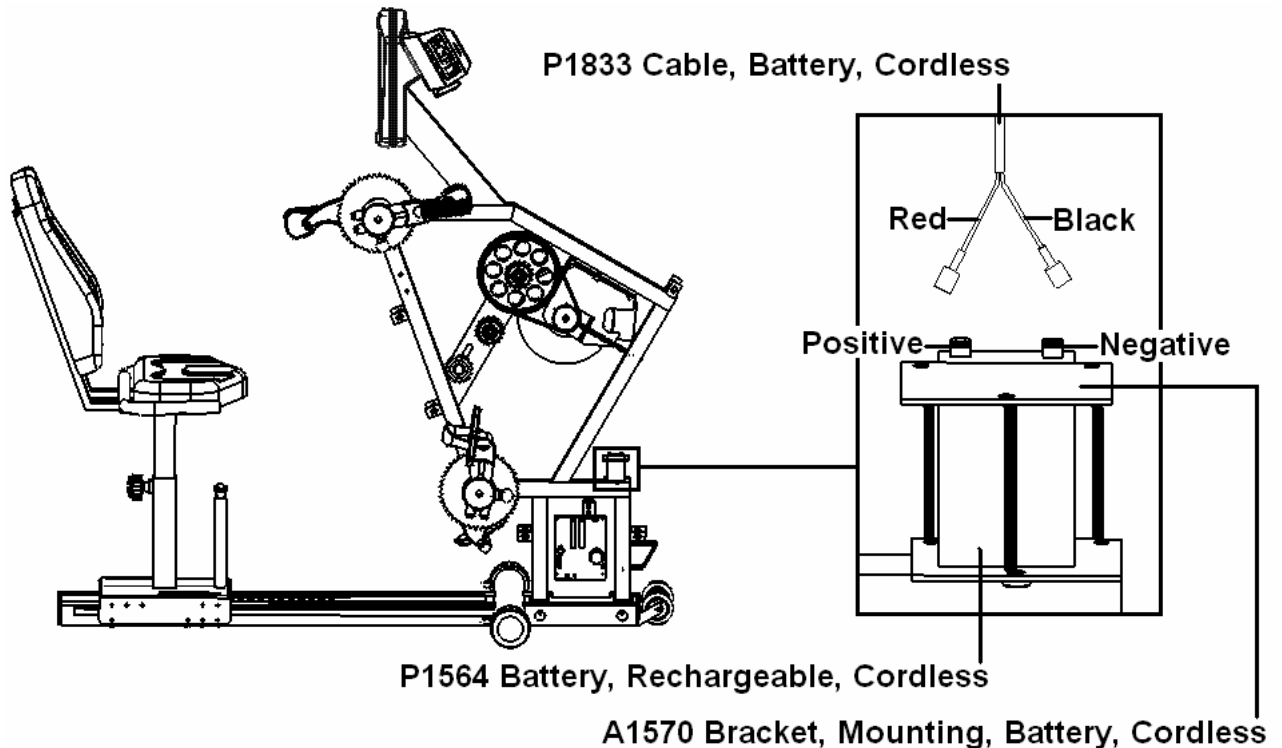
5. Remove the six (6) cover screws and washers holding the right side cover in place, using a Philips screwdriver.
6. Locate the lower PCB (P2161).
7. Disconnect all cables to the lower PCB. **Make sure you are grounded when handling electronics. Do not touch any components on the lower PCB. Static damage can occur.**
8. Remove the four (4) screws mounting the lower PCB, using a Philips screwdriver.
9. Remove the lower PCB from the unit.
10. Install the new lower PCB in the exact same orientation as the old one.
11. Reconnect all cables to the new lower PCB. Confirm all connections to the lower PCB match those shown above.
12. Rotate the left upper crank arm to see if the upper display lights up.
13. If the upper display lights up, reinstall the right side cover. If the display doesn't light up, verify your connections again.
14. Reinstall the popper pins on both the upper and lower crank hubs. Use a dab of blue loc-tite on the threads when installing. **Do not torque these down very tight. Over-tightening will cause damage to the threads of the popper pin or crank hub assembly.**
15. Verify the popper pin is functioning properly. Pull the black knob out and then release. The black knob should return to its lowest position. If it doesn't, the popper pin is tightened down too far.
16. Once verified, reinsert the crank assemblies into their respective locations.
17. It is optional whether to reinstall the crank retaining bolts with washers.
18. Rotate the cranks to see if the upper display still lights up. If display lights up, do an operations test. Use different programs to verify unit is working correctly.

