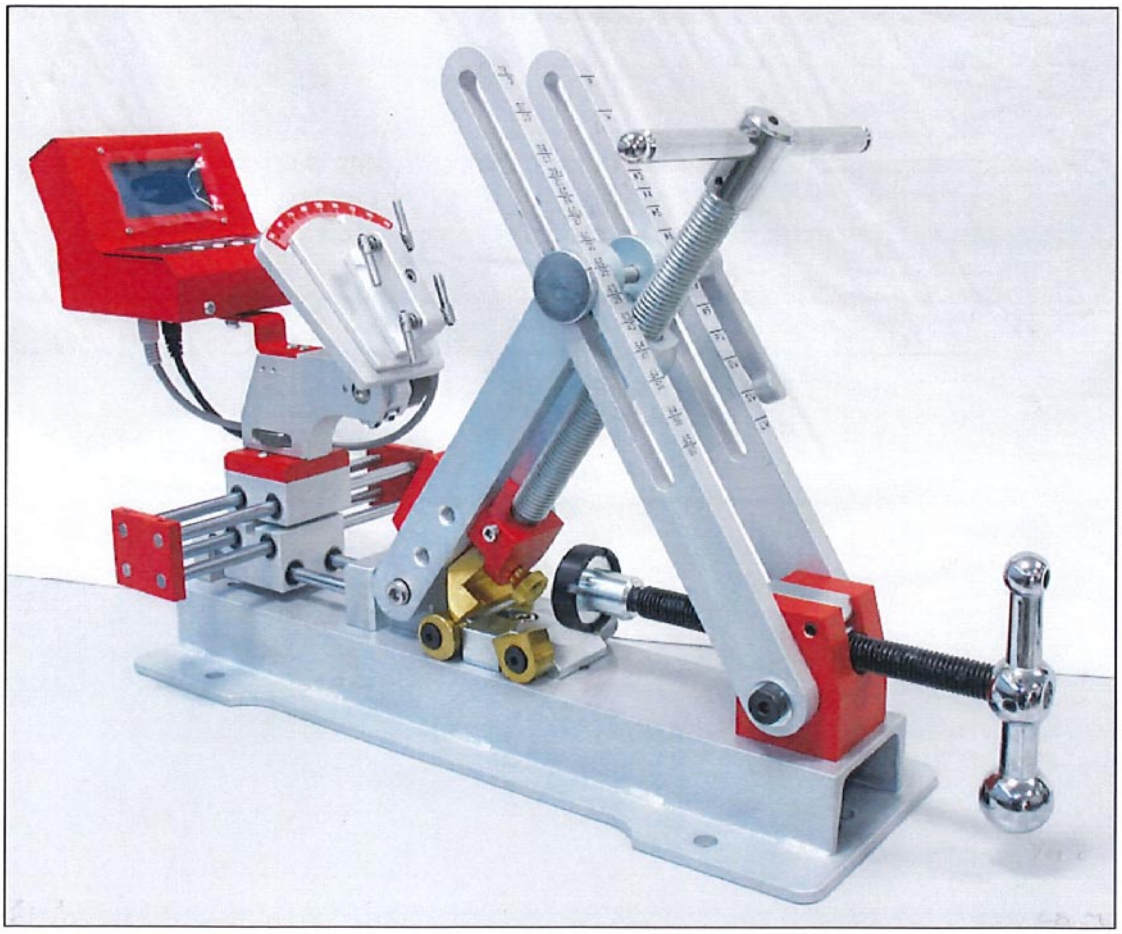
THE GOLFWORKS®

Instructions For:

Auditor Digital Universal Bending Gauge

Code: **GM1067**



OPERATION MANUAL
150951D
Version 1.1

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Introduction

This unit is the upgraded version of its analog predecessor the 150951. Made with the same Adjustable Frame design as its predecessor, the 150951D is able to not just clamp irons, but also clamp Fairways, Hybrids and even Putters using the included accessory kits.

The unit is outfitted with a unique version of our Auditor Pi engine which is engineered to work with this specific units Adjustable Frame design. The A.P.E. sports 2 different high precision digital encoders that are capable of generating 3600 pulses per rotation, which translates to a resolution of 0.1 degree per pulse. For ease-of-use and to minimize user errors, the lie and loft measurements are taken simultaneously in a single setup and displayed on a large blue LCD screen.

A memory function has also been added for newer versions of the 150951D (post May 2019). This gives you 20 different onboard memory slots to store club Lie/Loft data. This can then be transferred into your PC using the Auditor Pi software, which will also turn your data into a Microsoft Excel readable format (.CSV).

Quick Note of the Adjustable Frame Design

The Adjustable Frame design of this unit allows you to adjust the bending gauge to best fit the clubhead you wish to mount into it. When mounting low lofted clubs (3, 4 Iron), the bending frame can be adjusted more upright, and when mounting higher lofted clubs (LW, SW), the frame can be tuned more flat. This ensures that no matter what club you mount into the gauge, the clubhead can sit flatly inside the clamp with the hossel pointing upright; improving stability and preventing slippage during bending. Furthermore, you will no longer have to bend the clubhead at an awkward angle as the hossel of the clubhead will always be oriented upright within 5 degrees no matter the loft of the clubhead.

The Adjustable Frame design also gives the unit the versatility to clamp and bend almost every club in the bag. With the frame adjusted more upright, the gauge can accommodate most Fairways and Putters on the market. Specially made clamping accessories are included to help the gauge adjust to the different crown and sole designs of these clubs. Our Metal Wood Bending Kit 150951-W1 can also be purchased to let you clamp and bend metal woods in the gauge.

About this Manual

The 150951D is, to date, the most advanced Lie and Loft bending gauge produced by Golfmechanix, and it's precision of measurement and versatility is un-parraled. With that said, the unit can be at times rather difficult to understand. This manual will focus on how to use the various function of the units Auditor Pi Engine as well as the steps it takes to mount and measure an iron.

