



What Happens When You Start An Aircraft Engine?

+Infographic

By [Swayne Martin](#) | 05/30/2014 | [Previous](#) | [Next](#)



When you turn the key, a lot happens under the hood. Check out this infographic for a step-by-step breakdown of how aircraft engines start.



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WHAT HAPPENS WHEN YOU START AN AIRCRAFT ENGINE?



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Have you ever thought about what happens when you turn the key in your airplane? Check out this step-by-step breakdown of

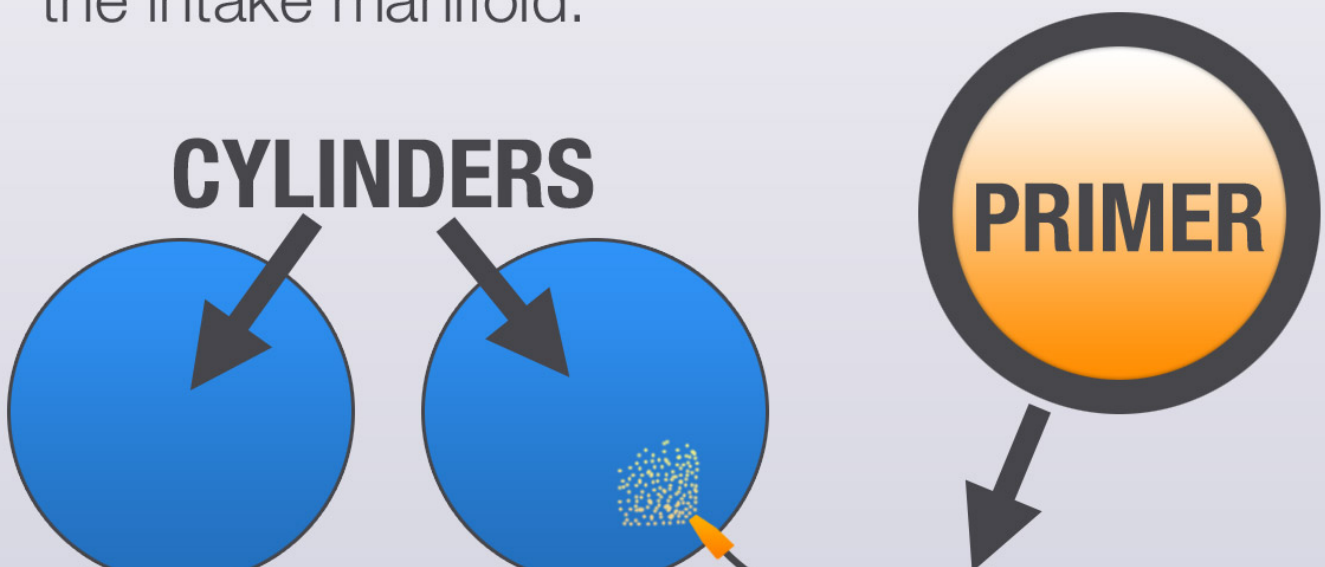
Check out the step by step breakdown of what happens from priming to takeoff.

