MATRIX	Troubleshooting Guide: CX Series Training Cycle	
Prepared by: E. de Jonge, J. Sleppy	Date: 12/18/2019	Models Affected: 2018 Training Cycles: CXP (FC24), CXM (FC23) & CXC (FC20)

PURPOSE

Use this document to troubleshoot Matrix Indoor Training Cycles. The Console section applies to the CXP console only; the Frame section applies to all model frames (CXC, CXM, and CXP). The intended users are Matrix (Johnson) Customer Tech Support Representatives & Field Service Techs, but distribution is free.

This guide is intended to be used alongside the CXP Service Manual. Refer to it for error codes and instructions for many tasks directed here. Additional resources are available in Online Remedy

Read and understand the General Troubleshooting and Using this Guide sections before proceeding further.

TABLE OF CONTENTS (TOC)

GENERAL TROUBLESHOOTING

ToC

- **UPDATE TO THE LATEST SOFTWARE VERSION, if possible.**
  - **Reference the Software Update topic if anything unexpected happens.**

- Cycling power is recommended as the first attempt to fix most failures, and after major repairs are implemented.

- To access Service Modes:
  - CXP from idle: Press & hold “MATRIX” logo for ~5 seconds, then type 3001 enter.
  - CXP during workout: Press the “Hamburger” button in upper right. Press & hold on “Options” in upper left until keypad appears, then type 3001 enter.
  - CXM: Hold both left and right arrows for ~5 seconds.

- If multiple, identical machines are available, swap suspected failed parts (console, LCB, cables, etc.) and observe if the failure follows.

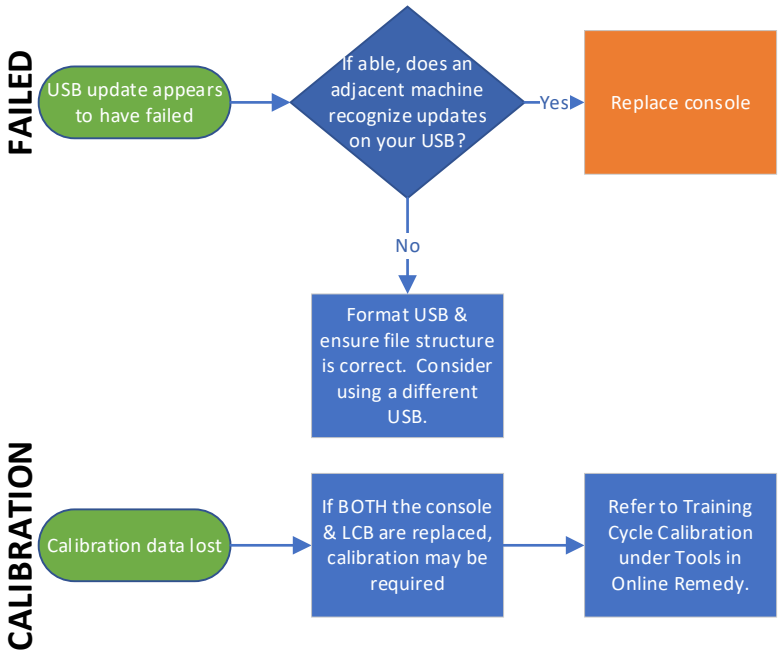
USING THIS GUIDE

Read & understand the General Troubleshooting section above.

Given a problem description, link to the topic that appears most fitting from the ToC on the first page or Find (ctrl-f) by keyword. Find the Green flowchart bubble that best describes the specific issue, and follow the flow through asking questions, taking measurements, and suggesting corrective action. The “Additional Information” section within each topic contains notes and details pertaining to that topic.

After each corrective action is taken, re-evaluate if the failure has been resolved. Some indications have a straightforward order of attempts, and not all steps are always necessary if a lower-level fix resolves the issue.

