CLUBMATE GOLF AUSTRALIA

GOLF CLUB COMPONENTS

# eTECHREPORT

## June 2006 eTECHreport - Welcome!

- **TWGT and Search Go National in USA Today**
- **Search Wins ING Book of the Year**
- **Q&A on Shafts**
- **The Spin on Spin**
- **Common Sense Clubfitting**
- **An Inexpensive Road to More Business**
- **TWGT Makes the Big Tour**
- **Identify with TWGT**

### TWGT and Search Go National in *USA Today*

On June 15 and 19, millions of golfers who read "USA Today" found a quarter page ad in the Sports section for *The Search for the Perfect Golf Club* to continue the campaign to get Search in the hands of as many golfers as possible.


Yes, this is very expensive for a small company like TWGT to do. But we know that a very high percentage of golfers who read the Search book DO respond by heading to their local clubmaker's shop to be custom fit with golf clubs that will enable them to get the most from their game. Those of you who currently use Search or the 12 Myths booklets to promote your services already know the power of the message in these two TWGT publications. Since the major golf publications are hesitant to promote these books, we simply decided it was time to get a little more serious and put Search in front of a huge number of regular golfers.

*USA Today* has a daily circulation of over 2.3 million with a "pass-around" readership of over 5 million people. According to two independent professional media research firms, 48% of all *USA Today* readers are golfers. The Sports section of *USA Today* is comprised of only 8-10 pages and has very few advertisements. Thus the message of Search will not be overshadowed by numerous ads all competing for the eyes of the readers. Since the US Open is being played June 15-18, we chose to display the Search ad in two separate issues of *USA Today* which will have extensive coverage of the tournament and will more likely attract the attention of golfers.

No other custom clubmaking supplier works this hard for you. But we're glad to be the only company that markets to consumers to generate demand for your services because Search DOES just that!

## Search Wins ING Book of the Year Award

The International Network of Golf, a leading organization of golf media professionals, has announced they have chosen The Search for the Perfect Golf Club as their 2005-2006 Book of the Year.

ING was founded in 1990 as a non-profit organization of golf media professionals to increase awareness of the game through improved communication and networking. The ING announced their selection of Search as their 2005-2006 Book of the Year at their annual conference in Pinehurst, North Carolina the week of May 22-26.

"It was really nice to hear that the Search book impressed the ING's selection committee enough to merit receiving this prestigious award," said TWGT founder and president Tom Wishon. "We've been working very hard to get publicity for Search because its message is so good for both golfers and custom clubmakers. Now that we can say the book has been chosen as the best golf book for 2005-2006, we are confident this will help overcome any of the hesitation that may have prevented the book from being shown and promoted more frequently."

"Few people know the difficulty that we have faced in getting publicity for Search. Most of the consumer golf publications have been hesitant to promote it because the message of Search does encourage golfers to seek out their local custom clubmaker as the best source for golf clubs which will bring out the most in their games," Tom continued. "That truthful message flies in the face of buying standard made OEM clubs off the rack. Since the OEMs buy so many ad pages in the consumer golf magazines, that makes it difficult for these publications to promote the Search book. In addition, the big time national variety or business publications have held back promoting Search simply because they felt it was just another golf book. So believe me, we are definitely making all of the possible publicity sources know that if Search is good enough to be selected as the Book of the Year in golf by a respected group of golf media professionals, then it is definitely something every major publication needs to expose to golfers."


For clubmakers who have yet to see or read The Search for the Perfect Golf Club, or the 32-page compilation of Search excerpts, 12 Myths That Can Wreck Your Golf Game, there is no excuse now! Get your copy of these books today and find out why so many custom clubmakers are both more knowledgeable in their fitting as well as benefiting from the way that Search and 12 Myths generate an increase in their business.

## Q&A on Shafts

Last month, to help her research an upcoming article on shafts for Golf for Women magazine, Golf Digest assistant equipment editor Caroline Stetler sent a series of questions about shafts to Tom Wishon. Realizing the opportunity for being able to steer the publication in the right direction with regard to offering their readers completely hype free, factual information about shafts, Tom took the time to answer Ms. Stetler's questions in detail. Because the information touches on so many different aspects of shafts, we decided to publish Tom's responses so that not only can you have another good dose of shaft information, but so

you can see how much Tom is willing to help get the best information in the hands of the golf publications who write articles for consumer golfers. We warn you. This is a little on the long side, but when it comes to explaining the function and performance of shafts, no one can tell it like it is more than Tom! Enjoy!

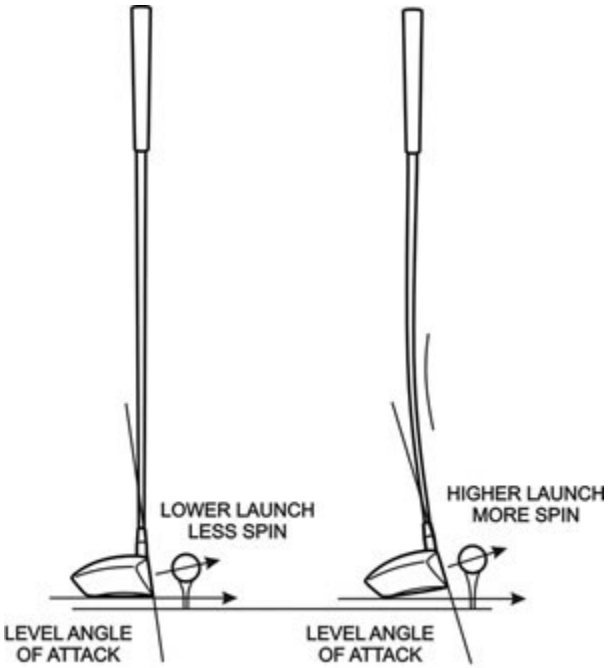
### *1. What is the role of the shaft in a golf club and how important is it?*

**1.** The shaft is the number one controller of the total weight of the golf club. If you want a heavy feel, you have to go with a heavy shaft and vice versa for a light feel. Shafts exist between 40 grams and 130 grams. For achieving a normal swingweight range at the average lengths to which golf clubs can be built today, the heads each exist within a pretty narrow range of weight. Hence because you can have as much as a 90g range in shaft weight, the shaft is the #1 determinant of the total weight of the club.

From that of course, you have the ability to affect the golfer's swing speed; lighter shaft = lighter total weight = more swing speed. Fact – it takes a decrease of 20-25g of total weight of the club to allow the avg golfer with decent swing fundamentals to gain 1mph in swing speed. Hence if you shift from a 120g steel shaft to a 60gram graphite, most golfers would gain about 2.4mph in swing speed. For most golfers a 1mph increase in swing speed = 2.8 more yards in carry distance.

Now that something like 90% of all drivers are sold with a graphite shaft that weighs in the area of 60-75 grams, you can see that it's going to be pretty tough for most golfers to ever lower the total weight of their driver by enough more to get enough of a total weight decrease to account for any more swing speed increase. Yes, if you have a 70g shaft in your driver now and you go to a 40g shaft, you could pick up 1+ more mph in swing speed. But is that a measurable improvement in distance? Probably not in my book. So when it comes to using the shaft to decrease total weight and gain swing speed, you have to say that today, only in the irons is where that can happen. The reason is because graphite shafts currently comprise only 25-35% of the market share in iron shaft assembled club sales. Hence you do have quite a few golfers who could gain some distance in the irons if they have the money to stand the cost of an all light-graphite set of irons.

**2.** So, bottom line is that YES, the shaft can allow you to drop total weight to gain more swing speed, but how many golfers are in the position where they can do that when they already own a light graphite shafted driver, and possibly fairway woods too?




The shaft may be able to have a slight effect on the launch angle and trajectory of the shot. However, it can only do this for golfers who have a mid- to late release of the wrist cock on the downswing, and who are able to keep the club accelerating on the downswing. Golfers who unhinge the wrist cock angle very early on the downswing expend all of the centrifugal force too early in the downswing that causes the shaft to bend forward at impact. Thus by the time they reach impact the shaft will no longer be able to bend forward and cannot have any effect on the trajectory. This is why golfers with an early release and passive downswing acceleration will hit all shafts the same height. Only the golfers who can retain the wrist cock angle until midway to late in the downswing will ever be able to see any change in the trajectory of the shot for any given clubhead loft or CG position. And that will be a slight change – in wood shafts, the most I have ever seen is a 2.5 degree change in launch angle between the

most high trajectory shaft and the most low trajectory shaft designs. In the irons, this difference is only 1.5 degs because all iron shafts are much stiffer than all wood shafts by virtue of their shorter length and their larger tip diameter.