This manual, as of now, does not include a section that details the use of the various included accessories which are to be used for Fairways, Hybrids and Putters. In the mean time, for information regarding the above topics, please see the manual of this units predecessor 150951, which can be found here:

Getting Started

When you first receive your Auditor Digital Universal Bending Gauge, please un-pack the box care and inspect each item that is contained in the box for damage. Then, compare the accessories you have received against the ones listed below to ensure that everything is accounted for. If any items are missing or damaged, please send us an email at: sales@golfmecahnix.com to make a claim. In the case of damaged items, please include a photo of the part in question so that it may be assessed.

Accessories List

A. Bending Unit
B. Face Pad
C. Soling Block x2
D. Rubber Top Clamp
E. 2 Point Top Clamp
F. Allen Wrench Set
G. Cap Screws x4
H. Hex Screws x4
I. 150950-W1 Wood Bending Kit
J. Power Supply (not depicted)

Setting Up Your Bending Gauge

Your bending gauge must be mounted onto a sturdy and secure surface in order to perform correctly. If your bending gauge is mounted to a flimsy surface, you will not be able to apply ample force when bending your clubs and you may even break/damage said surface. We recommend that the bending gauge be mounted onto a hard wood or steel work bench. Our 150710 Bending Stand and 150760 Portable Heavy Duty Bending Gauge are both good options for mounting your bending gauge on.

Aside from the rigidity of the mounting surface, there are also a few other concerns you must think through when deciding where to mount your bending stand.

Ample Working Area

Make sure there is enough room in front of the bending gauges so that you can work with it without feeling cramped. When bending clubs, a bending bar will also be required. These tend to be quite long, so make sure you have ample space to work around your machine.

Right Hand/Left Hand Access

Both right handed and left handed clubs can be mounted onto the bending gauge. However, they are mounted from opposite sides. Hence, if you expect to use the bending gauge for both types of clubs, you will need to make sure there is room to work around both side of the unit.

This may be hard to accomplish depending on the set-up of your workshop. If needed, the bending gauge can be mounted on our 150705 Heavy Duty Bench Top 360 base, which will allow you to rotate the bending gauge as needed.

Height

This gauge is designed to measure and bend shafted clubs. Depending on the length of the shaft on your club, the shaft may extend up to 40+ inches from the base of the unit. Make sure you have ample space above the bending gauge so that even the longer clubs do not bump into the ceiling when secured in the gauge.

Once you have chosen the appropriate area to mount your bending gauge, mark out the mounting holes on the bending gauge onto the intended surface. Drill the appropriate holes and mount the bending gauge using the screws provided. Depending on the thickness of your work bench, you may have to purchase additional screws from the hardware store in order to secure your bending gauge onto the mounting surface.

If you choose to mount your bending gauge on one of our bending stands, the bending stands must first be secured to the ground using its own screws before you can mount your bending gauge onto it.

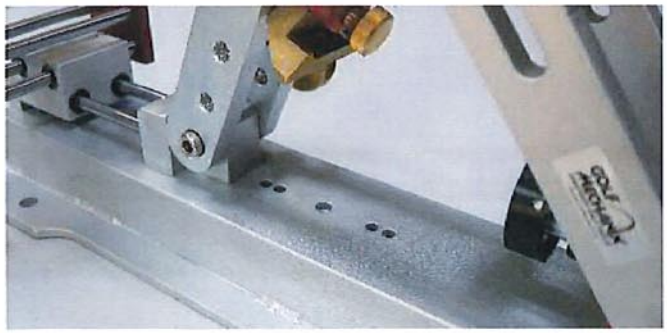
Introduction of Included Clamping Accessories

Your bending gauge comes with multiple different clamping accessories to help you secure different types of clubheads. These accessories can be split into 2 different groups: Soling Pads and Top Clamps. This section will seek to introduce these various accessories, give instructions on how to swap them out and a chart to show which accessories are to be used when working with different clubs.

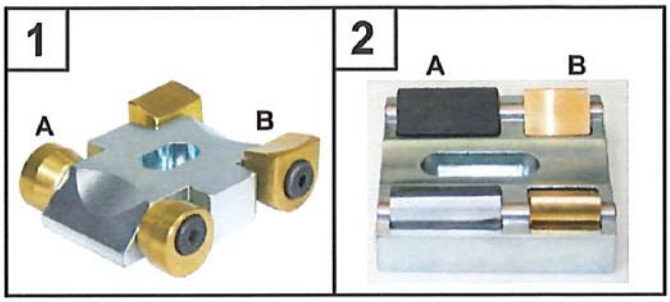
Soling Pads

The bending gauge comes with 2 different soling blocks, each with 2 sets of soling pads attached to them. These soling pads are what your clubs will sit on when they are mounted into the gauge. The function of these soling pads is to ensure clubs can sit squarely while inside the gauge without being marked during the process. This is why these pads are either made out of soft brass or covered in rubber. Depending on which club you wish to mount into the gauge, different soling pads will be used.

The soling block can be mounted and removed from the bending unit easily. To remove the soling block, use the allen wrench included to loosen the screw securing it to the base. Then, once the screw is off, you can remove the soling block.



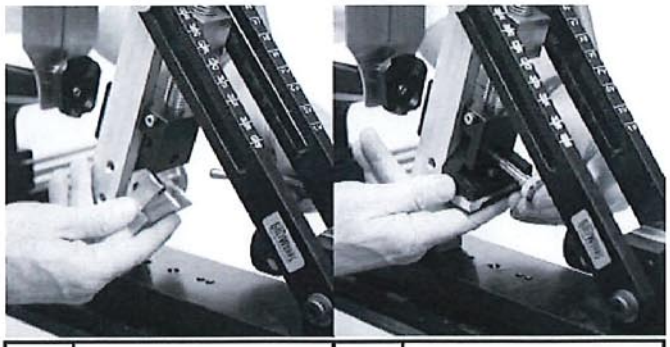
To mount the soling block onto the gauge, align the pins on the bottom of the soling block to the respective holes on the base of the bending gauge. The soling blocks can either be mounted in a more forward position or a more rearward position, depending on the type of club. Once the soling block is aligned and mounted into the proper holes, use the screw you first removed from the soling block and the include allen wrench to secure it to the base.

