RP3 TRUE ROWING EXPERIENCE

HOW TO USE RP3 ROWING IN AN COACH APPROACH?

INSTRUCTION DOCUMENT: RP3 PORTAL ADVANCED FOR DATA DRIVEN COACHING

JUNE 2024

RP3 Academy

“CONSISTENT DELIVERY OF NEAR PERFECT PERFORMANCE”

WHAT IS FAST ROWING?

- Exerting as much force as possible to accelerate the boat
- Delivering this power smoothly ensures minimal disruption and maximum acceleration
- Acceleration provides boat speed
- Keeping boat speed as constant as possible means least delay*
- Consistency is essential, any fluctuation slows things down*
- Remaining consistent as fatigue increases is important
- In a team, synchronization, equal drive, is essential. This consistency is also a prerequisite for optimal and effective rowing together
- Equality ensures balance and balance provides space for relaxation in recovery

* Read more in Addendum 3

QUANTITATIVE VERSUS QUALITATIVE

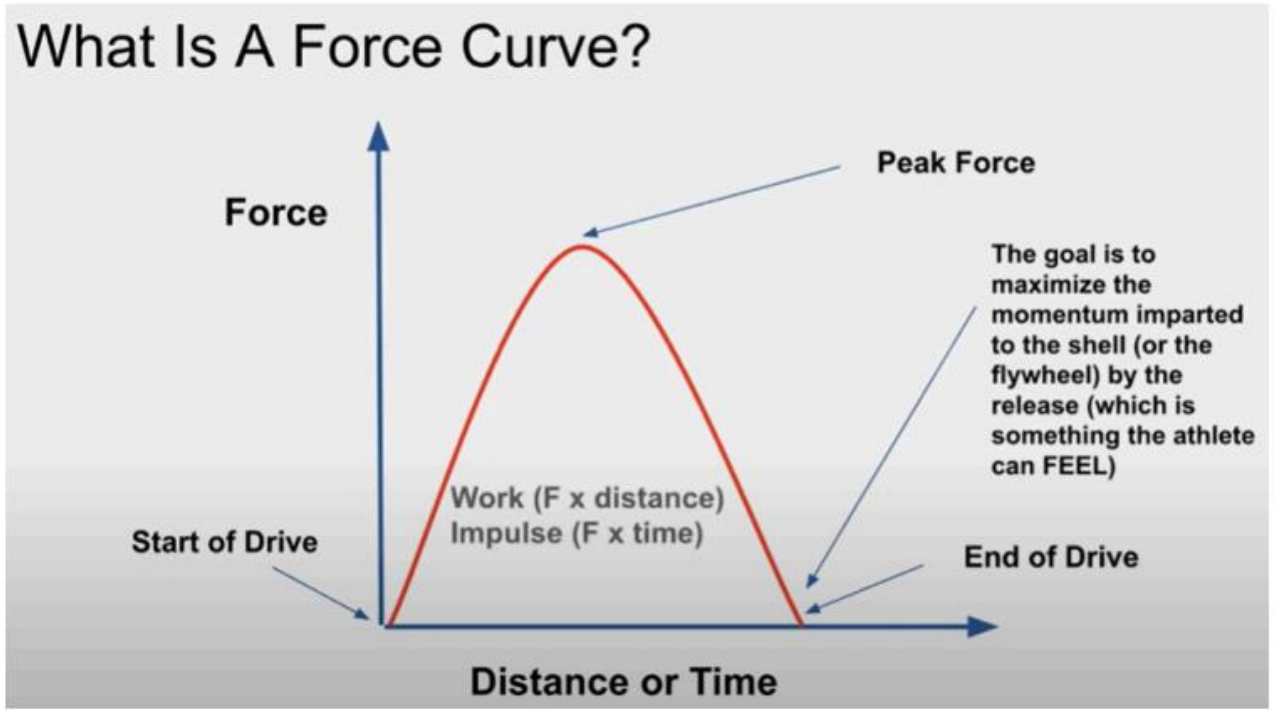
Quantitative

- Basic condition
- Force / Strength
- Power
- Effort
- Perseverance
- Commitment

Qualitatively

- Efficiency
- Coordination
- Consistency
- Effective power
- Synchronization
- Convert to boat speed

COMBINATION OF QUANTITY AND QUALITY



Source: coach Neil Bergenroth

"The Force Curve is a window into the effort of the force application during the drive phase"

- Area under the Force curve is a measure of energy delivery (joules)
- Comparable with energy through the blade in the water for acceleration of the boat
- Four parameters for best surface area:
  - Stroke length
  - Max. power (peak)
  - Peak position (at 45-49%)
  - Convex / full flowing shape

- Finding and holding connection
- Minimalize 'slip' (Catch & Release)

- Power (watts): Joules / sec.
- → higher rates means more strokes per minute and more power on the water
- → Split (time / 500m) is the conversion of speed in the boat and power on RP3

DATA DRIVEN
SPORTS ANALYTICS

"MEASURING IS KNOWING"

- ✓ What is my ideal Force Curve?
- ✓ Where can I improve this?
- ✓ What points do I take into the boat?
- ✓ What is my qualitative and quantitative progression?
- ✓ What happens when I get tired?
- ✓ How can I maintain my consistency best?
- ✓ What should I pay extra attention to if something happens?
- ✓ Which focus provides my best contribution in the final sprint?
- ✓ What is my focus for the best crew performance during Race pace?
- ✓ ... etc.