Now, what do you do with that to end up finding the best driver loft that will maximize distance for any golfer? Seriously clubmakers, you really should have and use TWGT's Trajectory and Ball Flight modeling software. For an amazingly powerful and informative piece of shot prediction software such as this to only cost $89.50 is literally a steal, considering all it can do for your fitting. With the TWGT Launch Angle Mat, Trajectory and Ball Flight software and a driver of known loft, clubmakers can very accurately fit any golfer for THE loft angle which will result in the most distance.

**3.** Here's the BIGGIE that messes us all up and makes so many people think that the shaft contributes more to the shot results than it really does. The shaft has a very large effect on the FEEL of the golf club in two different ways. One, if you have a very discerning sense of feel in the swing, you can FEEL the shaft bend at the beginning of the downswing and again, right before impact. Most definitely there are golfers who have developed a very personal sense of what feels good and what feels bad when it comes to this perception of the shaft bending in the swing. Hence you have the situation where a rep on the tour hands a club to a pro who hits it once and tosses it back to the rep saying, "nope, I don't like this." Or, you have the opposite situation where a pro hits a club with a new shaft and after one or two swings says, "I like this, how soon can you re-shaft my driver?" If any player has a very definite sense of like and dislike in the bending feel of the shaft, when they get a shaft that feels bad to them in the bending feel, they start to change their swing to make the shaft feel better. This usually leads to more swing mistakes which result in more bad shots, which then are all attributed to the performance of the shaft. In reality, the poor performance happens because the golfer's swing moves are not well-matched to that shaft to be able to make it bend so it feels good to the golfer. On the other hand, when such a player gets a shaft that has all the desirable bending feel characteristics, their swing becomes more fluid, more consistent, and the shotmaking is better – and that is typically attributed to the shaft and thus labeled as a "performance element of the shaft."

The other FEEL that comes from the shaft is a portion of the feeling of the impact of the ball on the face of the clubhead. When the shaft is too stiff for the swing moves of the golfer, the shaft will transmit a more harsh feeling of the impact. Likewise when the shaft is more flexible, the shaft will transmit more of a softer feel of the impact of the ball on the face. Granted, a lot of this feel can also be controlled by the design of the face and the weight distribution of the head. So it is easy to confuse where the shaft's contribution to the impact feel stops and the contribution of the face/head design starts. But there is no question that if the shaft is too stiff for the golfer's swing moves, the impact feel will not be as pleasing as it will when the shaft is more flexible and thus more in tune with the golfer's swing moves.

**4.** The shaft has a slight contribution to the accuracy of the shot both through its overall stiffness design AND through its torque. This too is difficult for a golfer to separate out and determine if any misdirection is coming from the flex being too stiff or the torque being too high – or if something about the shaft and the assembled specs of the club are contributing to make the golfer make swing mistakes that cause the misdirection. Basically, torque is not much of an issue in performance these days because of the more narrow range in which torque exists within the design of shafts.

As you know, most shaft companies will make their graphite shafts so that the stiffer flexes will have a lower degree of torque, while the more flexible designs have a higher degree of torque. Currently, you don't see torque existing much below 2 point something degrees, and this is always in the stiffer shaft designs which are intended for the strongest of the higher swing speed golfers. Likewise you do not see shafts with a torque much higher than 6 degrees, and this is almost always in shafts that are very flexible or intended for less strong, less skilled golfers.

Hence when it comes to torque, as long as the very strong golfer with the very aggressive

downswing and late release stays away from shafts with a torque higher than 4.5 degs, that golfer won't see any misdirection that comes from the twisting of the shaft on the downswing. And likewise, as long as the much weaker golfer with a much more passive downswing stays away from shafts that have a torque lower than 3.5-4 degs, they won't end up with a harsh, unsolid feel from impact. And that's the way it is with torque.

For tour players or tour player like ball strikers, this is a little different but ONLY because these guys and gals are SO CONSISTENT with their ball striking that they can notice when a club results in a shot pattern that makes the ball move 5 feet off line. So for a player who is that good, yes, there can be situations in which a change of torque of 1 degree can tighten up their ball flight to the point that they don't see the slight movement of the shot that causes them concern for accuracy.

### *1A. What does the shaft NOT DO in the swing?*

As you can see Caroline, I added this question to your list. This is REALLY IMPORTANT because here is where you find so many MYTHS and MIS-INFORMATION about the performance of the shaft. First of all, the shaft DOES NOT "buggywhip" like a slingshot to hit the ball. Golfers think it does because they feel the shaft bend at the start of the downswing and then they feel the shaft kick at the bottom of the swing just before impact. That sensation naturally makes golfers think that the shaft "loads and unloads" as if to propel the ball in a slingshot manner of "spring back and spring forward".

The bending of the shaft at the start of the downswing and the bending of the shaft just before impact are TWO DIFFERENT ACTIONS which are unrelated to each other in their source. The amount of bending the golfer feels in the shaft at the start of the downswing happens in the 6 o'clock/12 o'clock plane of the shaft, i.e. in a toe-up direction. The bending of the shaft just prior to impact happens in the 3 o'clock/9 o'clock plane of the shaft, i.e. toward the target line. These are two totally different planes of the shaft.

The reason that the shaft cannot spring forward in a sling shot action is because our hands are so fleshy and supple. Here's an experiment any golfer can do to prove this. Grip a driver as firmly as you can and ask a friend to flex the shaft backward while you maintain the most firm hold on the grip you can to keep your hands and the grip from moving while your friend flexes the shaft back. Now ask your friend to let go of the shaft. The shaft simply goes back to straight and no more because your hands are so supple that they "Kill" the spring action of the shaft. If you want to see an example of the shaft springing forward in a slingshot action, secure the grip of the club in a bench vise, then pull the shaft back and let it go. Here you will see this slingshot action because the vise is so rigid that it can hold the grip with absolutely no movement when the shaft springs back. Your hands are not nearly as strong and rigid as a bench vise and therefore any slingshot action of the shaft is killed by the hands.

The initial bending of the shaft at the start of the downswing is controlled by, 1) how forceful and sudden the golfer starts the downswing (we call this the transition move in the swing). The more sudden the application of force by the golfer to start the downswing, and the more forceful this transition move, the more the shaft will flex at the very beginning of the downswing, and the more the golfer will feel this bending action. 2) the overall stiffness or flex of the shaft. Obviously, the stiffer the shaft, the more it will resist the golfer's transition move to be bent. And vice versa, the more flexible the shaft, the more it will bend in response to the golfer's transition move. 3) the length of the club – Again, obviously the longer the club, the more it will flex in response to the golfer's transition move in the swing, and vice versa for shorter lengths. This combined with #2 is why iron shafts never flex as much as a wood shaft. 4) the clubhead weight – the more weight in the clubhead, the more the head reacts to the transition move of the golfer to resist starting to move. The more the head resists the force of the downswing, the more it places a bending action on the shaft.

The bending of the shaft just before impact is controlled by, 1) How late or early the wrist-cock is unhinged in the downswing. As long as the golfer is able to retain and keep this wrist

cock angle "hinged" from the start of the downswing, the golfer's arms and the club are moving AT THE SAME SPEED. The second the golfer starts to unhinge the wrist-cock angle, centripetal force is now applied to the clubhead and shaft. 2) the more centripetal force the golfer thus applies to the club, the more the head is "encouraged" to "push" the shaft forward. This is pure physics and is not subject to debate, period. When the golfer unhinges the wrist-cock angle early in the downswing (casting off the club) all of that centripetal force effect which causes the shaft to bend forward happens way before impact. Thus by the time the club gets to impact all of the forward bending influence of the early unhinging of the wrist-cock is "spent and gone" and the shaft arrives at impact in a straight position, thus unable to have any additional effect on the launch angle and trajectory of the shot.

Only in EXTREMELY RARE circumstances will the shaft be lagging backward when the clubhead arrives at impact. This can only happen when, 1) the golfer never fully unhinges the wrist-cock before impact, 2) the golfer also has a very aggressive downswing acceleration with the arms, 3) the shaft is flexible enough so it cannot resist the effects of #1 and #2 to start bending forward. Tiger Woods' famous "stinger shot" with a fairway wood or 2-iron would be the closest swing action I can describe that could cause the shaft to be lagging with the head behind the shaft and hands at impact.

