

Short Tucano T Mk.1



Extraction Guide

ZF136 (N613AL)



Document Revisions

Author	Description	Date
LRL	Initial Release	6/21/13

Table of Content

1.	Quick Reference	4
2.	Pilot Information	5
3.	Electrical - Ignition System	6
	<i>Overview</i>	6
	<i>Crash Protection</i>	6
4.	Ejection Seats	7
5.	Canopy System	7
	<i>Overview</i>	7
	<i>Normal Operation</i>	7
	<i>Emergency Operation – External Opening</i>	8
	<i>Emergency Operation – Internal Opening</i>	9
6.	Harnesses	10
7.	Oxygen System	11
8.	Fuel System	13

1. Quick Reference

Electrical System

- Two (2) 24-volt Lead Acid Batteries.
 - One just forward of the canopy.
 - One in the nosewheel compartment
- Switched located on right side of each cockpit.
 - **BATTERY 1, BATTERY 2, GEN – OFF**
 - **ESSENTIAL BUS – ISOLATE**
- Crash Protection
 - Power to all systems is cut, regardless of the position of the switches above, except direct battery power for the fuel and hydraulic cut-off valves
 - Fuel to the engine is automatically cut-off
 - Hydraulic fluid is automatically cut-off

Ejection Seats

- **THEY ARE NOT ARMED. EJECTION GUN HAS BEEN REMOVED FROM AIRCRAFT**

Canopy

- One piece, open handle is on the left side, hinged on the right
- **DETONATING CORD IS ARMED. FRACTURE HANDLES ARE ON BOTH SIDES OF AIRCRAFT – REAR OF CANOPY, MARKED RESCUE**
- Internal canopy fracture handles allow detonate of the canopy from inside either cockpit
 - These are **RED T-pins** visible from the outside of the canopy
 - Canopy cannot be fractured internally if these pins are in
 - Internal canopy fracture handles are safety pinned for normal operation
 - These pins have NO effect on the operation of the external fracture handles

Harness

- Two sets of shoulder straps
 - Black, 5-point harness with military style, single-point release
 - Blue parachute straps. Two leg releases, One Chest Release
- Pilot can be removed with the blue parachute still attached if required based on the situation

Oxygen System

- Single 2250-liter bottle located behind the rear cockpit bulkhead
- Green ON/OFF switches located on right console if each cockpit

Fuel System

- All Fuel is stored in the wings
- Maximum of 182 gallons (91 per wing) of Jet-A
- As stated above, there is a Crash Protection system that will automatically cut off all fuel and hydraulic lines forward of the firewall in the case of a crash

2. Aircraft and Pilot Information

Aircraft Type:	Short Tucano T MK.1
Registration:	N613AL
Pilot Name:	Leroy Leet
Emergency Contact Name:	Angela Leet (Wife)
Emergency Contact Number:	(502) 836-7793

3. Electrical – Ignition System

Overview

The Tucano has 29-volt DC electrical system. There are two 24-volt sealed lead acid batteries in the aircraft. One is located just forward of the canopy. The other is located in the nosewheel compartment. The system is controlled from one of two Electrics panel located on the right-hand of each cockpit.

Crash Protection

In a longitudinal deceleration of 4.5 Gs or more, internal crash relays a tripped. These relays will disconnect all power from all aircraft systems with the exception of the fuel and hydraulic cut-off switch and valves.

To remove power from the aircraft systems:

Front Cockpit Switches

BATTERY 1	.....	OFF
BATTERY 2	.....	OFF
GEN	.....	OFF
ESSENTIAL BUS	.....	ISOLATE

Rear Cockpit Switches

BATTERY 1	.....	FRONT	or	OFF
BATTERY 2	.....	FRONT	or	OFF
GEN	.....	FRONT	or	OFF
ESSENTIAL BUS	.....	FRONT	or	ISOLATE

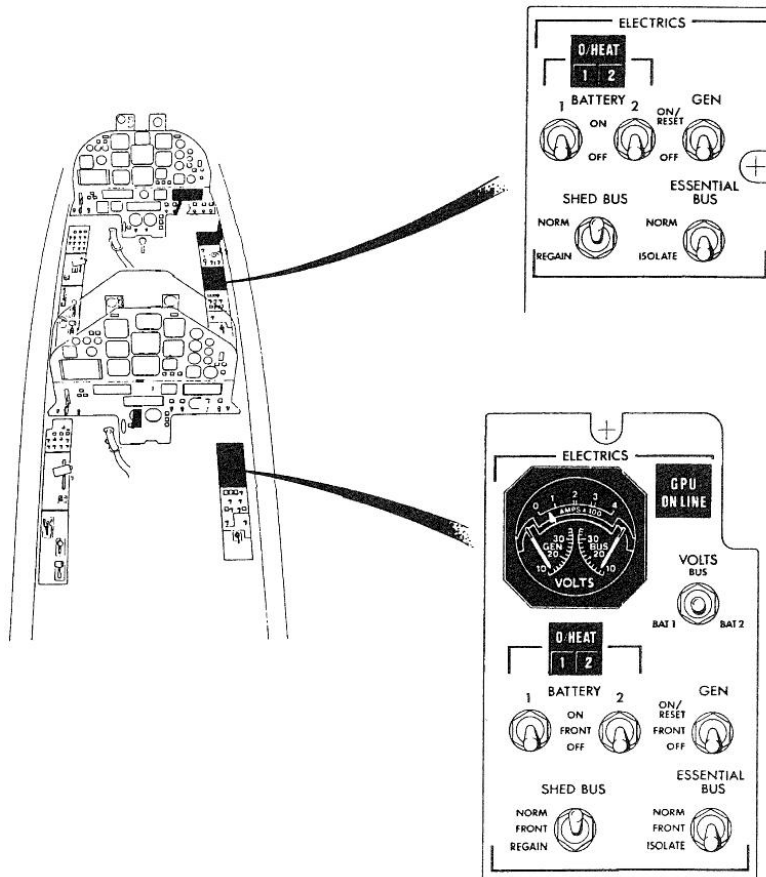


Figure 1: Electrics Panels for the Front and Rear Cockpits

4. Ejection Seats

The aircraft is equipped with Martin Baker Type 8 CLK ejection seats in both cockpits. However, these are not armed. The Ejection Gun and all explosive components of the seat have been removed from the aircraft. The only part of the ejection system that is still installed and active in the aircraft is the explosive canopy system. That system is covered in the Canopy section of this guide.

5. Canopy System

Overview

The canopy is a piece construction that covers both cockpits. The canopy is hinged on the right side of the aircraft. The canopy is opened from the left side. The canopy is fitted with three interconnected sections of linear cutting cord (LCC) and miniature detonating cord (MDC) for use in emergency ground egresses.

Normal Operation – External Opening

The canopy handle is a chrome handle located on the left hand side of the aircraft. To open the canopy, pull out the release handle on the left side of the fuselage at the rear cockpit and turn it fully clockwise (downward). This disengages the locking mechanism and enables the canopy to be lifted open using the black, external handle at the rear cockpit position.



Figure 2: The chrome canopy lock/unlock handle and black lifting handle

Emergency Operation – External Opening

Ground rescue of incapacitated crew is aided by the use of one or other of two external canopy fracture handles, one on each side of the canopy rear frame. Each handle is housed within a hinged access panel which has a quick release latch. This access panel is painted with yellow stripes and is marked by a large “RESCUE” arrow. The handle is connected to a 17 foot long cable. The operator should grasp a handle and, facing away from the aircraft, take up the cable slack and then sharply tug the cable. When the taut cable is tugged all three sections of the LCC/MDC are exploded.



Figure 3: Yellow Stripped External Canopy Fracture Access Panel on the Canopy Rear (left side)



Figure 4: Yellow Stripped External Canopy Fracture Access Panel on the Canopy Rear (right side)

Emergency Operation – Internal Opening

A CANOPY FRACTURE – PULL TO ARM/PUSH TO FIRE handle, stripped black/yellow, is on the right side in each cockpit. The handle is used to assist escape if any ground incident prevents normal opening of the canopy. To operate the handle, remove the safety pin, pull the rear portion inwards and then push it firmly forwards. This actuates all three cockpit LCC/MDC systems.

