

A man in a red shirt and grey shorts is running on a dirt trail, accompanied by a black and tan dog. The background features a scenic view of mountains and a valley with greenery and a winding path.

ELECTRONIC STRIDE ADJUSTMENT SYSTEM TECHNICAL CERTIFICATION TRAINING

Field Engineering | 2010

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Course Objectives

- » Life Fitness Electronic Stride adjustment
 - ◆ On Consumer Cross Trainer (X7,X8)
 - ◆ Block Diagram and System Operation
- » Troubleshooting Common Issues

Cross-Trainer with Electronic adjust

X7

X8



Electronic Stride Adjustment System | Technical Certification Training

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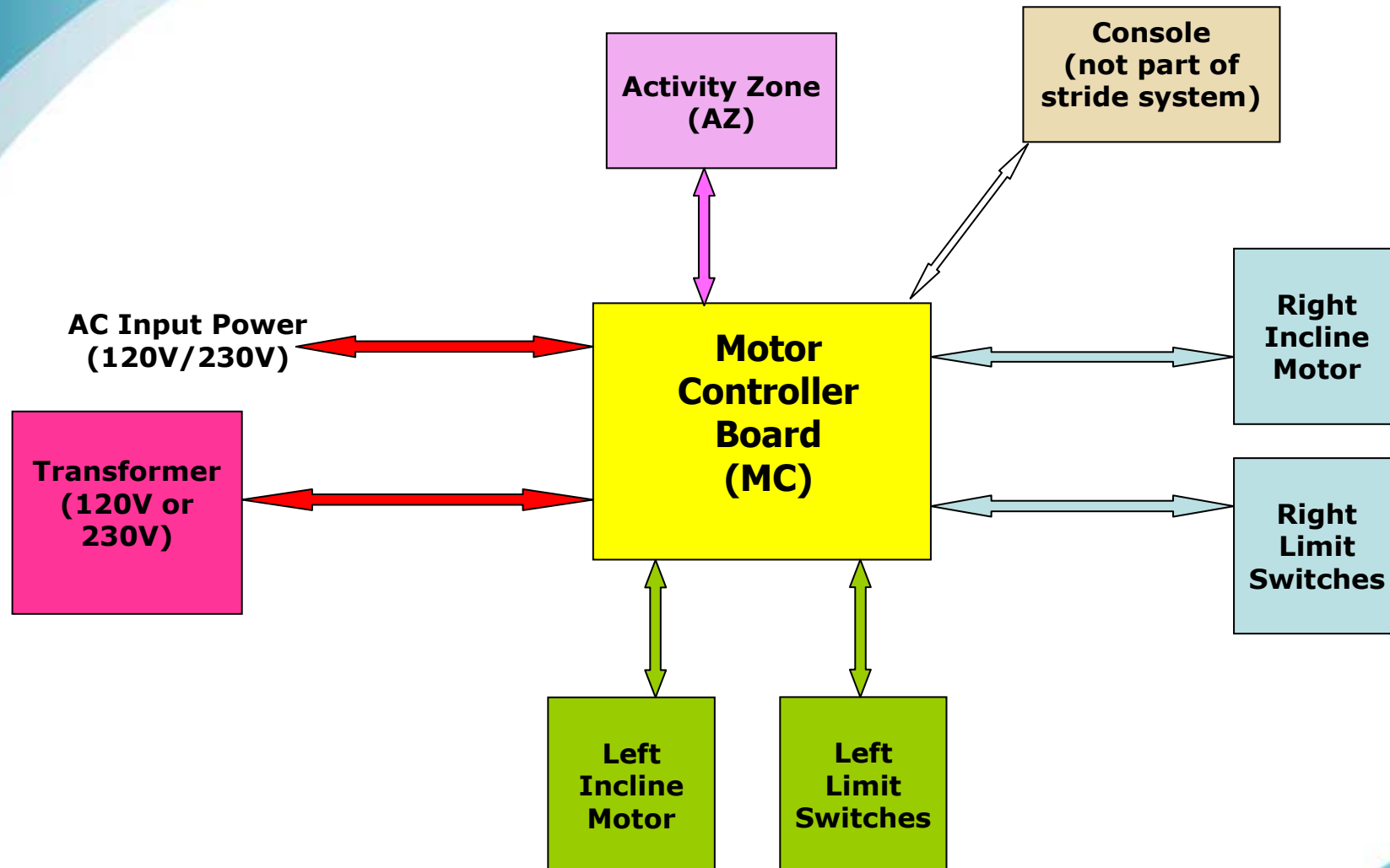
Cross Trainer Stride Adjust Models

- » X5 has manual/mechanical Stride Length adjustment
- » X7 and X8 have Electronic adjustment of Stride Length.
 - ◆ The X7 and X8 activity zone controls the Stride Adjustment of the Cross Trainer.
 - ◆ The activity zone has a blue LCD display with white backlight.
 - ◆ There is also an automatic stride control program on the activity zone.
 - ◆ Consoles do not have Stride Length information – only the activity zone.