99.9% of the time for players with a mid-way to late downswing release (unhinging of the wrist-cock angle) the shaft will arrive at impact bent FORWARD by some amount. This is the ONLY WAY the shaft can have an additional effect to the clubhead loft and CG and the the swing angle of attack to determine the final launch angle/trajectory of the shot. How much the shaft bends forward at impact is determined by, 1) how late the wrist cock release happens in the downswing. The later the release is FULLY unhinged before impact, the more the shaft could bend forward, 2) The golfer's swing speed – the higher the swing speed, the greater the centripetal force that is applied to the head to push the shaft forward, 3) the flex/overall stiffness of the shaft. Obviously, the more flexible the shaft in relation to #1 and #2 above, the more the shaft could flex forward before impact, 4) The distance that the center of gravity of the head is to the rear of the hosel bore. The laws of physics say that the shaft cannot bend forward more than the distance that the CG is back from the center of the hosel bore in the head. This too is unalterable scientific fact. So the farther back from the hosel bore the CG is located, the more the shaft can bend forward at impact.

Point #4 combined with point #3 above is why iron shafts cannot change the launch angle and trajectory of the shot as much as can a wood shaft. Conventional irons cannot get their CG very far back of the hosel bore because as you know, irons are narrow in their face to back dimension by tradition in their design. Also, iron shafts are all stiffer than the wood shaft of the same model and flex – this is because they are shorter in length AND iron shafts are almost always made with a larger tip diameter than wood shafts.

### *2. What are the swing characteristics necessitating different shafts for women and men (swing speed, load, strength)?*

How many hours do you have for me to explain THIS answer to you?!!! HA! Caroline, THIS is what shaft fitting is ALL ABOUT. Basically there are 5 things. 1) Swing speed, 2) The golfer's TRANSITION move, ie the force with which they start the downswing, 3) Swing TEMPO, i.e their ability to keep the club accelerating and to how much intensity on the downswing, 4) Wrist cock, aka the RELEASE, ie how early or how late in the downswing does the golfer unhinge the wrist cock angle. 5) BENDING FEEL, ie how much does the golfer notice AND depend on a specific bending feel to gain the confidence that the shaft is good for them and how they play.

**1. Swing Speed –** I think it was True Temper who coined the term to describe their philosophy about swing speed vs flex fitting in the early to mid 90s which said, "it's not how fast you swing the club, it's how you swing the club fast." What they mean is that you definitely can have two golfers with the same clubhead speed at impact who have such different swing moves that each may need to be fit into a totally different flex. However, there is still no question that we have to start with swing speed in shaft fitting as a way to

ELIMINATE shafts that are definitely out of the question with regard to fitting. Let me put it another way – It is VERY probable that you can find two golfers with the same swing speed who do need to be fit into two different ADJACENT flexes, like an R or an S, or like an A or an R. But it would be VERY RARE to find two golfers with the same swing speed who would end up with one of them in an A and the other in an S. So no question, swing speed is a critical STARTING POINT in the shaft fitting process, but it is definitely not the main thing.

**A critical part of using swing speed in the shaft fitting process is to have a really good list of what the shaft companies or shaft research people say is the swing speed range for each shaft.** This way if you have a golfer with a 70 mph driver swing speed, you know that you are going to eliminate all shafts with a swing speed rating of 75-80mph and higher and all shafts with a rating of 60-65mph and lower.

**2. Backswing to Downswing Transition move –** How does the golfer start the downswing with regard to the initial force that they apply to the shaft? I identify three basic transition moves in golfers with regard to their influence on shaft fitting. A) Smooth Transition – this is the golfer that starts the downswing very passively with little visible sense of applying an immediate force to start the downswing. B) Hard Transition – this is the golfer that cannot wait to start the downswing and actually gives the visible impression of really ramping up the force to really HIT the ball hard. C) Avg Transition – obviously this is in between; you sense that the golfer is trying to apply some real force to the start of the downswing to get the speed up there, but it is not nearly as much as the Hard Transition player.

If the golfer has a hard transition move, they will bend the shaft far more at the beginning of the downswing than will the golfers with an avg or smooth transition. Therefore, for the purpose of fitting FEEL for golfers who note and care about that, when I see a hard transition move, I look for shafts that come from a swing speed rating that is 5 to 10mph HIGHER than what the golfer's swing speed really is. This is because the higher the swing speed rating for a shaft, the stiffer it will be. Thus with a hard transition move, the golfer would be better off in a SLIGHTLY stiffer shaft (i.e. a little higher swing speed rating) than the golfer with the same swing speed who has an avg to smooth transition.

Here's how it works – let's say the golfer has a driver swing speed of 85mph. With a smooth transition, I look for shafts that are rated as 75-85mph. With an avg transition move, I look for shafts that are rated as 80-90mph. And if this golfer has a hard, forceful transition, I look for shafts that are rated as 85-95mph. See how

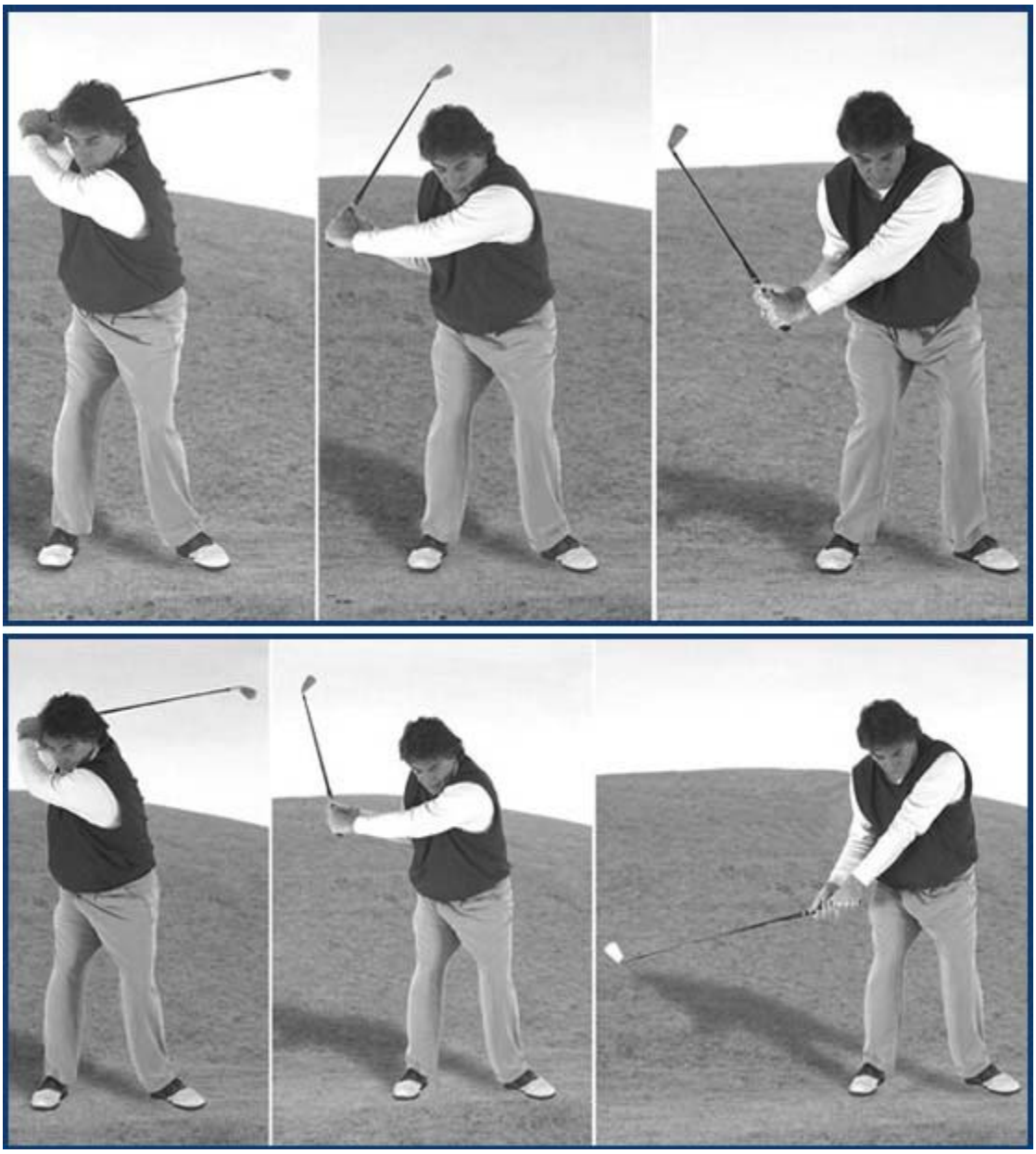
this works to give the harder transition golfer a shaft that is a little stiffer than their swing speed?