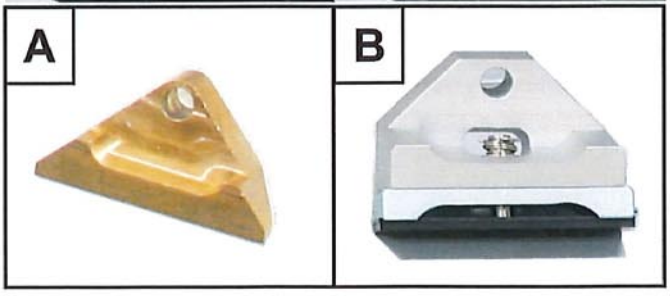


The above photo shows the 2 soling blocks that come included with the unit. The soling pads on the soling blocks will be referred to as 1A, 1B, 2A, 2B.

Top Clamp

The top clamp is what will be applying the force to secure your club in the gauge. 2 different top clamps are included with the unit. To switch out the top clamp, simply pull out the pin securing it and the top clamp will come loose. To install a new one, simply slide the new top clamp into position and align the opening, then slide in the lock pin to secure it in place.





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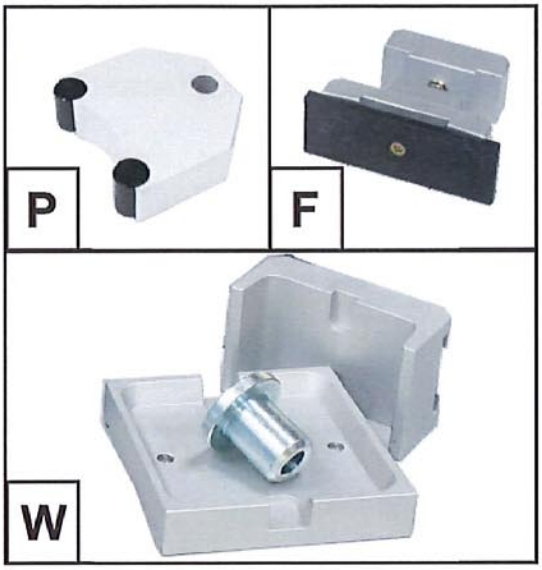
The photo above shows the 2 top clamps that are included with the bending unit. Top clamp A is the default top clamp and should be attached to the bending gauge out of the box. This is mainly used for clamping irons. This top clamp is made out of soft brass as not to mar the head. The other top clamp, B, is used for heads with a flat crown, mainly Hybrids, Fairways and Drivers. This top clamp has a layer of rubber where it contacts the club head to prevent marring.

Other Accessories

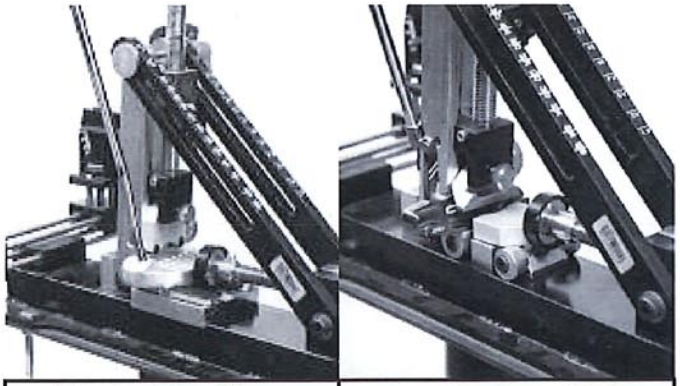
Aside from the soling blocks and the top clamps, your bending gauge comes with three other clamping accessories.



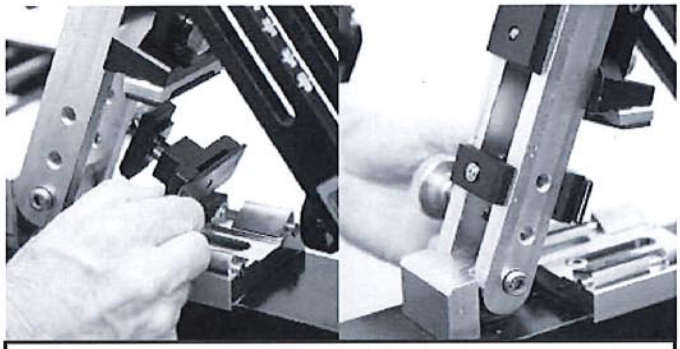
Putter Clamping Block (P)
The putter clamping block is used when securing putters in the bending gauge. This block can be used either as a top clamp or a rear clamp.

Rubber Face Pad (F)
The rubber face pad's purpose is to prevent the club face from being marred while the head is in the gauge. It is mainly used when securing Hybrids, Fairway woods and Drivers. This accessory is designed with a spring loaded mechanism and can be installed without any tools.

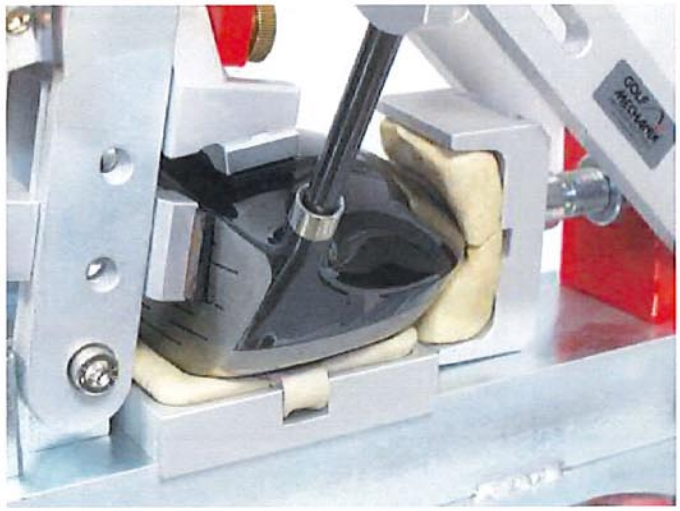
Driver Clamping Kit (W)
The Driver Clamping Kit is used for clamping drivers. This kit requires the use of putty to create a mold of the driver, which will act as the clamps once they set. For more information on how to use the Driver Clamping Kit, look here:



Used as Top Clamp | Used as Rear Clamp



Face Pad Installation



Toe Stop

The Toe Stop is the round brass nut that comes with your bending unit. It is used to prevent your club from slipping out of the gauge when the clubhead is being bent.