F. Battery Replacement



1. Remove crank retaining bolts and washers, using a 5/32" Allen wrench.
2. On the lower right side crank hub assembly (A1871), pull the black knob on the popper pin assembly (A1754) out and slide the crank assembly (A1868) out.
3. On the upper right side crank hub assembly (A1884), pull the black knob on the popper pin assembly and slide the crank assembly (A1870) out.
4. Remove the popper pin assembly by turning it counterclockwise with a crescent wrench.
5. Remove the six (6) cover screws and washers holding the right side cover in place, using a Philips screwdriver.

6. Locate the battery.



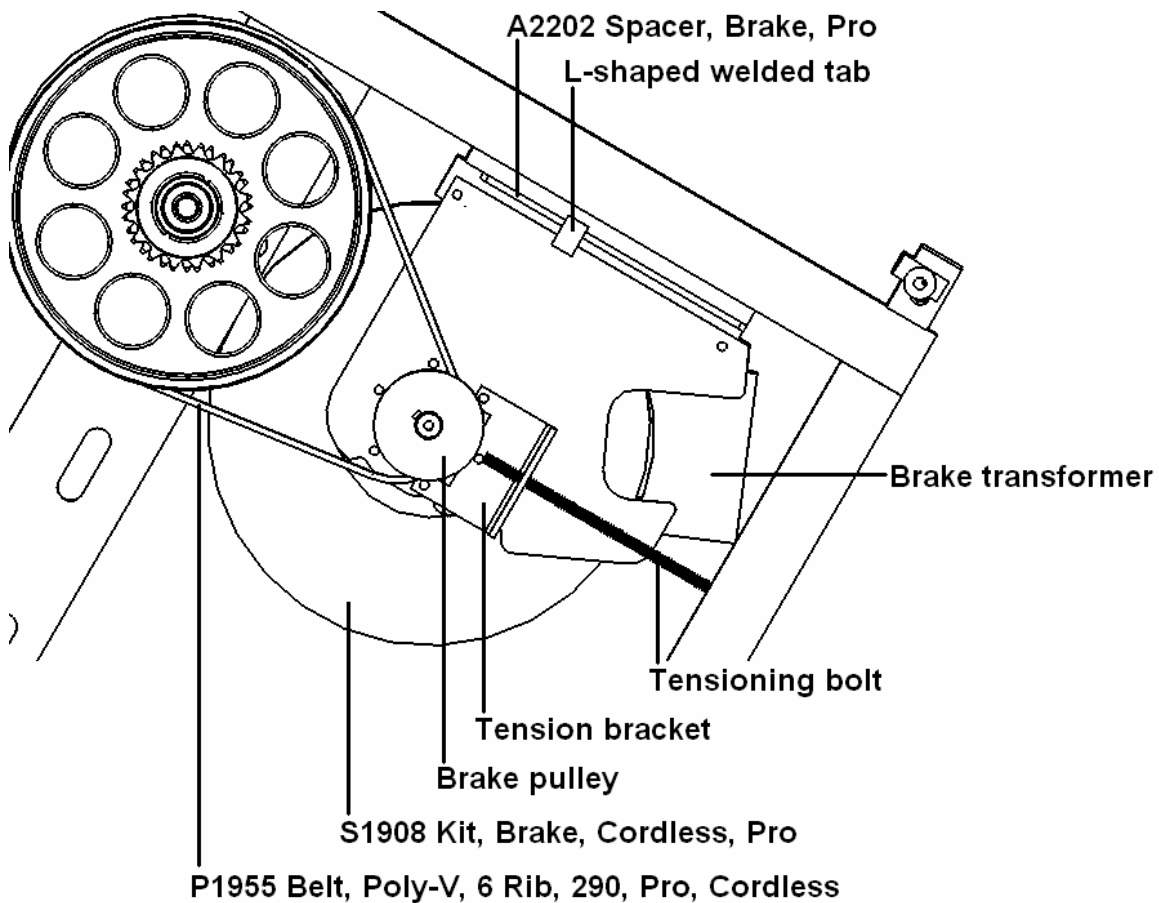
7. Disconnect the two (2) wires connected to the battery. The red wire is connected to the positive terminal while the black wire is connected to the negative terminal.
8. Remove the three (3) Philips screws through the battery mounting bracket (A1570).
9. Remove the old battery.
10. Install the new battery.
11. Insert the three (3) Philips screws through the battery mounting bracket and tighten.
12. Connect the two (2) wires to the battery. The red wire is connected to the positive terminal while the black wire is connected to the negative terminal.
13. Verify connections.
14. Test operation of the unit.
15. If everything works fine, re-install the right side cover and crank assemblies.

