

WORLD CLASS START TECHNIQUE – IMPORTANT OBSERVATIONS



1) Phelps keeps his shoulders well underneath his hips as he drives off block. He moves forward with low shoulders.

Green line

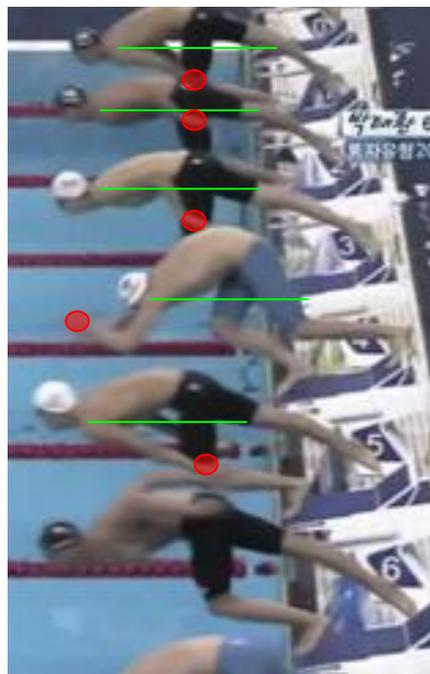
2) Lochte, Agnel and Park extend their upper torso from the hips quickly. They all move forward and upwards by their shoulders.

Green line

3) All swimmers arms travel backwards as the body drives forwards apart from Biedermann. His arms travel straight forward. As can be seen in the pictures Biedermann is by far the slowest off the block. His spine is also extremely flexed which isn't good for finding horizontal flight quickly.

Red dot

4) Phelps, Lochte and Agnel all drive their elbows up high prior to moving their arms to streamline. I feel this helps them find extension through the bodyline quicker.



5) Most of these world class swimmers on look forwards for a flash moment whilst they drive the front leg to extension. The vision returns to the water as the front leg leaves the block.

Yellow arrow

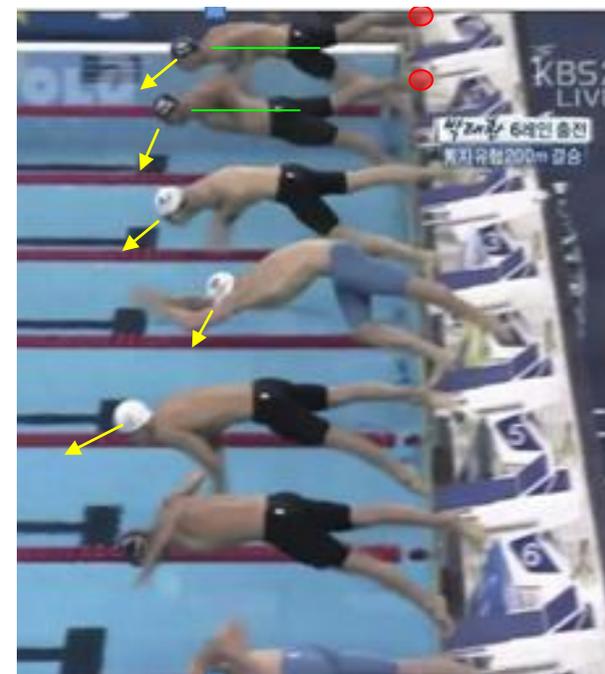
6) Phelps and Lochte achieve rear leg drive height more quickly than other swimmers.

Red dot

7) Notice how much quicker Lochte is reaching leg and bodyline extension compared to Agnel (very similar in picture 2 / different picture 3).

8) As the front leg leaves the block I feel Phelps and Lochte have the best bodyline hips through to shoulders.

Green line



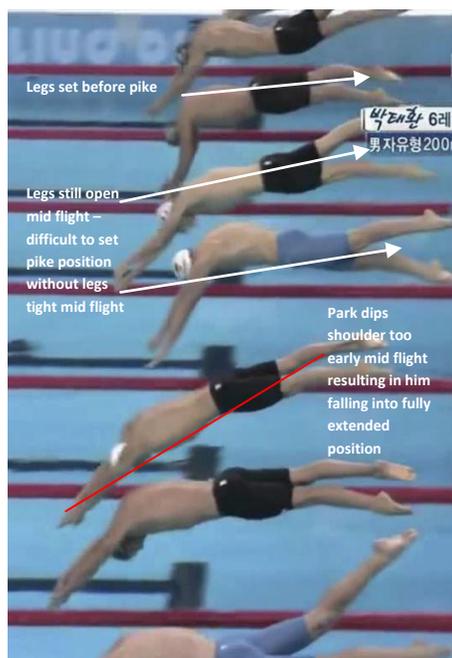
9) Phelps, Lochte & Park get their front leg horizontal far quicker than Biedermann & Agnel.