One more thing about transition – usually the harder and more forceful the transition, the HEAVIER the shaft weight should be. And vice versa, the smoother the transition move, the LIGHTER the shaft weight should/could be for the golfer.

**3. Swing Tempo -** This one is a little related to the transition. The faster the swing tempo, the more tendency to shift into a SLIGHTLY stiffer shaft than what the golfer's swing speed indicates. Also the faster the swing tempo, the heavier the shaft weight could be as well. If I see a hard transition PLUS a fast tempo, I definitely am pushing the golfer into a shaft

that has a little higher swing speed rating than the golfer's actual swing speed.

**4. Wrist Cock release -** The later the unhinging of the wrist-cock in the downswing, the more bending force the golfer is applying to the TIP SECTION area of the shaft. Hence the later the release in the downswing, the more TIP FIRM the bend profile of the design should be for the golfer. This is primarily done for a



trajectory and feel aspect of the shaft fitting for the golfer. Normally if you have a golfer with a late release and you put them into a tip flexible design, they will hit the ball higher than they prefer and they will get more of a "whippy" feeling of the bending of the shaft just before impact – also something that most players with a late release do not like.

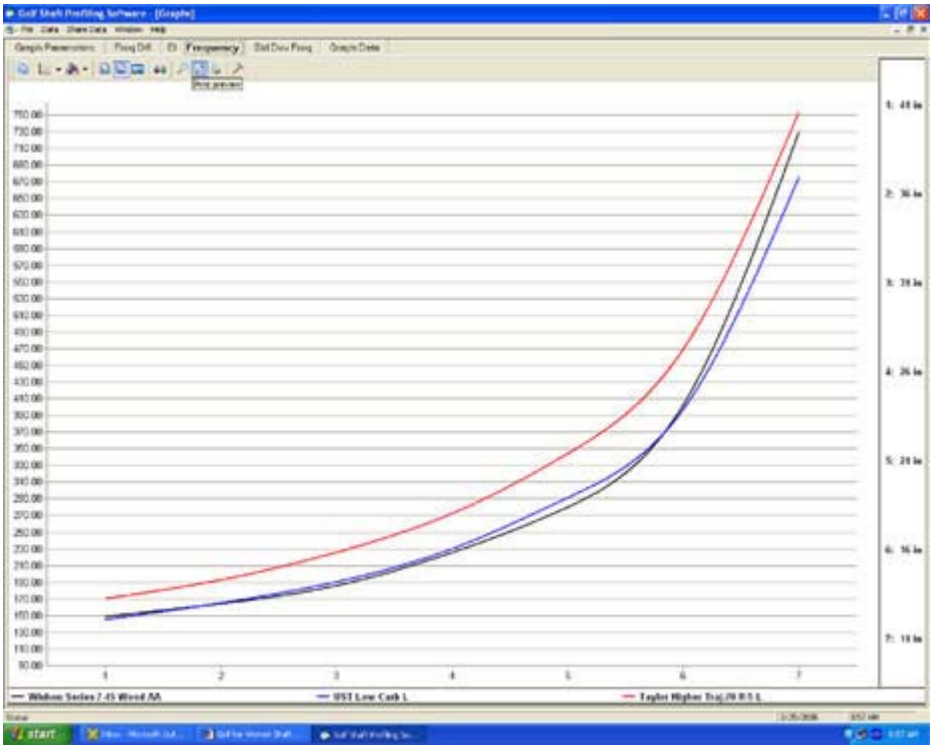
So the vice versa of this applies as well. The earlier the release, the more tip flexible the bend profile of the shaft should be for the golfer.

**5. Bending FEEL –** This is where it can get tough in the fitting because somehow the golfer has to TELL YOU what they like to feel in the bending of the shaft and what they do not like to feel. Then you have the problem of translating the golfer's inadequate descriptions into finding what shafts will display that feel and what shafts will not. Because shafts are only described by their makers in vague, non-quantitative means (letters for flexes and phrases like "butt firm, tip stiff, etc") it becomes pretty difficult to really pin down exactly what shaft feels like this or that.

And as a result, for the player who really depends on a specific bending feel of the shaft for confidence in the finished club, this becomes a trial and error thing in the fitting. Hence another reason why shafts are so confusing.

BUT. . . . (and you had to know I was going to say something like that!!) there is some help coming in this right around the corner. We here at TWGT have just developed a piece of software we call the TWGT Shaft Bend Profile System. First of all, when I say the "bend profile" of the shaft, I am talking about its DISTRIBUTION OF STIFFNESS over the whole length of the shaft. As you know, you have heard the terms "butt stiff/tip flexible" or "butt flexible/Tip firm, etc" in the description of shafts. These vague terms are an attempt to identify the bend profile of a shaft. But we need MORE than that. We need actual numbers or something quantitative to rely on to make valid comparisons between shafts. That's where the Bend Profile System software comes about. Take a look below.

I have the bend profiles of three shafts which are designed for average women golfers – our Wishon Golf Series 7-45 AA Flex (BLACK line),



the UST LowCarb L flex (Blue Line) and the Taylor Made L flex shaft (RED line) in their R5 driver.

First, let me give you a little tutorial on how to read this graph. Each graph line is constructed from 7 different stiffness measurements made in 5" increments down the shafts from the butt to the tip end. The bottom left end of the lines is the butt end of the shafts, the upper right end of the lines on the graph is the tip end of the shaft; the higher the line up the graph, the stiffer the reading and the lower the line, the more flexible the reading of the stiffness. The numbers going up the left hand side of the graph are the frequency increments – the higher the number, the stiffer the reading of flexibility.

Take a look at the butt end of the three shafts down in the lower left. You will see that the UST shaft and our Series 7-45 gram shaft are virtually the same stiffness, both just under the 150cpm measurement. But the Taylor Made L shaft is over 20cpm higher in stiffness in the butt end of the shaft. In the butt end measurements, 10-12cpm = 1 full letter flex of stiffness. Therefore, in the butt end of the shaft, the Taylor L flex is almost 2 full flex levels stiffer than the UST and our women's flex shafts!! Here you really see how there is NO standard for any of the letter flexes. Really, this Taylor L-flex shaft is as stiff as many of the industry's R flex shafts.

Now start looking at the difference in the position of the rest of the shafts as the lines curve up from butt to the center of the shaft to the tip end. In the center area of the shafts, the Taylor shaft is visibly stiffer than the UST and my shaft. Then at the tip end of the shafts, you see three distinctly different tip stiffness measurements. The Taylor shaft is the stiffest, the TWGT shaft is a little more flexible in the tip section and the UST is the most flexible of these three in the tip section. In the fitting of these three shafts, the UST and my shaft will both have similar swing speed ratings, in this case both would be in the area of a wood shaft for a golfer with a driver swing speed of 55-70mph. The Taylor Made shaft would really require a driver swing speed of at least 75-85mph to be properly matched to this design. The UST shaft with its more soft tip of the three would be for a very early release golfer. Our TWGT Series 7-45 gram shaft would be for a golfer with an early to midway downswing release and the Taylor shaft for a late release golfer.

From a feel standpoint, let's say a golfer liked the feel of the UST shaft the best. If they were to play with our shaft, they might sense that the bending feel right at impact would be a little firm for their liking although the bending feel of the shaft in the start of the downswing would be very similar between my shaft and the UST. This is because the bending feel at the start of the downswing is controlled more by the BUTT SECTION stiffness design. But the bending feel at impact is going to be controlled a little more by the TIP section feel. The golfer who likes the feel of the UST shaft will think that the Taylor shaft feels like a telephone pole because it is so much stiffer over the whole length of the shaft.

So this is how we are now starting to work on identifying the bending feel of the shaft. If we know a shaft that the golfer has liked the feel of before, we can put that bend profile line up on the screen and then start to compare other shafts to see how close the lines are to each other. This is how shaft fitting has to evolve so we have a much more quantitative manner of displaying the actual stiffness over the WHOLE LENGTH of the shafts.