G. Wireless HR Replacement (Use this procedure for PROII's with serial numbers through 650-005XXX.)

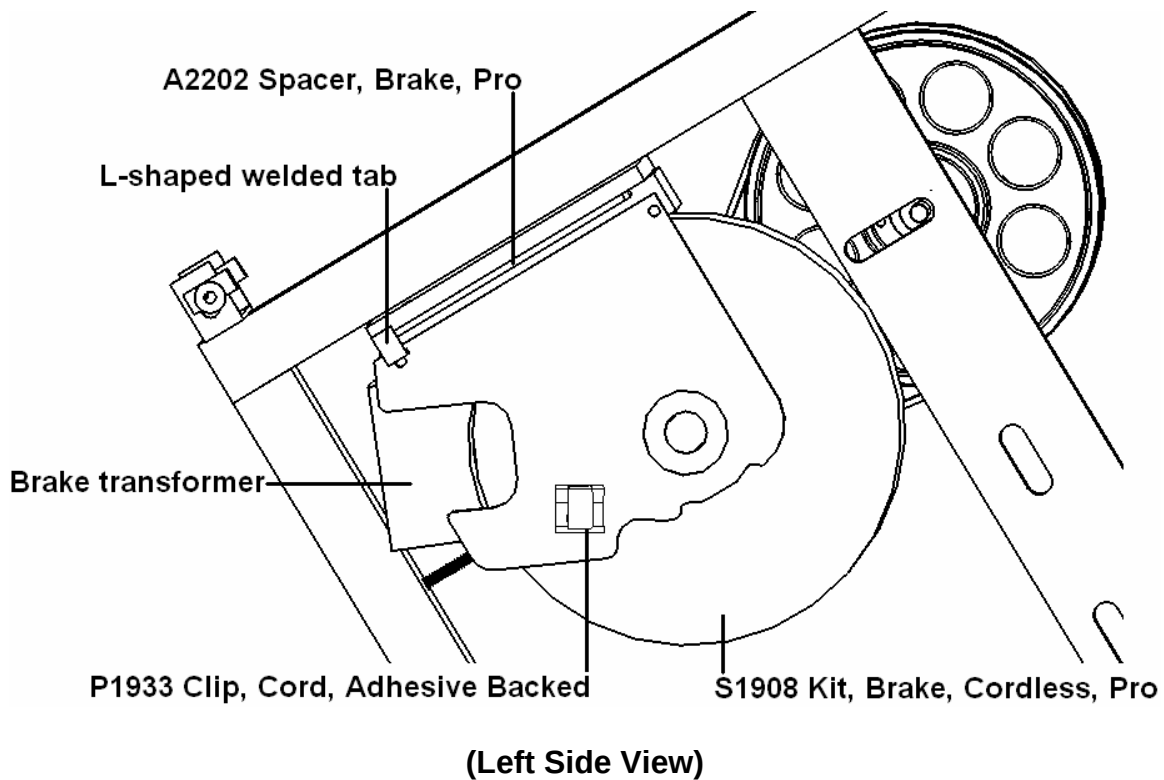
H. Wireless HR Replacement (Use this procedure for PROII's with serial numbers 650-005XXX thru 650-005XXX.)