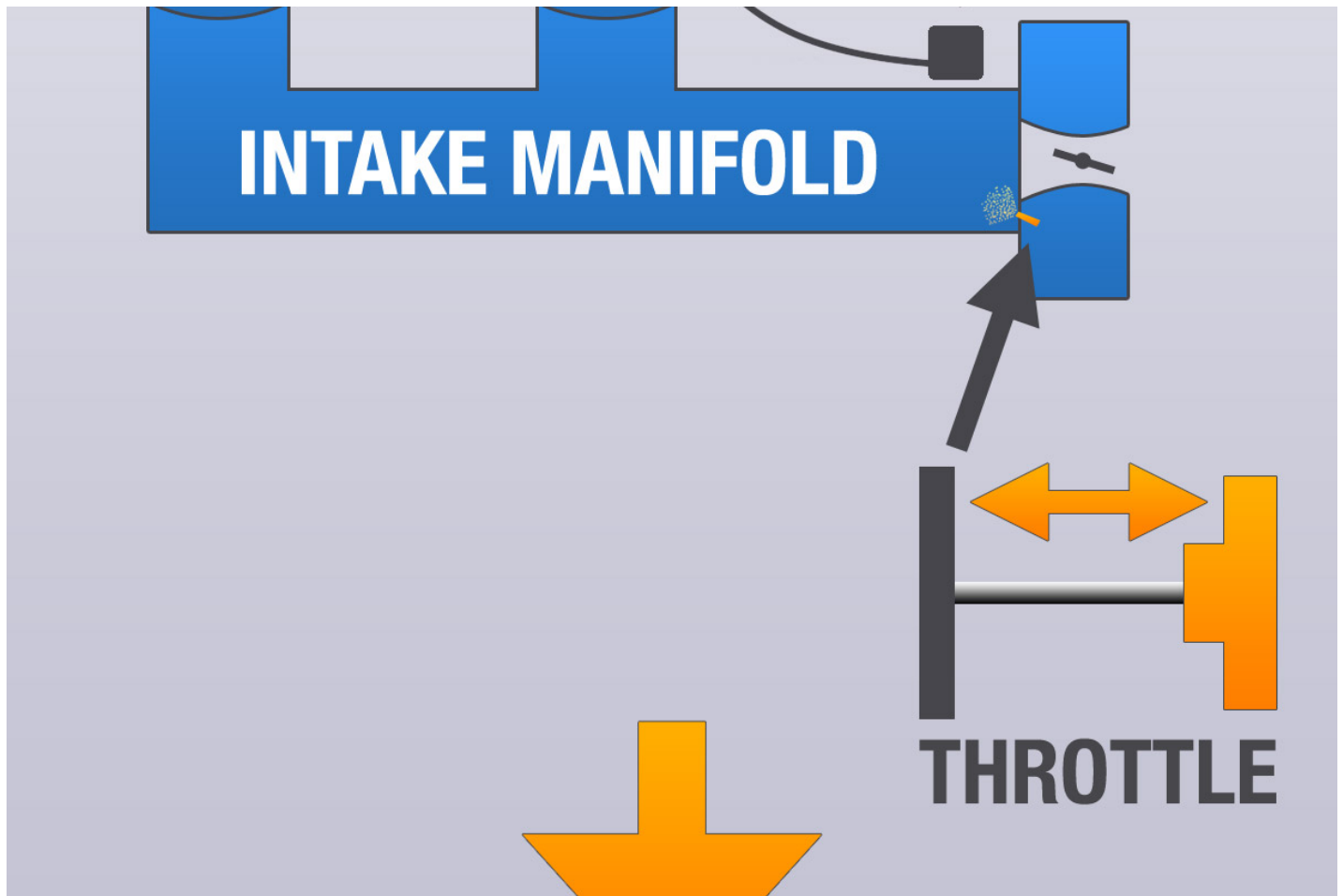


1) PRIME THE ENGINE

Without fuel in the cylinder, the engine won't start. How do you solve this?

Two ways: prime the engine, or pump the throttle. Priming injects fuel directly into the cylinder, and pumping the throttle manipulates the accelerator pump on the carburetor, placing fuel in the intake manifold.





2) BATTERY AND ALTERNATOR ON



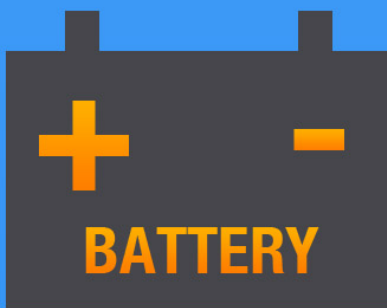
To power the starter, you need to turn the battery on. You also need to turn the alternator on; it

