

Maintenance correction edition

sop-1-strength-cable-equipment.pdf | Issued 2026-10-04

This correction supersedes the conflicting instructions in the archived original. It is not certification of every model in the brand list or permission to return equipment to service.

Withdraw unsupported shared calibration and acceptance limits

The original biomedical templates are not model-specific calibration or compliance certificates. Withdraw the shared +/-0.1 mph, +/-0.2% grade, +/-3% watts, +/-5% selector-load, 1.5-2.5 mm sensor gap, 1.5% chain elongation, zero-play and 0.5 ohm criteria as universal OEM limits. Withdraw the generic button sequence, 2.30 roller entry and automatic calibration timing; diameter and circumference are not interchangeable. Obtain the exact model, production year, serial range, market, console/controller and service-manual revision before setting a limit. Record the OEM measurement method, instrument uncertainty, applicable leakage/earth tests and As-Found/As-Left results. Electrical input watts do not establish mechanical exercise output. Concept2 self-calibration is not a generic stroke-count calibration. WaterRower Club is belt-driven; its chain test is N/A. All sample records are illustrative, not actual service evidence; a missing final measurement cannot support PASS. No return-to-service or certification is authorized by these examples.

Applicability: match model, production year/serial range, market and manual revision. An edition date is not an equipment production year. Where these are unknown, do not infer a numerical lubrication, adjustment, electrical or clinical specification. Restricted service instructions must be obtained through the owner before approval.

Reviewed sources

S2: [TRACKMASTER TMX428/TMX428CP/TMX58 service manual, revision 6](#).

S3: [NuStep T5/T5XR user manual, revision M](#).

S4: [Concept2 monitor self-calibration explanation](#).

S5: [WaterRower S4 owner's manual](#), manufacturer-hosted.

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Professional visits do not replace routine inspections

Annual, semiannual or quarterly professional service is additional to the OEM's owner/operator routine inspections. Bowflex Xtreme 2 SE requires pre-use inspection; the cited Life Fitness and Matrix schedules require daily cable inspection. For applicable Concept2 chain-drive rowers, retain OEM chain oiling and condition checks, including institutional intervals. Visual inspection remains required. Touch is supplemental only if the OEM procedure permits it; neither touch nor visual inspection guarantees absence of hidden strand damage. Withdraw 'only reliable method' claims. Remove suspect equipment from service and replace affected parts under the applicable OEM procedure.

Applicability: match model, production year/serial range, market and manual revision. An edition date is not an equipment production year. Where these are unknown, do not infer a numerical lubrication, adjustment, electrical or clinical specification. Restricted service instructions must be obtained through the owner before approval.

Reviewed sources

S14: [Bowflex Xtreme 2 SE owner's manual](#), Safety/Maintenance.

S15: [Life Fitness strength maintenance schedule](#).

S16: [Matrix Aura G3-MS20 owner's manual](#).

S17: [Concept2 RowErg maintenance](#).

Archived original follows

The following pages preserve the supplied original for historical comparison. Conflicting instructions, numerical limits and example certifications are superseded by the correction pages above. They must not be used as current service instructions.

[Download the unchanged original PDF](#)



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Clinical Calibration & Safety Protocol

Standard Operating Procedure for Cable-Based Rehabilitation & Resistance Equipment

DOCUMENT ID: HFR-SOP-BIO-005

REVISION: 2.1 (Clinical Grade)

EFFECTIVE DATE: August 2026

SERVICE REGION: Tampa Bay Metro

STANDARDS: Clinical PM & Audit Trail

1. CLINICAL GOVERNANCE & PATIENT SAFETY MANDATE

In physical therapy and cardiac/orthopedic rehabilitation environments, cable- and pulley-based resistance equipment delivers a prescribed, protocol-driven load rather than general fitness training. A pulley system carrying uneven friction, or a cable stack applying 8 lbs of actual resistance when the selector indicates 5 lbs, directly alters a patient's prescribed exertion beyond their clinician-set threshold. Undetected cable wear introduces acute injury risk on top of this: internal strand failure is completely invisible until catastrophic rupture under load. Heartbeat's Biomedical Division enforces mandatory tactile cable inspection and resistance-load verification (As-Found vs. As-Left) on every clinical service visit.

2. FOUR-STEP BIOMEDICAL PREVENTIVE MAINTENANCE & CALIBRATION PROTOCOL

STEP 1 Baseline Specification Mapping

Identify machine OEM factory tolerance thresholds from clinical service documentation. Benchmark target parameters including resistance-to-load ratios, pulley reduction ratios, and cable tension specifications.

STEP 2 Multi-Point Load & Travel Verification

Perform dynamic physical testing across the full resistance range: verify actual applied load against console/selector-pin indicated value at low, mid, and high stack positions; confirm uniform cable travel with no binding.

