

2011
**Shaft Fitting
Addendum**

**Chapter 5
DSFI Listings**

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THE DSFI FITTING PROCEDURE

This DSFI Fitting Procedure continues to be a work in progress by updating and simplifying on a yearly basis. However, it is important to follow all of the steps in order to better fit your customer. A few factors have been changes compared to that outlined in Chapter 7 of “The Modern Guide to Shaft Fitting”. The new information will supersede that information that has been published in the past. The reason for the change has to do with updating the information based on field testing as well as information gathered by custom clubmakers who have used publication on a regular basis for their shaft fitting.

Before delving further into the text, there are a few very important issues to address. First is the concept of the Dynamic Shaft Fitting Index (DSFI). The key word is “*Index*” as it is a means of comparing one shaft to another. The index number was then adjusted to reflect something that clubmakers could reference, which is swing speed as a guide to shaft fitting. Over the years, this has served its purpose well as the concept of shaft matching to swing speed is quite common.

Probably the key to remember in this study is that the shafts are compared apples-to-apples under the same testing conditions and the parameters of the shafts were revealed. There are many valid theories on shaft fitting, some of which do not base shaft selection on clubhead speed. This text contains information to help those who fit by clubhead speed, and those that do not, because the information on each shaft is quantified so that one can see just how stiff a shaft is, how much torque, its cut weight and the amount of tip stiffness. There will be times where you will find a person who uses a particular shaft well that doesn’t necessarily “*fit by the book*”, where as the shaft may be rated for someone who swings much faster or slower that what the individual does. It really does not matter, as the final outcome is what is most important anyway. But by knowing what the specifications of that shaft are becomes equally important, because any other shaft with similar qualities would also be a shaft choice for that individual.

Take some time to look at the charts at the end of this chapter. Look very closely to find shafts you might have used in previous clubs. Take note of the ones you hit well and ones you have not. Examine the specifications and you might notice certain parameters that are alike. This is important, because shafts that share common characteristics will normally play and feel the same. That is if the weight, then the frequency, butt and tip deflections and finally torque are alike then they should perform similarly. This can save customers money by avoiding shafts that share similar characteristics to ones you have not fared well with in the past. In addition, it will allow you to look toward newer shaft models that share similar parameters to those you have used well in the past.

Step 1 - Personal interview

Ask questions concerning the golfer’s existing clubs. Chances are if someone is in your shop, then something must be wrong with a particular club(s). Are the existing clubs too heavy, too light or just right? Are the existing clubs too stiff, too flexible or just right? Does the ball go left, right or straight to the target? How far does the person hit a Driver and/or a #5-iron? Lastly, what are the goals of the golfer?

Some of these questions may have some influence on the shaft selection, especially the weight and the flexibility. Other questions are only for your reference. The ball going right may be influence more by offset, center of gravity or the face angle of the woods or the lie angle of the irons. The height of the shot will be more influenced by loft, angle of attack, solidness of impact than by shaft selection. Remember, the more accurate the information that is provided, the better result of any fitting will be in the long run.

Step 2 - Measure existing clubs

Often overlooked, it is important to measure the golfer’s existing clubs to help identify the possible shaft selections. If all you have is a swingweight scale, you can measure the overall weight of the club. If the golfer complained the club was too heavy, then all you need to do is find a lighter shaft that what was already in the club(s). For other specifications you may need more sophisticated tools to measure with, such as a frequency analyzer. This way you can compare a certain shaft to those tested in this addendum.

If the shaft in the golfer's current clubs is in listed this addendum, you can look up the specifications and analyze why the person is not satisfied with them. Use the previous portions of the addendum as a reference. In cases where the shaft is not listed in this addendum (as in the case with proprietary shafts) get as much information as possible either through measuring the clubs or obtaining as much information from the manufacturer.

Step 3 - Examine the golfer's swing speed

It is not only important to measure the swing speed with the Driver and/or #5-iron, but also how that speed is obtained through the tempo of the swing. For example, if two golfers both have a 100-mph swing speed with their driver, but one has a fast tempo and the other has a slow tempo, then the two golfers do not necessarily use the same shaft. We shall make adjustments while we measure the golfer's swing speed.

For accurate clubhead speed recording it is necessary to have the golfer warm up first. After the player hits a few shots, use an accurate swing speed device to obtain the clubhead speed for the Driver and/or #5-iron. To gain a consistent and accurate reading of the golfer's swing speed, have the customer first warm up. Then have him or her hit a standard length Driver or a #5-iron. Take the average of 5 swings with each club as you will find there will be a slight variance from one swing to the next.

The swing speed measurements for DSFI were originally based on a device such as a GolfTek Golfswing Analyzer. Many portable units such as the Beltronic SwingMate will yield similar driver swing speeds on average. However, these devices may yield higher #5-iron swing speeds than the GolfTek analyzers that records swing speed just prior to impact. Also, be aware of the difference between clubhead speed and ball speed as launch monitors will record ball speed (which will result in much higher values). As a guideline for swing speed with a #5-iron (26° loft), you can also use the chart below based on #5-iron carry distance. (Note: High elevation areas such as the Rocky Mountain region will yield greater distances than in the chart)

#5-iron swing speed vs. distance chart

Swing speed (mph)	Distance (Yards)	Swing speed (mph)	Distance (Yards)
40	90	66	148
42	94	68	153
44	99	70	157
46	103	72	162
48	108	74	166
50	112	76	171
52	117	78	175
54	121	80	180
56	126	82	184
58	130	84	189
60	135	86	193
62	139	88	198
64	144	90	202

Important Note: The hybrid ratings are based upon 5-iron swing speeds rather than the driver swing speed

In recent years launch monitors have been more commonly available to the general public. The launch monitors are designed to focus not only on launch angle and spin rate but ball speed as well. However, it should be noted the ball speed is not to be confused with club head speed values. Driver clubhead speed will be approximately 2/3rd of the ball speed as previously noted. For those that have only had their ball speed measured, a chart is provided to approximate what your driver speed would be. It is important that you understand this is only a guideline because ball speed is affected by such things as the loft of the driver and how solidly the player hits the ball on the face of the club. It is not uncommon to see two players with the same swing speed but obtain entirely different ball speeds.

There is no substitute for having an accurate swing speed on your driver. But if all you have is ball speed, this chart should serve as a close enough approximation rather than guessing.

Driver ball speed (mph) vs. driver swing speed chart

Ball Speed	Driver mph	Ball Speed	Driver mph	Ball Speed	Driver mph
89	60	127	86	165	112
91	62	130	88	168	114
94	64	133	90	171	116
97	66	136	92	174	118
100	68	139	94	177	120
103	70	142	96	180	122
106	72	145	98	183	124
109	74	148	100	186	126
112	76	150	102	189	128
115	78	153	104	192	130
118	80	156	106	195	132
121	82	159	108	198	134
124	84	162	110	201	136

Step 4 - Determine the tempo and length of the golfer’s swing arc

Tempo is important from an accuracy standpoint when selecting shafts. If the golfer has a smooth tempo, the golfer’s swing will look almost effortless. A smooth tempo will allow the golfer to opt for a lighter shaft as well as one that is more flexible. Many professional golfers generate high swing speeds because of the efficiency of their swing and not due to brute strength.

A golfer with a fast tempo tends to be less consistent from swing to swing. You can spot out a quick tempo by examining the initial part of the downswing. The reversal from the top of the take away to the initial downswing is harder to visualize as compared to the smooth tempo. The smooth tempo, there is a gradual build up of speed throughout the downswing. The fast tempo has the greatest acceleration at the top of the swing; thus this swing type may need a heavier shaft and stiffer shaft as well. The highest percentage of golfers fit into the fast tempo category.

If you cannot distinguish between the smooth and fast tempo swing, this is referred to as a moderate tempo. The moderate swing tempo will most likely need a moderate weight and stiffness shaft. The moderate tempo would consist of a good percentage of the golfers who walk into your shop.

Length of swing plays a factor as well. Typically, a golfer with a longer swing arc will use a more flexible shaft than someone with the same tempo and swing speed, but with a shorter swing arc. The reason for this is due to the rate of recovery. With a shorter swing arc (where the shaft is less than parallel to the ground) there is less time to allow for the shaft to load and then return to a square position. Thus the stiffer shaft with the shorter swing will yield more accuracy. As golfers become older, there can be less flexibility that can restrict the length of the swing arc. Even though the golfer’s swing speed may decrease, it does not necessarily mean that the shaft flex needs to be decreased for these reasons.

A golfer with a short backswing and no wrist cock (an all arm swing), may need a much stiffer shaft than you would consider based upon their swing speed. Many newcomers to the game as well as many women golfers have this swing tendency. Not having a wrist cock greatly reduces clubhead speed. But as this golfer develops a wrist cock with lessons, their swing speed will automatically increase, thus it is best to recommend a stiffer shaft for them to grow into.

In the charts following labeled “**Driver, 5-iron or Hybrid Listed by DSFI**”, we have broken down the DSFI into several categories based on the tempo for quickly indexing the appropriate shafts. This should be a shortcut for

those who do not want to do the math. Simply find the appropriate column based on your or your customer's tempo and length of swing, and go down until you find the person's swing speed.

Step 5 - Adjusted DSFI calculations (optional)

Remember that the DSFI is an indexing of the stiffness of shaft and not just a mile per hour rating of the shaft. However, to fit the golfer to their swing speed we need to factor both the golfer's tempo and length of swing and perform a small calculation to obtain an adjusted DSFI rating to look at appropriate shafts. It may be common that the DSFI range of the recommended shafts may be much lower or higher than the actual swing speed of the golfer. An explanation of a full swing is where the club goes to parallel (to the ground on the backswing) or beyond. Following are the factors for both tempo and length to consider.

Tempo

For a **fast tempo golfer with a full swing**, the DSFI rating of the shaft should be very close to the average swing speed of the golfer. For the adjusted DSFI, multiply the average swing speed by 0.97 and 1.02 to give the DSFI range for possible shaft selections. For example, if the golfer had a 90-mph average swing speed, then look for shafts with a DSFI rating between 87 and 92.

For a **moderate tempo with a full swing**, the person is not loading (or deflecting) the shaft as much as someone is with a quicker tempo. Thus, the person can opt to go to a slightly more flexible shaft. For the moderate tempo range, multiply the average driver swing speed by 0.92 and 0.97. For example, if the golfer has an average swing speed of 90-mph, then the DSFI range of shafts to look for would be between 83 and 87.

For the **slow tempo with a full swing**, the person doesn't load (or deflects) the shaft that much during the swing. This golfer could benefit from a softer shaft than normally would be thought of for a golfer with that swing speed. For example, if the golfer had an average driver clubhead speed of 90-mph, multiply that amount by 0.87 and 0.92. Thus look for shafts with a DSFI rating between 78 and 83.

If you do not feel comfortable with detecting the tempo of a golfer with a full swing, there is an alternative method. Use the moderate tempo with a full swing factors (92 – 97% of the golfer's swing speed). You can choose the higher frequency / higher torque combination for what looks like a faster tempo. For the golfer who may not look like a faster tempo then opt for the lower frequency / lower torque combination that yields the same DSFI rating.

Golfer's who possess a **short back swing, with a wrist cock**, will need a stiffer shaft to compensate for the shorter distance traveled with the clubhead. For example, if the golfer had an average driver clubhead speed of 80-mph, multiply that amount by 1.02 and 1.07. Then look for shafts with a DSFI rating between 82 and 86.

Golfer's who possess a **short back swing, without a wrist cock** will need even a stiffer shaft to compensate for the shorter distance the clubhead travels and allow them to grow into the shaft. For example, if the golfer had an average driver clubhead speed of 50-mph, multiply that amount by 1.15 and 1.25. Then look for shafts with a DSFI rating between 58 and 63.

Length

The club length has a direct bearing on the stiffness of a shaft. In Chapter 2 of the "2011 Shaft Fitting Addendum", the shafts were tested at lengths that could be normal lengths based on the weight of the shaft (and the balance point) with modern head weights to obtain a normal swingweight range. Each shaft in this study will specify what length it was tested at. In many cases, the length we tested the shaft and the length you will be making the club for you or your customer will be the same. In cases where you or the customer need longer or shorter lengths compared to the length the shaft was tested at, adjustments to the DSFI will need to be made.

