

Maintenance correction edition

sop-2-elliptical-stepper-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.

NuStep clinical measurement and electrical scope

NuStep T5/T5XR user manual 50274-01 revision M says heart-rate, watts, METs and calorie displays are not suitable where patient health and safety depend on their accuracy. A generic calibration certificate does not override this restriction. These models use batteries and an optional specified isolated power supply; dedicated-mains/protective-earth tests are not automatically applicable. Use the device classification, approved supply and facility/OEM test procedure; record inapplicable tests as N/A, not PASS.

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

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

Maintenance correction edition

sop-2-elliptical-stepper-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.

Maintenance correction edition

sop-2-elliptical-stepper-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.

Model-specific electrical installation and protection

Replace universal 120 V / 15-20 A, no-GFCI and direct-wall-with-no-exceptions rules with the model nameplate, market-specific OEM installation requirements and local electrical rules. Keep the warning against shared power strips, but allow OEM-required approved surge protection; the NTL11219.3 manual requires a compliant surge suppressor. A lamp test does not verify capacity, grounding or loaded voltage. Never bypass required GFCI protection; have an electrician resolve compatibility. Repeated trips require diagnosis, not simply another outlet.

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

S7: [NordicTrack Commercial 1750 NTL11219.3 manual](#), manufacturer CDN, Electrical Power and Maintenance/Troubleshooting.

S12: [Life Fitness Integrity CLST operation manual](#), Electrical Requirements and PM.

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](#)



HEARTBEAT FITNESS REPAIR

BIOMEDICAL DIVISION • CLINICAL CALIBRATION & SAFETY PROTOCOL

Factory-trained biomedical engineering for hospital, clinical & commercial fitness equipment

(727) 512-5120 • service@theequipmentfixer.com • TheEquipmentFixer.com

Clinical Calibration & Safety Protocol

Standard Operating Procedure for Elliptical, Cross-Trainer & Recumbent Stepper Equipment

DOCUMENT ID: HFR-SOP-BIO-006

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 cardiac and orthopedic rehabilitation environments, low-impact ellipticals and recumbent steppers (including NuStep and SciFit clinical units) deliver a prescribed resistance workload calibrated to a patient's target Metabolic Equivalent of Task (MET) and heart rate zone. A resistance system drawing 12 watts of actual output when the console indicates 10 watts alters the patient's real cardiovascular workload beyond their clinician-set threshold, introducing unmonitored strain and invalid diagnostic data. Heartbeat's Biomedical Division enforces rigid dual-reading tolerances (As-Found vs. As-Left) to ensure all facility resistance systems maintain hospital-grade calibration and liability compliance.

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/watt curves, electromagnetic brake air-gap spec, and stride pivot tolerances.

STEP 2 Multi-Point Operational Dynamic Verification

Perform dynamic physical testing across graduated resistance tiers: verify actual watt output against console display at low, medium, and high resistance levels. Confirm stride motion carries zero lateral play at the arm and stabilizer pivots.

STEP 3 Dual-Reading Calibration & Mechanical Alignment

Where resistance output has drifted beyond permissible clinical thresholds ($\pm 3\%$ watt accuracy), enter console engineering mode to adjust brake air gap and recalibrate the resistance potentiometer. Both As-Found and As-Left readings are formally recorded.

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 resistance accuracy, pivot bushing wear, and grounding integrity.

CRITICAL CLINICAL ACCEPTANCE TOLERANCES

- **Resistance / Watt Accuracy:** $\pm 3\%$ of console-indicated output across full range
- **Stride Lateral Play:** Zero measurable play at arm and stabilizer pivots
- **Sensor Air Gap:** 1.5 mm to 2.5 mm brake-to-flywheel clearance, no physical contact

SAFETY CONDEMNATION CRITERIA: Any device exhibiting grounding resistance $> 0.5 \Omega$, measurable lateral play at the main stride pivot, or failing emergency stop response must be immediately tagged CONDEMNED / OUT OF SERVICE.

- **Emergency Braking:** Immediate stop response, < 1.5 sec shutoff on E-stop or handle release
- **Electrical Grounding:** Direct dedicated circuit; strictly zero GFCI nuisance trips
- **Pivot Bushing Wear:** Zero measurable lateral play at full stride extension

● 3. STEP-BY-STEP TECHNICAL CONSOLE CALIBRATION SEQUENCE (RESISTANCE SYSTEMS)

STEP	PROCEDURAL ACTION & CONSOLE INTERACTION	VERIFICATION PARAMETER	TECHNICAL TOLERANCES & NOTES
1	Enter Calibration Mode: Power down fully. Press & hold [Mode] and [Resistance +] simultaneously, then power on.	Console displays 'Engineering Mode' or flashes a service prompt.	Confirm unit is fully unloaded before entering calibration.
2	Configure Resistance Units: Toggle to select Watts or resistance-level display.	Display shows 'Watts' or programmed level scale.	Must match hospital protocol resistance units.
3	Verify Brake Air Gap: Remove access panel; measure brake-to-flywheel clearance with a feeler gauge.	Gap measures within 1.5 mm to 2.5 mm.	Gap drift is the leading cause of silent resistance error.
4	Set Resistance Range: Confirm minimum and maximum programmable resistance levels against OEM spec.	Displays 'Min Level' then 'Max Level' matching spec.	Critical for low-resistance cardiac rehab protocols.
5	Execute Automated Self-Calibration: Press [Start]. Unit cycles through resistance tiers automatically.	Resistance ramps through low, medium, and max levels in sequence.	Takes 60–120 seconds; do not interrupt the cycle.
6	Apply Calibrated Load Verification: Use a calibrated watt meter at each tier; compare to console-displayed value.	Reading within ±3% of console-indicated output at all tiers.	Document As-Found value before any adjustment.
7	Verify Pivot & Stabilizer Play: Grip each arm and pedal; check for lateral movement at full extension.	Zero measurable play at any pivot point.	Any play detected requires bushing service before sign-off.

● 4. CLINICAL FIELD VERIFICATION CHECKLIST & EQUIPMENT AUDIT LOG

ASSET ID / TAG	EQUIPMENT MAKE & MODEL	SERIAL NUMBER	PIVOT PLAY	GROUNDING (<0.5Ω)	AS-FOUND RESISTANCE	AS-LEFT RESISTANCE	CLINICAL STATUS
PT-ER-01	NuStep Recumbent Stepper	NS-T5XR-410	✓ PASS	0.10 Ω PASS	Level 4: -12W	Calibrated ±2W	CERTIFIED
PT-EL-02	SciFit Recumbent Elliptical	SF-E7-2291	✓ PASS	0.14 Ω PASS	18W / drift +9%	20W / ±2%	CERTIFIED
PT-EL-05	Precor EFX Cross-Trainer	PC-EFX-8814	Play at 0.4mm	0.09 Ω PASS	22W / drift +6%	Bushing replaced	TAGGED / OK
[Blank Log]			[] PASS [] FAIL	___ Ω [] PASS	___ W	___ W	[] 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.

PHONE
(727) 512-5120

EMAIL
service@theequipmentfixer.com

WEB
TheEquipmentFixer.com