### *3. Do you think women need as many shaft options as men?*

When we teach clubmakers about fitting in general, we teach that real custom fitting knows no gender or age among golfers. Real custom fitting only knows that there are human beings with differences in physical strength, athletic coordination and swing characteristics. If you take that approach, then you do recognize that within any one segment of golfers there can be people who should be playing with an avg L-flex just as there are people who could be properly fit into an X flex.

Granted, the number of women golfers who would be well fit into a low-flight bend profile in an X-flex is pretty darn small ( !! ). But there certainly are some women who should be fit into an A or an R flex. If you view fitting as being non-gender then yes, you could be challenged to find a low flight A flex or high

flight R flex for a woman sometime – it's just that it's typically not that often because a majority of women golfers are in a group that consists of, 1) lower than average strength as compared to an avg man, 2) lower than average athletic ability as compared to an avg man, 3) fewer fundamentally sound swing characteristics as compared to an avg man. Given those statistics, it could be said that shafts designed expressly for the average woman golfer would not need to have as many options in flex and bend profile design. Another way to put that is to say that if the woman needs to have different flight/bend profile options in a shaft, it is pretty likely that along with that need comes the fact that there is probably an A flex or R flex shaft out there that will still match their swing speed for overall flex match, and could be found with a different bend profile option.

Another reason I say this is because when a woman golfer really starts to learn the proper fundamentals of a good golf swing, typically their swing speed will increase to a point that they will be able to be fit into some A and even some R flex shafts, where there will be more design options for bend profile in the shafts. But as long as a woman does NOT have decent swing fundamentals, simply by virtue of such women being so typically smaller in stature and probably lower in strength and athletic ability than the avg man, that precludes the need for a ton of shaft options.

***4. Is there marked difference between shaft manufacturers in terms of technology and performance? Does that technology carry over to the women's market?***

Yes, there is a marked difference between shaft makers in technology and performance, as well as in QUALITY. As you probably know, you can buy a graphite shaft for $5 and you can buy one for over $500+ !! All that means is that you have companies who do NOT make it a point to hire any personnel to do R&D and all efforts are only made to produce cheap shafts for companies who do not want to pay anything for their shafts. And likewise, you also have companies who DO make it a point to hire personnel who can do R&D with an eye toward being "trendsetters", i.e. to establish new points around which their shafts are designed and marketed. Same as it is in the foundry business, and the same as it is among the companies that sell golf clubs.

Does it carry over to the women's shaft designs? No, not really because the lion's share of the shaft companies realize that the priorities in making what they would call an "average woman's shaft" will be 1) light in weight, i.e. not heavier than 65 grams, 2) more flexible overall than whatever they make as their A flexes. In other words, all this about high flight and low flight and bend profile designs really does not exist among the vast majority of women's shafts.

## How to find the right shaft

**1. What factors should women consider before purchasing a shaft?**

Number one is shaft weight. Look at my points in your question #2 below for why and what on this. Number two is the flex or overall stiffness for the shaft. As I said, not all L flexes are the same stiffness so the woman needs to be accurately measured for swing speed, evaluated for the tempo and transition and athletic ability, and THEN this is compared to a swing speed listing of all the L flex or A flex or R flex shafts to find the ones that are of the correct weight which ALSO are in the right swing speed range for these points of measurement and evaluation I mentioned.

So that brings me to number three which really should be NUMBER ONE. Seek out a clubmaker who KNOWS shafts, regardless of where they work. Yes, there might be a few fitters in big retail stores who know this and have this information. But there are more who are independent clubmakers who have this information than there are in retail by a long shot. Now, not all clubmakers are really well versed in shaft fitting. So the woman needs to 1) get recommendations from any golfers in her area who have worked with any clubmakers in the area to see if there are any who are really into shaft fitting. 2) head to the Clubmaker Locator in our website (www.clubmate-golf.com.au) or to the web site of the Professional Clubmakers' Society (www.proclubmakers.org) and look for their 'Find a Clubmaker' link. If they find a Class-A Accredited PCS member in their area, they'll be

in good hands for their shaft fitting needs for sure.

**2. What weight would you recommend?**

Shaft weight selection is based on the combination of physical strength, the swing tempo, the force of the downswing transition, and the golfer's athletic ability. The stronger the golfer, the faster the tempo, the more forceful the transition and the better the athletic ability, the heavier the shaft could be for the golfer. The kickers in this are the golfer's strength PLUS their tempo and transition. If they are very strong + fast tempo and strong transition, they MUST have a heavier shaft like 90g in the woods and 120g in the irons or else they will tend to get too quick and lose consistency.

Thus if you are talking about women golfers, you are talking about people who are below average in strength, normally slower in tempo and less forceful in transition and I mean in comparison to ALL men and women together as one genderless golfing population. Remember, fitting knows no gender. Find me a woman who can bench 250lbs, curl 70 lbs, who has a fast tempo and a strong transition move and I will put her into an 80-90g graphite shaft in the woods and 120g steel in the irons, same as I would a man who hits the same levels of strength, tempo and swing characteristics.

Now that you understand I am not picking on women, you must now agree that since most of the women golfers are in the lower half of the qualifications for heavier shaft weights, you see that most women would be better off with 50-65g shafts in the woods and 60-70g shafts in the irons. Only when they start to move up to the middle of the total golfing population in strength, tempo and transition would I push the weights of the shafts up any from there.

**3. What's the difference between graphite and steel?**

Weight and how the feeling of impact with the ball and the clubface is transmitted to the golfer. As you know, there are graphite shafts made in weights between 40g and 125g. And there are steel shafts made in weights between 80grams and 130grams. So if you want a REALLY light total weight in the club, you go graphite. But if you want medium weight to heavy weight in the total weight, you have a choice between steel and graphite. That's where it gets to the other difference, that being the impact feel.

Strictly because of the difference in chemistry between graphite and steel, the vibrations from impact are transmitted up the two different shaft materials in different final outcomes to the golfer. Steel shafts always have the feeling of being a little more "crisp", or "sharp" because that's the way a metal transmits the impact vibration through its molecular grain structure. Graphite shafts tend to have a more "dull" or "soft" feel of vibration because graphite as a material is a natural vibration dampener.

So that means if a golfer needs to have a shaft that weighs say, 90 grams, and if the golfer's desired flex and bend profile can be found in both types, their decision between graphite and steel should be made on the basis of what impact feel do they like more than the other. Things like flex and torque have no bearing on this because both of these factors can be duplicated on either graphite or steel.

**4. Should the driver, fairway woods, and hybrid shafts match?**

Not necessarily. You know right now that there are a TON of golfers who play all light graphite in the woods and normal weight steel in the irons and there is no cry of horror about that in their reports of performance. The human body has an incredible ability to adapt to the total weight of a golf club, but not to the swing balance (AKA swing weight or the MOI of the club). Therefore if the golfer is going to use lite graphite in the woods, medium lite graphite in the hybrids but heavier steel in the irons, the clubs ALL need to be properly fit for the right amount of headweight to satisfy the golfer's swing tempo, strength and downswing force. This happens to be a PERFECT situation for having the golfer's clubs all matched to the same MOI rather than to the same swingweight.

When you change the shaft weight in a set, if you build all of the differently shafted parts of the set to the same swingweight, they will NOT have the same swing feel. Normally, the lighter

the shaft, the higher the swingweight has to be bumped to achieve the same swing feel as in the clubs with a heavier shaft. This is simply another way to say that if you make all these differently shafted parts of the set to the same swingweight, they will not have close to the same MOI. I am talking about the MOI of the WHOLE GOLF CLUB.

Any engineer who knows anything about golf clubs will agree that if the goal of swing feel matching is to make all the clubs so they require the golfer to make the SAME physical effort to swing the clubs so the clubs all feel like they have the same swing balance (ratio of headweight to length to total weight) then the clubs must all be built to have the same MOI as each other. So my point is that in a set where you mix the weight of the shafts around, that's ok but you better do one of two things with that, 1) if you build the clubs to swingweight, you will need to kick the swingweight of the 70-90g graphite shafted clubs up by 2 points over what the right swingweight is for the golfer in their steel shaft irons. If the graphite shafts are 50-65 g in weight, the swingweight should be +3-4 over what was good for the golfer in the steel shaft irons. 2) build the lighter graphite shafted clubs to all have the same MOI as the steel shaft irons. This will require seeking out one of the few custom clubmakers in the country who are trained and have the equipment now to do real MOI matching of the clubs to each other in a set.

