

DOING THE LEGWORK



Everyone knows that you need to use your legs well in rowing, but what exactly does this mean? This month, **Robin Williams** delves into the foundation of a good leg drive and its relation to the power curve

PHOTOS: **ROBIN WILLIAMS**

Okay, so surely the legs just push until they're flat on the deck, rise during the recovery and push flat again next time? Absolutely, but you can push your legs fast, slow, soft or hard, early or late, and then there's the question of how far you push before you pull. It's not always easy to tell if you are using your legs in the right way or for the coach to look at you and tell a good leg drive from an 'okay' one. So it's useful to delve

a tennis ball and produce a lot of power but with a low force.

When you make that first quick **foot** pressure the graph rises steeply, but it doesn't take more than a few milliseconds so it doesn't move much to the right (time). Photo 1 indicates this part of the stroke, which is essentially the catch and is just a balls-of-the-feet movement. To build the graph higher, the quads now work through the **knee** joints which also make the **hips** push away (photo

the hull accelerates so much – hence we now have some real power resulting from that original force. Your back extension contributes to the primary technique because it can happily work against the leg drive, but eventually you have to use the shoulders and arms (secondary technique) and they pull very fast because the load is low now yet the speed is high. It's a good problem to have because it means you are going fast!

This is a mechanical way of looking at the formation of your leg drive. Nevertheless it's not hard to see that if you create good force at the beginning and feed in the power from the quads, hips and back at the optimum rate, there will be a strong feeling of acceleration to the finish and consequently a good rhythm. In this sense, the rhythm of the legs is the rhythm of the boat – move your legs the way you would like the boat to move.

“ Move your legs the way you would like the boat to move ”

a bit more into this component of the stroke.

The action of the leg drive is quite similar to a squat jump from the floor and – just like the floor – the stretcher is your fixed point. The movement sequence goes ankle-knee-hip with the movement gathering pace as you open those joints. I describe two kinds of leg pressure: there's the quick, reactive pressure from the feet to the blade which simply fixes the spoon and connects you up but only uses the first inch of slide. And then there's the main leg shove which moves the hull forwards and uses up all the slide. Both can be practised.

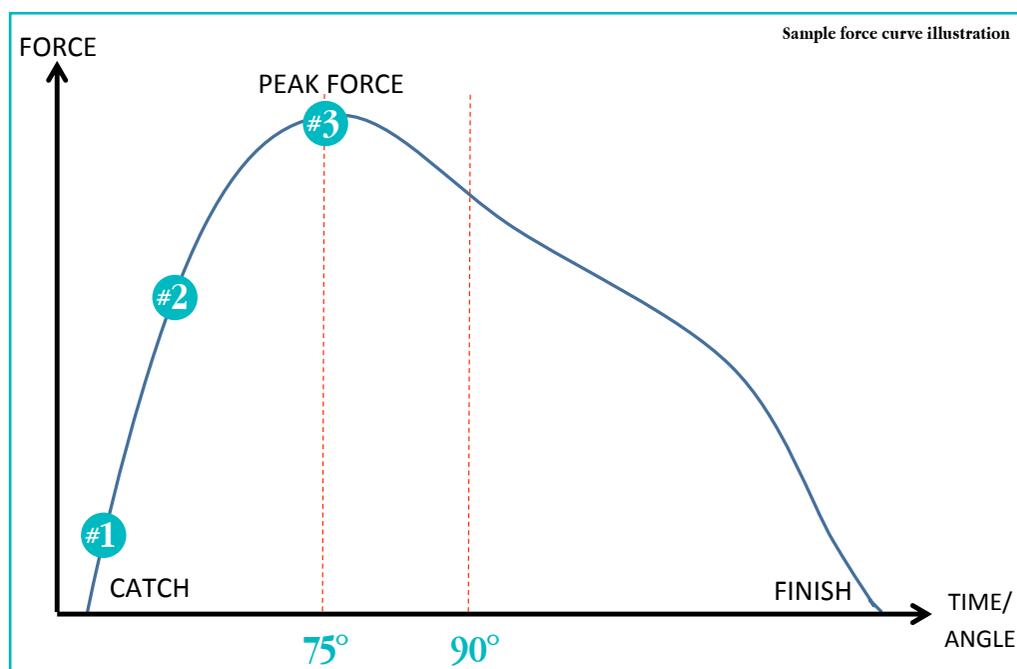
Have a look at the 'force curve' diagram. This is a sample graph you might get if you attach sensors to the boat and shows force produced on the vertical (Y) scale and time or angle on the horizontal (X) scale. In other words it displays how hard you can work versus how explosive or powerful you are. For juniors it is helpful to understand the difference between force and power because many youngsters try to power the catch ('hit it') instead of loading it and are simply wasting energy because the boat cannot 'jump' speed so quickly. For example, you can make a lot of *force* by pushing against the wall of your house but it (hopefully!) won't move. So you have lots of force but no distance or power because there's no movement to measure. Conversely, you can get a lot of movement out of a light object like

2) so you now see the graph develop to the right. The more force you make, the more the boat tries to move away from it so there comes a point in this primary drive where you cannot push any harder and the force peaks out. This is ideally about 15° before the oar is square to the boat (photo 3) and is the highest point of the graph, the challenge now being to maintain the high force.

In practice, it is hard to hold the peak because

What can go wrong though and how can you practise getting it right?

Well, **slippage** at the catch is the significant problem. As I said in the last issue, it can take 0.1" or more to cover and lock the spoon yet the boat may move half a metre in that moment. Slippage can come from a mis-timed entry or a poor legs /



#1



Olympic champions Zac Purchase and Mark Hunter at the catch, which is almost just a balls-of-the-feet movement

#2



The graph ascends as the quads work through the knees making the hips push away

#3



The highest point of the graph where the force peaks out – ideally about 15 degrees before the oar is square to the boat

back connection, so practising an accurate entry point is time well spent. Static roll-ups progressing on to rowing legs-only are two useful exercises. Your power curve won't begin until you've dealt with any slippage or slack in the system.

Next consider the **amount of drive** to apply. It is worth trying various leg pressures from light to firm and quickness from slow legs to fast. Somewhere in there will be the happy medium where you feel well connected and the boat will respond willingly to your work, squeezing off your foot pressure and accelerating through your strong quads / hip drive.

Pushing / pulling: the first 30-40° of the stroke is about pushing, loading, and force production, not about pulling. So if the legs are doing their job properly in this sector the back will work but will not physically open until later. This means that the handle is not going to get closer to the seat or overtake it just yet. The distance will remain constant. Try legs-only rowing and maybe even tie a strap from the seat axle to the handle so it's a set distance and then see if you can get your pressure without opening the back, which will make the strap go slack. You can also position a straw on the saxboard where you think the pulling movement should start.

Robin Williams

Robin coaches the GB women's pair who won silver at the 2011 World Rowing Championships. He coached the lightweight men's four to gold at the 2007 Worlds and to fifth at the 2008 Olympic Games. From 1995 to 2005, Robin was Chief Coach at CUBC, achieving seven wins out of 10 in the Boat Race against Oxford. After learning to row at Monmouth School and then representing the University of London Boat Club, he gained his first GB vest in 1981 when he was selected for the Worlds.