# Policies and Procedures for Preheating LFC Airplanes

Updated: 2/22/2015

## HISTORY

During February 2015 the weather in Lexington was very cold. There was an incident in which a pilot along with an instructor attempted to start the C-152 that had not been preheated. It was around 15-20 degrees per Mike Smith. Needless to say, the engine did not start and they wore down the battery. Fortunately Mike observed what they were doing and stopped them before they attempted to start another bird……our newest 172. Had they done so, we would have had another battery worn down.

This incident clearly indicates that many of our pilots and instructors do not understand the damage that can occur and the potential risk of an engine failure as a result of a cold engine start. They must think that if they can get an engine started, and the oil temperature comes up, then all is well and they are good to go……but this certainly is not the case

More importantly, sever damage to an airplane engine does and will occur anytime the engine has a cold soak temperature below freezing. The only way to bring the temperature up to a proper start temperature is to thoroughly preheat. Major damage can occur below 20 degrees and can lead to catastrophic engine failure right after takeoff.

We no longer have the option of having TACAIR bring the planes in the night before a flight when the temperatures are cold, and our hanger is not heat. As a result, it is the responsibility of the pilot to bring the airplane they want to fly into the hanger and perform the proper preheating procedure. We have installed a large-face thermometer in the hanger to measure the hanger inside temperature to assist with performing the preheat procedure.

## PROCEDURE

The following procedure is to be followed any time an airplane is to be flown in cold weather:

1. If the airplane has been an environment above 32 degrees F for 3 hours or more, no preheat is required. Avoid cranking for more than 5 seconds each start attempt. Make sure the engine temperature reaches at least 90 degrees F before attempting a takeoff.
2. If the airplane has been in an environment between 20 & 32 degrees, the airplane must be brought into the hanger, the preheater turned on, and the inside temperature of the hanger must be brought up to 40 degrees as measured by the large face thermometer on the wall of the hanger. As soon as the temperature inside the hanger has reached a minimum of 40 degrees F, the preheat may be turned off, the airplane taken outside, and the engine started. Avoid cranking for more than 5 seconds each start attempt. Make sure the engine temperature reaches at least 90 degrees F before attempting a takeoff.
3. If the airplane has been in an environment of less than 20 degrees, the airplane must be brought into the hanger, the preheater turned on, and the inside temperature of the hanger must be brought up to 40 degrees as measured by the large face thermometer on the wall of the hanger. The temperature inside the hanger must be maintained at a minimum of 40 degrees F for 30 minutes before terminating the preheat process. The airplane can be then be taken outside and the engine started. Avoid cranking for more than 5 seconds each start attempt. Make sure the engine temperature reaches at least 90 degrees F before attempting a takeoff.

**BACKGROUND**

A noted A&P and aircraft maintenance expert Mike Busch, has stated in one of his published articles:

***"In less than a minute, a single cold start without proper preheating can produce more wear on your piston aircraft engine than 500 hours of normal cruise operation. If it's cold enough, a single cold start can cause the catastrophic destruction of an engine shortly after takeoff. This is serious stuff, folks! .....you need to know how to make it through the cold-weather flying season without damaging your expensive power plant."***

**Also he states:**

***"As a general rule, we consider any start in which the engine is cold-soaked to a temperature below freezing (32°F or 0°C) to be a "cold start," and any start below about 20°F (-7°C) to be nothing short of a capital offense against your power plant. The colder the temperature, the worse the crime."***

With the move of LFC to the GA side of the airport we have lost the convenience to have TacAir preheat our planes. As a result, we are going to have to expect pilots to do things differently if we expect to continue to get good engine TBO's and avoid a catastrophic engine failure due to cold engine starts. There are too many good, warm flying days during the year to risk a cold engine start just to get a little flying time in…..and risk the loss of life, limb, and a perfectly good airplane!