I. Wireless HR Replacement (Use this procedure for PROII's with serial numbers 650-005XXX and above.)

J. Brake Replacement



(Right Side View)



1. Remove the crank arms and both side covers, using the Crank Arm and Cover Removal procedure.
2. Remove the two (2) nuts holding the tensioning bolt to the tensioning bracket.
3. Remove tensioning bolt from the frame.
4. Cut the tie wrap mounting the 2-pin brake cable to the frame.
5. Disconnect the 2-pin brake cable affixed to the brake transformer from the extension cable leading to the lower PCB.
6. Unplug the 3-pin brake cable from the backside of the brake assembly (S1908) and hook the cable from the cable hook tab.
7. Loosen each brake mounting bolt 3-4 turns.
8. Unhook the poly-v belt (P1955) from around the brake pulley.
9. Remove the two (2) brake mounting bolts on the right side of the frame. Let the brake flange rest on the L-shaped tab welded to the frame.
10. Remove the brake spacer (A2202) on the right side.
11. Support the brake and remove the two (2) brake mounting bolts on the left side of the frame.
12. While supporting the brake, remove the brake spacer on the left side.
13. Remove the brake assembly from the unit. **Be very careful, as the brake assembly weighs approximately 32lbs.**
14. Rest the new brake assembly on the L-shaped tab welded to the frame on the right side.
15. Place the brake spacer in place on the right side and start the two (2) brake mounting bolts. Each brake mounting bolt should have a flat washer followed by a lock washer. Tighten bolts finger tight