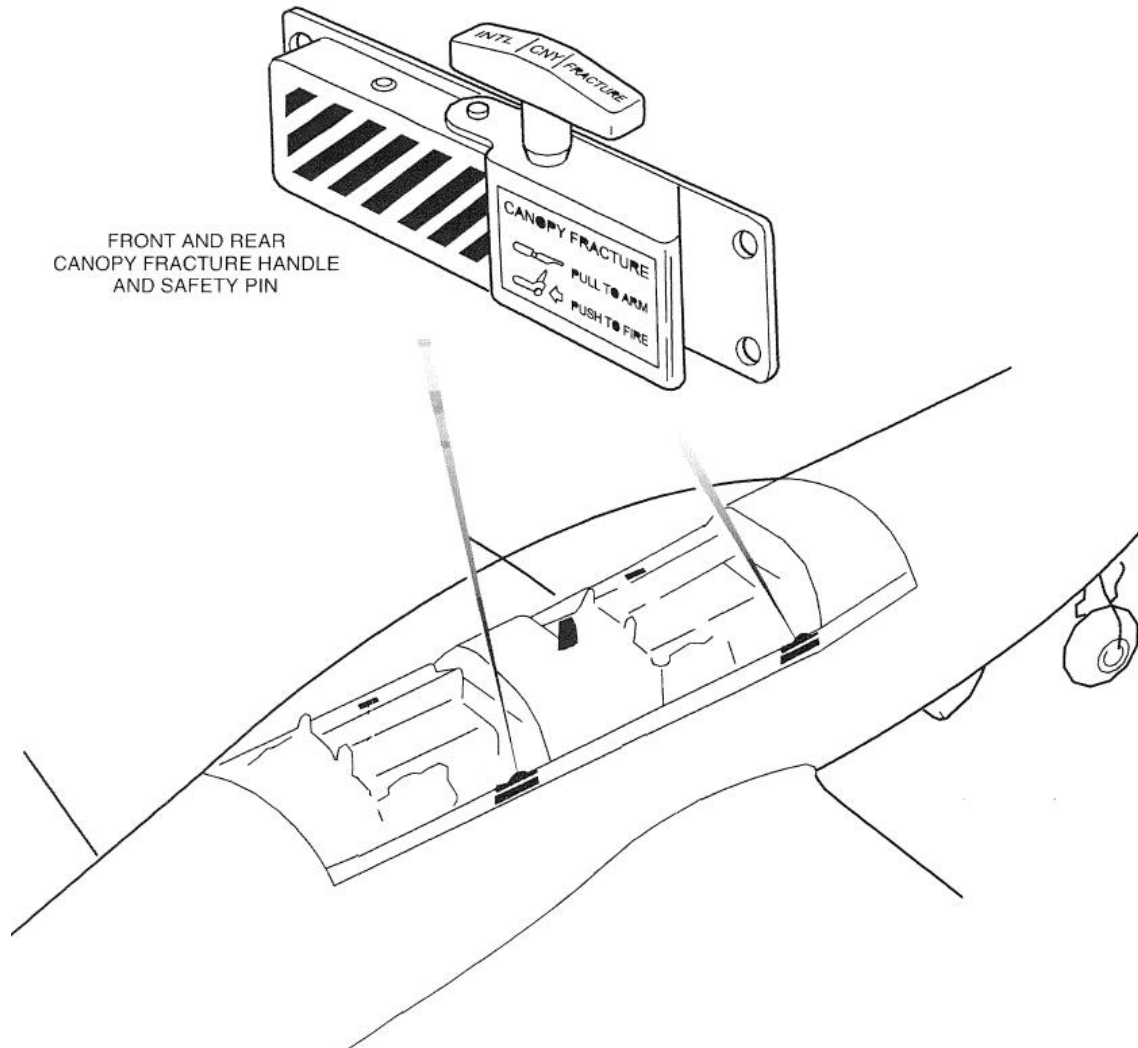


Figure 5: Internal Canopy Fracture Handles

6. Harnesses

Since the ejection seats are not active, the Tucano has two sets of straps. The outer straps connect the pilot to the seat. This is a black, five-point harness with a military style, single-point release. The black harness must be removed before the pilot can be removed from the aircraft. The inner straps are the parachute straps and are blue. The parachute is not connected to the aircraft therefore the pilot can be removed with the parachute still attached if required.

