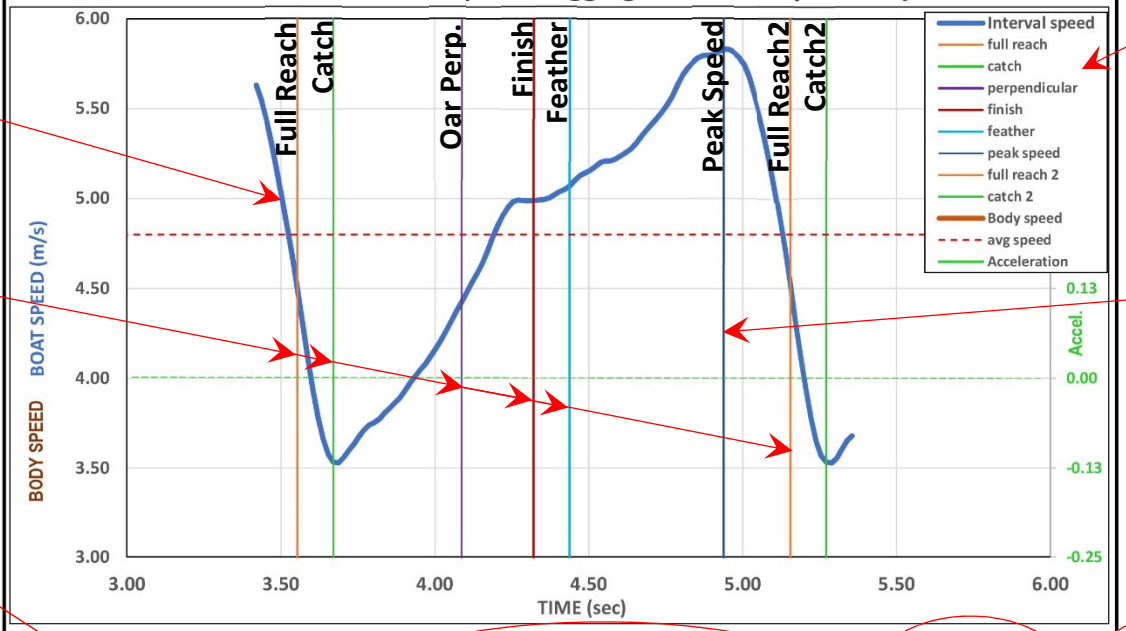
PURCERVERANCE - Boat Speed, Rigging and Technique Analysis



Crew Name	Athlete Name	Video File	20180624093228.m2ts	GMS Time	6:33.00
Boat Class	M1x	Video Location	Speed Order (1900m), London	Finish Time	7:00.70
Race Category	Men	Video Description	M1x Final	Percent GMS	93.4%
Boat Length	8.33	Video Time & Date	9:32 AM 2018-06-24	Average Split	1:45.18

GRAPH ANALYSIS

	time	boat speed
full reach	3.55	4.50
catch	3.67	3.53
perpndclr	4.09	4.43
finish	4.32	4.99
feather	4.44	5.07
full rch 2	5.16	4.51
catch 2	5.27	3.53

		GMS
Split Speed	1:44.18	1:38.25
Average Speed	4.80	94.3%

acceleration	time	speed diff	calc	efficiency
Catch to Finish	0.65	1.46	2.24	96%
Catch to Perp	0.42	0.89	2.14	86%
Perp to Finish	0.23	0.56	2.41	130%
Finish to Peak	0.62	0.84	1.36	87%
Peak to Catch2	0.33	2.29	-6.88	118%

Boat Movement	7.69	
Drive Distance	2.76	36.0%
Dist. Before Pin	1.64	59.3%
Dist. After Pin	1.13	40.7%
Recovery Dist.	4.92	64.0%
	speed	time
Minimum Speed	3.53	5.29
Maximum Speed	5.83	4.94

RIGGING ANALYSIS

	0.81	Typical Drive Time
Drive Time	0.77	
Blade Slip	-0.02	
Stroke Position	64.2%	
Stroke Time	1.60	
Stroke Rate	37.5	
Stroke Ratio	1.09	
Oar Catch Angle	69.7	Estimated