It is important to realize that clubs made at different lengths than those we tested the shafts at will have an effect on the final DSFI rating. If a club is made shorter, yet the swingweight remains the same by adding additional head weight, then the club will be more flexible. The reason for this is twofold: the increased head weight will make the

shaft more flexible, plus removing material from the butt end reduces the stiffest portion of the shaft. The converse holds true as well. If a club is made longer, but the head weight is reduced, then the shaft becomes stiffer. This is true if the shaft length is adjusted from the butt end only.

For example, many clubmakers have been making graphite-shafted irons longer than steel-shafted irons by approximately 1/2" to maintain a normal swingweight with the head weights that exist in the industry. Using a light weight steel shaft, 257 gram #5-iron and 50 gram grip, the swingweight is usually D-1 at 38". A non-tip heavy graphite shaft built to the same length will need approximately 5 additional grams of head weight. But by making the club 1/2" longer, the swingweight is the same without the additional 5 grams of head weight, thus increasing stiffness. The shaft length, if added to the butt end, being larger in cross-section further increases stiffness.

To make adjustments for non-standard DSFI lengths, you need to divide the adjusted DSFI (from the tempo) by the length constants below. For example, if the golfer needed a 1" over length driver and had a 100-mph average swing speed with a fast tempo, then the adjusted DSFI rating would range between 97 and 102. Now divide the adjusted DSFI by 1.036. The new DSFI range would be between 94 and 99, taking into account for the length of the club.

Conversion for Extending (+) or Reducing (-) Shafts from the Butt End Only						
Woods	+2"	+1.5"	+1"	+0.5"	-0.5"	-1.0"
	1.075	1.056	1.036	1.018	0.983	0.966
Irons			+1"	+0.5"	-0.5"	-1.0"
			1.033	1.016	0.984	0.969

(Note: not all shafts can be used at that length and obtain the desired swingweight with the weights of the components you have. Consult the How to Use This Addendum to Compute Swingweight, Head Weight and Approximate Frequency section in this chapter.)

Swingweight (optional)

The men's flex shafts were tested at D-1 and the ladies flex shafts were tested at C-6 for the calculated DSFI ratings. In the world of custom club fitting, all golfers will not play with one swingweight. Therefore conversions must be made to adjust for non-standard DSFI testing procedures. If the swingweight of a men's flex shaft is less than D-1 (*assuming grip weight is not decreasing the swingweight*), the shaft becomes stiffer. For example, if the frequency of a club is 250 cpm at D-1, then at C-9 the frequency will be 252 cpm. If the swingweight is higher at D-3, then the frequency will decrease to 248 cpm. Add 1 mph to the player's adjusted swing speed for each 2-swingweight point increase for clubs to be built higher than a D-1 swingweight (C-6 for ladies). For clubs built lighter than D-1 (C-6 for ladies), subtract 1 mph to the player's adjusted swing speed for each 2-swingweight point decrease.

For example, a golfer has a 100-mph swing speed, but he has a slow tempo with a full swing. The adjusted DSFI for his tempo will be between 87 and 92. If he needs a swingweight of D-5 using a standard weight grip (approximately 50g), then the adjusted DSFI based on the swingweight will now be between 89 and 94. Starting out with a slightly stiffer shaft will then be offset by the higher-than-normal swingweight during the assembly. Note, that it would require a rather substantial change in swingweight to cause the shaft's flex to change.

Grip Weights (optional)

The grip weights used to calculate the DSFI for each shaft are listed in the Cut Shaft Data tables. Not all grips that clubmakers use will weigh the same as what we used to test the clubs. It is important to know that changes in grip weights or grip sizes do not affect the stiffness of the shaft, only the balance point of the club. The only parameters that affect stiffness of a shaft are the length of the shaft and the weight of the clubhead.

If you are using a lighter grip than what was listed in the Cut Shaft Data to increase the swingweight over the standard DSFI measurement (D-1/C-6), then there is no change in the DSFI swing speed ratings. Remember, the head weight hasn't increased to make the shaft any more flexible. However, if you are using a lighter weight grip than what was used to test the shaft to obtain the standard DSFI swingweight, then this will be the same as using a

lighter swingweight. For example, if you were using a 25g grip instead of a 51 g grip, less head weight would be necessary to obtain the desired swingweight. Thus the shaft would react as if the swingweight was C-6, instead of the D-1 the club actually will become.

If you are using a heavier grip than what was used in the Cut Shaft Data and you will increase the head weight to bring the club back to the D-1 swingweight, and then you will need to make the DSFI adjustments. For example, if you were to use a 66 g oversized grip instead of a 51 g grip that was used in the testing, the club will be counterbalanced by 3-swingweight point to C-8. To bring it back to D-1, then additional head weight is required and follow the steps above regarding swingweight conversions. Note, that it would require a rather substantial change in grip weight and subsequent alteration to swingweight to cause the shaft's flex to change.

Step 6 - Start looking at the applicable selection of shafts

Study the shafts for a given swing speed range in the back of "The 2011 Shaft Fitting Addendum". These shafts are labeled either "Driver Shaft Listing by DSFI Ratings", "#5 Iron Shaft Listing by DSFI Ratings" or "Hybrid Shaft Listing by DSFI Ratings". Familiarize yourself with those shafts that are steel or graphite.

Step 7 - Take note of cost consideration

Naturally, cost is an overriding factor in fitting a player with a shaft. Determining the best shaft for a player is meaningless if he or she cannot afford the club. Because fitting with DSFI involves considering a wide range of shafts and matching those to a player's swing, there will be times when the shaft of choice ends up being a potentially expensive investment. After all, individual shafts can range from just under \$3 to \$300 or more. Be certain to select the best shaft choice that is within the customer's budget.

Step 8 - Take note of compatibility with different head types

Not all shafts listed herein can be assembled with any clubhead. Do some homework as to what types of heads are compatible to the shafts. For instance, is the hosel parallel or taper? What is the size of the inside diameter of the hosel? Does the shaft have ample parallel tip length for the hosel length after tip trimming? Is the shaft weight proper for the head weights and lengths that you will assemble the clubs? Is the shaft designed for through bore or standard metal wood? For answers to these questions consult the Hireko catalog or the manufacturer to see if the shafts are compatible with the heads that you have chosen for your customers.

Step 9 - Sort shafts by weight and material

Sort shafts by their material(s) - as denoted in the following DSFI listing - and weight(s) whether by request from the golfer or through your own fitting recommendations. For example, is graphite a viable choice for the golfer? If so, what weight range is most appropriate?

Remember the fundamental rules of fitting. Whenever a golfer has a quick tempo, opt for a heavier weight shaft in whatever material you are seeking. For slow tempo golfers, they are candidates for using lighter weight shafts. The length of the swing arc can also play importance in the proper shaft weight. The longer the golfer's swing arc, potentially they could use a lighter weight shaft, while a shorter golf swing may need a heavier weight shaft for added control.

Step 10 - Sort shafts by bend point description or T/B Ratio

Although bend point / or kick point are not distinguished by a large measurable range, as stated in Chapter 6 of "The Modern Guide to Shaft Fitting", they do impact a definite "feel" difference. For instance, the True Temper Dynamic Gold steel pattern has a stiffer feel in the tip than does the Dynalite pattern, but yet has the similar DSFI ratings in like flexes.

The T/B Ratio can be helpful to identify shafts that may hit the ball higher than another with the same head. The higher the T/B Ratio, typically the more flexible the tip and subsequently a higher launch angle may occur. Another thing we have found is a shaft with a higher T/B ratio can produce a draw bias, or assist in allowing the clubface to close. For woods, a T/B Ratio of 3.0 or higher could be considered draw bias, while shafts with a 2.2 or lower T/B Ratio could be considered sliced bias, or assist those who hook the ball. For irons, a T/B Ratio of 1.7 or higher

could be considered draw bias, while shafts with a 1.4 or lower T/B Ratio could be considered sliced bias, or assist those who hook the ball. Special consideration may be needed for loft, angle of center of gravity or face angle on woods. Make sure as well to compare T/B ratios of shafts that were tested at the same length.

Step 11 (optional) - Sort shafts by frequency/torque relationship

If you have already adjusted for the tempo earlier, you need not follow this step. This is the alternative step mentioned earlier when adjusting DSFI by the tempo of the golfer. If the golfer has a slow swing tempo, find a shaft with a low frequency / low torque combination within the selected range of shafts. If the golfer has a fast swing tempo, then opt for a shaft with a higher frequency / higher torque relationship within the selected range of shafts. The stiffer shaft will stabilize the clubhead while the higher torque will typically offset the stiff feel.

Step 12 - Final considerations

Dampening: In cases where a golfer may have hand, wrist or joint discomfort while hitting golf balls could benefit from the new technology. Shaft materials such as graphite, aluminum and titanium have been known to dampen shock at impact. Steel shafts with special inserts inside the shaft, such as True Temper's SensiCore line can dampen shock upon impact.

Color: While not a performance issue, the color has some merit when fitting shafts. Does the golfer want a particular color, something flashy or plain? Cosmetically, will the club look like a finished golfer club? Even though the shaft may fit the golfer, would a pink colored head match up with a navy blue shaft and a lime green grip?

Brand Name Loyalty: Certain customers who come into your shop may ask for specific brand names. For companies that offer a full line of shafts, this should pose no problem finding a shaft that meets the swing speed and tempo requirements of the golfer.

Warranty: Some companies offer a lifetime warranty against breakage from normal use. Some companies may offer only limited warranties. A small factor, but one you may deem important.

Working Example #1 (Simple Method)

A male golfer has a measured driver swing speed of 88 mph and possesses a fast tempo. He wants a graphite shaft in the 60 gram range and one that might reduce his fade. The first thing to do is find the chart labeled "Driver Shaft Listing by DSFI Ratings". Next, on the far right hand side find the column labeled "Fast Tempo". On the third page of the Driver Shaft Listing by DSFI Ratings chart you will find a whole page of shafts with an adjusted DSFI between 87 and 89. Sometimes it may help to look for a DSFI number +/-2 from the swing speed to have more selections to choose from. After all, the person's swing speed can vary slightly from one swing to the next. Now you can sort through the shafts that have a cut weight in the 60g range, plus look at all shafts with a higher T/B Ratio (of 3.0 or higher) to help reduce the fade. Lastly, you can sort by manufacturer, cost, color, etc.

Working Example #2 (Advanced)

We have a golfer who is looking for graphite shafts in his irons. He normally carries his #5-iron 170 yards. We have determined that he has a full swing with a slow tempo and from dynamic fitting a 38.5" #5-iron is best suited to him. Lastly, he felt the clubhead best with a D-3 swingweight using a normal weight grip. Here are the adjustments to find the appropriate range of shafts that would work for him.

Examining the swing speed vs. distance chart, 170 yards would approximate a 76 mph swing speed with his #5-iron. Next we adjust for his tempo. With a slow tempo, we multiply his #5-iron swing speed by 0.87 and 0.92. The adjusted DSFI range is between 66 and 70.

Next we adjust for the non-standard DSFI swingweight of D-1. Because we are using a standard weight grip, we will add 1 mph to the adjusted DSFI range (1 mph equals two swingweights). The adjusted DSFI range is now between 68 and 72. Now look at the shaft choices in the DSFI column between 68 and 72 and find appropriate graphite shafts in the "#5-iron Listings by DSFI Ratings section.

Working Example #3 (Advanced)

In another example, we have a lady golfer who has a short back swing with no wrist cock. We have determined from a dynamic fitting a 36.5" #5-iron is best suited to her. Lastly, she liked the feel of a graphite shafted demo club with a C-2 swingweight using a normal weight ladies grip. Here are the adjustments to find out the range of shafts that will work best for her.

We measured her swing speed with a #5-iron and find it to be 52 mph. Next we adjust for the tempo. With a short back swing and no wrist cock, we multiply her #5-iron swing speed by 1.15 and 1.25. The adjusted range would be between 60 and 65.

Next we adjust for the lighter C-2 swingweight. Since the swingweight is lower than C-6, we need a more flexible shaft. For each 2 swingweights, we will subtract 1 mph off the adjusted DSFI range. The new range is now between 58 and 63. Now look at the shaft choices in the DSFI column between 58 and 63 and find appropriate graphite shafts in the "#5-iron Listings by DSFI Ratings section.

Special Consideration

In some cases, a shaft selection may not be close to the golfer's adjusted swing speed range, due to cost, material, weight, etc. In these situations, pick a shaft that is the closest fit to the parameters required by the golfer. It may not be an exact match however it will be a safer selection than other shafts with DSFI ratings further from the actual swing speed of the golfer.

