

# Operation

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## Diagnostic Codes

Diagnostic codes are used to test various components of the machine such as the display, keyboard, serial port, alternator, and tachometer, as well as viewing the error log information and resetting the time between service or maintenance calls.

1. Press [Level: UP], [6], [ENTER]. The console will display **DIAGNOSTICS**
2. Press [Level: UP] or [Level: DOWN] to scan through the choices. Select the option you want to view by pressing [ENTER].

### Test display

To test the LCD display, press [ENTER] when the message, **DISPLAY TEST** is displayed. The console screen alternates turning on all LCD segments and a representative program screen. Verify that all LCD segments turn on.

### Test keyboard

To test all the keys on the keyboard, press [ENTER] when the message, **KEY TEST** is displayed. Then, press any key on the keyboard and that key's name will be displayed in the text line. Press [CLEAR] as the last key to exit this test.

### Test serial port

To test the serial port, press [ENTER] when the message, **SERIAL TESTS** is displayed. This test performs a serial loop back test. Select the **CSAFE RS-232** selection. You will need a loop-back test cable inserted into the appropriate connector port to successfully run this test. Console will display either **PASS** or **FAIL**.

### Test alternator

To test the machine's alternator, press [ENTER] when the message, **ALT TEST** is displayed. This test verifies the alternator field routines through the console. Position yourself on the machine and press [Level: UP] for field on. After exercising briefly you should build up resistance. For field off, press [Level: DWN].

### Test tach response

To test the machine's tachometer, press [ENTER] when the message, **TACH TEST** is displayed. Start exercising on the machine. The console should regulate the alternator resistance based on the tach signal to maintain approximately 2,000 RPMs while you are exercising. If not, there is a possible problem in the AC tap or field circuit. Check the alternator, the AC tap wire, the field wire, the diode, the terminal posts, and the main cable.

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## I/O Test

Press [ENTER] when the message I/O TEST is displayed. The AUX and B+ values represent the current and voltage delivered from the alternator respectively. AUX is scaled by 1000 and B+ is scaled by 300. These values will increase with the speed of the alternator (note that both values will reach 0 if the alternator is left at rest). The --- string is displayed at all times since the StepMill does not require a magnetic key.

## A Sensor B

N/A

3. To exit DIAGNOSTICS, press the [CLEAR] key.

### To review the error log and reset the service timer:

1. Press [Level: UP], [7], [ENTER]. The console will display MAINTENANCE LOG.
2. Press [Level: UP] or [Level: DOWN] to scan through the choices. Select the option you want by pressing [ENTER].

## Error log

To display the machine's error log, press [ENTER] when the message, ERROR LOG, is displayed. The console will report various error messages in the display window. The total amount of errors will be displayed in the upper right window. Note that only the highest priority reported error will be displayed. Errors are handled in two ways. First, as a non-fatal WARNING which will display the text message but continue system operation until you press the [CLEAR] key. The second way is a fatal ERROR which will stop the exercise and return the system to an idle intensity state. The console will display the error text and not let you restart the program unless power has been turned off and then back on. There are 16 error entries available.

## Reset service time

To reset the time between service or maintenance calls, press [ENTER] when the message, MAINT HOURS is displayed. Press the [0] key, then [ENTER] to reset.

## QA ID

N/A

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3. To exit MAINTENANCE LOG, press the [CLEAR] key.

## Configuration Codes

1. Press [Level: UP], [8], [ENTER]. The console will display CONFIGURATION.
2. Press [Level: UP] or [Level: DOWN] to scan through the choices. Select the option you want by pressing [ENTER].

## Change Machine

Changes the machine type from StairClimber, StepMill® machine, Bike rev B, Bike rev A or Elliptical. Scroll through the screen until CHANGE MACHINE is displayed. Press (ENTER), then press [Level: UP] or [Level: DOWN] to scan through the choices. Select the machine type you want by pressing [ENTER].

## Reset Data Set Up

Scroll through the screen until RESET DATA SET UP is displayed and press (ENTER). All customized customer settings will be cleared.

**NOTE:** The Console will need to be reconfigured.

## Clear Error Log

Scroll through the screen until CLEAR ERROR LOG is displayed and press (ENTER). The word DONE will appear and all accumulated errors in the Error Log will be cleared.

## Reset Console

Scroll through the screen until RESET CONSOLE is displayed and press (ENTER). Resets all defaults to original manufacturing settings.

