

## **Guideline of “Specification Measurements” on Golf Clubs**

**Date of “Standards on Golf Clubs” Establishment: January 1988,  
Revision: September 16, 2015**

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## **I . Introduction :**

### **I -1. Gist of this guideline**

The purpose of this guideline is to make the consumers to compare and select the products easily and properly with clearly understandable functions and characteristics when they purchase golf clubs.

In addition, this guideline provides advantages for member companies, which are to improve the confidence of consumers in golf clubs provided in the market and to ultimately improve the confidence in the entire golf industry.

In this guideline, “Standards on Golf Clubs” of which the member companies were informed in a JGGA news in 1988 were reviewed, and the measurement methods on main specifications of golf clubs were revised and added to improve clarity and transparency.

\* We tried to address description that is easier to understand by clarifying the points of change for the items which were revised in this revision. It is described so on related points.

### **I -2. Subjects for which this guideline is recommended**

- (1) This guideline is recommended to the JGGA member companies as the measurement methods for specifications of golf clubs manufactured and sold by JGGA member companies.
- (2) The scope of application items to products and implementation timing under this guideline are not forced by JGGA, but is left to voluntary discretion of the member companies. JGGA requests that the member companies address provision of indications according to this guideline as soon as possible so that the users can benefit.

### **I -3. Golf club specifications for which the measurement method is recommended in this guideline**

- (1) The golf club specifications for which the measurement method is recommended in this guideline are the following important specifications in order to make the consumers to compare and select the products properly when purchasing:
  - [1] Items related to the measurement of club specifications (except for the specifications for single-unit shaft):  
“Lie angle, loft angle, face angle, face progression, club length, total club mass (weight), club balance and head volume”
  - [2] Items related to the measurement of shaft specifications:  
“Stiffness, mass (weight), torque, Shaft Kick Point and percentage of the location of center of gravity of shaft”
  - [3] Items related to the measurement of center of gravity in club heads:  
“Height of center of gravity, sweet spot height, depth of center of gravity from face plane, angle of center of gravity from face plane, distance between sweet spot and shaft axis, and distance between center of gravity and shaft axis”
- (2) While indication in “International System of Units” described in “Measurement Act” shall be used as the expression unit for the above items in principle, joint indication in units described in “Fair competition rule for indication on sporting goods” is also accepted.

- (3) This guideline revised on September 16, 2015 is the guideline for (1)- [1] Items related to the measurement of club specifications above. We hope to add to and revise this guideline as necessary for (1)- [2] Items related to the measurement of shaft specifications and (1)-[3] Items related to the measurement of center of gravity in club head.

#### **I -4. Selection of measurement method**

In revision of this guideline, examination was implemented with priority on the viewpoint that it is an appropriate one to ensure personal and rational selection by general consumers as well as fair competition among businesses, and the following 6 items were used as the judgment criteria for preparation of various measurement methods:

- [1] Comparability: Consumers/golfers can easily compare various golf clubs.
- [2] Rationality: Whether the measurement method suits the physical principle.
- [3] Accuracy: Accuracy of measurement results.
- [4] Simplicity: Simplicity of the measurement method.
- [5] Degree of popularity: Whether the instruments necessary for measurement are widely popularized.
- [6] Commonality with the Rules of Golf: Commonality with evaluation method in “the Rules of Golf” specified by R&A /USGA.

\* Furthermore, while specification of measurement tolerance is another issue besides measurement methods, our goal at present is to unify the measurement methods by all manufacturers and we want to propose eventually on the tolerance with consideration of the degree of permeation of this guideline in the market.

#### **I -5. Cautionary notes on operation**

- (1) Please clearly specify “based on JGGA Guideline on Specification Measurement Methods on Golf Clubs” and so forth in catalog, Web catalog or leaflets, storefront display and so forth for the “golf club specifications” indicated based on this guideline.
- (2) Please actively provide the measurement data (basis) and so forth upon request from the consumers.
- (3) We ask our member companies to take measures upon sufficient confirmation and understanding of the gist of this guideline and cautionary notes on its operation when they utilize this guideline.
- (4) The items and measurement methods described in this guideline are subject to review or revision as necessary based on new technology, concept and so forth.