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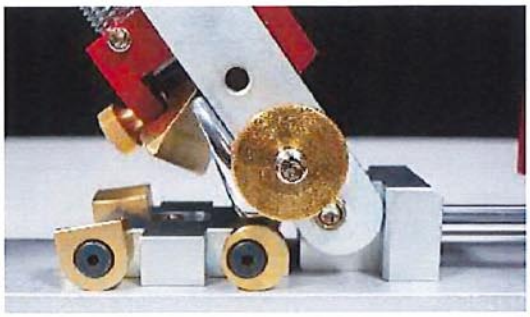


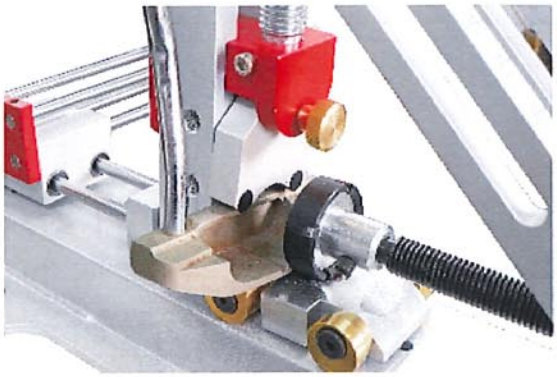
To install the Toe Stop, simply lock in the screw into one of the holes on the side of the bending frame. Secure the screw tightly using the Hex nut provided, then screw in the toe stop.

The toe stop must be installed on the right side of the bending gauge when working with right handed clubs and on the left side when working with left handed clubs.

Rear Clamp

The bending unit also comes with a rear clamp built into the frame. The rear clamp is used to further secure your clubhead and is mainly used for Hybrids, Fairways and Putters.

To use the rear clamp, first mount your club in the gauge and secure it using the top clamp. Then, push the rear clamp towards the club until it makes contact. Turn the handle bar to tighten the rear clamp until snug.



Clamping Combination

The following chart details which clamping accessory should be used when clamping different types of heads.

Head Type	Soling Pad	Top Clamp	Face Pad	Rear Clamp
Iron	1A/1B	A	X	X
Wide Sole Iron	1B/2A	A	X	X
Hybrid	2B/1B	B	X	V
Fairway Wood	2B	B	X	V
Driver	W	B	V	W
Putter (Thin Top)	2A/2B	A	X	P
Putter (Flat Top)	2A/2B	P	X	V

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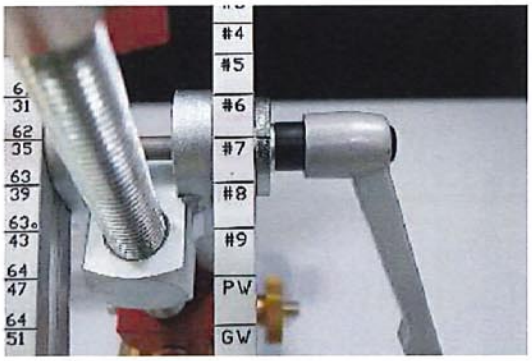
Mounting an Iron

Now that the different clamping accessories have been explained, this section will go over how to adjust the Frame Angle of the bending gauge and the basic steps to mount an Iron into the bending gauge.

Adjusting Frame Angle

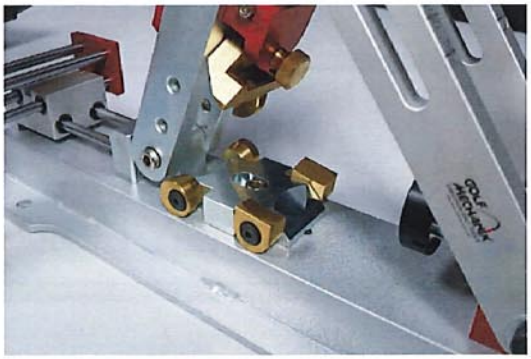
The Auditor Digital Universal Bending Gauge has an Adjustable Frame design. Prior to mounting a club in the gauge, you must first adjust the frame to the appropriate set-up. This is done by loosening the handle on the right side of the frame and moving the frame so that the indexes align with which head is being mounted.

For example, if you are to mount a 7 iron into the gauge, first turn the handle to loosen the frame. Then, push the frame and to move it so that the index mark on the handle lines up to "#7" index on the frame. Once the frame is in the proper position, tighten the handle to lock the frame in place. You are ready to mount your club.

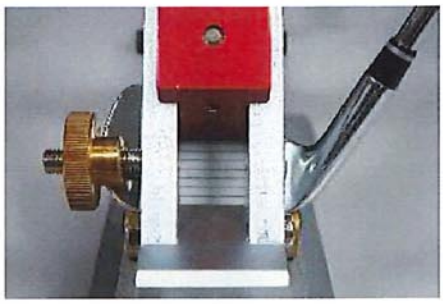


Mounting Your Iron

Once the bending frame is set up in the proper position, place the iron into the gauge. Turn the T-Bar to raise your top clamp so that there is enough clearance to mount your head into the gauge.

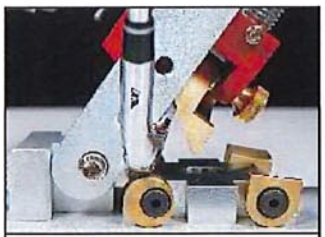


Then, place your clubhead inside the gauge so that the sole is sitting on the soling pads and the face is flush against the frame.

