

PROPELLER BLADE MOUNTED TIMING DEVICE

MAGNETO TO ENGINE TIMING

- Any specific engine will have a data plate installed and most normally the required magneto timing will be stated there.
- The Type Data Certificate Sheet for the specific engine will also have the degrees BTDC specified.
- In some cases the engine may have the addition of an STC that may require a change to the specified magneto timing.



- The manufacturer design of a specific part numbered magneto will also have a preset expected internal timing.
- For these instructions it is taken as a given that the correct magnetos are installed correctly.

DESCRIPTION OF THE TIMING DEVICE

- The propeller blade mounted timing device is a self-contained unit that incorporates the blade mount, digital inclinometer, and adjustable cinch strap.
- The blade slots are graduated and spaced so as to allow installation on many different blade model designs.
- The desired position of the mount on the blade is to obtain perpendicular plane to the centerline of the crank.

INSTALLING THE TIMING DEVICE

- With the loose end of the cinch strap running over and through the slot on the back of the mount, gently slide the mount down along the blade from the outboard tip toward the propeller hub.
- Position the mount in a location of the blade that ensures the row of 3 buttons on the inclinometer points towards the center of the prop hub.



- There is no need to press fit the mount to the blade. Too tight on the blade may scratch the blade finish or damage the mount.
- Use the cinch strap to secure the mount to the blade securely.
- Once the mount is in the desired location along the blade, grab the loose end of the cinch strap, gently pull up and aft to secure the mount to the blade.
- Use just the force needed to

secure the mount, then while pulling aft bring the strap down and around the bottom edge of the blade and secure to the mating Velcro below the mount.

- The end result should be a secure mount with no wiggle but not too tight to cause damage.



- To remove the timing device mount, grasp the loose end of the cinch strap and pull it outward to disengage the Velcro.
- Then slide the mount off the blade out toward the blade tip.

OVERVIEW

- Timing the magnetos to the engine utilizes a slight variance to the procedures specified in the Continental Motors manual.



- The procedure is the same except for the tool used to determine Top Dead Center (TDC) and degrees Before Top Dead Center (BTDC) is the Propeller Blade Mounted Timing Device.
- An overview of the procedure is to find TDC of the #1 cylinder piston, then find the desired degrees BTDC of the #1 cylinder piston.
- Tools required to do this are.
- The Propeller Blade Mounted Timing Device.
- A magneto Synchronizer Device (many styles available).
- A threaded Timing Piston Stop Pin. A specific pin designed to be used with this device is provided in the kit.
- The ability to do a tiny bit of math.
- As stated earlier, it is presumed that the proper magnetos are properly installed on the engine.

MAGNETO TO ENGINE TIMING PROCEDURE

- Remove all upper spark plugs.
 1. This is to allow the propeller/crank to be rotated easily and safely.
- Turn propeller to bring #1 cylinder piston up to the most extended position on the compression stroke.
 1. Place thumb over the upper spark plug hole on the #1 cylinder.
 2. Rotate the propeller in the direction of forward rotation.
 3. When the #1 piston is coming up on compression stroke, air pressure will blow past your thumb.
 4. Release your thumb a little to allow the air to bleed out as you turn the propeller.
 5. You have reached TDC when the air pressure stops and turns to suction.
- Install the timing piston stop pin.
 1. Turn the propeller backwards to draw the piston down in the cylinder far enough to allow screwing in of the stop pin fully.
 2. Once the pin is fully seated, gently and slowly rotate the propeller in forward rotation direction until the piston lightly comes into contact with the top of the piston.
- Install magneto synchronizer.

1. Follow your specific model synchronizer instructions for proper installation.

TIMING PROCEDURE (CONT.)

- Place ignition switch to the “both” position.
 1. For safety it is best to disconnect the battery to avoid inadvertent starter engagement and major damage to the engine.
- Install the Propeller Blade Mounted Timing Device.
 1. Install in accordance with the previous covered instructions.
 2. While it is best to install the timing device on the blade that is head high with leading edge up, it can be installed on any blade to get same results.
- Finding Top Dead Center (TDC) of #1 piston.
 1. Turn on the digital inclinometer (push the “on/off” button).
 2. Ensure the #1 piston is lightly up against the timing piston stop pin by applying a slight pressure on the propeller blade in direction of forward rotation.
 3. Review inclinometer operating instructions that was provided with the unit for button operation.
 4. Press the “on/off” button again to zero the inclinometer.
 5. Rotate the propeller in backwards direction gently and slowly to bring the piston around to the stop pin from the backwards direction.
 6. While holding a slight pressure to keep the piston lightly in contact with the stop pin, write down the reading on the inclinometer.
 7. Push the “on/off” button to zero the unit. It may be necessary to push the button twice to get zero.
 8. Now rotate the propeller in the direction of the forward rotation all the way around gently and slowly until the #1 piston comes back into contact with the piston stop pin again.
 9. Write down the reading on the inclinometer again.
 10. It is expected that the 2 different reading will be within a couple of tenths of a degree of each other.
 11. If the difference is greater than a few tenths of a degree you should determine the cause and redo steps 2 through 9. Any movement of the airplane can cause the readings to be split.
 12. When you have the desired accuracy of the reading, divide the last reading by 2 and write this number down.
 13. Without moving the propeller, zero the unit again.
 14. Remove the piston stop pin.



15. Continue to rotate the propeller in the direction of forward rotation until the inclinometer reads the divided by 2 number.
 16. EXAMPLE. First reading 64.3, second reading 64.2, divided by 2 equals 32.1
 17. Push the “on/off” button again to zero the unit.
 18. Now the #1 cylinder piston is set exactly at Top Dead Center on compression stroke.
- Finding desired magneto degree timing.
 1. At this point the engine is set to #1 cylinder piston exactly at TDC and the inclinometer is reading zero.
 2. Simply rotate the propeller in opposite direction (backwards) to the desired degree timing Before Top Dead Center (BTDC) that will be indicated on the inclinometer.
 3. EXAMPLE. Engine data plate states magneto timing is 22 degrees BTDC. Simply rotate the propeller backwards until the inclinometer reads 22.0.
 4. Now the engine is set exactly at 22.0 degrees BTDC.
 5. NOTE. Due to the “slack” in the magneto gear drive train, it is best to rotate the propeller backwards a couple of degrees beyond your desired timing and come back to it in direction of rotation.
 - Adjusting the magnetos.
 1. Utilizing the magneto synchronizer, adjust the magnetos to get the correct indication.
 2. This sets the magnetos to exactly what the inclinometer reads.

COMPLETION

- Turn off ignition switch.
- Ensure magnetos are tight.
- Remove Propeller Blade Mounted Timing Device.
- Remove magneto synchronizer.
- Reinstall all spark plugs.
- Reinstall all ignition leads.
- Reconnect battery.
- Test ground run the engine.

DISCLAIMER

Only qualified, trained individual should perform this maintenance. Individual performing the task assumes full responsibility and liability for misuse and damage.