

Priming Protocol Guide v0.x



Know your readiness
before you train.

What Determines the Quality of Training or Competition

Even perfectly planned sessions can fail if the athlete's **neuromuscular system isn't ready** to perform. Muscle fatigue, CNS exhaustion, or incomplete recovery can reduce force output by 15-25% without anyone noticing — until performance drops!

Monitoring this invisible readiness factor is the fastest way to keep training stimulus optimal, injury risk low, and maximal performance outbursts timed to perfection. This is precisely what Priming Protocol enables — **a simple objective check of**

With Priming, you know your strength capacity before you train — not after you're already tired.

Read on to learn **How to apply Priming Protocol** with Tendo Force and how it can redefine your daily training routine.

Priming Protocol — Guided Manual Edition (v0.x)

This edition provides structured human-guided interpretation while keeping coaches in control, supported by objective guardrails.

Optional automated decision support will be introduced in future software-enabled versions.

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Why Use Isometric Principles to Test Readiness

Isometric testing isolates the ability to generate force without the confounding variables of motion or technique.

This makes it uniquely sensitive to both **central (CNS)** and **peripheral** fatigue.

Why coaches rely on it:

- Detects neuromuscular fatigue before visible technical breakdowns or poor performance.
- Allows daily, non-fatiguing testing — safe even mid-season.
- Produces consistent data (typical test-retest reliability > 0.95 ICC).
- Closely correlates with dynamic 1RM.

Did you know?

In studies comparing the isometric squat at 90° to the dynamic 1RM back squat, correlations exceeded $r = 0.91$. The isometric squat showed, however, higher reliability than most dynamic strength tests — making it ideal for daily readiness tracking (Tillin & Folland, 2014). This means the numbers you see on the Tendo Force display can be used to estimate real-world performance safely and instantly.

But

Why choose between isometrics and dynamic? Pick the best of both worlds.

Measure readiness with isometrics.

Train performance with velocity.

Together, you control both.



How Isometrics and Dynamics Work Together

Dynamic lifts express the **outcome** of strength.

Isometric tests show the **capacity** behind it.

Used together, isometric (Priming) and dynamic (Velocity-Based Training), form a closed feedback loop. This combination offers safer and more effective progression throughout the season, both in-season and off than any of the methods alone.

Find out more about how to integrate Priming into your VBT sessions [here](#).

1.

Priming

Priming indicates today's available strength and informs the following workload (1RM).



2.

Velocity-Based Training

VBT uses the revealed 1RM and adjusts the load in real-time to match the goal of the day.



Research Spotlight: Coaches who adjusted loads based on daily readiness maintained higher power outputs over 6 weeks compared with fixed-load programs. (James et al., 2020). Take the load personalisation a step further with Priming and see the performance progression skyrocket.

How to Start with Priming

Priming with Tendo Force is designed for speed and simplicity. One device, one movement, and a few seconds are enough to reveal an athlete's readiness.

Start simple.

Choose one lower-body and one upper-body position.

Use the same time of day, same angle, and same warm-up conditions.

Recommended Tests:

- **Isometric Waist Squat (90° knee angle)** = Lower-body readiness
- **Isometric Standing Bench Press** = Upper-body readiness

Both take < 2 minutes and require no special preparation.

Athletes receive immediate feedback — turning testing into motivation.

Why It Works:

- Minimal setup and zero load = no fatigue
- Whole-chain testing (squat or press) mirrors real athletic force expression
- Immediate feedback drives motivation and intent

Did you know?

Real-time feedback during isometric testing increases intent and measurable force output by 5-10% (Weakley et al., 2020).

