

LENGTH IS GROUND ZERO WHEN FITTING

Fitting books written in the past always seem to start out by talking about the clubhead first. After all, the companies who are writing these books sell component golf club heads. The Modern Guide to Clubfitting is unlike these other books as we want to put the sequence of fitting in the best possible order.

Let us take an example of fitting a brand new golfer. If we look at the first page of our personal fitting form, very few of the lines will be filled out besides the player's contact information, perhaps age and weight, the golfer's handedness and their height. There is not much to go on. Even the question if the player is right or left handed may not automatically mean that the golf clubs will be the same as certain golfers that are left-handed decide or are more comfortable playing right-handed.

To begin fitting, you need a starting point. If there ever was one parameter that has an effect on more parameters than any other, it is the club length. Think about this for a second, a golf club is merely a tool to propel the ball from one position to another in the most efficient manner.

If you wanted to loosen a screw, you will first need to find an appropriate sized screwdriver. You may have at your disposal several length screwdrivers to choose from, starting with a short stubby one to work in remarkably close quarters to a long handle one to reach into deep crevices. Obviously, the short stubby screwdriver will be too short in some cases and the extended length screwdriver will be too cumbersome in other situations. The key is to use the right length tool for the job.

We discussed in the first chapter that golfers come in all varied sizes. So, it only seems reasonable that golf clubs should as well. But go look on any rack at a golf specialty store or at an off-course pro shop. If you pick up a 7-iron, you will have only a couple of choices, standard men's, and ladies lengths. Do not get me wrong, the golf club manufacturers are aware of that so they will offer assorted sizes upon request (usually a week or two turnaround time).

However, most golfers are content buying the standard off-the-rack length instead of waiting and then they adjust their posture, stance, or swing plane to comply with their new purchase. Well custom fitting is supposed to be the other way around. The golf clubs are supposed to conform to the golfer rather than golfers conforming to their clubs. No wonder this game is so hard for so many golfers.

How is the Length of a Golf Club Measured?

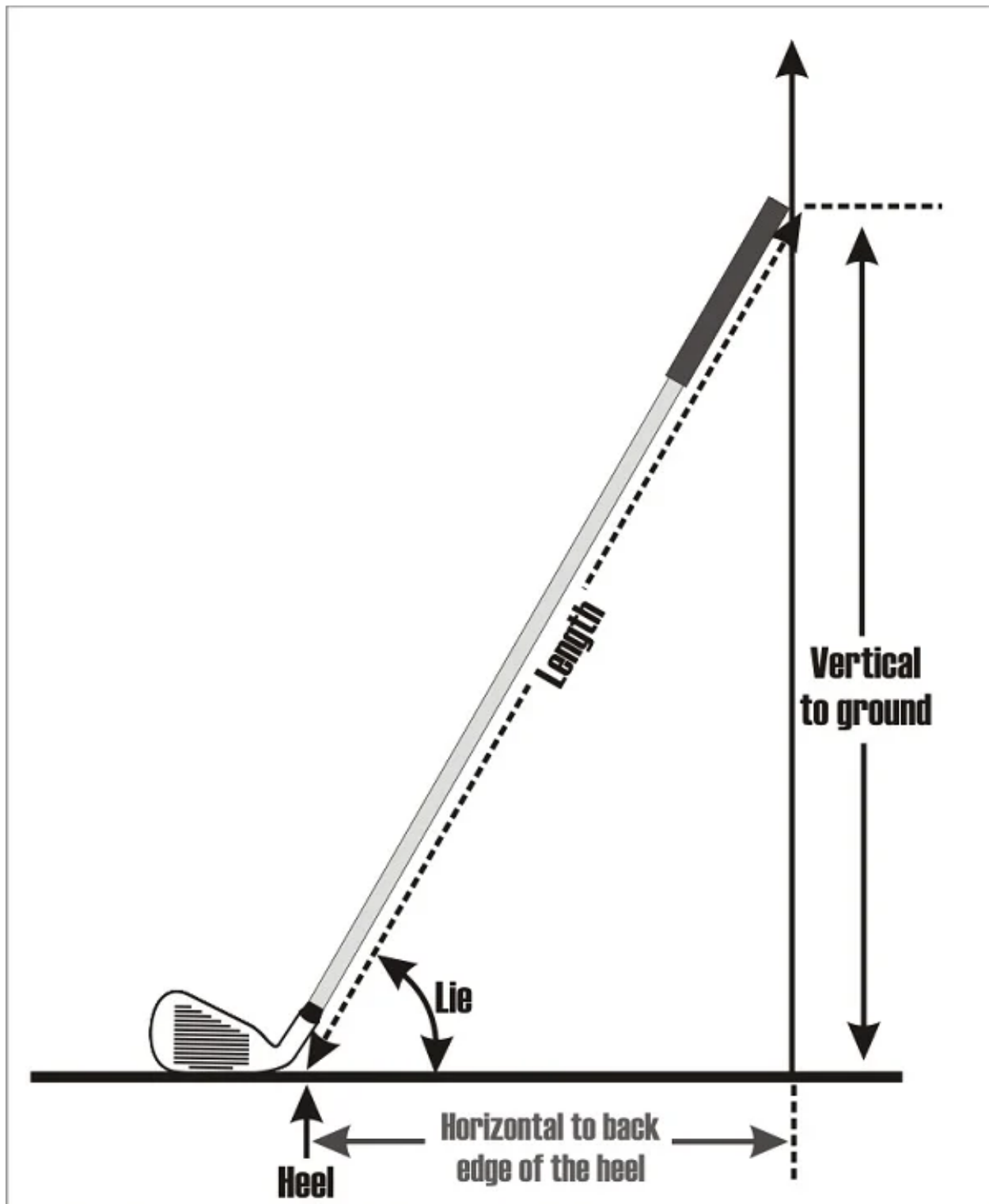
You are at the range and drop a ball on the ground (or place it on a tee). You grab a club randomly out of your bag and then try to hit the ball with the club. It could be any club. It simply does not matter if the club is 32" or 48" since your only intent is to hit the back of the ball with the front of the face. The first in a sequence of things you do is set the clubhead behind the ball and then stand far enough away from the ball that your arms feel comfortable, and then you alter your hand height. This is all a subconscious response. The most amazing thing is you do not ask what length the club is. Length itself is especially important as it is one component for the distance you hit the ball as well as develop consistency if the length is fitted correctly.

Before we can address that issue, we first need to know how the length of a golf club is measured. While one would think that measuring the length of the club would be simple and universal, you might be surprised it is not. So let us explain three methods you may encounter.

Common Methods of Measuring Golf Club Length

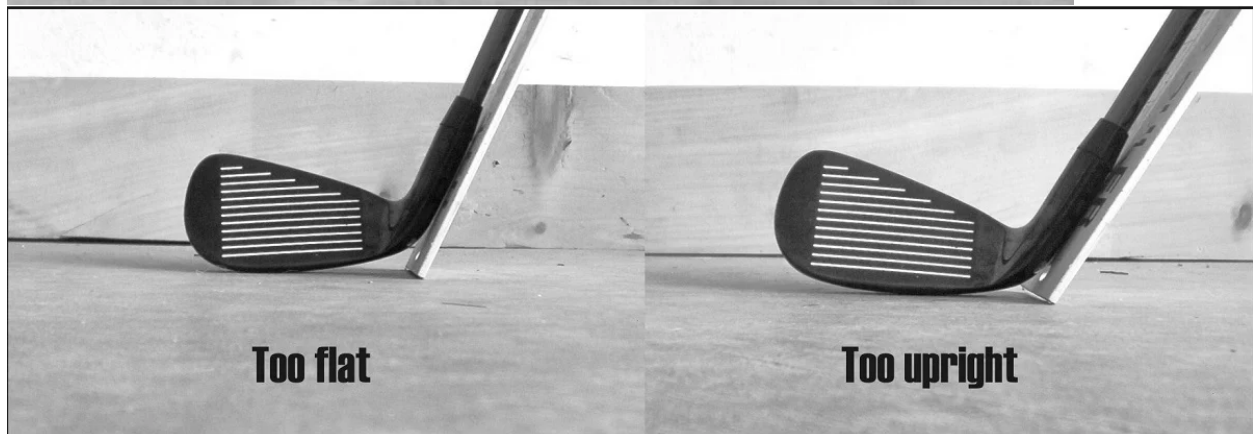
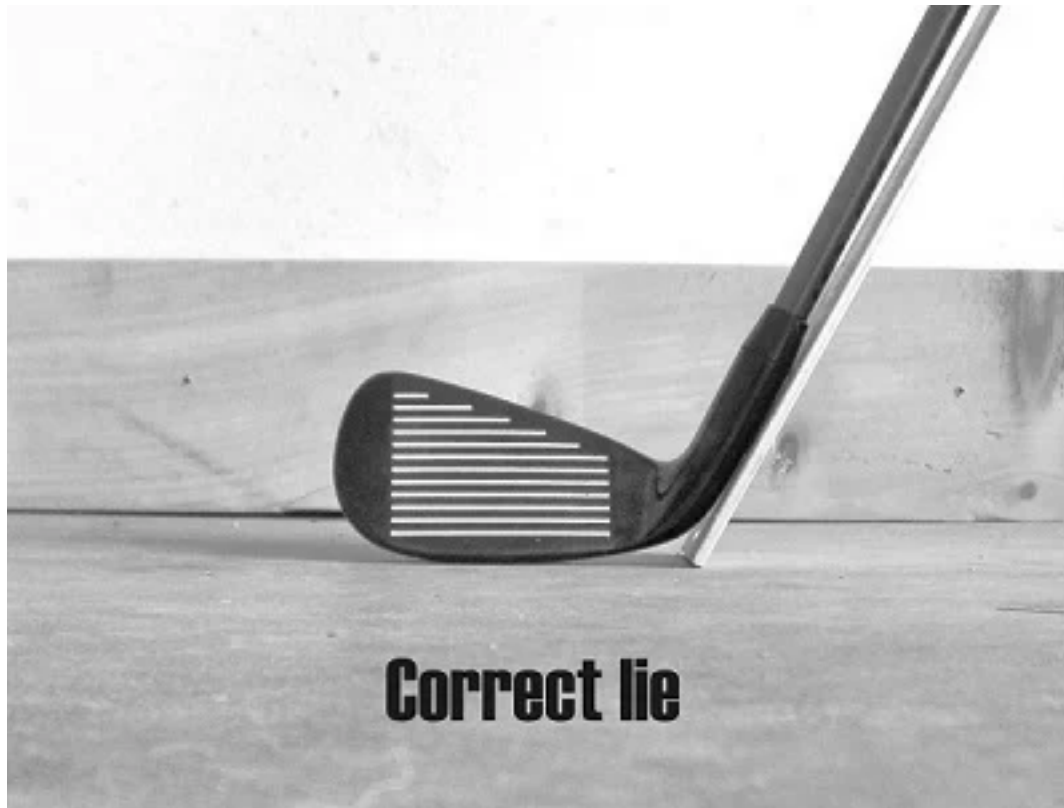
Playing Position Method

The method most used involves placing the club in the playing position with the center of the sole touching the ground. Then a 48" ruler is placed along the backside of the club with the tip of the ruler touching the ground by the club's heel. The final length is measured at the edge of the grip cap (and not the very top). This method is used in all cases except putters that the shaft is not located at the heel.