**NOTE:** The Console will need to be reconfigured.

# Maintenance

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## Maintenance Records

For ease of maintenance the StepMill® SM916 console will keep track of hours, number of workouts, time between last servicing, etc. You can access any of the custom menus by pressing [LEVEL: UP], [4], [ENTER]. The console will then display MACHINE STATUS. Use the [Level: UP] and [Level: DOWN] keys to scroll through the options. For details, refer to the Machine Status Console Codes in the previous section.

## Resetting the Maintenance Hour Timer

After each maintenance period reset the counter. Press [LEVEL: UP], [7], [ENTER]. Then use the Level keys to scroll through the options. When MAINT HOURS is displayed, press [ENTER]. Press the [0] key, then press [ENTER]. Press [CLEAR] to return to the opening screen.

## Moving your StepMill® SM916

The StepMill® SM916 is delivered with attached transport wheels. These same transport wheels will be used whenever the machine needs to be relocated.

**Note:** 2 people are required to attach/remove the transport wheels and move or relocate the machine. The transport wheels are intended for indoor use only and should never be rolled on concrete or asphalt surfaces.

## Initial Service

Upon receiving your machine, use a soft, clean towel to wipe off the dust, which may have accumulated during shipping. Your new machine will require minor assembly. Refer to the Assembly Manual for details.

## Cleaning

1. Do not use glass cleaners or any other household cleaners on the console. Clean the console daily with a water-dampened cloth and wipe dry after cleaning.



The safety and performance of this product can be maintained only if it is inspected regularly for damage and wear.

Pay particular attention to components most susceptible to wear such as steps and lower side covers.

Remove any damaged machine from service and replace damaged components immediately.

Direct any question regarding maintenance or its function to a qualified Nautilus® Technician. For contact information please see the Important Contact Numbers page at the back of this manual.



# Maintenance

2. Clean the exterior of the machine daily using soap and water or a diluted, non-mineral based household cleaner such as Fantastik®.

## Maintenance Schedule

	Daily	Weekly	Monthly	Every 3 months	Comments
<b>General Maintenance</b>					
Check Safety & Warning Labels	X				
Spot Check Step Chains	X				
Alternator Belt Tension			X		Tension to 40-54 inlbs
<b>Lubrication</b>					
Drive Chains			Or every 300 hrs.		30W Oil
Step Hinges			X		30W Oil
Bearing Plate			X		Multi-Purpose grease
<b>Cleaning</b>					
Clean Console	X				Clean with a water dampened cloth and wipe dry after cleaning.
Clean Side Covers	X				Clean exterior with soap and water or a diluted household cleaner.

## Inspection

1. Inspect the frame for any rust, bubbling, or paint chips during the daily cleaning. The salt in perspiration can damage the unpainted surfaces. Repair the damaged area with a touch-up paint kit purchased from Nautilus® (call Customer Service for order information).

## Parts and Service

Regular and scheduled maintenance will prolong the life of your Nautilus® equipment. Only use genuine Nautilus® replacement parts. The Nautilus® Customer Service Team invites you to call in your order for replacement parts.

## External Power Supply

The StairMaster® Commercial Series StepMill® SM916's external power supply is supplied with the unit and plugs into a standard 115 volt, 15 amp outlet, or a 220-240 volt 50 Hz, 10 amp outlet. (All major voltage plugs are available.) The plug-in for the external power supply is located on the underside of the machine.