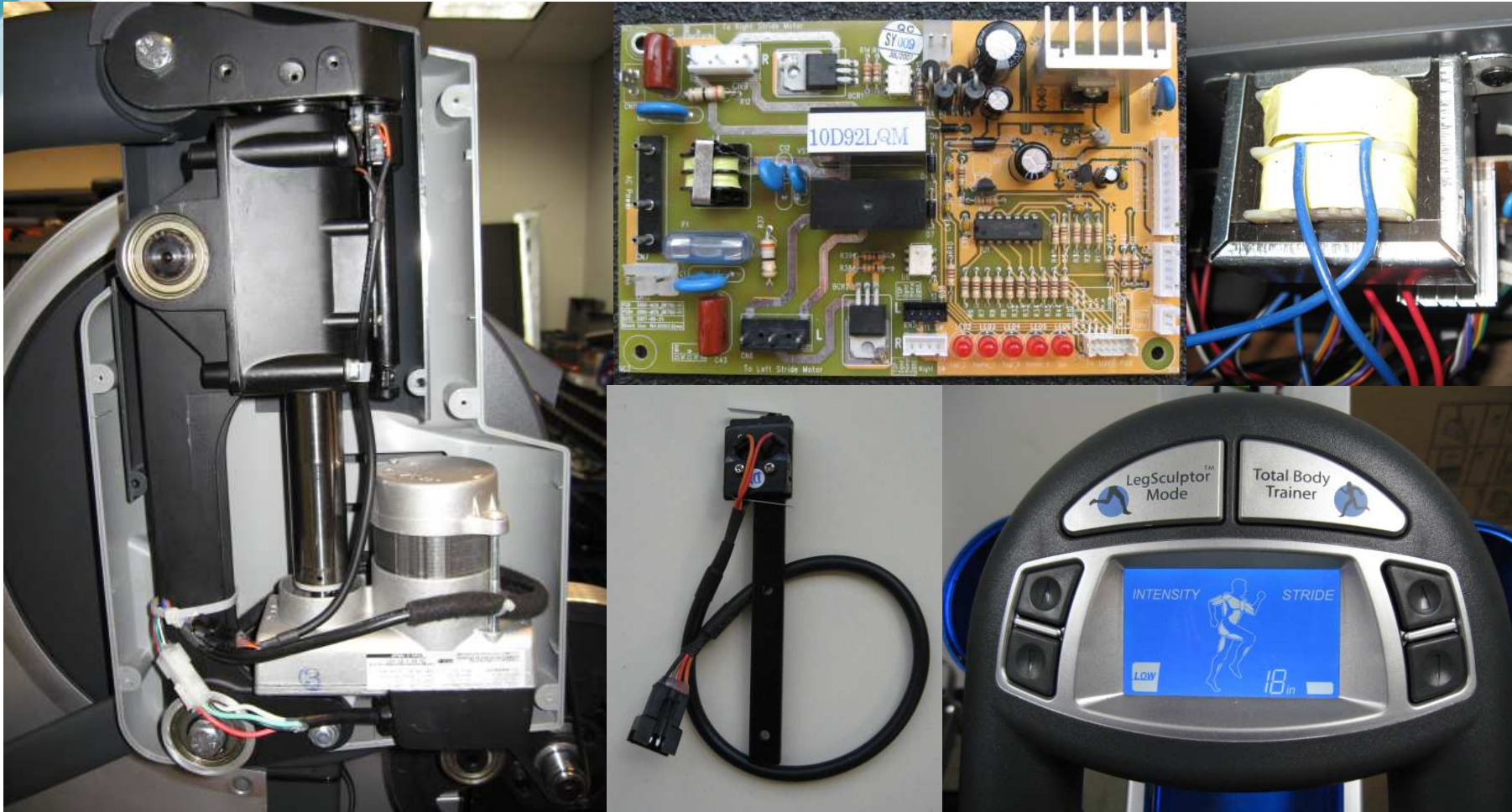
X7, X8 stride adjustment system operation

- » Five part system
 - ◆ Activity zone (console has nothing to do with stride adjustment)
 - ◆ Control board (Lower PCB)
 - ◆ Limit switch assembly
 - ◆ Stride actuator
 - ◆ Transformer
- » Stride length is controlled by activity zone not the console
- » Stride motor position is calculated by the activity zone based on the time the motor is turned on as it moves away from the home (min stride length) position.
- » Stride length is adjustable in 1" increments

Block Diagram – Stride Adjust system



X7, X8 stride adjustment system



» Electrical cables are also part of the system

X7, X8 Activity Zone (AZ)

- » Activity Zone PCB controls all Stride adjustments, independent of the Console
- » The Activity Zone can run a stride program or change stride position even if the console is in select workout. Stride programs don't even need a Console.
- » Inputs from MCB:
 - ◆ 4 Stride adjust limit switches
 - ◆ Speed
 - ◆ Power (with jumper in cables)
- » Outputs to the MCB:
 - ◆ UP and Down control for both the Left and Right actuator motors



X7, X8 Activity Zone (Cont.)