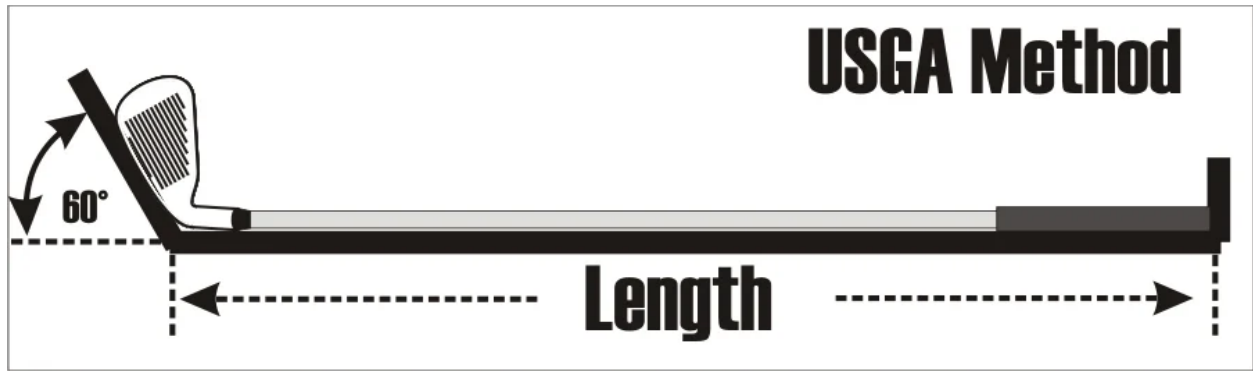
In this method, it is critical that the lie of the club be positioned correctly. If the club is placed with the heel raised higher off the ground than the toe, then the measurement will be greater than measured with the center of the sole touching the ground. Conversely, if the toe is raised higher off the ground than the heel, then the measured length will be

decreased. Those not careful in positioning the club correctly can easily be off $\pm 1/8$ " or even more.



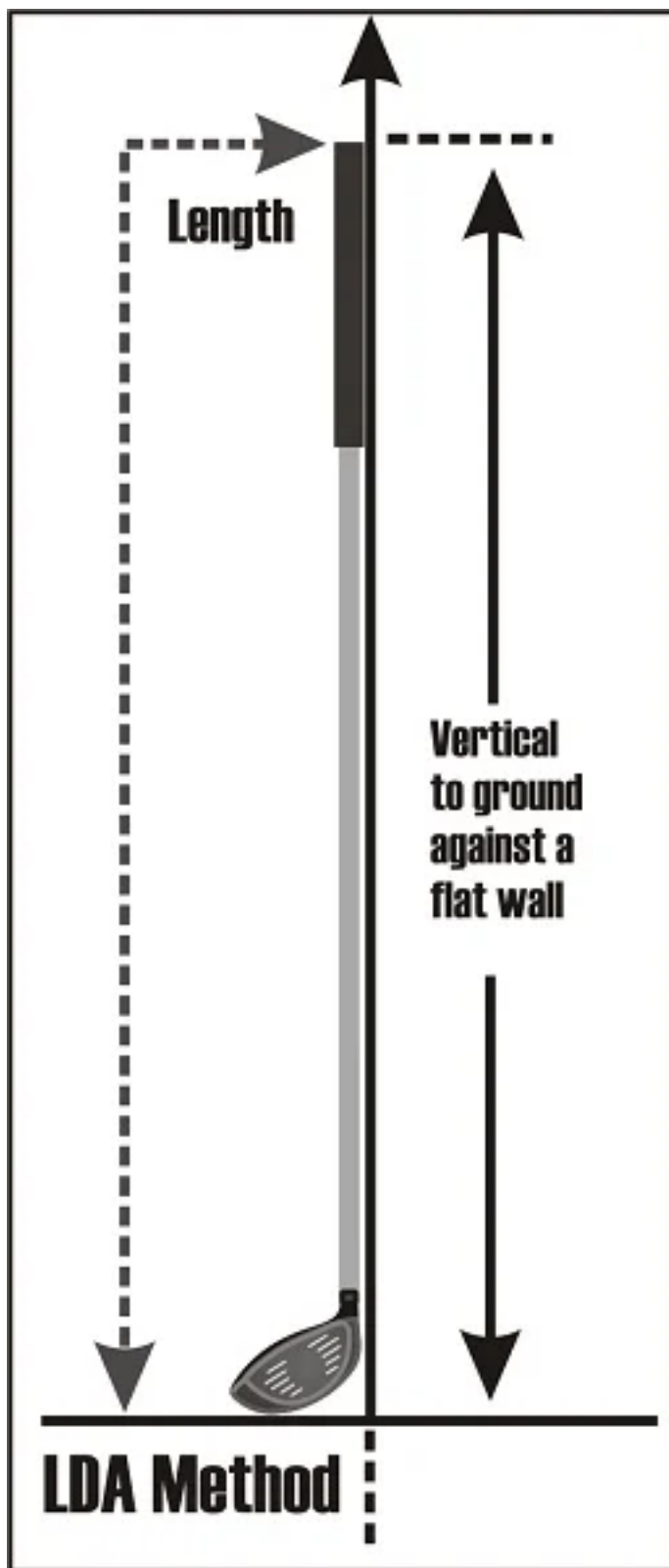
USGA Method

The United States Golf Association (USGA) has a method outlined in the Rules of Golf. The USGA uses an apparatus that uses a piece of angle iron as a stop that forms at a 60° angle from the horizontal. Why 60° ? Probably because this was the mid-way point of lies from years back when the driver was 56° and the wedges 64° , plus 60° is a good even number. In addition, they measure to the very end of the grip cap and not the edge. This difference amounts to approximately $1/8$ " in the addition of the grip cap. The USGA does have a limit of 48" for any club, besides the putter, which has no length limits. However, they exclude putters using this measuring technique. For a more detailed explanation, you should visit the USGA's website.



Long Drivers of America Method

Yet another method is from the Long Drivers of America (LDA). They measure club length by placing the shaft flat against the wall with the toe of the driver positioned on the ground. This will result in a much longer length than the other two methods mentioned before. The lie of the club can contribute to the final length. For the record, the LDA has a 50" length limit for sanctioned long drive competitions.



Club Length Measuring Tools

Regardless of the method one uses, the key is consistency. This is why there are jigs or fixtures for measuring club length. One such example would be the Dynacraft Bench Ruler

Soleplate and works in conjunction with a 48" aluminum ruler. This [golf club length measuring tool](#) can be laid flat on a table or workbench and there is a roll pin that the bottom of the club's sole rests against. This is an inexpensive item that can speed up and accurately measure club length on a consistent basis.



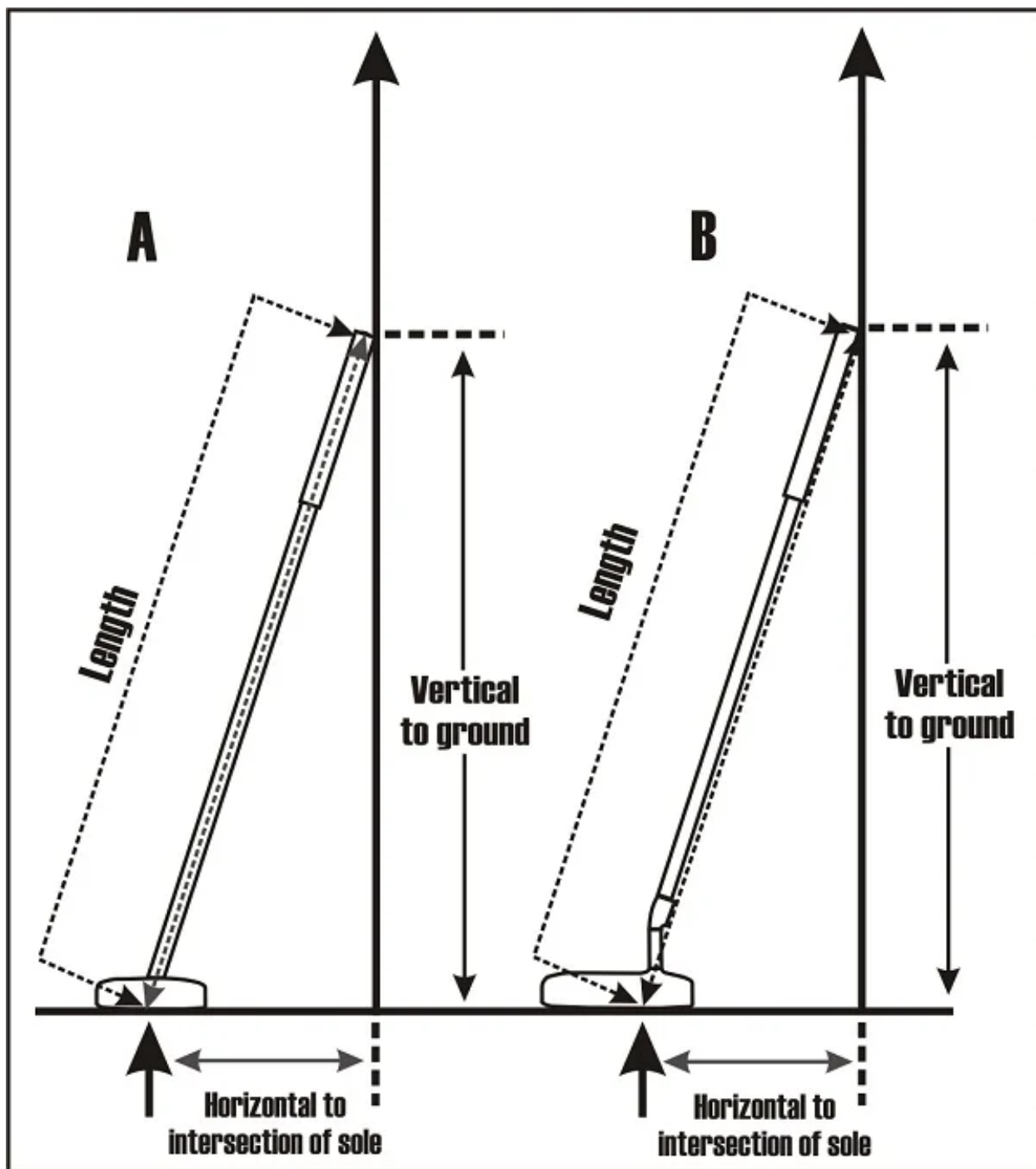
How To Measure Putter Length

For putters, length can be measured a number of ways because of the position of the hosel and/or shaft in relationship to the heel. The hosel on an Anser-style putter may be inward 1" from the heel. You have center-shafted putters where the shaft intersects the center of the putter head. Lastly, there have been putters with the hosel located out near the toe such as the Bass Ackwards putter designed by the legendary Jim Flood.

As mentioned before, the length on heel-shafted putters can be measured the same way as an iron or wood. Let us look at two other options. In Option A, this represents a non-offset center-shafted putter like a Titleist Bullseye. Measuring length is not referenced by the heel, rather the shaft axis so the 48" rule is placed alongside of the putter's shaft at the point it intersects the ground up to the edge of the grip cap.

