

The fuel system on this aeroplane is simple to fly and easy to get wrong on paper, because the crossfeed has firm rules and the examiner tests them. Learn where the fuel lives, how much of it you can actually use, and — most importantly — the do's and don'ts of the selector valves.

3.1 Where the fuel lives

Fuel is carried in an aluminium tank inside each wing, each tank made of three chambers linked by a flexible hose and filled from a single filler on the outboard chamber. Of the fuel in each wing, a small amount is unusable, leaving:

Tank	Total per side	Usable per side
Main wing tank (standard)	26.0 US gal (98.4 l)	25.0 US gal (94.6 l)
Optional auxiliary tank (in each nacelle)	13.7 US gal (52.0 l)	13.2 US gal (50.0 l)
Total per side with auxiliary fitted	39.7 US gal (150.4 l)	38.2 US gal (144.6 l)

So a standard aeroplane has **50 US gallons usable** in total (2×25.0), and one with the auxiliary tanks has about **76 US gallons usable** (2×38.2). The maximum permissible left/right imbalance is **5 US gal (18.9 l)**.

TOTAL IS NOT USABLE — AND THE EXAM KNOWS IT

About **1 US gal (roughly 4 litres) per main tank is unusable** — it is in the tank but cannot be fed to the engine, so it is dead weight, not endurance. Plan on the *usable* column. Quoting a total figure where a usable one was asked for is one of the easiest marks to throw away on this paper.

3.2 How fuel reaches the engine

Normally the left engine draws from the left tank and the right from the right. Each engine has **two** independent low-pressure electric fuel pumps working in parallel; in normal flight only one runs, and if it loses pressure the ECU automatically switches to the second. From there a high-pressure pump raises the fuel to common-rail pressure and the injectors spray it directly into the cylinders. Fuel that isn't burned is returned to the wing tank.

A FUEL PUMP switch lets you run both pumps together — you do this for take-off and landing, and any time you suspect a fuel-pressure problem.

3.3 The fuel selector valves — read this twice

Each engine has a fuel selector on the centre console with three positions: **ON**, **CROSSFEED** and **OFF**. In normal operation both are ON, each engine feeding from its own side. CROSSFEED lets an engine draw from the *opposite* tank — you use it to balance fuel during a long single-engine flight. To reach OFF you must twist a safety guard, so you cannot select it by accident.

THE CROSSFEED RULES — HIGH-YIELD EXAM MATERIAL

- **Do not** take off with a selector in CROSSFEED.
- **Do not** put both selectors in CROSSFEED at once.
- **Do not** run the FUEL PUMP together with CROSSFEED — the extra pressure can damage the high-pressure pump and forces special maintenance.
- **Do not** shut an engine down with the selector — that also risks the high-pressure pump. Shut down with the ENGINE MASTER.
- If an engine is **inoperative**, its selector goes to **OFF**.

WHY IT MATTERS

Crossfeed exists for one real job: keeping the aeroplane laterally balanced when you're flying a long way on one engine and burning fuel from only one wing. It is a fuel-balancing tool, not a normal-ops setting — which is exactly why every rule around it is a "don't."

3.4 The auxiliary tanks (if fitted)

Where auxiliary tanks are installed, an electric AUX PUMP on each side transfers their fuel forward into the related main tank; there are two AUX PUMP switches in the cockpit. Use them together to avoid a lateral imbalance, but switch the two on about 10 seconds apart so the starting current doesn't trip the fuse. Fuel level switches stop the transfer automatically when the auxiliary tank runs empty or the main tank fills. A G1000 advisory tells you a transfer is in progress; a caution warns you when an auxiliary tank is empty and its pump should be turned off.

3.5 Knowing how much you have

Two capacity probes in each main tank feed the fuel quantity to the flight display. For pre-flight you can also confirm the contents mechanically: a communicating-containers measuring device reads the level directly at the tank drain, and a second "fuel indicator II" method uses the aircraft's measured pitch angle together with a lookup table to give an exact figure. Either way, the maximum permitted fuel temperature is **60 °C**, and only the approved jet-fuel grades may be used.

REMEMBER FOR THE EXAM

Same-side feed is normal · two pumps per engine, one runs · both pumps for take-off/landing ·
CROSSFEED is for single-engine fuel balancing only · never crossfeed + pump, never crossfeed
on take-off, never shut down on the selector · inoperative engine → selector OFF.

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