Date: 03-01-2026

Circular

This is to inform all concerned that the physical tests as specified below shall be conducted from the forthcoming National Camp onwards. The results of these tests will be considered for athlete assessment and evaluation of boxers. These tests shall supersede all previously followed physical testing protocols. Compliance with the revised testing framework is mandatory for all participants.

BFI Physical Testing Selection Criteria

Overview and intent:

The aim of this test battery is to profile elite boxer's aerobic/anaerobic capacity, fatigue resistance, lower-body elastic power, and unilateral upper-body punching power.

Outcomes inform conditioning targets (aerobic vs. glycolytic emphasis), power training priorities (leg spring vs. hip/arm drive), asymmetry management, and readiness monitoring. Furthermore, the below tests will be used as part of the broader Team India selection criteria.

Evaluation Tests:

The following 4 tests scores will be considered for evaluation scoring process.

- CMJ
- Landmine Punch Throws
- 30-15 IFT
- 30's Anaerobic Wingate Test

The athleticism score of these tests will be used as a Physical Assessment Score during selection process before any major International Championships.

1) 30-15 Intermittent Fitness Test (30-15 IFT)

What it measures:

Intermittent aerobic capacity, high-intensity running speed, and change-of-direction tolerance under incomplete recovery.

Primary output:

VIFT (speed at final completed stage).

Why it matters for boxing:

Boxing is intermittent with bursts and partial recoveries. VIFT is a strong anchor for prescribing high-intensity intervals that mimic rounds.

Protocol (standard):

1. Setup: 40 m shuttle (2×20 m with a midline), paced by audio beeps.
2. Work: 30 s run at prescribed speed.
3. Recovery: 15 s passive or walking recovery within the lane.
4. Speed increases by 0.5 km/h every stage until the athlete twice fails to reach the line on time.
5. Record speed at final/completed stage (km/h) and HR peak if available.

Key outputs and use:

1. VIFT → prescribes interval speeds or power for equipment-based conditioning (e.g., assault bike power equivalents).
2. Estimated VO2max (optional): some formulas use VIFT and age/sex.

2) Wingate Anaerobic Test – Fatigue Index

What it measures:

Peak power (PP), mean power (MP), and Fatigue Index (FI) over a 30 s all-out sprint on a cycle ergometer.

Fatigue Index reflects drop-off in power across the test, a proxy for anaerobic capacity and fatigue resistance.

Why it matters for boxing:

Repeated high-power efforts under acidosis are characteristic of exchanges and flurries inside rounds.

Protocol (standard):

1. Warm-up: 5–8 min with 2–3 brief sprints.
2. Test: 30 s maximal sprint from a rolling start; provide strong verbal encouragement and real-time feedback.

Calculations:

a. Peak Power (W): highest 1 s (or 5 s) power.
b. Minimum Power (W): lowest 1 s (or 5 s) power.

c. Fatigue Index (FI, %): [(Peak Power – Minimum Power)/ Peak Power] x 100%

Interpretation:

a. Lower FI indicates better fatigue resistance (power is maintained better). However, very low FI with low PP is not desirable—aim for high PP with moderate FI.

3) Countermovement Jump (CMJ) – Jump Height

What it measures:

Explosive lower-body power and neuromuscular readiness.

Why it matters for boxing:

Lower-body elastic power underpins kinetic chain speed for punching and evasive footwork;

Protocol (standard):

1. Warm-up: 5–8 min with 2–3 warm up Jumps.
2. Hands-on-hips (to remove arm swing)
3. Depth self-selected but cue “fast down–up.” Perform 2-3 trials, best value recorded; 60–90 s rest between.

Measurement options:

Force plate (gold standard)

4) Landmine Punch Throw – Peak Relative Power (PP)

What it measures:

a. Unilateral upper body/torso power in a punching pattern, capturing kinetic sequencing from lower body/hips through the arm.
b. Output of interest: Peak Power relative to bodyweight for each arm,

Why it matters for boxing:

Punching is unilateral and explosive. Arm-to-arm power asymmetry and absolute Peak Power are highly relevant for performance and injury risk management.

Protocol (practical):

1. Setup: Barbell in landmine/jammer attachment with a light to moderate load (e.g., 20-30kg total on the barbell). Use boxing stance.
2. Stance options: Half-kneeling (reduces lower-body contribution and improves standardization) or split-stance with cue to minimize countermovement.

Instrumentation:

Linear position transducer or inertial sensor (VBT) (e.g., GymAware/Push) attached to the bar end to compute power.

Execution:

a. 3–5 maximal single-arm punch throws per arm, 45–60 s rest between reps, 2–3 min between arms.
b. Cue “fast and clean drive; full extension; release if safe or decelerate consistently” depending on facility policy.
c. Record: Peak velocity and Peak Power per rep; take the best rep per arm.

Weight-class normalization and scoring framework

Goal: Ensure fairness across different body sizes by benchmarking each athlete against peers in the same weight class.

Method: For every test, the Z-score within each weight class will be calculated. Then sum of all other fitness parameters Z-scores will be calculated to produce a single “Total Athleticism Score” relative to that weight class.

What is a Z-score?

Concept: Z-score expresses how far and in what direction a score deviates from the weight-class average, in units of that weight-class standard deviation.

Formula (for athlete value x in a given weight class):

Z = (Any fitness test Score – Weight class average for the specific test) / weight class standard deviation

Why it’s relative:

Z-scores are computed against peers in the same weight class. Z = +1 means the athlete is one standard deviation above the average of the same weight-class. This controls for class-specific distributions and makes comparisons fair and interpretable within the class.

Quick interpretation:

- z = 0 (around average)
- z = +1(about top ~84th percentile (assuming normal-ish distribution) (Means above the average score of 0)
- z = -1 (about bottom ~16th percentile) (Means below the average score of)

Directionality and sign conventions (very important)

To make the total score meaningful, the scores will be converted to “higher is better” before computing or combining Z-scores:

Higher-is-better:

a. 30-15 IFT (VIFT; km/h)
b. CMJ jump height
c. Landmine punch throw Peak Power (PP) and PP/BW ($W \cdot kg^{-1}$)

Lower-is-better:

a. Wingate Fatigue Index

**Side note* - Store Z-scores alongside raw values for transparency.

Total Athleticism Score (sum of Z-scores)

Unweighted sum (default):

Calculation: SUM of the Z-score of all 4 tests will be converted to a T score with the following formula $T = (Z \times 10) + 50$, as a total score of athleticisms.

Example:

Suppose an athlete’s Z-scores within their weight class are:

b. 30-15 IFT: +0.8
c. Wingate Fatigue Index (inverted): +0.3
d. CMJ height: +1.1
e. Landmine Throw Peak Power (best arm or averaged): +0.6
f. Total: Z-score = 0.8 + 0.3 + 1.1 + 0.6 = 2.8
g. T= (2.8 x 10) + 50
h. Total Score of athleticism = 78

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