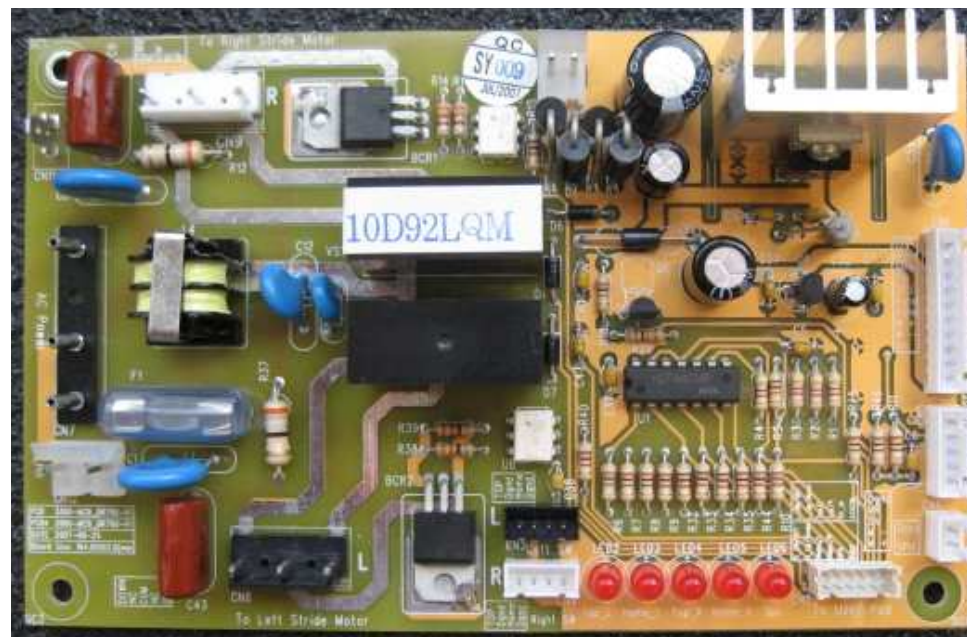
- » The Console runs user workouts and adjusts user resistance, while the AZ runs Stride Programs in parallel.
 - ◆ When the Console ends a workout, the Stride program (on the AZ) would keep running.
 - ◆ The Stride program stops after 1 minute of no user speed (from MCB) or if the user presses the leg sculptor key
- » Activity zone will display an error message if something is not working properly in the Stride Adjustment System
- » Activity zone has it's own diagnostics and settings menus
- » Some buttons are located on the AZ board, but are not used for Stride Adjustment and so are passed to the Console as inputs. These Buttons are: Total Body and the Up/Down Intensity buttons
- » The AZ enters Sleep mode after 5 minutes of no user key press or Speed detected.
 - ◆ In Sleep mode, Stride Actuators are commanded to move to the Home position and the backlight is turned off.

X7, X8 Activity Zone Settings Menu

- » Entering the settings menu
 - ◆ Press and hold stride down and leg sculptor for 3 seconds from idle mode
- » Move through the menu options using the Leg Sculptor key
- » Use the stride up and down keys to change values
- » Menu Options:
 - ◆ Audio: On/Off
 - ◆ Sleep mode: On/off
 - ◆ Contrast: 1, 2 or 3
 - ◆ Units: Inches or Centimeters
 - ◆ Language: English or German

X7, X8 Motor Control Board (MCB)

- » Input: 120 VAC
- » Creates 12 VDC to power the Console and Activity Zone
- » An external Transformer plugs into this board to assist in creating the DC supply.
- » This MCB communicates to both the Console and Activity Zone.
- » It is a junction for inputs/outputs to the console.
- » The MCB receives commands from the Activity Zone to move stride motors up or down.
- » Left and right limit switch assemblies plug into this board.
- » Indicator LED's show which limit switch is activated. The information is also passed on to activity zone
- » Speed signal is also passed on to the activity zone



X7, X8 Limit Switches

- » Each stride adjust actuator/motor has two Limit switches – Upper and Lower. They indicate limits of travel for stride adjustment system.
- » The Limit switches require no calibration
- » The switches are normally closed and open when activated.
- » Switches come pre-assembled to the bracket. Left and Right assemblies are unique.
- » In normal operation, the switch is only activated for a few seconds and then the motor direction is reversed until the switch is deactivated. Note that there might still could be contact to the switch lever, but the switch is electrically deactivated.



X7, X8 Stride Actuator

- » The Stride actuator/motor specifics:
 - ◆ Treadmill style Lift/Incline motor
 - ◆ 120VAC/60Hz motor
 - ◆ No internal limit switches
 - ◆ No position feedback mechanism
 - ◆ Left and Right side motors differ only by the direction the wires exit the actuator
 - ◆ Has Thermal Protection

- » Thermal protection operation:
 - ◆ Running the Stride adjust motor too often will cause the internal thermal limit switch to activate. This will result in the actuator being inactive until it cools.
 - ◆ An Activity Zone error can be generated if the motors reach their thermal limit don't move when commanded.



Common Issues

Common Issues

» **No power.**

- ◆ Check that unit has Power switch ON.
- ◆ Check the connection where the Power cord plugs into base. Tends to get pulled and kicked. Replace connector or cord if needed.

» **No speed display.**

- ◆ Check that magnet is in place.
- ◆ Adjust position of reed switch closer to magnet.
- ◆ Can check reed switch function with an Ohm meter

Stride Adjustment System - Errors

- » Stride Adjustment System Errors are displayed on the Activity Zone.
 - ♦ Note that the Console will not display Stride Adjustment failures.
 - ♦ See Service Bulletin for complete details and trouble-shooting of AZ errors (following this presentation).
 - ♦ Cable routing is critical and can cause many errors.