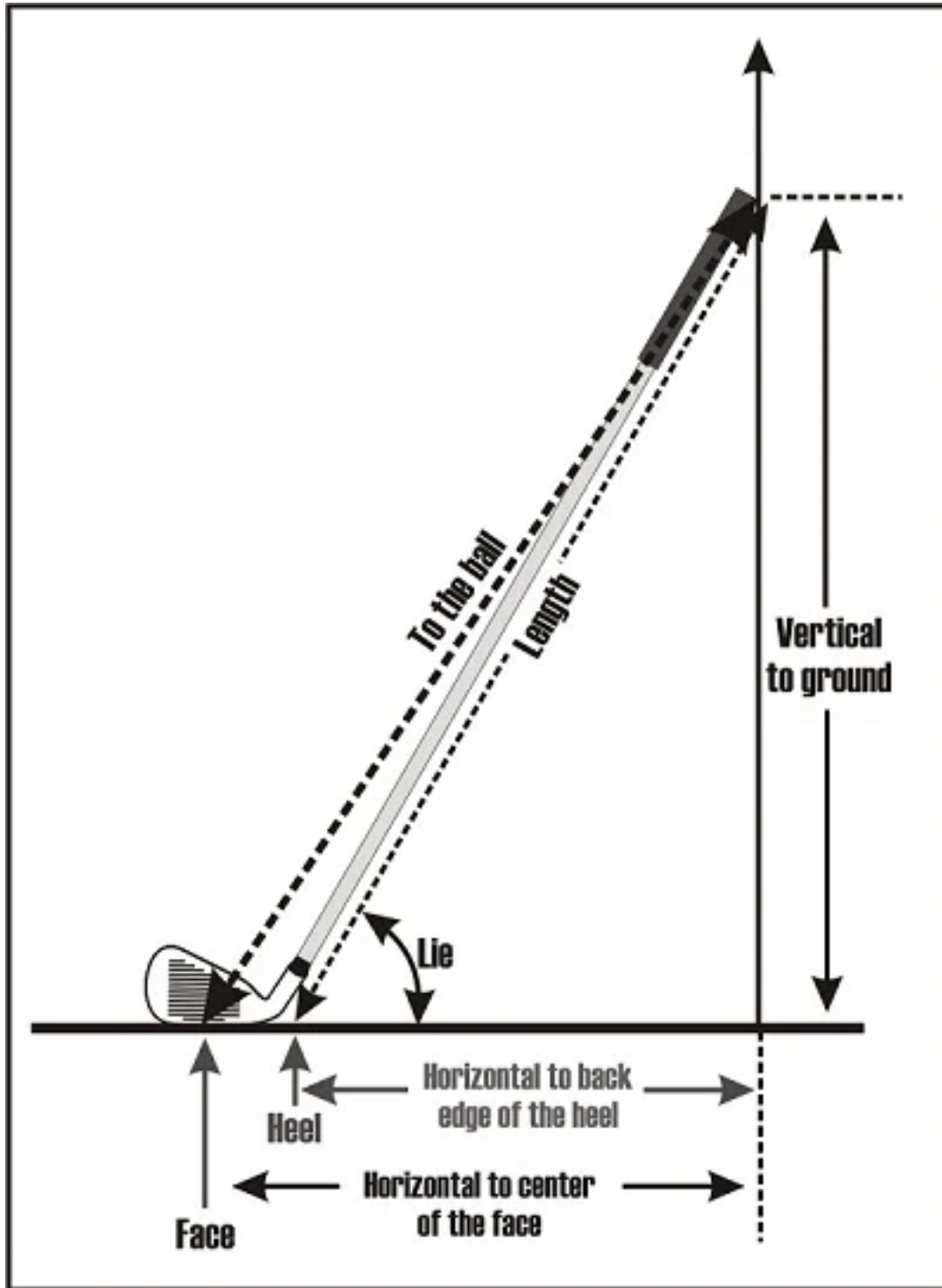
Option B represents an offset putter. Because the shaft is ahead of the face of the putter, the ruler is not placed in-line with the shaft, rather along the back side of the shaft like an iron would be measured. The difference being that the ruler would touch the ground somewhere other than behind the heel of the club.

While these methods have been used to measure golf club, it does not necessary illustrate the length we are most concerned with, which is the distance from the golfer's wrists to the ball. The end of the grip correlated with your wrists unless you choke down (or place your hands lower) on the grip. More importantly the target is the ball, which should be position in the center of the face. Perhaps a more accurate reading of the length of the club should be like the following diagram. This would consider all the other methods and simplify length measuring.



One way to understand how this would help determine the proper length is to look at the Odyssey hockey putter Adam Sandler used in the movie Happy Gilmore. Because the blade length was so long, he had to stand much further away from the ball at address. Thus, the effective length of the putter was much longer than had it been a normal putter at the same length measured in the conventional manner. In addition, this would also change the lie reading of the club is measured as well. Remember, irons and wedges can vary in blade length too.

No manufacturer measures clubs in this manner, perhaps out of tradition or that the length is being measured in the plane that the lie is referenced from the shaft / hosel, but this may be a plausible method of measuring length someday in the future. But whatever method you use to measure length – be consistent.



How Length Affects Other Club Fitting Parameters

A fitter's ultimate goal is to select the proper length club that will allow the player to return the club to square in a repeatable manner, so the ball goes toward their desired target

line. This is easier said than done. As we saw in measuring length, other parameters are tied together. We will address each of the parameters during this text, but here is a preview of what is to come.

The first is lie or the angle of the shaft as it exits the head relative to the ground line. Length also affects the swing weight, overall weight, shaft flex, shaft weight and even clubhead selection as not all clubs of the same number engraved on the sole will have the same weight or lie angle. So, this is why length is ground zero when fitting. Plus, before you ever build or purchase a club, it is an absolute must to know what length to make it.

What Length Golf Clubs Does a Golfer Need?

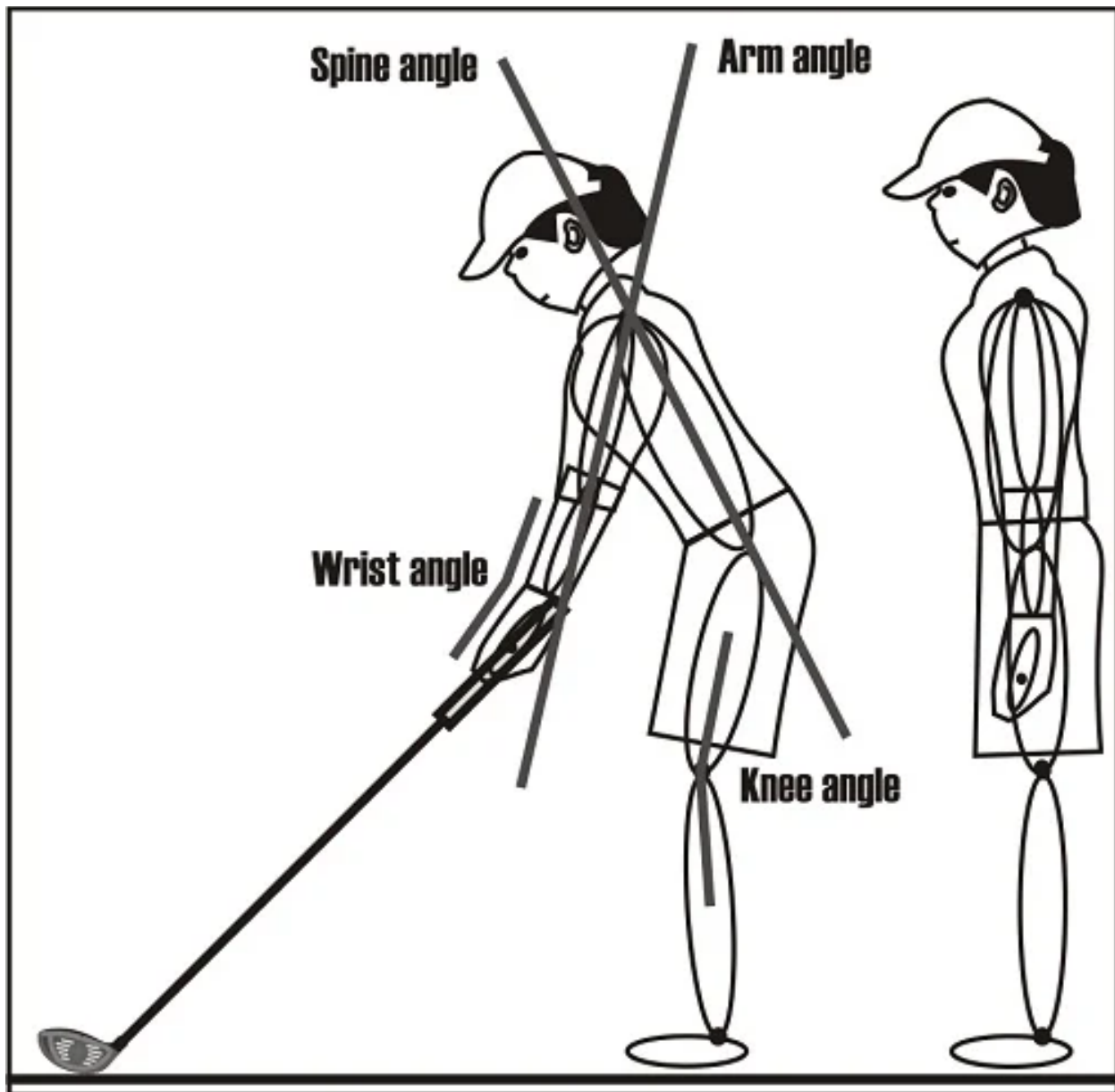
One of the most frequent questions a golfer will ask is “What length golf club should I use?” This is exceedingly difficult to address as it is not always a black or white answer. We addressed how club length is measured. If you have clubs that fit you well or one you tried, then you need to know what length they are if you are trying to duplicate their lengths in a new set. However, as discussed in chapter one, there are no standards, so knowing your driver length is 45.5” is universally adopted rather than saying it is ½” long or short of standard because of the lack of standards. This simply eliminates any confusion.

Secondly, let us go back to our example when shopping for jeans. A man does not purchase jeans based upon their height alone, rather two important pieces of information. If that person knows what their waist and inseam measurements are, they can purchase a pair of jeans that will most likely fit (but not always) without having to try them on. Then the jeans can be paired down based upon the color/finish and leg cut, which are personal preferences.

In any given golf bag, you will see clubs of all different lengths. For example, golf clubs in a set may range from say a 45” driver down to a 34” putter, but why? The reason is we need different length screwdrivers. Each club does a specific job.

So why the concern of selecting the wrong length when the average golfer already has clubs that are close to 11 inches apart? Your body can adapt by tilting from the waist, swinging the arms away from our body, and bending the wrists at different angles as shown in this diagram. Even someone who picks up a club for the very first time naturally adjusts to the length.

Not shown from this angle, but we do spread our legs at address to give us a good foundation for us to swing upon. Using a longer club requires a wider stance and decreases how tall we stand at address. We also do one other thing. Instead of having our legs rigid at address we sit or squat down by bending at the knees. This is what helps us create our balance.



