

# RICHARD GOODE AEROBATICS

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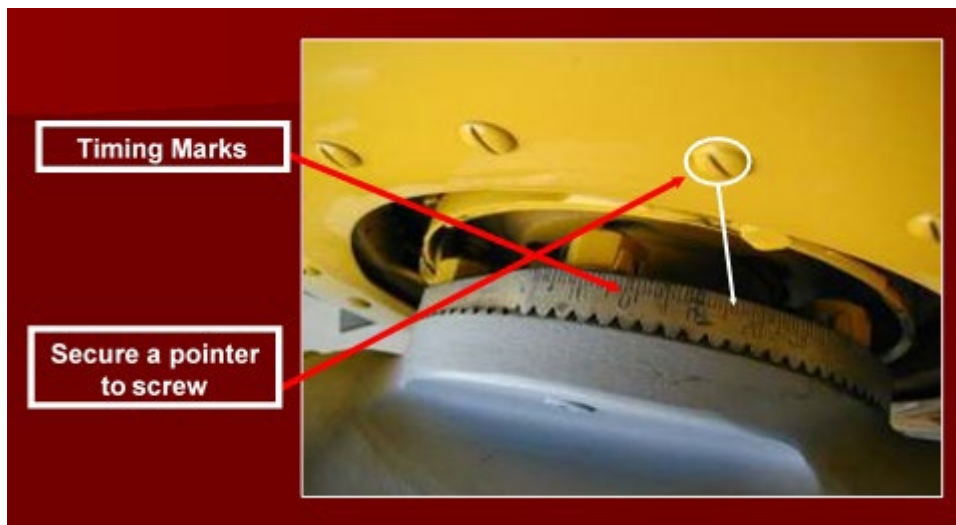
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**WORLD LEADERS IN EAST EUROPEAN & CHINESE RADIAL AIRCRAFT ENGINES**

## Magneto and Air Distributor Timing

### Magneto Timing



1. Remove one spark plug from each cylinder
2. Bring Cylinder #4 up to Top Dead Center on the compression stroke
3. Using a piece of safety wire, create a point by attaching one end of the safety wire to a screw or nut and bend the open end of the safety wire to point directly at the "0" mark on the prop flange.
4. Connect the timing box to the spring clip on the magneto points. Turn on the timing box, then turn the mag switch ON to 1+2.
5. Rotate the prop counterclockwise until the safety wire pointer points past 30 degrees.
6. Now rotate the prop clockwise slowly. Carefully watch the timing box. When the box either buzzes or sounds off or the light goes out, observe the safety wire pointer. This is where the points first begin to open and is THE timing of the magneto. Write it down.
7. On M9F magnetos, to adjust the timing there are two ways to set the timing, assuming the point gap is adjusted to spec i.e.: .010 - .014 or .25mm to .35mm. Ideally, .012 or .3mm.

#### Coarse Timing Adjustment

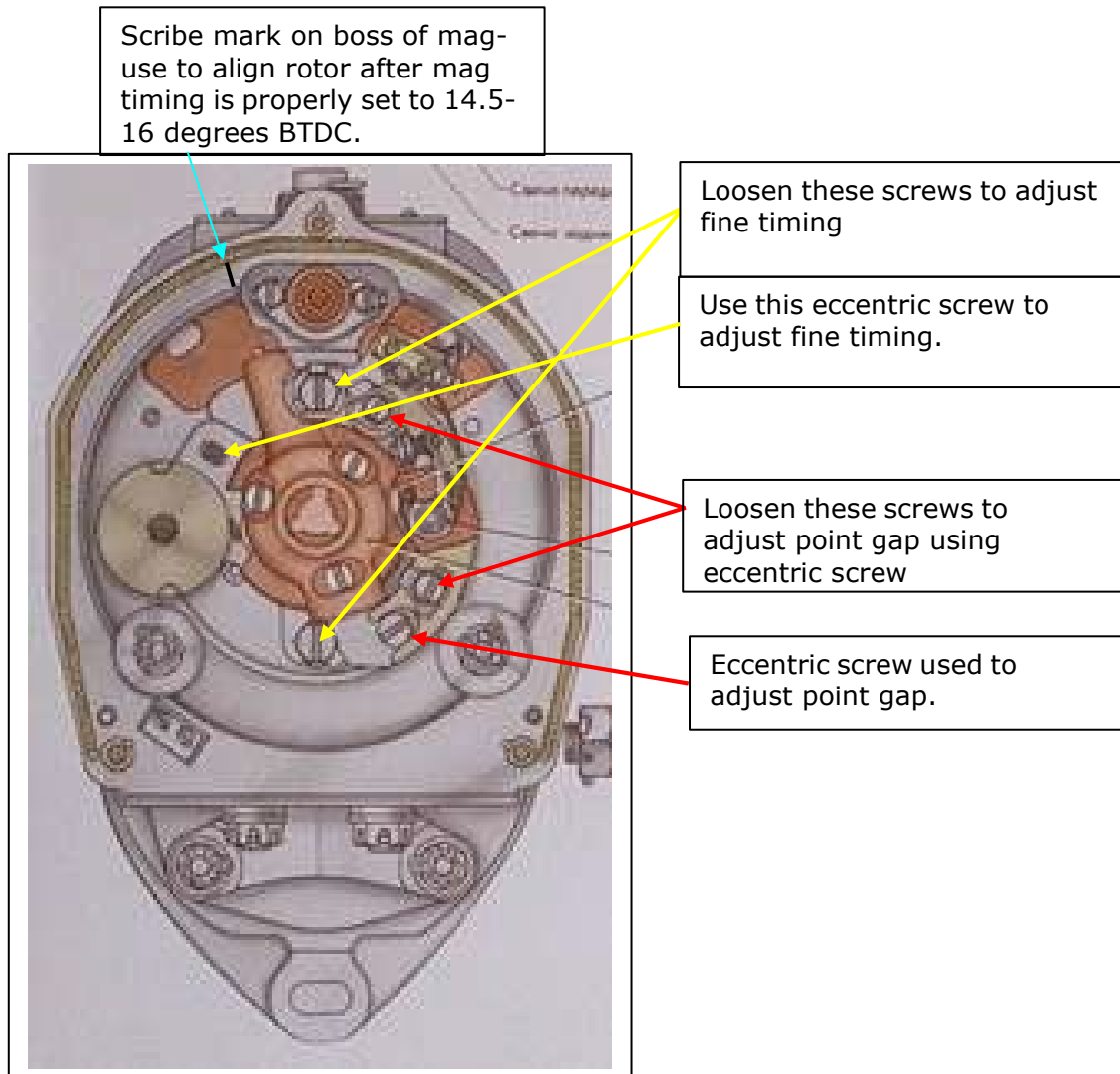
- A. Rotate the prop counterclockwise past the 30 degree mark again.
- B. Rotate the prop clockwise until the pointer is pointing at 14 – 16 degrees BTDC.
- C. loosen the 3 – 14mm magneto hold down nuts (Note – to loosen the front hold down nut, you will need a short 14 mm box end wrench bent at approx. 120 degrees. Once the wrench is bent, cut the open end off.)
- D. Turn on the magneto timing box
- E. Turn the mag switch ON to 1+2
- F. Rotate the magneto left or right until the timing box buzzes.
- G. Tighten the 3 magneto hold down nuts.
- H. Rotate the prop past the 30 degree mark again