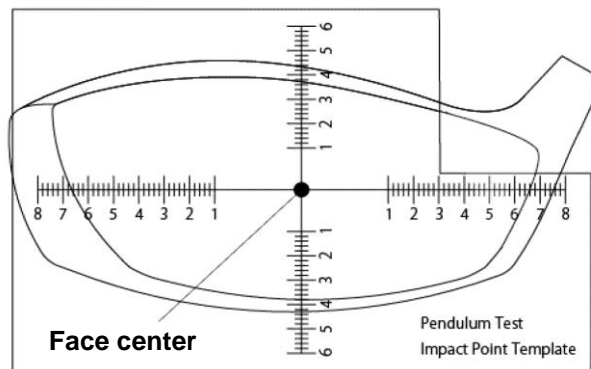
## II. Description :

### II-1. Guideline of “Lie Angle Measurement Standard” for golf clubs

JGGA recommends that the value obtained in accordance with the measurement method specified below should be defined as the “lie angle”:

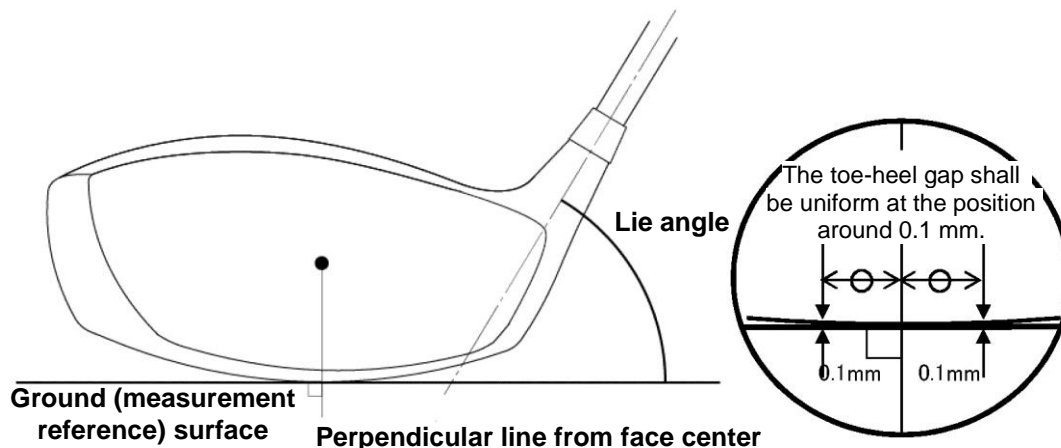
#### [Lie angle measurement standard for wood-type clubs]

- [1] Measurement of the lie angle in wood-type clubs shall be taken by using the measurement method which uses the face center and shaft axis as reference.
- [2] “Face center” here shall be the same as the face center position defined in pendulum measurement standard in the Rules of Golf (Fig. 1).



(Fig. 1) Determination of face center

- [3] The head posture in lie angle measurement shall be measured with the sole stable placed against the ground (measurement reference) surface.
- [4] In doing so, the head shall be maintained so that the perpendicular line from the face center contacts the ground (measurement reference) surface at the intersection point with the sole surface, that the sole is most stable against the ground (measurement reference) surface regardless of the direction of the face and that the toe-heel gap at the contact with the ground (measurement reference) surface is equal.
- [5] The angle formed by the shaft axis and ground (measurement reference) surface under this condition shall be considered the lie angle.



(Fig. 2) Lie angle standard for wood types

<<Difference from the standard conventionally recommended by JGGA>>

This standard has the same concept (= easier to understand) as “measurement of the inclination angle of shaft axis by bringing the head center line in contact with the ground and setting the spaces in front of it and behind it uniform” which has been conventionally recommended by JGGA.

<<Reason why this measurement method is recommended>>

This standard has the same concept as “measurement of the inclination angle of shaft axis by bringing the head center line in contact with the ground and setting the spaces in front of it and behind it uniform” which has been conventionally recommended by JGGA. By setting the face center and shaft axis as the measurement reference, lie angle measurement is possible whether there is groove line or not, and it provides the advantage of easier comparison of head characteristics.

It was considered possible to take measurements simply by using the angle measurement instruments that are currently popularized and this method, and to unify the measurement values for the same reference point by using the determination method used in the Rules of Golf at the “face center.”

<<Supplementary explanation on this measurement method>>

When determining the face center, the possibility that there will be some errors cannot be denied. However, this standard is recommended with consideration of the above advantages, judging that the effect of deviation in lie angle measurement value because of this is not high enough to cause trouble in actual use.