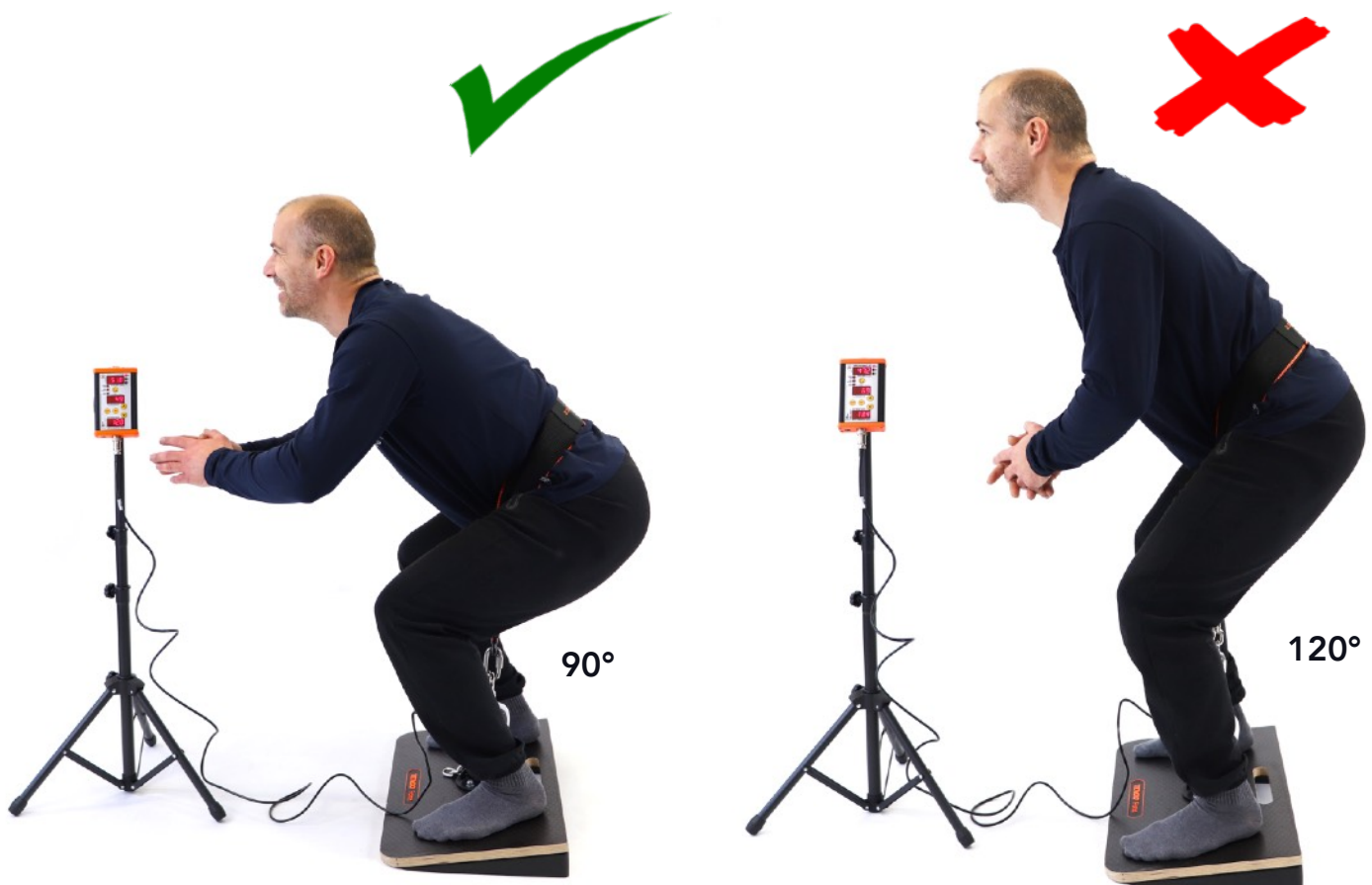


Lower-Body Priming Protocol

Isometric Waist Squat

Why This Test

The **isometric waist squat** provides a precise and repeatable snapshot of lower-body strength capacity and neuromuscular readiness. It isolates the athlete's ability to generate force at **the most fatigue-sensitive joint position — the 90° knee angle** — and avoids the variability of loaded squats technique.



Why 90° knee angle and not 120°?

Because you're only as strong as your weakest point.

If you're strong at 90°, you are most certainly strong at 120° too. But if you're strong at 120°, it doesn't automatically imply that you're also strong at the most critical 90°.

Why Measure at the Waist and Not the Mid-Thigh

Traditional lab testing often uses the isometric mid-tight pull, which requires a barbell, precise hand placement, and consistent grip technique.