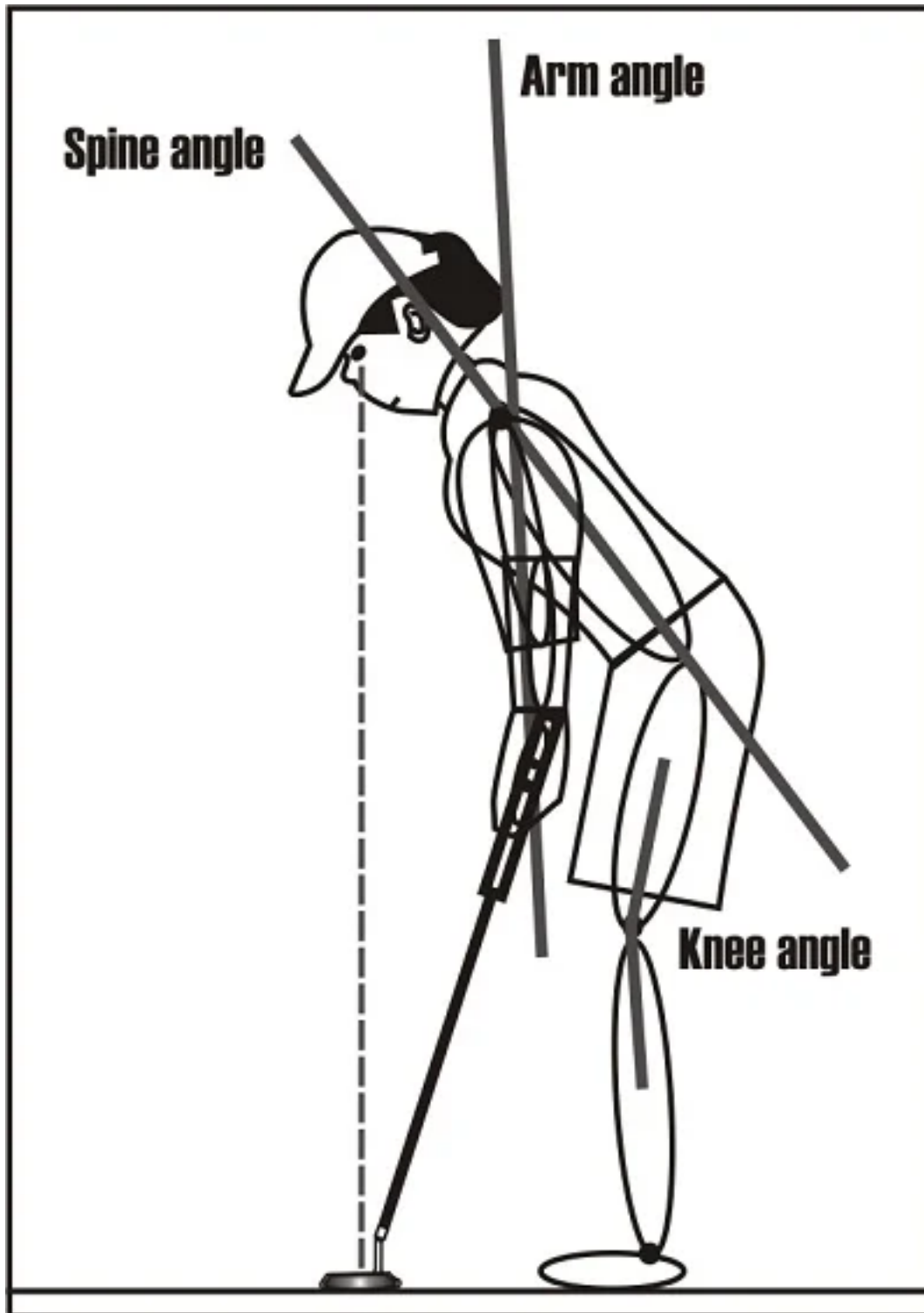
The more you tilt at the waist and change your spine angle, the more you must sit back and bend your knees otherwise you might fall forward as you have the force of swinging the club to contend with.

While the first diagram depicted a woman golfer setting up to the driver, this is the opposite extreme. Now take a look at the change in the angles for a putter. The spine angle of the driver may have been close to 30 degrees, but for a putter, the spine angle may be tilted forward another 10 degrees. Also remember how the arms went away from the body with, with a putter they often go inwards.

The importance of this is to get the player's eyes positioned over the ball as taught by many teachers. This is what the dotted line you see represents.

The arms may look all bunched up. In this case the arms fall too far down on the grip, so the elbow moves outwards in essence shortening the arm length. All the other clubs in the set

fall somewhere in-between these two examples creating a different position for each club in the set.



Height Based Fitting Charts

The most common method used to recommend the length of a golf club is a height-based chart. Golf clubs are available in two primary lengths (excluding juniors) and somewhat

based on statistics, like the average height of an average male and female. In the US, the average height adult male is 5 foot 10 inches, while an average adult female is approximately 5 foot 4 inches tall. When you look at the difference in club length between men and women it has been traditionally a 1" difference. Even though there is a 6" difference in their average height, there is only a 1" difference in club length.

So, what happens if someone is in-between these heights? Wouldn't it be safe to assume there would be a need for a third set of standards? Furthermore, for taller or shorter individuals, shouldn't the principle of proportionality take over and suggest there should be additional categories for length, much the same way that blue jeans are sold?

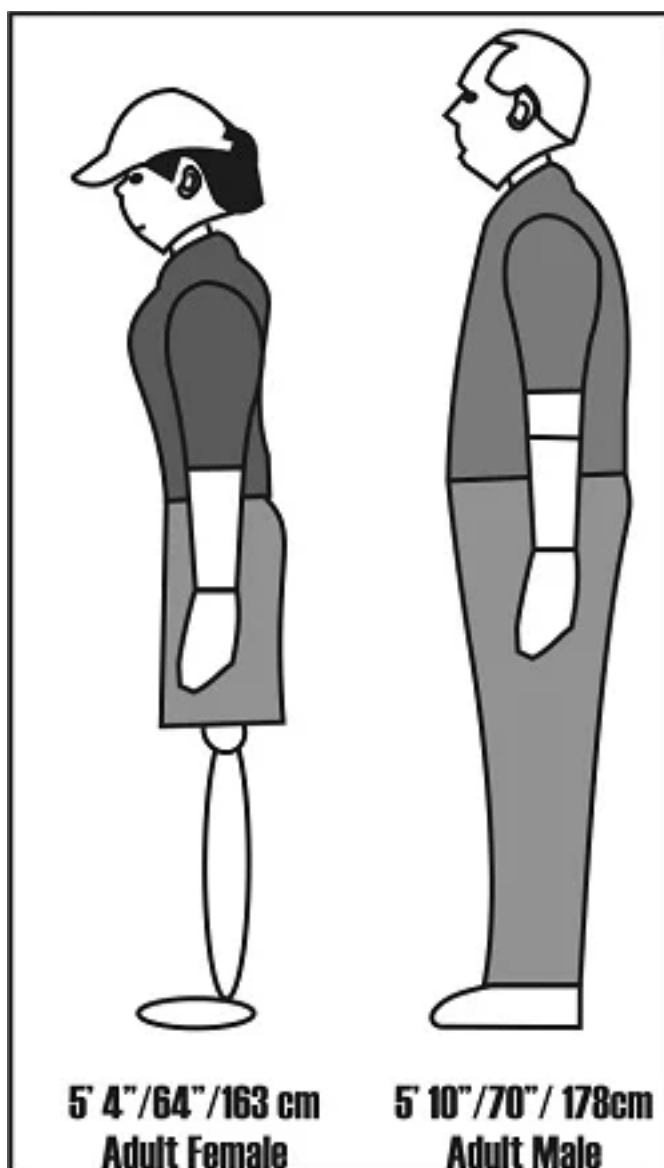
Well, in the world of ready-made or off-the-shelf golf clubs, this formula simply does not work. The manufacturers mass produce their stock clubs to fit the average height adult male for one length and women for another.

With this in mind, some charts will use these proportions; that is for each 5" or 6" of height differential, the clubs should be 1" shorter or longer. Of course, each manufacturer has their own idea for what standard length of their clubs will be that is why the actual lengths were omitted and the Length Factor in the following chart could be applied to what one would consider to be "standard length."

A little fun fact here and manufacturers know this. 68 % of all women fall between 5 foot 2 inches and 5 feet 7 inches and 68 % of men are between 5 feet 6 inches and 5 feet 11 inches which is a high percentage to produce only two lengths.

If each 6 inches of height equals a 1" change in club length then 3 inches one way or another is only a ½" difference in club length and the manufacturers are banking you can make the minor adjustments at the waist, arms, and wrist.

For the 32% that fall outside that range, the various manufacturers do offer custom assembly programs with a typical 2 week turnaround time. This is why local custom clubmaker building from scratch or fitting and repair centers can make those adjustments on demand after fitting the individual.



So, let us talk about height based charts for a moment. The important thing about them is the height is height regardless of if you are a man or a woman. Using our rule of thumb that for every 6" difference in height is equal to a 1" length change, we can extrapolate the following chart.

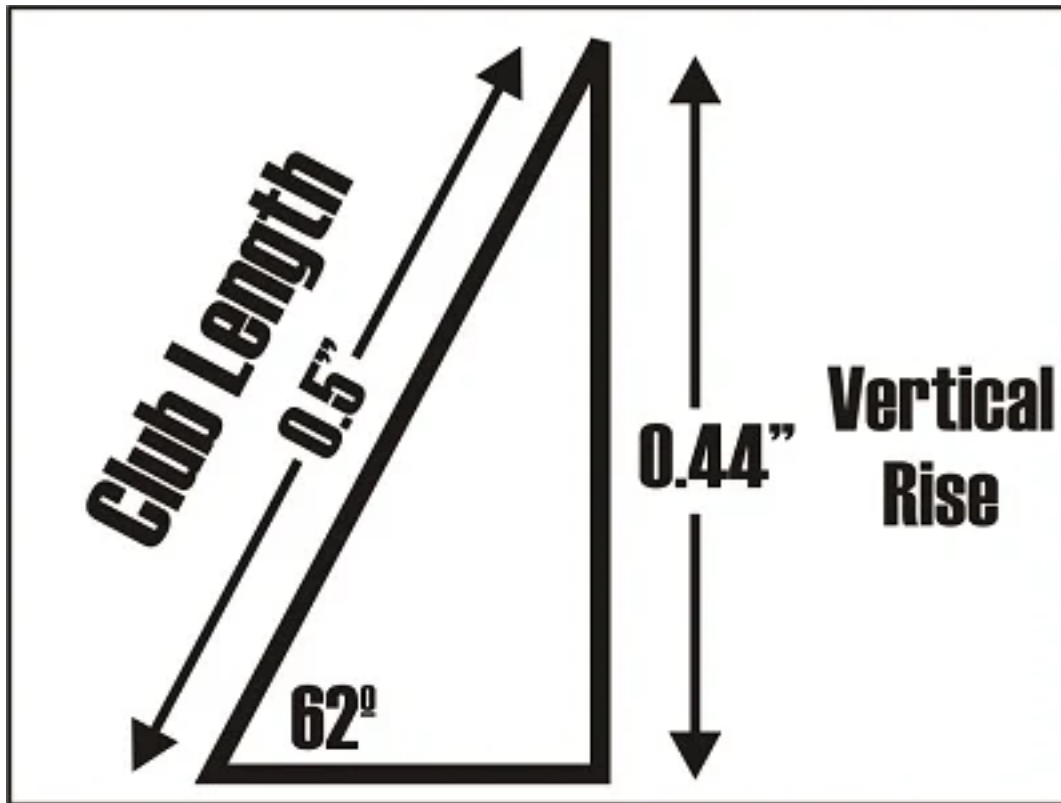
For example, someone 6' 5" might look at a club that is 1" over the men's standard as a starting point. Or a 5' 2" person, note I did not say women although it could be, may want to look at 1 ½" under men's standard. Knowing that woman's standard length is 1" shorter, then if this were someone ordering woman's clubs then they would look at ½" under ladies length.

These height based charts are often use in static fitting or situations when the player may not be able to hit different length demo clubs as a means of becoming properly fit. Or club fitters will ask this in the personal interview process again to give them a starting point in which to conduct the rest of their fitting.

Height Based Length Chart			
Height	Height	Height	Relative to Men's Standard Length
	(inches)	(centimeters)	
4' 7"	55	140	2 1/2" under standard
4' 10"	58	147	2" under standard
5' 1"	61	155	1 1/2" under standard
5' 4"	64	163	1" under standard
5' 7"	67	170	1/2" under standard
5' 10"	70	178	Standard
6' 1"	73	185	1/2" over standard
6' 4"	76	193	1" over standard
6' 7"	79	201	1 1/2" over standard
6' 10"	82	208	2" over standard
7' 1"	85	216	2 1/2" over standard

It is interesting in the fact that junior club lengths do not use this same 6" to 1" formula. For each 3" of added height equates to 1.5 - 2" increase in length.

For taller individuals, it is only logical to assume longer clubs are recommended. But it should be noted that a 0.5" increase in club length does not necessarily make the club 1/2" longer from the floor to the ground. It is the sine of the lie angle that is the length component in the vertical direction. In the diagram on the right, a representation of a 1/2" at 62° amount to a vertical increase 0.44". This will be important when we discuss our next topic.