ADD RP3 IN THE SCHEDULE – (13 WEEK) EXAMPLE FOR PREPARATION

Block 1
- Baseline measurement
- Quantitative
- Qualitative
- Commitment
- Progression

Week 1 - 6

Training in week schedule:

- 2x boat training: 75 – 90min *extensive*
- ***1-2x RP3* min. 45min extensive (HR< 70%)***
- 1x min. 30min Weights
- 1-2x self training (boat / bike) extensive min. 60min

Block 2
- Progression
- Load
- Technical
- Consistency
- Synchronization

Week 7 - 11

Training in week schedule:

- 3x Boat training: 75 – 90min incl. *intensive blocks*
- ***1x RP3* min. 45min extensive (HR< 70%)***
- ***1x RP3* HITT (example: 2x 8x 30/30)***
- 1x min. 30min Weights
- Evt. 1x self training (boat / bike) extensive min. 60min

Block 3
- Speed
- Optimalization
- Flexibility
- Focus
- Race readiness

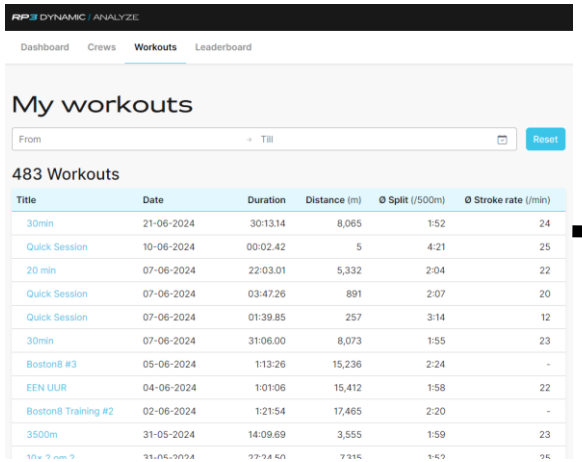
Week 12 & 13 (to race)

Training in week schedule:

- 4x Boat training: 75 – 90min incl. *intensive blocks*
- ***1x RP3* min. 45min extensive (HR< 70%)***
- 1x min. 30min Weights
- Optional 1x self training (boat) extensive

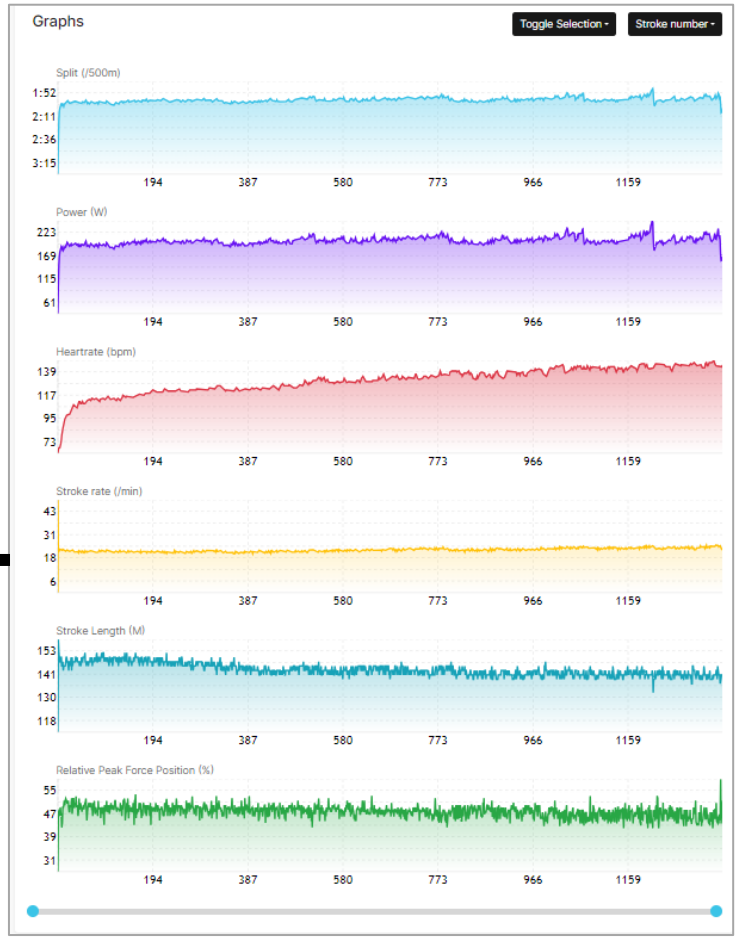
** Do **not** use Concept2 – see addendum*

RP3 PORTAL - **COACH ANALYSIS** REPORT (PORTAL.RP3ROWING.COM)

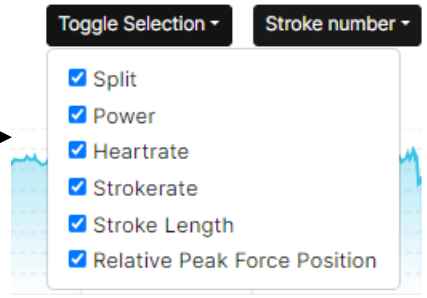


Workouts overview

Workout summary



Workout graph overview



Compare Qualitative and Quantitative values

- Check “steady state” level
- Relation HR and Stroke Length
- Relation HR and rel. Peak Force Position
- Input for R-square analysis
- Add data point for progression report

