

Duration of rotation : 0.83 - 0.70 (sec)

(Indicate effect of flip turning)

Forward movement of hips during rotation : 1.0 to - 1.3 (m)

(Shows how much hips moving during rotation forward)

Requirements for self control:

Continue movement of hips towards the wall during rotation making ellipse

Avoid unnecessary movements of arms during rotation

Make good dolphin leg kick at the beginning of rotation



Place the feet correctly and simultaneously on the wall

Avoid too much over rotation of shoulders

4. PUSHING PHASE

AIM of movements Try to increase pushing power and speed !

Limiting positions beginning: when the feet touch the wall
 ending: when the feet leave the wall

Parameters:

Forward speed during push : 1.50 - 2.5 (m/sec)

(Mean speed of hips during pushing indicate effect of pushing action. Mean speed should be analysed as beginning from zero and ending as max speed when feet leaves the wall : mean speed 1.5 m/sec means that max speed is about 3.0 m/sec and mean speed 2.0

Push off duration : 0.3 - 0.2 (sec)

(Push off duration indicate power of pushing : then shorter then better, but if swimmer is waiting before pushing, this duration considered as extra unnecessary time)

Requirements for self control:

Take streamlined position of body and arms for push, hide head between the arms

Avoid twisting from hips during push and push with body on the side

Keep back rigid and fixed during push

Keep horizontal direction of push, relatively deep, under wave

Begin push-off immediately after feet touch and make push duration very short

5. GLIDING PHASE



AIM of movements Try to maintain gliding speed !

Forward speed during first pullout stroke : 1.7 - 2.1 (m/sec)
 (Parameter indicate efficiency of that first pull)
 Forward speed during second pullout stroke : 1.70 - 2.1 (m/sec)
 (Parameter indicate efficiency of that second pull)

Requirements for self control:

Timing the start of first pullout stroke must be in time, at the end of the last dolphin leg kick, and optimum depth of the bc - not too deep

Simultaneously at the beginning of first arm pull switch over to flutter leg kicks, so that catch of right arm pull is co-ordinated with the left leg kick up, or vice versa

Make first arm pull with extreme stretching forward of the other arm

Body must be rising up to the surface at the end of the first arm pull

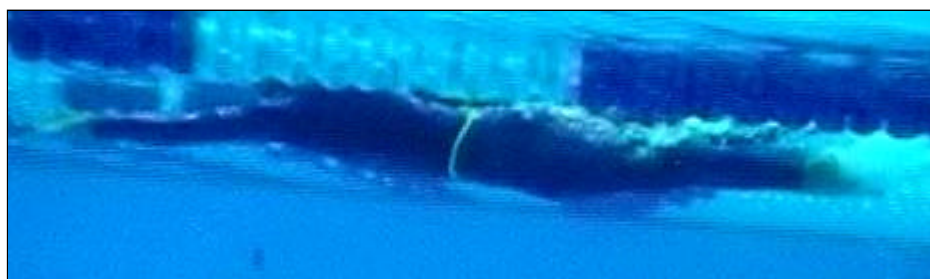
Timing of the beginning of second arm pull must be in time, at the end of first arm push, not too late - avoid extra gliding between strokes

The action of both arm strokes during pullout must be long with good acceleration, fixed high elbow positions

Avoid breathing actions during first pullout, and keep body position flat

Try to make pullout through " one hole " on water surface, head first, followed by body and legs - not like a submarine

8. SWIMMING AFTER TURN



AIM of movements Try to continue with same speed as before turn !

Limiting positions beginning: at the start of the stroke after pullout strokes
 ending: at the end of the full stroke cycle

Parameters:

Speed of the swimming cycle after turn : 1.7 - 2.1 (m/sec)

(High speed indicate good swimming technique after turn movements and must be compared with pullout speeds before it, well as with swimming speed before turn: must be same or higher)

Requirements for self control:

Continue the proper rhythm of swimming and breathing actions with swimming speed according to your individual tactical plan of the race

THE WORLD BEST START, TURN, FINISHING AND SWIMMING TIMES & SPEEDS

Men FREESTYLE

distance start 15m swims turns 15m finish 5m

50m	Jiang	Hoogenband	Popov
	22,33	22,06	22,25
sec	5,57		2,15
m/sec	2,69	2,17	2,09

100m	Popov	Popov	Gimbutis	Frölander
	48,74	48,93	50,93	49,53

sec		5,77		6,86	2,29
m/sec		2,6	2,02	2,19	1,97
200m	Kasvio	Klim	Rosolino	Loader	
	1.47,32	1.47,41	1.48,37	1.48.49	
sec		6,02		7,54	2,47
m/sec		2,49	1,81	1,99	1,82
400m	Kasvio	Perkins	Rosolino	Perkins	
	3.48,55	3.43,80	3.48,11	3.43,80	
sec		6,16		7,83	2,4
m/sec		2,44	1,73	1,91	1,88
1500m	Hackett	Perkins	Neethling	Hirano	
	14.51,70	14.50,52	15.12,50	15.14,63	
sec		6,45		7,99	2,6
m/sec		2,33	1,63	1,88	1,73