

Flight Test Profiles

- **GAMI Lean Test**
- **In-Flight Lean Mag Check**

NOTE: Before conducting these flight test profiles, please program your digital engine monitor to utilize its highest available sample rate (if the rate is programmable). This will provide the highest possible resolution in the data that is dumped from the engine monitor after the test flight.

Instructions for setting JPI EDM-series monitor sample rate

(If you do not have a JPI EDM-series digital engine monitor, skip this section.)

- Hold the STEP and LF buttons simultaneously for five seconds to put the EDM into programming mode.
- Tap STEP repeatedly until the display shows “DUMP? NO”
- Hold the STEP and LF buttons simultaneously for five seconds to access long-term memory.
- You should see “TIME n” denoting the current sampling rate of the instrument. “TIME 6” means that the instrument is set to its default 6-second sampling rate.
- Tap or hold LF until the display reads “TIME 2” indicating that the sampling rate is 2 seconds (which is the highest rate supported by the EDM).
- Tap STEP to sequence through the rest of long-term memory. While doing this, you may want to check and possibly set the time clock (month, day, year, hour and minute) to accurate UTC time, and make sure that your N-number is entered correctly. Tap or hold LF to make changes to any of these values.
- When you reach “END Y” tap STEP to end the programming procedure.

To set the sample rate back to the default 6-second rate after the test flight, repeat this procedure.

GAMI Lean Test

The GAMI lean test is a test of mixture distribution, and is used to help diagnose incorrect fuel nozzles sizing, dirty/clogged fuel nozzles, induction system leaks, etc.

Perform the GAMI lean test procedure by setting up the airplane in normal cruise on autopilot.

IMPORTANT: Cruise power setting for this test should be 65% or less to avoid excessive CHTs and stress on the cylinder assemblies. Then perform the following procedure.

- Start with a rich mixture of at least 100°F ROP.
- Retard the mixture control as slowly and steadily as you possibly can until you reach an LOP mixture that is lean enough to produce significantly rough engine operation. Try to do this slowly enough that it takes no less than 3-4 minutes to move from the rich mixture to the lean one. The slower and smoother you can move the mixture control, the better.
- If your engine monitor does not record fuel flow, then manually record the exact fuel flow value as each individual cylinder reaches peak EGT. The fuel flow should be recorded to the nearest 0.1 GPH or 1 PPH from a digital fuel flow instrument if possible. (If your engine monitor does record fuel flow, then manually recording is not necessary.)
- Reverse the process, very slowly and steadily richening the mixture until you get back to about 100°F ROP. Again, try to do this slowly enough that it takes 3-4 minutes to do the sweep. If your engine monitor does not record fuel flows, then manually record the exact fuel flow value as each individual cylinder reaches peak EGT.
- Repeat this rich-to-lean-to-rich mixture sweep procedure several times.

For twins, repeat this procedure on the other engine. Do each engine separately, do not try to do both simultaneously.

In-Flight Lean Mag Check

The in-flight lean mag check is a test of ignition system performance, and is used to help diagnose problems with magnetos, ignition harnesses, spark plugs, ignition timing, etc.

Perform the in-flight lean mag check procedure by setting up the airplane in normal cruise on autopilot. Then perform the following procedure.

- Lean to an aggressively lean cruise mixture. The leaner, the better for this test. The test will be much more discriminating and meaningful if you lean to a lean-of-peak-EGT (LOP) mixture setting. Preferably lean as far LOP as you can without experiencing significant engine roughness.
- For a key or rotary style magneto switch (as found in most singles), select BOTH-LEFT-BOTH-RIGHT-BOTH, leaving the mag switch in each of these positions for one full minute.
- For individual magneto toggle switches (as found in most twins), turn off the LEFT ENGINE/LEFT MAGNETO switch for one full minute, then turn it back on and wait for one full minute. Repeat this procedure with each of the other three magneto switches in sequence. (LE/LM, LE/RM, RE/LM, RE/RM.)

NOTE: It is normal for engines to run a bit rougher on one magneto than they do on two, but they should not run change-of-underwear rough. Please report on the level of perceived roughness during phase of the test.

NOTE: For turbocharged engines, TIT may rise to above red-line during single-magneto operation. This is normal and will not do any harm if the exceedences do not exceed a few minutes' duration.

After The Test Flight

When you have completed the test flight, please dump your engine monitor data and upload the data to Savvy's engine monitor data analysis website at SavvyAnalysis.com. If you don't know how to dump your engine monitor data, please refer to the document "How to download engine monitor data" at <https://savvyanalysis.com/how-to-download> that provides detailed procedures for dumping the data and uploading it to SavvyAnalysis.com.

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