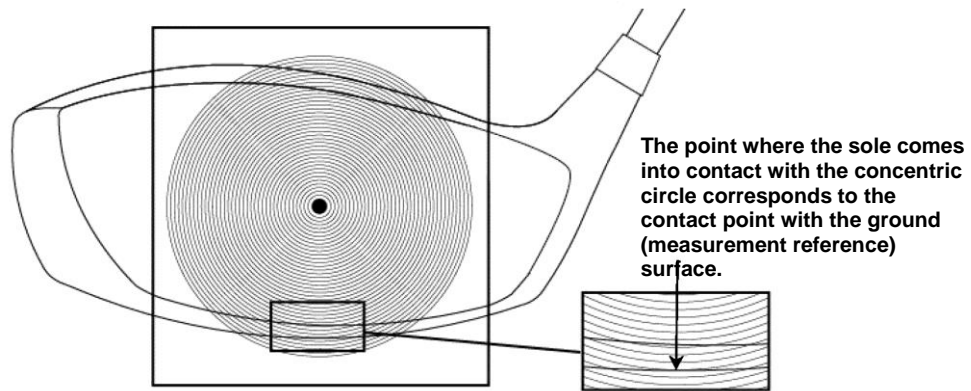
Although there is also an issue that it differs from the measurement standard for iron-type clubs which is described later, it was concluded that the best measurement method is adopted for each of the iron-type and wood-type, considering the actual circumstance in which the groove line cannot be considered the reference as with iron-types, since wood-type clubs do not always have groove lines and groove lines are not always designed to be horizontal to the sole, in addition to the fundamental difference between the curved face of wood-types and the flat face of iron-types in head characteristics.

Furthermore, this standard is more rational as there are many drivers designed to have inclination in the groove line even though the Rules of Golf assumes that groove line is used as the reference for the lie angle for wood-type as well.

See the table below for the user convenience under this standard:

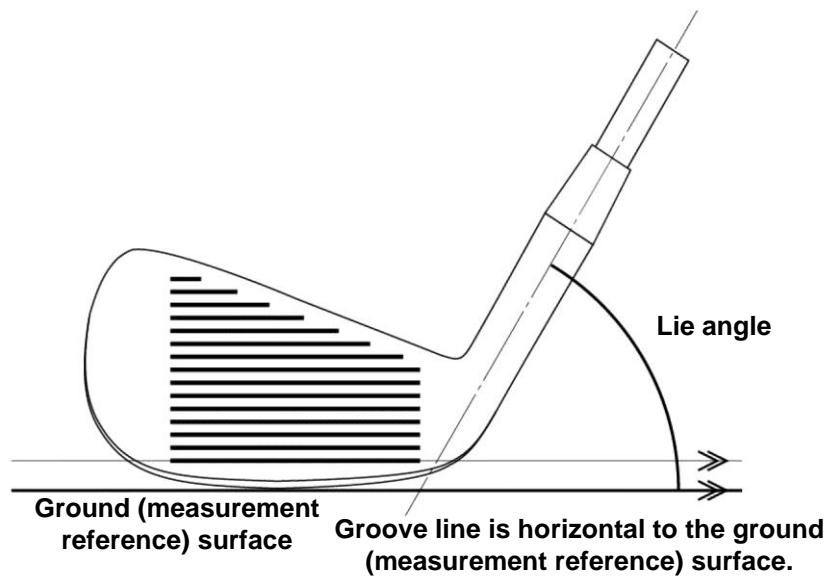
[1] Comparability	[2] Rationality	[3] Accuracy	[4] Simplicity	[5] Degree of popularity	[6] Commonality with the Rules of Golf
○	○	△	○	○	×

It is also possible to simply identify the contact point by using a concentric circle template as shown in the figure below regarding [4] above.



**[Lie angle measurement standard for iron-type clubs]**

- [1] Measurement of the lie angle in an iron-type club shall be taken using a measurement method which uses the groove line(face line) and shaft axis as the reference.
- [2] The angle formed by the ground (measurement reference) surface and shaft axis when the face angle is set to 0 degrees and the groove line horizontal to the ground (measurement reference) surface shall be considered the lie angle (Fig. 3).