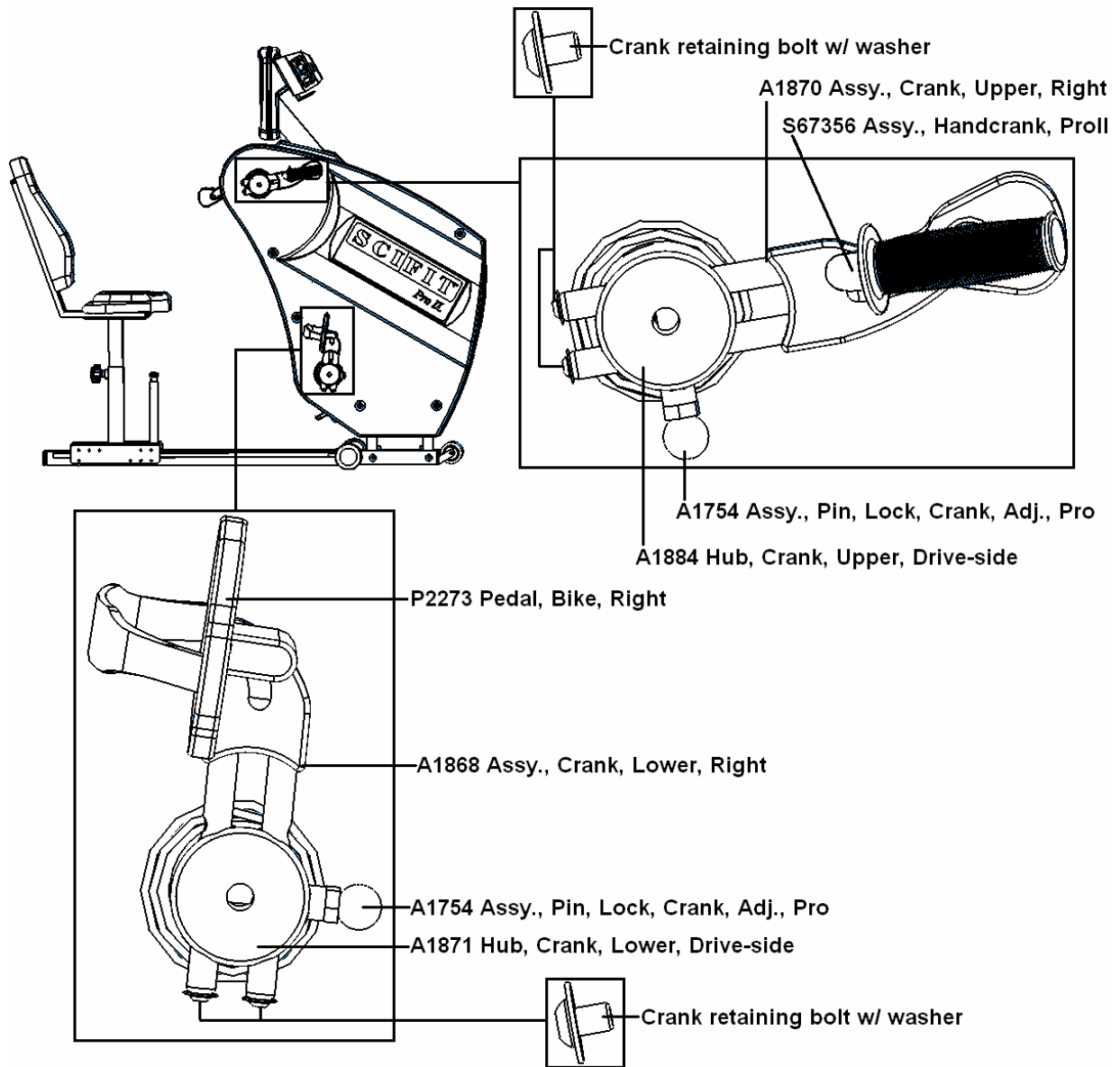
16. While still supporting the brake assembly, insert the brake spacer on the left side and start the two (2) brake mounting bolts. Each brake mounting bolt should have a flat washer followed by a lock washer. Tighten bolts finger tight.
17. Reinstall the poly-v belt on the brake pulley.
18. Insert the tensioning bolt back through the frame and tensioning bracket.
19. Start one (1) of the two (2) nuts on the tensioning bolt.
20. Align the poly-v belt.
21. Turn the nut on the tensioning bolt resting against the tensioning bracket clockwise until the belt is taut.
22. Tighten all four (4) brake mounting bolts.
23. Install the second nut on the tensioning bolt and tighten.
24. Make sure the poly-v belt is running straight by spinning the brake assembly.
25. Reconnect the 2-pin brake cable affixed to the brake transformer to the extension cable from the lower PCB.
26. Reconnect the 3-pin cable to the backside of the brake assembly.
27. Tie-wrap cables to the frame just below the brake transformer.
28. Verify all connections and bolt tightness.
29. Reinstall the covers and crank arms.
30. Test operations of the unit. Make sure the poly-v belt does not slip at high resistance. If it does, the poly-v belt is not tight enough.