USB, Update, Failed, Detect



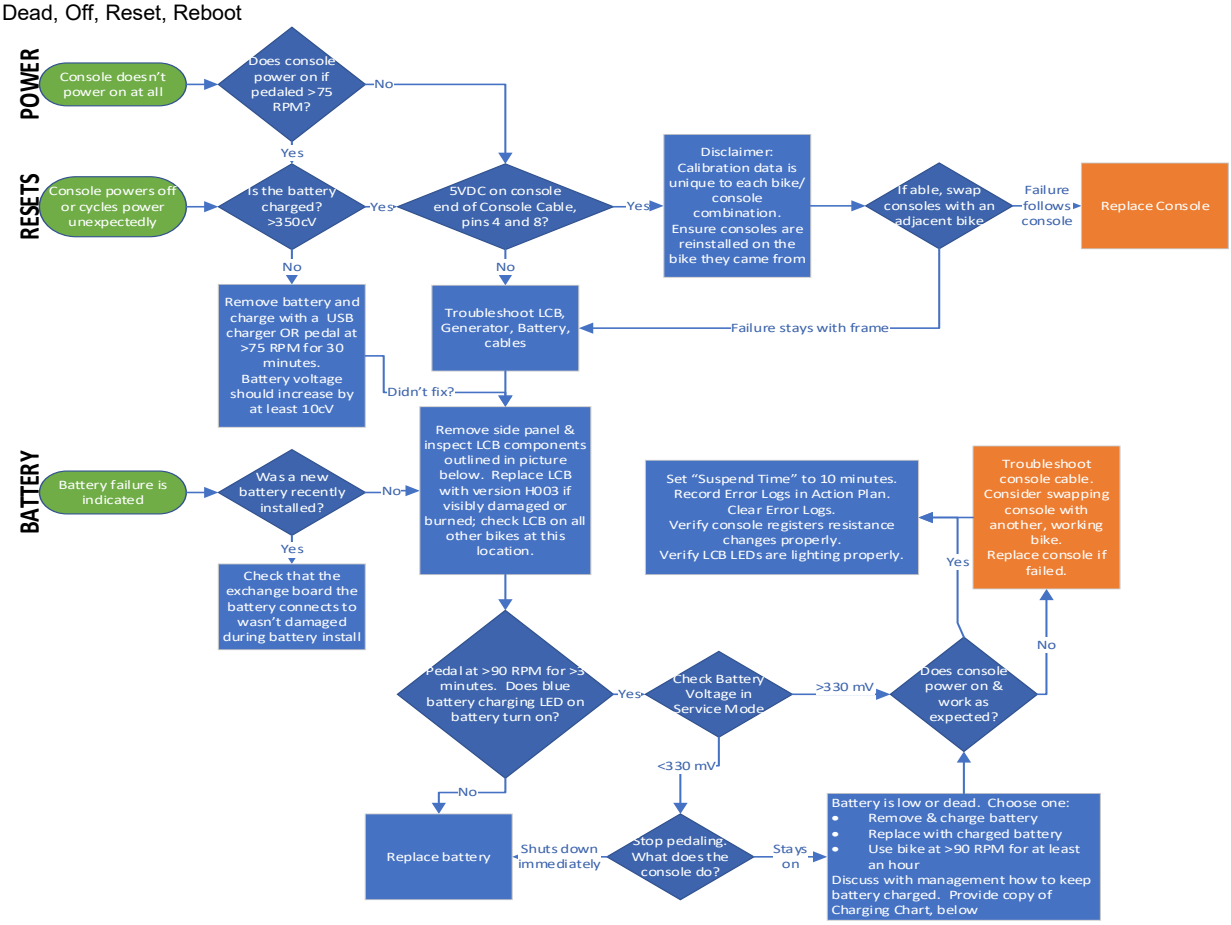
Additional Information

- Do not allow the battery to die during manual updates. Check battery status; charge if low before attempting update.
- Automatic updates via RSCU are preferred over manual USB updates.
- If unable to navigate into software update menus, consider Touchscreen, Display, Freezing, or Power failure.

POWER & BATTERY ISSUES

ToC

Dead, Off, Reset, Reboot



Additional Information

- "Power" issues describe when *nothing* on the console appears to power on. Also consider that the console can freeze on a black screen that can appear as not on.
- Refer to "Battery Information" Appendix 1.

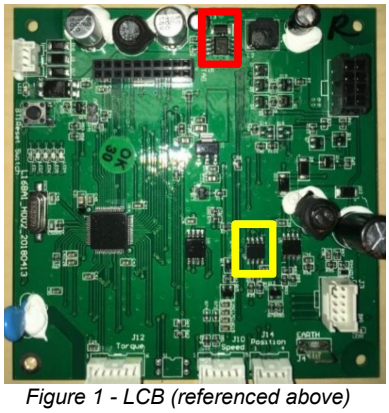


Figure 1 - LCB (referenced above)

RPM RANGE	CXP GENERATOR STATUS	BATTERY CHARGING STATUS
*0-45	No power from generator	Quickly draining battery
45-75	Powering bike, not charging battery	Slowly draining battery
76	Beginning to charge battery	Slowly charging battery
85+	Charging battery at maximum rate	Quickly charging battery

*If the battery is dead, locked, or crashed, the console will turn off immediately if the user pedals below 45 RPM.