**(Fig. 3) Lie angle standard for iron-types**

<<Difference from the standard conventionally recommended by JGGA>>

This measurement standard is identical to the measurement standard conventionally recommended by JGGA, and there has been no change.

<<Reason why this measurement method is recommended>>

The standard is clear as the groove line and shaft axis are used as the measurement reference. It is therefore easy to compare the lie angles and offers the advantages of measurement being both accurate and simple.

It also offers the advantages of simple measurement and use of the currently popularized angle measurement instruments with this method, requiring no introduction of new measuring instruments.

<<Supplementary explanation on this measurement method>>

When determining the face center, the possibility that there will be some errors cannot be denied. However, this standard is recommended with consideration of the above advantages which are bigger, judging that the effect of deviation in lie angle measurement value because of this is not high enough to cause trouble in actual use.

Although it is possible that the score line is not always made horizontal to the sole depending on the design and that there is no measurement reference due to the groove line with special designs even in iron-type clubs, it is extremely likely that at least one groove line horizontal to the sole is provided on most iron-type clubs under the current circumstances surrounding design. It was therefore concluded that it was best to recommend this standard.

If a club should have such a special design, it is recommended that the lie angle reference in design for the corresponding model shall be clearly disclosed when indicating the lie angle for the club in a figure.

See the table below for the user convenience under this standard:

[1] Comparability	[2] Rationality	[3] Accuracy	[4] Simplicity	[5] Degree of popularity	[6] Commonality with the Rules of Golf
○	○	○	○	○	○

## II-2. Guideline of “Loft Angle Measurement Standard” for golf clubs

JGGA recommends that the value obtained using the measurement method specified below should be defined as the “loft angle”:

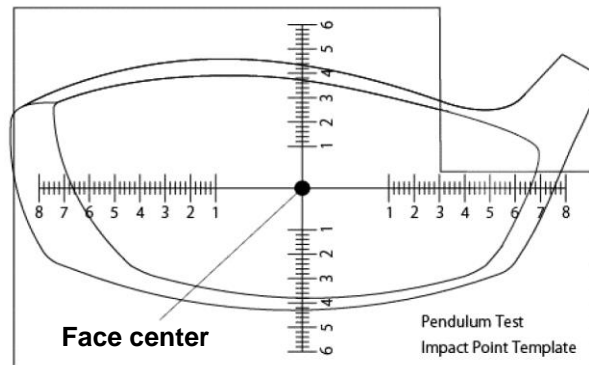
[Loft angle measurement standard]

[1] Measurement of the loft angle shall be taken by using the measurement method which uses the ground (measurement reference) surface and the face center under the lie angle measurement conditions as reference.

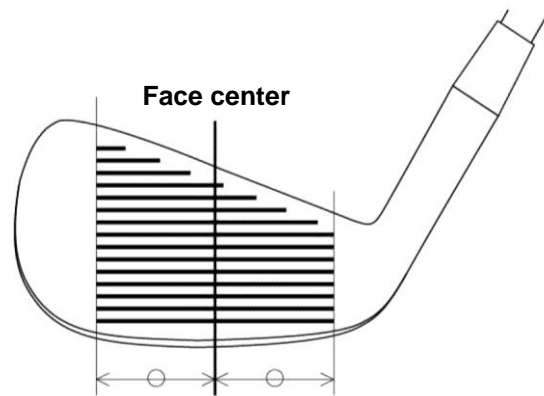
[2] “Face center” here shall be the same as the face center position defined in R&A pendulum measurement standard (Fig. 1).

However, the center of toe-heel on the longest groove (the top-to-bottom center is not specially defined as it is a plane surface) shall be used as the reference on heads with flat faces such as irons (Fig. 2).

It is recommended that the measurement method for iron-types should be used for utility (hybrid) clubs and so forth with flat faces.