While the mid-tight pull is accurate in controlled conditions, it introduces unnecessary variability in the field — grip strength, bar height, body sway, and upper-body fatigue can all distort the results — all easily avoidable with a simple waist squat.



Research Spotlight: Studies comparing mid-thigh and waist-anchored setups show similar correlations with dynamic 1RM ($r \approx 0.9$). However, the waist position yields higher reliability ($ICC > 0.95$) and lower measurement error due to reduced technical variation (Beckham et al., 2019; Drake et al., 2018).

Why Use the Inclined Platform

The inclined platform that comes with Tendo Force isn't just for comfort. It's a biomechanical control tool. It standardises both joint angles and weight distribution, ensuring consistent testing conditions across sessions and different athletes.

Consistent body geometry

The incline naturally aligns the athlete's ankles and knees at the same angle every time, improving measurement reproducibility.

Reduced sway

The slight forward lean stabilises the centre of mass, minimising body movement that can distort force readings.



Improved comfort and intent

Athletes feel grounded and stable, which encourages higher, more confident force output.

Cross-athlete comparability

Identical foot position and angle remove one of the biggest sources of between-test variation.

Did you know?

Even a 1-2cm change in heel elevation can alter measurement force by 2-3% (Beckham et al., 2019). The integrated platform keeps this variable locked in. One setup, consistent testing every time.

Key Advantages of Isometric Waist Squat:

- High sensitivity to central and peripheral fatigue.
- Low technical variability, ensuring string test-retest reliability (ICC > 0.95, Tillin & Folland, 2014)
- Safe and non-fatiguing — can be repeated daily without affecting training.
- Direct correlation with dynamic 1RM squat ($r \approx 0.9$, Murphy et al., 1995).

Setup Checklist:

- Tendo Force microcomputer
- Tendo Force inclined platform with sensor and chain
- Waist belt with carabiner
- Low bench or box for initial positioning
- Goniometer (app or manual) for knee angle confirmation



Testing Protocol - Step-By-Step

• Preparation:

1. Reset the Tendo Force unit to zero before each new athlete.
Note: No force must be applied when resetting the unit.
2. Remove shoes to standardise foot position and minimise height variation.
3. Stand on the platform with feet shoulder-width apart, toes forward.
4. Adjust belt and chain length so the knee angle is exactly 90° (acceptable range $80-90^\circ$).

Pro Tip: To save time and standardise set up, note the number of eyelets on the chain after it has been adjusted for the correct knee angle. This way, you only measure the knee angle once and use the eyelet number for all future reps.

Did you know?

Small changes in angle ($\pm 5^\circ$) can alter peak force by $>3\%$. Standardising at 90° is critical for valid comparisons (Beckham et al., 2019).

• Warm-Up Contractions:

5. Perform two sub-maximal 3-second holds at $\sim 70\%$ effort to rehearse positioning.
6. Rest 15 seconds between holds.

Active Contraction





● **Testing Series:**

1. Perform three maximal isometric contractions, each lasting 3-4 seconds.
2. Build tension gradually (no jerking movement) until maximal effort is reached.
3. Rest 45-60 seconds between attempts while remaining connected to the belt.
4. Record **Peak Force (kg or N)** for each repetition.

● **Data Evaluation:**

5. Take the average of the top two attempts to produce a more stable readiness indicator.
6. Compare with the individual baseline.
7. Track trends over time.

Change vs Baseline	Interpretation	Coaching Action
0 to +3%	Fully recovered / Peak condition	Proceed as planned
-5 to -10%	Mid fatigue	Reduce load or volume
> -10%	Significant fatigue / CNS strain	Consider deload or recovery session



Translating Isometric Force to Real-World Strength Estimating 1RM

While the isometric test is primarily designed to assess readiness, its data can also **approximate dynamic strength capacity**.

Multiple studies have shown a strong relationship between peak isometric force at a 90° knee angle and compound exercises (e.g. back squat) **1RM** performance (correlation typically around $r \approx 0.9$), provided the testing position and setup are consistent.

This makes isometric force testing especially valuable when traditional 1RM testing isn't practical or safe, such as during the in-season period, or when managing multiple athletes in a limited time frame.

