

# **DC-8™ Jetliner Series 10 to 40**

## **Pilot's Notes**

Please note that Flight Simulator X Steam Edition must be installed correctly on your PC prior to the installation and use of this DC-8 simulation.

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## INTRODUCTION

Although it was comparatively late with the introduction of its first jet-powered airliner, Douglas, like its competitors at Lockheed, was watching the development of other designs such as the de Havilland Comet but staying with proven propeller-driven models like the DC-6 and DC-7 until the new jet technologies advanced into reliability.

This wait cost Douglas the Air Force contract for a jet-powered tanker (it was lost to Boeing) but the lessons learned helped them greatly in designing a safer and more versatile jetliner in the form of the DC-8. Officially announced in 1955, 'Ship One' made its maiden flight on May 30 1958. Although small changes to this model, such

as extended wingtips, were made on production variants, the design remained largely unchanged through the next four generations of the DC-8.

A total of 34 DC-8-20s were built and an additional 15 were converted from DC-8-10s. Extra fuel capacity and strengthened airframes resulted in the DC-8-30 series, of which 57 were built.

More efficient and environmentally friendly (by 1950s standards) Rolls-Royce Conway engines were fitted to the -30 airframe and this aircraft was designated the DC-8-40. 32 of these were delivered to a number of international airlines. By the mid-1960s DC-8s were flying with all the major US domestic and international airlines, with United Airlines being a major customer.

The DC-8 went on to evolve steadily across a much wider range, with stretched fuselages, cargo conversions and engine changes through to aircraft equipped with the modern CFM turbofans.

It is a testament to the aircraft's design that the basic airframe remained unchanged throughout production and many DC-8s still fly the world's air routes, albeit with modern retrofits such as digital avionics and current engine types.

This simulation concentrates on the first incarnations of the DC-8 design, recreating the raw power and 'seat of the pants' style of operations typical of the golden age of 1950s commercial flying.

## DC-8 specifications (DC-8-32 variant)

### Dimensions

Length	45.87 m
Wingspan	43.41 m
Height (to top of fin)	13.21 m
Wing area	257 m <sup>2</sup>

## Power plants

Type	4 x Pratt & Whitney JT4A turbojets
Static thrust	16,800 lb per engine

## Weights

Maximum gross weight	140,614 kg
Maximum landing weight	90,500 kg
Empty weight	60,781 kg

## Performance

VMO	Mach 0.86
Typical cruising speed	485 knots
Service ceiling	36,000 feet
Range (max. payload)	6,300 nautical miles
Cockpit crew	Three
Passenger capacity	176 seats (first class) / 124 seats (mixed class)

# AIRCRAFT IN THIS SIMULATION

## DC-8-10 'Ship One'

'Ship One' was the first variant of the DC-8. It was developed for domestic service and was powered by four Pratt & Whitney JT3C-6 turbojets, each producing 13,500lb of thrust. It is depicted here shortly after roll-out, featuring the shorter wingtips (by three feet) and systems probe mounted on the port wing.

- Douglas (N8008D)

## **DC-8-12**

The Series 12 was the first variant of the DC-8 to enter airline service. It was developed for domestic service and was powered by four Pratt & Whitney water-injected JT3C-6 engines, each producing 13,500lb of thrust.

- N804E
- N8013U

## **DC-8-21**

The Series 20 saw the introduction of the more powerful Pratt & Whitney JT4A-3 turbojets which each produced 15,800lb of thrust. This additional thrust allowed for a gross weight increase of over 10,000lb. A total of 49 DC-8-20s were delivered to major domestic and international airlines. Many would go on to be converted to later versions, thus getting a second lease of life.

- N8021U
- N8608
- EC-BZQ
- NE572C
- N821F

## **DC-8-32**

The Series 30 featured an upgraded airframe for use on intercontinental routes, with JT4A turbojets, a 30% increase in fuel capacity and strengthened landing gear. 57 aircraft were produced.