- » AZ Errors are as follows (see Bulletin for details):
 - ♦ **E1: Returning Home, both switches**
 - ♦ **E2: Time between the 2 Home switch closures**
 - ♦ **E3: Returning to Top, both switches**
 - ♦ **E4: Time between the 2 Top switch closures**
 - ♦ **E6: Unexpected Switch Closure for Top or Home**

X7, X8 Activity Zone Diagnostics Menu

- » **Entering the Diagnostic menu**
 - ◆ **Press and hold stride up and leg sculptor for 3 seconds from idle mode**
- » **Move through the menu options using the Leg Sculptor key**
- » **Menu Options:**
 - ◆ **Photo shoot mode**
 - ◆ **Display test: runs automatically and repeats until leg sculptor is pressed**
 - ◆ **Software version**
 - ◆ **Button test**
 - > **Lowest stride bar illuminates with each button pressed**
 - > **Press leg sculptor to exit**

Stride Adjustment System Errors – Service Bulletins

CT08011101R2 – Errors on Activity Zone Display

» Failures reported:

- ♦ Activity zone lights up with blank screen
- ♦ Both actuator motors run up past the maximum stride position until they reach the end of travel.
- ♦ Motors heat up until the internal thermal protection switch cuts off power. A burning smell would likely be given off by the motor.

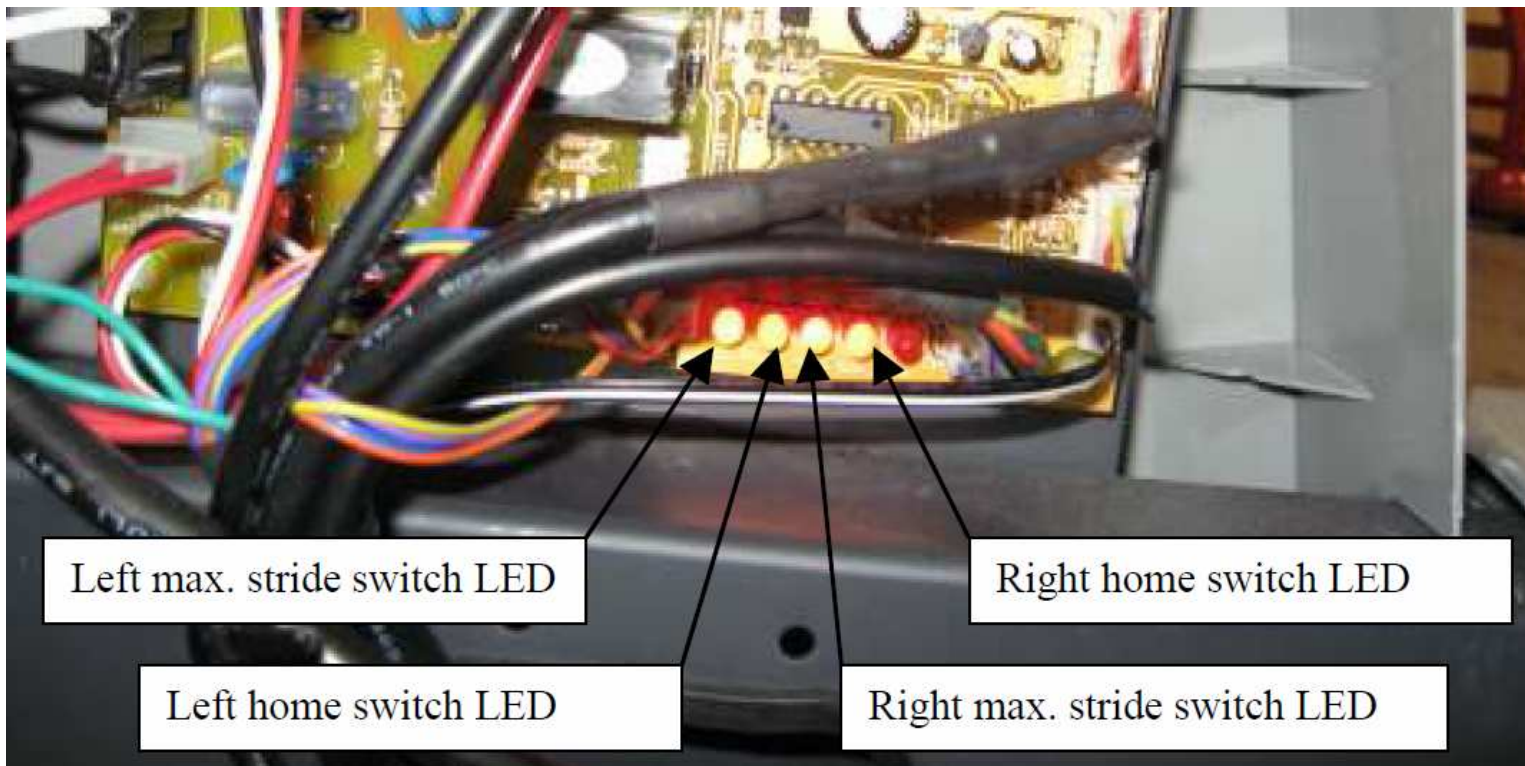
» Possible Cause:

- ♦ Intermittent connection between the limit switches and the Motor Control Board:
 - > Damaged limit switch wires
 - > Damaged idler link cable

CT0801101R2 – Errors on Activity Zone Display

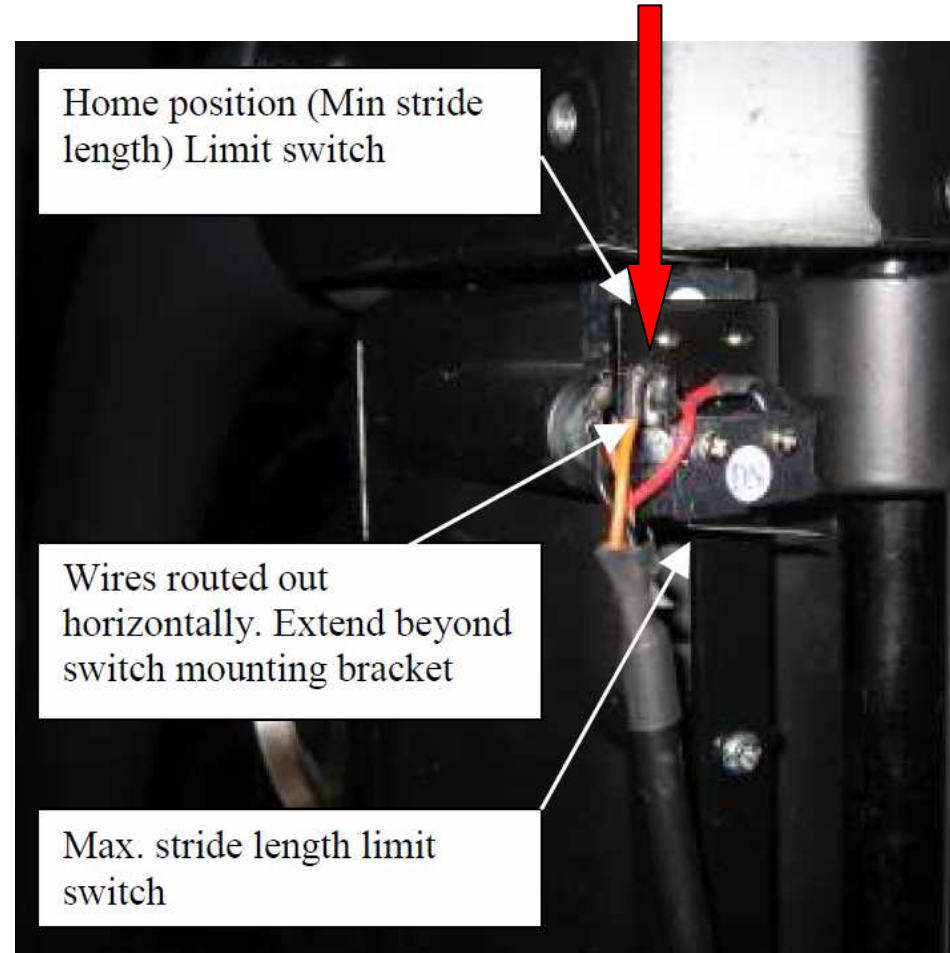
» Basic Troubleshooting – Use diagnostic LED's on the Motor Control Board:

- ♦ If any of the LED's are off and no switch is actuated, you must determine if the cause is a bad switch assembly or if the wire from the switch to the control board has a broken wire.