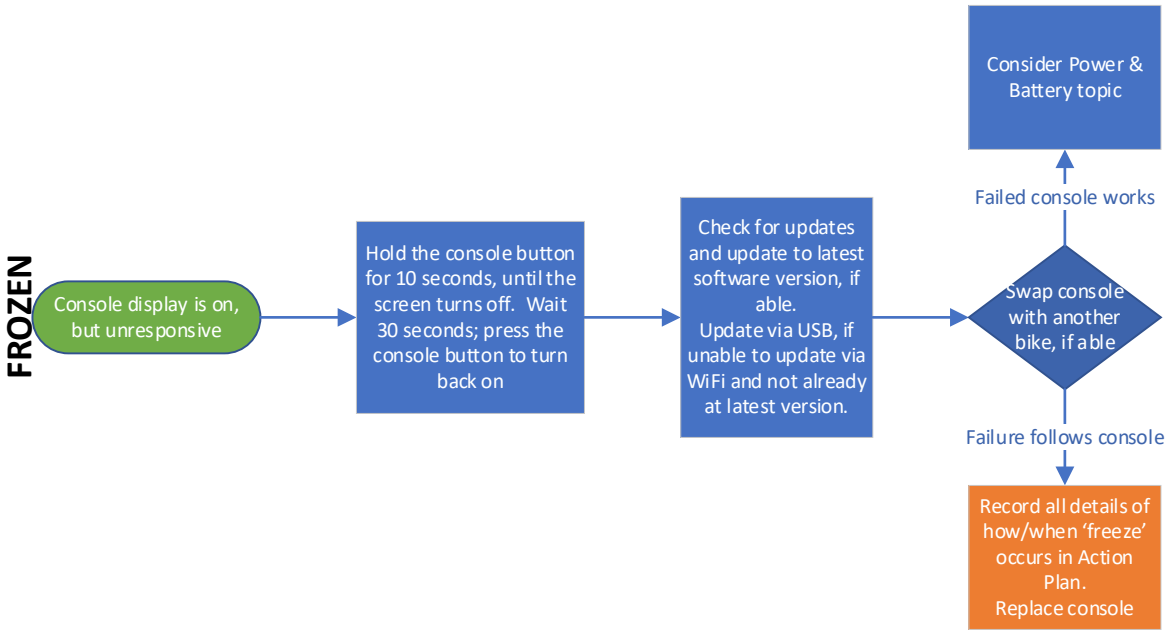
If cycles are not used regularly, check battery levels every 20-25 days and charge any batteries under 350 cV.

Figure 2 - Charging Chart (referenced above)