The tables below provide **approximate estimates** for contextual decision-making. Final load prescription and automated adjustment will be handled by future Tendo software.

From 20 - 109 kg

Iso Peak Force (kg)	1RM (kg)	Iso Peak Force (kg)	1RM (kg)	Iso Peak Force (kg)	1RM (kg)
20	15	50	38	80	60
21	16	51	38	81	61
22	17	52	39	82	62
23	17	53	40	83	62
24	18	54	41	84	63
25	19	55	41	85	64
26	20	56	42	86	65
27	20	57	43	87	65
28	21	58	44	88	66
29	22	59	44	89	67
30	23	60	45	90	68
31	23	61	46	91	68
32	24	62	47	92	69
33	25	63	47	93	70
34	26	64	48	94	71
35	26	65	49	95	71
36	27	66	50	96	72
37	28	67	50	97	73
38	29	68	51	98	74
39	29	69	52	99	74
40	30	70	53	100	75
41	31	71	53	101	76
42	32	72	54	102	77
43	32	73	55	103	77
44	33	74	56	104	78
45	34	75	56	105	79
46	35	76	57	106	80
47	35	77	58	107	80
48	36	78	59	108	81
49	37	79	59	109	82

From 110 - 199 kg

Iso Peak Force (kg)	1RM (kg)	Iso Peak Force (kg)	1RM (kg)	Iso Peak Force (kg)	1RM (kg)
110	83	140	105	170	128
111	83	141	106	171	128
112	84	142	107	172	129
113	85	143	107	173	130
114	86	144	108	174	131
115	86	145	109	175	131
116	87	146	110	176	132
117	88	147	110	177	133
118	89	148	111	178	134
119	89	149	112	179	134
120	90	150	113	180	135
121	91	151	113	181	136
122	92	152	114	182	137
123	92	153	115	183	137
124	93	154	116	184	138
125	94	155	116	185	139
126	95	156	117	186	140
127	95	157	118	187	140
128	96	158	119	188	141
129	97	159	119	189	142
130	98	160	120	190	143
131	98	161	121	191	143
132	99	162	122	192	144
133	100	163	122	193	145
134	101	164	123	194	146
135	101	165	124	195	146
136	102	166	125	196	147
137	103	167	125	197	148
138	104	168	126	198	149
139	104	169	127	199	149

From 200 - 289 kg

Iso Peak Force (kg)	1RM (kg)	Iso Peak Force (kg)	1RM (kg)	Iso Peak Force (kg)	1RM (kg)
200	150	230	173	260	195
201	151	231	174	261	196
202	152	232	174	262	197
203	152	233	175	263	198
204	153	234	176	264	198
205	154	235	177	265	199
206	155	236	177	266	200
207	155	237	178	267	201
208	156	238	179	268	201
209	157	239	180	269	202
210	158	240	180	270	203
211	159	241	181	271	204
212	159	242	182	272	204
213	160	243	183	273	205
214	161	244	183	274	206
215	162	245	184	275	207
216	162	246	185	276	207
217	163	247	186	277	208
218	164	248	186	278	209
219	165	249	187	279	210
220	165	250	188	280	210
221	166	251	189	281	211
222	167	252	189	282	212
223	168	253	190	283	213
224	168	254	191	284	213
225	169	255	192	285	214
226	170	256	192	286	215
227	171	257	193	287	216
228	171	258	194	288	216
229	172	259	195	289	217

Practical Use Examples:

- If an athlete produces 120kg of isometric peak force, their estimated 1RM back squat would be 90kg.
- If on another day athlete produces 108kg of isometric peak force, their estimated 1RM would decrease to 81kg.
- A drop of ~10% in isometric force (~12kg) often corresponds with a similar 1RM reduction, indicating reduced readiness for maximal effort.

Coaching Notes

- Maintain consistent setup and testing time each day — pre-warm-up preferred.
- Motivate athletes to apply maximal effort — intent affects accuracy.
- Immediate visual feedback enhances engagement and output.
- Encourage competition — athletes perform best when chasing their previous score.



Did you know?

Real-time feedback increases intent and force output by 5-10% (Weakley et al., 2020). Use the microcomputer as a motivational tool, not just a data recorder.