- SE-DBA
- N804PA
- HB-IDA
- PH-DCG
- 5Y-ASA

## **DC-8-42**

32 DC-8-40s were built. The -40 was essentially a Series 30 aircraft but fitted with Rolls-Royce Conway 509 turbofans. These engines were more efficient, quieter and produced less smoke, but despite these benefits the Series 40 failed to sell in great numbers due to the reluctance of US airlines to purchase an airliner fitted with engines manufactured overseas and their desire to wait for the more advanced Pratt & Whitney JT3D turbofan which was due to be introduced.

- I-DIWM

- CF-CPJ
- CF-TJF
- N9604Z
- CU-T1210
- 6YJME

## INSTALLATION

Installation is handled by Steam after purchase of the product. After purchasing the product the files will be downloaded and installation into the Scenery Library will be automatic.

### Accessing the aircraft

**To access the DC-8 variants in FSX:SE.**

1. Click on 'Free Flight'.
2. Select 'Just Flight' from the 'Publisher' drop-down menu.
3. Select 'Douglas' from the Manufacturer drop-down and choose one of the DC-8 variants.

Tick the 'Show all variations' box to see all the available liveries.

### Updates

Updates to the product will automatically be deployed, downloaded and installed via Steam to all users who own the product.

### Technical Support

To obtain technical support (in English) please visit the Support pages at [justflight.com](http://justflight.com). As a Just Flight customer you can obtain free technical support for any Just Flight or Just Trains product.

For support specifically on the Steam version of the add-on please contact Dovetail Games. <https://dovetailgames.kayako.com/>

### Regular News

To get the latest news about Just Flight products, sign up for our newsletter at <https://www.justflight.com/>

## AIRCRAFT WALK-AROUND

The DC-8 is very similar in size, layout and appearance to its competitor, the Boeing 707, for which it was often mistaken. Significant differences which are immediately noticeable are the signature nostril intakes in the nose and the 'double bubble' design of the fuselage, designed to provide greater strength at high altitude pressures.



Large luggage compartments are positioned on the right side of the aircraft and the electrically operated doors open inwards. Many airlines made use of specially designed cargo containers which were shaped to fit these bays perfectly.

The aircraft features landing lights mounted in retractable pods beneath each wing and wing lighting mounted within the wing roots.



The engines fitted to the early DC-8s were turbojets which operated with reverse thrust capability and 'silencers' called ejectors which extended aft to cover the exhausts in an attempt to reduce noise. These ejectors carried the reverser buckets which, when reverse thrust was selected, closed completely over the exhausts and directed the gases forward.



The engines were typically very smoky affairs and a DC-8 on a full-power take-off was not the finest example of low emissions!

Special reverser smoke has been created for these Just Flight DC-8 aircraft and when you apply reverse thrust you will see this smoke exiting from the sides of the engines.



Another unique feature of the DC-8's engines was their use in braking the aircraft during flight; the inner two engines could be put into reverse thrust mode to slow the aircraft, providing a similar effect to spoilers.

In fact, spoilers were never used on DC-8s for braking during flight. The resulting disturbance to airflow over the wing would produce very unstable flight characteristics, so the spoilers are restricted to ground use only.

Spoilerons are employed on the DC-8, however, but only when the landing gear is extended at slow speeds. Only the three outer panels extend as aileron aids for manoeuvring at slow speeds. A guide to the correct use of reversers and spoilers is included in the flight guide later in this manual.

The split flaps on the DC-8 are huge and extremely effective, so much so that although they will extend to a full 48 degrees, this setting is only ever rarely used. 15-20 degrees is the norm for take-off and landing. Full deployment is used to assist with braking on landing and in adverse weather conditions.

The leading edges of the wings on early DC-8s have small slats which open before the main flaps to assist with lift.

The unique features of the DC-8 design extend to the landing gear. In a tight turning circle, each rear-wheel bogie will automatically disconnect from the main chassis and rotate towards the direction of the turn in order to reduce friction and wear on the large tyres. Only one of the bogies rotates, in the direction of the turn.