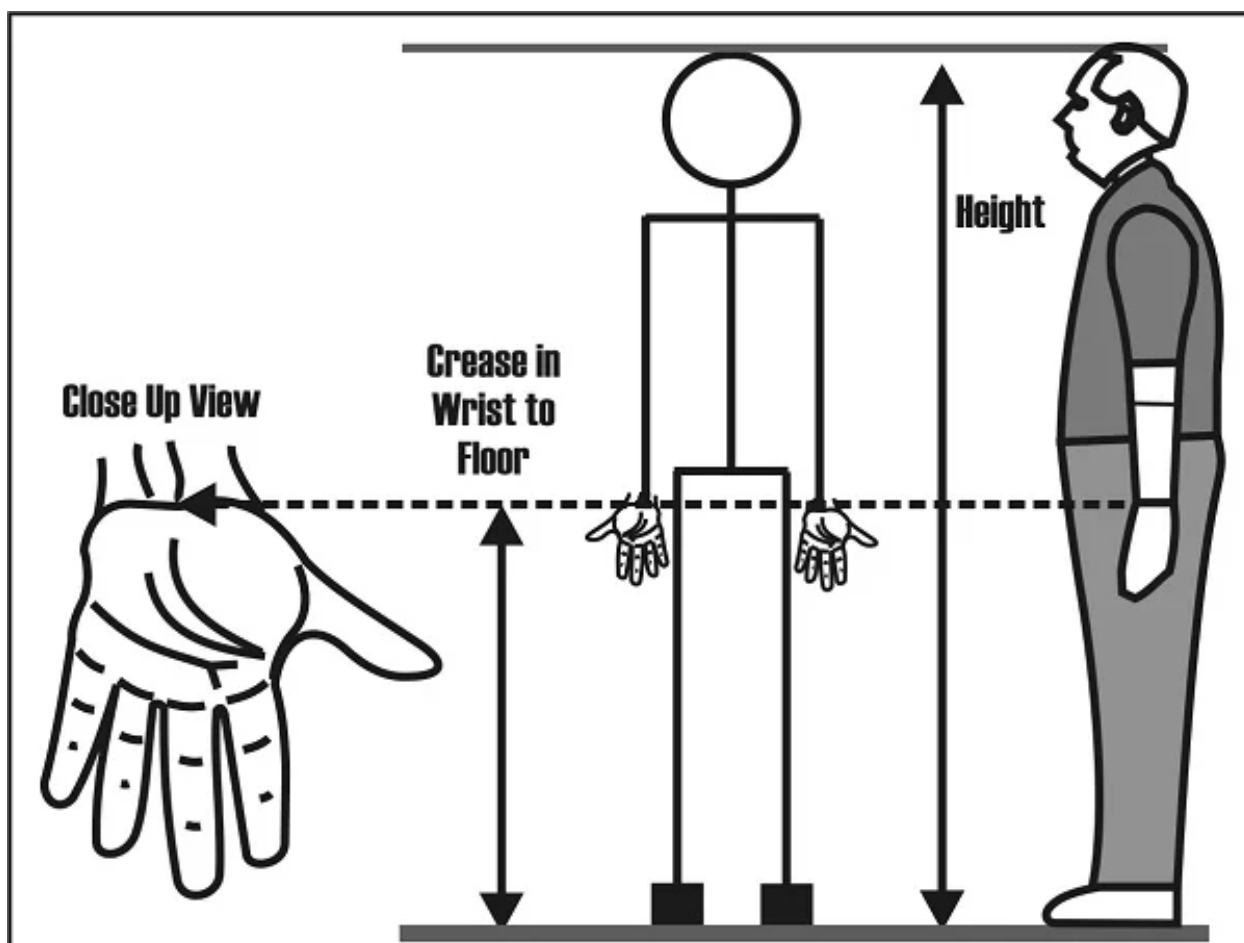


Wrist-to-floor (WTF) Measurement

Wrist-to-floor measurement (or WTF for short) is a common method in which the golfer stands with their feet together in street / tennis shoes with their arms hanging straight down and relaxed. Then someone measures from the floor to the crease just above the wrist. That reading then is indexed by the golfer's height to suggest the club length. The most common example of this is the Ping® Iron Color Code Chart.

This is better than fingertip to floor which was used when I started in the business because you do not have to factor in finger length too, which can vary from one person to the next and one less variable to contend with.

Statistically, the average WTF measurement is 48.9% of the person's height. If everyone was proportional to this percentage, then height-based charts would have the same effect. However, statistics are based on averages and not everyone will have proportionate arm lengths to their height, thus requiring not only different lengths than what their height may indicate, but also the lie of the club as we will discuss.



In the ensuing chart, we can see that a 5' 10" male on average will have a WTF measurement just shy of 34 1/4", while the average female that stands 5' 4" would be just a hair over 31 1/4". The 6" difference in height equals a 3" difference in the WTF measurement and to 1" length change. Well, at least in theory between men and women stock clubs. If you consider that a 48" junior golfer has a WTF measurement of nearly 12" less than the 70" golfer would suggest that the junior golfer, get a 5-iron that is 4" shorter than a typical men's club. However, the math does not add up as most junior charts will suggest a 48" junior to have a 5-iron about 9" shorter. Will go over that later in our junior fitting chapter later in the text.

Wrist To Floor Measurement Average Proportions		
Height (Ft. In.)	Height (inches)	WTF 48.9%
4' 0"	48"	23.47"
4' 2"	50"	24.45"
4' 4"	52"	25.43"

4' 6"	54"	26.41"
4' 8"	56"	27.38"
4' 10"	58"	28.36"
5' 0"	60"	29.34"
5' 2"	62"	30.32"
5' 4"	64"	31.30"
5' 6"	66"	32.27"
5' 8"	68"	33.25"
5' 10"	70"	34.23"
6' 0"	72"	35.21"
6' 2"	74"	36.19"
6' 4"	76"	37.16"
6' 6"	78"	38.14"
6' 8"	80"	39.12"
6' 10"	82"	40.10"
7' 0"	84"	41.08"
7' 2"	86"	42.05"
7' 4"	88"	43.03"

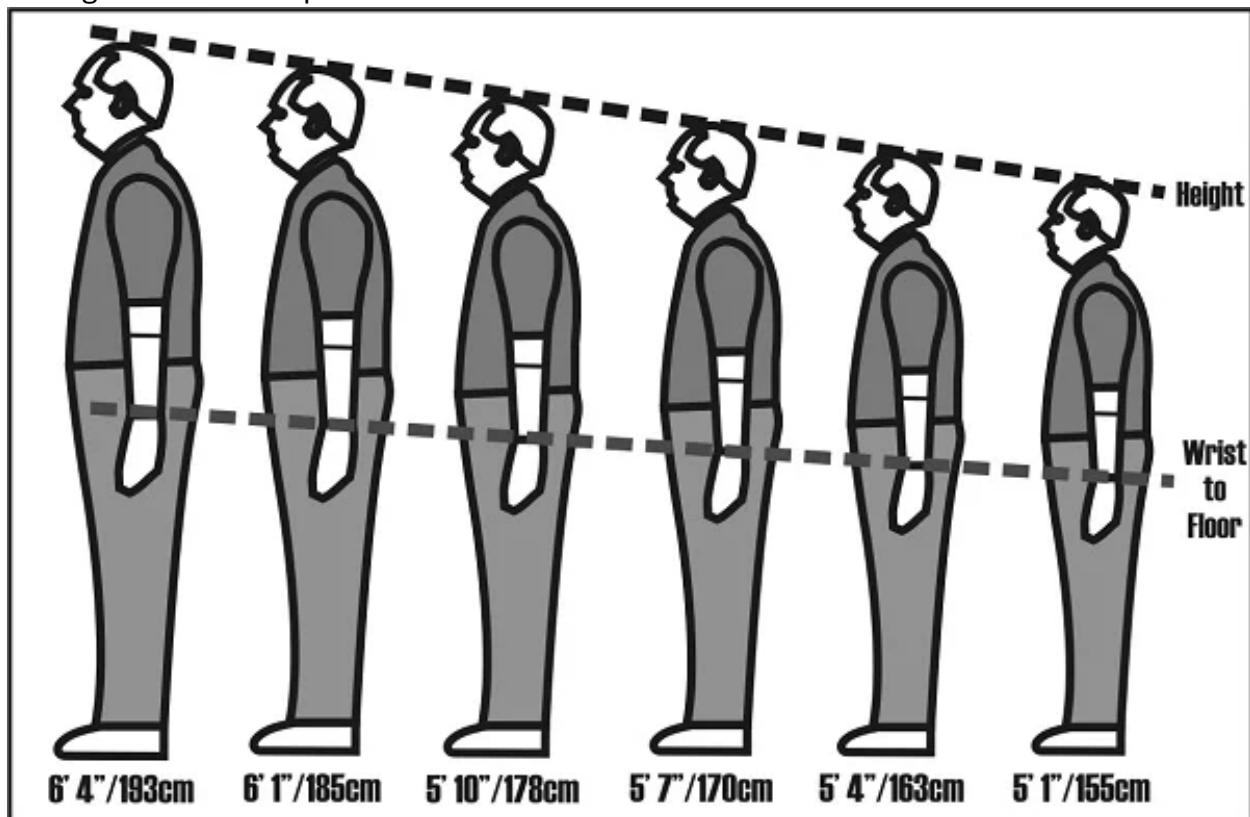
Part of this can be explained by the fact that the WTF measurement coupled with the golfer's height is only a starting point. The actual wrists at impact will be lower than the

wrists in an erect, standing posture as the player will bend at the knees and waist and have a certain arm angle away from their body when swinging a golf club.

Each person may have a slightly different comfort zone as to which of these angles feel best, thus the actual person's wrist at impact will not always be the same proportion to the player's WTF measurement when comparing one player to another.