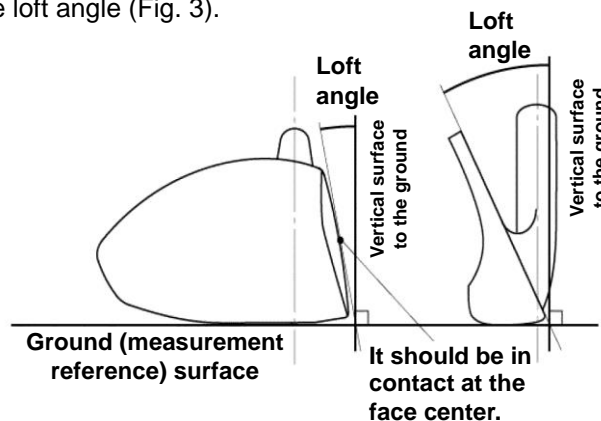


(Fig. 1) Determination of face center (Wood-type)



(Fig. 1) Determination of face center (Iron-type)

- [3] The angle formed by the vertical surface to the ground (measurement reference) and the plane in contact with the above face center under the lie angle measurement conditions shall be considered the loft angle (Fig. 3).



(Fig. 3) Loft angle standard

<<Reason why this measurement method is recommended>>

It is possible to measure simply and accurately by setting the measurement standard to take measurements in the same head posture as lie angle measurement, and it offers the advantages of rationality as an angle characteristic of head as well as easy comparison. The angle measurement instruments currently popularized can be used for this measurement method, allowing simple measurement and requiring no introduction of new measuring instruments. It also addresses unification of measurement values for an identical reference point as it adopts the method used in the Rules of Golf to determine the “face center.”

The reason why the so-called “real loft” with the face angle set to 0 degrees is not recommended in this guideline is that the customer’s impression on the loft angle based on appearance is also important, and it was decided that this standard should be recommended for the simplicity to measure the loft angle at the same time under the lie angle measurement conditions and ease of comparison with consideration of tendency for shift in visual impression with real loft and irrationality in which the lie angle itself changes during loft angle measurement as the head posture is changed from the lie angle measurement conditions.



<<Difference from the standard conventionally recommended by JGGA>>

While this standard standardizes the so-called “original loft” as the loft angle for wood-type clubs, it corresponds to a review on the standard on “real loft” with the face angle maintained square, which had been recommended by JGGA as an expression of the loft characteristics in hitting. There has been no change from the conventional recommended standard for iron-type clubs.

<<Supplementary explanation on this measurement method>>

While the standard is changed for wood-type clubs from real loft which had been recommended conventionally, even real loft does not express the actual loft angle in hitting. It was decided that this standard should be newly recommended for loft angle as a value which can rationally express the angle as a head characteristic while unifying the standard with lie angle measurement according to the purport of this standardization to compare the head characteristic values more simply and accurately.

See the table below for user convenience under this standard:

\* As described in the section on lie angle, the loft angle also varies since the lie angle itself is expected to vary from the standard in rules for wood-type clubs.

On the other hand, the standard matches that of the rule for iron-type clubs and thus △ mark was specified for the rule field in the table below:

[1] Comparability	[2] Rationality	[3] Accuracy	[4] Simplicity	[5] Degree of popularity	[6] Commonality with the Rules of Golf
○	○	○	○	○	△

### II -3. Guideline of “Face Angle Measurement Standard” for golf clubs

JGGA recommends that the value obtained using the measurement method specified below should be defined as the “face angle”:

[Face angle measurement standard]

The direction of the face when it is set under lie angle measurement conditions shall be measured at the face center section.

This item does not apply on iron-type clubs.

- [1] The club to be measured shall be fixed under the set lie angle measurement conditions.
- [2] The angle formed by the plane vertical to the ground (measurement reference) surface which includes the shaft axis and the horizontal line in contact with the face center (specified for loft angle) shall be considered the face angle.

<<Reason why this measurement method is recommended>>

It is possible to measure the loft angle and face angle under the lie angle measurement conditions, ensuring simplicity and unification of angle values with the same head posture.

<<Supplementary explanation on this measurement method>>

In a similar fashion to loft angle measurement method, the measurement point was set to “face center section.” This makes the measurement point (height of measurement from the ground (measurement reference) surface) vary between models.

In addition, expressions such as closed xx degrees, square, and open xxdegrees are recommended based on how easy to understand for the customers, while the “measured value” is often expressed using (+) and (-).