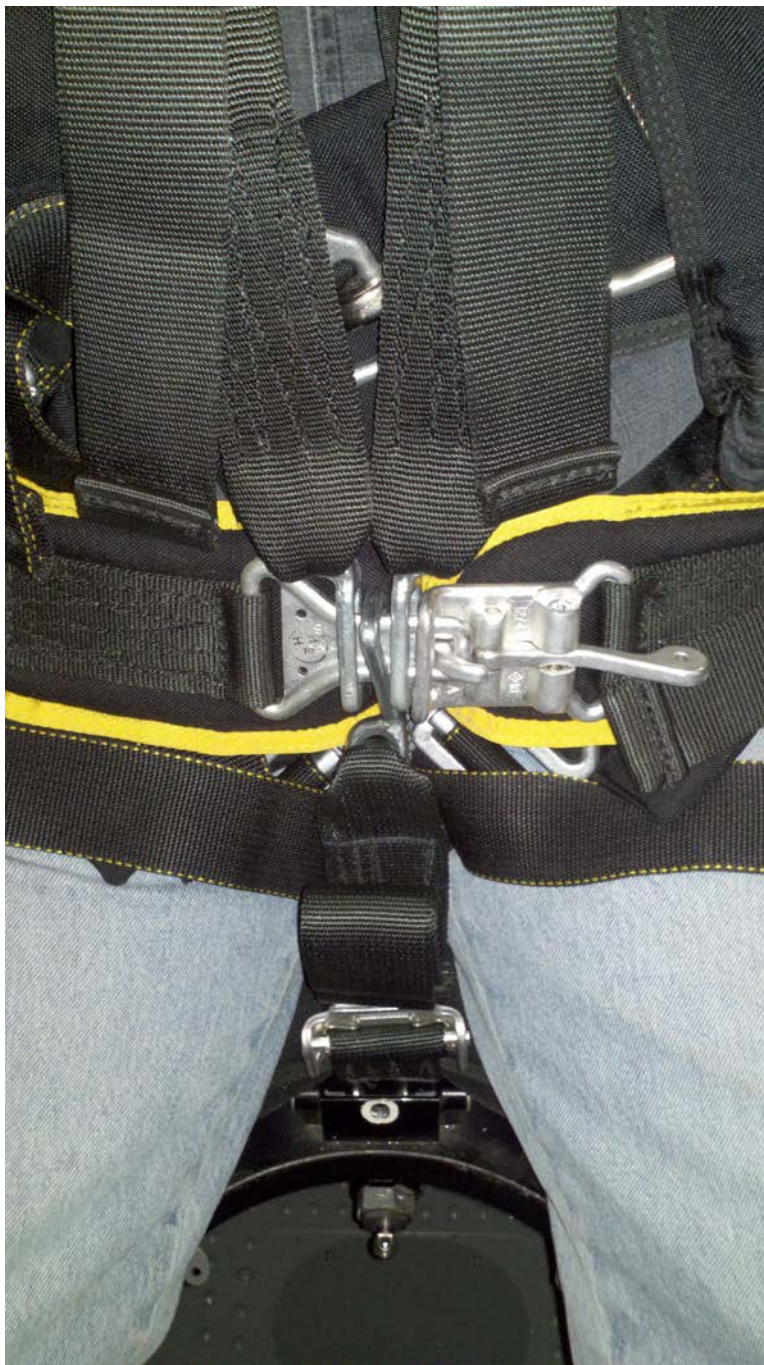


Figure 6: Five-point harness with military style single point release

7. Oxygen System

The aircraft is equipped with a gaseous oxygen system supplied from a single 2250-liter cylinder located behind the rear cockpit bulkhead. Main selector switches, located on the right rear console in each cockpit, control the main oxygen supply to each cockpit.