CT0801101R2 – Errors on Activity Zone Display

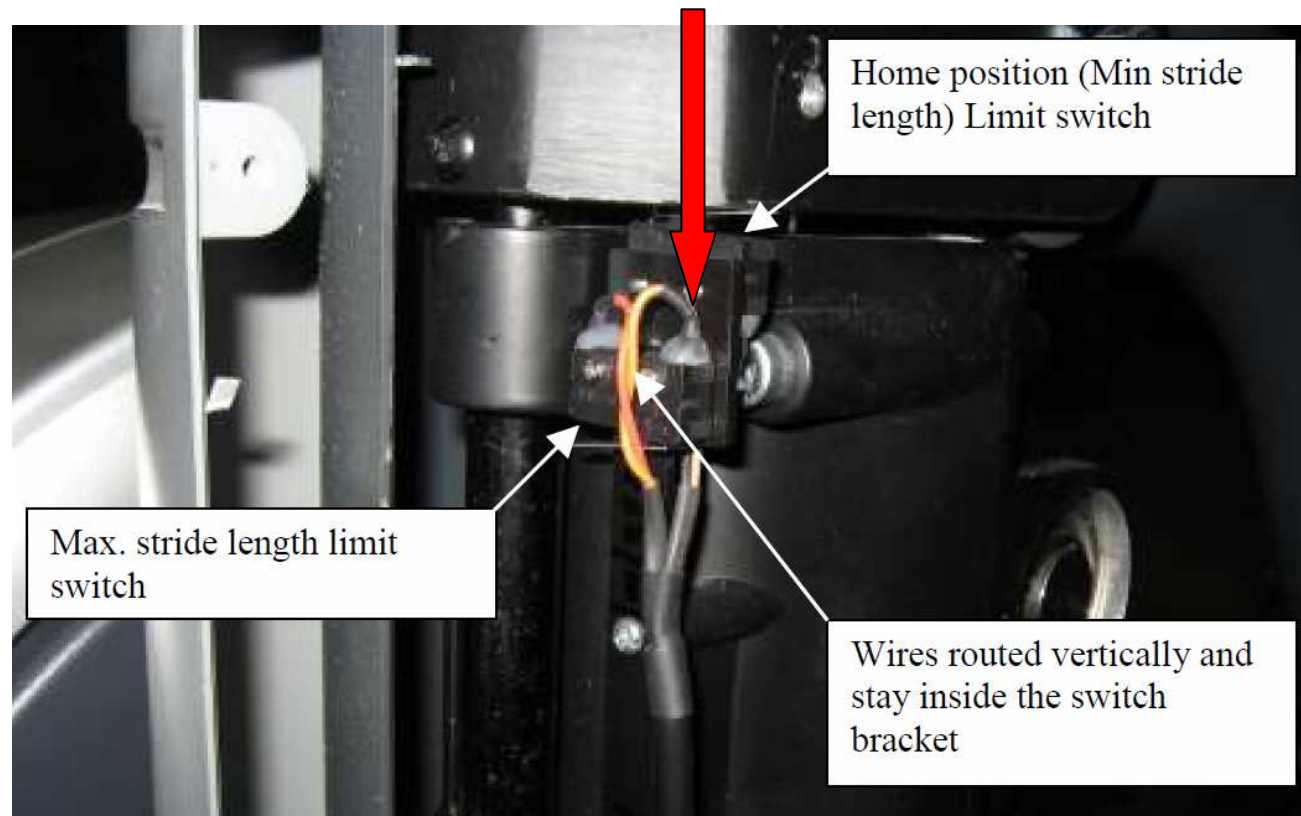
X7 original limit switch wire routing



CT0801101R2 – Errors on Activity Zone Display

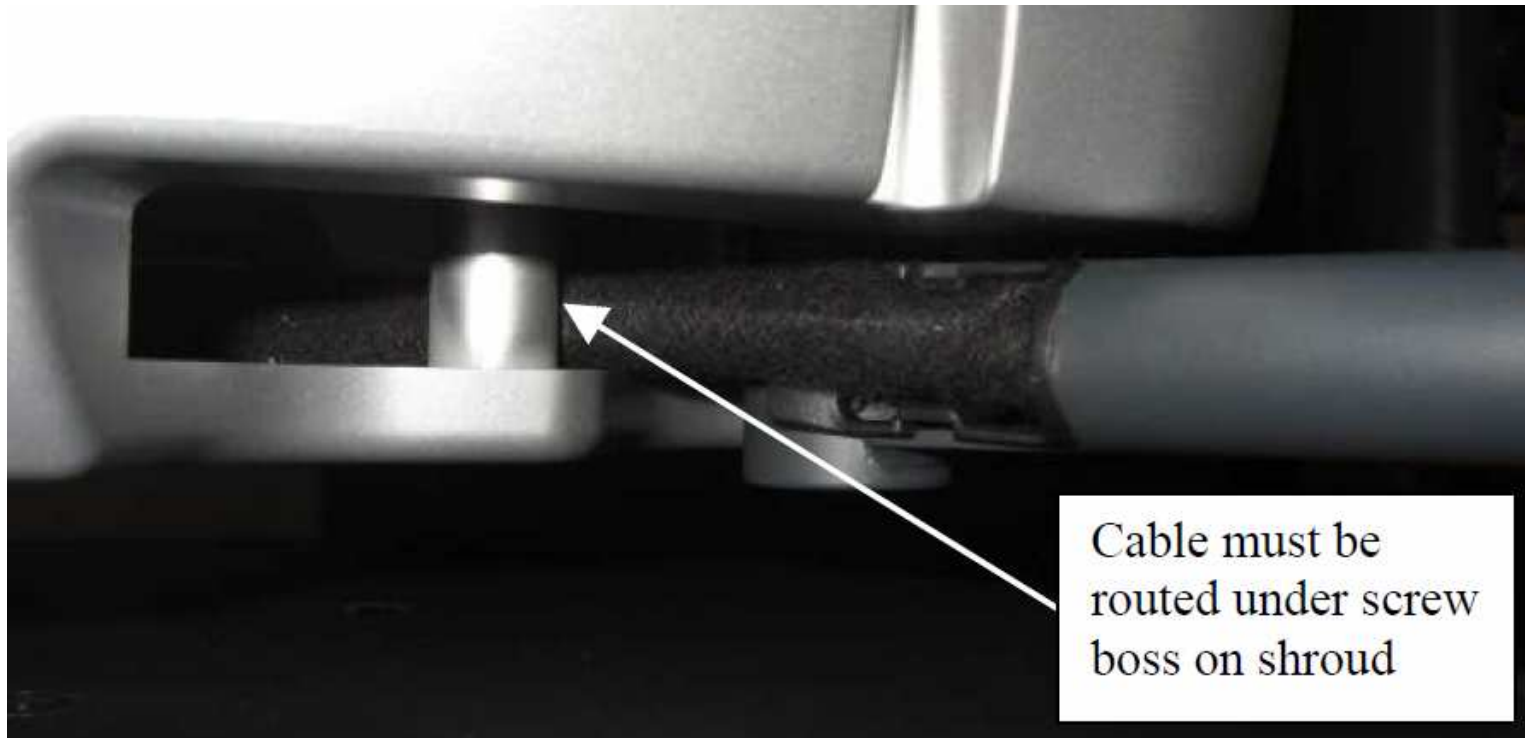
» Possible Solutions:

- ◆ Replace the limit switch assembly with the one with:
 - > Improved limit switch wire routing



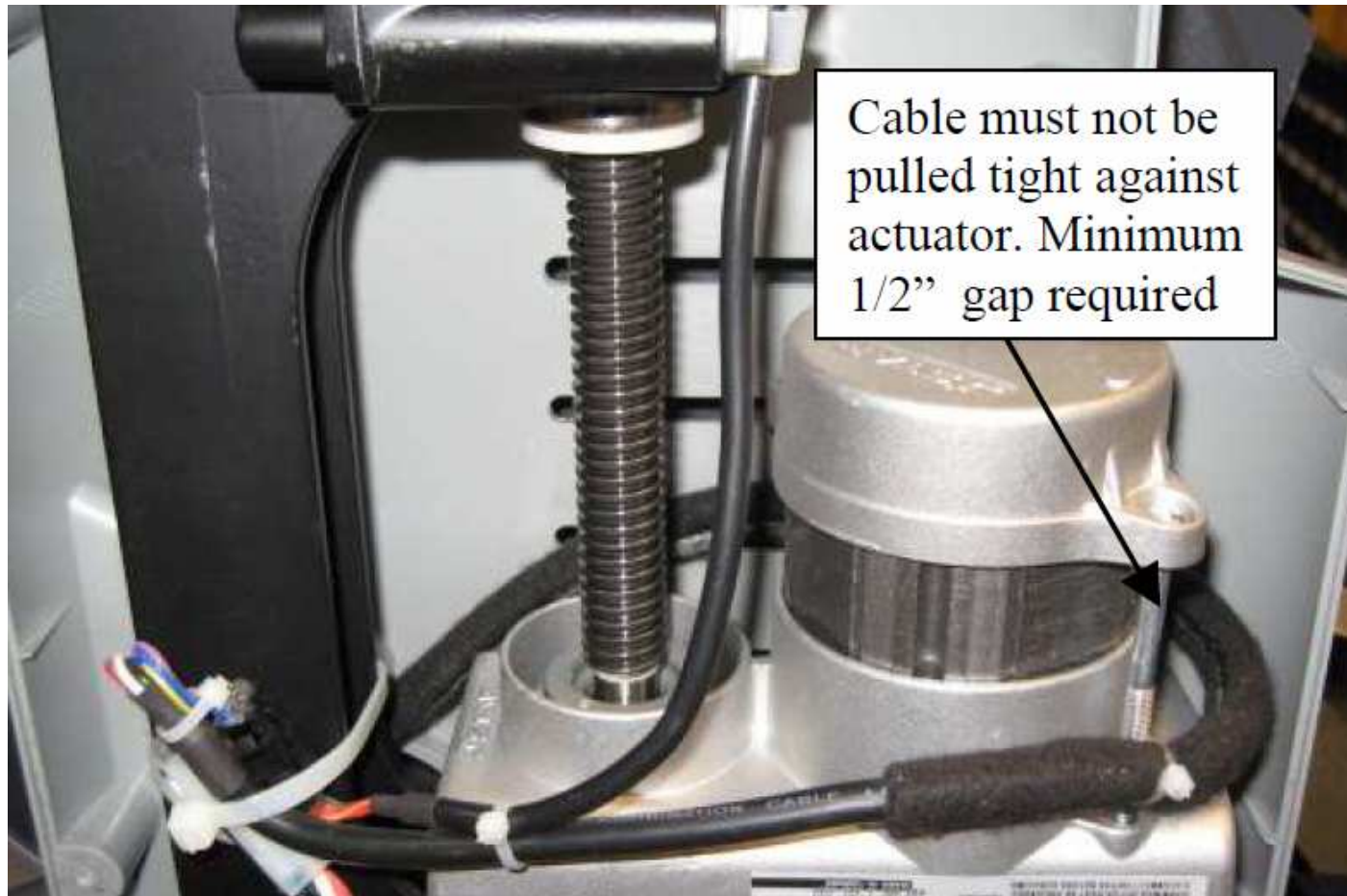
CT0801101R2 – Errors on Activity Zone Display