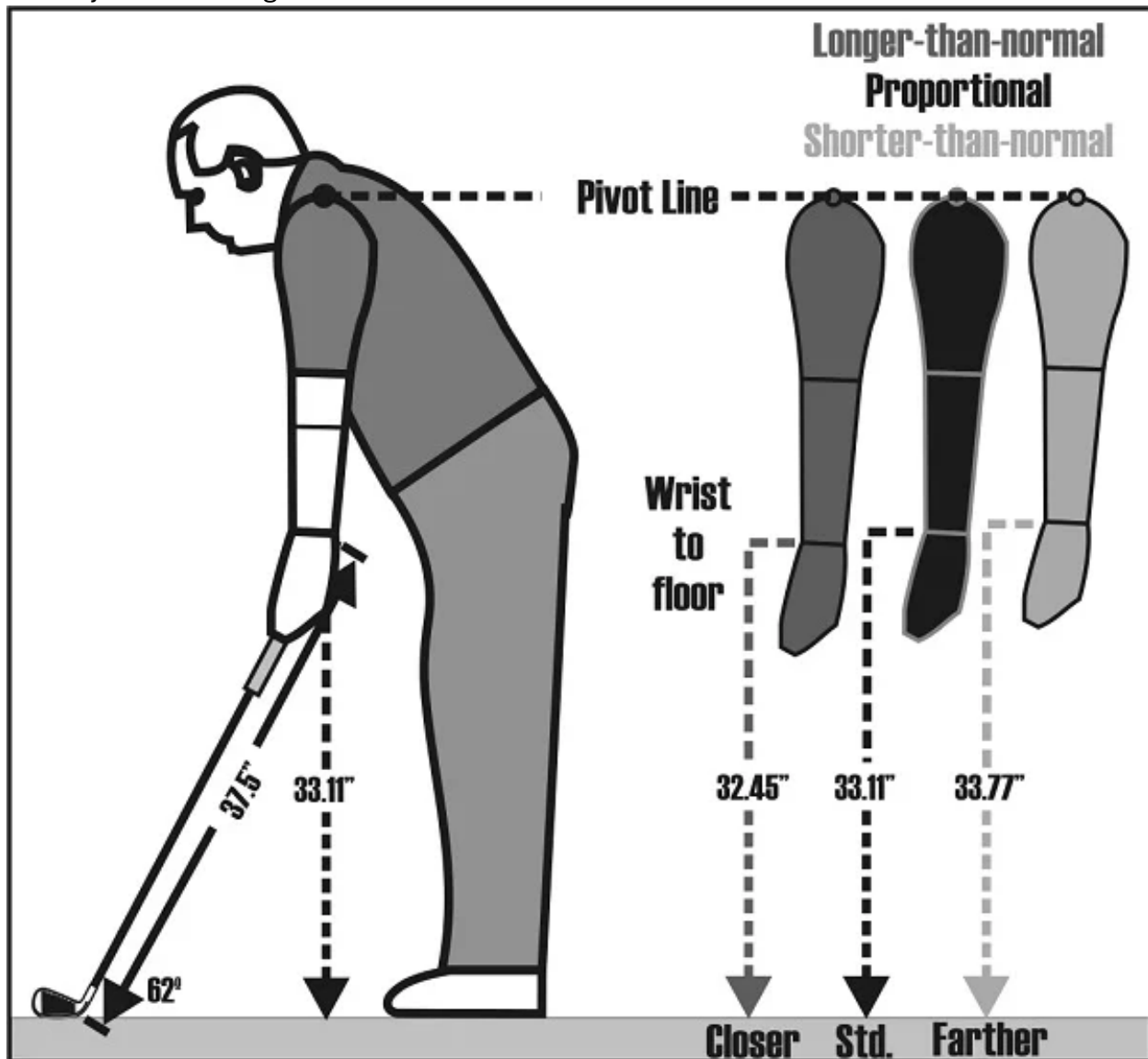
In this diagram below you get an understanding of the proportionality. Each figure is 3 inches taller or shorter than the adjacent figure. The wrist-to-floor line, which is the grey dotted line you see, does not decrease at the same amount as the change in height. This was the reason there is an approximate 6:1 ratio for height to club length. You know fitting for height would be easy if everyone was proportional, but that is not always the case as you will see.

You may have watched a basketball game where the announcer said that 6 foot 9 forward has the wingspan of someone that would stand 7 feet 4 inches. What this means in simple terms is the player has disproportionately longer arms than their height would indicate. Think about what an average is? It is a culmination of all the highs and lows, yet we use the average or mean as a point of reference all the time.



The following diagram illustrates a player in an athletic posture addressing a 6-iron. Let me rephrase that for a second, this is the position at impact we want because the toe might be slightly off the ground at address. The length of this 6-iron is 37 1/2" with a lie angle of 62° which are typical measurements. Measuring vertically from the edge of the grip or where the crease of the wrist may be, to the ground measures 33.11." This is using simple trigonometry to produce these numbers.

However, if the player's arms were longer by 2/3 of an inch as depicted in darker shade of gray, then the player's arms would dangle lower from the same pivot point on the shoulders and the wrists would be closer to the ground. The golfer would have several options. One of which would be for the player to maintain this position by gripping farther down on the club. This would be the same as if this player were to use a shorter club. Or they could change their spine angle and stand taller at address if that felt more comfortable. Again, the player can adjust to the length of the club.



However, if the player's arms were shorter by 2/3 of an inch as depicted in the lighter shade of gray, then the player's arms would not dangle as low from the same pivot point on the shoulders and the wrists would be further from the ground. In this case the customer may need to hunch over just to grab the club and no longer be in a comfortable athletic posture. There are a couple of other options. One of which is to use a longer club than a height based chart might show due to the person's arm are not proportional to the average.

Golfers that are used to buying off-the-rack or want a club immediately and do not want to wait the proverbial two weeks may seek a 3rd option. This is the option that many manufacturers would rather see because changing the length alters the balance or swing weight of their clubs.

Wrist To Floor Based Fitting Chart

Relative to Men's Standard Length	Height	Heigh (in)	Height (cm)	2° Flat	1° Flat	Standard	1° Upright	2° Upright
2 1/2" under standard	4' 7"	55	140	26.24"	26.57"	26.90"	27.23"	27.56"
2" under standard	4' 10"	58	147	27.70"	28.03"	28.36"	28.69"	29.02"
1 1/2" under standard	5' 1"	61	155	29.17"	29.50"	29.83"	30.16"	30.49"
1" under standard	5' 4"	64	163	30.64"	30.97"	31.30"	31.63"	31.96"
1/2" under standard	5' 7"	67	170	32.10"	32.43"	32.76"	33.09"	33.42"
Standard	5' 10"	70	178	33.57"	33.90"	34.23"	34.56"	34.89"
1/2" over standard	6' 1"	73	185	35.04"	35.37"	35.70"	36.03"	36.36"
1" over standard	6' 4"	76	193	36.50"	36.83"	37.16"	37.49"	37.82"
1 1/2" over standard	6' 7"	79	201	37.97"	38.30"	38.63"	38.96"	39.29"
2" over standard	6' 10"	82	208	39.44"	39.77"	40.10"	40.43"	40.76"

2 1/2" over standard	7' 1"	85	216	40.91"	41.24"	41.57"	41.90"	42.23"
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This chart builds upon the height based chart we saw earlier except now we show the proportional wrist-to-floor measurements and then suggestions for varying the lie angle plus or minus 2 degrees from the standard. Now this chart is not set in stone or the Bible when it comes to height and wrist-to-floor measurements. Rather it is a guideline to show how this process works.

So, let us say for the sake of example we have a golfer that is 6' 5" with a WTF measurement of 37 1/4" or 37.25". From the chart we can conclude a good starting point is +1" over men's standard and standard lie.

In another example, let us say we had a 6' 1" golfer a WTF of 35". Looking at the chart for a 6' 1" golfer, the average WTF measurement is 35.7". This golfer's WTF is 7/10" shorter meaning disproportionately longer arms. As I said earlier, for every 1/3" is a 1° change. In this case we could make the club 1/2" longer with a 2° flatter lie.

A golfer's arms pivot from the shoulders and in the case of a 6-iron swing away from the body by a few degrees. What we are attempting to do is lower the butt end of the club, so the spine angle does not change or create an imbalance problem.

Let us go back to our length and lie triangle depicting 1/2" of length at 62°. The vertical rise of this 1/2" segment is only 44/100 of an inch. Even though the club is 1/2" longer or shorter, the butt end of the club would only rise or lower 44/100". Lie angles other than 62° will vary slightly.

Using our example above where we could have the player use a 0.5" longer 6-iron and 2° flatter lie, we could elect to go 1/2" shorter (standard length) and only a 1° flatter lie change and here is the reason. Somehow, we need to drop the butt end of the club 7/10" shorter either by length, lie or a combination of the two to accommodate the lower-than-average WTF measurement for the customer's height.

Remember, the effect from the 2 degree changes from earlier? By flattening the lie two degrees we took the end of the grip from 33.11" down to 32.45" which equals 0.66" change in the vertical rise and remarkably close to the 7/10" we are trying to achieve.

If we elected to make the club 1/2" shorter instead, this would account for 44/100" of the 70/100" and we only have to make up the 26/100" difference with the lie change which would be approximately 1° flatter.

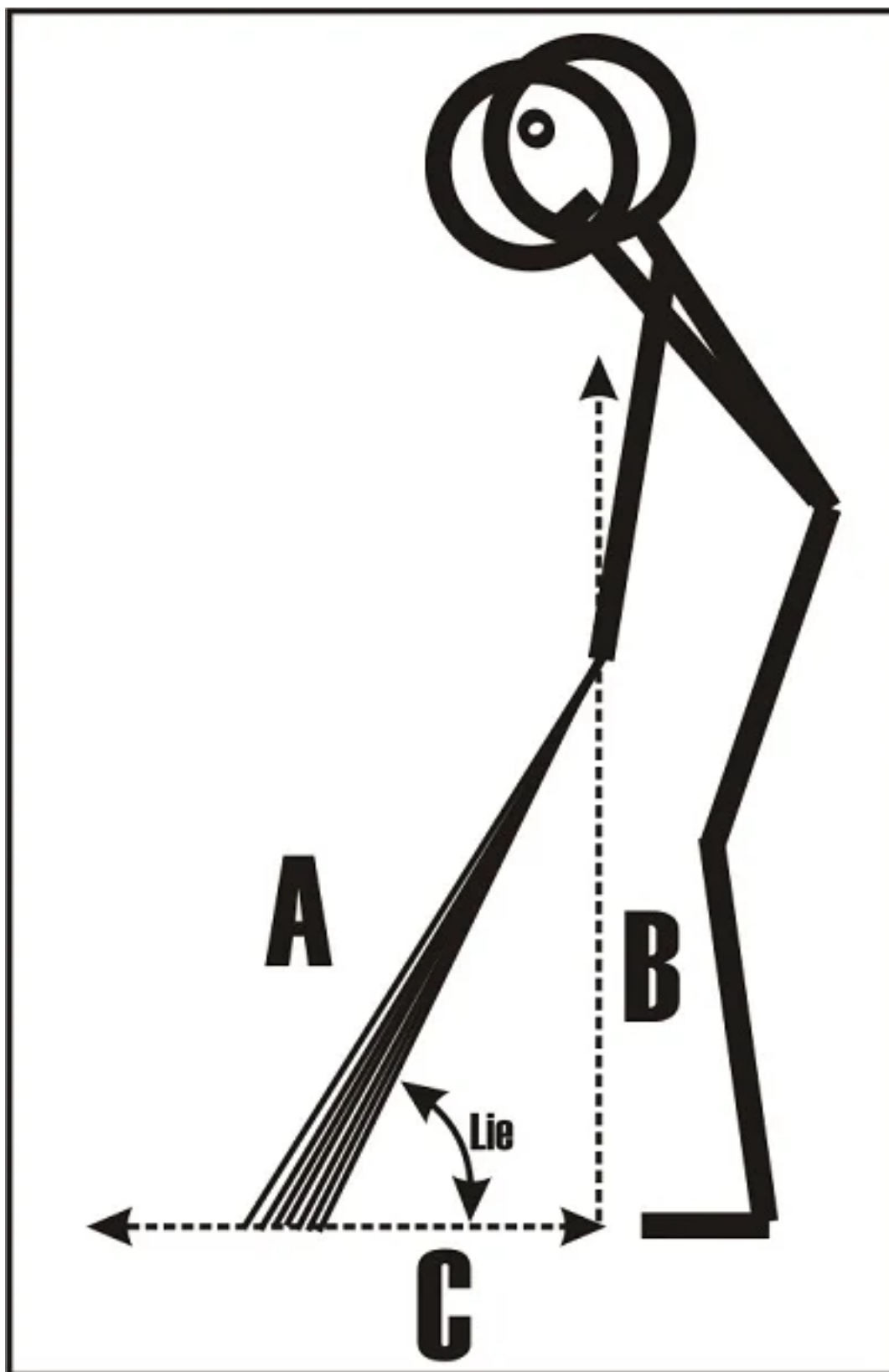
The point I am making is the club fitter has options as to what length and appropriate lie change (if at all possible) he or she could make for their customer and again the reason this is ground zero when it comes to fitting.

Importance of the Lie of a Golf Club

As we have seen, the lie also influences the length as well. The diagram shows the "Triangle" formed by the length of the club (A), distance in the vertical direction from the butt end of the grip to the ground (B) and the horizontal distance from the back edge of the heel of the club to butt end of the club (C). In the following charts, the lie angle of each club will be listed as well.