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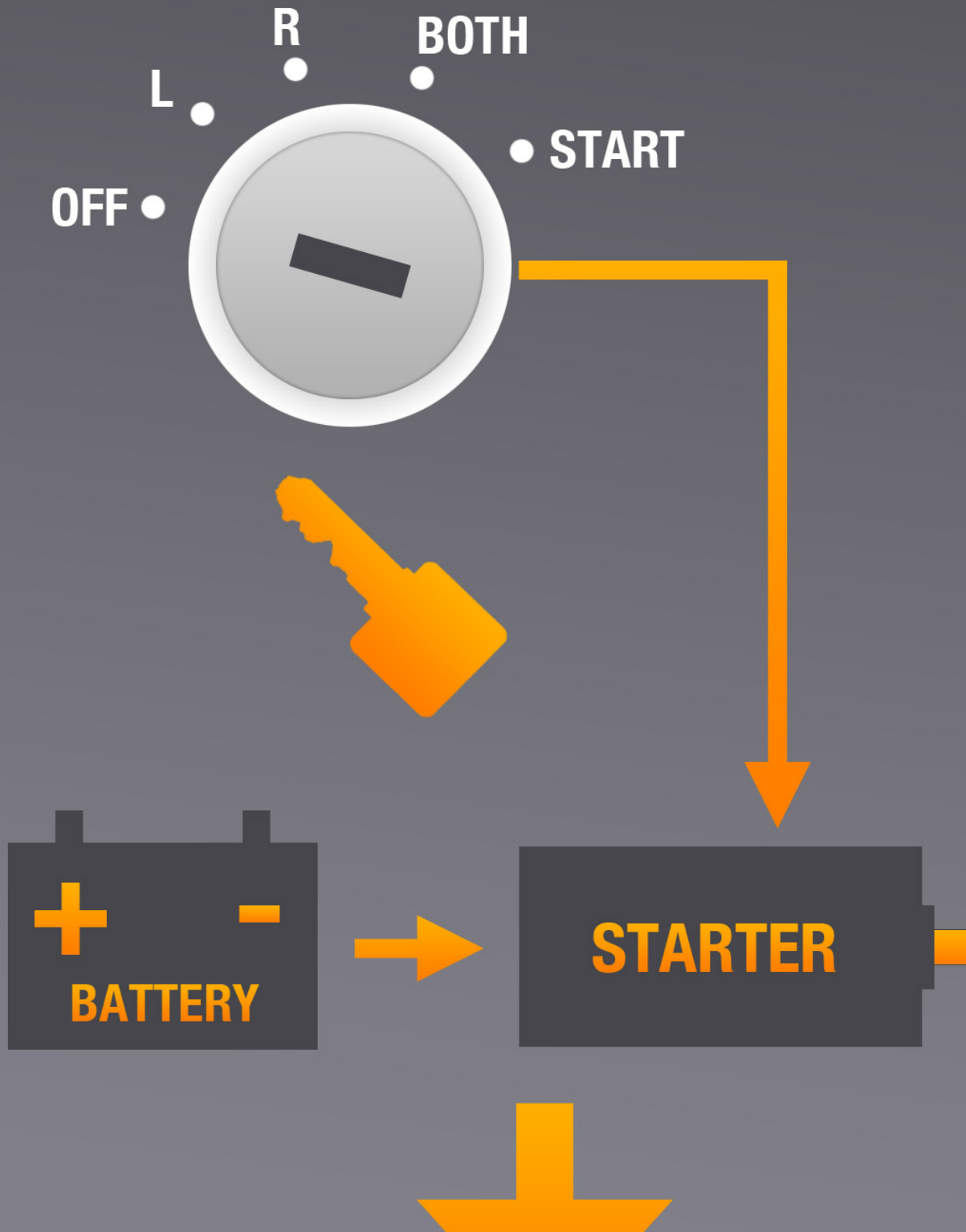
provides in-flight power, as well as battery charging once the engine is running.