See the table below for the user convenience under this standard:

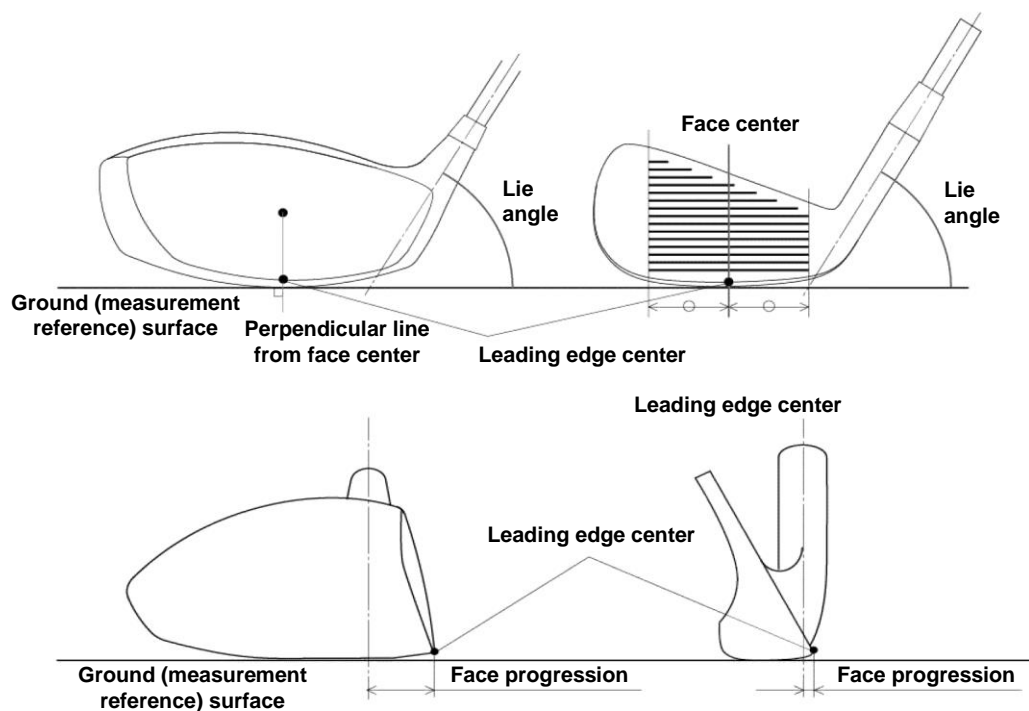
[1] Comparability	[2] Rationality	[3] Accuracy	[4] Simplicity	[5] Degree of popularity	[6] Commonality with the Rules of Golf
○	○	△	△	△	No setting

## II -4. Guideline of “Face Progression Measurement Standard” for golf clubs

JGGA recommends that the value obtained using the measurement method specified below should be defined as the “face progression”:

[Face progression measurement standard]

Face progression (FP value) shall be defined as the distance from the plane containing the shaft axis to the leading edge center (central point for lie angle measurement) with the face angle set to 0.



- [1] The club to be measured shall be fixed to the set lie angle and face angle 0 degrees.
- [2] The distance from the plane containing the shaft axis to the leading edge center or the most projecting part of the face shall be measured.

<<Reason why this measurement method is recommended>>

Since it matches the FP value measurement method which is generally recognized, it was clarified as a definition.

<<Supplementary explanation on this measurement method>>

Although the measuring instrument capable of accurately measuring the FP value is not sufficiently popularized, it was clarified as the concept of measurement is unified.

See the table below for the user convenience under this standard:

[1] Comparability	[2] Rationality	[3] Accuracy	[4] Simplicity	[5] Degree of popularity	[6] Commonality with the Rules of Golf
○	○	△	△	△	No setting

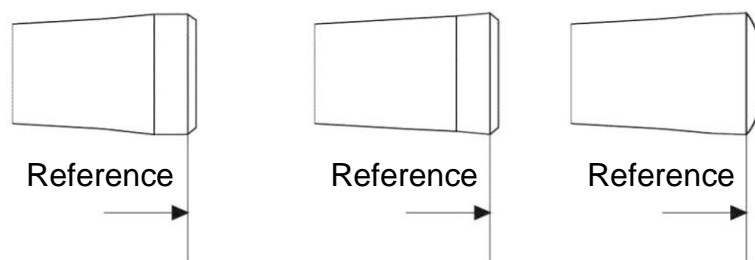
## II-5. Guideline of “Club Length Measurement Standard” for golf clubs

JGGA recommends that the value obtained using the measurement method specified below should be defined as the “club length”:

[Club length measurement standard]

- [1] The distance from “intersection between shaft axis (central line) and sole” to the “grip cap line” shall be considered the club length.
- [2] It shall be a common measurement method for all woods, irons and putters.
- [3] The length indication method shall conform to the fair competition rule.
  - Furthermore, measurement shall be taken by considering the intersection between shaft axis and sole line seen from the head front surface (face front) as the starting point on the edge side for club length when the “intersection between shaft axis (central line) and sole” part is depressed into the head, as in clubs with adjustment functions.
  - \* The bottom surface of the “sole runner,” “sole railer” and so forth provided on the sole shall be used as the sole line.
  - Grip cap line does not include swelling parts. It is assumed rational when considered from the viewpoint of gripping the club.