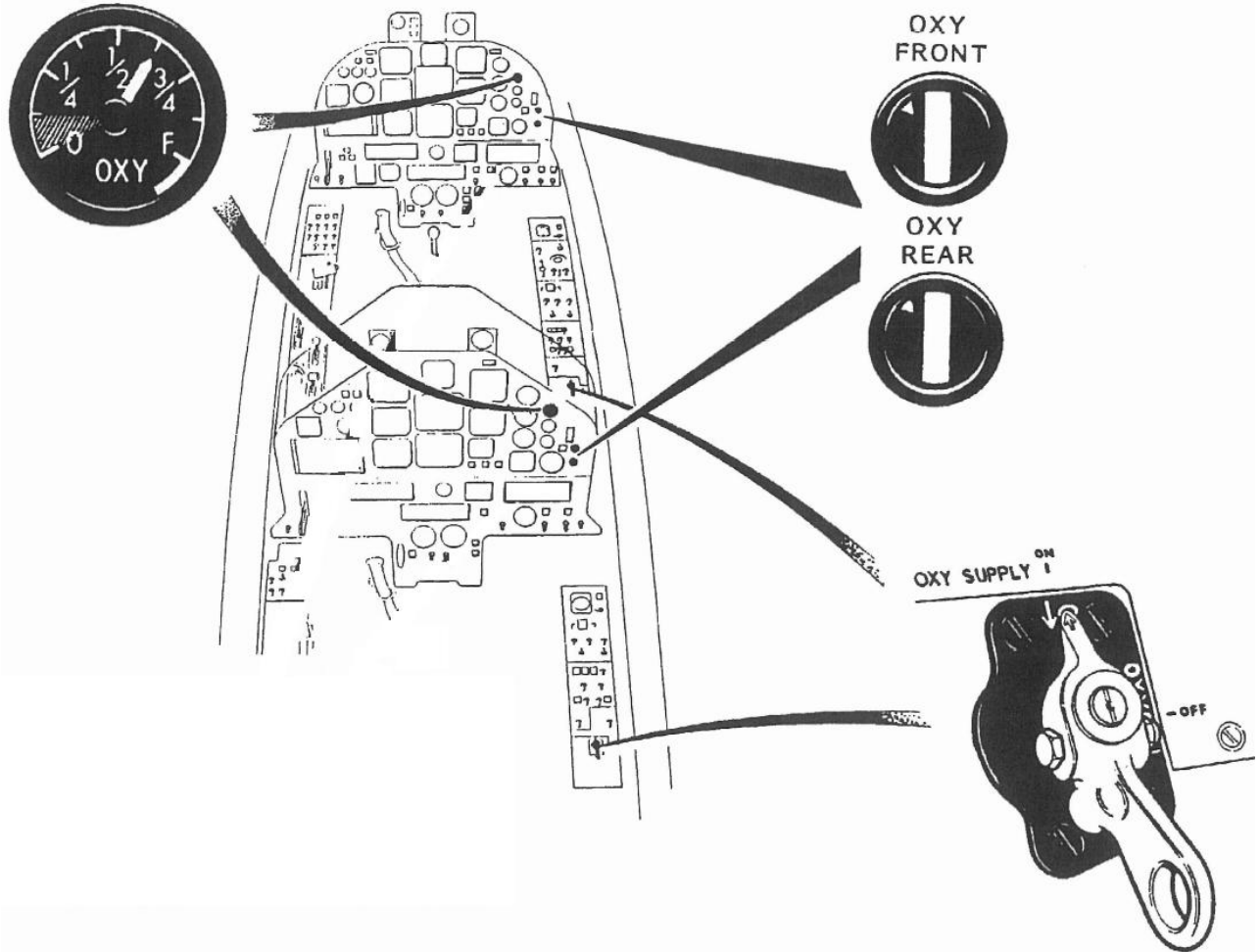


Figure 7: Oxygen System Main Selector Switches

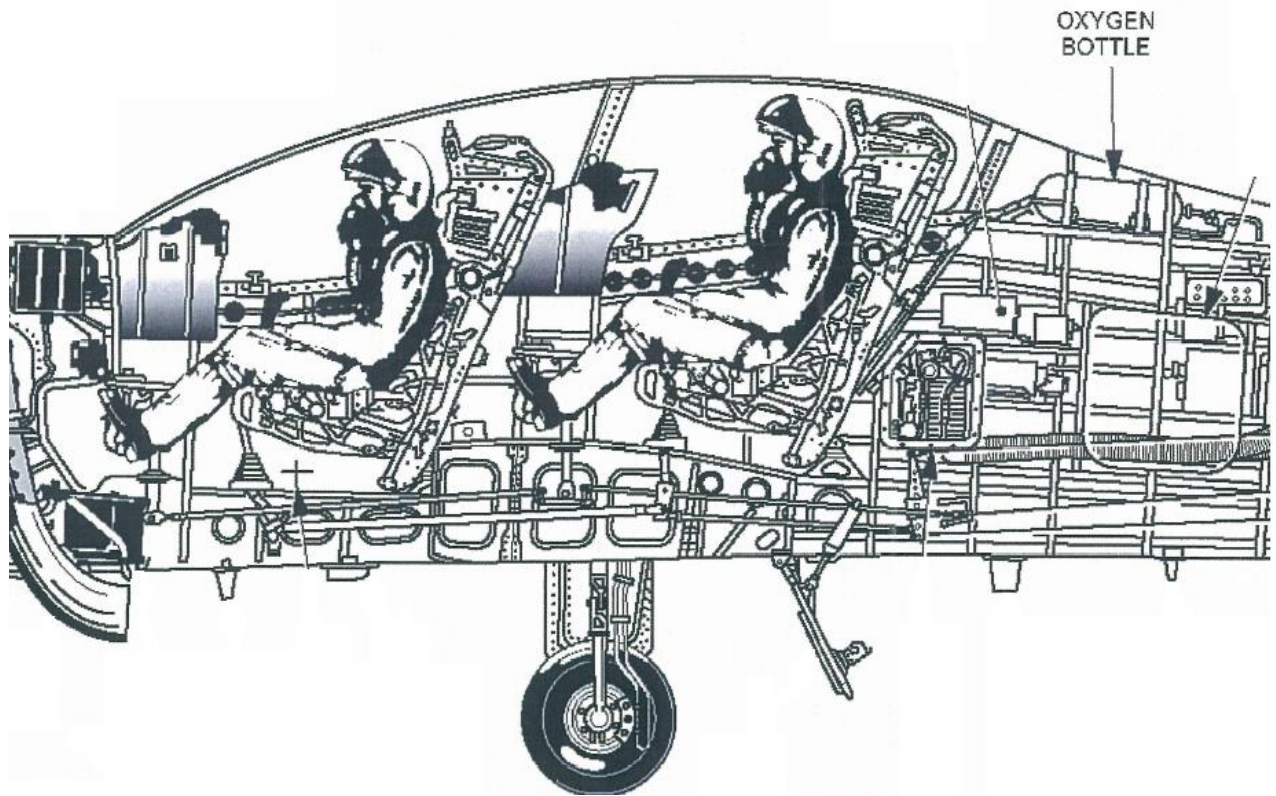


Figure 8: Location of the Oxygen System's 2250 Liter Supply Tank Located behind the Rear Cockpit Bulkhead

8. Fuel System

All aircraft fuel is stored in integral tanks located in each wing. Each tank has two cells. Each tank holds up to 91 gallons of Jet A fuel.