FREEZING/STALLING

ToC

Frozen, Boot, Lock, Crash



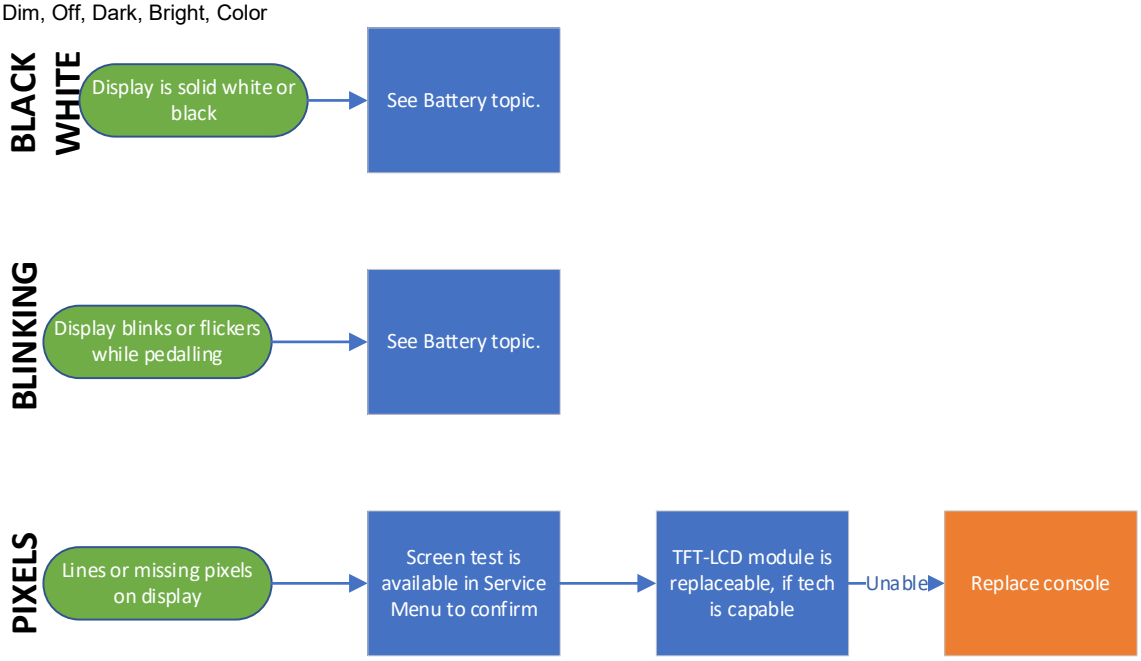
Additional Information

- "Freezing" and "Stalling" (and synonyms) are very general words that mean different things to different people. In this Guide, they are taken to mean the console display is on, objects on the screen may or may not be moving, but no touch or button response is recognized. Be mindful that Touchscreen failures may be reported as freezing.

DISPLAYS

ToC

Lines, Dim, Off, Dark, Bright, Color

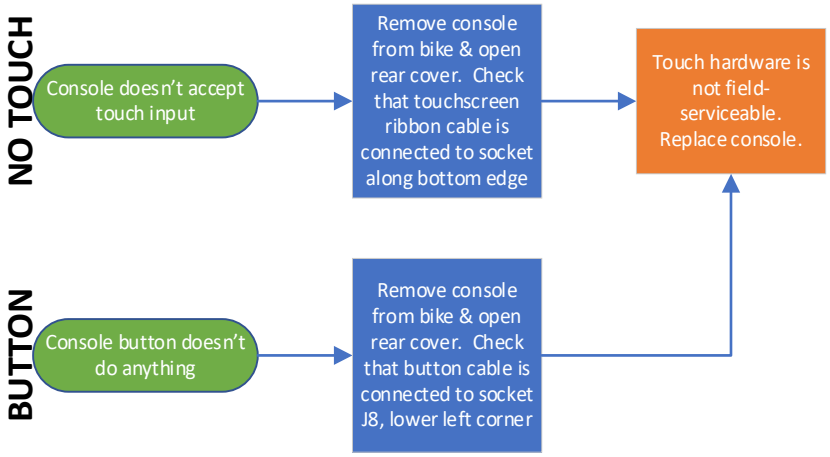


Additional Information

TOUCH RESPONSE

ToC

Sensitive, Hard, Press



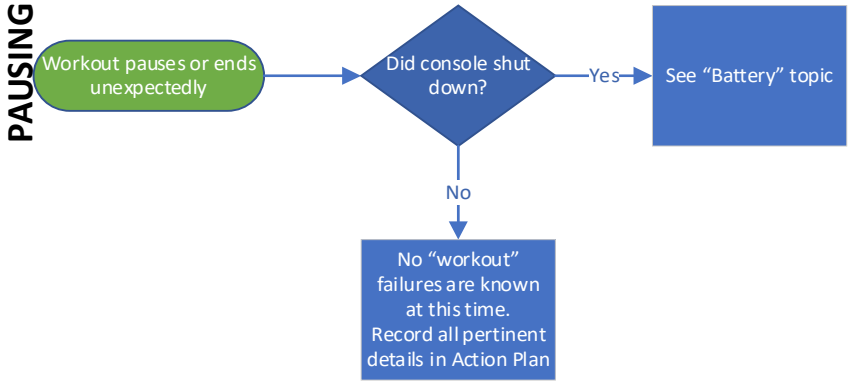
Additional Information

- Sweat, cleaner, water, and other contaminants on the touchscreen frequently cause apparent failures. Properly cleaning the touchscreen is commonly all that's required to resolve.
- Spraying cleaner directly on the screen is not recommended. Spray cleaner on a cloth and wipe the screen with it.

WORKOUTS

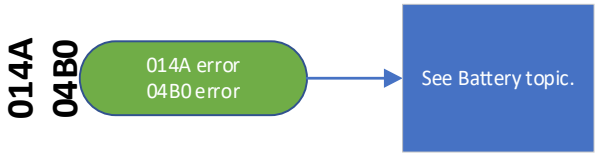
ToC

Programs, Training, Exercise, Pause



Additional Information

- All workouts are maintained by software. If software updates don't resolve issues, hardware failure is indicated.
- Also consider if LCB is working properly if workouts pausing or stopping. LCBs can be swapped between similar frames to troubleshoot. If you swap LCBs or Consoles between bikes to troubleshoot, be sure to return them to their original frames, as they contain critical calibration data.