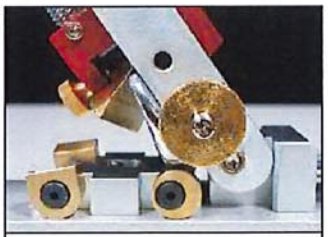


Then, using the top clamp as a guide, check if your grooves are parallel. If not, adjust your clubhead until the grooves are parallel to the clamp. This is to ensure proper Lie angle readings once the club is secured.

Once you have the head into position, hold the head in position with one hand and tighten down the T-Bar bolt with the other.



Tighten down T-Bar Bolt



Dial in Toe Stop

When the Top clamp has been tightened, dial in the Toe stop to complete the mounting process. To check if the head has been secured properly, try to apply some force to the head at the hosel. If the head does not feel like it is securely mounted, release the head and repeat the mounting process.

If re-securing the head still does not work, try using a different combination of the clamping accessories to see if your results improve.

Once the head is securely mounted, you are now free to measure your clubhead and bend it as necessary. To measure the clubhead's Lie and Loft angle, you will need to use the Auditor Pi unit. The next section will detail the instructions to operate the A.P.E.

Auditor PI Engine Usage

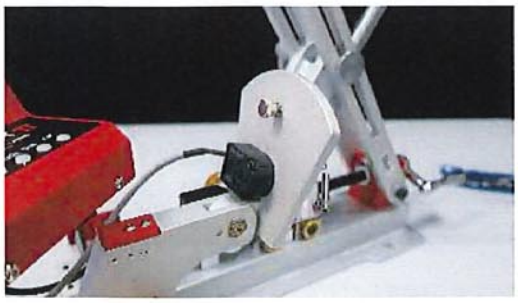
Knowing how to operate the Auditor PI engine is essential to using the 150951D. This section will go over the different functions performed by the A.P.E. and how you operate them. This includes:

- Boot Up Procedure
-Measurement Screen
-Input Frame Position
-Memory Function

Boot Up Procedure (Setting MC Ref)

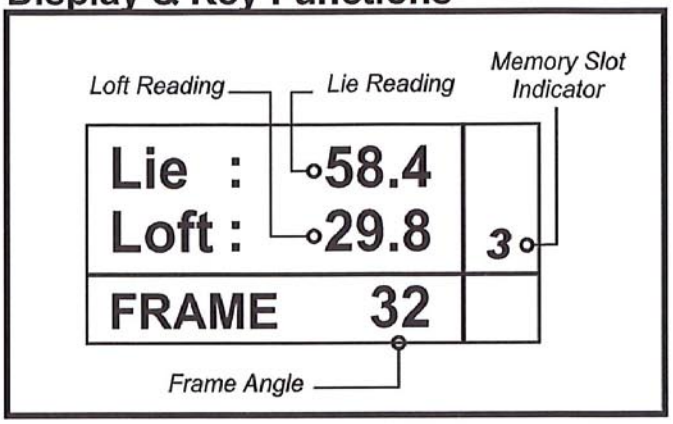
To turn the unit on, first make sure the power adapter is plugged in, then press the On key. Each time the unit is turned on you will be asked to set "MC REF"

To do this, tilt the loft protractor all the way forwards (photo 11) and center the lie protractor by aligning the dark index line to the 90 degrees mark (photo 12). If the lie protractor is properly centered, you should be able to press and hold down the centering pin located on the back.



While holding the protractor in this position, press the Zero key. This sets the units machine reference angle and the machine will continue to boot into the measurement screen.

Display & Key Functions



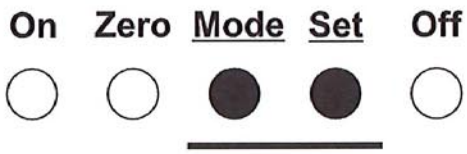
After MC REF has been set and the unit finishes booting up, you will be shown a screen similar to the one pictured above. This is the default measurement screen.

Lie Reading: Displays the current Lie angle as measured by the protractor

Loft Reading: Displays the current Loft angle as measured by the protractor

Frame Angle: The current frame angle chosen to be used as the base for your measurements.

Memory Slot Indicator: The current memory slot that is currently open.



On: Used for turning on the A.P.E. Has not use once the unit is turned on.

Zero: Initiates the Set Origin Function.

Mode: Activates Paging Mode

Set: Brings out the Save Data menu.

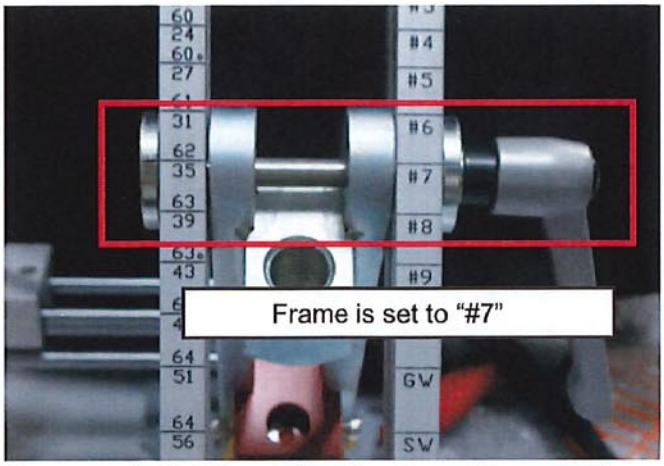
Set (long press): Starts the process to change the current frame angle.

Off: Turns the A.P.E. Off.

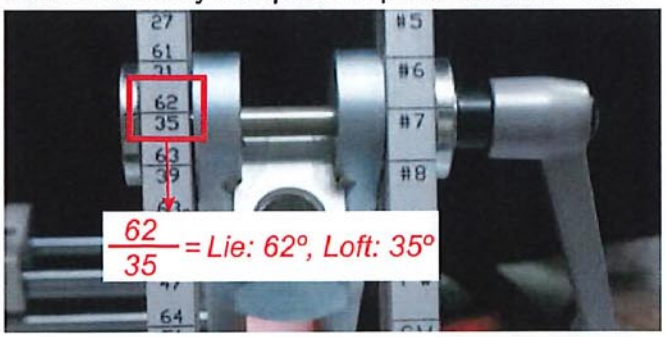
The above listed Key functions only work in the Default Measurement Screen.