K. Idler Replacement

L. Shimano Removal / Replacement

M. Brake Drive Hub Assembly Replacement

N. Adjustable Crank Locking Pin Removal / Replacement



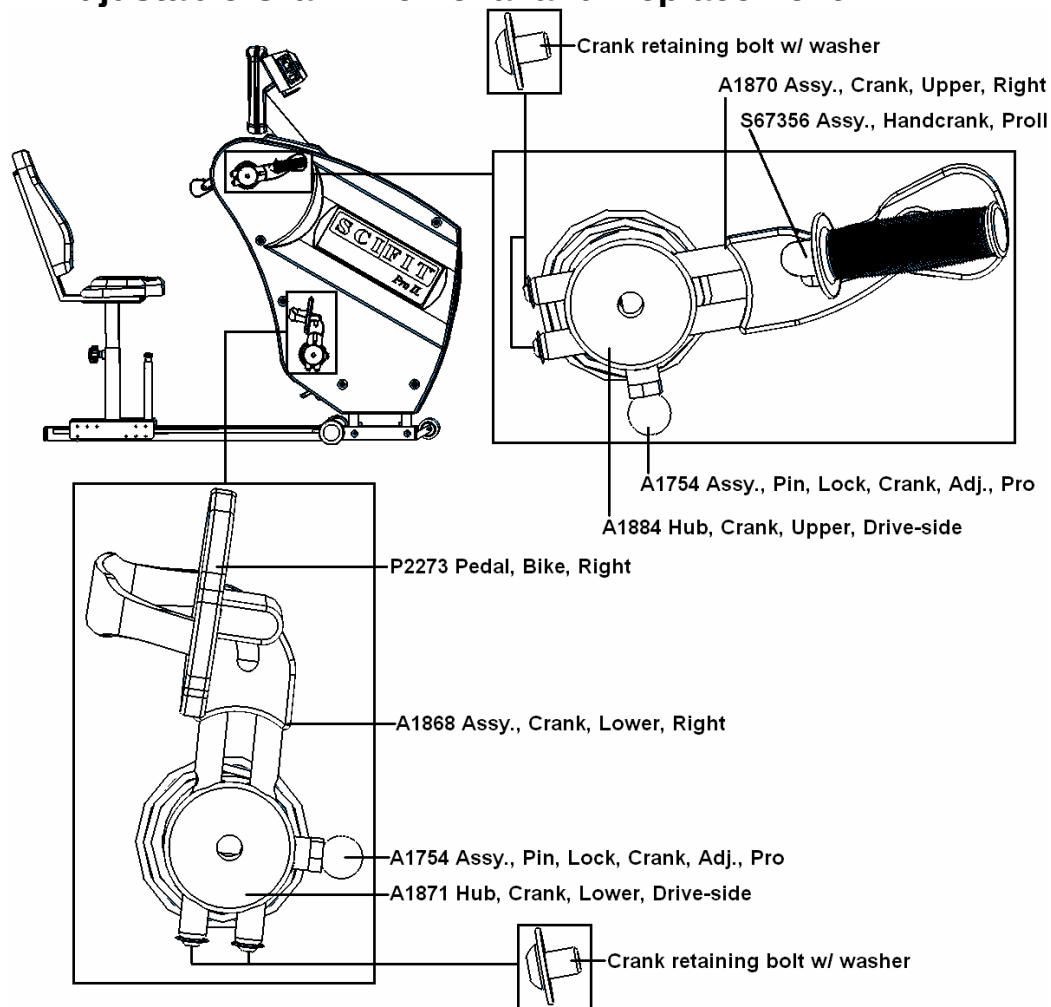
To Remove Locking Pin

1. Remove crank retaining bolts and washers, using a 5/32" Allen wrench.
2. On the upper crank hub (A1884 or A1885), pull the black knob on the locking pin assembly (A1754) out and slide the crank assembly (A1869 or A1870) out. On the lower crank hub (A1871 or A1874), pull the black knob on the locking pin assembly (A1754) out and slide the crank assembly (A1867 or A1868) out.
3. Rotate the upper crank hub until the locking pin assembly is on top.
4. Using a crescent wrench on the hexagonal portion, rotate the locking pin assembly counterclockwise until it is free from the upper crank hub.

To Install Locking Pin

1. Make sure threads in the upper or lower crank hub are clean and free of debris.
2. Place a small amount of green loc-tite on the threads of the locking pin assembly. ***Note: Do not get loc-tite on any area except the threads. This will cause the locking pin to bind up later.***
3. Screw the locking pin assembly in by hand until it comes to a stop.
4. Using a crescent wrench on the hexagonal portion, turn the locking pin assembly clockwise 1/8 of a turn. ***Note: Over-tightening will cause the locking pin assembly to bind up when the black knob is pulled. If the locking pin assembly is binding, loosen the locking pin assembly until it moves freely.***
5. Slide the upper or lower crank assembly back into the crank hub. ***Note: It is optional whether to reinstall the crank retaining bolts and washers. The retaining bolts are to keep the cranks from falling out when the locking pin is pulled.***