Rigging Notes

- Drive Time at 0.77 seconds is within typical limits. no change to load required.
- Blade Slip at -0.02m is slightly low.
- Stroke Position 64.2% is slightly low. move footstops to stern 1cm recommended.
- Stroke Rate at 37.5 good.
- Stroke Ratio 1.09 is slightly low (preferred range 1.2~1.3)

Span/Sprd		160
Oar Lngth		290
Inboad		88
Blade Sz.		822
Footstop	Dist.	36
	Angle	42
	Height	18
Work Thr.		23

TECHNIQUE ANALYSIS BASED ON SPEED CURVE

Catch Effic. (full reach to catch)	0.12	very good. continue to work on catch (blade path and entry)
Drive Accel. (catch to finish)	2.24	very good. continue to work on leg drive in first third of stroke.
Accel. Efficiency (curve vol.)	96%	very good percentage of acceleration curve compared to straight line acceleration catch to finish.
Perp to Finish Accel (perp to fin.)	2.41	fair. work on developing strong finish keeping blades buried longer. see curve above prior to finish.
Release Effic. (finish to feather)	0.12	good. quick transition from finish to feather allows recovery to start and continues boat acceleration
Recovery Accel. (finish to peak)	1.36	good. continue to use recovery to accelerate boat pulling footstops towards seat.
Recovery Effic. (curve vol.)	104%	very good. overall boat speed was increased on average throughout recovery.
Recovery Peak Speed (% of Rec.)	65%	very good. peak speed late in recovery is effective maintaining speed & contributes to curve volume.
Deceleration (peak to catch2)	-6.88	excellent. steep deceleration maximizes volume under curve (speed).
Recovery Boat Movement (%)	64%	

BOAT SPEED CURVE (m/s)