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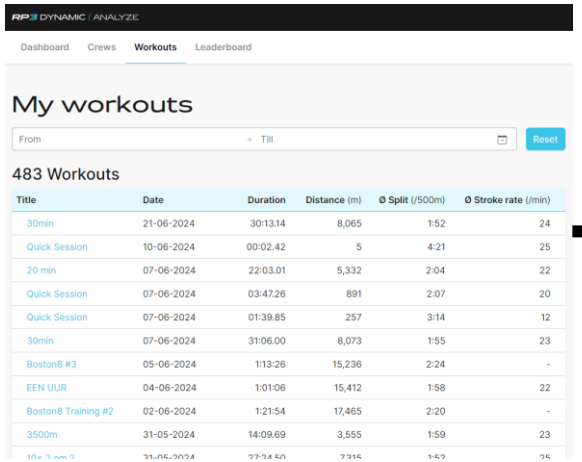
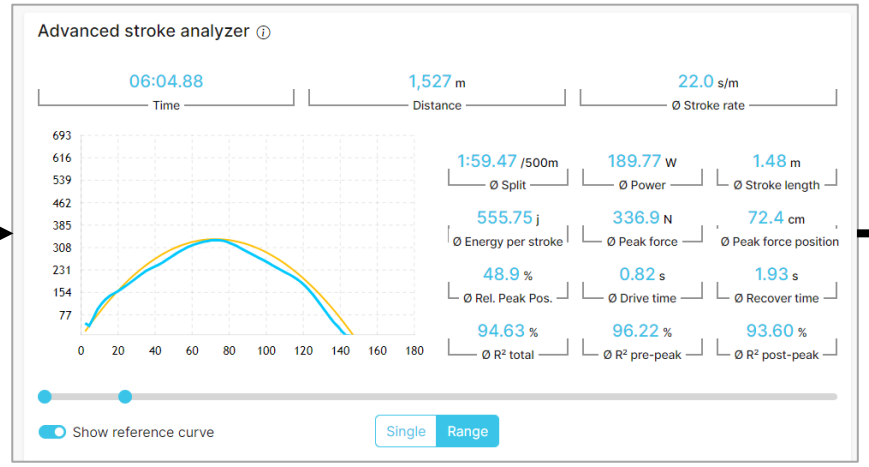


Workouts overview

Workout summary

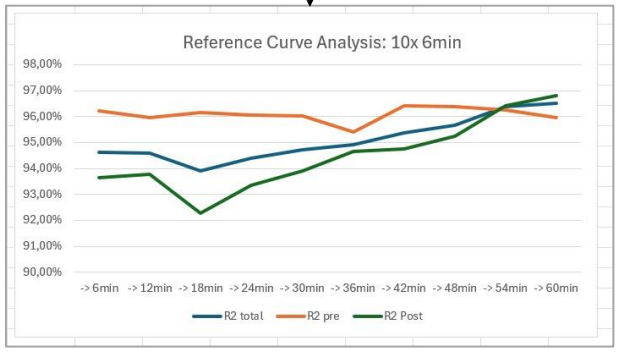
Workout split table



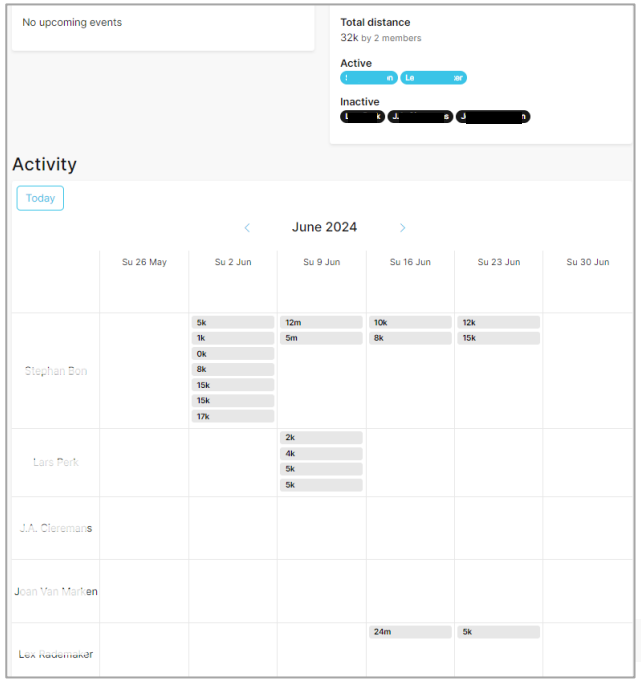
Advanced Stroke Analyzer (ranges)