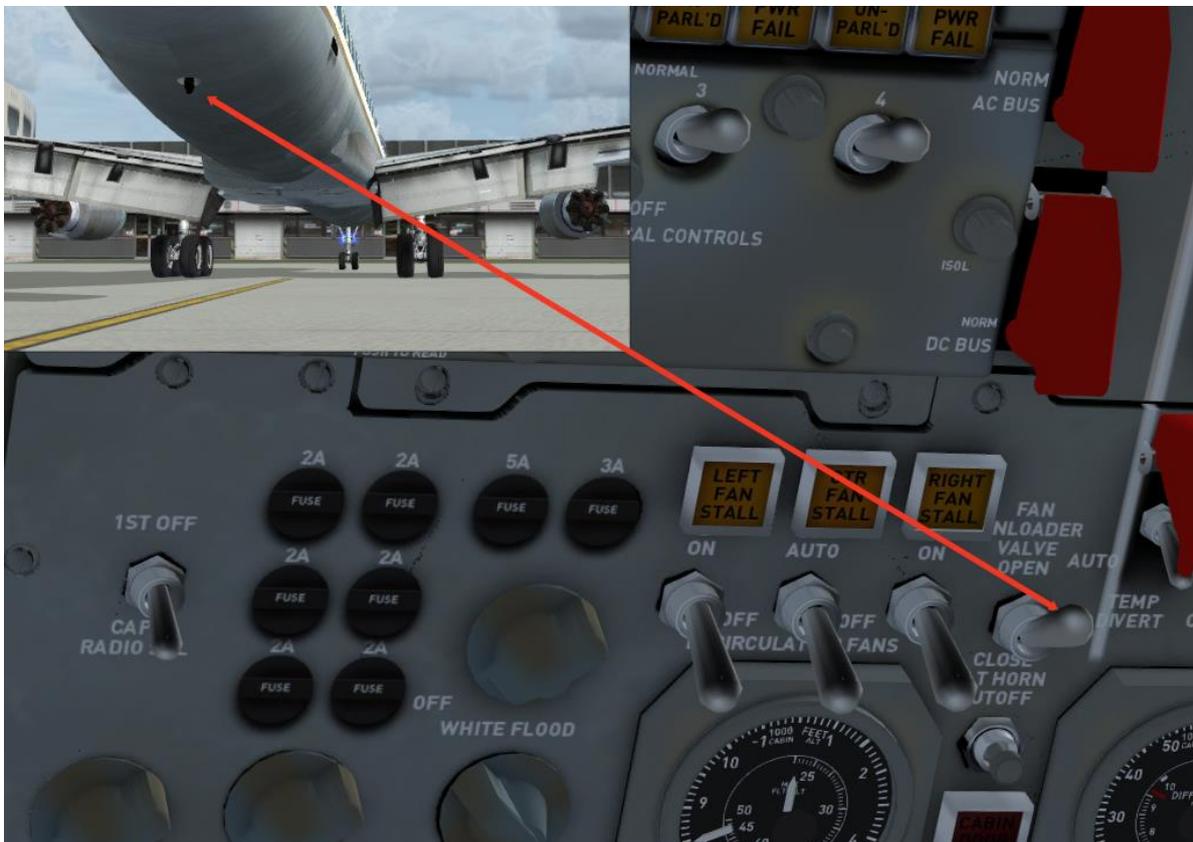


The bogies are also designed to remain level when the weight is lifted from the gear. They do not droop like they do on most modern aircraft, which allows for a more compact retraction system.