3) TURN THE KEY

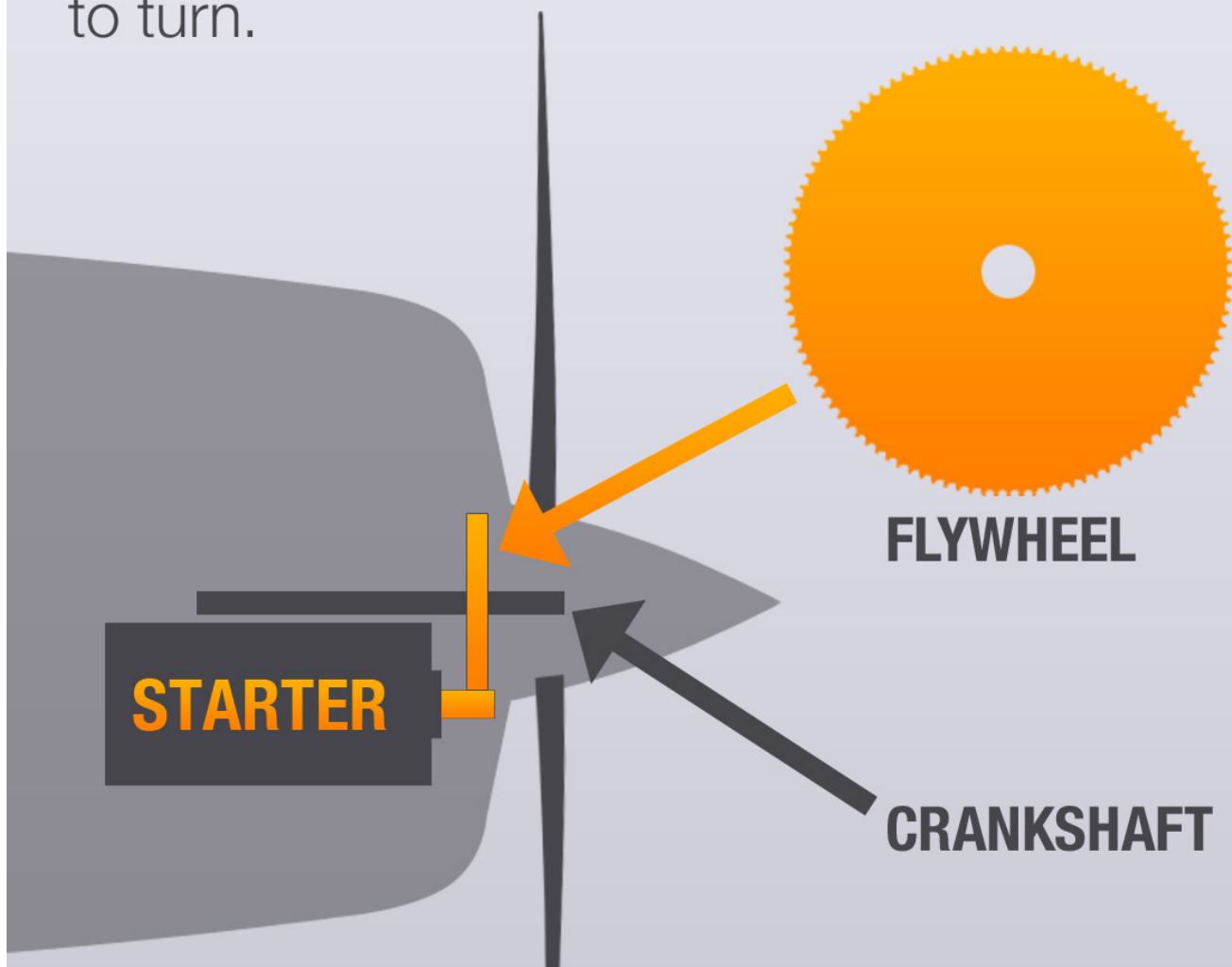
When you turn the ignition to 'start'

