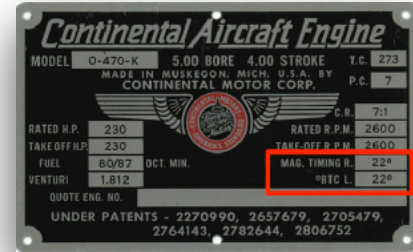


# Digital Magneto Timer Instructions

## Background

- The Digital Magneto Timer is a propeller blade-mounted digital inclinometer that is used to measure the angle of the crankshaft relative to Top Dead Center of piston travel (TDC) in the #1 cylinder.
- Overview: First TDC will be determined using the piston stop, then locate the desired angle before TDC for magneto timing.



## Preparation

- Materials:
  - Arrigetch Design Digital Magneto Timer
  - Arrigetch Design Piston Stop (the other piston stops on the market are the wrong length to use with this system)
  - Magneto Synchronizer (any model)
- Consult relevant TCDS, STCs, ADs, and engine data plate to determine the Magneto Timing ° Before Top Dead Center (BTDC).
- Ensure that the aircraft is completely stationary as any movement will affect Inclinometer readings.
- Remove all upper spark plugs.
  - This will allow the crankshaft to be rotated easily and safely.
- Prepare by hooking up your Magneto Synchronizer
- Mount the Digital Magneto Timer securely to the propeller using the provided velcro cinch strap.
  - The mount is designed to accommodate as many propellers as possible, however it is up to the user to ensure that a usable fit has been achieved.
  - The goal is to have the digital inclinometer rotating on a plane perpendicular to the crankshaft (parallel to the prop flange). The Inclinometer will show "Err" if it is too far from vertical.



Face of Inclinometer parallel to Crankshaft Flange

## Finding TDC

- Find the compression stroke on the #1 cylinder.
  - Rotate the propeller while keeping a finger over the spark plug hole until you feel air pressure building.
- Thread in the Piston Stop. (Install by hand only.)
- Locate the angle that the Piston Stop is contacting on either side of TDC:



## Arrigetch Design

- Turn the propeller in the forwards direction **slowly** until it **lightly** comes into contact with the Piston Stop.
- Zero Inclinometer.
- Rotate the propeller all the way around in the backwards direction until it is again **lightly** contacts the Piston Stop and write down the Inclinometer reading.
- It is recommended to repeat the previous step to ensure consistent readings:
  - Rotate the propeller all the way around in the forwards direction until it again **lightly** comes into contact with the Piston Stop.
  - The Inclinometer should read  $0^\circ (\pm 0.3^\circ)$ .
  - Rotate the propeller in the backwards direction until it is again **lightly** in contact with the Piston Stop and write down the Inclinometer reading.
  - Compare the 2 Inclinometer readings you wrote down.
    - If the 2 readings are within a few 10ths of a degree ( $\pm 0.3^\circ$ ) of each other , proceed.
    - If the 2 readings are not within a few 10ths of a degree of each other: go back and see what is causing the error. (Movement of the aircraft is the most common issue.)
- When the desired accuracy has been achieved, divide the recorded reading by 2. (So, for example, if you got  $60^\circ$ , then  $60^\circ/2 = 30^\circ$ .)
- Turn the propeller in the forward direction until it again contacts the Piston Stop.
- Remove the Piston Stop and continue to turn the propeller in the forward direction until you get to the reading you wrote down divided by 2. (So, in our example,  $30^\circ$ .) This position is TDC of the Compression Stroke on the #1 cylinder.
- Zero the Inclinometer at TDC.



## Finding Magneto Timing Position

- From TDC, turn the propeller in the backward direction until the Inclinometer reads the desired magneto timing position Before Top Dead Center.
  - (For example: if your engine's desired magneto timing is  $22^\circ$  Before Top Dead Center, rotate the propeller in the backwards direction until the Inclinometer shows  $22^\circ$ . Now the engine is set at exactly  $22^\circ$  Before TDC)
- Zero the Inclinometer at the Magneto Timing Position.
- Utilizing your Magneto Synchronizer, check/adjust the magnetos to obtain the correct timing. It is recommended to always rotate the prop in the forward direction when checking/adjusting magneto timing to eliminate backlash.

## Disclaimers

- These instructions are provided as a reference for a trained, certified, qualified individual. The individual performing the task assumes full responsibility and liability for any misuse and/or damage.
- Consult all relevant regulations and manufacturer's publications prior to use.