Training aid only, not flight instruction. Review it with your CFI and get their approval before you use it in training or in the airplane. Check every number against the POH and current FAA sources. Last reviewed Nov 15, 2026 against the Cessna 172N (1977) and 172P (1981) Pilot's Operating Handbooks.

STARTING THE CESSNA 172

Cessna 172N and 172P · Carbureted Lycoming O-320 · Engine start

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AT A GLANCE

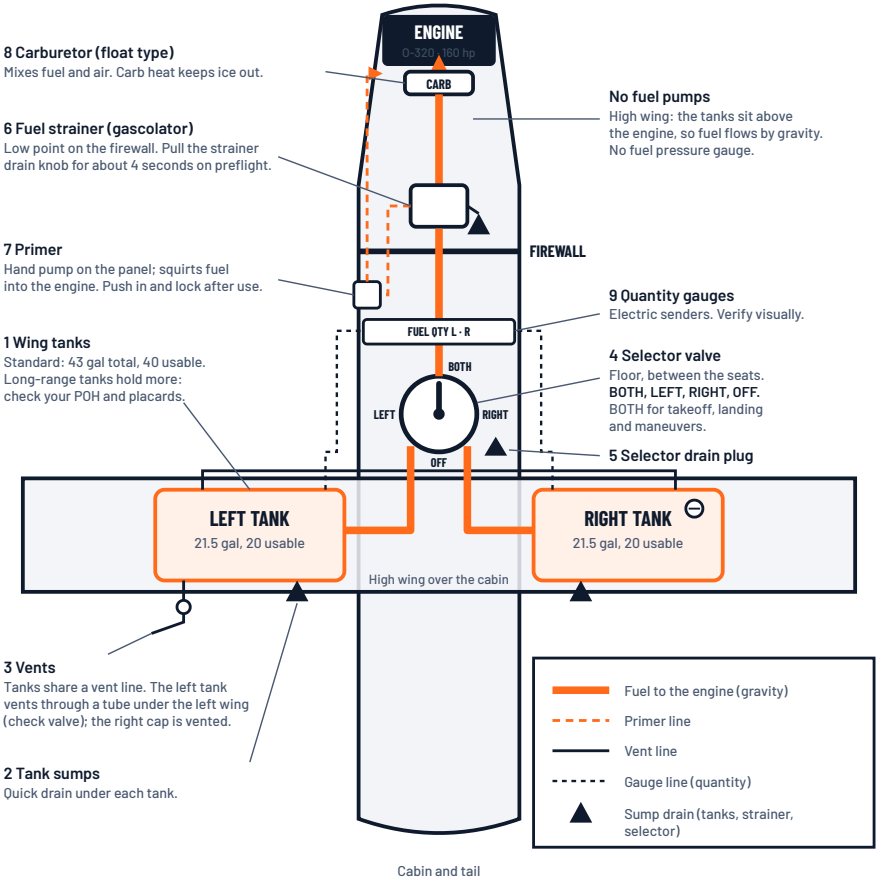
The numbers that matter for a carbureted 172N or 172P. They come from the 1977 172N and 1981 172P handbooks; check them against the POH in your airplane.

Item	172N and 172P
Fuel selector	**BOTH** (no electric fuel pump: fuel feeds by gravity)
Mixture	**RICH**
Carb heat	**COLD** (pushed in) for the start and all ground operation
Prime, cold engine	**2 to 6 strokes**: 1 or 2 on a warm day, up to 6 in the cold. Lock the primer
Prime, warm engine	**None**
Throttle	Open about **1/8 inch**
Oil pressure	Rising within **30 seconds** (about 60 seconds in very cold weather), or shut down
Warm-up	About **1,000 RPM**
Run-up	**1,700 RPM**: mag drop no more than **125 RPM**, no more than **50 RPM** between mags

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FUEL SYSTEM

Fuel flows by gravity from the wing tanks, through the selector and the fuel strainer, to the carburetor. There are no fuel pumps; the primer is the only way to push fuel into the engine for the start.



Schematic, not to scale. Tank sizes are for standard tanks; check the vent layout and tank options against the POH for your airplane. The Cherokee's pumped system is in Aerodynamics and Aircraft Systems.

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BEFORE START

Do these in the same order every time, so a missed step stands out.