# ***Maintenance***

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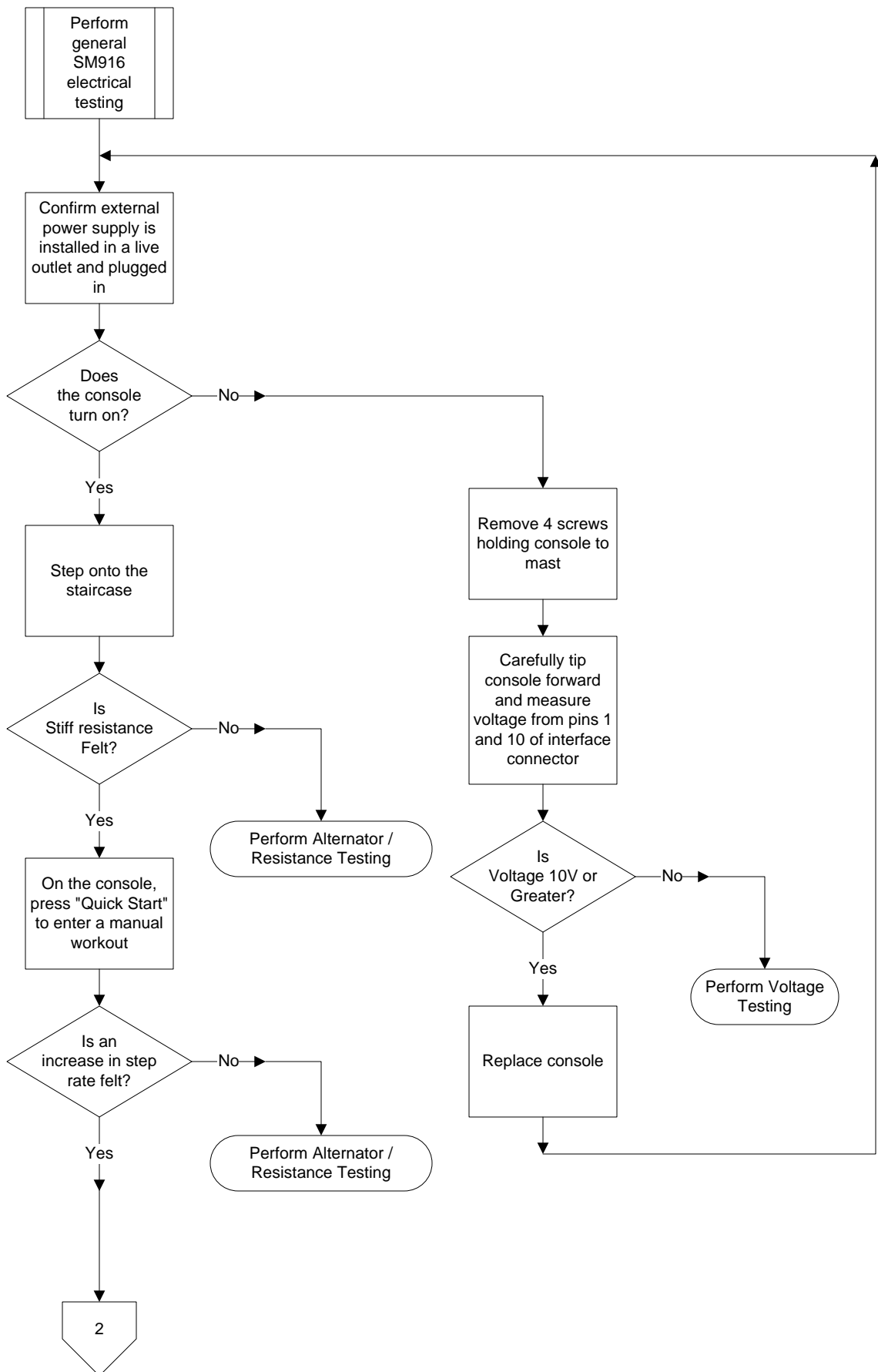
**IMPORTANT:** If installing the optional LCD Monitor, refer to the NV915 installation manual at this time.

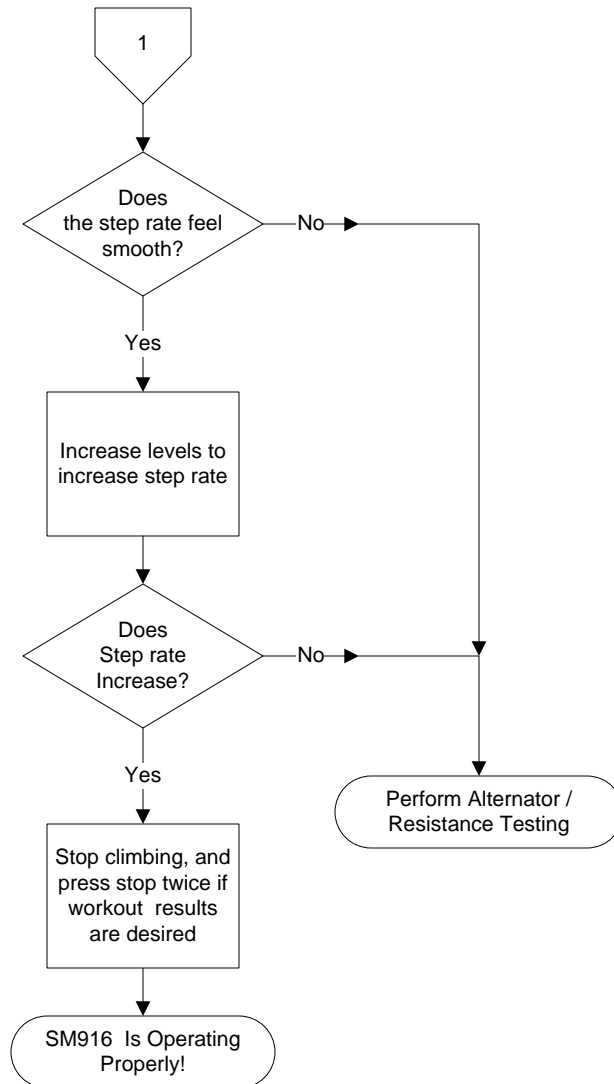
The console will power on and remain powered whenever the external power supply is connected.