ROWING TECHNIQUE POINTS

Crew name and category

Video file information

Boat length used for distance reference

Video file time reference

Time between stroke segments

Speed difference between stroke segments

Rigging Analysis based on stroke, oar position and time

Technique Analysis based on stroke oar position, time and acceleration

Graph Legend

Peak boat speed

GMS Time
Race Finish Time
Percent RCA GMS
Average 500m Split

Speed based on curve

Boat movement, one stroke

efficiency = curve volume / calc. line volume

Calculated acceleration

Existing Rigging Dimensions

Rigging Evaluation/Recommendation

Rowing Technique Evaluation/Recommendation

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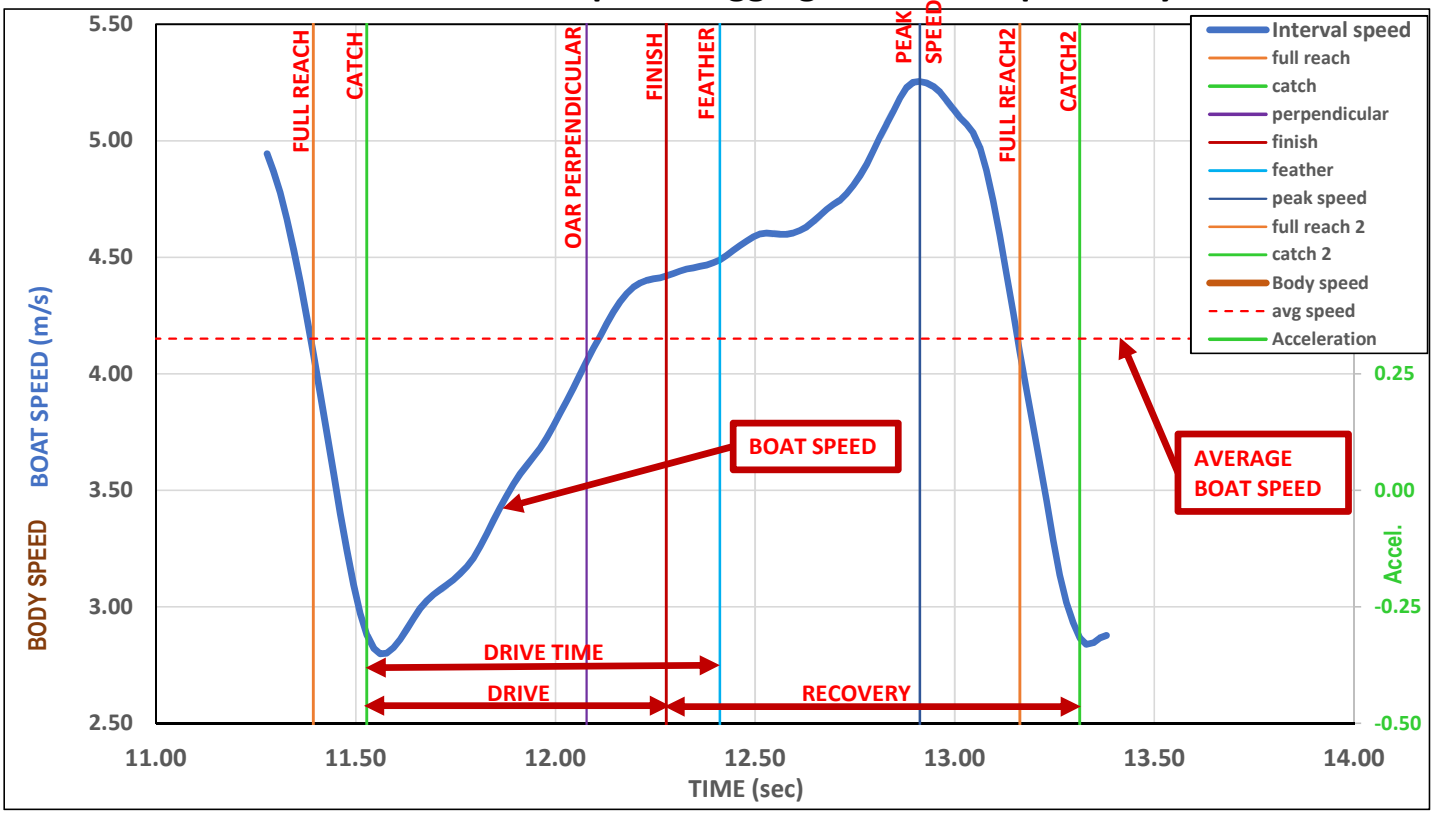

Crew Name	Name	**Video File**	20180603100858.m2ts	**GMS Time**	6:33.00
Boat Class	M1x	**Video Location**	St. Catharines	**Finish Time**	7:36.39
Race Category	Men	**Video Description**	CSSRA Sr. M1x Final	**Percent GMS**	86.1%
Boat Length	8.13	**Video Time & Date**	10:04 AM 2018-06-03	**Average Split**	1:54.10

GRAPH ANALYSIS

	time	boat speed
full reach	11.39	4.08
catch	11.53	2.88
perpndclr	12.08	4.06
finish	12.28	4.42
feather	12.41	4.49
full rch 2	13.16	4.09
catch 2	13.31	2.87

		GMS
Split Speed	2:00.47	1:38.25
Average Speed	4.15	81.6%

acceleration	time	speed diff	calc	efficiency
Catch to Finish	0.75	1.54	2.05	91%
Catch to Perp	0.55	1.18	2.14	74%
Perp to Finish	0.20	0.36	1.82	135%
Finish to Peak	0.63	0.83	1.32	68%
Peak to Catch2	0.40	2.39	-5.96	124%

Boat Movement	7.40	
Drive Distance	2.70	*36.4%*
Dist. Before Pin	1.83	*67.9%*
Dist. After Pin	0.86	*32.1%*
Recovery Dist.	4.71	*63.6%*

	speed	time
Minimum Speed	2.80	11.56
Maximum Speed	5.25	12.91

RIGGING ANALYSIS

0.81 Typical Drive Time

Drive Time	0.88
Blade Slip	+0.07
Stroke Position	73.3%
Stroke Time	1.79
Stroke Rate	33.6
Stroke Ratio	1.02
Oar Catch Angle	65.9

Rigging Notes

- Drive Time is catch full bury to finish blade on feather
- Blade Slip is the distance the tip of the blade moves in the water measured parallel to the boat
- Stroke Position meassured on the drive is the percentage of time (from catch to perpendicular) divided by (catch to finish)