STEP 3 Tactile Cable Inspection & Mechanical Alignment

Perform full-length gloved tactile inspection of all load-bearing cables to detect internal kinks, soft spots, or core deformation invisible to the eye. Lubricate, align, or replace guide rods, pulleys, or bushings measuring friction beyond tolerance.

STEP 4 Clinical Audit Trail & Certification Sign-Off

Affix tamper-evident calibration certification tags with asset ID, technician initials, and due date. Generate a digital service report cataloging cable condition, pulley alignment, guide rod wear, and frame structural integrity.

CRITICAL CLINICAL ACCEPTANCE TOLERANCES

- **Resistance Load Accuracy:** $\pm 5\%$ of console/pin-indicated load across full stack range
- **Cable Travel:** 100% uniform resistance through full range of motion, zero binding
- **Guide Rod Alignment:** Zero measurable lateral play at full extension

SAFETY CONDEMNATION CRITERIA: Any device exhibiting frayed cable coating with visible inner core distortion, a cracked or deformed guide rod, or a weight stack that fails to fully seat must be immediately tagged CONDEMNED / OUT OF SERVICE.

- **Cable Fatigue:** Any detected internal strand separation ("bird-caging") is grounds for immediate replacement
- **Frame Structural Integrity:** Zero visible or tactile weld cracking at load-bearing points
- **Weight Stack Seating:** Full, positive stack engagement required at every selector position

● 3. STEP-BY-STEP TECHNICAL CALIBRATION SEQUENCE (SELECTORIZED CABLE STATIONS)

STEP	PROCEDURAL ACTION & CONSOLE INTERACTION	VERIFICATION PARAMETER	TECHNICAL TOLERANCES & NOTES
1	Isolate & Power Down: Disconnect power (electromagnetic units) or fully unload the weight stack (pin-selected units).	Stack rests at zero load; cable slack confirmed throughout.	Never inspect a loaded cable or stack under tension.
2	Visual Cable Path Inspection: Trace the full cable path across every pulley for visible fraying, discoloration, or misalignment.	No visible core exposure; cable rides centered on each pulley.	Visual check alone is not sufficient — proceed to tactile check.
3	Full-Length Tactile Cable Check: Run a gloved hand along the entire cable length, feeling for kinks or flat spots.	No irregularities felt; consistent diameter throughout the cable.	The only reliable method to catch internal strand failure.
4	Resistance Load Verification: Apply a calibrated load gauge at low, mid, and high stack positions.	Reading within ±5% of indicated load at all three positions.	Document As-Found value before any adjustment.
5	Pulley & Guide Rod Friction Check: Cycle the full range of motion by hand; feel for binding or grinding.	Motion is smooth and uniform through the full travel.	Binding often indicates a dry bushing, not a cable problem.
6	Adjust & Re-Verify: Lubricate, align, or replace components as needed; re-run the load verification.	As-Left reading matches target within ±5% tolerance.	Record both As-Found and As-Left readings in the compliance log.
7	Weight Stack Seating Check: Cycle the selector pin through every position; confirm full engagement.	Stack seats fully and consistently at every position.	A stack that fails to fully seat is a condemnation trigger.

● 4. CLINICAL FIELD VERIFICATION CHECKLIST & EQUIPMENT AUDIT LOG

ASSET ID / TAG	EQUIPMENT MAKE & MODEL	SERIAL NUMBER	CABLE INTEGRITY	GUIDE ROD PLAY	AS-FOUND LOAD	AS-LEFT LOAD	CLINICAL STATUS
CR-CB-01	Cybox Eagle Cable Column	SN-773510-C	✓ PASS	0.0 mm	42 lbs / 8%	45 lbs / 5%	CERTIFIED
CR-CB-02	Keiser Functional Trainer	SN-773588-C	✓ PASS	0.2 mm	18 lbs / 4%	20 lbs / 2%	CERTIFIED
PT-CB-04	Dual Adjustable Pulley	DAP-702-91	Internal fraying	N/A	—	Replaced cable	TAGGED / OK
[Blank Log]			[] PASS [] FAIL	___ mm	___ lbs / ___%	___ lbs / ___%	[] PASS [] COND

LEAD BIOMEDICAL FIELD ENGINEER

Name: _____

Certification ID: _____

Signature: _____

HOSPITAL / FACILITY CLINICAL DIRECTOR

Facility Name: _____

Authorizing Sign: _____

Inspection Date: _____

CALIBRATION AUDIT TRAIL STATUS

Compliance: Annual PM Protocol Complete

Next Due Date: _____

Emergency Dispatch: 727-512-5120

SCHEDULE CERTIFIED BIOMEDICAL SERVICE

Heartbeat Fitness Repair's Biomedical Division performs this full calibration and safety protocol on-site, with a complete clinical audit trail for facility compliance records.

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