Special Note

Don't overlook the importance of the cut specifications, especially when working with a customer that happens to use a particular shaft well where the DSFI rating is nowhere close to his or her swing speed and the adjusted tempo. If that shaft happens to have been tested in this publication, pay very close attention to the cut weight, frequency, length, torque, and butt and tip deflections. If you find another shaft(s) with similar numbers, the shaft should react equally as well regardless of manufacturer. While this might be contrary to the DSFI Fitting Procedure, we are most concerned with obtaining a correct fit. After all, these specifications make up the DNA of the golf shaft.

How to Use This Addendum to Compute Swingweight, Head Weight and Approximate Frequency

Example: We will use the True Ace Cadence Orange Fairway shaft in an R-flex. The shaft was tested at a length of 43" and standard swingweight of D-1, but we want to make the club 44" with a swingweight of D-0. How much head weight do we need and what will be the approximate frequency? Here are the measurements from the actual cut data:

Head wt	Grip wt	CPM	Swingweight	Length
213.2 g	51g	258	D-1	43"

First, let us change the length to 1" longer. Remember that for each 1/2" addition in length will result into a 3 swingweight-point increase.

Head wt	Grip wt	CPM	Swingweight	Length
213.2 g	51 g	?	D-7	44"

What would be the approximate frequency of the club become with the changes? Since the swingweight is 6 points higher, the frequency will go down 1 cpm per swingweight, so the final result will be:

Head wt	Grip wt	CPM	Swingweight	Length
213.2 g	51 g	252	D-7	44"

If we wanted the swingweight to be D-0, how much head weight will be necessary? Examine the chart to see how much weight is required per swingweight and length. At 44", each swingweight requires 1.65 grams. To reduce the swingweight from D-7 to D-2, then we would need to reduce the gram weight by 8.3 g.

Head wt	Grip wt	CPM	Swingweight	Length
204.9 g	51 g	?	D-2	44"

What would the adjusted frequency be in this case? Since the swingweight is 5 points lower, the frequency will increase by 5 cpm.

Head wt	Grip wt	CPM	Swingweight	Length
204.9 g	51 g	257	D-2	44"

What happens when we will use a grip weight different from that tested in the addendum? If we take our previous scenario, but change the grip weight to 65 grams, what would be the new swingweight? Remember, for each 5 grams of grip weight compared to what was listed, the swingweight will change by 1 point. Therefore 15 grams of additional grip weight will decrease the swingweight by 3 points.

Head wt	Grip wt	CPM	Swingweight	Length
204.9 g	66 g	257	C-9	44"

Notice that the frequency of the club did not change. There are only two factors that affect frequency; head weight and length. By changing grip weight, there is no change to the frequency of the club. However, your frequency analyzer may pick up a small change due to the density or pressure exerted on the clamping mechanism.

If we use the same scenario, but want to have a swingweight of D-2, how much head weight will be necessary? Remember, 1.65 grams per swingweight is needed at 44". So a change in 3 swingweight is 5 g.

Head wt	Grip wt	CPM	Swingweight	Length
209.9 g	66 g	?	D-2	44"

What will be the final frequency of the club become now? Since we are adding 3 swingweights to the club, the frequency will be reduced by 3 cpm.

Head wt	Grip wt	CPM	Swingweight	Length
209.9 g	66 g	254	D-2	44"

These examples are made to show you how to use the addendum to figure out ahead of time what the parameters might be if you were to built the club differently than what was tested. Your results may vary slightly due to the tolerances of the components such as raw shaft frequency, shaft weight and balance point. The lie angle of the head as well as its center of gravity could also have an influence on the final outcome.

CLUB LENGTH & SWINGWEIGHT

Driver Length	Grams/ Swingweight	5-iron Length	Grams/ Swingweight
45"	1.60	39.5"	1.95
44.5"	1.63	39"	1.98
44"	1.65	38.5"	2.03
43.5"	1.68	38"	2.07
43"	1.71	37.5"	2.11
42.5"	1.74	37"	2.16
42"	1.77	36.5"	2.21
41.5"	1.80	36"	2.26
41"	1.84	35.5"	2.31

DRIVER SHAFTS LISTED BY DSFI RATING

Manufacturer	Shaft	Flex	Shaft Weight (g)	Freq. (cpm)	Butt Deflect. (oz.)	Tip Deflect. (.oz.)	T/B Ratio	Torque Cut (deg)	Length (in.)	DSFI	3/4 Swing	Fast Tempo	Medium Tempo	Slow Tempo
SK Fiber	V.I.P.	LL	58.0	210	23	6	3.8	7.34	44"	62	61	64	67	71
Apollo	Acculite 45 Graphite	L	45.0	217	24	10	2.4	8.60	44"	63	62	65	68	72
Powerflex	FW 114	L	90.1	227	33	3	11.0	9.27	43"	63	62	65	68	72
UST Mamiya	ProForce V2 55	L	49.8	214	21	8	2.6	5.76	44"	65	64	67	71	75
Graman	R70	L	62.2	222	34	11	3.1	5.20	42"	66	65	68	72	76
Grafalloy	ProLaunch Blue 45	L	43.8	213	23	8	2.9	5.38	44"	66	65	68	72	76
Powerflex	FW 114	A	92.3	228	32	5	6.4	8.61	44"	66	65	68	72	76
Aldila	NVS 45	L	43.5	219	24	9	2.7	6.33	44"	66	65	68	72	76
Tour Gear	Renaissance	L	76.8	219	26	10	2.6	6.24	44"	66	65	68	72	76
IBella	Bellissima	L	56.5	229	31	9	3.4	6.21	43"	68	67	70	74	78
Graman	R70	A	63.3	219	32	10	3.2	5.03	43"	68	67	70	74	78
Aldila	NVS 55	L	50.4	216	24	8	3.0	5.08	44"	68	67	70	74	78
New Image	Berry Image Graphite	L	68.8	223	29	8	3.6	4.60	43"	69	68	71	75	79
New Image	Lipstick Red Image Graphite	L	68.8	223	29	8	3.6	4.60	43"	69	68	71	75	79
New Image	Purple Image Graphite	L	68.8	223	29	8	3.6	4.60	43"	69	68	71	75	79
Acer	Velocity	L	61.7	234	25	4	6.3	6.00	44"	69	68	71	75	79
Aldila	VL	L	66.8	237	36	15	2.4	6.25	42"	70	69	72	76	80
Aldila	NV 55	L	49.9	219	25	10	2.5	5.19	44"	70	69	72	76	80
Fujikura	Sakura	L	52.2	227	23	10	2.3	5.71	44"	70	69	72	76	80
Tour Gear	Renaissance	A	78.7	218	26	10	2.6	6.05	45"	70	69	72	76	80
Apollo	Spectre Lite Steel	L	92.5	223	25	10	2.5	3.58	43"	71	70	73	77	82
UST Mamiya	Competition Series	L	52.3	233	34	10	3.4	5.79	43"	71	70	73	77	82
Acer	Velocity	A	65.1	231	26	7	3.7	6.69	45"	72	71	74	78	83
Dynacraft	Super Collider	L	59.5	239	28	6	4.7	6.32	44"	72	71	74	78	83
New Image	Emerald Image Graphite	A	63.7	219	31	6	5.2	4.32	44"	72	71	74	78	83
Powerflex	FW 114	R	98.8	241	36	6	6.0	8.43	44"	72	71	74	78	83
Power Play	Adrenaline	L	59.5	239	28	6	4.7	6.32	44"	72	71	74	78	83
Grafalloy	ProLaunch Blue 45	A	42.4	221	26	9	2.9	5.87	45"	72	71	74	78	83
Apollo	Acculite 60 Graphite	L	54.0	229	28	12	2.3	5.32	44"	74	73	76	80	85
Apollo	Balistik Graphite	L	68.2	238	37	10	3.7	5.74	43"	74	73	76	80	85
Apollo	Shadow UL Graphite	L	58.6	234	30	9	3.3	5.77	44"	74	73	76	80	85
SK Fiber	V.I.P.	A	64.0	227	29	6	4.8	5.57	45"	74	73	76	80	85
Fujikura	Fit-On E150	R2	57.2	231	22	9	2.4	4.90	45"	75	74	77	82	86
Power Play	System Q	L	63.5	235	32	9	3.6	5.93	44"	75	74	77	82	86
Acer	Velocity	R	64.4	241	26	6	4.3	6.16	45"	75	74	77	82	86
Dynacraft	Super Collider	A	61.2	238	28	5	5.6	6.03	45"	75	74	77	82	86
Power Play	Adrenaline	A	61.2	238	28	5	5.6	6.03	45"	75	74	77	82	86
True Ace	Cadence Blue	L	59.0	234	29	8	3.6	4.78	44"	75	74	77	82	86
Apollo	Shadow Graphite	L	64.4	242	37	15	2.5	6.17	43"	76	75	78	83	87

DRIVER SHAFTS LISTED BY DSFI RATING

Manufacturer	Shaft	Flex	Shaft Weight (g)	Freq. (cpm)	Butt Deflect. (oz.)	Tip Deflect. (.oz.)	T/B Ratio	Torque Cut (deg)	Length (in.)	DSFI	3/4 Swing	Fast Tempo	Medium Tempo	Slow Tempo
IBella	Obsession	L	55.0	238	34	9	3.8	5.85	44"	76	75	78	83	87
Apollo	Spectre Lite Steel	A	97.0	227	28	9	3.1	3.44	44"	76	75	78	83	87
Powerflex	FW 114	S	100.4	247	38	8	4.8	7.50	44"	76	75	78	83	87
Aldila	VL	A	69.1	246	35	13	2.7	5.21	43"	77	75	79	84	89
Aldila	Habanera	R	57.7	242	27	9	3.0	6.10	45"	77	75	79	84	89
Grafalloy	ProCustom	L	61.5	238	32	11	2.9	5.53	44"	77	75	79	84	89
Graphite Design	Aura Blue	A	59.4	234	26	11	2.4	5.42	45"	77	75	79	84	89
Graphite Design	Aura Gold	A	59.1	232	26	12	2.2	5.51	45"	77	75	79	84	89
Power Play	System Q	A	61.5	235	31	8	3.9	5.82	45"	77	75	79	84	89
SK Fiber	Tour Trac 80	A	72.4	240	33	8	4.1	4.94	44"	77	75	79	84	89
Tour Gear	Renaissance	R	80.0	247	33	12	2.8	8.60	45"	77	75	79	84	89
UST Mamiya	Competition Series	A	57.0	233	30	7	4.3	5.54	45"	77	75	79	84	89
Acer	Velocity	S	65.1	247	28	7	4.0	6.09	45"	78	76	80	85	90
Fujikura	Fit-On E160	R2	63.2	237	24	10	2.4	4.98	45"	78	76	80	85	90
True Temper	TT Lite	L	98.4	241	38	15	2.5	3.27	42"	79	77	81	86	91
Aldila	VX	R	75.5	250	43	14	3.1	6.26	43"	79	77	81	86	91
Apollo	Acculite 50 Graphite	R	51.3	243	32	12	2.7	7.21	45"	79	77	81	86	91
Apollo	Shadow Steel	L	106.7	238	32	12	2.7	3.33	43"	79	77	81	86	91
Fujikura	Fit-On E150	R	55.7	239	26	9	3.2	4.92	45"	79	77	81	86	91
Fujikura	Sakura Sport	L	62.8	241	28	13	2.2	4.76	44"	79	77	81	86	91
Graman	R70	R	66.7	244	43	15	2.9	5.59	43"	79	77	81	86	91
Power Play	System Q	R	67.2	241	32	8	4.0	5.94	45"	79	77	81	86	91
Project X	Project X Graphite	5.0	56.6	238	29	10	2.9	5.33	45"	79	77	81	86	91
True Ace	Cadence Blue	A	61.5	233	29	8	3.6	4.71	45"	79	77	81	86	91
UST Mamiya	MP5	R	49.9	231	29	8	3.6	4.36	45"	79	77	81	86	91
Apollo	Acculite 60 Graphite	R	56.8	241	30	13	2.3	6.00	45"	80	78	82	87	92
Apollo	Balistik Graphite	A	70.4	243	38	10	3.6	5.32	44"	80	78	82	87	92
Apollo	Shadow Graphite	A	66.3	246	40	12	3.3	5.97	44"	80	78	82	87	92
Dynacraft	Super Collider	R	61.4	246	33	7	4.7	6.12	45"	80	78	82	87	92
IBella	Obsession	A	56.0	241	33	8	4.1	5.75	45"	80	78	82	87	92
Power Play	Adrenaline	R	61.4	246	33	7	4.7	6.12	45"	80	78	82	87	92
SK Fiber	Helium	A	56.4	237	29	7	4.1	4.59	45"	80	78	82	87	92
Tour Gear	Renaissance	S	80.9	253	33	15	2.2	7.96	45"	80	78	82	87	92
Apollo	Acculite 70 Graphite	R	70.3	246	33	15	2.2	6.83	45"	81	79	84	88	93
Apollo	Shadow Graphite	R	69.2	248	40	11	3.6	6.02	44"	81	79	84	88	93
Aldila	Voodoo 65	R	62.8	240	27	13	2.1	4.96	45"	81	79	84	88	93
Apollo	Shadow UL Graphite	A	59.9	236	33	11	3.0	5.59	45"	81	79	84	88	93
Grafalloy	ProLaunch Blue 45	R	43.4	240	31	12	2.6	5.62	45"	81	79	84	88	93
UST Mamiya	Competition Series	R	59.3	242	33	9	3.7	5.75	45"	81	79	84	88	93