- Stroke Rate is calculated by time (catch to catch2)
- Stroke Ratio is the recovery time dividefd by drive time
- Catch Angle is the approximate angle of the oar at the catch measured from perpendicular

Span/Sprd		160
Oar Lngth		287
Inboad		87.5
Blade Sz.		822
Footstop	Dist.	51
	Angle	42
	Height	18
Work Dist.		22

TECHNIQUE ANALYSIS BASED ON SPEED CURVE

Catch Effic. (full reach to catch)	0.13	- time from full reach to blade at fully bury (sec.)
Drive Accel. (catch to finish)	2.05	- boat acceleration between catch and finish (m/s^2)
Accel. Efficiency (curve vol.)	91%	- percent volume of acceleration, curve volume compared to straight line acceleration volume
Perp to Finish Accel (perp to fin.)	1.82	- boat acceleration between oars at perpendicular on drive and finish (m/s^2)
Release Effic. (finish to feather)	0.13	- time from finish (blade square most sternward) to feathered position (sec.)
Recovery Accel. (finish to peak)	1.32	- boat acceleration from speed at finish to peak speed on recovery (m/s^2)
Recovery Effic. (curve vol.)	103%	- percent volume of curve (finish to catch2) above horizontal line of boat speed at finish
Recovery Peak Speed (% of Rec.)	61%	- percent of time of recovery that boat reaches peak speed
Deceleration (peak to catch2)	-5.96	- deceleration, peak speed to catch2 (m/s^2)
Recovery Boat Movement (%)	64%	- percent of total boat movement on recovery (recovery/total boat movement)

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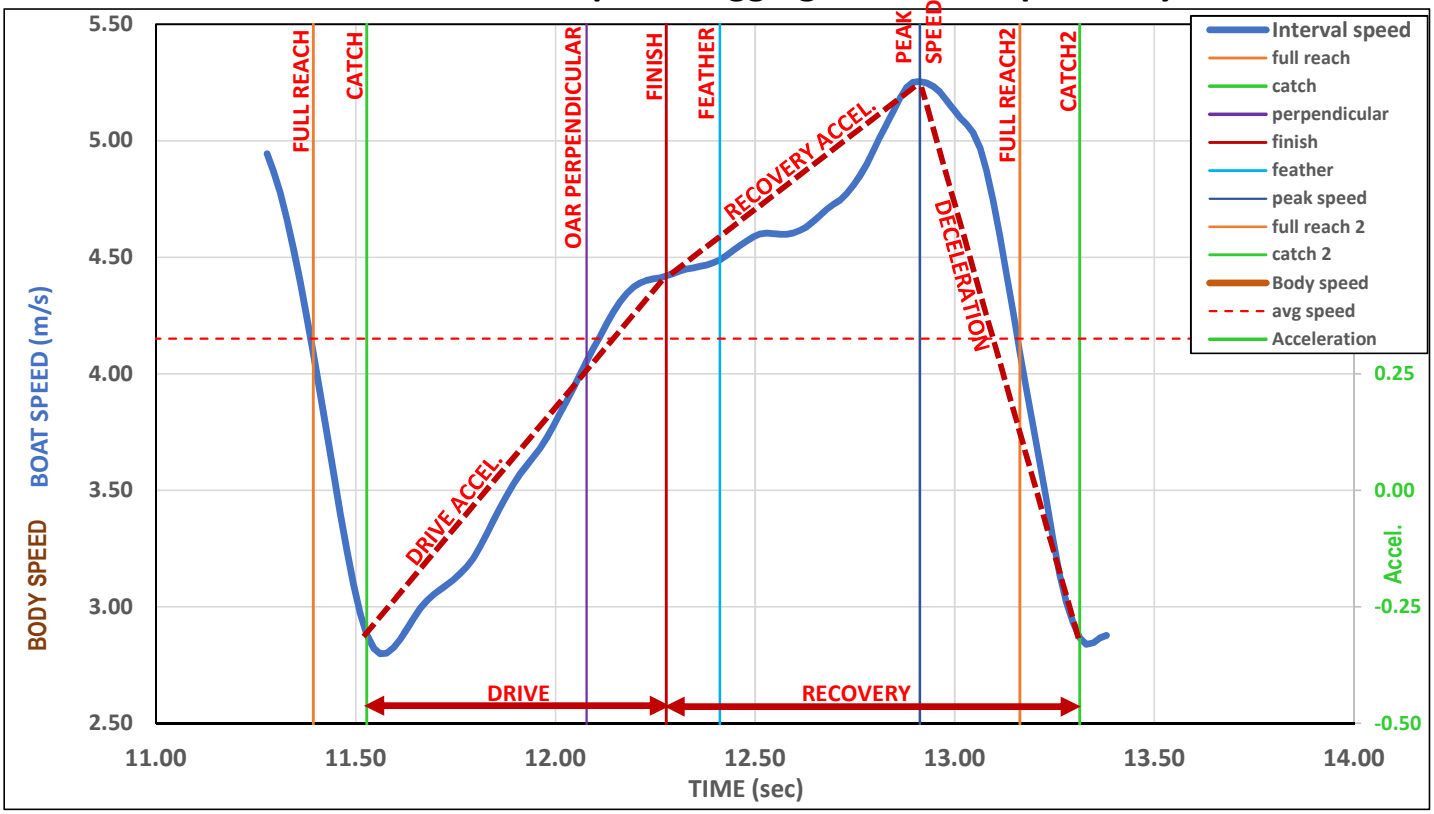

