

My diesel engine is turning over nicely, but it just won't start. What do I do?
(Also known as "How to trace a fuel problem")

You almost certainly have a fuel problem.
90% of diesel engine issues can be traced back to fuel issues.
There are some rare issues that could be causing a similar problem, but they are outside the scope of a simple flow chart, and I would always try the steps here before assuming the worst.

Lets get started.
Do you have fuel in your fuel tank?
Can you check it physically, by unscrewing a cover or inserting a stick, rather than trusting the gage?

You are going to need some clean diesel to do the next few steps. It's important it isn't taken from your filters, but fresh from the dock or your main tank.

Don't feel bad, we have all made this mistake at some point

OK, you have fuel. Time to check your fuel filters.
This is a task that every boat owner needs to have a good grasp on, It's quite common for filters to clog underway, and if you cannot fix it, you will be dead in the water and looking at an expensive tow.

Add fuel to your tank

First, the primary filters (often RACORS), replace the filter element and be sure to refill them with clean diesel. Any trapped air will cause the engine to struggle to start

Try starting the engine.
Did that fix the problem?

Time to change your secondary filter.
This will be specific to your engine, often a spin on filter similar to the oil filter in a car.
You may need the manual to find the correct procedure, but in a pinch you can just follow the fuel lines and find the filter that has at least 2 lines going to it.
You will need to change it, and just like the primaries you will need to refill any empty space with clean diesel.

Did that fix the problem?

If you try to turn over the engine for too long you are going to fill up the exhaust system with water, and also run down your battery. Use your starting attempts sparingly, very rough rule of thumb is if it doesn't start in 10 secs, stop and check the next thing. This can vary wildly with engine model and compression, but as a general rule keep your attempts to a minimum.

You probably have some air in the system. (Rarely) this can be pushed through just by turning the engine over for 20 seconds or so, but more common you will need to bleed the air out of the system. There will be a procedure in your manual, but here's a generic method that works for most motors (You will need a helper for this part)

Be sure to only open any lines WHILE YOU ARE PUMPING, and close them immediately when you stop pumping. The idea is to get the air out, not suck more air in!

Figure out how to trigger your fuel pump.
For electric pumps, it's usually turning on the ignition switch one position (not starting but on)
For mechanical fuel pumps, it's often a little lever below the pump you have to push up and down a million times.
Some secondary fuel filters have a button on top you can press a bunch to pump fuel
Some (very wise) sailors have a little remote switch in the engine room that turns it on.

Now that your fuel pump can be used to push fuel through the lines, we are going to use it to force the air out.
This part is generally messy and unpleasant, sadly. The general idea is you open the fuel lines in a variety of places, while pushing fuel down the line with the pump.
The exact places to open will vary a lot by engine, but if you have no documentation you can try first at the secondary fuel filter.
Open a line or fitting a tiny bit, and push fuel using the pump.
Keep doing it until there are no bubbles (this is exhausting with a mechanical pump, sorry)

Now try a start. Did that fix the problem?

This last step isn't possible with a common rail diesel. If your engine is a large diesel with an ECM, it's time to speak to your dealer or local tech, you need a computer with the right programs to fix ECM issues.

Now you are at the last stage of "easy" DIY. You have one more attempt at bleeding the engine, then it's time to call a mechanic or dig deeper into the project than this chart can help with. It's time to bleed the injectors. This is tricky and requires a way to safely work on the top of the engine WHILE IT IS BEING STARTED. You need to protect yourself from the moving parts on the front of the engine while still being able to use a wrench on the top. You will also need a good assistant who will work with you, and a good way to communicate with them. Ready?

Locate the injectors on the top of the engine, and find the metal fuel line coming into the top of each one
Select a wrench that fits the long flat fitting on the end of the fuel line. It needs to be a good fit or you will damage the fittings
You are going to "crack", or slightly loosen one fitting at a time, WHILE THE ENGINE IS BEING TURNED OVER
This means you call to your assistant "start", and loosen the fitting enough that it starts spraying diesel/air.
After a few seconds, close the fitting, THEN call "stop". Only turn over the engine for max 10 secs each attempt.
You will see bubbles in the diesel at first, and after a bit it will just be diesel.
Do one injector at a time. Usually after a few of these, then engine will just start when you close the fitting, that means you got it!
If you have done all the injectors and it doesn't start, start over and do them again, it's not uncommon to need to do this a few times.
Remember, you are trying to get all the air out of the lines, and the it may take a bit.

Did it finally start?

You have a more serious issue than this chart can help you with, unfortunately. It's time to start looking for air leaks in your fuel lines, or bring in a mechanic for further attempts

Great job!