- I. Rotate the prop clockwise until the timing box buzzes and read the timing.
- J. Turn the magneto switch to OFF.
- K. Repeat the above procedure if the timing is not within 14 – 16 degrees BTDC.

### **FINE TIMING ADJUSTMENT AND MAGNETO SYNCHRONIZATION**

- A. Look at figure 2 below. Find the small eccentric adjustment screw on the opposite side of the points as well as the two hex head screws which must be loosened to enable the plate to rotate using the eccentric screw. (Yellow lines).

**FIGURE 2**



- B. Reconnect the timing box to the spring clip on the points on BOTH magnetos.
- C. Turn on the magneto switch to the 1+2 position
- D. Rotate the prop counterclockwise past the 30 degree mark
- E. Rotate the prop clockwise until the timing box buzzes. Carefully observe the timing point for EACH magneto. Whichever mag is closer to the spec timing, you will now adjust the fine timing of the OTHER magneto to synchronize with the other mag. Example: Assume the left mag (#1) timing is found to be 15 degrees BTDC and the right mag (#2) is found to be 17 degrees BTDC. Adjust the #2 magneto fine timing eccentric screw to synchronize the #2 mag to the #1 mag at 15 degrees BTDC. Proceed
- F. Loosen the hex head screws you located in Fig. 2 for the fine timing adjustment eccentric screw on the magneto you want to adjust the timing on.
- G. Rotate the eccentric screw until the timing box buzzes for the magneto you are adjusting. The timing box should be buzzing for both magnetos. Tighten the hex head screws.

H. Check the magneto synchronization by once again rotating the prop counterclockwise past the 30 degree mark and then rotating the prop clockwise SLOWLY as you approach 20 degrees BTDC until the timing box buzzes for both magnetos. The timing box should buzz almost at exactly the same timing point as observed on the prop flange for both magnetos.

I. Should the timing be off by more than  $\frac{1}{2}$  degree, repeat the fine timing/synchronization adjustment.

## Magneto and Air Distributor Figures

Setting the magneto timing					Air distributor timing		Propeller ration	Control check
Engine type	Magneto type	Value stamped onto the case	Measured on the crankshaft	Measured on the propeller shaft	On the crankshaft	On the propeller shaft		
M-14 P	M9-25M	23	2,3	1,4	12°	8°	0,658	1,1 mm
		24	1,4	1				
		25	1	0,5				
		26	0,2	0,13				
		27	-1	-0,4				
	M-9F		<b>-23 ± 1°</b>	15,8				
	M9-35M	32	-4,4 ± 0,5°	-2,9 ± 0,5°				
		33	-5,3 ± 0,5°	-3,5 ± 0,5°				
		34	-6,2 ± 0,5°	-4,1 ± 0,5°				
		35	-7,1 ± 0,5°	-4,6 ± 0,5°				
		36	-8 ± 0,5°	-5,2 ± 0,5°				
		37	-8,8 ± 0,5°	-5,8 ± 0,5°				

### Example:

In case of the M9-35M magneto where 36° stamped into the case:

Ratio crankshaft: 1,125

Magneto pre-ignition: 36

Ratio propeller shaft: 0,658

In case of the Carillo pistons we use 21° instead of 23°

Engine pre-ignition (Carillo piston): 21

So the calculation:

Stamped value/crankshaft ratio: 32

The difference of the degrees: -11 on the crankshaft

On the propeller shaft: -7,238 degree, before the top centre



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