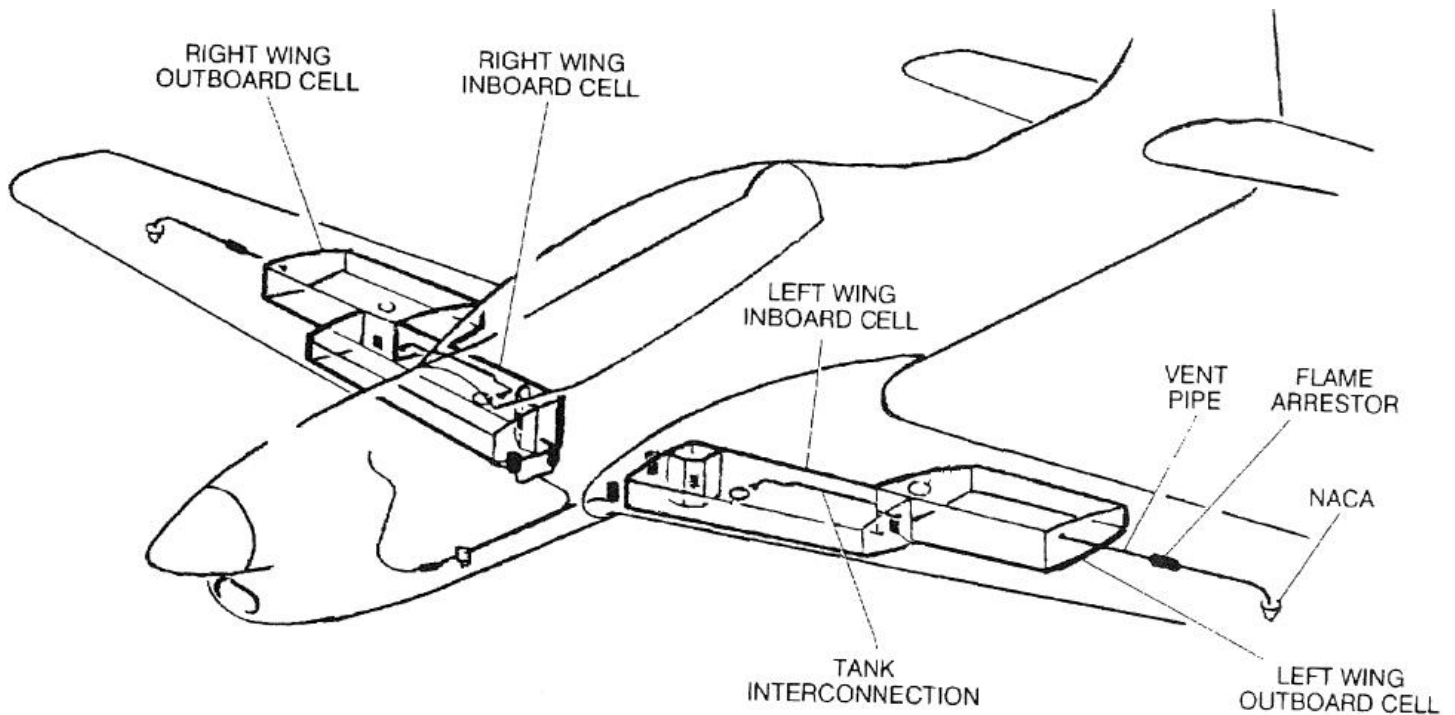


Figure 9: Fuel System General Layout

There is a FUEL CUT OFF switch located on the upper right-hand side of the main instrument panel in each cockpit. The valve that this switch controls is located rear of the engine fire shield. Selecting this switch to ON will cut off fuel to the engine side of the fire shield. This valve is automatically closed in the event of an engine fire or engine mechanical failure.