**5. What would your recommendations be regarding shaft length?**

There is an old adage in custom clubmaking which says, "The longer the length, the stiffer the flex, the heavier the total weight and swingweight, and the lower the loft, the harder the club will be to hit." So, that obviously means that for most golfers, the shorter the length, the more flexible the shaft, the lighter the weight and the higher the loft, the easier the clubs will be to hit. Hence when it comes to length, wow, you always err on the side of shorter rather than longer.

But because we have women golfers who vary from 4 feet something to 6 feet something, and with different length arms and different athletic ability, you have to have something that tells you what each golfer type should have in terms of the length. Take a look below for the BEGINNING ONLY of the length decision process.

| Wrist to Floor | Driver Length | 5-iron Length |
|---|---|---|
| 27" to 29" | 42" | 36 1/2" |
| 29+" to 32" | 42 1/2 | 37 |
| 32+" to 34" | 43 | 37 1/2 |
| 34+" to 36" | 43 1/2 | 38 |
| 36+" to 37" | 44 | 38 1/4 |
| 37+" to 38" | 44 1/4 | 38 1/2 |
| 38+" to 39" | 44 1/2 | 38 3/4 |
| 39+" to 40" | 44 3/4 | 39 |
| 40+" to 41" | 45 | 39 1/4 |
| 41+" to 42" | 45 1/2" | 39 1/2 |
| over 42" | 46 and up | 39 3/4 and up |

Length is also a specification of clubs which knows no gender. Therefore, man or woman, you start with this chart and make a measurement of the distance from the golfer's lead wrist crease (lead wrist meaning left hand for RH golfers and vice versa) to the floor in inches plus any fraction. The golfer must be standing comfortably ERECT, shoulders perfectly LEVEL, arms hanging RELAXED at the sides, standing on a hard surface floor with flat sole shoes.

This is only a STARTING POINT for the length. This tells us what length would be comfortable based on the golfer's height + their arm length. We're talking anatomy fitting only so far. Now we have to add on ability of the golfer so we know if the golfer is going to be better off in a little longer length than what the chart says, the same length as the chart says, or shorter than what the W to F measurement says. This is a judgment call but it consists of following this credo – the flatter the swing plane, the smoother the tempo, and the more athletically inclined the golfer, the longer the length COULD be – note I said could be and not should be. Again, be very stingy with increasing length over what the chart says. Make the golfer "earn it" in the sense that they better be a golfer with good control over the club in the swing athletically and have a reasonably smooth to avg tempo before you start adding on to the length from the wrist to floor measurement.

By the way, this here is the ONLY reason that the LPGA pros can play well with the lengths they have in their drivers and woods. They are ATHLETES and they can control that club at that length. Average golfers are far from that when it comes to controlling the club and still making a consistent fundamentally sound swing.

**6. Flex? If you were to recommend an A-flex or an R-flex to a woman, what would her swing speed have to be?**

Well you probably had to know that I would say this to start, but how do you define an A or an R flex, or ANY flex letter in the first place? Your question is valid IF and only if all companies made their letter flexes to the same stiffness. They don't, they never have and it's likely they never will. So no matter what piece of equipment you measure the flex of shafts with, if you test all of the shafts in the industry of the same letter flex, their stiffness measurements will range by the equivalent of three flex levels. It's just the way it is because each shaft company wants the right to determine what stiffness they will use for what letter flex codes.

So, that being the case, this is why at least having an accurate swing speed rating for shafts is so important. If you have that, you then have a way to determine how stiff the A is, or the R is, and whether the woman would be reasonably well matched with either one. So, if you ask what is the swing speed that a woman would have to be reasonably well matched with the stiffness of the AVERAGE A-FLEX shaft in the industry, the answer would be 75-85mph with the driver. For the average R-flex it would be 85-95mph.

But please, do realize that there are some A flex shafts out there which only require a 65-75mph driver swing speed, just as there are a few that are a little stiffer than the avg I mentioned. And the same goes for the R and for any letter flex. So you really can't tell your readers that if you have XX swing speed, you are into an A flex. You'll have to qualify that.

One last and important thing here – Very likely one of the worst things that the shaft industry has done to women is to label their most flexible shafts as L for LADIES. By doing that, the shaft industry has literally POLARIZED ALL WOMEN into one and only one shaft flex level. At least in the minds of husbands and retailers it has. It would be far better if this would have been F for FLEXIBLE – that way a whole gender would not be stuck with the thought that there is only one flex for all women.

**7. Why is shaft technology so complicated and misunderstood?**

This is actually a little easier to explain than you might think. OK, think about this – in clubheads, every single specification is defined by a REAL QUANTITATIVE FORM OF MEASUREMENT. Loft is in degrees. There is no disagreement in how to measure the degrees of loft of a clubhead. If you have the right equipment and are trained in using it, all designers will read loft the same way. Same for lie angle, same for face angle, same for bulge and roll and center of gravity measurement. Hence we KNOW what the performance difference is between a 10 and 11 degree head or any other of these specs, because their form of measurement is real in terms of science.

This is not the case with shafts because we still use letters to define the flex. These letters don't have any scientific meaning until someone applies some form of quantitative measurement to them. As you know, there is NO standard in the industry for how stiff an L, or an A or any other letter flex really is. And as I told you, each company has their own definition for what constitutes an L, A, R S or X flex. Hence the R from one company may be as stiff as the A from another or the S from yet another.

If a golfer is used to an R flex in a club he likes were to head to the retail store and pull some other brand and model of club off the rack with an R flex label on the shaft, there is absolutely no guarantee that new R shaft will even feel close to the one he has. To consumers, R should equal R. But it doesn't and never has, and therein is the origin of the confusion surrounding shafts. Golfers have to hunt and peck to find the same shaft flex feel because there is NOTHING to accurately guide them through the maze.

Nothing other than a custom clubmaker who really studies shaft fitting from someone like our company and what we write and teach.

Seriously, you are NOT going to find the retailers with any shaft swing speed charts provided from any OEM for their shafts. Maybe by now some do, but I can testify that when I was working for Golfsmith from 1993-2001, no such list ever was given by an OEM to Golfsmith for training retail sales people to know what swing speed was right for each flex offered by the company in whatever models they had. So retailers have to guess at how stiff the R is in the Cleveland vs the R in the Callaway vs the R in the Tour Edge and so on. It is the SAME WAY FOR L FLEX SHAFTS TOO.

However, as a final note the number one problem with standard women's clubs is that they are too long for the majority of women who shop for pro-line golf clubs. Especially the driver and the fairway woods. I'd make you a bet today that if you went out and swapped every woman amateur player's driver with one that was 42" to 42.5" in length (normal in the industry today is 44" for a woman's driver) I would bet the farm that 80% of the women would be happier with their tee shot game than they were before. And I would win that bet too.

## QUESTIONS FOR EQUIPMENT COMPANIES

Caroline - I'm tired, it's Friday at 6PM, but since we here at TWGT do design original shaft models just like any of the high end brand name shaft making companies, I'll keep cranking on to answer your questions that are directed to those who design their own shafts.

**1. How have shafts evolved in your company?**

swing types + player abilities. Therefore I identify a number of distinctly different profiles and design the shafts with that in mind. If you go back to your question about what swing characteristics denote what in a shaft, this is pretty much how I do it. Butt stiff shafts in 65 and 85g for players with hard transitions and avg to faster tempo – the 65 for the ones that are avg strength and the 85g for those who also are strong. Tip firm shafts for players with a late release. High and low flight shafts which both have the same butt stiffness (hard to do) for players with an avg transition, avg tempo and mid to later release who want to change the flight of the ball without changing loft or head CG. Butt soft/tip soft shafts for less skilled players with an early to mid release who also do not have a hard transition to start the downswing. In other words, every shaft has to have a specific swing type and player type to correspond to so the shaft bend profile can be an integral part of the custom fitting for the player.

**2. How did you select the flex options currently available?** (Aldila initially had 15 options).

I strictly go by swing speed ranges for all my shaft designs. I do still label them with a letter flex ONLY because it is too hard in the industry today to swim upstream against this manner of flex designation. Golfers still want to see a letter flex. But each of my shafts has a distinctly different swing speed rating for the letter flexes within each shaft model. So right now I can cover players from a 50mph driver swing speed to a 120mph driver swing speed. In irons I can cover players from a 45mph iron swing speed to a 90mph 5-iron speed. Plus we offer custom trimming information to our clubmakers with explanations for how to trim more specifically to hit a specific swing speed PLUS transition and tempo move in the golfer's swing.

