

TRICKS FOR STARTING PROMPTLY AT INTERMEDIATE TEMPERATURES

Airplanes can be a particular pain to cold-start at 30° - 40° F. (They can also be tough to luke-warm-start 10 or 15 minutes after shutdown, for much the same reasons.) You're damned if you prime, or damned if you don't, either way. The 172, especially, can be obnoxious at intermediate OAT's, and the Mooney can refuse to go again after a brief shutdown.

(Note: use the recommended procedure on the Mooney -- it generally works -- but if it fails, then consider what's outlined here.)

THE THING TO AVOID IS GRINDING & GRINDING: PROPERLY SET UP, THE ENGINE STARTS AT ONCE! YOUR JOB IS TO FIGURE OUT WHAT IT NEEDS AHEAD OF TIME, GIVE IT JUST THAT, AND GET A PROMPT START EACH TIME WITHOUT GRINDING.

In the in-between range, on the 172 and other carburetted engines, what seems to work best is to give it just one shot of prime, and then wait. Finish the preflight. Check your charts and plates. Wait. (It's not necessary to pull the engine through, etc., as in the full cold-start procedure, but it is necessary to allow time for the gasoline to evaporate inside the engine, and for any excess to drain out or get lost.) Then give one or two sharp strokes with the throttle (mixture rich), then CUT THE MIXTURE OFF and crank. (For a luke-warm start, omit the shot of prime. Squirt a little gas by pumping once or twice, then cut off and crank). It should catch instantly. When it does, push the mixture in.

If it doesn't catch, stop cranking. Don't do anything further. Wait 4 - 5 minutes and try again. It will usually start right up. THE MAIN THING IS NOT TO OVER-PRIME, AND WHEN CRANKING, NOT TO PUT IN MORE GAS THAN THE ENGINE CAN HANDLE, especially at these intermediate temperatures! Most particularly, don't keep pumping the throttle and priming, or you will have a fire. You only need to load a few cubic inches inside the engine, not the whole engine compartment!

Sometimes you see people pumping hell out of the throttle. Each pump is a teaspoon or so of raw gas. Signs of too much priming or pumping are dripping and smell of gas, and later, colored stains, etc. on the firewall and nosewheel. Don't do it. Remember that you only need a medicine-dropper's worth of gasoline vaporized in a confined space (the cylinders) to produce one hell of a bang. (Compare the highly-dangerous kid's stunt with a plastic-topped coffee-can with a pinhole or spark-plug for ignition. All you need for a terrific bang is a couple of drops on the crumpled paper towel inside - and to wait a moment or two before firing!)

Another thing to keep in mind that properly set up, it only takes a twitch of the prop past the spot where the impulse-coupler clicks, and it's running! (Useful if you ever have to start by propping, or sense that you have only one or two blades worth of cranking left in the battery.) It's much more elegant to stand on the float and just twitch the blade past the 10-o'clock position to set it running smoothly, as I have seen sea-plane operators do, rather than have to belly up close to an engine only poorly set up to go, and then grunt and heave to whop the prop through repeatedly, meanwhile exposing yourself to horrible risk and uncertainty.

If you're in a hurry, and the engine doesn't catch right away, tie the plane down or put someone qualified inside, check keys in pocket, open the throttle, cut off the mixture, and prop it at least 20 blades. Get back in and try, without priming. Usually, after cleaning it out this way, it will start right up.

If you suspect that in the course of cranking and propping, it has somehow gone from too rich to too lean, enrich the mixture, try just one stroke of the throttle, then cut off and crank again. There is a great temptation to suspect this too soon, and to give it still more gas. Usually, the engine is still flooded, in which case this last maneuver is a definite mistake which will have to be undone by still more propping! Remember, when the mixture up in the cylinders is right, IT WILL GO!

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Flooding is particularly apt to happen in cool weather (or analogously, when starting from luke-warm), when both the shot of prime and the gas brought in via the regular settings of the carburetor do not vaporize promptly, but then do so eventually, leaving the engine progressively more and more flooded and the mixture in the cylinders hopelessly rich. The trick is to use only a little prime, and then wait for it all to evaporate to produce the right gas-air mixture, ready to fire. Keeping the mixture control cut off avoids dumping in still more fuel, and guarantees that the mixture will in fact progress toward lean, with firing virtually certain when the right composition is reached. (This procedure works on snow blowers and lawn mowers too!)

When it's very cold, gasoline vaporization is extremely slow, and flooding doesn't matter quite so much -- you generally need all the vapor from a deliberate flooding just to obtain a reasonable mixture that will fire. In frigid weather, use the regular cold-start procedure, which is designed to flood the engine to a controlled degree. Even so, not overdoing it, and waiting a few minutes for the gas to evaporate and distribute itself around seems to help.

No one seems to know whether or not the sure-fire instant-start trick for snow blowers in extremely cold weather, of directing a steady stream of propane from an unlit bernzo torch into the air intake while cranking, is appropriate with an aircraft engine. Perhaps, as with starting ether, you risk a bad backfire, and therefore this is FORBIDDEN unless we hear officially otherwise. I mention it here only to point out that it is, in fact, the ultimate effect you are trying to produce via the cold start procedure with the the cold and recalcitrant avgas.

The main thing to bear in mind is that WHEN THINGS ARE JUST RIGHT, THE ENGINE WILL ALWAYS GO -- INSTANTLY! Try to psych it out ahead of time -- it's a great game: Every time you can start instantly, you've won -- and so have we all!