DRIVER SHAFTS LISTED BY DSFI RATING

Manufacturer	Shaft	Flex	Shaft Weight (g)	Freq. (cpm)	Butt Deflect. (oz.)	Tip Deflect. (.oz.)	T/B Ratio	Torque Cut (deg)	Length (in.)	DSFI	3/4 Swing	Fast Tempo	Medium Tempo	Slow Tempo
UST Mamiya	65 Gold	R	59.7	241	32	9	3.6	5.58	45"	81	79	84	88	93
UST Mamiya	ProForce AXIVCore Blue	R	55.7	244	31	9	3.4	5.44	45"	81	79	84	88	93
Apollo	Acculite 50 Graphite	S	54.4	250	34	13	2.6	7.43	45"	82	80	85	89	94
Apollo	Acculite 80 Graphite	R	79.7	247	33	14	2.4	6.41	45"	82	80	85	89	94
True Temper	TT Lite	A	102.0	239	39	13	3.0	3.23	43"	82	80	85	89	94
New Image	Emerald Image Graphite	R	77.6	243	38	11	3.5	4.43	44"	82	80	85	89	94
Apollo	Shadow UL Graphite	R	60.7	246	36	7	5.1	5.98	45"	82	80	85	89	94
AXE	XCALIBER 6	R	58.3	243	31	16	1.9	6.50	45"	82	80	85	89	94
Fujikura	Fit-On E160	R	63.9	246	26	11	2.4	4.91	45"	82	80	85	89	94
Fujikura	Fit-On E350	R	58.2	241	30	11	2.7	4.76	45"	82	80	85	89	94
True Ace	Cadence Orange Fairway	R	78.8	258	41	12	3.4	5.64	43"	82	80	85	89	94
Apollo	Acculite 60 Graphite	S	56.9	248	33	13	2.5	6.31	45"	83	81	86	90	95
SK Fiber	Tour Trac 80	R	75.1	246	41	9	4.6	4.70	44"	83	81	86	90	95
Aldila	NV 55	R	52.9	240	30	15	2.0	5.20	45"	83	81	86	90	95
Aldila	Serrano	R	58.7	247	27	15	1.8	5.35	45"	83	81	86	90	95
Aldila	Wasabi	R	57.7	245	30	12	2.5	5.31	45"	83	81	86	90	95
Grafalloy	ProCustom	A	61.9	241	32	12	2.7	4.94	45"	83	81	86	90	95
Grafalloy	ProCustom	R	66.7	246	37	8	4.6	5.88	45"	83	81	86	90	95
Grafalloy	ProLaunch Blue w/ Axis Tech.	R	56.6	244	30	12	2.5	5.24	45"	83	81	86	90	95
Project X	Project X Graphite	5.5	58.0	242	32	12	2.7	5.03	45"	83	81	86	90	95
True Ace	Green Ghost	R	64.1	237	32	9	3.6	4.18	45"	83	81	86	90	95
Apollo	Standard Stepped Steel	L	115.3	243	34	17	2.0	3.08	43"	84	82	87	91	97
Aldila	Voodoo 75	R	72.0	242	29	14	2.1	4.72	45"	84	82	87	91	97
Aldila	Habanera	S	58.3	256	32	12	2.7	6.10	45"	84	82	87	91	97
Aldila	DVS 60	R	60.1	246	27	11	2.5	4.22	45"	84	82	87	91	97
Aldila	NVS 65	R	63.5	236	32	11	2.9	4.01	45"	84	82	87	91	97
Apollo	Shadow Steel	A	111.8	242	31	11	2.8	3.15	44"	84	82	87	91	97
Fujikura	Fit-On E150	S	58.6	250	30	11	2.7	5.03	45"	84	82	87	91	97
Grafalloy	Booyah	S	49.1	244	33	12	2.8	4.99	45"	84	82	87	91	97
Grafalloy	Epic	R	70.0	248	30	10	3.0	4.65	45"	84	82	87	91	97
Grafalloy	ProLaunch Blue 45	S	44.3	247	33	13	2.5	5.71	45"	84	82	87	91	97
Grafalloy	ProLaunch Blue 55	R	53.2	244	32	11	2.9	4.80	45"	84	82	87	91	97
Graman	R70	S	68.2	252	47	18	2.6	5.41	43"	84	82	87	91	97
New Image	Red Image Graphite	R	57.2	243	35	8	4.4	4.68	45"	84	82	87	91	97
Power Play	System Q	S	69.4	252	38	5	7.6	5.80	45"	84	82	87	91	97
SK Fiber	Helium	R	55.5	249	31	8	3.9	4.57	45"	84	82	87	91	97
SK Fiber	Pure Energy	R	55.2	242	34	8	4.3	4.78	45"	84	82	87	91	97
True Ace	Cadence Blue	R	62.6	247	34	7	4.9	4.84	45"	84	82	87	91	97
True Ace	Cadence Orange Ultralite	R	68.7	242	31	11	2.8	4.50	45"	84	82	87	91	97

DRIVER SHAFTS LISTED BY DSFI RATING

Manufacturer	Shaft	Flex	Shaft Weight (g)	Freq. (cpm)	Butt Deflect. (oz.)	Tip Deflect. (oz.)	T/B Ratio	Torque Cut (deg)	Length (in.)	DSFI	3/4 Swing	Fast Tempo	Medium Tempo	Slow Tempo
Acer	Superleggera	R	47.3	236	32	12	2.7	6.28	47"	85	83	88	92	98
Apollo	Acculite 70 Graphite	S	73.2	254	36	15	2.4	6.83	45"	85	83	88	92	98
True Temper	Dynamic Gold w/ SensiCore	R300	110.6	241	42	16	2.6	3.12	43"	85	83	88	92	98
Grafalloy	ProLaunch Platinum w/ Axis Tech.	R	57.1	247	30	8	3.8	4.07	45"	85	83	88	92	98
Grafalloy	ProLaunch Red w/ Axis Tech.	R	59.6	248	33	15	2.2	5.73	45"	85	83	88	92	98
Fujikura	Fit-On E250	R	54.5	245	31	11	2.8	4.45	45"	85	83	88	92	98
SK Fiber	Superfly	A	45.3	242	33	8	4.1	4.15	45"	85	83	88	92	98
True Ace	Death Stick	R	50.3	252	32	11	2.9	5.10	45"	85	83	88	92	98
True Ace	Cadence Red Fairway	R	83.9	257	40	11	3.6	3.97	43"	85	83	88	92	98
UST Mamiya	Competition Series	S	60.3	247	36	10	3.6	5.51	45"	85	83	88	92	98
Aldila	NV Voodoo SNV6	R	68.8	244	32	13	2.5	4.53	45"	86	84	89	93	99
Apollo	Acculite 80 Graphite	S	78.6	257	37	14	2.6	6.36	45"	86	84	89	93	99
Apollo	Balistik Steel	L	115.3	246	44	21	2.1	2.92	42"	86	84	89	93	99
Apollo	Shadow Graphite	S	70.3	256	44	15	2.9	5.95	44"	86	84	89	93	99
Aldila	NVS 75	R	71.0	236	31	13	2.4	3.58	45"	86	84	89	93	99
Dynacraft	Super Collider	S	61.8	255	35	10	3.5	5.68	45"	86	84	89	93	99
Fujikura	Fit-On E160	S	63.5	255	31	12	2.6	4.95	45"	86	84	89	93	99
Fujikura	Fit-On E260	R	67.3	243	31	12	2.6	4.04	45"	86	84	89	93	99
Graphite Design	Aura Gold	S	63.3	252	31	15	2.1	5.40	45"	86	84	89	93	99
Power Play	Adrenaline	S	61.8	255	35	10	3.5	5.68	45"	86	84	89	93	99
SK Fiber	Lite Revolution I	R	57.8	244	35	11	3.2	4.63	45"	86	84	89	93	99
True Ace	Cadence Orange Fairway	S	78.3	266	43	15	2.9	5.43	43"	86	84	89	93	99
True Ace	Green Ghost	S	64.5	243	33	9	3.7	3.95	45"	86	84	89	93	99
UST Mamiya	ProForce AXIVCore Tour Green 65R	S	61.3	247	29	11	2.6	4.10	45"	86	84	89	93	99
Aldila	VX	S	76.5	265	51	15	3.4	5.49	43"	87	85	90	95	100
Apollo	Masterflex HP48	R	51.2	245	32	12	2.7	7.21	45"	87	85	90	95	100
Apollo	Balistik Graphite	R	71.0	254	43	13	3.3	4.71	44"	87	85	90	95	100
Aldila	NV 65	R	63.1	239	32	14	2.3	3.94	45"	87	85	90	95	100
Apollo	Shadow UL Graphite	S	60.4	252	40	9	4.4	5.69	45"	87	85	90	95	100
Fujikura	Fit-On E270	R	69.4	247	31	11	2.8	3.87	45"	87	85	90	95	100
Fujikura	Fit-On E350	S	58.0	252	32	14	2.3	4.65	45"	87	85	90	95	100
Graphite Design	Aura Blue	S	63.4	253	32	14	2.3	5.30	45"	87	85	90	95	100
SK Fiber	Superfly	R	50.0	250	35	9	3.9	4.36	45"	87	85	90	95	100
True Temper	TT Lite XL	R	107.2	244	43	14	3.1	3.04	43"	87	85	90	95	100
UST Mamiya	65 Gold	S	59.4	256	36	11	3.3	5.52	45"	87	85	90	95	100
True Temper	Dynamic Gold	R200	111.2	248	42	15	2.8	2.99	43"	88	86	91	96	101
True Temper	Dynamic Gold	R300	112.0	249	42	15	2.8	2.98	43"	88	86	91	96	101
Apollo	Shadow Steel	R	117.3	248	35	12	2.9	3.04	44"	88	86	91	96	101
True Ace	Cadence Blue	S	63.3	253	37	8	4.6	4.72	45"	88	86	91	96	101