Workout Quantitative / Qualitative overview table

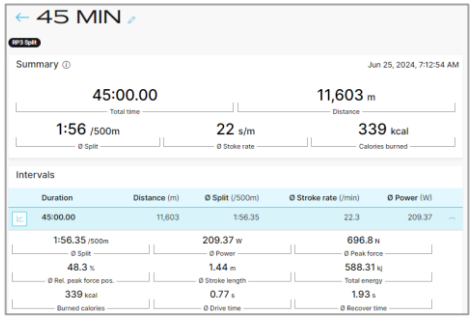
Workout R-square progression graph



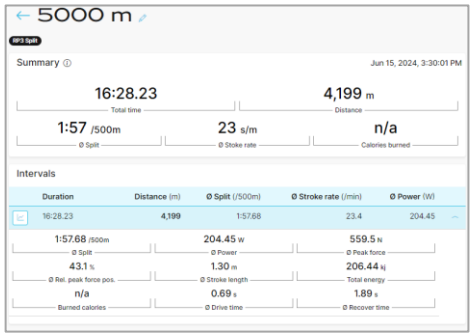
RP3 PORTAL – **CREW DATA & CURVE ANALYSIS** (PORTAL.RP3ROWING.COM)



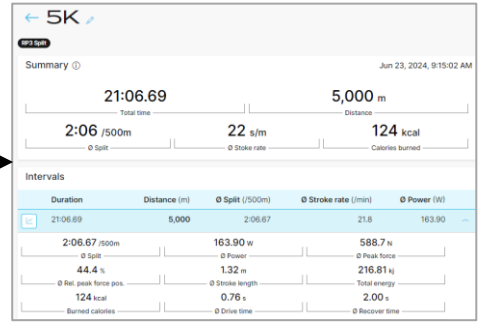
Crew Workouts overview



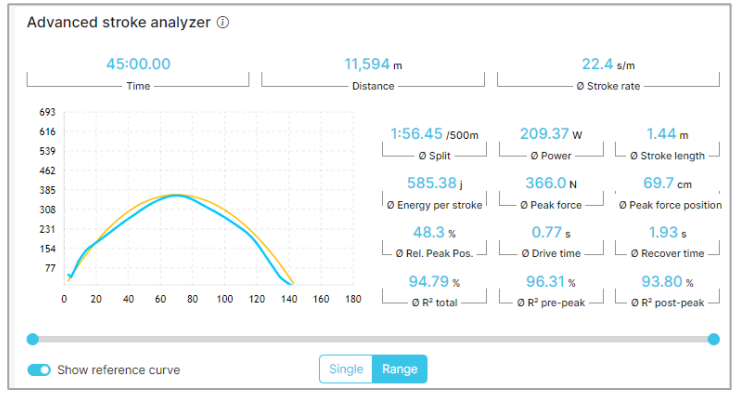
Workout summary – A

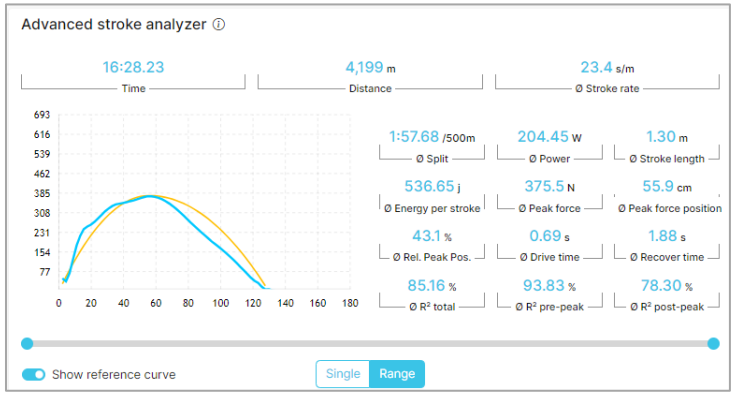


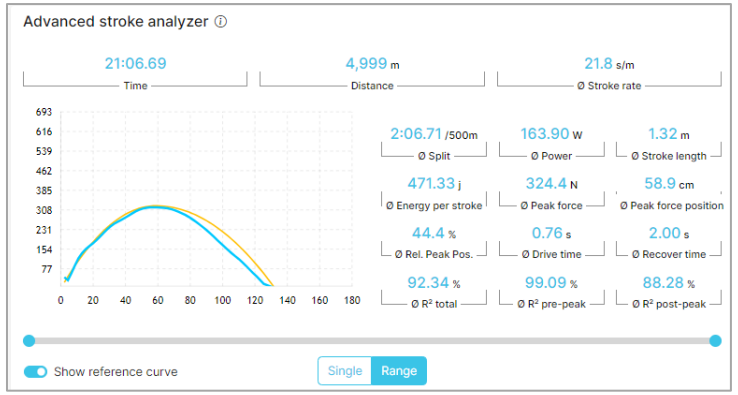
Workout summary - B



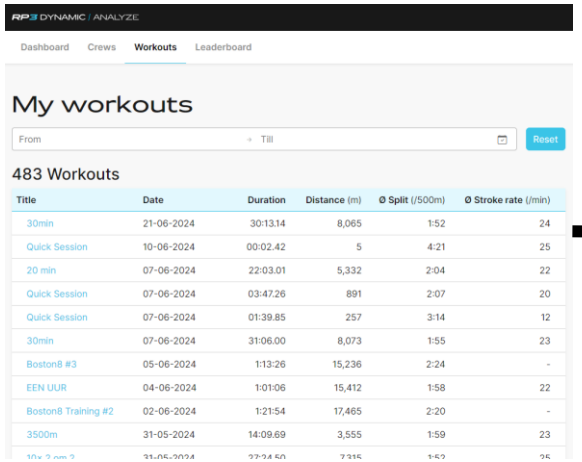
Workout summary - C





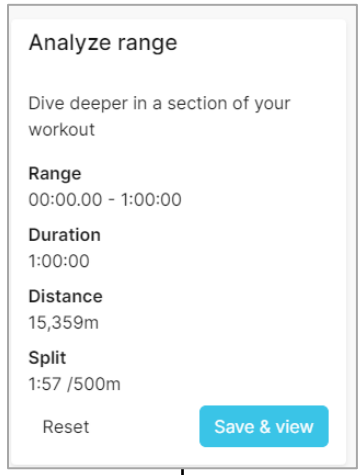


RP3 PORTAL – **CREW CURVE ANALYSIS** (PORTAL.RP3ROWING.COM)

