Timing your Lycoming GO-480 engine

(Ed note: A few Seabee owners with a Lycoming GO-480 engine have had issues with their mechanics assuming the timing procedure is a standard thing like direct drive engines. Not so much! Mechanics new to the Lycoming GO-480 series engines don't realize the prop turns 77 times when the engine is turning 120 times. Try as they may using the "standard" timing procedure it just doesn't work. Their frustration level goes up even more when they turn the propeller a full revolution, which changes the "timing" even worse. If you see your mechanic using a propeller protractor thingy, stop them! It ain't gonna work. Let your new mechanic read this and things will be all right!)

This is what the Lycoming manual says:

b. Timing Magnetos to Engine - Although several combinations of magnetos are used on this series engines, (see Table of Models for model application) the timing procedures, in the following paragraphs, are the same for all magnetos.

NOTE

Either the impulse coupling or retard breaker magneto (whichever is applicable) is installed in the left side of the engine.

(1) Remove a spark plug from the No. 1 cylinder (the front cylinder on the right). Also remove the inspection plug from the top of the reduction gear (rear mounted accessories) or from the right side of the accessory housing (crosswise accessories). Turn the crankshaft in direction of normal rotation until pressure can be felt when the thumb is pressed against the spark plug hole. Continue turning the crankshaft until the timing pointer is in alignment with the mark in the gear, which can be observed through the inspection hole. At this point, the engine is at 25° BTC on the compression stroke of No. 1 cylinder and is ready for assembly of the magnetos.

Here is the rest of the story:

This procedure is best done with at least one spark plug removed from all cylinders and assumes the magnetos have been installed to the engine correctly. That is, they have been on the Seabee for a while with no problems. This makes it easier to rotate the propeller as you check for "compression" on number one cylinder with your thumb. Remember the number one cylinder on the Seabee is the one on the **aft left** side of the Seabee. After the compression is felt, remove the plug on top of the gear box and SLOWLY turn the propeller in the normal direction of rotation until the left (right side of the airframe) magneto impulse coupling "click" is heard.

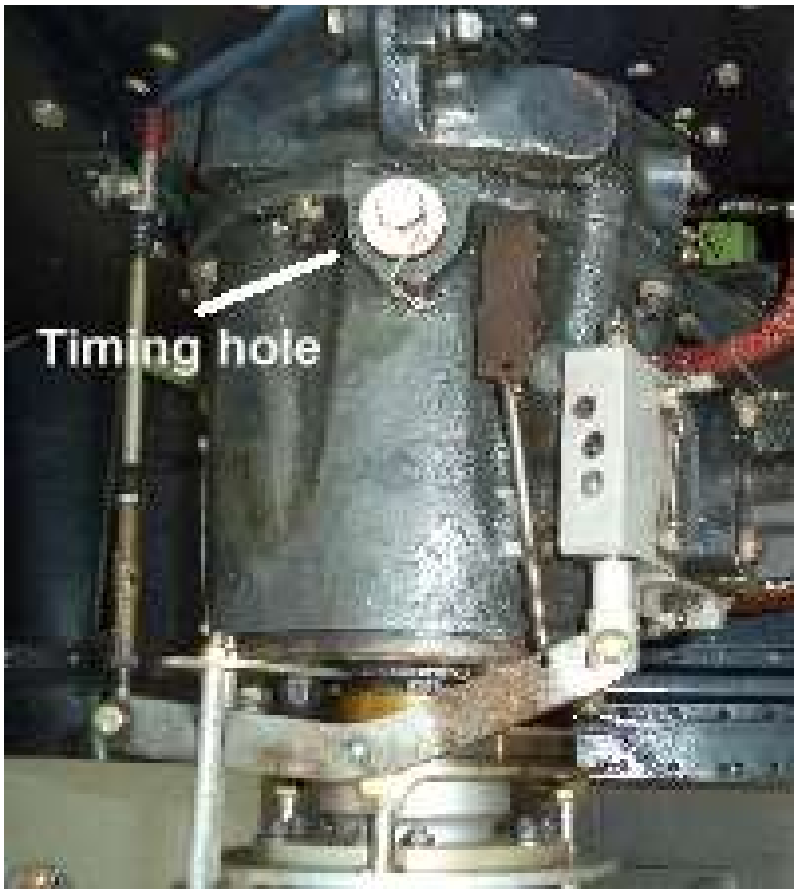
Now back off the propeller while looking into the timing hole on top of the gear box. You are looking for a mark similar to a magic marker line (which is actually an acid etched line). This is the 25° BTC line on the **crankshaft**.

> **WARNING**: The magnetos are hot when the P-leads are removed! Take the plugs out first.

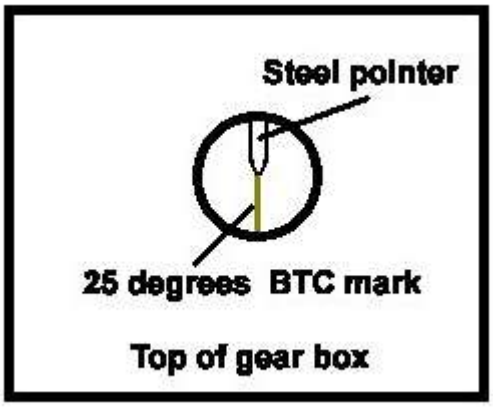
Remove the P-lead(s) on the magneto(s) to be adjusted. Install the P-lead adapter from your timing light goodies and connect the red wire to it. Connect the black wire from your timing light to a good ground on the engine. Now turn on your timing light and see what you got. Move the prop back and forth slightly without going too far as the inpulse coupling may engage again. See if the lights GO OUT (or come ON depending on your timing light) when the mark hits the pointer. If it's good, disconnect the timing light, put the timing cap back on (with a new copper gasket) and safety the plug. Install the spark plugs and go fly. Have a good day.

If the timing is off a little do this:

Remove the two nuts on the magneto(s) that is "off" a little.
Don't move the magneto yet!
Replace the nuts with NEW lock washers and replace nuts until they are just finger-tight.
Don't tighten the mags just yet.
Keep the timing mark on the crankshaft (inside the timing hole) lined up with the pointer.
(See photo and sketch below)



Looking down from top of gear box



Rotate the magneto(s) left and right until the timing light just come on (or goes out). Without moving the magneto, check the timing by rotating the propeller back and forth to see if the timing light(s) come on at the pointer. (If you are checking both mags, the lights should go out together). The point where the lights go out should be as close to the pointer as possible. If adjustment is necessary, you can turn the magneto by hand or use a **small** rubber mallet on the side of the magneto to make small adjustments (tap lightly). When all is well, tighten the magneto nuts to 17 ft-lbs and check the timing again just to make sure it hasn't moved. Reinstall the P-leads, spark plugs and safety the timing cap.

Some mechanics keep a record of how much the magneto has been adjusted each time to predict future problems. The timing should be checked at least every annual inspection or 100 hours which ever comes first. When you take the plugs out would be a good excuse to check the timing again.

One thing that is overlooked by some is the small felt inside the magneto cover on the back (no, front) of the magneto. The felt should be lubricated with just a drop or two of engine oil. This allows the cam to run smoothly over the point's control arm. Don't use too much oil as this can short out the magneto! Don't ask me how I know.

While you have the back plate removed from the magneto, check the point clearance (.018"). You may have to check the timing again.

Hint: Use the solid brass or bronze P-lead adapters! (see photo). The ones with the spring tend to fall apart at the most inoportune time. Don't ask me how I know either.

All the best and be safe!