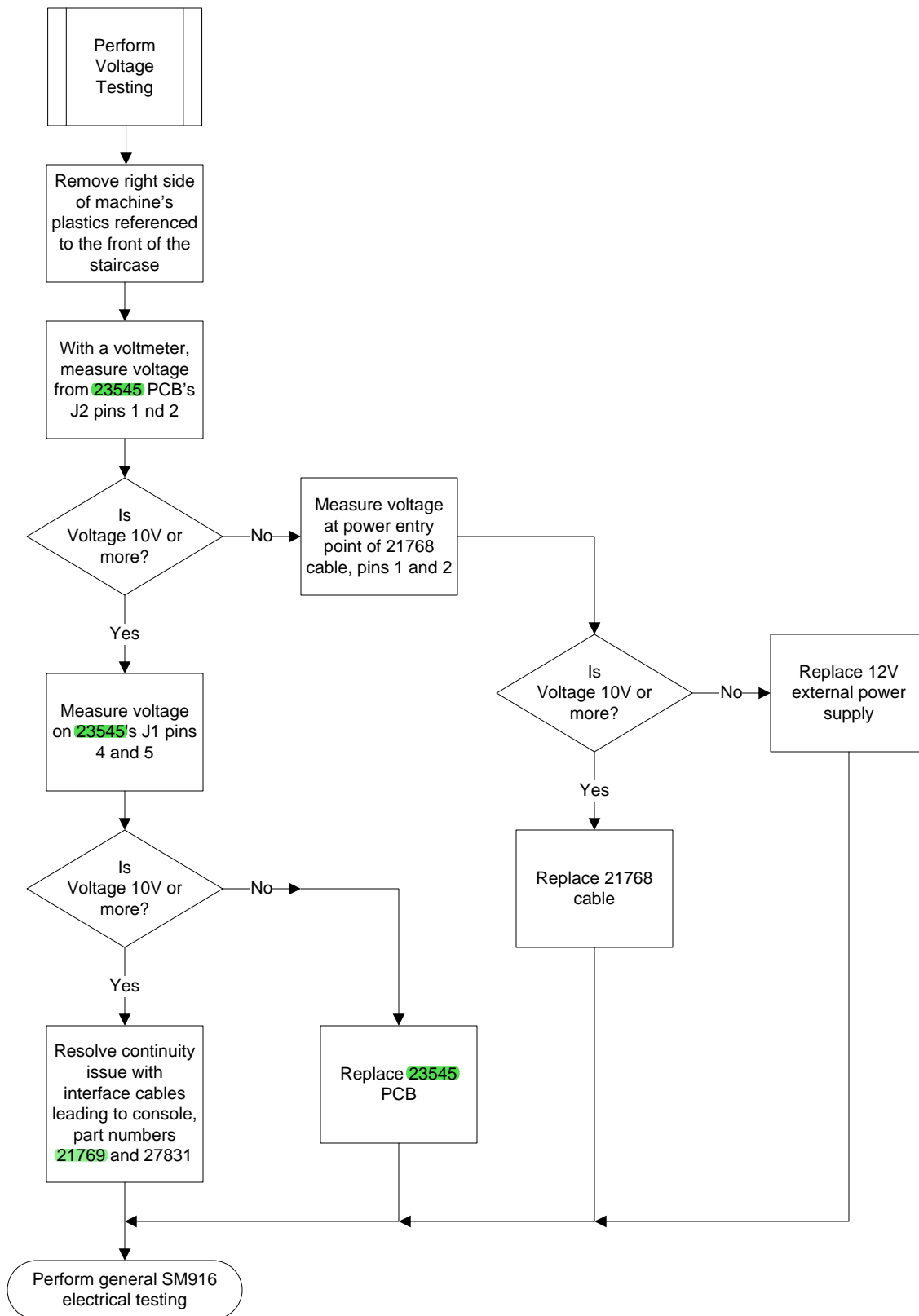
## **Recycling**

Do not dispose of this product as refuse. This product is to be recycled. For information on the proper method of disposal contact a Nautilus® Customer Service Representative.