DRIVER SHAFTS LISTED BY DSFI RATING

Manufacturer	Shaft	Flex	Shaft Weight (g)	Freq. (cpm)	Butt Deflect. (oz.)	Tip Deflect. (oz.)	T/B Ratio	Torque Cut (deg)	Length (in.)	DSFI	3/4 Swing	Fast Tempo	Medium Tempo	Slow Tempo
UST Mamiya	ProForce AXIVCore Blue	S	56.4	259	35	10	3.5	5.06	45"	88	86	91	96	101
UST Mamiya	ProForce V2 65	R	61.5	238	34	11	3.2	3.50	45"	88	86	91	96	101
Aldila	VS Proto by You 60	R	59.3	244	35	15	2.3	4.06	45"	89	87	92	97	102
Aldila	Wasabi	S	59.5	259	33	14	2.4	5.21	45"	89	87	92	97	102
Apollo	Balistik Steel	A	119.6	247	42	18	2.3	2.86	43"	89	87	92	97	102
Apollo	Spectre Lite Steel	R	102.7	254	36	11	3.3	3.12	44"	89	87	92	97	102
Grafalloy	ProLaunch Blue w/ Axis Tech.	S	57.7	257	34	15	2.3	5.43	45"	89	87	92	97	102
New Image	Emerald Image Graphite	S	75.6	255	44	13	3.4	4.31	44"	89	87	92	97	102
SK Fiber	Tour Trac 80	S	76.0	257	44	12	3.7	4.54	44"	89	87	92	97	102
SK Fiber	Pure Energy	S	58.5	254	37	10	3.7	4.73	45"	89	87	92	97	102
True Ace	Cadence Orange Ultralight	S	69.8	251	34	11	3.1	4.13	45"	89	87	92	97	102
True Ace	Orange Ion	R	69.4	245	33	13	2.5	3.89	45"	89	87	92	97	102
True Temper	Dynamic Gold	R400	114.4	250	43	15	2.9	2.93	43"	89	87	92	97	102
Aldila	Serrano	S	59.2	263	31	16	1.9	5.18	45"	90	88	93	98	103
Apollo	Standard Stepped Steel	R	118.1	253	34	14	2.4	2.98	44"	90	88	93	98	103
Aldila	NV 55	S	54.7	253	36	17	2.1	5.02	45"	90	88	93	98	103
Aldila	NV 65 0.350"	R	64.9	239	35	19	1.8	3.94	45"	90	88	93	98	103
Fujikura	Fit-On E360	R	69.3	252	33	17	1.9	4.34	45"	90	88	93	98	103
Grafalloy	ProLaunch Blue 55	S	55.1	252	35	14	2.5	4.40	45"	90	88	93	98	103
Grafalloy	ProLite 35 .350"	R	58.4	238	37	18	2.1	3.90	45"	90	88	93	98	103
MCC	MFS 58+	R	59.7	249	37	17	2.2	4.73	45"	90	88	93	98	103
True Ace	Cadence Red Fairway	S	83.5	266	43	14	2.9	3.76	43"	90	88	93	98	103
True Temper	Dynamic Gold w/ SensiCore	S300	110.9	252	45	15	3.0	2.93	43"	90	88	93	98	103
True Temper	Dynamic Gold 0.350"	R300	113.9	248	44	19	2.3	2.80	43"	91	89	94	99	105
Apollo	Standard Stepped Steel	A	123.2	250	36	16	2.3	2.93	44"	91	89	94	99	105
Grafalloy	ProLaunch Red w/ Axis Tech.	S	61.2	262	34	17	2.0	5.70	45"	91	89	94	99	105
Powerflex	FW 501	R	82.4	262	41	14	2.9	6.21	45"	91	89	94	99	105
True Ace	Orange Ion	S	65.6	250	34	13	2.6	3.62	45"	91	89	94	99	105
True Temper	TT Lite XL	S	109.8	258	46	15	3.0	2.88	43"	92	90	95	100	106
Apollo	Standard Stepless Steel	R	122.6	254	36	15	2.4	2.95	44"	92	90	95	100	106
SK Fiber	Tour Trac 90	S	82.0	259	45	15	3.0	4.15	44"	92	90	95	100	106
Aldila	DVS 60	S	60.9	262	31	14	2.2	4.20	45"	92	90	95	100	106
Aldila	NV 75	R	75.6	241	33	17	1.9	3.26	45"	92	90	95	100	106
Aldila	NVS 65	S	64.5	251	36	16	2.3	3.91	45"	92	90	95	100	106
Aldila	VS Proto by You 70	R	63.7	246	34	16	2.1	3.37	45"	92	90	95	100	106
Fujikura	Fit-On E260	S	67.4	254	34	15	2.3	4.04	45"	92	90	95	100	106
Grafalloy	ProCustom	S	66.4	260	42	10	4.2	5.11	45"	92	90	95	100	106
Grafalloy	ProLaunch Blue 65	R	61.6	248	37	13	2.9	3.53	45"	92	90	95	100	106
Grafalloy	ProLaunch Red	R	61.1	249	32	18	1.8	3.73	45"	92	90	95	100	106

DRIVER SHAFTS LISTED BY DSFI RATING

Manufacturer	Shaft	Flex	Shaft Weight (g)	Freq. (cpm)	Butt Deflect. (oz.)	Tip Deflect. (oz.)	T/B Ratio	Torque Cut (deg)	Length (in.)	DSFI	3/4 Swing	Fast Tempo	Medium Tempo	Slow Tempo
Graphite Design	Aura Gold	X	65.9	263	35	18	1.9	5.28	45"	92	90	95	100	106
Harrison	Striper J R/F	R	61.9	254	39	11	3.6	4.33	45"	92	90	95	100	106
New Image	Red Image Graphite	S	60.9	255	40	13	3.1	4.64	45"	92	90	95	100	106
Project X	Project X Graphite	6.0	62.1	256	35	14	2.5	4.11	45"	92	90	95	100	106
Aldila	Voodoo 65	S	62.3	258	33	16	2.1	4.11	45"	93	91	96	101	107
Fujikura	Fit-On E250	S	57.0	260	36	13	2.8	4.21	45"	93	91	96	101	107
Fujikura	Fit-On E270	S	70.5	257	36	13	2.8	3.96	45"	93	91	96	101	107
Fujikura	Fit-On E350	X	56.9	264	37	14	2.6	4.63	45"	93	91	96	101	107
Grafalloy	ProLaunch Platinum w/ Axis Tech.	S	61.5	262	34	13	2.6	4.10	45"	93	91	96	101	107
Acer	Superleggera	S	49.4	252	38	14	2.7	6.02	47"	94	92	97	102	108
Apollo	Standard Stepped Steel	S	120.2	259	37	15	2.5	2.81	44"	94	92	97	102	108
Aldila	NVS 75	S	73.5	250	36	17	2.1	3.68	45"	94	92	97	102	108
Aldila	VS Proto by You 80	R	77.7	247	32	14	2.3	2.77	45"	94	92	97	102	108
Aldila	NV Voodoo SNV6	S	68.2	257	33	17	1.9	3.86	45"	94	92	97	102	108
Fujikura	Fit-On E360	S	69.1	260	37	17	2.2	4.43	45"	94	92	97	102	108
Fujikura	Fit-On E370	R	80.0	252	34	17	2.0	3.57	45"	94	92	97	102	108
Harrison	Striper J R/F	F	62.1	259	40	11	3.6	4.22	45"	94	92	97	102	108
Graphite Design	Aura Red	S	64.6	257	33	15	2.2	3.41	45"	94	92	97	102	108
True Ace	Death Stick	S	51.1	261	36	18	2.0	4.74	45"	94	92	97	102	108
True Temper	Dynamic Gold	S200	112.5	259	46	16	2.9	2.80	43"	94	92	97	102	108
True Temper	Dynamic Gold	S300	114.3	261	47	16	2.9	2.75	43"	94	92	97	102	108
True Temper	Dynamic Gold w/ SensiCore	X100	108.9	259	44	19	2.3	2.79	43"	94	92	97	102	108
Apollo	Balistik Steel	R	121.4	258	46	21	2.2	2.69	43"	95	93	98	103	109
Grafalloy	Epic Fairway	R	83.7	262	39	20	2.0	2.73	43"	95	93	98	103	109
True Temper	Dynamic Gold	S400	116.1	262	47	17	2.8	2.72	43"	95	93	98	103	109
Apollo	Standard Stepless Steel	S	125.5	260	38	17	2.2	2.85	44"	95	93	98	103	109
SK Fiber	Tour Trac 100	S	88.3	263	46	13	3.5	3.48	44"	95	93	98	103	109
Fujikura	Fit-On E380	R	80.5	259	36	15	2.4	3.71	45"	95	93	98	103	109
SK Fiber	Lite Revolution I	S	63.1	260	42	11	3.8	4.07	45"	95	93	98	103	109
True Ace	Cadence Red Ultralite	R	62.4	258	38	15	2.5	3.96	45"	95	93	98	103	109
UST Mamiya	ProForce V2 65	S	61.5	253	39	14	2.8	3.47	45"	95	93	98	103	109
Grafalloy	ProLaunch Red Fairway	S	71.2	275	46	20	2.3	3.68	43"	96	94	99	104	110
Apollo	Shadow Steel	S	119.8	262	38	14	2.7	2.72	44"	96	94	99	104	110
Apollo	Spectre Lite Steel	S	105.3	265	39	13	3.0	2.86	44"	96	94	99	104	110
Fujikura	Fit-On E260	X	68.6	262	37	16	2.3	3.89	45"	96	94	99	104	110
Grafalloy	ProLaunch Amp	S	60.0	258	40	15	2.7	3.96	45"	96	94	99	104	110
Powerflex	FW 501	S	84.0	270	43	17	2.5	5.62	45"	96	94	99	104	110
UST Mamiya	Attas 60	S	67.0	261	37	14	2.6	3.88	45"	96	94	99	104	110
Apollo	Balistik Graphite	S	71.7	264	50	19	2.6	4.01	44"	97	95	100	105	111

DRIVER SHAFTS LISTED BY DSFI RATING

Manufacturer	Shaft	Flex	Shaft Weight (g)	Freq. (cpm)	Butt Deflect. (oz.)	Tip Deflect. (oz.)	T/B Ratio	Torque Cut (deg)	Length (in.)	DSFI	3/4 Swing	Fast Tempo	Medium Tempo	Slow Tempo
Aldila	Voodoo 75	S	71.8	261	36	17	2.1	3.67	45"	97	95	100	105	111
Fujikura	Fit-On E360	X	68.5	267	38	18	2.1	4.31	45"	97	95	100	105	111
Grafalloy	Epic	S	70.1	273	36	17	2.1	4.66	45"	97	95	100	105	111
Harrison	Striper J F/S	F	62.7	262	41	14	2.9	3.97	45"	97	95	100	105	111
UST Mamiya	Attas T2 60	S	62.3	262	37	15	2.5	3.56	45"	97	95	100	105	111
Grafalloy	Epic Fairway	S	84.5	270	42	22	1.9	2.82	43"	98	96	101	107	113
True Temper	Dynamic Gold	X100	111.2	269	49	18	2.7	2.67	43"	98	96	101	107	113
True Temper	Dynamic Gold 0.350"	S300	117.1	261	49	21	2.3	2.62	43"	98	96	101	107	113
UST Mamiya	ProForce AXIVCore Tour Green 75S	S	71.1	262	37	15	2.5	3.25	45"	98	96	101	107	113
UST Mamiya	ProForce V2 86	S	79.9	259	31	14	2.2	2.51	45"	98	96	101	107	113
Aldila	NV 65	S	64.7	260	41	17	2.4	3.94	45"	98	96	101	107	113
Aldila	NV 65 0.350"	S	66.1	256	40	20	2.0	3.90	45"	98	96	101	107	113
Aldila	VS Proto by You 60	S	58.7	258	39	18	2.2	3.66	45"	98	96	101	107	113
Aldila	VS Proto by You 70	S	68.2	257	37	18	2.1	3.23	45"	98	96	101	107	113
Grafalloy	ProLaunch Red	S	62.5	260	39	19	2.1	3.89	45"	98	96	101	107	113
Grafalloy	ProLite 35	S	62.4	261	41	19	2.2	4.14	45"	98	96	101	107	113
MCC	MFS 58+	S	60.4	262	45	17	2.6	4.78	45"	98	96	101	107	113
New Image	Gold Image Graphite	S	64.7	254	40	13	3.1	3.28	45"	98	96	101	107	113
SK Fiber	Superfly	S	53.3	265	39	12	3.3	3.58	45"	98	96	101	107	113
UST Mamiya	Attas 70	S	72.2	261	37	13	2.8	3.20	45"	98	96	101	107	113
Apollo	Balistik Steel	S	121.2	265	46	22	2.1	2.59	43"	99	97	102	108	114
Fujikura	Fit-On E270	X	74.0	267	38	17	2.2	3.75	45"	99	97	102	108	114
Fujikura	Fit-On E370	S	77.5	265	38	17	2.2	3.62	45"	99	97	102	108	114
Fujikura	Fit-On E380	S	82.3	272	39	16	2.4	4.09	45"	99	97	102	108	114
New Image	Red Image Graphite	X	61.7	268	45	14	3.2	4.46	45"	99	97	102	108	114
True Ace	Blue Crush	R	60.9	261	42	14	3.0	3.56	45"	99	97	102	108	114
Aldila	NV 75	S	73.8	258	40	18	2.2	3.44	45"	100	98	103	109	115
Grafalloy	ProLaunch Blue 65	S	63.0	259	39	17	2.3	3.31	45"	100	98	103	109	115
True Ace	Cadence Red Ultralite	S	64.8	266	40	15	2.7	3.52	45"	100	98	103	109	115
Harrison	Striper J F/S	S	62.0	270	43	15	2.9	3.84	45"	101	99	104	110	116
Graphite Design	Aura Red	X	65.9	268	36	18	2.0	3.37	45"	101	99	104	110	116
UST Mamiya	Attas T2 70	S	70.5	263	38	16	2.4	3.00	45"	101	99	104	110	116
UST	ProForce V2 75	S	71.8	256	40	15	2.7	2.73	45"	101	99	104	110	116
UST Mamiya	ProForce AXIVCore Tour Green 85S	S	81.0	263	38	14	2.7	2.74	45"	101	99	104	110	116
Fujikura	Fit-On E380	X	83.7	276	41	18	2.3	4.13	45"	102	100	105	111	117
True Ace	Blue Crush	S	64.3	267	44	15	2.9	3.37	45"	102	100	105	111	117
UST Mamiya	ProForce AXIVCore Tour Green 95S	S	90.5	266	36	14	2.6	2.60	45"	102	100	105	111	117
UST Mamiya	ProForce V2 96	S	89.0	261	34	14	2.4	2.27	45"	102	100	105	111	117
Aldila	VS Proto by You 80	S	77.9	257	40	17	2.4	2.57	45"	103	101	106	112	118