Additional Information

- Error Codes with a standardized 4-character alphanumeric ID are described in the Error Code List and typically relate to hardware failures. This topic relates to software error messages.

Console Error List

Error Code	Class	Description	Troubleshooting
0301	A	Memory block damage	a. Enter the Engineer mode disable B Level Error, bypass CLASS A and B error code. b. Replace Console.
0306	A	Keypad is abnormal. The keypad remains pressed for 60 seconds	a. Enter the Engineer mode disable B Level Error, bypass CLASS A and B error code. b. Replace Console.

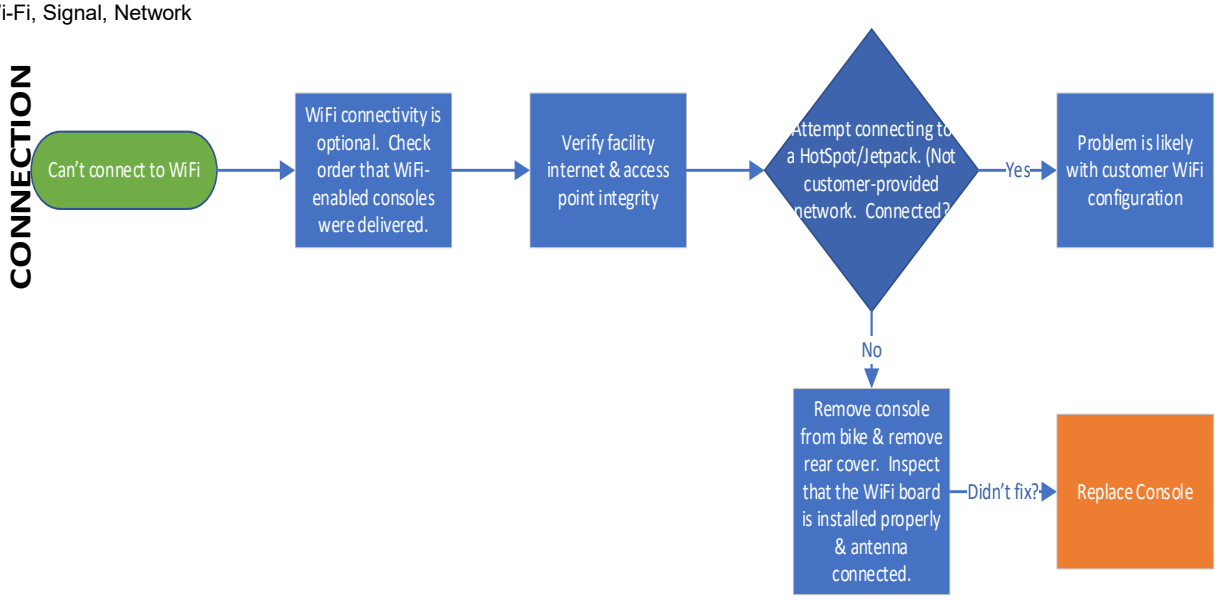
LCB Error List

Error Code	Class	Description	Troubleshooting
0248	B	Battery disconnection or failed LCB	a. Check battery wire connection to LCB. b. Check to see if the battery voltage is less than 2 volt. - If less than 2 volt, replace battery. - If not, replace LCB.
0256	B	LCB doesn't turn-off battery power (LCB failure)	Replace LCB.
02A0	C	Speed error	a. Check the generator wire connection to LCB b. Replace generator.
014A	B	Charging over-current for battery	a. Enter the Engineer mode disable B Level Error, bypass CLASS A and B error code. b. Replace battery.
0250	B	The 2nd speed sensor error	a. Replace the 2nd speed sensor.
0251	B	The communication of position sensor is no response.	a. Enter the Engineer mode disable B Level Error, bypass CLASS A and B error code. b. Check the position sensor and ECB magnet place and perform continuity test. c. Replace position sensor.
0252	B	Torque communication disconnection	a. Check the Torque sensor wire connection to LCB. b. Replace the Torque sensor.
0253	B	Torque circuit broken	a. Replace the Torque sensor.