Setting Frame Angle

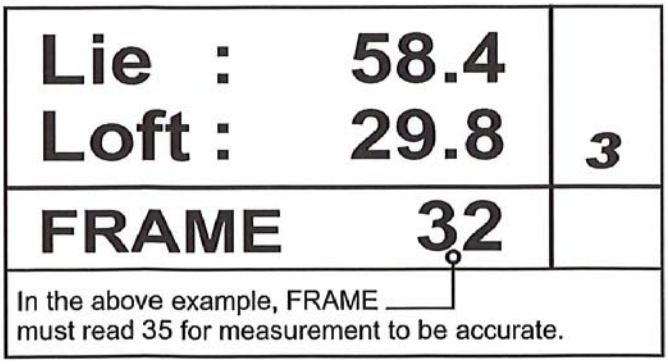
Before you use the unit to measure the Lie and Loft angle of your club, you must first make sure that the Frame Angle displayed on the A.P.E reflects the Frame Angle the machine is currently adjusted to.



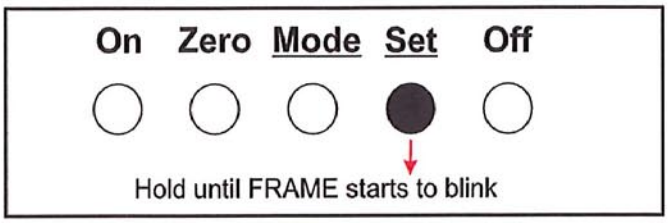
You can tell what Frame Position the unit is currently set to by looking at the frame and seeing where the index marker on the knob is currently aligned to. For example, in the photo above, the index mark on the knob is aligned to the "#7" mark. This means that the frame is currently set up to clamp and bend a #7 iron.

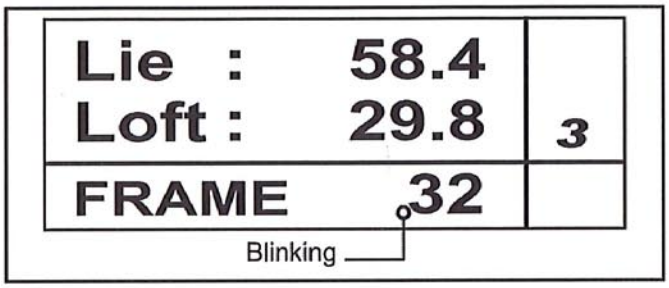


Looking directly left from the "#7" marking, you will see the following set of number engraved: 62 | 35. This indicates the standard Lie and Loft angle of a #7 iron. The standard loft angle of the club is what we use to designate the current Frame angle. Hence, in this case, while the frame is set to the "#7" mark, the A.P.E must display "35" under FRAME in order for you to measure your club and get the correct result.

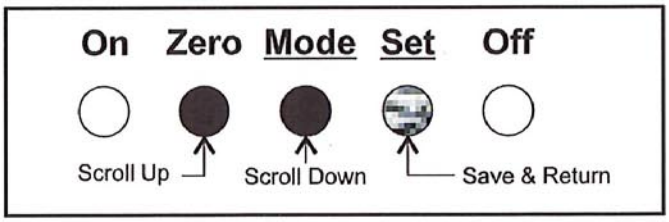


If the Frame Angle (FRAME) does not match with the current Frame Angle of the machine, you must adjust the value displayed before you go ahead and measure. To do so, press and hold the Set key until the display starts to blink.





Once the screen starts to blink, let go of the Set key. Then, use the Zero and Mode key to adjust the FRAME value until it matches the actual Frame Angle the unit is currently set to. Press the Set key once to lock it in and return to the default measurement screen.



Frame Angle Look Up Chart

If the explanation for reading Frame Angle is confusing, you can also use the lookup chart below. Simply identify what setting the index of the unit is pointing to on the right frame and then look up that particular setting's Frame Angle in the chart below.

Frame Engraving		Frame Angle
Right	Left	
P	72 | 3	3
W	57 | 10	10
#1-2	58 | 17	17
#3	59 | 21	21
#4	60 | 24	24
#5	60 | 27	27
#6	61 | 31	31

Frame Engraving		Frame Angle
Right	Left	
#7	62 | 35	35
#8	63 | 39	39
#9	63 | 43	43
PW	64 | 47	47
GW	64 | 51	51
SW	64 | 56	56
LW	65 | 60	60

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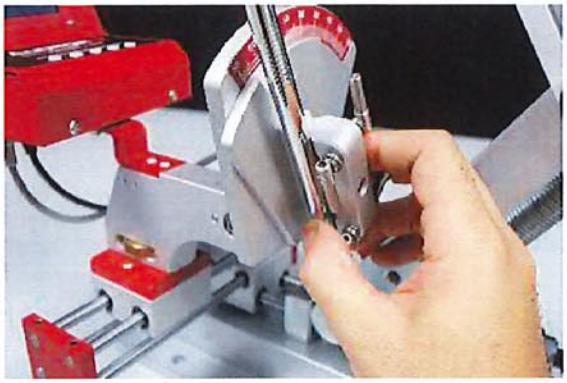
Measuring Lie & Loft

Once the FRAME Angle on the A.P.E has been adjusted to match the Frame Angle of the bending unit, you can now measure the Lie and Loft of your club. To do so, after your club has been secured properly, more the measurement plate towards the shaft of the club. Place the measurement plate against the shaft so that the shaft sits flatly in the groove as shown below.