Upper-Body Priming Protocol

Isometric Standing Bench Press

Why this Test

The **isometric standing bench press** measures the athlete's ability to generate horizontal pressing force without the fatigue or technical variability of a loaded bench press.

It **assesses readiness in the upper kinetic chain** — chest, shoulders, triceps, and stabilisers under tension, without eccentric stress — providing a complete view of force-production capacity.

Key Advantages of Isometric Standing Bench Press

- Engages stabilisers for sport-specific validity.
- Full kinetic-chain engagement while minimising technique bias.
- Highly reliable (ICC ≈ 0.95 ; Tillin & Folland, 2014)
- Safe for daily use, even in-season.
- Direct correlation with dynamic bench-press 1RM ($r \approx 0.9$).
- Non-fatiguing — quick to perform, no eccentric stress.

Setup Checklist:

- Tendo Force microcomputer
- Tendo Force sensor
- Waist belt with carabiner (fastened around chest level)
- Two Olympic bars or a power rack for press setup
- Extension chain and strap for force-sensor attachment
- Flat floor surface or platform



Testing Protocol - Step-By-Step

• Preparation:

1. Reset the Tendo Force unit to zero before each athlete.
Note: *No force must be applied when resetting the unit.*
2. Place one (1.) bar in front of the athlete at chest height on the front side of a power rack (pressing bar).
3. Place the second (2.) bar at the back of the rack (from the outside) to anchor the force sensor via the strap and chain.
4. Attach the sensor to the athlete's chest belt and to the rear bar so the chain is tense in the starting position (~10 cm bar-to-chest distance).

Pro Tip: To save time and standardise the set-up, note the number of eyelets on the chain after it has been adjusted. This way, you only measure the chain length once and use the eyelet number for all future reps.

5. Feet shoulder-width apart, toes forward, trunk upright.
6. Grip the front bar slightly wider than your shoulders — as in standard bench press.

Did you know?

Standing bench press testing removes lower-back support and forces greater stabilisation, revealing true upper-body readiness under functional conditions.

• Warm-up Contractions:

7. Perform two sub-maximal 3-second press holds at ~70% effort to rehearse position and activation.
8. Rest 15 seconds between holds.

- **Testing Series:**

1. Perform three maximal isometric presses (3-4s each).
2. Gradually increase force until maximal effort is reached — avoid jerky starts.
3. Rest 45-60 seconds between attempts.
4. Record **Peak Force (kg or N)** for each repetition.

- **Data Evaluation:**

5. Average the best two attempts for greater reliability
6. Compare with baseline.
7. Track long-term trends to differentiate between acute and chronic fatigue.

Change vs Baseline	Interpretation	Coaching Action
0 to +3%	Fully recovered / peak condition	Proceed as planned
-5 to - 10%	Mid fatigue / local upper-body strain	Reduce pressing volume or load
> -10%	Significant fatigue / systemic CNS fatigue	Emphasise recovery or technical drills

Did you know?

Daily isometric bench testing reveals upper-body fatigue earlier than velocity loss during loaded pressing, making it an ideal readiness indicator for dense training blocks (Argus et al., 2011).

Coaching Notes

- Ensure consistent stance and bar height for each session.
- Motivate athletes to “beat yesterday’s number”. Intent drives accuracy.
- For team settings, display results to increase engagement.

Quick Readiness Check (Fast Protocol Option)

Even the best monitoring system must fit the rhythm of real-world training.

When time is limited — **pre-game, between matches, or during group warm-ups** — the Quick Readiness Check allows coaches to assess daily neuromuscular status in **under 30 seconds per athlete**. This streamlined method retains the scientific precision of the standard protocol while focusing on speed and simplicity.

When to Use

- During in-season sessions, when fatigue risk is high and time is short.
- Before warm-up or lifting sessions to confirm readiness.
- For team-wide checks where 20+ athletes need fast testing rotation.
- When travelling, match congestion, or recovery windows limit full testing.