1. **Preflight complete.** Fuel sampled, oil checked (at least 4 quarts on the 172N; check your POH's minimum), tie-downs and chocks removed.
2. **Seats, belts and harnesses** adjusted and locked. Seat latched on its rail.
3. **Fuel selector BOTH.**
4. **Radios, avionics and electrical equipment OFF.** On a 172P, the avionics power switch must be off for the start to protect the radios.
5. **Brakes:** test, then set the parking brake.
6. **Circuit breakers** in.

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NORMAL START (COLD ENGINE)

A cold engine needs fuel in the cylinders before it will fire. The primer squirts it straight into the intake ports.

1. **Mixture RICH.**
2. **Carb heat COLD.**
3. **Master ON.** Beacon on now if your school wants it on before the start.
4. **Prime 2 to 6 strokes.** Use one or two on a warm day and more in the cold. Push the primer fully in and turn it to lock, or the engine can suck fuel through it and run rough.
5. **Throttle open 1/8 inch.**
6. **Propeller area clear.** Look, then call "Clear!" out the window and wait a moment.
7. **Ignition to START.** Release it to BOTH as soon as the engine fires. Crank for no more than about 30 seconds, then let the starter cool for a couple of minutes before you try again.
8. **Oil pressure:** rising within 30 seconds, or shut down and find out why.
9. **Throttle** to about 1,000 RPM.
10. **Lights as needed, avionics power ON, radios ON.**

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HOT START

A warm engine already has fuel vapor in the intake. Priming it is the usual way to flood it.

- **No prime.** Everything else is the same as a cold start.
- If it catches and dies, or coughs black smoke, treat it as flooded.

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FLOODED ENGINE

Signs: weak, uneven firing followed by puffs of black smoke from the exhaust, or a strong fuel smell.

1. **Mixture IDLE CUT-OFF** (pulled full out).
2. **Throttle FULL OPEN.**
3. **Crank** through several revolutions to blow the extra fuel out.
4. **Then do a normal start without priming:** mixture rich, throttle back to 1/8 inch, ignition START.

- Some instructors teach catching the engine while it is still cranking in this setup: when it fires, push the mixture in and pull the throttle back at once. The handbooks describe clearing first, then a normal start. Use the method your CFI teaches, and never forget the throttle is wide open.

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UNDER-PRIMED

Sign: the engine turns over but never fires at all. This is most likely on a cold engine in cold weather.

- Prime again, a stroke or two at a time, then try again.
- As soon as the cylinders start firing, open the throttle slightly to keep it running.

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AFTER START

1. **Oil pressure** in the green within 30 seconds (about 60 in very cold weather).
2. **Throttle** about 1,000 RPM to warm up. Long idling fouls plugs.
3. **Ammeter** showing a charge.
4. **Carb heat stays COLD on the ground** unless there is ice. Hot air bypasses the air filter, so dirt goes straight into the engine.
5. **Avionics ON, radios set, lights as needed.** Then taxi with the yoke positioned for the wind (see Taxiing in Wind).

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COLD-WEATHER STARTS IN MICHIGAN

Cold oil is thick, the battery is weak, and fuel doesn't vaporize well. Most engine wear happens in the first seconds after a cold start.

- **Preheat.** The 172P handbook recommends an external preheater and external power below about **20 °F (–6 °C)**; the 172N handbook says in extremely cold weather, **0 °F (–18 °C) and below**. Lycoming's own guidance and most shops preheat at about 10 to 20 °F. Use the more conservative number, and see Winter Flying in Michigan.
- **Pull the prop through** a few turns by hand before a cold start to loosen the oil. Treat it as live: a broken magneto ground wire can let the engine fire. Ignition off, mixture idle cut-off, and stay out of the arc.
- **With preheat:** ignition off and throttle closed, prime 4 to 8 strokes while the prop is turned by hand. Then a normal start: master on, mixture rich, throttle 1/8 inch, START. Use firm, full primer strokes for the best spray, and lock the primer afterward.
- **Without preheat:** the handbooks describe heavier priming and pumping the throttle while cranking. Pumping the throttle can leave raw fuel in the intake and start an **induction fire** if the engine backfires. Don't do an unpreheated cold start without your CFI, and have someone outside with a fire extinguisher.
- **If it won't start after a few tries,** or the firing gets weaker, the spark plugs have probably frosted over. Stop and preheat before trying again.
- **Warm up** 2 to 5 minutes at about 1,000 RPM. The oil temperature gauge may not move in very cold air; if the engine accelerates smoothly and oil pressure stays steady, it is ready.
- Take off with **carb heat off**. In very cold air (below about 0 °F) don't use partial carb heat: it can warm the air into the range where ice forms most easily.