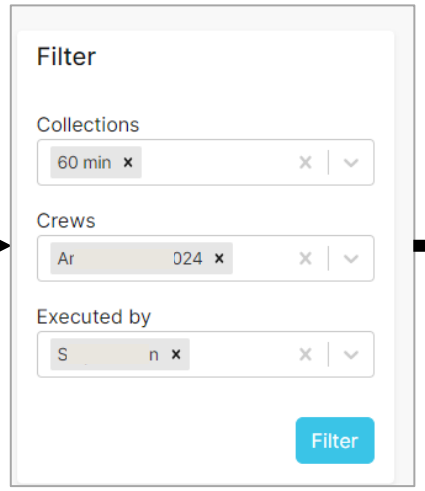


Workouts overview

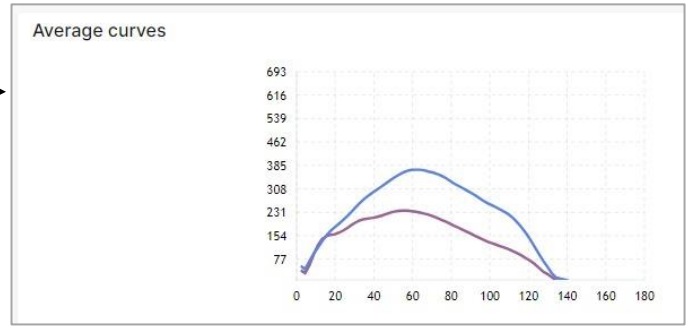
Workout summary



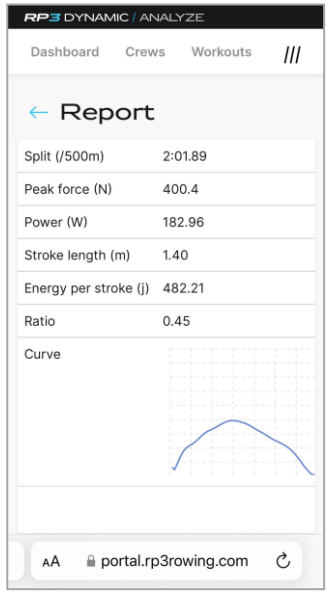
Save Workout Snippet



Filter crew Workout Snippets for report



Average reports



- Define crew curve
- Analyse differences
- Formulate rowers accents

USING DATA ANALYSIS

What do we do with this data?

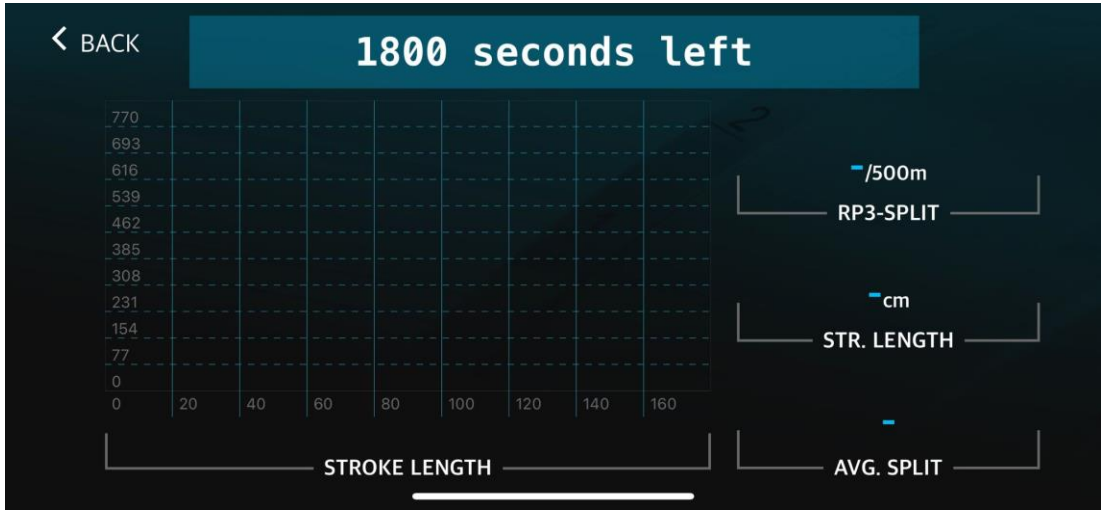
- Insight into the workout (quantitative & qualitative)
- R-Square analysis provides insight into qualitative progress during the RP3 Workout
- Translation to accent for next training (boat & RP3)
- Use similar workouts for progress report