How It Works

1. Position the athlete as in the standard Priming Protocol for:
 - > Isometric Waist Squat (lower body)
 - > Isometric Standing Bench Press (upper body).
2. Perform one warm-up contraction (~70% effort, 3 seconds).
3. After 15 seconds of rest, perform one maximal contraction (3-4 seconds).
4. Record Peak Force — the highest value reached.

Research Spotlight: Single maximal isometric contraction shows a correlation coefficient of $r = 0.86=0.9$ with multiple-rep averages in trained athletes under consistent conditions, making them valid for rapid readiness screening. (Beckham et al., 2019)

Interpretation

Compare today's peak force with the athlete's recent baseline (7-14-day rolling average).

Change vs Baseline	Interpretation	Action
$\pm 3\%$	Normal daily fluctuation	Proceed as planned
-5 to - 8%	Early fatigue	Reduce training load or volume
$\geq -10\%$	Significant fatigue / risk	Prioritise recovery

Did you know?

In many studies, a reduction of $\approx -10\%$ in isometric force preceded observable bar velocity loss during loaded lifts — making this the earliest fatigue signal available. (James et al., 2020).

Coaching Notes

- Maintain consistent testing time — ideally pre-warm up.
- No need for full warm-up or repeated trials — the goal is a quick check, not a full diagnostic
- Use immediate feedback on the microcomputer display to motivate intent and keep data reliable
- The Quick Readiness Check can be run **daily** without affecting training load or CNS freshness.

How to Implement Priming in Everyday Training

When to Test

1. Daily (Pre-Warm-Up):

- Best for tracking short-term readiness and adjusting daily loads.
- Takes <2 minutes per athlete (standard) or <30 seconds (quick)
- Ideal during congested competitive schedules.

2. 2-3x per Week:

- Suitable for large squads or lower monitoring demands.
- Helps identify recovery patterns, overreaching, and training effects.

3. After Matches or Heavy Blocks:

- Detect delayed fatigue, especially CNS-related.
- Helps decide whether the next session should emphasise recovery, skill, or performance.

How to Interpret Results

Track results over time and look for consistent deviations from each athlete's baseline.

Force Change	Interpretation	Adjustment Strategy
0 to + 3%	Fully recovered / peak condition	Proceed with planned intensity or add contrast work
-5 to - 8%	Early fatigue / Incomplete recovery	Reduce load by 10-20%, focus on speed, mobility, or skill
≥ -10%	Significant fatigue / High risk	Replace main lifts with activation or mobility work

Integrating with Velocity-Based Training (VBT)

VBT is one of the most powerful ways to guide in-season training performance.

But testing readiness and 1RM with VBT only is trickier. It requires both the athlete's and coach's expertise and only gives you feedback once the bar is loaded and the athlete is already moving.

This testing creates unnecessary risks:

- Fatigue or hidden weaknesses might only be uncovered *after* training begins.
- Athletes may already be tired — or even exposed to injury — before you realize something's wrong.

By introducing Priming to assess athletes' readiness and 1RM before your training session, and leaving VBT for training purposes only, you create the ultimate training strategy — safer, smarter, and sharper than VBT alone.



The Gold Combo:

- **Step 1 — Priming** (e.g. Tendo Force): Detect the athlete's available strength capacity (1RM) and CNS freshness before warm-up
- **Step 2 — VBT** (e.g. Tendo Unit, Tendo MyUnit): Adjust training intensity to match that readiness and your training goal for the day

Scenario	Priming Results	VBT Adjustment
0 to + 3%	Peak condition	Push for max intent and power emphasis
-5 to - 8%	Mild fatigue	Use moderate loads, high velocity focus
≥ -10%	Significant fatigue	Prioritise technique and mobility

Example Integration — In-Season Training Week

Day	Readiness Trend	Training Focus
Monday	-8% (Mild Fatigue)	Low-Load Activation
Tuesday	-4% (Stable)	Skill / mobility / recovery
Wednesday	+2% (Fresh)	Speed / Explosive Power
Thursday	-1% (Neutral)	Strength
Saturday	+2% (Fresh)	Game Day / Speed & Explosive Power

Coaching Tips

- Track readiness and performance together.
- When force decreases while performance remains stable, the athlete may be adapting positively.
- When both drop, it's time to intervene.

Communication with Athletes

Share data visually — it turns testing into motivation.

