Aircraft Fuel System FAQs

1. There are filters out there that can clog very easily and that should NEVER be used in aircraft. Below are pics of some examples with the filter element shown:

Please don't put any of the above filters in your plane.

2. Question. My fuel system has a primary and a backup fuel pump. There is a filter located before each fuel pump. Is this a good setup?

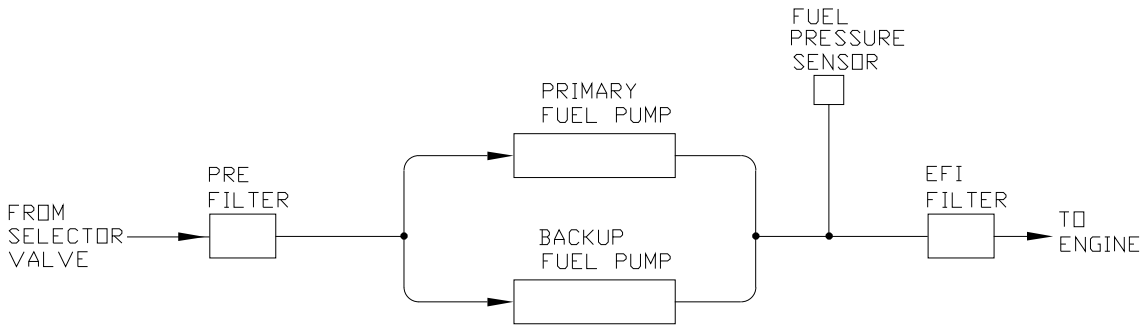
Answer. This setup will work. However one disadvantage is that there is no filter protection after the fuel pumps. Electronic injectors will clog or partially clog with the smallest debris particle. If the pumps generate even tiny particles as they wear, the injector flow can be compromised. Generally, there should be a high pressure EFI filter after the pumps just like in your car.

3. Question. What is the safest fuel filter setup?

Answer. The safest filter arrangement by far is one that mimics the system in your car. This consists of a large hole pre-filter (before the fuel pump) with a very large surface area, in your car this is the large screen at the inlet to the fuel pump. After the fuel pump, there should be a fine particulate (10 micron), high surface area, high pressure EFI filter.

A very good pre-filter for aircraft is the Aeromotive pn 12304. This is a 100 micron filter with a stainless mesh, large surface area element. The purpose of the pre-filter is to catch any large debris that may come out of the fuel tank. After the pump any high pressure EFI filter can be used. Protek pn FF-1 is a convenient EFI filter for use after the pump. The provided AN-6 fittings and easy mounting make it a simple installation. The EFI filter will catch any fine particulates and keep your injectors safe and free from clogging.

Below is a diagram of the safest and most reliable aircraft EFI fuel system:



4. Question. Should I use a gascolator in my EFI fuel system?

Answer. NO! Gascolators are for use with single direction flow fuel systems such as with a carburetor. Gascolators can only cause problems on EFI systems. They cause unwanted restriction when used on the low pressure side of the system which can lead to fuel vaporization. They can also cause air leaks on the low pressure side of the system due to the suction of the fuel pumps pulling open the gascolator drain valve and introducing air to the fuel system.

5. Question. Can the fuel pumps be located on the forward side of the firewall?

Answer. Yes. If the pumps are to be mounted on the forward side of the firewall, the pump inlets should sit as low as possible. The pumps should have a heat shield to block radiant heat from the exhaust system. The low pressure fuel feed line should be as short as possible from a bulkhead fitting in the firewall to the pump inlets. All fuel lines forward of the firewall should be fire sleeved and located away from exhaust pipes. The pumps are internally cooled by the large volume of fuel that flows through them. External cooling of the pumps via cold air is not necessary.

6. Question. Do I need to install check valves after each fuel pump to prevent backflow through the backup pump?

Answer. No. Walbro, Master, and Airtex pumps have a built-in check valve to prevent backflow. If you are using one of these type pumps no additional valving is necessary.