**3. Do you think women need as many stock shaft options as men?**

If you think of women golfers simply as non-gender and only described by their strength, athletic ability, swing speed, transition, tempo, release and sense of bending feel, then no, they don't. This is because when you think of women in this non-gender manner, that then means that ALL shafts in the universe are possible fitting options. So, if you have a swing speed rating for ALL shafts in the universe and if you have a bend profile description such as what I showed you in the graph, you can find what you need for each golfer's strength, athletic ability, swing speed, transition, tempo, release and sense of bending feel.

The obvious problem is that only a fraction of the people who work in golf equipment know this, and they are the few custom clubmakers who really live, eat and breathe shaft

technology such as what I am teaching you now.

**4. What are the most important qualities a woman should look for in a golf shaft?**

I think that I pretty much went over this in previous questions you asked. But - weight is number one to match to their strength, transition and tempo. Then overall swing speed flex rating of the shaft is number two, to match to their swing speed + transition + tempo. And then the bend profile design is number three to match to their transition and release.

**5. What steers you to put certain shafts in your clubs?**

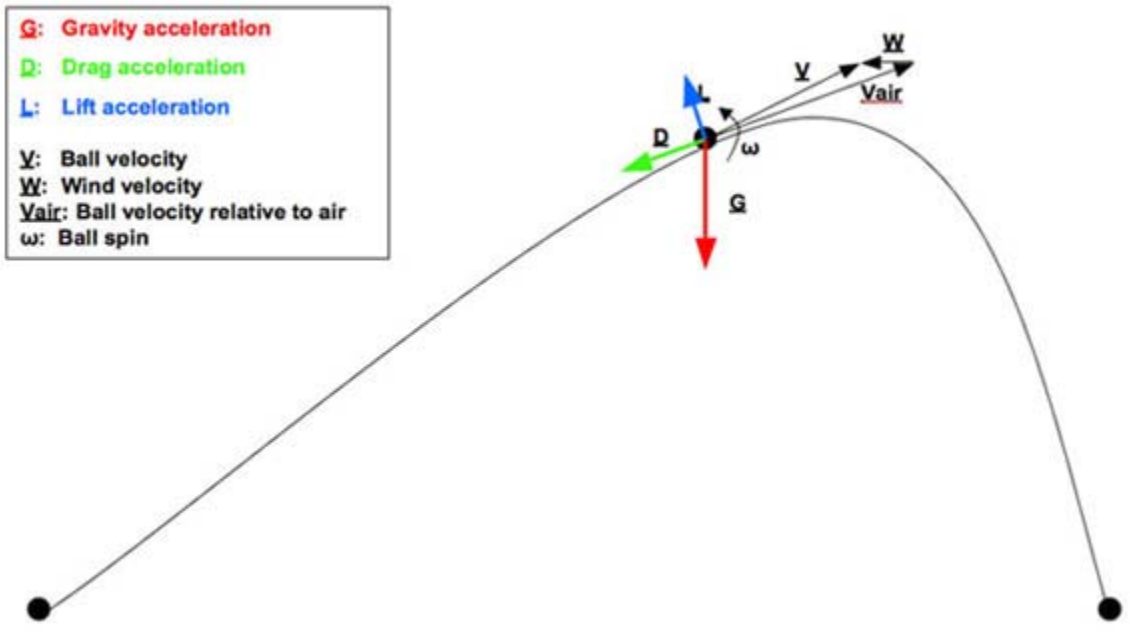
In true custom clubfitting, such as the market I serve in my design work, there is no such thing as a certain shaft in a certain club. The head is selected for the golfer on the basis of what loft, face angle, lie, etc that the golfer most needs for their swing characteristics. The shaft is selected the same way. Then the length and swingweight/MOI of the clubs are selected with the golfer's specific swing characteristics and feel requirements in mind and the whole thing is built, one club at a time, individually custom fit to the golfer.

## An Up to Date Spin on Spin

While our location in the southwest corner of Colorado precludes a lot of visitors, last month we were fortunate to receive a visit from a very switched-on engineer named Fredrik Tuxen. Who's Fredrik Tuxen and why I am writing about his visit to TWGT?

Perhaps you have heard of a relatively new ball flight tracking system being marketed under the name Trackman; Fredrik is the Danish engineer who invented the new Trackman ball flight analysis system which is in the process of taking the golf equipment industry by storm, see also www.trackmangolf.com. Fredrik was in the US recently working on some projects on behalf of the company and felt he wanted to "kill two birds with one stone" by including a visit to TWGT. The reason was to show us some of his latest research into backspin as a function of shot performance and to obtain technical information from us in return that might assist him in future Trackman projects.

A little background first for those of you not that familiar with Trackman and why it's fast becoming THE ball flight tracking system within the engineering and design side of the golf equipment industry. The reason is because



Fredrik's invention has the ability to record and output the trajectory, spin, ball velocity, landing angle and several other parameters of any shot all the way through its entire flight. All other launch monitors measure spin, ball speed and launch angle strictly at the moment of impact. What happens to the ball during flight is something that no one in the industry has been able to observe until Trackman came on the scene. And what happens to the ball in flight is truly what determines the final outcome of the shot.

The above illustration shows the factors which all combine to determine the ball's flight through the air. The key point is the ball's velocity relative to the air under the effect of wind conditions, then combined with the lift, drag and the effect of gravity. As you can see, the lift is always perpendicular to the velocity of the ball relative to the air. Because of this you can see how easily too much spin (which increases the lift) can actually work in opposition to the ball's velocity relative to the air and result in the "ballooned shot".

How Trackman does this is all a product of Fredrik's years of engineering training and experience in high-end Doppler radar technology. Prior to inventing Trackman, Fredrik worked to develop sophisticated radar tracking technology for military applications. Or as he put it, "once you figure out how to use radar to track all of the flight parameters of a missile or ordnance shell from launch to target, a golf ball just seemed like a better challenge and application for my knowledge and experience."

Our day with Fredrik was spent on the practice range in the morning, and back in my workshop/office in the afternoon. The morning consisted of test hitting sessions with Fredrik's Trackman revealing both launch and downrange analysis of shots hit with a variety of clubs from the driver all the way to the wedges. In the afternoon, Fredrik cranked up his computer to share a lot of his own test data in which he revealed a number of key observations from extensive hit testing with European and American tour players.

Following are some of the key points from this research.

1. High Launch + Low spin for the driver IS only a benefit for the higher ball speed players, i.e. over 150mph ball speed who ALSO have a good enough swing that they can consistently arrive at impact with a straight line position down the left arm/shaft. Under that ball speed, focusing on launch angle first and foremost is of more importance. And same for golfers who cannot quite achieve that straight line position down the lead arm and shaft at impact. This I felt good about because this is what I have believed strongly from my own work.
2. Vertical gear effect appears to be more important than I had thought from the data I have seen from other companies as well as from my previous limited work on this. Fredrik shared data that showed an 850 rpm decrease in backspin for a high face hit on a driver vs center face hit on the same driver – this done with a robot test. I think that part of the reason that people/companies had not put that much credence in vertical gear effect is because of the sheer difficulty of being able to get really accurate and consistently accurate spin measurements with camera based launch monitors.
3. High backspin creates a more upward arcing trajectory. This in turn reduces the forward velocity component by lowering the forward velocity at the apex of the ball's flight, which results in shorter carry with a steeper landing angle for less roll. From the aerodynamics of ball flight, the upward arcing of the trajectory is directly proportional to the spin rate but is proportional with the velocity squared! This is why the spin rate influence on the trajectory is more pronounced with a higher ball speed. This is also why the wind seems to have much more influence on the shot in a head wind than in a tail wind; you might gain 10 yards carry in tail wind but for the same shot you would loose as much as 40 yards in carry in a similar velocity head wind, plus resulting in less roll because of the steeper descent

angle created by the headwind. A 140 mph ball speed in a 10 mph head wind will experience similar aerodynamic forces as a 150 mph ball speed shot with same spin rate in calm weather, meaning the two shots would obtain more or less the same landing angle (the 140 mph shot would have less carry though because of less velocity over the ground).

4. When you take any club, play it back and hit a hard, low punch shot with hands ahead you will get more backspin by a lot than if you take the same club and hit it pure from a normal ball position and swing. I had previously thought that as you hood the face and decrease the loft by playing it back and keeping the hands ahead that the large decrease in loft would keep the spin lower than if you hit the shot with the normal loft of the head in a normal ball position for a regular shot. Hence spin is very much more about compressing the ball against the face to make it roll up the face before taking off than it is about pure loft on its own.