By altering the lie of the club, a manufacturer could theoretically change the B length. Below in the chart are 4 clubs that are the same length, but different lie angles. For each 1° increase in the lie angle, the butt end raised approximately 1/3" off the ground with the center of the sole touching the ground. In lieu of making the club longer to accommodate a taller individual or one with a high WTF measurement, some clubmakers may opt to change the lie angle.

A	Lie Angle	B	C
38"	60°	32.91"	19.00"
38"	61°	33.24"	18.42"
38"	62°	33.55"	17.84"
38"	63°	33.86"	17.25"

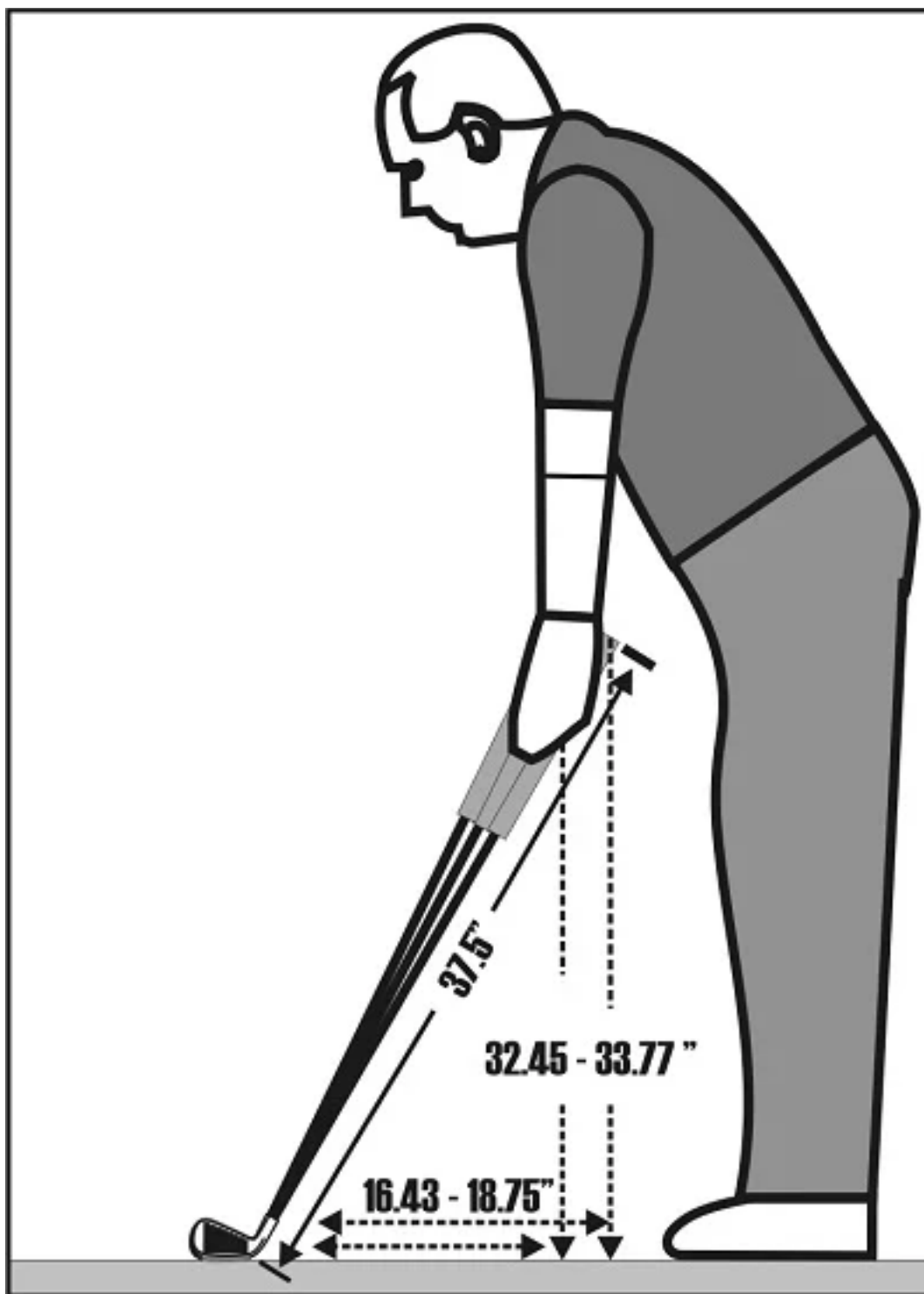


Oftentimes on an iron or a wedge, the lie angle could be altered. For approximately each 1/3rd of an inch higher or lower the wrist-to-floor measurement is, the lie of a mid-iron can

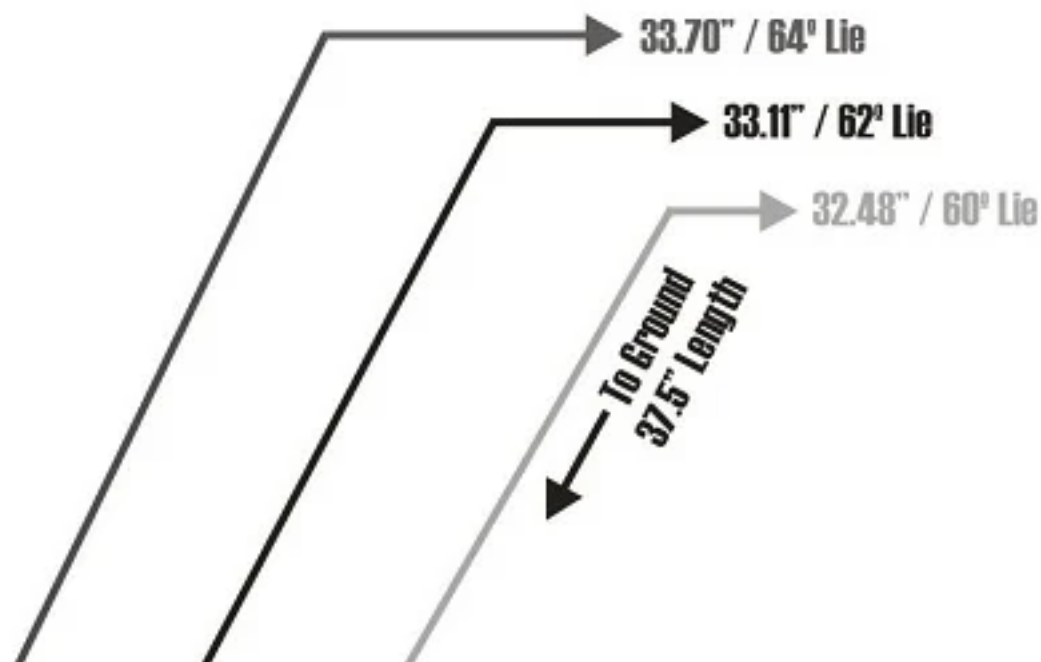
be altered by 1° and maintain our triangle where the center of the sole touches the ground and the player has not had to reposition their hand or body angles. For a driver it might be closer to ½” per degree and on a putter a little less than 2/10th of an inch.

While the grip can be lowered or raised by altering the lie angle and maintaining a player’s posture or spine angle it does not address another issue and that is how close or far we stand from the ball. By making the lie more upright, it also forces the player to stand closer to the ball, otherwise the impact of the ball may end up on the toe side of the face.

If the lie were flatter, it would lower the grip to accommodate the player’s longer arms, but the player will also have to stand further from the ball otherwise impact with the ball could be in the heel of the face.



In the diagram on the right shows the result of changing of altering lie angle just 2° in either direction yet maintaining the same length. You will see the vertical rise to the end of the grip changes by more than 1.25" and the horizontal distance changes by over 2".



Think about this for a second, a 5-iron is ½" longer than a 6-iron. The 5-iron is designed with a flatter lie and as a result the spine and arm angles are raised slightly higher and force you to stand further from the ball. This is why there is a smooth progression in both length and lie throughout the set. If the lengths and lies do not follow this progression, it will make it more difficult to make a repeatable stroke to what is already a difficult game.

Lie on an iron or wedge can often be adjusted, but usually within +/-2° of the published specification. This is why I said earlier that the length needs to be factored first as length and lie angle go together. Let us say you have a player that needs a specific length, and you have to bend a particular clubhead 3 or 4 degrees to reach your desired objective. You may be better off looking for another iron model with an appropriate starting lie angle instead of the risk of damaging a head while bending.

While most irons and wedges can be altered, this is not always the case with the other heads for several reasons. For example, the hosel is too short or the insertion depth is too deep, which is the case on most drivers, fairways, and hybrids. Adjustable lie drivers and fairways do exist, but the options are limited.

In cases with putters, some materials are not bendable without breaking or possess a curved shaft which requires special bending bars and lie/loft machines.

Swing Weight Factor on Golf Club Length & Lie

One of the reasons for selecting a length is factoring in the swing weight of the club. All the combinations of length and lie in the following chart will produce a situation where the center of the sole of the club is touching the ground and the butt end is essentially the same height off of the ground. If we have a standard weight 5-iron (256g) and a lightweight steel shaft, the swing weights will be approximately that listed in the chart.

A common lie angle for a 5-iron is 61°, therefore the length of the 5-iron may be 37.25" to achieve the B length. This combo may be very well for a lady golfer that is 5' 8" with a 33.25"

WTF measurement. A C6.5 swing weight would be perfectly normal in what you would see in a standard length woman stock set. However, let us say this was a man we were talking about that might have the same proportions of the lady golfer, or perhaps taller but with long arms. Instead of the shorter club with the lighter swing weight, the club fitter or manufacturer may suggest a 38" 5-iron that had a 2° flatter lie angle. This would make the swing weight in the normal range you would see for a male golfer.

#5 Iron Swing Weight by Length and Lie

A	Lie Angle	B	C	Swing Weight
38.50"	57.75°	32.56"	20.54"	D4
38.25"	58.25°	32.53"	20.13"	D2.5
38.00"	59°	32.57"	19.57"	D1
37.75"	59.5°	32.53"	19.16"	C9.5
37.50"	60.25	32.56"	18.61"	C8
37.25"	61°	32.58"	18.06"	C6.5
36.75"	62.25°	32.52"	17.11"	C3.5
36.50"	63°	32.52"	16.57"	C2
36.25"	64°	32.58"	15.89"	C0.5

It is easier to control the swing weight by manipulating the lie than by adding (or removing) weight from the head from a production standpoint. Most clubheads are made to such a narrow weight range from one manufacturer to another and there is a limit on how much weight can be added to a club. So, you may see tall golfers be fitted with a combination of extra length and a more upright lie as not to make the clubs feel too heavy or shorter golfer will be fitted with a shorter length / flatter lie combination so that it does not become too light. This is why it is not unusual to find a taller golfer naturally hit a high ball because of a more upright swing plane.