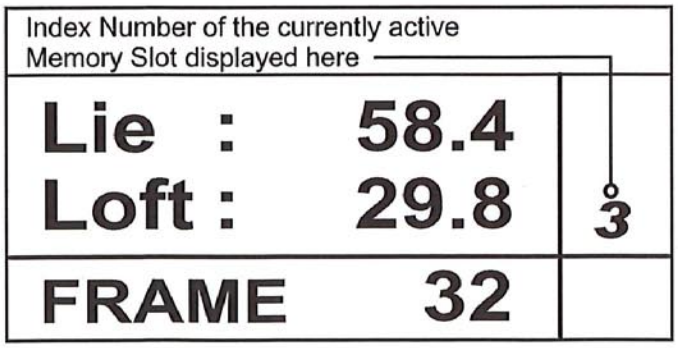


While holding the measuring plate flush to the shaft, the measured Lie and Loft angle of your club will be displayed on the A.P.E.

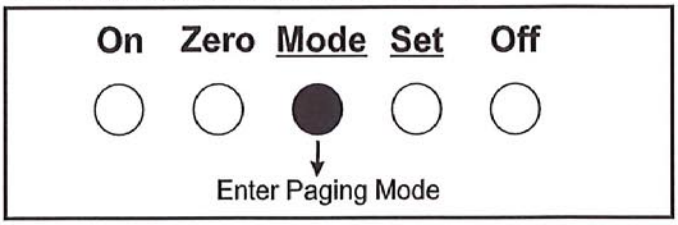
Note that the displayed Lie and Loft Values will only be accurate if the FRAME Angle has been properly adjusted prior.

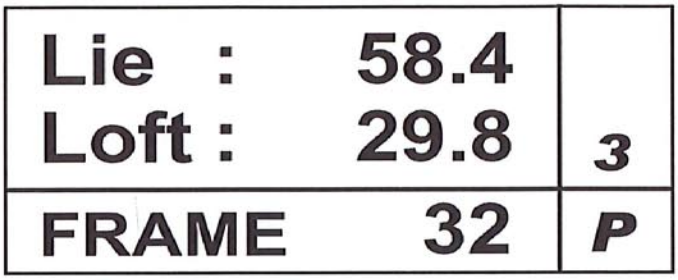
Paging Mode

The A.P.E of your 150951D Digital Bending Gauge comes with 20 slots of onboard memory. These memory slots are labeled 1~20. The currently active memory slot's index number is shown on the top right hand corner when in the default measurement screen. Going into Paging Mode allows you to view data that was previously saved, as well as let you change the active Memory slot open in the Default Measurement Screen.

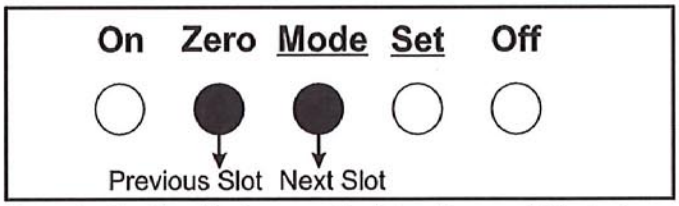


To enter Paging Mode from the default measurement screen, press the Mode Key. You can tell that the unit is in Paging Mode when the letter "P" is displayed on the bottom right hand corner of the screen.



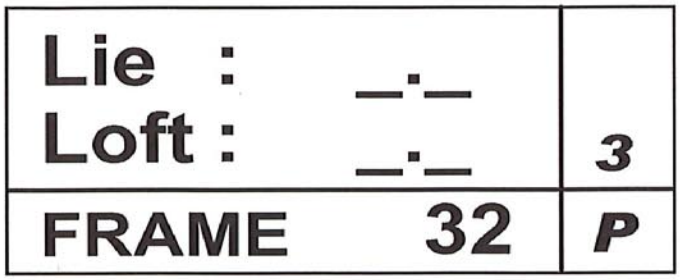


Paging Mode Key Functions
Zero: Move to Previous Memory Slot
Mode: Advance to Next Memory Slot



Once in Paging Mode, use the Zero key and Mode key to cycle between the 20 different memory slots. The Memory Slot index number on the top right hand corner of the screen indicates which Memory slot is currently being displayed.

Here, when you cycle to a memory slot that contains saved data, the data will be displayed on the screen. If the memory slot is empty, the Lie and Loft data will both be displayed as: "_._"



To exit Paging mode, simply move the measurement plate by at least 1 to 2 degrees. The P on the bottom right hand corner of the screen should disappear, indicating that you exited Paging Mode. The Memory slot last displayed in Paging mode will be the memory slot now open.

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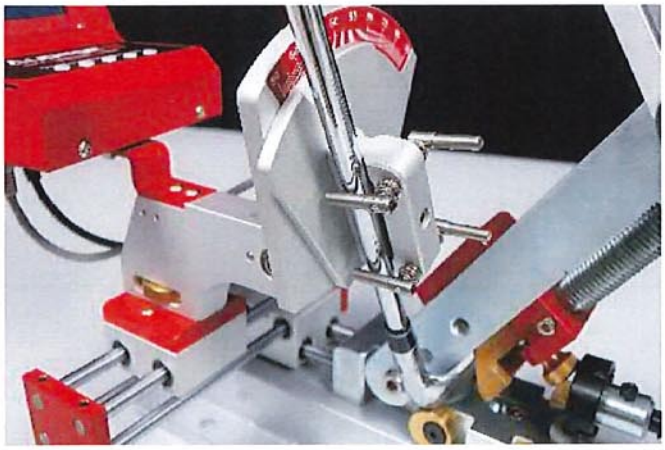
Saving Data

To save Lie and Loft data to the on board memory, first go into Paging Mode. Use the Zero Key and Mode Key to maneuver to the memory slot you wish to save to. If the memory slot you wish to save to already has data, saving new data into would overwrite any previous data.

Save Data Flow Chart
Paging Mode > Select Destination Memory Slot > Measure Club Lie/Loft > Save Data

Once the desired memory slot has been selected in Paging Mode, move the measurement plate by at least 1~2 degrees. This will return you to the Default Measurement Screen. Here, use the measurement plate to measure the mounted clubs Lie and Loft. Hold the measurement plate firmly against the shaft with one hand and press the Set Key with the other.