DRIVER SHAFTS LISTED BY DSFI RATING

Manufacturer	Shaft	Flex	Shaft Weight (g)	Freq. (cpm)	Butt Deflect. (oz.)	Tip Deflect. (oz.)	T/B Ratio	Torque Cut (deg)	Length (in.)	DSFI	3/4 Swing	Fast Tempo	Medium Tempo	Slow Tempo
Aldila	Voodoo 75	X	71.7	271	40	21	1.9	3.49	45"	104	102	107	113	120
New Image	Gold Image Graphite	X	67.6	268	45	16	2.8	3.28	45"	104	102	107	113	120
SK Fiber	Corsair 75	R	70.5	270	43	16	2.7	3.14	45"	104	103	108	114	121
Aldila	Voodoo 65	X	66.5	275	39	21	2.0	3.48	45"	105	103	108	114	121
Grafalloy	ProLaunch Blue 75	X	70.2	276	45	18	2.5	3.94	45"	105	103	108	114	121
Fujikura	Fit-On E370	X	77.4	275	41	21	2.0	3.68	45"	105	103	108	114	121
Aldila	NV 65	X	66.3	275	46	22	2.1	3.98	45"	106	104	109	115	122
Aldila	NV 75	X	75.5	273	44	26	1.7	3.30	45"	107	105	110	116	123
UST Mamiya	ProForce V2 86	X	82.2	272	39	18	2.2	2.42	45"	108	106	111	117	124
UST Mamiya	ProForce V2 96	X	90.7	275	38	18	2.1	2.25	45"	110	108	113	120	126
SK Fiber	Corsair 75	S	72.6	283	47	19	2.5	3.17	45"	111	109	114	121	127
SK Fiber	Rocket 85	S	80.5	292	48	19	2.5	2.86	45"	116	114	119	126	131
SK Fiber	Rocket 85	X	81.7	299	52	24	2.2	2.87	45"	122	120	125	132	137

#5-IRON SHAFTS LISTED BY DSFI RATING

Manufacturer	Shaft	Flex	Shaft Weight (g)	Freq. (cpm)	Butt Deflect. (oz.)	Tip Deflect. (oz.)	T/B Ratio	Torque Cut (deg)	Length (in.)	DSFI	3/4 Swing	Fast Tempo	Medium Tempo	Slow Tempo
Powerflex	FW 114	L	87.9	243	52	24	2.2	6.43	37"	44	43	45	48	51
Powerflex	FW 114	A	91.6	239	50	22	2.3	6.23	38"	46	45	47	50	53
Acer	Velocity	L	54.5	247	48	35	1.4	4.05	37.5"	50	49	52	54	58
Fujikura	Sakura	L	54.0	227	39	21	1.9	3.76	37.5"	50	49	52	54	58
Dynacraft	Super Collider	L	64.4	246	49	37	1.3	4.15	37.5"	51	50	53	55	59
Power Play	Adrenaline	L	64.4	246	49	37	1.3	4.15	37.5"	51	50	53	55	59
SK Fiber	V.I.P.	LL	51.2	246	54	36	1.5	5.19	37.5"	51	50	53	55	59
IBella	Obsession	L	55.0	248	54	35	1.5	4.62	37.5"	51	50	53	55	59
Tour Gear	Renaissance	L	74.2	254	55	37	1.5	5.65	37.5"	51	50	53	55	59
Acer	Velocity	A	57.8	251	50	30	1.7	4.29	38.5"	53	52	55	58	61
Apollo	Acculite 60 Graphite	L	53.0	255	51	34	1.5	3.30	37.5"	53	52	55	58	61
Power Play	System Q	L	58.1	256	54	36	1.5	4.22	37.5"	53	52	55	58	61
Tour Gear	Renaissance	A	76.6	251	54	32	1.7	5.41	38.5"	53	52	55	58	61
Apollo	Shadow UL Graphite	L	56.6	250	55	39	1.4	3.94	37.5"	54	53	56	59	62
Dynacraft	Super Collider	A	66.3	259	47	33	1.4	3.85	38.5"	55	54	57	60	63
IBella	Bellissima	L	54.7	256	56	39	1.4	4.20	37.5"	55	54	57	60	63
IBella	Obsession	A	56.7	248	53	34	1.6	4.02	38.5"	55	54	57	60	63
Power Play	Adrenaline	A	66.3	259	47	33	1.4	3.85	38.5"	55	54	57	60	63
Power Play	System Q	A	60.8	256	55	32	1.7	4.07	38.5"	56	55	58	61	64
True Ace	Cadence Blue	L	65.5	256	56	42	1.3	3.73	37.5"	56	55	58	61	64

#5-IRON SHAFTS LISTED BY DSFI RATING

Manufacturer	Shaft	Flex	Shaft Weight (g)	Freq. (cpm)	Butt Deflect. (oz.)	Tip Deflect. (oz.)	T/B Ratio	Torque Cut (deg)	Length (in.)	DSFI	3/4 Swing	Fast Tempo	Medium Tempo	Slow Tempo
Acer	Velocity	R	60.8	270	55	32	1.7	4.16	38.5"	57	56	59	62	66
Apollo	Acculite 75 Steel	R	76.6	265	52	32	1.6	2.57	38"	57	56	59	62	66
Apollo	Shadow UL Graphite	A	57.0	253	55	34	1.6	3.72	38.5"	57	56	59	62	66
Fujikura	Fit-On E160	R2	52.6	253	44	24	1.8	3.99	38.5"	57	56	59	62	66
Fujikura	Sakura Sport	L	53.9	262	49	28	1.8	4.03	37.5"	57	56	59	62	66
Powerflex	FW 114	R	103.1	279	68	28	2.4	5.63	38"	57	56	59	62	66
Graman	R70	L	58.5	269	69	47	1.5	4.27	36.5"	58	57	60	63	67
Grafalloy	ProCustom	L	60.4	275	63	33	1.9	3.25	37.5"	58	57	60	63	67
Apollo	Shadow Steel	L	87.3	271	61	36	1.7	2.50	37"	58	57	60	63	67
True Temper	GS-75	R	79.2	257	56	33	1.7	2.59	38"	58	57	60	63	67
Aldila	VL	L	65.8	270	68	52	1.3	4.46	36.5"	59	58	61	64	68
Apollo	Shadow Graphite	L	66.7	268	62	44	1.6	4.05	37.5"	59	58	61	64	68
New Image	Berry Image Graphite	L	61.3	269	66	39	1.7	3.75	37.5"	59	58	61	64	68
New Image	Lipstick Red Image Graphite	L	61.3	269	66	39	1.7	3.75	37.5"	59	58	61	64	68
New Image	Purple Image Graphite	L	61.3	269	66	39	1.7	3.75	37.5"	59	58	61	64	68
SK Fiber	Tour Trac 80	A	66.3	273	54	35	1.5	3.46	38.5"	59	58	61	64	68
SK Fiber	V.I.P.	A	56.9	263	60	38	1.6	4.91	38.5"	59	58	61	64	68
True Ace	Cadence Blue	A	68.8	261	55	40	1.4	3.67	38.5"	59	58	61	64	68
Graman	R70	A	60.8	268	68	42	1.6	4.09	37.5"	60	59	62	65	69
Power Play	System Q	R	63.0	272	62	33	1.9	4.14	38.5"	60	59	62	65	69
Powerflex	FW 114	S	103.5	285	70	33	2.1	5.51	38"	60	59	62	65	69
Acer	Velocity	S	65.1	283	62	32	1.9	3.91	38.5"	61	60	63	66	70
Apollo	Acculite 75 Steel	S	76.7	275	57	35	1.6	2.42	38"	61	60	63	66	70
Apollo	Balistik Graphite	L	64.5	273	64	47	1.4	4.21	37.5"	61	60	63	66	70
Fujikura	Fit-On E160	R	57.6	268	47	26	1.8	3.58	38.5"	61	60	63	66	70
New Image	Emerald Image Graphite	A	67.9	264	65	35	1.9	3.89	38.5"	61	60	63	66	70
Apollo	Shadow UL Graphite	R	58.5	273	63	35	1.8	3.87	38.5"	62	61	64	67	71
Apollo	Shadow Steel	A	94.6	277	62	34	1.8	2.38	38"	62	61	64	67	71
Fujikura	Fit-On E270	R2	62.7	271	61	38	1.6	3.30	38.5"	62	61	64	67	71
True Temper	GS-75	S	78.3	273	60	36	1.7	2.35	38"	62	61	64	67	71
Apollo	Acculite 60 Graphite	R	58.3	285	58	41	1.4	3.36	38.5"	63	62	65	68	72
Apollo	Shadow Graphite	A	69.8	271	64	40	1.6	3.99	38.5"	63	62	65	68	72
Apollo	Shadow UL Graphite	S	58.3	280	67	33	2.0	3.73	38.5"	63	62	65	68	72
Apollo	Standard Stepped Steel	L	101.3	282	65	44	1.5	2.20	37"	63	62	65	68	72
Power Play	System Q	S	64.2	282	67	32	2.1	3.85	38.5"	63	62	65	68	72
UST Mamiya	MP6	R	60.7	273	63	40	1.6	3.89	38.5"	63	62	65	68	72
FST	FST 90	A	88.3	279	63	38	1.7	2.33	38"	64	63	66	70	74
Fujikura	Fit-On E160	S	57.4	281	57	32	1.8	3.61	38.5"	64	63	66	70	74
Grafalloy	ProCustom	A	62.0	278	63	35	1.8	2.91	38.5"	64	63	66	70	74