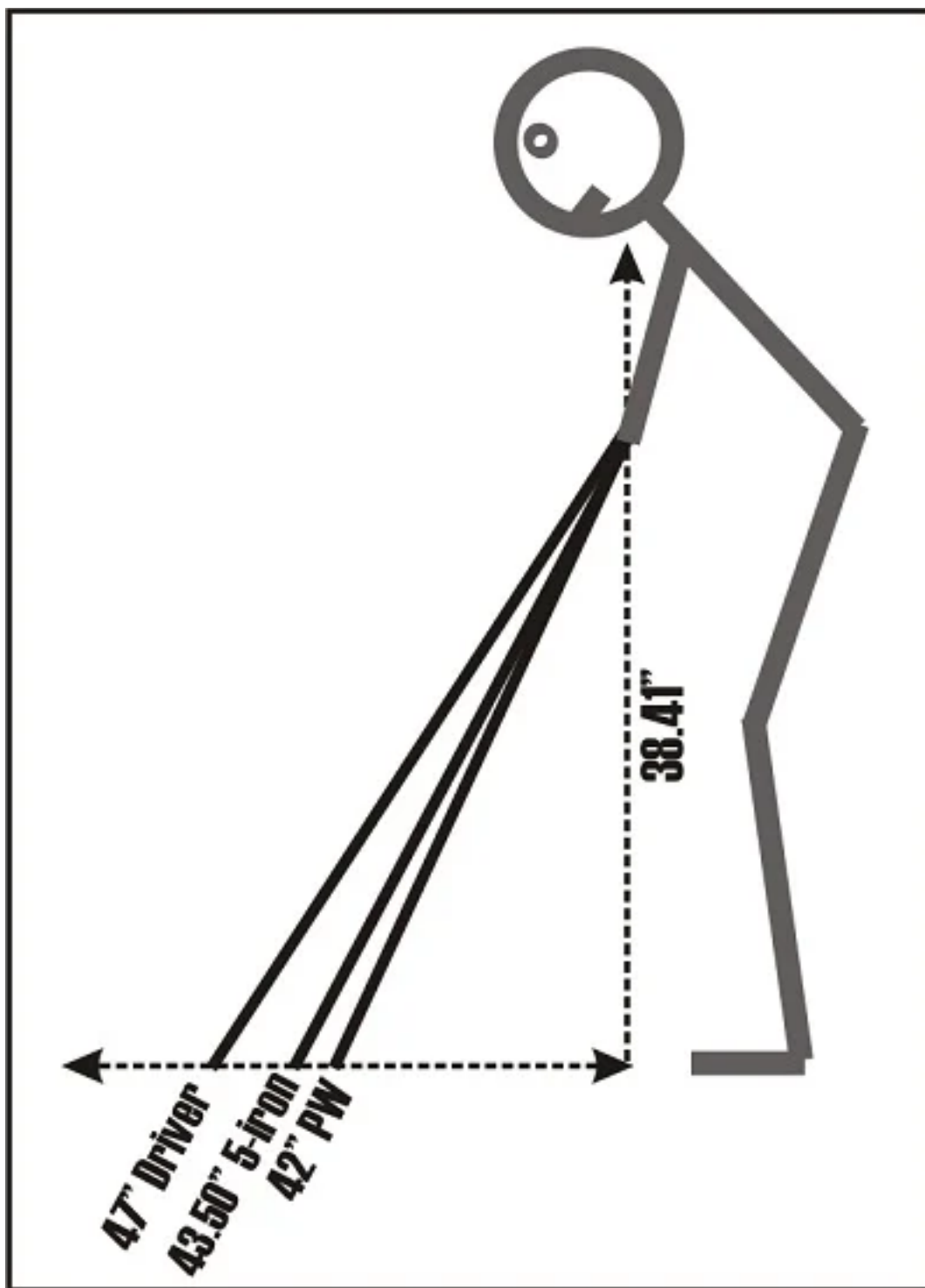
But more importantly is making sure the golfer has the proper swing plane as a result of the length / lie suggestion that will allow the golfer to make solid contact. Furthermore, not just for one club, but the rest of the clubs throughout the set since most club fitters base their fitting on a mid-iron and build the rest of the set around that using normal progressions in length (i.e., 0.5" length increments).

A Unique Golf Club Fitting Situation

Several years ago, I fitted an individual that presented a unique challenge. His name was Mike, and he was a professional in the medical field. Through referrals, he contacted me for a fitting. He explained on the phone that he had a birth defect in which his whole arm length was only the length of that to a normal person's elbow position. He wanted to play golf, but physically could not bend far enough down to grip a club. I asked him to stop by as I had some ideas that I thought would help him out.

Mike was approximately 5' 8", but a WTF measurement of 43". To put this in perspective, his WTF might be more equivalent of someone standing 7' 4". In addition, he was of average strength at best and not built like that of an individual much taller and physically stronger in which to compensate for heavier swing weights caused by the need for longer clubs. After some calculations, experimentation, and fast-setting epoxy we ended up making a partial set and a few of which I would like to share. His driver was only 2" longer than normal (47"), his 5-iron was 43.5" (5.5" longer than average) and his PW was 42" (6.5" longer than average).

When I reflect back, what I remember most about Mike was not his unique physique or the challenging fitting process, rather he was by far the happiest customer I could ever remember who picked up their clubs. He was so proud of "his" set of clubs. Finally, he had something that fitted him that he could enjoy that the majority of golfers take for granted.



Another consideration I might add is the golfer's weight. I had a customer I was helping on the phone to fit one of his clients. We did the height and wrist-to-floor measurements. However, the customer would always top the ball, if not miss it completely. Finally, it dawned on me to ask how heavy his customer was, which was kind of embarrassing since he was standing right next to him. His answer was close to 500 pounds. At that moment I tried to explain that would be the equivalent of us stuffing a pillow under

our shirt and then attempting to hit a ball. As you can imagine, his clubs needed to be much longer just so he could swing the club around his body.

So, unless you cater strictly to golfers of average proportions, you will find out quickly that slight alterations in the length and lie might allow one to make better contact with the ball, lower their score and make the game more enjoyable. As we have said, length (in conjunction with lie) is our first starting point toward the perfect fit.

Fitting Golf Clubs for Length

Length (including lie) along with weight (as we will see in the next chapter) is your primary contributors to solidness of contact on the face. Length is also one component for distance as a longer swing arc can potentially add to clubhead speed. This speed can, if the club is delivered squarely at impact, add distance to a club. However, this extra length will be more difficult to “time” properly at first since the longer club will take a longer time to swing due to the added length. Any situation in which the clubhead is not delivered in the square position will result in off-line shots. There is always a trade-off when making alterations to clubs. The longer the golf club, the more distance potential...but also the more potential for off-line shots.

Goldilocks and the 3 Bear’s Principle of Fitting Length

- Does the customer feel their current clubs are too long or too short?
- Does the customer choke or grip down on the club?
- Does the customer take large divots before making impact with the ball?
- Does the customer blade or top the ball?
- Does the customer routinely hit the ball in the heel or out near the toe on the face?

If the answer is yes to any one of these questions, then chances are the lengths are incorrect for the customer. It all comes down to comfort and performance even though the body can adapt to various lengths. Feel often comes first and foremost as the proper length puts you in a good balanced athletic posture.

But when you cannot determine which length feels right, then you must evaluate such performance issues such as solidness of contact, ball trajectory and direction to guide you. Unbelievably, but ½” in club length one way or another can make the difference between holing a putt, splitting the fairway to neither of each.

One of the fundamental rules is to use the length that feels the most comfortable to you or your customer, regardless of whether a height based, or wrist-to-floor chart stated otherwise.

A friend of mine made this driver for a female customer, who ended up never stopping by to pick it up. To make a long story short, he was so mad he took the time to assemble the driver and was not going to get paid he decided to take it out and use it himself. To give you a little background, my friend is tall and hits the ball an exceptionally long way. The last thing he needed was a short 42” ladies flex driver. But the funny part is he nailed that driver and was in his bag for several years. To this day, he still wishes he had kept it.

Over the past two decades I have used clubs over various lengths. At 6’ 2”, I have used standard length only because many of the clubs I make up may need to be handed to golfers shorter than me to try out. I have also played irons as much as 1 ½” longer than standard (due to back issues) and everything in-between, so I have a good idea of what I need. The same goes for drivers over the years. I have played shorter drivers (Thrivers) for

control off the tee to a 60" long driver for a scramble event (which it swung me rather than me swinging it).

Some clubmakers will alter the length of their builds just so the swing weight comes out at a so-called standard swing weight. But do not make the mistake of forsaking the length the customer needs only to achieve a certain swing weight as that is the opposite of what we are trying to accomplish in custom fitting.

If you or your customer is choking or gripping down on the club and does not like the smaller grip size, there is no reason you should not cut down the club. If you were concerned with swing weight, do not worry. You or your customer has been simulating what the club would feel like at the shorter length anyway.

- Play the length that feels the most comfortable regardless of what a chart based on height or wrist-to-floor would indicate
- Make sure the length is correct before trying to reach a specific swing weight
- Do not assume you or your customer needs standard length, experiment with different lengths as you might be surprised by the results
- If you choke or grip down on the club, you have already simulated what the club would feel like at the shorter length

Demo Clubs for Club Length

Demo clubs are a terrific way of finding out quickly what length you or your customers should use. This is the preferred method for finding out the exact length one needs. The height and/or wrist-to-floor charts may give you a starting point from which to conduct your fitting.

For club fitters, make up the same head as a mid-iron, but have several different length shafts of the same type and flex. Make sure the grips are all the same too. By having your customer hit balls, you can isolate just one parameter – in this case length. As an added bonus, you can also use those same clubs to fit for lie as you will see later.



Instead of making of several clubs, you could use an interchangeable fitting connection system that may be available on the market. This is where you can have gripped shafts of various lengths epoxied into special adapters and then these can be screwed into one head for your customer to hit to eliminate other variables. This will cut down on cost yet increase your fitting options.

But whichever method you use, make sure to clearly label the shafts so you know what you are handing to your customer.



Measure Performance

There are ways of telling if a golfer has the wrong length or not aside from the obvious signs of topping the ball or taking huge divots prior to hitting the ball. You might find the first can be remedied by a slightly longer club and the other by a shorter one.

The key is to look closely at impact. If the shots are all over the face, that could indicate the wrong length along with all sort of maladies. But shots hit consistently out near the toe or heel (but not both) may be remedied by a change in length or lie. There are also impact decals you can apply on the face of the club to see where you are hitting the ball.

There was once a product available just for golf ball impact called Mark-It. It was a spray that you can apply on the face of the club to see where you are hitting the ball. An alternative is foot powder spray.

In the picture here, you can see the impacts are clearly not in the center or just above center of the face on these drivers. Most drivers cannot be altered for lie, unless you have an adjustable adapter found in only select heads.



On an iron, you might only need to test for one (again like a mid-iron) and then build the rest of the set around the length of the demo club best hit. Any time you change to a different shaft or club category, you should check for the proper length of at least one representative hybrid, fairway, or wedge.

Not only do you observe the impact on the face, but also pay close attention to distance, direction, and trajectory. In some cases, the impact markings may be similar between two clubs. Choose the one that not only provides the desired ball flight, but also be sure to ask the player what feels the best.

Length becomes the key factor for setting you the correct distance from the ball that allows one to make a balanced and repeatable swing that will hopefully culminate in the player hitting the sweet spot of the club.



If impact is made consistently toward the heel or the toe, when you go to the clubhead selection you can choose a model that will complement the length with the correct lie and blade length. Length is tied directly to swing weight. You will be able to test this as we shall see in the next chapter. Selecting a non-standard length may influence the weight or type of shaft you need, which then in turn may affect grip selection and size. As you see no other parameter touches so many others than length.

- Use aids to show where your impact marks are on the face, such as impact labels or spray
- Most importantly, watch ball flight for distance, direction, and trajectory

Static Fitting for Golf Club Length

If you cannot fit the player in person, you will have to fit them based on their height and wrist-to-floor measurement charts or a [golf club length calculator](#) and use your best judgment. Make sure to ask what clubs the person had previously and if those clubs were longer or shorter than standard and if they felt too short or too long. If they do not know, chances they were stock items, and you might be able to research the stock lengths on the internet.

Items you might need

- 48" Ruler
- Impact decals or impact spray
- Identical mid irons (such as a #6 or 7) +1.5", +1", +0.5", standard, -0.5", -1"
- Identical Drivers +1", standard, -1"
- Remember, you can always choke or grip down on the club to simulate the ½" increments

Use various length gripped shafts onto an interchangeable fitting adapter. This can save both time and money.