

SAFETY GRAM 4.0

December 2021



Air Force Aero Clubs,

In the past two weeks there have been two incidents at Air Force Aero Clubs where pilots have had to accomplish forced landings on unprepared surfaces due to engine issues. In both incidents the aircraft were successfully landed and able to be recovered. Also in both incidents initial indications point to improper mixture procedures causing the engines to either lose significant power or shutdown in flight.

Many times when we think about and practice engine failures the assumption is something mechanical failed internal to the engine, but in reality mechanical failures make up a very small portion of why engines quit working in flight. A majority of the time it is something that could have been prevented with proper preflight, checklist usage, or airborne procedures. Some examples of preventable reasons why engines can stop working include:

- **Fuel Starvation:** This is when there is adequate fuel on board the aircraft, but for some reason the engine is not getting the fuel. Some common ways this happens is to have accidentally put the fuel selector switch to OFF or forgetting to change between LEFT/RIGHT/BOTH as checklists require. Another could be not having a fuel boost pump on (if installed).
- **Fuel Exhaustion:** This is when the engine actually runs out of fuel and could be caused by faulty fuel gauges and why it is important to verify fuel levels during preflight with a dipstick as checklists require.
- **Fuel Contamination:** This is when the fuel has contaminates in it which could cause the engine to work improperly and eventually fail. This is why you sump the aircraft fuel during pre-flight to check for the correct fuel and ensure it isn't contaminated.
- **Ignition:** Aircraft magnetos provide aircraft ignition through a spark plug. Ensuring the magnetos are in BOTH while airborne and testing them during the engine run-up procedure on the ground
- **Air Blockage:** Thoroughly checking the engine air intake for any blockages or FOD during pre-flight.
- **Carb Icing:** Ensuring Carburetor heat is at the proper setting for different phases of flight.
- **Mixture Procedures:** Proper mixture procedures are used to ensure the engine is running at its optimum performance for environmental conditions.
- **Engine Instrument Monitoring:** Monitoring engine instruments in flight may be the first sign to an impending engine problem. Monitoring them regularly will help identify a problem sooner so the proper steps to either correct the issue or land can happen.

Actual internal mechanical failures of single engine piston engines are very rare and probably even rarer because of Air Force Aero Clubs engine overhaul requirements. Being aware of other common reasons why your engine might quit, many which can be pilot induced, will help you prepare to handle the situation in flight when time to diagnose the problem is limited. This month please discuss some common errors pilots could make that have the potential to lead to engine problems.

Fly Safely,

A handwritten signature in black ink, appearing to read 'Jonathan Koch', written in a cursive style.

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