Green vs Red Lines

10) Phelps & Lochte hold the bodyline from shoulders through to toes mid flight whilst Park's shoulders drop too early. This results in him beginning to fall and find a steep entry line too soon.

Green vs Red Lines

11) As Agnel & Biedermann's front leg is too slow to find the horizontal line neither will have enough time to align the legs together which is needed before setting a pike entry position. As their shoulders drop diagonally the front leg will do the opposite, elevating upwards. The result will be a see saw effect with the body ending up entering completely straight (no pike).

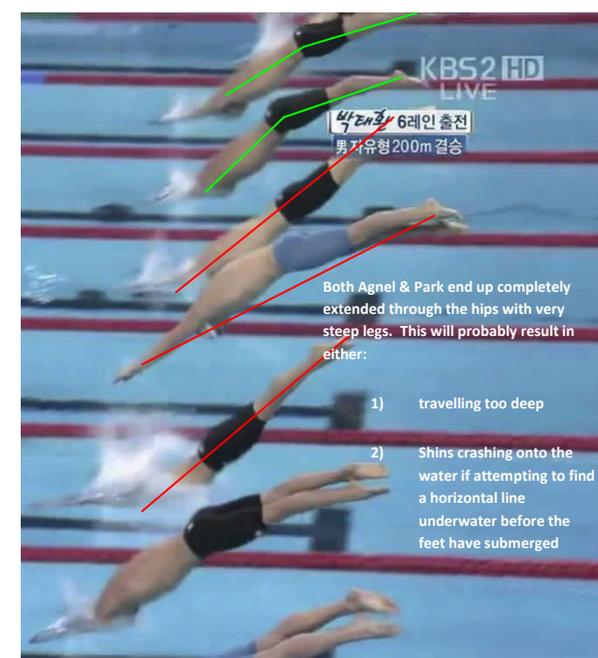


12) Phelps and Lochte bring their arms through forward later than the other swimmers. This is because they have held their bodyline in a more extended position for a slightly longer period of time. This will result in the ability to dip the shoulders late (originating from the hips) and set the pike entry position.

13) The pike entry position sees a steep upper torso line with a flatter leg line. The steep upper torso line aids speed cutting down into the water. The flatter leg line enables helps the swimmer find a horizontal line more quickly underwater and not travel so deep.

14) Phelps and Lochte achieve a more prominent pike position than Biedermann, Agnel and Park.

Green vs Red Lines





15) Lochte and Phelps hold their pike position as their upper torso slips into the water.

16) Biedermann's slow reactions and delayed drive see him well behind even as the race just reaches the water.

17) Park attempts to find a horizontal line before his feet submerge cause a large crater in the water which will cause a huge amount of drag.

[See Red circles](#)



18) Whilst the underwater kicking ability of Lochte and Phelps is unquestionable I also believe there start sequence is technically superior to the competition in this race.

Both post start times here of 5.48 & 5.68 which are between 0.3 to 0.58 seconds quicker the 15m than Biedermann, Agnel & Park.

For Phelps the time variance at the end of the race between him (2nd) and 3rd, 4th, 5th was 0.09, 0.13 & 0.20 seconds. Considering his start made a difference of 0.50, 0.58 & 0.53 seconds it could be argued that his start actually won him the silver medal instead of coming 5th.

A good argument for developing a swimmer's start technique.



WORLD CHAMPIONSHIPS 2011 – 200M FREESTYLE FINAL (MALE)

DATA

	Reaction	Distance to Break	Time to Break	Time to 15m	Overall Time
Lochte	0.67	12.81	4.56	5.68	1.44.44
Phelps	0.69	13.14	4.62	5.48 0.20	1.44.79 0.35
Beidermann	0.77	10.85	3.78	5.98 0.30	1.44.88 0.44
Park	0.66		3.48	6.06 0.38	1.44.92 0.48
Agnel	0.70			6.01 0.33	1.44.99 0.55