If you have questions, contact the Customer Service Department at 800-NAUTILUS (800-628-8458), International Office (41) (26) 460 77 77 or refer to the Important Contact Numbers section in this manual.







## Alternator / Resistance Testing

To minimize the complexity of the flowchart, this section will best be described in terms of system theory.

The colored connections to the alternator are as follows:

White-B+, Alternator output voltage

Brown-Field, Alternator Control Current

Black-Ground, Alternator return

Blue-Tachometer, velocity signal back to console

Resistance over gravity is performed by the alternator in the SM916. When the console senses a user with staircase movement, the console should be enabling full field current to the alternator. Field current is provided from the external power supply, through the console, into the 23545 and wired into the alternator's field terminal. Under this condition, the console should also be driving the 23545's J1 pin 1 low, switching the .5ohm load resistor onto the alternator's B+.

The alternator's B+ should rise as a result of field current, but its voltage will depend on the weight of the user and resulting velocity. Resistance is achieved by the oppositions of internal magnetic fields when field current is applied. The user's weight will affect the alternator's RPM under this condition, and under full field current conditions the voltage is not controlled. But, with the large gear ratio and full field current applied, the resistance should be maximum, and the step rate should be minimum.

Once a user starts a workout, the console controls the alternator's field current attempting to maintain the desired step rate. This signal is Pulse Width Modulated (PWM) from 0V to 12V, the level of the loaded external supply. If the step rate is fast, the console will deliver field current longer, if the step rate is slow, it will deliver less field current.

The only situation where no field current would be present during a workout, is if a very light weight person was attempting to achieve a step rate that could not be achieved by their weight overcoming the frictional resistance of the system. In this case, the console would keep field current off, or no induced resistance.

During workouts the alternator's B+ increases as a function of speed and user weight. For high level workouts with heavy weight users, B+ levels of 20V could be witnessed.

If no resistance is felt, regardless of whether the console is powered, remove the plastic shroud on the right side (with respect to the staircase entry). The 23545 PCB should be visible, along with the load resistor, and alternator. Prior to proceeding with tests below, perform continuity checks on the alternator connections, load resistor connections, and confirm these connections are secure into the 23545 PCB. Confirm the load resistor measures .5ohm.

Power entry is at the bottom of the unit. The 12V 2.5A supply enters via cable part number 21768, and enters into the 23545 PCB via J2. LED2 indicates power is present, but 12V should still be confirmed with a volt meter. Power and control interface to the console is provided at location J1. The cable to the console is made up of two sections for assembly, part numbers 21769 and 27831. 12V is provided up to the console at J1 pin 4, and GND pin 5.

In addition to alternator field current, the console controls the loading of the alternator's B+ with the .5ohm resistor which is switched by the 23545's relay. When the console detects a user has stepped on the staircase, it immediately applies full field current, and turns on the power relay to load B+ with .5ohm. LED1 is an indicator the console is attempting to close the relay, but this should be confirmed with a VOM.

If no resistance is felt, confirm 10V to 12V is being applied to the alternator's field. This should always be present once a user is detected, and before a workout has begun. Confirm the additional load is being switched also, which is controlled by a low voltage on J1 pin 1. The operation of the power relay can be confirmed by unplugging the unit, and removing the console connection at J1. Install external power again, and an ohmmeter should show continuity from B+ to field on the 23545's terminal strip. With a test jumper, connect J1 pin 1 to J1 pin 5, and the ohmmeter should now show continuity from the terminal strip's B+ to RES. If this test passes with no resistance felt, and full field current has been confirmed, replace the alternator. If the above test fails, replace the 23545 PCB. If no field current is detected, or LED1 does not light when a user steps on the staircase, check the interface cable continuity to the console. If this checks, replace the console.

If no increase in step rate is detected when instructed by the console, confirm the field line is not at 12V continuously. If the field is continuously at 12V, the console's field control has probably shorted.