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Stroke Position	73.3%
Stroke Time	1.79
Stroke Rate	33.6
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Oar Catch Angle	65.9

Rigging Notes

- Is the Drive Time within typical limites? Reference GMS time, stroke rate and stroke ratio for insight into the rowing conditions. **If not consider changing rigging load.**
- Evaluate the Blade Slip (Sculling >+0.15m, Sweep pairs >-0.30m, fours >-0.25m, eights >-0.20). **Slip less than typical require stroke position and/or load or bladework evaluation.**
- Evaluate Stroke Position. Sculling (1x) Men 70% Women 67%. **Stroke position adjustments require footstop placement changes.**
- Evaluate Stroke Rate to ensure this is a typical racing stroke.
- Evaluate Stroke Ratio related to Stroke Rate and Drive Time to analyze crew rhythm.

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TECHNIQUE ANALYSIS BASED ON SPEED CURVE

These values are boat class specific!!! (EXAMPLE ONLY)

Catch Effic. (full reach to catch)	0.13	< 0.10 Excelent, < 0.12 Very Good, < 0.15 Good, <0.19 Fair, > 0.18 Low
Drive Accel. (catch to finish)	2.05	>2.5 Excelent, >2.2 Very Good, >2.0 Good, > 1.8 Fair, < 0.18 Low
Accel. Efficiency (curve vol.)	91%	>120% Excelent, > 110% Very Good, > 100% Good, > 90% Fair, < 90% Low
Perp to Finish Accel (perp to fin.)	1.82	> 3.5 Excelent, <3.2 Very Good, >3.0 Good, > 2.5 Fair, < 2.5 Low
Release Effic. (finish to feather)	0.13	< 0.10 Excelent, < 0.12 Very Good, < 0.15 Good, <0.19 Fair, > 0.18 Low
Recovery Accel. (finish to peak)	1.32	>2.2 Excelent, > 1.8 Very Good, > 1.4 Good, > 1.2 Fair, < 1.2 Low
Recovery Effic. (curve vol.)	103%	>108% Excelent, > 104% Very Good, > 100% Good, > 96% Fair, < 96% Low
Recovery Peak Speed (% of Rec.)	61%	>68% Excelent, > 64% Very Good, > 60% Good, > 56% Fair, < 56% Low
Deceleration (peak to catch2)	-5.96	<-6.0 Excelent, <-5.5 Very Good, <-5.0 Good, <-4.5 Fair, >-4.5 Low
Recovery Boat Movement (%)	64%	>75% Excelent, > 70% Very Good, > 65% Good, > 60% Fair, < 60% Low