Grip cap line reference example



<<Difference from the standard conventionally recommended by JGGA>>

- Reference on the grip side: No change
- Reference on the head side: Changed. It was changed from “the position where sole radius extension and the extension line from the back of the neck intersect” to “the intersection point between shaft axis and sole.”

<<Reason why this measurement method is recommended>>

- It is rational to adopt a method using the intersection point between shaft axis and sole as the base point for items that satisfy the conditions by judging that the same measurement method should be selected for all of “woods, irons and putters.” In addition, grip cap line is rational for the grip side based on grip functions.

<<Supplementary explanation on this measurement method>>

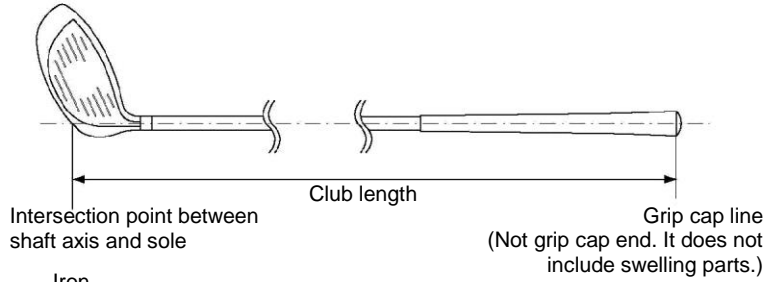
- Therefore, it is necessary to check separately whether the clubs with length of upper limit 48 inches and lower limit around 18 inches conform to the rules under the measurement methods of the Rules of Golf. See annex to rules II: 1. Club – C. Length.

See the table below for the user convenience under this standard:

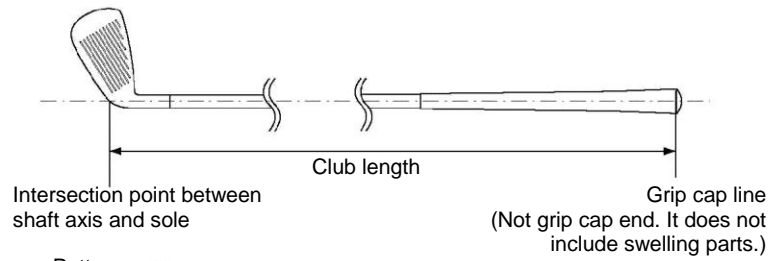
[1] Comparability	[2] Rationality	[3] Accuracy	[4] Simplicity	[5] Degree of popularity	[6] Commonality with the Rules of Golf
○	○	○	○	△	×

**Club length measurement position**

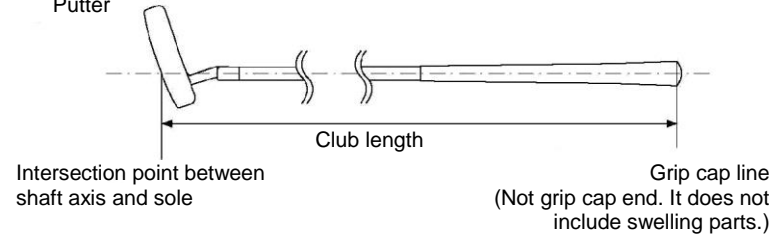
Wood



Iron



Putter



**II-6. Guideline of “Total Club Mass (Weight) Measurement Standard” for golf clubs**

JGGA recommends that the value obtained using the measurement method specified below should be defined as the “total club mass (weight)”:

[Total club mass (weight) measurement standard]

- [1] The mass (weight) of the club including the head, shaft (including socket) and grip assembled shall be considered the total mass (weight) of a golf club.
- [2] A general electric scale (one that can measure up to about 1000g) shall be used.
- [3] It shall be checked that the electric scale is installed horizontally. A electric scale that can measure up to 1/10g or more is desirable.
- [4] The center of gravity for the club shall be set at the center of the measuring balance to take measurements.