O. Adjustable Crank Removal and Replacement



To Remove Cranks:

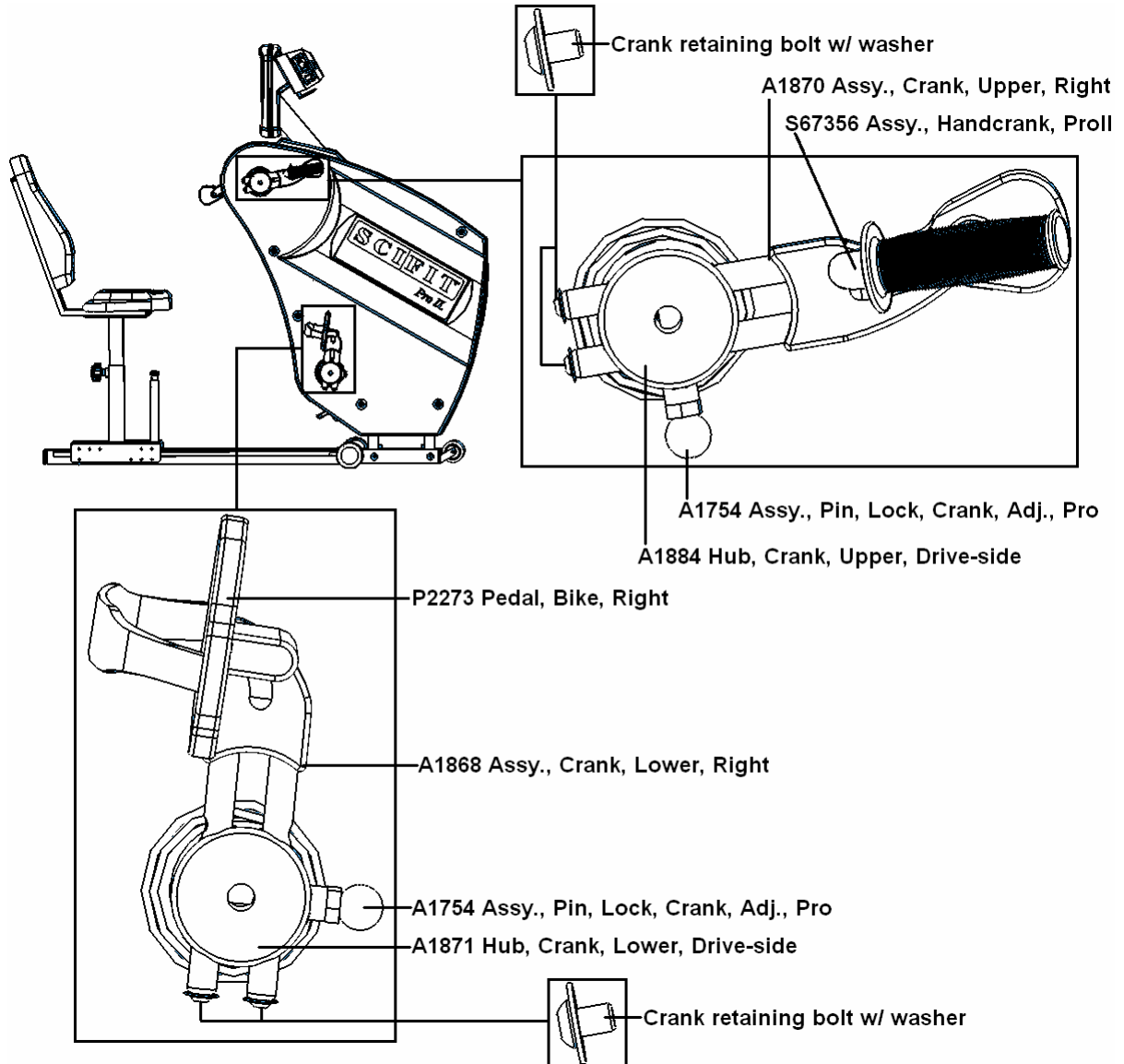
1. Remove crank retaining bolts and washers, using a 5/32" Allen wrench.
2. On the upper crank hub (A1884 or A1885), pull the black knob on the locking pin assembly (A1754) out and slide the crank assembly (A1869 or A1870) out. On the lower crank hub (A1871 or A1874), pull the black knob on the locking pin assembly (A1754) out and slide the crank assembly (A1867 or A1868) out.