INTERNET CONNECTION

ToC

Wi-Fi, Signal, Network



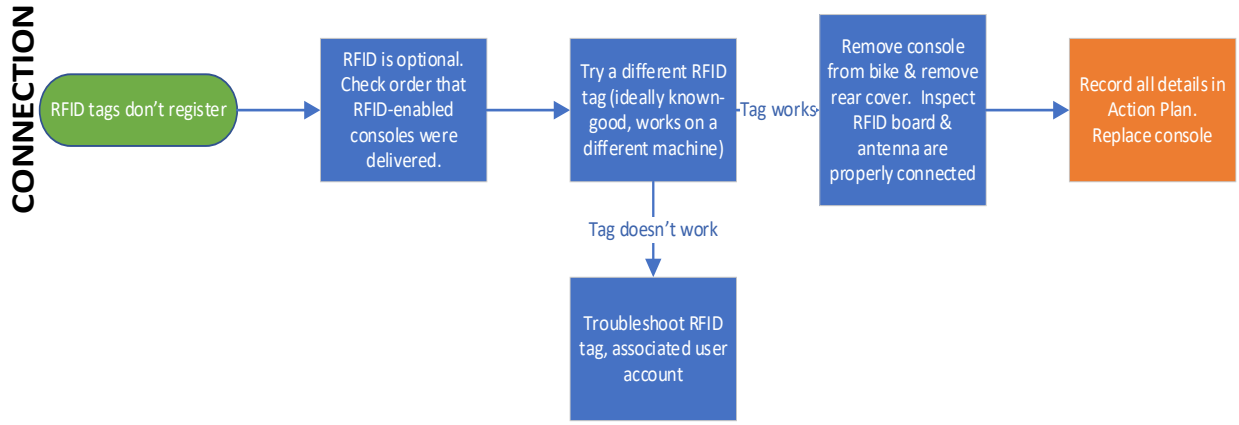
Additional Information

- Internet issues are difficult, because we can't be responsible for the internet at customer sites. Failures are frequently with the network, and not related to our equipment.
- Consoles are programmed to automatically connect to npwireless or rd02. Matrix Tech Support can provide the password, if appropriate. Facilities may have their own networks installed.

RFID & BLUETOOTH

ToC

BT, Signal, Pair, Login



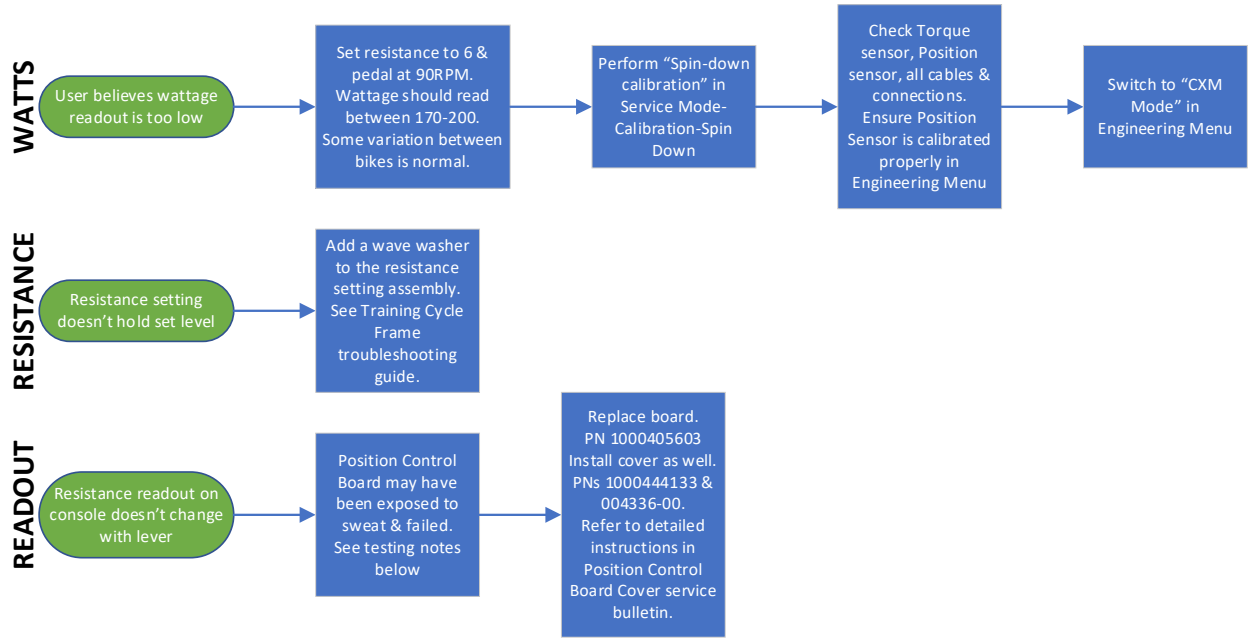
Additional Information

- RFID issues are not known to be common with these consoles.
- RFID issues are difficult, because we can't be responsible for the integrity of the device the customer is attempting to connect. Consider that failures may be with the other device – not our equipment.