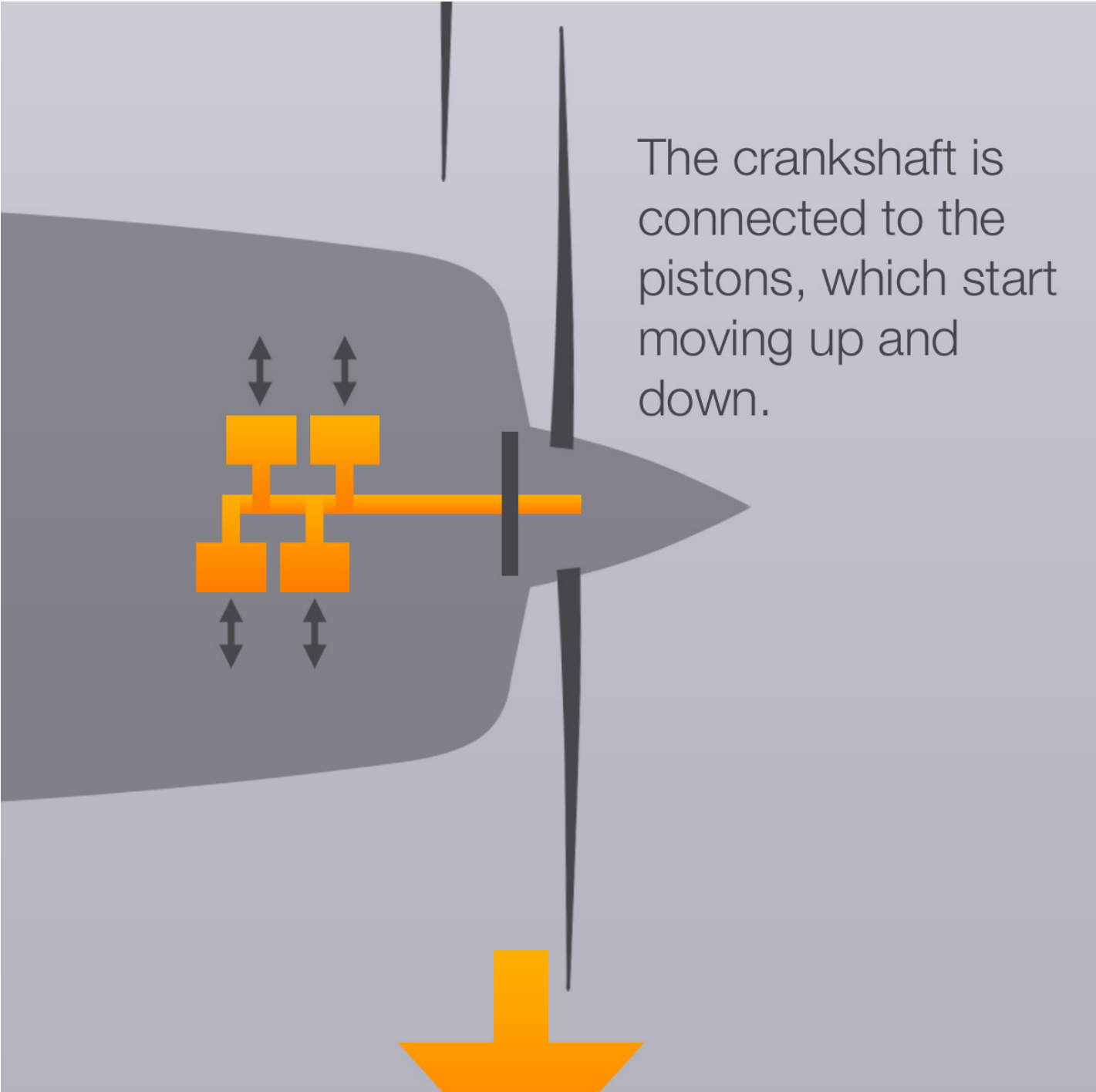
When you turn the ignition to start, the starter draws electricity from the battery and begins spinning.



4) CRANKSHAFT AND PROPELLER TURN

The starter's spinning gear catches the flywheel gear, which is connected to the propeller and crankshaft. Everything begins to turn.





The crankshaft is connected to the pistons, which start moving up and down.

The diagram shows a cross-section of an engine block. Inside, there are four orange pistons arranged in two rows of two. Each piston has a vertical double-headed arrow next to it, indicating its up-and-down motion. A horizontal orange connecting rod links the two pistons in the top row to the two pistons in the bottom row. A vertical black line, representing the crankshaft, passes through the center of the engine block. The background is a light gray gradient.

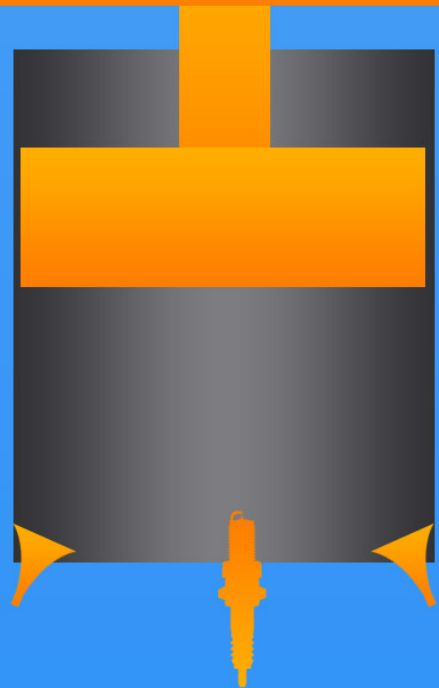
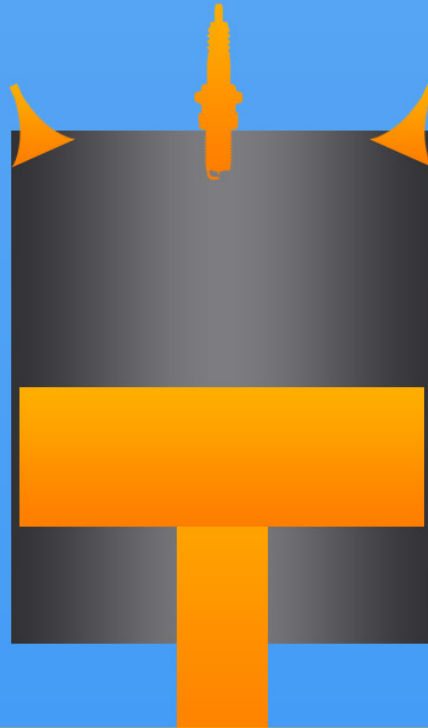
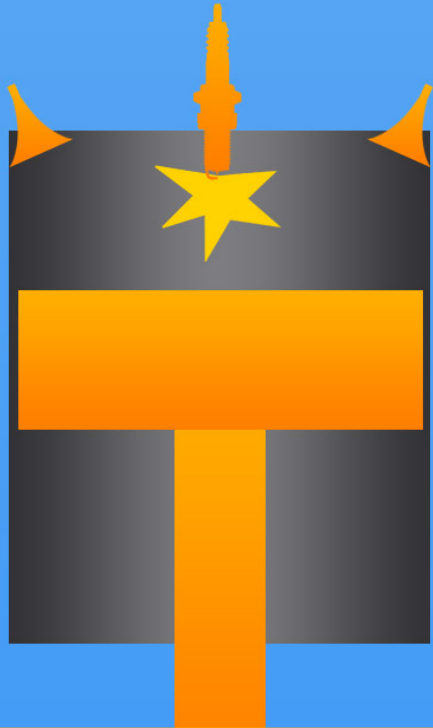