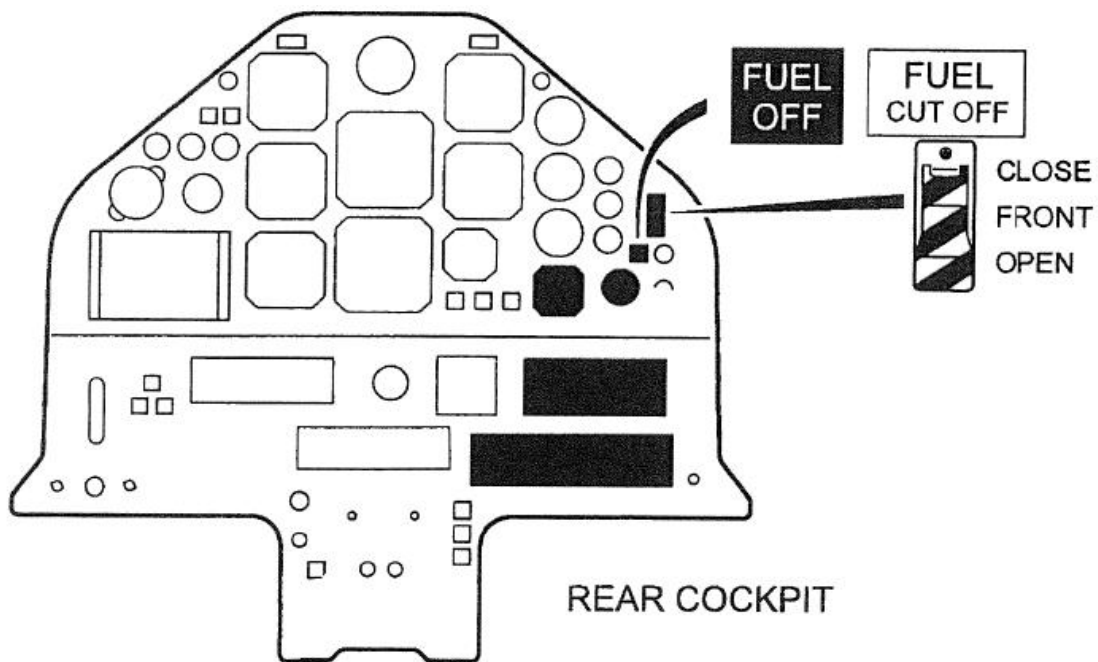
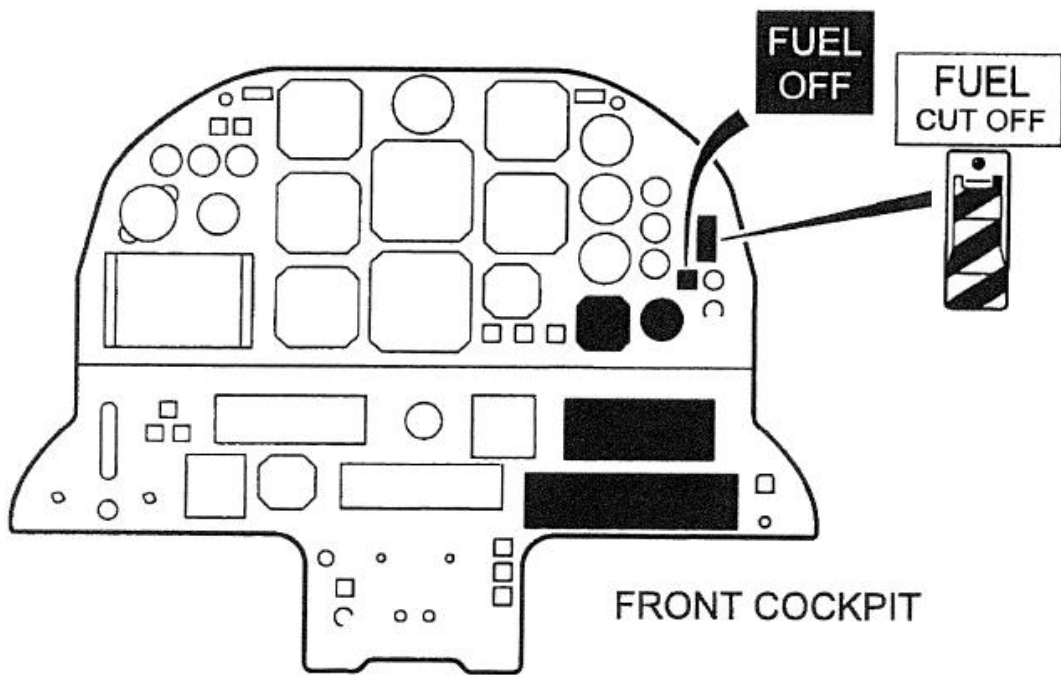


Figure 10: Location of the Fuel Shutoff switch in the Front and Rear Cockpits