SPEED & RESISTANCE

ToC

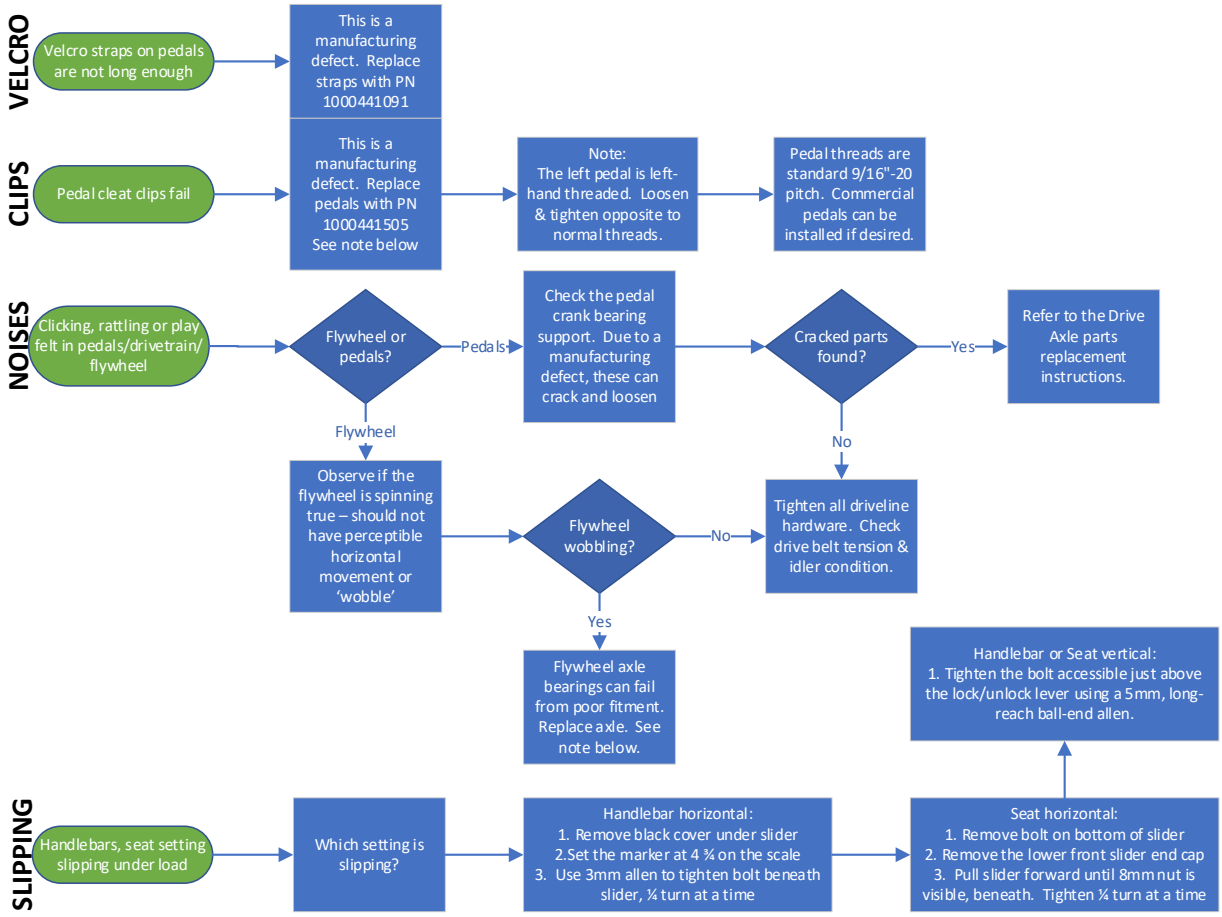
Level, Watts



Additional Information

- Speed Errors & Resistance Errors are rarely related to console failures without an accompanying error code or sensor hardware failure.
- To set resistance brake level 1 position, refer to Training Cycle Frame under Troubleshooting Guides, or section 8.4 of the Service Manual.
- To read the Position Control Board output, find the "resistance_pos" value at the bottom of the Hardware tab in 3001 Service Mode. Reference the following information:
    - 'resistance_pos" should increase with increasing resistance.
    - Resistance Lever at upper stop (minimum resistance), 'resistance_pos' should read approximately 10500 – 17500.
    - Resistance Lever at lower stop (maximum resistance), 'resistance_pos' should read approximately 10500 *greater than* the minimum.
    - If 'resistance_pos' is 0 or greater than 30000, or does not change when the Resistance Lever is moved, check all wiring connections & cables for damage before replacing parts.