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ENGINE FIRE DURING START

Usually caused by over-priming or pumping the throttle. Fuel in the intake catches fire on a backfire.

1. **Keep cranking.** If it starts, the engine sucks the flames and fuel through the carburetor and into the cylinders.
2. **If it starts:** run it at about 1,700 RPM for a few minutes, then shut down and have it inspected.
3. **If it won't start:** throttle FULL OPEN, mixture IDLE CUT-OFF, and keep cranking.
4. **If the fire continues:** master OFF, ignition OFF, fuel selector OFF. Get out with the fire extinguisher, or have ground crew bring one, and fight it from outside. A wool blanket or dirt also works.
5. **Don't fly again** until the damage has been inspected and repaired.

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RUN-UP NUMBERS

Not part of the start, but the numbers you will check next.

Check	172N	172P
Run-up RPM	1,700	1,700
Mag drop	125 RPM max on either	125 RPM max on either
Difference between mags	50 RPM max	50 RPM max
Carb heat	Check for an RPM drop	Check for an RPM drop
Full-throttle static, early in the takeoff roll	About 2,280–2,400 RPM, mixture rich	About 2,300–2,420 RPM, mixture leaned for max RPM

- **No drop at all** on a magneto check is not good news. It can mean a magneto isn't grounding (a hot mag). Tell maintenance before you fly.

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CESSNA 172 AND CHEROKEE 140 COMPARED

If you fly both, these are the habits that cross over badly.

Item	Cessna 172N/P	Cherokee 140
Fuel selector	BOTH	Fullest **single** tank
Electric fuel pump	None	**ON** for start, takeoff, landing and tank switches
Prime, cold engine	2 to 6 strokes before cranking	Only if it won't fire in 5–10 seconds: 1 to 3 strokes
Throttle, cold start	1/8 inch	About 1/4 inch
Throttle, hot start	1/8 inch	About 1/2 inch
Flooded start	Mixture cut-off, throttle full, crank, then normal start	Pump OFF, mixture cut-off, throttle full, crank
Run-up	1,700 RPM, 125 drop, 50 difference	2,000 RPM, 175 drop, 50 difference
Carb heat on final	ON through the landing (Cessna)	OFF on short final (see the pattern guides)

The Cherokee version is in Starting the Cherokee 140.

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SELF-CHECK

Where does the fuel selector go for the start?
BOTH. The 172N and 172P have no electric fuel pump; fuel feeds from both tanks by gravity.

How many primer strokes for a cold start on a warm summer day?
One or two. The range is 2 to 6 strokes, with more only in cold weather.

How much do you prime a warm engine?
Not at all. Priming a warm engine is the usual way to flood it.

Weak, uneven firing and puffs of black smoke. What is wrong and what do you do?
It's flooded. Mixture idle cut-off, throttle full open, crank several revolutions, then do a normal start without priming.

The engine turns over but never fires on a cold morning. What is the likely cause?
Under-priming. Prime a little more, and open the throttle slightly as soon as it starts to fire.

How long can you wait for oil pressure after the start?
About 30 seconds, or about 60 seconds in very cold weather. If it isn't rising, shut down.

Why keep carb heat cold on the ground?
The hot air bypasses the air filter, so dirt and grit go straight into the engine.

You see flames from the cowl while cranking. What do you do first?
Keep cranking. If the engine starts, it pulls the fire inside. If it won't start: throttle full open, mixture cut-off, keep cranking. If the fire goes on: master, ignition and fuel off, and get out with the extinguisher.

What are the mag-check limits on a 172N or 172P?
At 1,700 RPM, no more than 125 RPM drop on either magneto and no more than 50 RPM difference between them.

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– Why pull the prop through by hand before a cold start, and how do you do it safely?

It loosens thick oil and saves the battery. Treat the prop as live: ignition off, mixture cut-off, and keep your body out of its arc, because a broken magneto ground wire can let the engine fire.

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SOURCES

- Cessna Model 172N Pilot's Operating Handbook (1977), Section 4 Normal Procedures: starting engine, taxiing, before takeoff, cold weather operation.
- Cessna Model 172P Pilot's Operating Handbook (1981), Sections 2, 3 and 4: limitations, fire during start on ground, normal procedures and cold weather starting.
- Lycoming cold-weather operation and preheat guidance.
- Every airplane is different, even within the same model year. Use the POH and checklist in the airplane you are flying, and fly with your CFI.

Training aid only, not flight instruction. The POH in the airplane and its placards win: check every number against them, and fly with your CFI.

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