- ◆ Replace the idler link cable assembly



CT0801101R2 – Errors on Activity Zone Display

- ◆ Follow the instructions

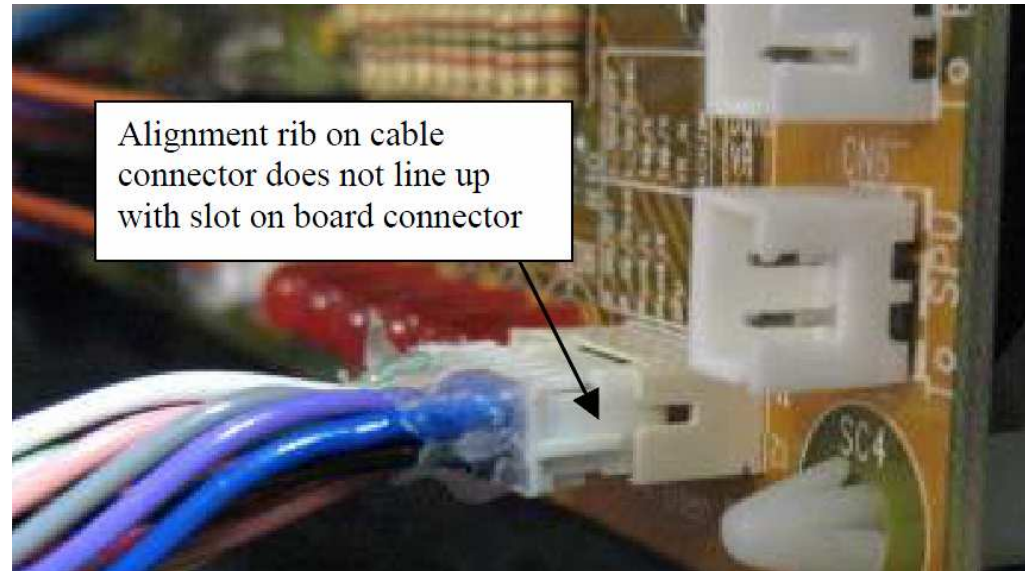


CT09030301N – Activity Zone Control Board Connector

- » Service Bulletin:
- » **Failures reported:**
 - ◆ Activity Zone lit up but screen is blank.
 - ◆ Both actuators at maximum position
 - ◆ Heating up/Burning smell in motors

Possible Cause:

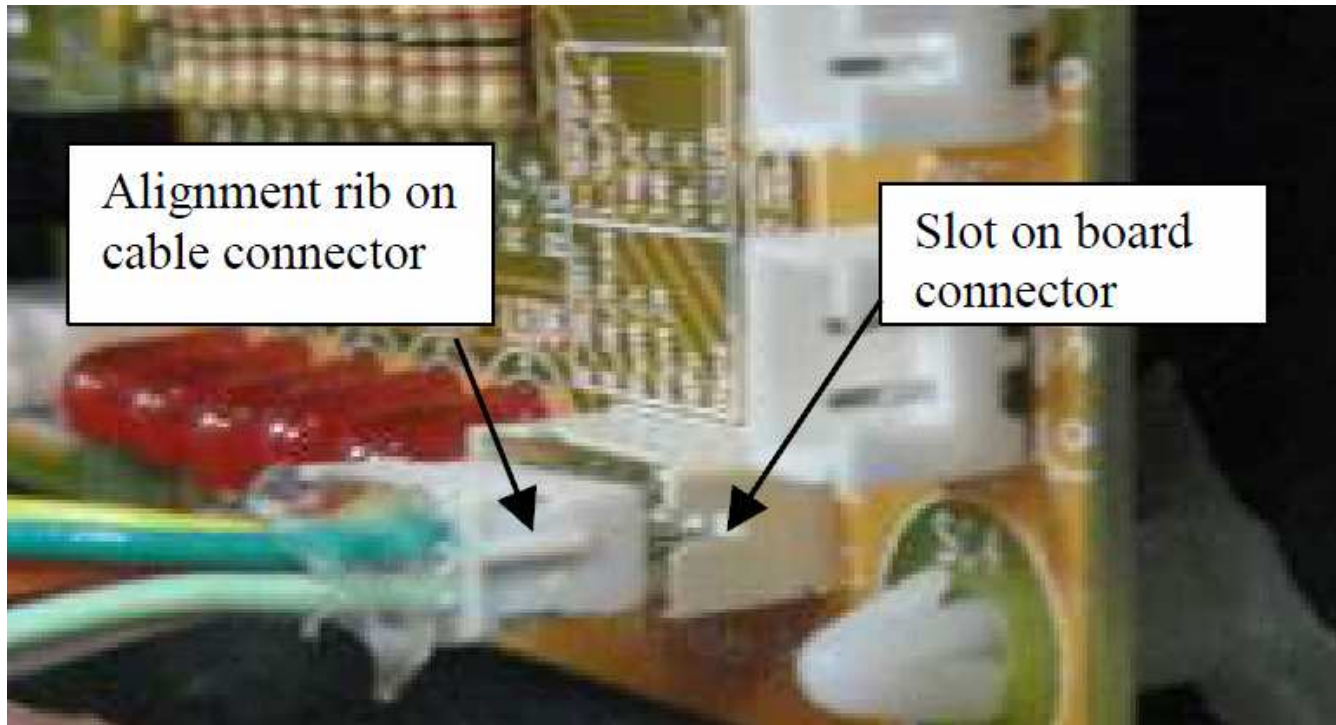
- ◆ Cable from AZ to Motor Control Board installed upside down at the Motor Control Board



CT09030301N – Activity Zone Control Board Connector

» **Solution:**

- ◆ Unplug unit.
- ◆ Reinstall connector at MCB so ribs properly match up



Summary

- ◆ Should the Console be changed for any failures with the Stride adjustment system?
- ◆ Do the Limit Switches cause resistance issues in the X7/X8?
- ◆ Is cable routing of Limit switches or Actuator critical to the Stride adjust system?

Questions





THANK YOU!

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