Pedal, Axle, Flywheel



Additional Information

- If a pedal clip failed and replacement with PN 1000441505 is directed, also replace all CXC (FC24) & CXM (FC23) bike pedals at that location. This is to prevent a potential user safety concern.
- If directed to replace the flywheel axle, reference the following part numbers.
  - CXP (FC24): 1000407507
  - CXM (FC23): 1000411467
  - CXC (FC20): 1000411467
- Details on many of these frame failures can be found on the CX series product pages in Online Remedy.

CHANGELOG

ToC

Rev#	Date	Author	Changes
	11/19/19	E. de Jonge	Document created. Sent for technical review.
	12/03/19	J. Sleppy	Incorporated changes. Prepared to publish.
1	12/18/19	R. Templeton	Further edits. Ready to publish.
2	3/6/2020	J. Sleppy	Made multiple changes to “Frame” section flowchart to reflect new flywheel failure mode.
3	6/2/20	J.Sleppy	Changes to flowchart on “Power and Battery Issues”. Reference to notes on “Frame” topic, Clips flow. Note added to Additional Information on “Frame” topic.

Older batteries have hardware that can make the battery unable to take a charge, making it “lock up”.

- Batteries marked as “V1.2” are the older design, more prone to locking
- Batteries marked as “V1.4” are improved, and should not fail in this manner

Any “V1.2” batteries removed from cycles in the field should be marked “bad/won’t charge” and sent back to Matrix.

To check the charge of a battery, press the button on the side. Each of the 4 LEDs that illuminate describe 25% or maximum charge.

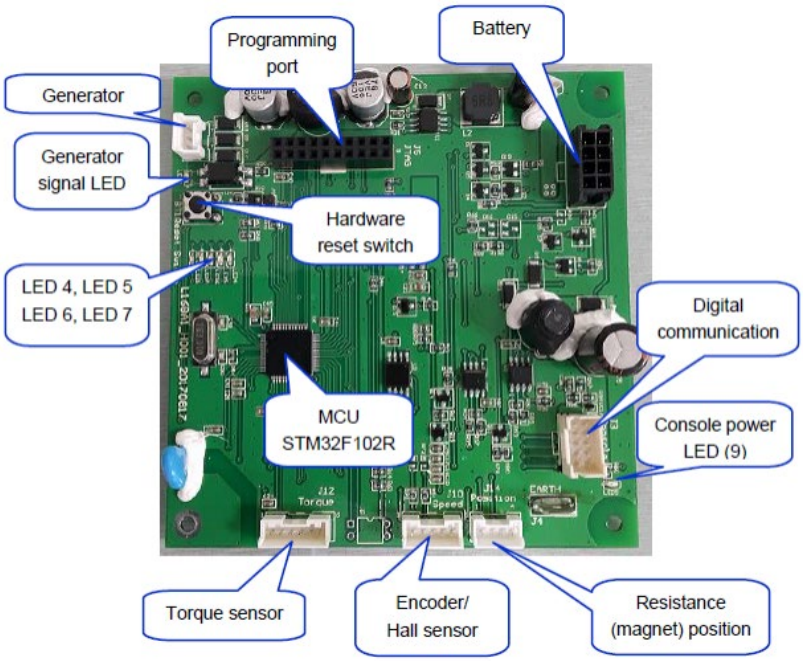
A functioning battery can be removed from the cycle and charged with a standard USB-microUSB cable. To charge multiple batteries at once, a device similar to this 5-port USB Charger can be used.

Periodic charging is recommended when:

- The battery indicates less than 25% charge
- The bike has not been used for an extended period (~1 month or longer)
- The situation dictates that the bike must be useable while pedaling under 75 RPM for extended periods

APPENDIX 2

Each LED on the LCB has useful meaning for troubleshooting & repair.



LED	STATUS
2	Generator signal
4	Software status This LED should blink once per second
5	Error status Lit Red: The LCB has encountered an error
6	Clear To Send (CTS) status for communication Lit Green: Primary mode (LCB active) Off: Secondary mode (LCB passive)
7	Communication status Change LCB Status by commanding one time (?)
9	Console power

Further detail is under development.