If this is inconvenient for you, you can also use the 2 clips built into the measurement protractor to secure the shaft without losing the Lie and Loft information displayed on the screen.

Once the Set Key has been pressed, you will be brought to the Save Data screen.

Save To?	3
MEM PRN NO	

Save Menu Key Functions
Zero: Save data to the active memory slot

Mode: Print data via the connected bar code printer

Set: Return to Default Measurement Screen

In the Save Data screen, you have three different options you can choose from. To save your data to the active memory slot, press the Zero Key.

To print the data via a connected barcode printer*, press the Mode key.

Note that when choosing either of the above actions, the screen will stay still and you will not exit the Save Data screen automatically. This is designed so that you can both save your data as well as print your data at the same time.

Once you have saved or printed your data, press the Set Key. This will return you to the default measurement screen. The active memory slot will automatically be advanced to the slot. (Eg. You saved the data into memory slot 4. After saving and exiting the Save Data menu, the new active memory slot will be memory slot 5)

Origin Mode

The Origin function built into the Auditor Pi Engine helps OEM's quickly QC their clubheads by allowing them to compare the measured head specs to the master models measurements. The Origin function "tares" the gauge to the master model so that future measurements made are displayed as the difference to the master model.

To use Origin Mode, first make sure the master model is mounted correctly into the gauge. Then, use the measurement protractor to measure the Lie and Loft of the Master model. Once you have made sure the Lie and Loft readings are correct, hold the measurement plate with one hand and with the other hand press the Zero Key.

Lie : 58.0 Loft : 29.0	3
FRAME 32	

On	Zero	Mode	Set	Off
○	●	○	○	○

Go into Set Origin Menu

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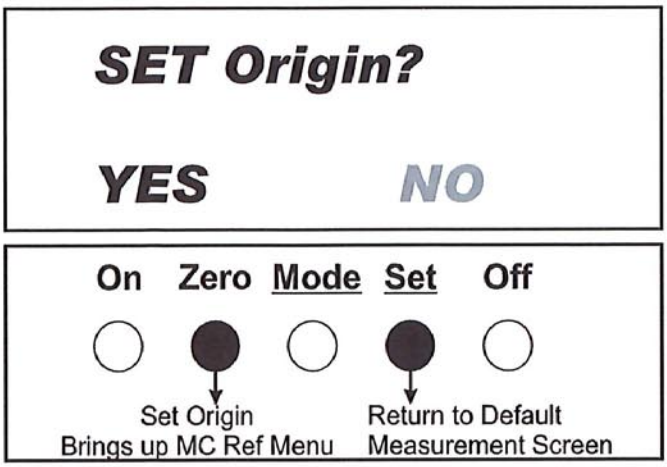
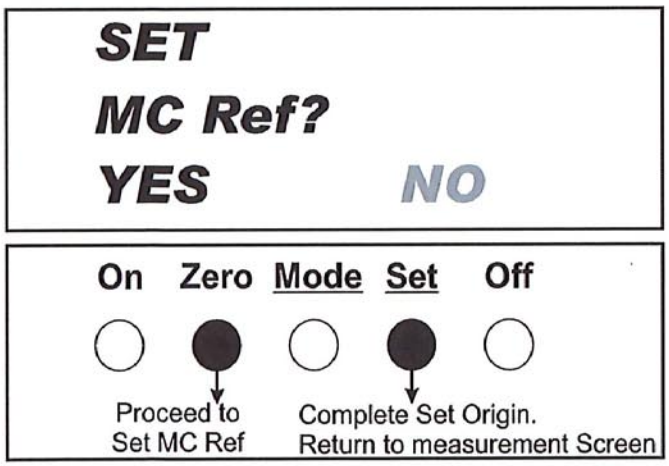
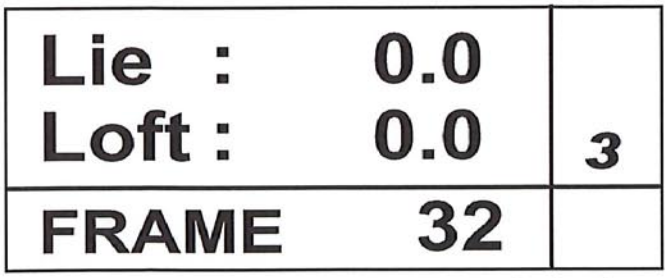
Once the Zero Key has been pressed, the screen will display the Set origin menu.



Press the Set Key to return to the Default Measurement Screen or the Zero Key to proceed with the Set origin function. This will bring out the Set MC Ref Menu.

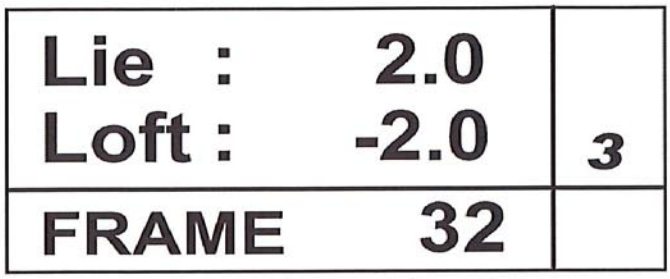


Press the Set Key to exit from the MC Ref menu. This should return you to the default measurement screen. Notice how both the Lie and Loft measurements are displayed as "0.0"



When the Lie and Loft measurements are displayed as "0.0", this means that the master model has successfully been set as the origin.
In our example, the measurements of the head that is set as origin is: Lie 58, Loft 29.

We now remove the master model and clamp in a different head with the following measurements: Lie 60 Loft 27. When you measure this head in Origin Mode, you will see the following result:



The measurements of the new clubhead is now displayed as the difference between it and the master model.

	Lie	Loft
Master :	58.0	29.0
Sample:	60.0	27.0
Display:	2.0	-2.0

To exit Origin Mode, simply turn off the Auditor Pi unit and turn it on again.