5) PISTONS AND FUEL

A large, solid orange arrow points downwards from the engine diagram towards the section header.

The turning crankshaft causes the pistons to

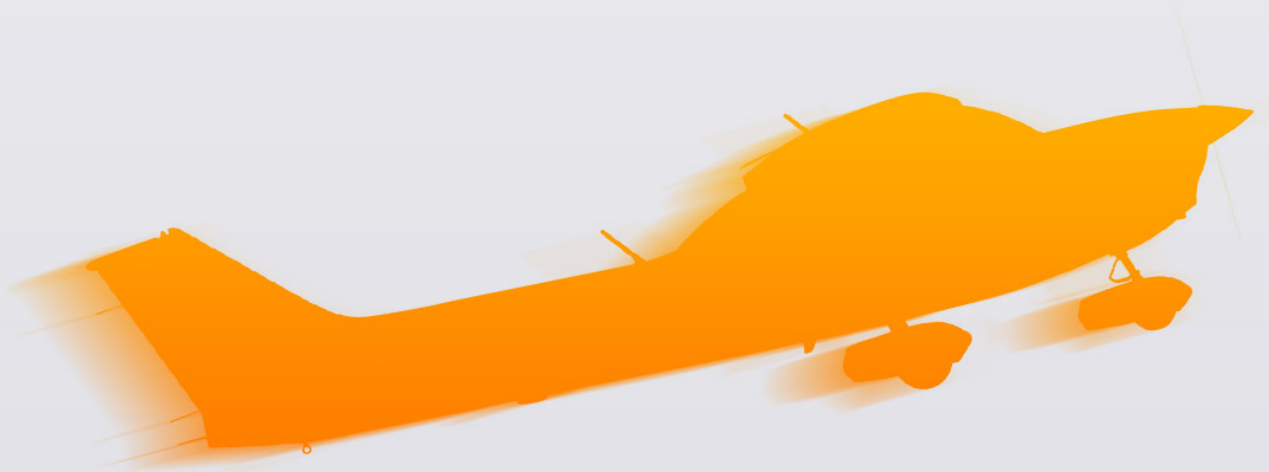
The turning crankshaft causes the pistons to move up and down the cylinders. At the same time, the magnetos fire a spark to the spark plugs, igniting the fuel/air mixture.





6) THE ENGINE IS RUNNING

Now that you've started the engine, you're almost ready for takeoff!



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Steve Berger

As a mechanical engineer I'm very saddened by this. A) Because some people of "flying age" may not actually understand how an internal combustion engine works. B) Because this is a gross over simplification of the workings of a four stroke IC engine that may actually be needed for some.

Now I don't go around asking pilots how the engine works, but if I did and they could not answer I think the max altitude I'd see that day would be the 2 feet AGL of my car seat. No offense was meant here, I just think one should have a better than average understanding of the machine that keeps them airborne.

