


1. Goal of this process


Check for problems with fuel distribution, respectively fuel injection, as well as ignition system weaknesses.


2. Preparations

- I. It is recommended to fly this flight test profile with two pilots to allow for work load distribution of flight execution, outside scan and the steps of this flight test profile
- II. A. For engines w/o turbocharger: Use AFM to determine minimum altitude with engine power $\leq 65\%$ at full open throttle
 B. For engines with turbocharger: Use AFM to determine a combination of RPM and MAP to generate $\leq 65\%$ engine power, Select altitude with ambient pressure close to chosen MAP
- III. Ensure engine monitor recording interval is between 1 and 2 seconds (see specific instructions if necessary)
- IV. Safety: Check AFM for in-flight engine restarting procedure. If it exists, study/memorize it. If there is no procedure specified in the AFM, use the following:
 - i. Ensure ignition set to BOTH magnetos
 - ii. Let propeller windmill or use starter
 - iii. Slowly enrichen mixture until engine starts

3. Execution

Nr.	Step	Details
1	Magneto check prior to flight	<p>(RPM drop on single magneto in this configuration may be different from AFM specifications for magneto check at full rich mixture. However, you should see all EGTs rise during single-magneto-operation and drop again when on both magnetos.)</p> <ol style="list-style-type: none"> 1. Lean mixture aggressively (However you still need to be able to achieve magneto check RPM) 2. Set magneto check RPM per AFM 3. Switch to right magneto for at least 10 seconds 4. Switch to both magnetos for at least 10 seconds 5. Switch to left magneto for at least 10 seconds 6. Switch to both magnetos for at least 10 seconds 7. Repeat steps 3-6 one more time 8. Set mixture for take-off 9. Perform magneto check per AFM
2	Climb to specified altitude	<ol style="list-style-type: none"> 1. Take off and climb to altitude that was determined in preparation to this flight 2. Establish straight and level flight 3. Set engine power setting $\leq 65\%$ 4. Set mixture to have EGTs $50^{\circ}\text{C}/100\text{F}$ rich of peak
3	Lean Cycles	<p> (It is best to perform the following sequence without using any lean-find-feature of the engine monitor. You should not lean the mixture beyond onset of engine roughness, as this may lead to engine shutdown and does not generate and additional useful data.)</p> <ol style="list-style-type: none"> 1. Very slowly and steadily lean the mixture until the onset of engine roughness. To get good data, this process should take at least 2 minutes from the start of leaning until onset of engine roughness. 2. Now enrichen the mixture again with the same slow and steady speed to reach the starting mixture setting after at least 2 minutes. 3. Repeat steps 1 & 2 again 4. Repeat step 1 again, then enrichen the mixture just enough to achieve smooth engine operation

Instructions	Rev.	Flight test profile fuel distribution and ignition system	 ENGILYTICS <small>know your engine</small>
FP_01	A		

4	Ignition system check	 <p>(This configuration will put a lot of stress on the ignition system of your engine. If there are significant weaknesses in your ignition system, the engine may shut down during single-magneto operation. Be prepared for inflight engine restart procedure (see Preparations))</p> <ol style="list-style-type: none"> 1. Maintain mixture setting of step 3.4 2. Switch ignition to right magneto 3. A. If the engine runs significantly rougher or has ignition failures, immediately switch back to both magnetos and enrichen the mixture. Either cancel the flight test profile at this point, or re-try step 2 with slightly richer mixture B. If the engine runs smoothly, maintain magneto setting for at least 30 seconds 4. Switch ignition to both magnetos and maintain setting for at least 30 seconds 5. Switch ignition to left magneto 6. A. If the engine runs significantly rougher or has ignition failures, immediately switch back to both magnetos and enrichen the mixture. Either cancel the flight test profile at this point, or re-try step 2 with slightly richer mixture B. If the engine runs smoothly, maintain magneto setting for at least 30 seconds 7. Switch ignition to both magnetos and maintain setting for at least 30 seconds 8. Repeat steps 2 – 7 two more times
5	Continue normal flight	<ol style="list-style-type: none"> 1. Ensure ignition is set to BOTH magnetos 2. Set mixture for normal cruise flight 3. Continue normal flight

4. Emergency procedures

Follow the instructions of the aircraft flight manual!

Pay special attention to

Ignition -> BOTH magnetos

Mixture -> RICH

5. Post-processing

- I. Download data from digital engine monitor
- II. Set recording interval of digital engine monitor to desired value (see instructions on our website for help with your unit type, our recommendation: 1-2 seconds)
- III. Upload data to www.engilytics.eu for review