To Install Cranks:

1. If both upper cranks were removed, install left side upper crank assembly (A1869) first. Pull the black knob on the locking pin assembly while inserting the left crank assembly (A1869) into the left hub (A1885). **Note: The side of the crank assembly with the notches in it must be inserted into the holes closest to the locking pin assembly.**
2. Pull the black knob on the locking pin assembly while inserting the right crank assembly (A1870) into the left hub (A1884). **Note: The right side upper crank assembly has notches in both rods. Generally, it is mounted 180° opposite the left side upper crank assembly. It can also be rotated 180° for rowing exercises.**

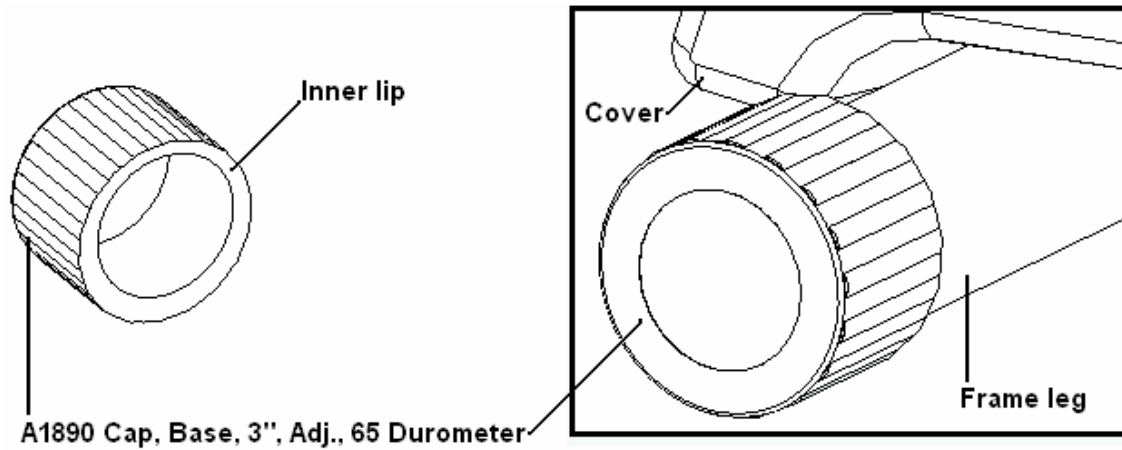
3. Install foot crank assemblies (A1867 and A1868). With the arm in the down position, the foot crank assembly on that same side must be inserted into the holes in the hub from the side opposite the user.
4. Verify locking pin assemblies are seating properly before using the unit.
Note: It is optional whether to reinstall the crank retaining bolts and washers. The retaining bolts are to keep the cranks from falling out when the locking pin assembly is pulled.

P. Side Cover Removal



1. Remove all adjustable crank assemblies and locking pins using the Adjustable Crank Locking Pin Removal / Replacement procedure.
2. Using a Philips screwdriver, remove the cover screws.
3. Remove the side cover (P1860 or P1861) from the unit.

Q. End Cap Replacement / Adjustment



1. Position an object under the frame leg to elevate the end cap (A1890).
2. Pull the rubber end cap off the end of the frame leg. For older versions with plastic end caps, a plastic or rubber mallet may be needed to tap on the inner lip of the end cap until it comes off the frame leg.
3. Replace end cap or make necessary adjustment to the existing end cap.
4. The mounting hole in the end cap is offset to allow leveling the machine. On legs that do not always contact the floor, rotate the end cap so a thicker section of the cap is next to the floor. Do this until the machine is level.