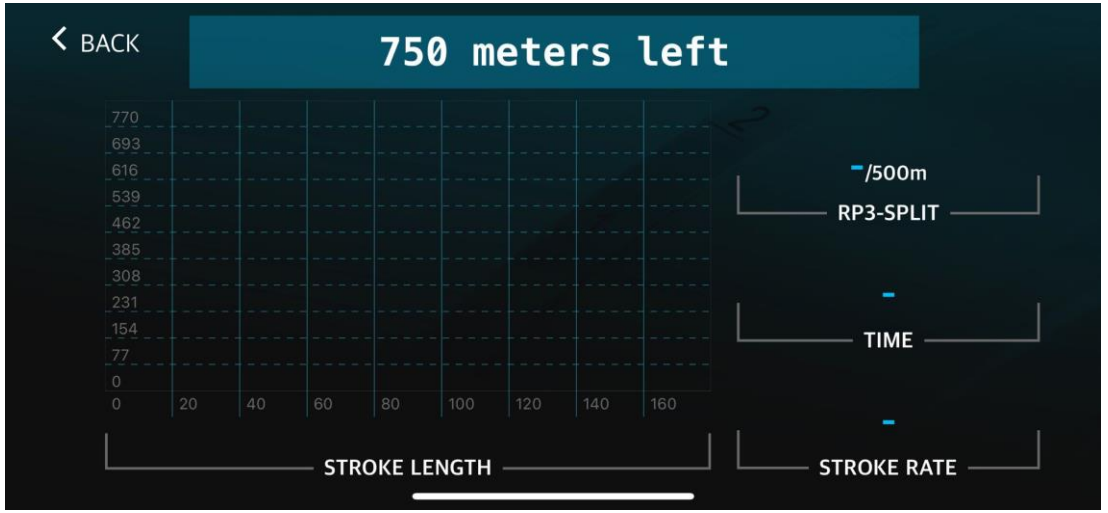
Incorporating insights for the next training session and team optimization

- Identify basic differences in the team (quantitative and qualitative)
- Establish and validate target values over time (progression)
- Accents in average Crew curve (shape)
- Accents for rower in relation to crew curve
- Take points of interest into the boat
- Measuring progress or effect

Weekly analyzes provide emphasis for next boat training (personal & team)

START WITH BASELINE MEASUREMENT (WEEK 1)
→ 30MIN. EXTENSIVE & 500 OR 750M AT RACE PACE





<u>30min steady state:</u>

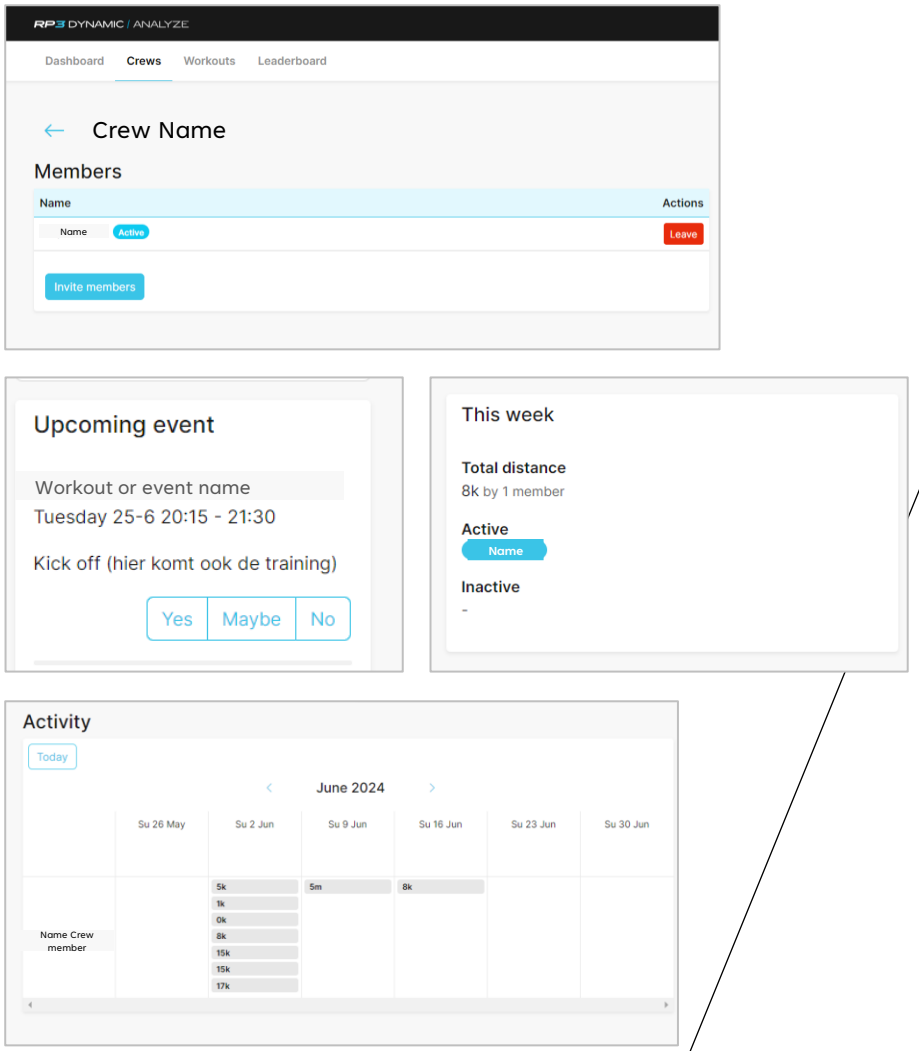
- Extensive (HR < 70%)
- As flat as possible, or slightly progressive
- No right or wrong: just baseline measurement