<<Reason why this measurement method is recommended>>

It is popular in general. The range of error can be minimized by observing the measurement method.

<<Supplementary explanation on this measurement method>>

Nothing in particular

See the table below for the user convenience under this standard:

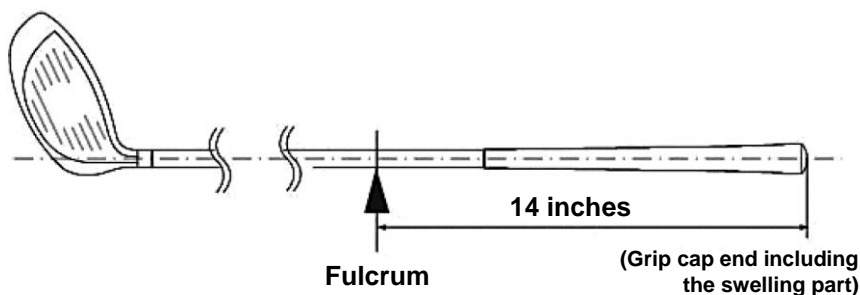
[1] Comparability	[2] Rationality	[3] Accuracy	[4] Simplicity	[5] Degree of popularity	[6] Commonality with the Rules of Golf
○	○	○	○	○	No setting

**II-7. Guideline of “Club Balance Measurement Standard” for golf clubs**

JGGA recommends that the value obtained using the measurement method specified below should be defined as the “club balance”:

[Club balance measurement standard]

- [1] The golf club balance shall be measured as the value indicated by the measuring instrument (swing weight scale (14-inch method)) using the position 14 inches from the end of the grip cap as the fulcrum.



- [2] A general swing weight scale (14-inch method) shall be used.
- [3] It shall be checked that swing weight scale is horizontally installed.
- [4] The club to be measures shall be set = installed properly on the swing weight scale.
- [5] Measurement shall be taken by properly moving the scale weight.

<<Reason why this measurement method is recommended>>

Because it is generally popular

<<Supplementary explanation on this measurement method>>

Some putters cannot be measured including long ones.

Since balance measurement itself is not generally done for putters, it shall be evaluated only as a reference value.

In addition, while “grip cap line” was used for club length as the reference on the grip side, “grip cap end (grip end)” which also includes the swelling part of the grip end and allows simpler measurement shall be used for club balance due to the characteristics of measuring instrument which is generally accepted.

See the table below for the user convenience under this standard:

[1] Comparability	[2] Rationality	[3] Accuracy	[4] Simplicity	[5] Degree of popularity	[6] Commonality with the Rules of Golf
○	△	○	○	○	No setting

## II -8. Guideline of “Head Volume Measurement Standard” for golf clubs

JGGA recommends that the value obtained using the measurement method specified below should be defined as the “head volume”:

[Head volume measurement standard]

- [1] The head volume for a golf club shall be the volume of the solid head (single unit).  
Measurement of the head volume for a golf club shall be taken according to the method described in the Rule of Golf.  
If there are depressions on the head, “straight line filling method” specified by the Rules of Golf shall be adopted.
- [2] A container large enough to immerse the head shall be prepared, and enough water (to immerse the head) shall be poured.
- [3] The container filled with water shall be placed on a general electric scale to set the scale to “0.” A general electric scale (capable of measuring up to about 2000 g) shall be used.
- [4] It shall be checked that the electric scale is placed horizontally. The electric scale that can measure up to 1/10 g or more is desirable.
- [5] The head shall be immersed into the water to the root of the hosel (hosel shall not be included) to read the scale.  
\* Before the head is immersed in water, the depressions of the head shall be padded so that the surface is smooth according to the Rules of Golf.

<<Reason why this measurement method is recommended>>

Because it matches the Rules of Golf and is generally popularized.

<<Supplementary explanation on this measurement method>>

Nothing in particular.

See the table below for the user convenience under this standard:

[1] Comparability	[2] Rationality	[3] Accuracy	[4] Simplicity	[5] Degree of popularity	[6] Commonality with the Rules of Golf
○	○	○	○	○	○

<Unofficial Translation / For Your Reference Only>