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Dawn Annette Poling

Thank you for the information. I know it will be a long time before, I learn everything, I need to know to make a great pilot. But, I am willing to learn, and keep adding to my knowledge till, I learn it all. Thank you for sharing this with me. If, you have think of anything else, please let me know. I still love Boldmethod and information can always be added. Thank you, Colin for creating and sharing Boldmethod with me. Learning so, much.

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Steve Berger

Dawn Annette Poling no problem at all! Google is a great resource for information, but I'd have to say that your instructor is likely the best person to ask regarding what you need/should know. There is no substitute for hands on learning. Also, a seasoned instructor is likely to know all the problems you may encounter, what causes them, how to remedy them, and whether or not it's safe to fly.

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Dawn Annette Poling

Steve Berger, the nice thing about this being so, simple is you can add to that knowledge. You don't want to overwhelm but, catch interest. It did mine. And, I would like to learn more.

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Steve Berger

I can understand that. However, being simple and very basic, if one does not pursue things further the information could create could actually make one more dangerous.


To learn more just Google 4 cycle internal combustion for a general understanding of how any engine works. Also search starting a carbureted engine (or carburetor equipped engine) carbureted aircraft etc. Special attention should be placed on

equipped engine), carbureted aircraft, etc. Special attention should be placed on flooding, fouling, choke, you can also add "cold" to any of the starting searches.

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Horell Johnson

wow that was some useful educational tips 

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Anton Lückhoff

Wow never knew you had to have a spark and fuel

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Dawn Annette Poling

Kevin Walker, I am glad Steve Berger, suggested to look more into how it works. Still, love BOLDMETHOD. Simplicity, easy to learn, hands on, just what I need. But, it is nice to learn a little more than expected. Got a lot of information off NASA WEBSITE. But, love learning from great instructors as well, Meredith Holladay and Joel Weaner. Thank you.

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Swayne is an editor at Boldmethod, certified flight instructor, and a First Officer on the Boeing 757/767 for a Major US Carrier. He graduated as an aviation major from the University of North Dakota in 2018, holds a PIC Type Rating for Cessna Citation Jets (CE-525), is a former pilot for Mokulele Airlines, and flew Embraer 145s at the beginning of his airline career. Swayne is an author of articles, quizzes and lists on Boldmethod every week. You can reach Swayne at swayne@boldmethod.com, and follow his flying adventures on his [YouTube Channel](#).

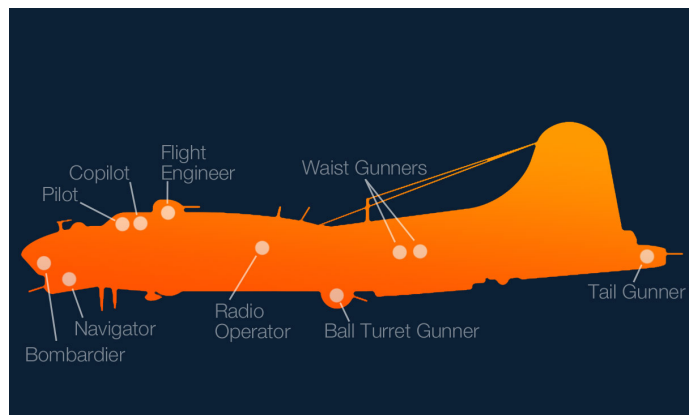
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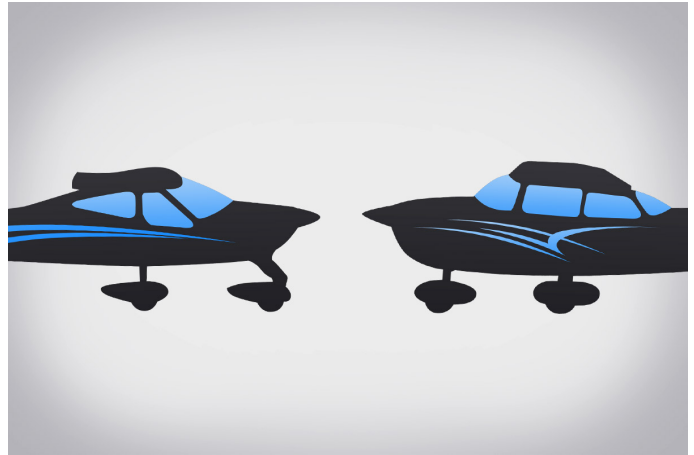
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