<u>500 or 750meter at race pace:</u>

- With race plan: start → race pace → sprint
- Minimal Rate 35-36
- No right or wrong: just baseline measurement

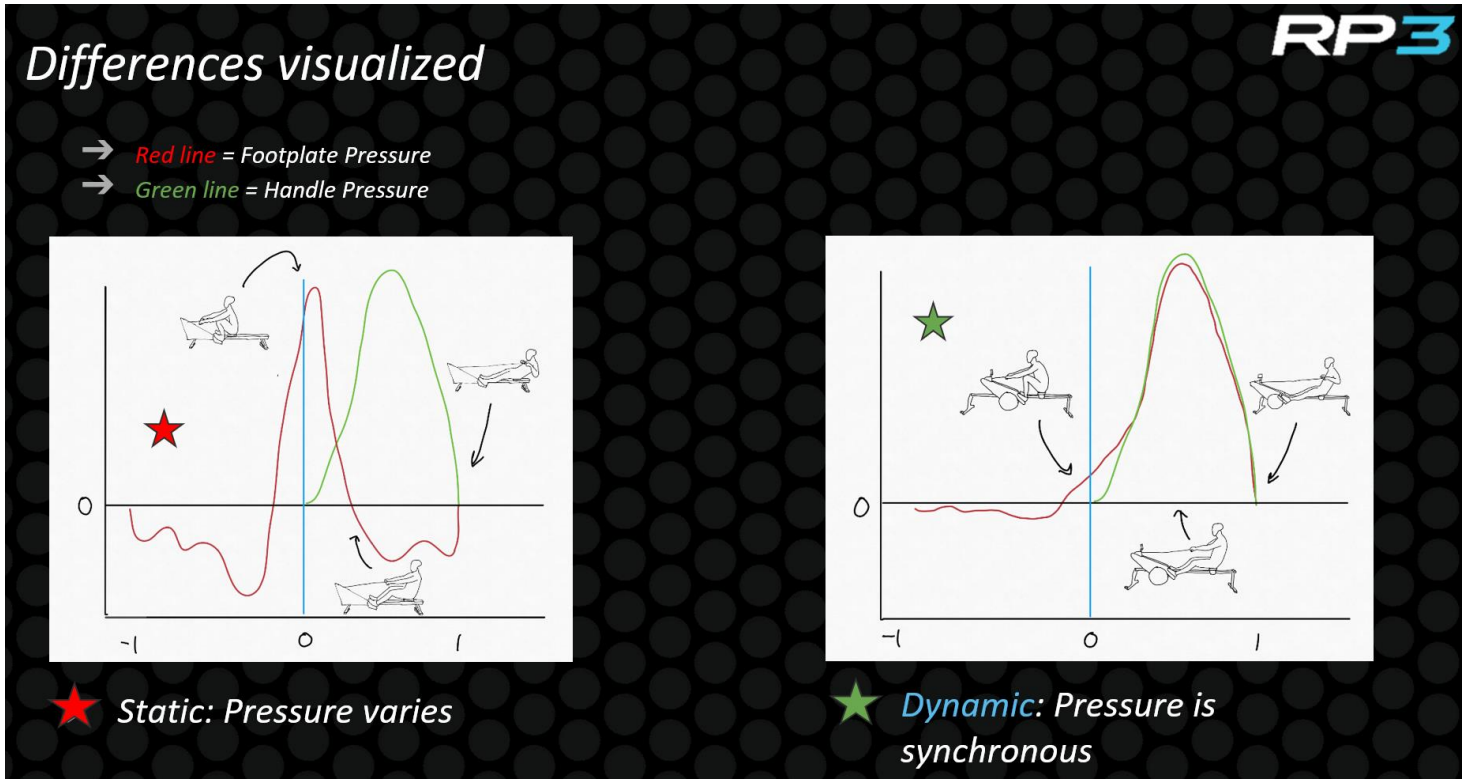
USE THE RP3 PORTAL CREW FUNCTION

- **Create an RP3 Account: https://portal.rp3rowing.com/**
- **Provide your account (email address) to the coach**
- **Accept the invite**
- **Create events, show your presence**
- **See training schedules (content)**
- **RP3 & On Water sessions are (optional) automatically uploaded to Strava**
- **The coach team keeps up the progression and is able to make and use reports for analysis**



ADDENDUM

ADDENDUM: DON'T USE CONCEPT2 - 1



https://rp3rowing.com/rp3-academy-whitepapers

Static rowing:

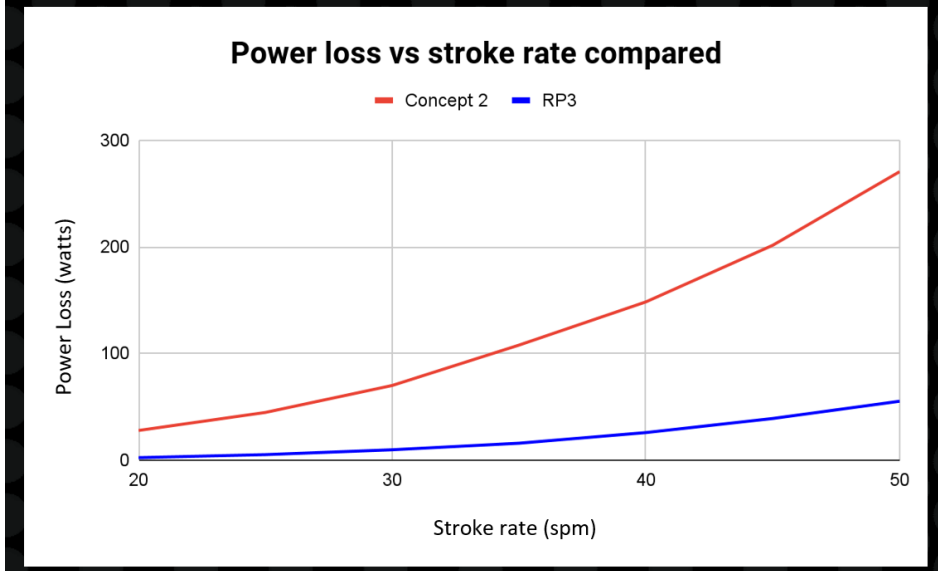
- Brake or holding towards and before the catch
- No connection at the catch (reversing body mass), so finding connection with arms, shoulders or back
- "impact" when connection is suddenly there
- Remaining to hold energy, enlongen legs towards finish
- Holding to not fall off:
  - Pull up to the handle
  - Performing a sit up movement
  - Grabbing with the feet (footplate connection)
- Legs movement is starting too early in the recovery (different to boat or dynamic movement)

Dynamic rowing:

- Direct connected at the catch, 'hook' on the footplate feeling
- Hanging longer and perform the pure leg drive
- Acceleration during the stroke, keep pressure on the footplate and fast / loose finish ('Explosive" power)
- Train the "Hip Hinge" not a Sit-up (reverse movement)
- Hold the right sequence in the recovery, for better rhythm

ADDENDUM: DON'T USE CONCEPT2 - 2

RP3 Rowing Whitepaper: findings and conclusions Static versus Dynamic power calculations



Significant energy losses during static rowing → (major) adjustments in rowing technique for a better score:

→ Extend legs during stroke and recovery to limit loss
→ Recovering energy from the drive: falling through ("yenking") and pulling high
→ Lower stroke rate and/or is different than physiologically optimal in the boat
→ Reward for a longer recovery, longer strokes, higher resistance factor. Different boat feeling: concerning lightness and stroke rates

"it pays to row very hard and slow"

https://rp3rowing.com/rp3-academy-whitepapers

- To compensate for the biomechanical energy loss, rowers automatically, instinctively, adjust the stroke to make it 'easier'.
- This involves – implicitly – self teaching, ingraining a statically optimal rowing stroke.
  (also applies to dynamic on RP3)
- The static rowing movement is less effective for boat speed, due to differences in, among other things:
  - disconnect
  - hip hinge versus sit up movement
  - invert body weight
- Injury prone

ADDENDUM 3 – THE NEED FOR CONSTANT BOATSPEED

The negative effect of boat speed variation can be explained using principles of fluid dynamics and drag. The key concept here is drag force, which is the resistance force caused by the motion of a boat through water.

Formula for Drag Force

The drag force Fd experienced by a boat moving through water can be expressed as:

$$Fd=1/2\ \rho\ v2\ Cd\ A$$

Where:

- ρ is the density of the water.
- v is the speed of the boat relative to the water.
- Cd is the drag coefficient, which depends on the shape of the boat and the nature of the flow (laminar or turbulent).
- A is the cross-sectional area of the boat facing the direction of motion.

Explanation of the Negative Effect of Speed Variation

1.Non-linear Relationship: The drag force is proportional to the square of the boat's speed (v2). This means that small increases in speed lead to disproportionately large increases in drag force. Conversely, small decreases in speed lead to disproportionately small decreases in drag force.
2.Energy Consumption: When a boat's speed varies, the peaks in speed result in significantly higher drag forces compared to a constant speed. This requires more energy to maintain, as the rowers have to exert extra effort to overcome these higher drag forces during the speed peaks.
3.Efficiency Loss: Maintaining a constant speed is more efficient because it avoids the high peaks in drag force. Variations in speed mean that more work is done against the water resistance, leading to greater overall energy expenditure for the same distance traveled.

Minimizing Speed Variation
To minimize the negative effects of speed variation:
- **Steady Rowing**: Rowers should aim to maintain a steady and consistent stroke rate and power application to keep the boat speed as constant as possible.
- **Technique and Coordination**: Effective rowing technique and synchronization among the rowers help in maintaining a smooth and constant boat speed.
- **Equipment Optimization**: Using well-designed boats and oars that reduce drag and improve hydrodynamics can also help in maintaining a more constant speed.

Conclusion
In summary, the drag force's quadratic relationship with speed means that variations in speed lead to greater overall drag forces and energy consumption. Keeping the boat speed constant minimizes these variations, leading to more efficient rowing by reducing the peaks in drag force and the corresponding energy expenditure. This is crucial for achieving optimal performance and endurance in rowing.