#5-IRON SHAFTS LISTED BY DSFI RATING

Manufacturer	Shaft	Flex	Shaft Weight (g)	Freq. (cpm)	Butt Deflect. (oz.)	Tip Deflect. (.oz.)	T/B Ratio	Torque Cut (deg)	Length (in.)	DSFI	3/4 Swing	Fast Tempo	Medium Tempo	Slow Tempo
Grafalloy	ProCustom	R	63.7	283	66	35	1.9	3.45	38.5"	64	63	66	70	74
True Temper	GS85	R300	88.0	281	61	39	1.6	2.25	38"	64	63	66	70	74
True Temper	Multi-Step Lite	L	99.8	287	68	41	1.7	2.22	37"	64	63	66	70	74
UST Mamiya	IROD	R	69.8	285	60	40	1.5	3.57	38.5"	64	63	66	70	74
Aldila	VL	A	68.1	274	70	52	1.4	4.04	37.5"	65	64	67	71	75
Aldila	VX	R	76.2	279	74	45	1.6	3.97	37.5"	65	64	67	71	75
UST	Competition Series	L	66.0	283	73	49	1.5	4.31	37.5"	65	64	67	71	75
Apollo	Acculite 70 Graphite	R	71.4	286	64	44	1.5	4.33	38.5"	65	64	67	71	75
Apollo	Spectre Lite Steel	L	87.4	287	68	43	1.6	2.15	37"	65	64	67	71	75
FST	Pro 115	A	98.1	279	63	41	1.5	2.28	38"	65	64	67	71	75
Tour Gear	Renaissance	R	76.1	290	70	42	1.7	5.95	38.5"	65	64	67	71	75
True Ace	Cadence Orange	R	72.8	281	66	44	1.5	4.01	38.5"	65	64	67	71	75
True Temper	GS-95 Taper Tip	R	94.6	283	64	36	1.5	2.27	38"	65	64	67	71	75
UST	Competition Series	A	67.0	278	71	41	1.7	4.18	38.5"	65	64	67	71	75
Apollo	Acculite 60 Graphite	S	60.9	293	60	42	1.4	3.25	38.5"	66	65	68	72	76
Apollo	Acculite 80 Graphite	R	72.8	289	65	43	1.5	3.83	38.5"	66	65	68	72	76
Apollo	Balistik Steel	L	101.7	293	69	45	1.5	2.15	37"	66	65	68	72	76
Dynacraft	Super Collider	R	77.4	292	60	43	1.4	3.65	38.5"	66	65	68	72	76
Grafalloy	ProLaunch Blue	R	74.0	286	65	33	2.0	2.39	38.5"	66	65	68	72	76
Power Play	Adrenaline	R	77.4	292	60	43	1.4	3.65	38.5"	66	65	68	72	76
True Ace	Cadence Blue	R	76.3	283	65	36	1.8	2.61	38.5"	66	65	68	72	76
Apollo	Acculite 95	R	92.9	286	67	40	1.7	2.21	38"	67	66	69	73	77
Apollo	Phantom	R	90.9	286	65	41	1.5	2.23	38"	67	66	69	73	77
Apollo	Balistik Graphite	A	66.3	281	65	48	1.4	3.90	38.5"	67	66	69	73	77
Apollo	Shadow Graphite	R	75.1	284	70	43	1.6	4.22	38.5"	67	66	69	73	77
Apollo	Standard Stepped Steel	A	106.0	285	65	40	1.6	2.12	38"	67	66	69	73	77
FST	FST 90	R	90.6	287	65	41	1.6	2.22	38"	67	66	69	73	77
Graman	R70	R	64.4	295	76	51	1.5	4.71	37.5"	67	66	69	73	77
SK Fiber	Tour Performance	R	67.5	280	70	41	1.7	3.17	38.5"	67	66	69	73	77
SK Fiber	Tour Trac 80	R	67.0	284	71	39	1.8	3.42	38.5"	67	66	69	73	77
UST	ProForce 75 Rv2	R	71.2	284	73	41	1.8	2.99	38"	67	66	69	73	77
Apollo	Acculite 85	R	84.4	297	66	39	1.7	2.12	38"	68	67	70	74	78
True Temper	Dynalite 100	L	94.9	290	79	50	1.6	2.06	36.5"	68	67	70	74	78
Grafalloy	ProCustom	S	64.4	293	70	39	1.8	3.14	38.5"	68	67	70	74	78
Powerflex	FW 501	R	79.8	294	70	41	1.7	3.38	38.5"	68	67	70	74	78
Apollo	Hump	R	99.5	283	61	46	1.3	2.07	38"	68	67	70	74	78
FST	Pro 115	R	99.9	288	67	43	1.6	2.18	38"	68	67	70	74	78
True Ace	Cadence Blue	S	77.4	290	67	37	1.8	2.52	38.5"	68	67	70	74	78
True Ace	Cadence Orange	S	73.5	289	68	45	1.5	3.77	38.5"	68	67	70	74	78

#5-IRON SHAFTS LISTED BY DSFI RATING

Manufacturer	Shaft	Flex	Shaft Weight (g)	Freq. (cpm)	Butt Deflect. (oz.)	Tip Deflect. (.oz.)	T/B Ratio	Torque Cut (deg)	Length (in.)	DSFI	3/4 Swing	Fast Tempo	Medium Tempo	Slow Tempo
True Ace	Cadence Red	R	79.1	282	63	33	1.9	2.83	38.5"	68	67	70	74	78
True Temper	Multi-Step Lite	A	104.6	294	67	39	1.7	2.17	38"	68	67	70	74	78
Aldila	VX	S	77.6	292	80	49	1.6	3.59	37.5"	69	68	71	75	79
Apollo	Acculite 70 Graphite	S	71.1	301	69	47	1.5	4.25	38.5"	69	68	71	75	79
Apollo	Shadow Graphite	S	75.8	292	72	43	1.7	3.81	38.5"	69	68	71	75	79
Fujikura	Fit-On E270	S	65.8	297	68	41	1.7	3.19	38.5"	69	68	71	75	79
New Image	Emerald Image Graphite	R	72.1	287	73	41	1.8	3.85	38.5"	69	68	71	75	79
Apollo	Spectre Lite Steel	A	93.6	291	67	40	1.7	2.06	38"	69	68	71	75	79
Apollo	Standard Stepped Steel	R	110.7	292	68	42	1.6	2.03	38"	69	68	71	75	79
Tour Gear	Renaissance	S	76.7	301	76	45	1.7	5.74	38.5"	69	68	71	75	79
True Temper	GS85	S300	87.0	289	66	43	1.5	2.14	38"	69	69	72	76	80
Apollo	Acculite 80 Graphite	S	82.0	299	71	44	1.6	3.52	38.5"	70	69	72	76	80
FST	FST 115	A	97.8	296	72	41	1.8	2.16	38"	70	69	72	76	80
Graman	R70	S	64.3	303	82	52	1.6	4.47	37.5"	70	69	72	76	80
Dynacraft	Super Collider	S	78.0	301	66	45	1.5	3.51	38.5"	70	69	72	76	80
New Image	Emerald Image Graphite	S	71.8	295	72	44	1.6	3.71	38.5"	70	69	72	76	80
Power Play	Adrenaline	S	78.0	301	66	45	1.5	3.51	38.5"	70	69	72	76	80
SK Fiber	Tour Trac 80	S	69.1	292	76	41	1.9	3.15	38.5"	70	69	72	76	80
SK Fiber	Tour Trac 100	R	92.6	293	72	37	1.9	2.40	38.5"	70	69	72	76	80
Apollo	Balistik Steel	A	106.0	298	67	42	1.6	2.02	38"	70	69	72	76	80
Apollo	Acculite 85	S	87.3	306	67	41	1.6	1.96	38"	71	70	73	77	82
Apollo	Acculite 95	S	94.5	295	70	44	1.6	2.02	38"	71	70	73	77	82
Apollo	Phantom	S	92.3	295	69	46	1.5	2.07	38"	71	70	73	77	82
FST	Pro 115	S	95.4	296	68	44	1.5	2.09	38"	71	70	73	77	82
True Temper	Dynalite 100	A	98.0	290	75	47	1.6	2.02	37.5"	71	70	73	77	82
Apollo	Balistik Graphite	R	66.2	290	72	49	1.5	3.53	38.5"	71	70	73	77	82
Fujikura	Fit-On E380	R	78.9	293	66	52	1.3	3.36	38.5"	71	70	73	77	82
SK Fiber	Tour Performance	S	71.2	290	74	42	1.8	3.35	38.5"	71	70	73	77	82
True Ace	Cadence Red	S	79.1	291	67	33	2.0	2.61	38.5"	71	70	73	77	82
Powerflex	FW 501	S	81.3	298	73	44	1.7	3.16	38.5"	72	71	74	78	83
UST	Competition Series	R	70.5	296	77	48	1.6	4.28	38.5"	72	71	74	78	83
Apollo	Hump	S	104.7	294	67	49	1.4	1.87	38"	72	71	74	78	83
Apollo	Standard Stepped Steel	S	114.2	302	69	44	1.6	1.90	38"	72	71	74	78	83
True Temper	Dynalite Gold SL	R300	92.1	296	67	50	1.3	1.94	38"	72	71	74	78	83
True Temper	TT Lite	L	95.9	298	83	58	1.6	1.83	36.5"	73	72	75	79	84
KBS Steel	Tour 39" Taper	R	99.5	307	70	50	1.4	1.80	37.5"	73	72	75	79	84
True Temper	Dynamic Gold SL	R300	90.7	299	75	51	1.5	1.90	37.5"	73	72	75	79	84
Apollo	Balistik Steel	R	108.4	305	71	45	1.6	1.93	38"	73	72	75	79	84
Apollo	Spectre Lite Steel	R	95.9	312	72	41	1.8	1.96	38"	73	72	75	79	84

#5-IRON SHAFTS LISTED BY DSFI RATING

Manufacturer	Shaft	Flex	Shaft Weight	Freq.	Butt Deflect.	Tip Deflect.	T/B Ratio	Torque Cut	Length	DSFI	3/4 Swing	Fast Tempo	Medium Tempo	Slow Tempo
FST	FST 115	R	99.4	302	74	43	1.7	2.07	38"	73	72	75	79	84
FST	FST 115	S	96.4	301	75	42	1.8	2.08	38"	73	72	75	79	84
True Temper	GS-95 Taper Tip	S	98.4	304	72	44	1.5	2.00	38"	73	72	75	79	84
Apollo	Black Steel	R	114.8	306	71	46	1.5	1.92	38"	74	73	76	80	85
Apollo	Standard Stepless Steel	R	109.3	306	71	46	1.5	1.92	38"	74	73	76	80	85
FST	Pro 115	X	97.0	303	73	46	1.6	1.99	38"	74	73	76	80	85
UST	ProForce 75 Rv2	S	74.7	306	80	48	1.7	2.94	38"	74	73	76	80	85
UST	ProForce 95 Rv2	R	88.7	299	80	48	1.7	2.54	38"	74	73	76	80	85
Aldila	NV MLTi 105 Pro	R	96.8	304	72	59	1.2	2.06	37.5"	75	74	77	82	86
Grafalloy	ProLaunch Blue	S	75.1	301	77	43	1.8	2.40	38.5"	75	74	77	82	86
UST	Competition Series	S	71.3	306	81	49	1.7	4.04	38.5"	75	74	77	82	86
True Temper	TT Lite	A	98.5	297	81	54	1.5	1.81	37.5"	76	75	78	83	87
SK Fiber	Tri-Tec	S	76.0	302	81	45	1.8	2.94	38.5"	76	75	78	83	87
Apollo	Balistik Steel	S	109.4	313	73	47	1.6	1.87	38"	76	75	78	83	87
Fujikura	Fit-On E380	S	79.0	307	74	56	1.3	3.36	38.5"	76	75	78	83	87
True Temper	Dynalite Gold XP Taper Tip	R300	106.8	305	72	52	1.4	1.83	38"	76	75	78	83	87
True Temper	Multi-Step Lite	R	109.8	318	76	44	1.7	1.90	38"	76	75	78	83	87
UST	ProForce 95 Rv2	S	90.7	305	80	52	1.5	2.58	38"	76	75	78	83	87
UST	ProForce 115 Rv2	R	101.0	299	79	50	1.6	2.28	38"	76	75	78	83	87
FST	FST 115	X	98.1	312	78	46	1.7	1.91	38"	77	75	79	84	89
Project X	Rifle	4.5	104.4	307	80	52	1.5	1.86	37.5"	77	75	79	84	89
True Temper	Dynalite 100	R	103.1	304	83	51	1.6	1.89	37.5"	77	75	79	84	89
True Temper	Dynamic Gold	R200	109.8	302	82	52	1.6	1.83	37.5"	77	75	79	84	89
True Temper	Dynamic Gold	R300	110.9	304	83	53	1.6	1.80	37.5"	77	75	79	84	89
True Temper	Dynamic Gold w/ SensiCore	R300	111.7	303	83	53	1.6	1.92	37.5"	77	75	79	84	89
True Temper	Dynamic Gold w/ SensiCore Taper	R300	115.6	298	80	58	1.4	1.78	37.5"	77	75	79	84	89
Apollo	Balistik Graphite	S	66.2	301	78	53	1.5	2.99	38.5"	77	75	79	84	89
Apollo	Shadow Steel	R	109.4	319	77	44	1.8	1.88	38"	77	75	79	84	89
Apollo	Standard Stepless Steel	S	110.5	316	73	50	1.5	1.81	38"	77	75	79	84	89
SK Fiber	Tour Trac 100	S	97.0	311	78	45	1.7	2.24	38.5"	77	75	79	84	89
True Temper	Dynalite Gold SL	S300	93.1	304	69	56	1.2	1.76	38"	77	75	79	84	89
FST	FST 125	S	104.9	313	79	48	1.6	1.86	38"	78	76	80	85	90
True Temper	Dynamic Gold	R400	113.2	307	84	53	1.6	1.79	37.5"	78	76	80	85	90
True Temper	Dynamic Gold Taper	R300	115.6	295	80	59	1.4	1.75	37.5"	78	76	80	85	90
Apollo	Spectre Lite Steel	S	98.4	324	75	47	1.6	1.78	38"	78	76	80	85	90
Aldila	NV MLTi 105 Pro	S	95.7	319	78	64	1.2	2.14	37.5"	79	77	81	86	91
Apollo	Black Steel	S	117.1	318	76	51	1.5	1.79	38"	79	77	81	86	91
True Temper	TT Lite XL Taper	R	102.0	312	82	54	1.5	2.05	37.5"	79	77	81	86	91
Apollo	Hump Taper Tip	X	105.1	319	74	54	1.4	1.71	38"	80	78	82	87	92
KBS Steel	Tour 39" Taper	S	111.6	329	79	54	1.5	1.68	37.5"	80	78	82	87	92

