Installation Instructions for 81691 Digital Angle Gauge

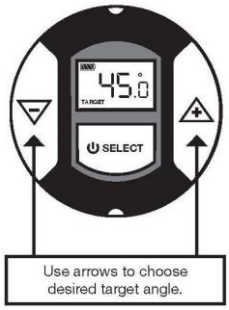
Power On/Off

- Put the unit down on a flat surface and press the Select button.
- The letters CAL will appear on the LCD. The unit is in self-calibration mode, **and it should not be touched or moved until the letters CAL no longer appear on the LCD**.

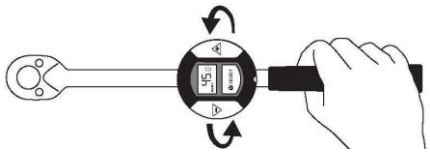
- Press and hold the Select button for 3 seconds to turn the unit off.
- Auto Shut Off: When not used for 5 minutes, the unit will automatically turn off to preserve battery power.

Operation

- Once the unit is done self-calibrating, the last Target Angle will be displayed on the LCD. When the unit is used for the first time, or when the batteries have been removed and reinserted, all zeros will be displayed.
- Press the Up or Down button until the desired Target Angle is reached. The Target Angle changes in 1-degree increments. Hold down the Up or Down button to speed up the change in value.



- Attach the unit using the magnets in the V-Channel bottom to the shaft of any standard ratchet, breaker bar, or wrench. It does not matter which direction the unit faces as long as the V-Channel is parallel on the shaft.



- Begin to apply torque to the fastener until resistance is felt. At this point, press the Select button to zero out the unit. This will be the starting point at which the unit will begin to measure angular rotation.

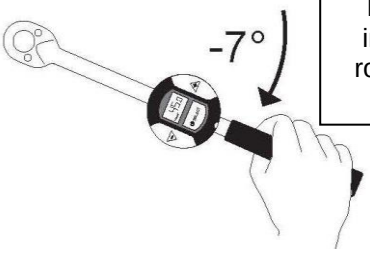
Operation *(Cont.)*

- Apply torque to the fastener. As the fastener rotates, the angular movement will be displayed on the LCD.
- As the fastener turns, the following will happen:
  - At 90% of the Target Angle, both LEDs will light up yellow.
  - When you are within 1 degree of the Target Angle, both LEDs will turn green and an audible buzzer will go off.
  - If the user continues to apply torque and turn the fastener, the LEDs will turn from green to red and the buzzer will go off in short bursts at 110% of the Target Angle.
- Once the LEDs light up green, the unit will continue to measure the angular movement until the readings fall below the Target Angle. At this point, the unit will stop taking readings and will display the highest angle hit. The highest angle reading will be displayed for 5 seconds and will be blinking. After 5 seconds, the Target Angle will be displayed.
- You are now ready to move onto the next fastener. Pressing the Select button again (either when the High Angle Value is blinking or when the Target Angle is displayed) will zero out the LCD and allow you to measure the angular rotation from that point forward.
- Pressing the Up or Down button at any time allows you to change the Target Angle.

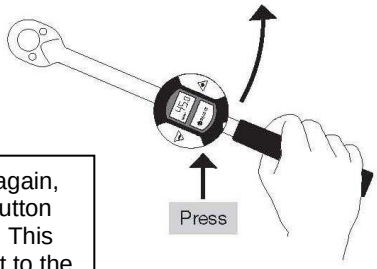
Ratcheting Feature

- The unit can be used on a ratcheting wrench in the following manner:
  - Any time the unit is rotated backwards more than 7 degrees, the unit will begin to beep and both red LEDs will begin to blink. This signals that the unit is in ratchet mode.
  - When you begin to move the unit forward again, press the Select button when initial resistance is felt and the unit will add the additional movement from this point forward to the previously saved angular movement.
  - The Ratchet function can be used as many times as necessary until the Target Angle is reached.

Ratcheting Feature *(Cont.)*



The angle gauge is put into rachet mode when rotated backwards more than 7 degrees.



Begin rotating forward again, and press the Select button when resistance is felt. This adds any new movement to the angular rotation saved when rachet mode was activated.

Operational Notes

- Pressing the Select button at anytime will reset the LCD to all zeros and allow the user to begin counting angular movement from that point forward. The only exception to this is if the unit is in ratchet mode, pressing the Select button will display the previous saved angle movement and begin to add to that point.
- Pressing the Up or Down button at anytime will instantly display the Target Angle (and will stop all measurements taking place).
- The accuracy of the readings are +/- 2% (from 10 degrees to 360 degrees), at speeds greater than 10 degrees per second and less than 120 degrees per second.
- Flex-Heads: The unit is designed to be used along a shaft that is 90 degrees perpendicular to the fastener. If the unit is used on a shaft with a flex head, and the head is flexed, the unit will be less accurate. This can be calculated by the following equation: Cosine of the number of degrees flexed.

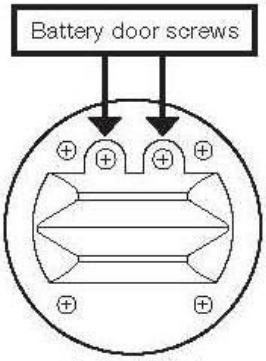
  For example, if the head is flexed 10 degrees, the Cosine 10 degrees = .985, so the unit readings will be low by 1.5%.

Changing Batteries

- Unscrew the access screws on the battery door.

Changing Batteries *(Cont.)*

- Lift battery door off the housing.
- Insert 2 AAA batteries. Battery orientation is specified on the inside of the battery chamber.
- Fit the battery door back on the housing, inserting the tabs first at a 45-degree angle, and then lowering the door into place.
- Reattach the access screws.



Back of Digital Angle Gauge

- Note: When the Battery Icon displays zero bars, the batteries must be changed in order to ensure that the unit operates properly.
- Note: When the unit is not used for prolonged periods of time, it is recommended you remove the batteries from the case.

Safety Instructions

- Always wear eye protection when using the Digital Angle Gauge to tighten a fastener.
- Keep proper footing and balance when using the Digital Angle Gauge.
- Never apply more torque than the maximum wrench capacity that the Digital Angle Gauge is being used on.
- Do not use Digital Angle Gauge near explosive gases or fumes.
- The Digital Angle Gauge is a precision instrument. Avoid bumping or shocking the unit when being used.
- Do not immerse the Digital Angle Gauge in fluids.