    - Lob wedge data was really interesting. While it is possible once in a while to achieve, say 10,000-11,000 rpms of backspin with a 60* wedge, the majority of the time that golfers hit such high loft wedges, the spin is only in the 3,000-4,000 rpm range because the very angled back face simply slides under the ball, never compresses the ball to any degree against the face, never takes advantage of possible friction between face and ball and thus the ball cannot roll up the face much – it just slides. Same thing happens a lot with a SW (wedges at 54-58 degs) as well, though not quite as often as it does with a lob wedge.
    - From some of the spin/velocity downrange data, it was evident that the balls which are designed to increase spin do start out with more spin, but they decay in flight sooner and decay faster in flight so by the time the ball comes to earth, the spin is only slightly higher as for a normal medium spin design ball. Thus one of the only ways the fuller swing shot hit with a higher spin ball helps to stop the ball on the green is from the initial higher spin's capability to generate a higher trajectory, that then drops on a steeper angle to the ground when this decay of the spin happens in flight. So the stopping ability of the higher spin ball is not so much from the spin when it hits the green but more from the steeper angle of descent.
    - The golf swing itself has far more to do with what the spin will be for any golfer than what can possibly be done in changing club/shaft design or in changing ball construction. Example – for lowering spin with a driver the absolute worst killer to that goal is when the golfer unhinges the wrist-cock early and allows the clubhead to pass the hands as the wrists flex forward coming into impact. That adds as much as 2000-3000 rpms to the driver shot even when this swing error is slight to only moderate! So the higher your swing speed, the more you have to teach yourself to arrive at impact with a straight line from the left arm/down the shaft position to be able to even have a chance at achieving lower spin. However, Trackman research has seen as much as a 4,000 rpm difference in ball types from short iron testing, so look for more on this matter of real ball testing in the future.
    - Maximizing driver distance for ALL golfers is all about finding the best shaft to head loft match which will generate the best launch angle

for maximum carry but which at the same time will allow the ball to come to earth at an angle no higher than 40* to the ground. But this right here is where the high ball speed hitter has to be cognizant of the delicate balance between loft and launch angle because it is possible to get into a loft/CG/shaft that generates a launch angle which carries the ball farthest, but which will still result in a more steep angle of descent to the ground and thus less roll on the end of the max carry distance.

## Common Sense Clubfitting

While it may be "old news" that Tom Wishon's new book, Common Sense Clubfitting: The Wishon Method, is printed and available, it is certainly "new news" to say that the depth of up to date modern clubfitting information that Tom shares in the new book is without question, indispensable to clubmakers who are serious about ensuring that every golfer be fit as accurately as possible.

How do I actually fit the driver so all golfers will get the best performance possible?

What are the most important principles of wedge and putter fitting?

How can I make sense of the confusion that gets in the way of shaft fitting?

How will I know what possible fitting recommendations are going to result in real improvement, and how much?

How can I know what parameters of fitting are important and which are not?

What is it specifically about the moves of the golf swing that control how my fitting recommendations are going to work, or not, for the golfer?

How important is the sole design of irons and wedges in fitting golfers?

What design technologies in clubheads really do bring about a visible change in ball flight?

The most factual answers to these and hundreds more questions about clubfitting are explained in Common Sense Clubfitting, in easy to understand terms by the game's leading authority on clubfitting.

If you don't have your copy yet, you ARE missing a huge opportunity to elevate the level of your fitting knowledge and skills, and with it, become a lot more confident in approaching each fitting session you offer.

## An Inexpensive Road to More Fitting Business


Regardless if your commitment to clubmaking and fitting is full or part-time, if you ever dream of increasing the number of fitting sessions you book with regular golfers so you can increase your income, add that special tool or machine to your shop, or spread the word around your area that you are THE expert in golf equipment, the solution is right at your fingertips.

Are you tired of having to come up with a way to explain to golfers how what you build is "as good as" the big brand name clubs that sit on the display racks of every retail golf shop/store? Have you been frustrated that you just can't seem to gain a measure of real respect for what you can offer golfers in your area?

Hundreds of clubmakers are already reaping these benefits in their work in fitting because

they know and use a simple but highly effective "inexpensive road to more business".

That solution is contained in your commitment to using the Search and 12 Myths books as "your primary vehicle of sales" for your clubmaking business.

Yawn. OK, I can hear some of your already. "There's TWGT sounding like a broken record again about their books." OK, then let me put it another way.

How do you think the big brand name companies got to the point where consumers respect the brand and walk into golf shops on their own to ask for their models? Collectively, they did it with more than a Billion dollars in marketing spent over the past 15 or so years. Multiple full page ads in every issue of every consumer golf magazine – commercials broadcast during every televised golf tournament – endorsement contracts with hundreds of professional golfers – demo days staged at local courses and driving ranges by each company's sales representatives.

How does ANY brand name in any area of commerce become a "household word?" The same way - with money and lots of it, spent repeatedly over time.

Clubmakers, the companies who comprise our side of the golf industry do not have that kind of cash. The very few that do will never spend it to launch a campaign to drive golfers into your shop because the majority of their total business comes from courting the OEMs that make the standard clubs which are simply bought off the racks of their retail stores.

Tour use? Will any company from our side of the industry ever build a staff of tour players who use their clubs? Highly unlikely to utterly impossible are the chances of that happening, again because of the money required to make that happen. Tour players today may use a single club here or there they happen to find from a company with no consumer marketing program, but will never play a majority of clubs from a company not willing or able to pay for the privilege.

But all this is ok because one Search or 12 Myths book does have the power to overcome a billion dollars of marketing expense.

Pollyanna thinking there? Not at all when you think of how many golfers have read Search or 12 Myths and immediately responded by booking a fitting session with a good clubmaker in their area. We here at TWGT are doing all we can to get Search and 12 Myths into the hands of golfers – this month's decision to promote Search in two separate issues of USA Today stands as an example of our commitment to getting the word out.

But YOU have to step up and do your part too if you wish to increase the number of sets you custom fit and build. The good news is that when you do make the effort to get Search and 12 Myths in the hands of more golfers, you will be rewarded with an increase in business. Hundreds, approaching thousands, of clubmakers know that to be a fact.

What have you got to lose other than the lack of respect that so many golfers have withheld from the hard work you do to help them play better and enjoy the game more.

### TWGT Catches Air Time on the BIG Tour; Westchester and Winged Foot are Next!

In only his fifth tournament as a professional caddy and tour representative for TWGT, Brendan Vahey found himself "in the hunt" on the PGA Tour when his player, Jay Delsing was a contender to win the FedEx St. Jude Classic in Memphis, Tennessee, and eventually finished in a tie for fifth.

As a provisionally exempt player on the PGA Tour from his 2005 results, Jay earned a spot in the FedEx St. Jude Classic when a number of the fully exempt players chose not to compete. After rounds of 70-68-66 on the TPC Southwind course in Memphis, Jay stood at 5-under par and just two shots from the third round lead. Playing in the next to last group on Sunday, Jay actually held the lead at 8-under when he jumped on the TPC Southwind course early with three birdies in the first four holes.

Unfortunately a series of missed greens and putts eventually landed Jay in fifth place, but for most of the final round he was in contention

and thus the focus of the CBS cameras. While most viewers were not aware, Brendan was wearing his TWGT shirt and hat and carrying Jay's bag which had a TWGT logo on the sides. In addition, Jay was carrying a TWGT 785 hybrid in his bag during the tournament.

But the FedEx St. Jude tournament is just a start; Jay's top ten finish qualified him for a spot in the Barclay's classic big tour event at Westchester CC in New York. And because of Jay's stellar play at the St. Louis sectional qualifier for the US Open, he will get to stay in New York for the next week to play in the US Open at Winged Foot GC. We all wish Jay and Brendan the most success possible in these two big events this month and we hope we see you again on national television!

Granted, this pales in comparison to the huge endorsement contract budgets of the 9-figure OEM companies, but we here at TWGT prefer to call this "a start" in adding a little more consumer recognition to our company.

## Identify With TWGT

In case you haven't noticed, we are stocking and offering high quality shirts, microfiber wind shirts and wind vests which carry the TWGT logo. TWGT golf shirts are available in tan and a "mottled black" from Cutter and Buck's Dry Weave fabric – one of the highest quality and most comfortable fabrics in the industry.