#5-IRON SHAFTS LISTED BY DSFI RATING

Manufacturer	Shaft	Flex	Shaft Weight	Freq.	Butt Deflect.	Tip Deflect.	T/B Ratio	Torque Cut	Length	DSFI	3/4 Swing	Fast Tempo	Medium Tempo	Slow Tempo
Project X	Rifle	5.5	107.7	319	83	55	1.5	1.78	37.5"	80	78	82	87	92
True Temper	Multi-Step Lite	S	107.6	327	81	46	1.8	1.83	38"	80	78	82	87	92
True Temper	TT Lite XL	R	105.9	315	86	55	1.6	1.87	37.5"	80	78	82	87	92
Fujikura	Fit-On E380	X	80.9	317	78	62	1.3	3.27	38.5"	81	79	84	88	93
True Temper	Dynalite	S	102.9	317	87	55	1.6	1.79	37.5"	81	79	84	88	93
UST MAMIYA	ProForce 115 Rv2	S	103.9	314	84	56	1.5	2.17	38"	81	79	84	88	93
True Temper	Dynamic Gold	S200	112.7	318	90	55	1.6	1.67	37.5"	82	80	85	89	94
True Temper	Dynamic Gold w/ SensiCore	S300	115.1	319	87	58	1.5	1.71	37.5"	82	80	85	89	94
Apollo	Shadow Steel	S	111.5	331	80	49	1.6	1.74	38"	82	80	85	89	94
FST	FST 125	X	108.5	328	83	53	1.6	1.72	38"	83	81	86	90	95
Project X	Rifle	6.0	111.7	323	86	58	1.5	1.70	37.5"	83	81	86	90	95
True Temper	Dynalite Gold XP Taper Tip	S300	111.0	322	82	56	1.5	1.69	38"	83	81	86	90	95
True Temper	Dynamic Gold	S300	114.4	320	91	56	1.6	1.66	37.5"	83	81	86	90	95
True Temper	Dynamic Gold	S400	115.4	322	91	56	1.6	1.66	37.5"	83	81	86	90	95
True Temper	Dynamic Gold w/ SensiCore Taper	S300	117.1	317	87	60	1.5	1.65	37.5"	83	81	86	90	95
True Temper	TT Lite XL	S	106.1	325	90	57	1.6	1.75	37.5"	83	81	86	90	95
KBS Steel	Tour 39" Taper	X	118.0	336	81	58	1.4	1.56	37.5"	84	82	87	91	97
SK Fiber	Tour Trac 100	X	101.4	329	85	52	1.6	2.25	38.5"	84	82	87	91	97
True Temper	Dynamic Gold SL	S300	96.6	322	83	64	1.3	1.59	37.5"	84	82	87	91	97
Project X	Rifle	6.5	114.4	328	90	60	1.5	1.66	37.5"	85	83	88	92	98
True Temper	Dynamic Gold w/ SensiCore	X100	115.8	329	90	58	1.6	1.67	37.5"	85	83	88	92	98
True Temper	TT Lite XL Taper	S	108.1	333	89	60	1.5	1.79	37.5"	85	83	88	92	98
Project X	Project X steel	5.5	106.4	321	89	64	1.4	1.60	37.5"	86	84	89	93	99
True Temper	Dynamic Gold	X100	114.9	329	93	58	1.6	1.62	37.5"	86	84	89	93	99
True Temper	Dynamic Gold Taper	S300	121.0	321	88	65	1.4	1.58	37.5"	86	84	89	93	99
True Temper	Dynamic Gold w/ SensiCore Taper	X100	118.3	327	90	68	1.3	1.55	37.5"	88	86	91	96	101
Project X	Project X steel	6.5	112.5	332	92	67	1.4	1.50	37.5"	89	87	92	97	102
Project X	Rifle	7.0	121.9	335	95	62	1.5	1.55	37.5"	89	87	92	97	102
True Temper	Dynamic Gold Taper	X100	119.8	330	90	69	1.3	1.51	37.5"	89	87	92	97	102

HYBRID SHAFTS LISTED BY DSFI RATING

Manufacturer	Shaft	Flex	Shaft Weight (g)	Freq. (cpm)	Butt Deflect. (oz.)	Tip Deflect. (.oz.)	T/B Ratio	Torque Cut (deg)	Length (in.)	DSFI	3/4 Swing	Fast Tempo	Medium Tempo	Slow Tempo
Fujikura	Fit-On E160	R2	54.9	246	42	22	1.9	4.36	39.5"	53	52	55	58	62
Fujikura	Fit-On E270	R2	63.5	247	42	21	2.0	3.86	39.5"	54	53	56	59	62
Fujikura	Fit-On E160	R	59.3	258	47	24	2.0	3.83	39.5"	58	57	60	63	67
Aldila	VL Hybrid	L	63.7	262	56	30	1.9	3.44	38.5"	59	58	61	64	68

HYBRID SHAFTS LISTED BY DSFI RATING

Manufacturer	Shaft	Flex	Shaft Weight (g)	Freq. (cpm)	Butt Deflect. (oz.)	Tip Deflect. (oz.)	T/B Ratio	Torque Cut (deg)	Length (in.)	DSFI	3/4 Swing	Fast Tempo	Medium Tempo	Slow Tempo
Fujikura	Fit-On E270	R	65.9	262	50	27	1.9	3.89	39.5"	59	58	61	64	68
Aldila	VL Hybrid	A	66.7	263	54	27	2.0	3.52	39.5"	61	60	63	66	70
Graphite Design	Aura Blue	R	67.6	268	52	32	1.6	3.96	39.5"	61	60	63	66	70
Fujikura	Fit-On E160	S	58.7	276	52	30	1.7	3.99	39.5"	62	61	64	67	71
Aldila	NVS 85 Hybrid	R	71.0	259	54	29	1.9	2.82	39.5"	63	62	65	68	72
True Ace	Cadence Orange Hybrid	R	74.7	263	53	27	2.0	3.29	39.5"	63	62	65	68	72
Aldila	VX Hybrid	R	68.1	272	58	30	1.9	3.43	39.5"	64	63	66	70	74
Fujikura	Fit-On E270	S	66.6	276	56	32	1.8	3.82	39.5"	64	63	66	70	74
True Ace	Cadence Red Hybrid	R	84.8	262	54	37	1.5	3.15	39.5"	64	63	66	69	73
Graphite Design	Aura Blue	S	69.9	280	57	36	1.6	4.00	39.5"	65	64	67	71	75
Aldila	NV 85 Hybrid	R	73.5	263	56	41	1.4	2.80	39.5"	66	65	68	72	76
Apollo	Shadow Hybrid Graphite .370	R	80.0	259	55	44	1.3	3.01	39.5"	66	65	68	72	76
True Ace	Cadence Red Hybrid	S	85.0	270	58	36	1.6	2.98	39.5"	66	65	68	72	76
Aldila	DVS 90	R	78.7	267	50	31	1.6	2.12	39.5"	67	66	69	73	77
Apollo	Shadow Hybrid Graphite .370	S	83.0	266	57	42	1.4	2.84	39.5"	67	66	69	73	77
Aldila	VX Hybrid	S	70.3	284	63	32	2.0	3.45	39.5"	67	66	69	73	77
Fujikura	Fit-On E270	X	68.4	288	59	35	1.7	3.82	39.5"	67	66	69	73	77
Fujikura	Fit-On E380	R	79.8	272	53	42	1.3	2.85	39.5"	67	66	69	73	77
Graphite Design	Aura Blue	X	73.6	287	59	37	1.6	3.95	39.5"	67	66	69	73	77
True Ace	Cadence Orange Hybrid	S	75.7	274	55	29	1.9	3.13	39.5"	67	66	69	73	77
Aldila	NVS 85 Hybrid	S	74.6	278	58	34	1.7	2.67	39.5"	68	67	70	74	78
Aldila	NV 85 Hybrid	S	73.5	276	61	43	1.4	2.73	39.5"	70	69	72	76	80
Fujikura	Fit-On E380	S	80.0	278	55	43	1.3	2.79	39.5"	69	68	71	75	79
Aldila	VS Proto by You 80 Hybrid	R	75.0	271	56	38	1.5	2.03	39.5"	70	69	72	76	80
Grafalloy	ProLaunch Red Hybrid	S	81.1	276	52	40	1.3	2.11	39.5"	70	69	72	76	80
KB Steel	Hybrid	R	88.0	276	55	39	1.4	2.19	39.5"	70	69	72	76	80
Grafalloy	Epic Hybrid	R	80.4	276	51	32	1.6	2.45	40.5"	70	69	72	76	80
Project X	Project X Hybrid	5.5	76.4	285	58	36	1.6	3.07	39.5"	70	69	72	76	80
UST Mamiya	ProForce V2 70 Hybrid	R	68.3	275	55	35	1.6	2.57	39.5"	70	69	72	76	80
Aldila	VS Proto by You 95 Hybrid	R	82.7	269	55	33	1.7	1.67	39.5"	71	70	73	77	82
UST Mamiya	ProForce V2 Tour 85 Hybrid	R	79.2	278	59	32	1.8	2.42	39.5"	71	70	73	77	82
Aldila	DVS 90	S	79.1	285	59	35	1.7	2.13	39.5"	72	71	74	78	83
Aldila	VS Proto by You 80 Hybrid	S	77.0	278	59	40	1.5	2.06	39.5"	72	71	74	78	83
Grafalloy	Epic Hybrid	S	79.9	281	53	36	1.5	2.53	40.5"	72	71	74	78	83
KBS Steel	Hybrid	S	92.4	284	57	40	1.4	2.41	39.5"	73	72	75	79	84
UST Mamiya	ProForce AXIVCore Red 85	S	77.2	287	62	41	1.5	2.60	39.5"	73	72	75	79	84
UST Mamiya	ProForce V2 70 Hybrid	S	66.7	287	61	37	1.7	2.56	39.5"	73	72	75	79	84
Fujikura	Fit-On E380	X	81.9	293	62	48	1.3	2.77	39.5"	74	73	76	80	85
Aldila	VS Proto by You 95 Hybrid	S	83.6	281	59	41	1.4	1.68	39.5"	75	74	77	82	86

HYBRID SHAFTS LISTED BY DSFI RATING

Manufacturer	Shaft	Flex	Shaft Weight (g)	Freq. (cpm)	Butt Deflect. (oz.)	Tip Deflect. (.oz.)	T/B Ratio	Torque Cut (deg)	Length (in.)	DSFI	3/4 Swing	Fast Tempo	Medium Tempo	Slow Tempo
UST Mamiya	ProForce AXIVCore Red 85	X	78.0	300	67	43	1.6	2.57	39.5"	76	75	78	83	87
UST Mamiya	ProForce V2 Tour 85 Hybrid	S	78.1	293	67	35	1.9	2.34	39.5"	76	75	78	83	87
UST Mamiya	ProForce V2 Tour 100 Hybrid	S	94.3	297	67	39	1.7	2.09	39.5"	78	76	80	85	90
UST Mamiya	ProForce AXIVCore Red 100	X	94.7	306	69	42	1.6	2.39	39.5"	79	77	81	86	91
UST Mamiya	ProForce V2 Tour 100 Hybrid	X	90.6	304	70	40	1.8	2.18	39.5"	80	78	82	87	92
UST Mamiya	ProForce V2 Tour 85 Hybrid	X	79.6	309	71	40	1.8	2.33	39.5"	80	78	82	87	92