Let the athlete see progress or recovery patterns.

They'll start connecting how they feel with what they see.

That awareness builds discipline and accountability.

**Once athletes start predicting their own readiness scores
You know they're becoming self-aware performers.**

Using Tendo Force Beyond Priming

More Than Readiness Testing

While Priming is the fastest and most common use of Tendo Force, the device's capabilities extend far beyond pre-session readiness.

With its ability to record force in real time, you can use it for **diagnostics, rehabilitation progress tracking, and even targeted strength development** — all without external load.

Think of Tendo Force as both a readiness tool and a data lab — in your gym, on the field, or during rehab.

1. Asymmetry and Strength Diagnostics

Small asymmetries can lead to major performance gaps or injury risk when left unchecked. By testing sides separately (**unilateral isometric tests**), coaches can quickly quantify strength imbalances and track improvements over time.

Test Example	Purpose	Coaching Insight
Single-leg isometric squat	Detect left/right force deficits	Monitor rehab or return-to-play readiness
Single-arm isometric press	Upper-limb asymmetry	Adjust loading symmetry in dynamic sessions

Did you know?

A side-to-side force difference greater than 10% has been associated with higher injury risk and decreased sprint efficiency (Impellizzeri et al., 2007).

2. Recovery and Fatigue Tracking

Repeated isometric measures are extremely sensitive to both neuromuscular and metabolic fatigue. By comparing morning or pre-session values, coaches can track how well the athlete is recovering between matches or micro-cycles.

Applications

- Post-match or post-tournament fatigue diagnostics
- Sleep and recovery quality validation
- Return-to-play readiness progress after injury

Trend	Interpretation
Gradual improvement over days	Normal recovery progression
Persistent force deficit 5%<	Cumulative fatigue / overreaching
Unusual spikes	Possible technical inconsistency or compensatory effort

Did you know?

Force values typically rebound to baseline within 46-72h after heavy training; slower recovery may indicate suboptimal regeneration or overreaching (Beattie et al., 2017).

3. In-Season Strength Maintenance & Improvement

Isometric training can be used to **maintain or improve strength** in-season without adding load or mechanical stress. Short-duration maximal contractions (3-5s) can produce neural and muscular benefits similar to traditional resistance work — with minimal fatigue.

Did you know?

6-8 weeks of isometric training can increase maximal strength by 10-15% with negligible fatigue or muscle damage. (Lum et al., 2020). Making it a perfect training option for demanding in-season times.

Example Integration

- 2-3 sets x 3-5s maximal contractions at key positions (e.g., 90° squat, 120° bench angle).
- Rest 45-60s between sets.
- Combine with dynamic activation or mobility work for best results.

Training templates coming soon!

4. Integration with the Tendo Ecosystem

Tendo Force fits seamlessly within the broader Tendo performance ecosystem, creating a unified strength-speed-readiness profile.

Tool	Purpose	How It Complements Force
Tendo Unit (VBT)	Dynamic strength & velocity monitoring	Links readiness to execution & in-season performance
Tendo BroadJumper	Horizontal jump diagnostics & sprint priming	Adds horizontal power dimension and sprint readiness specificity
Tendo ForceBench	Lab-grade lower-body diagnostics and analysis	In-field prerequisite test for tissue readiness

By combining these devices, you can track everything **from priming readiness to power expression.**



Conclusion — From Insight to Action

A few seconds of testing can redefine how you train.

With Tendo Force, you can evaluate strength, fatigue, and readiness — without a single loaded rep.

By making Priming part of your daily routine, you:

- Detect fatigue before it impacts performance
- Adjust load and intensity with surgical precision
- Keep athletes healthy, confident, and consistent throughout the season.

Key Takeaway

Every rep, every game, every day — starts with knowing the athlete's true capacity. The strongest athletes don't always lift the most — they lift at the right time.

Prime, Perform. Protect.
That's the Tendo way.

Next Steps

Already using Tendo Force?

Explore strength diagnostics and isometric training templates (coming soon).

New to Tendo Force?

Visit www.tendosport.com/tendo-force for more.

Contact Us: info@tendosport.com

Start every session with clarity
and let data help you drive performance.