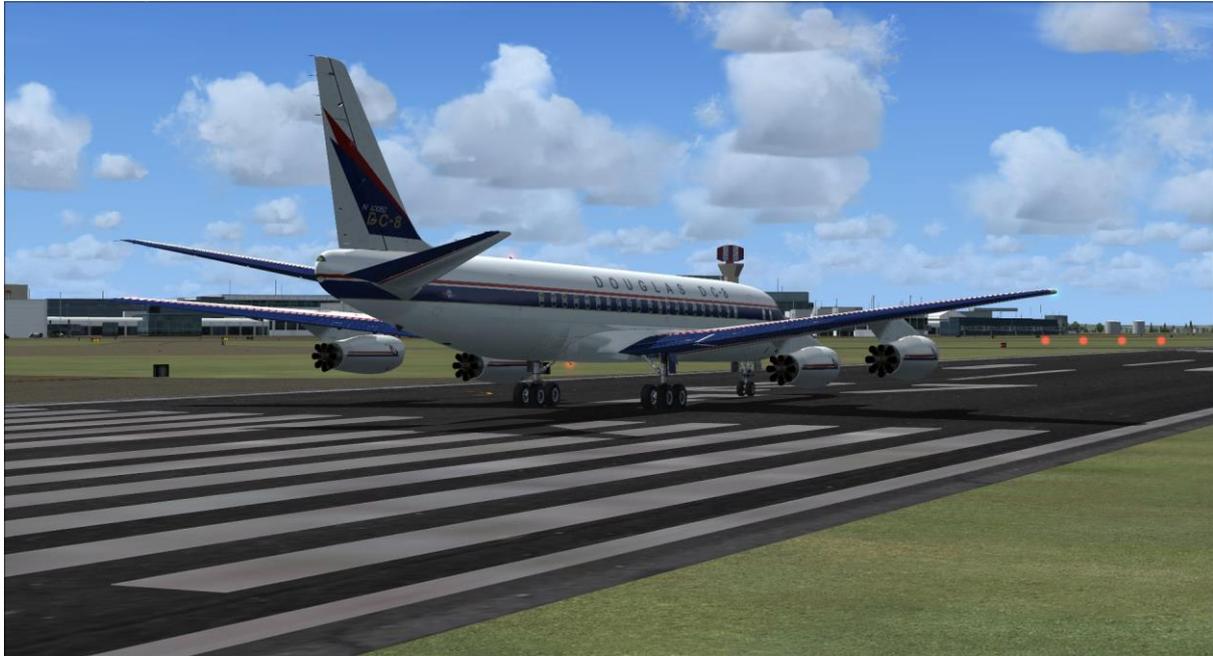
The large main gear doors retract and extend like those found on many fighter aircraft, providing a more aerodynamically efficient profile with less drag at low speeds.



Towards the tail of the aircraft, under the fuselage, is mounted the pressure relief vent door for the cabin pressurisation and air conditioning system. Opening and closing this door is simulated by using the [Shift]+[E]+[4] keys or the relevant switch in the virtual cockpit.



The DC-8 has a large tall fin and rudder to maintain directional stability. Heavy duty hinges and a large trim tab deal with the powerful aerodynamic forces and provide improved lateral control.



## COCKPIT GUIDE

The cockpit can be divided into nine areas:

- Captain's panel
- First Officer's panel
- Centre panel
- Forward centre console
- Throttle quadrant
- Aft centre console
- Flight Engineer's panel
- Overhead panel
- Navigator's panel

The following pages will guide you through these areas.

Many bespoke animations and much special programming code has been used in the cockpit to replicate the systems and functionality of the real aircraft, so we recommend that you read this Cockpit Guide and the rest of this manual to learn the location and function of all the controls and systems.

## Captain's panel



1. Parking brake and nose-wheel steering tiller
2. Windscreen heater/rain disperser
3. Comparator (annunciator fail lights)
4. NAV 1 course deviation indicator (CDI)
5. RMI (NAV 1 / ADF 1 and NAV 2 / ADF2)
6. Airspeed indicator (ASI)
7. Radio altimeter
8. Mach meter
9. True airspeed
10. Artificial horizon indicator (AHI)
11. Horizontal situation indicator (HSI)
12. DME display (displays NAV 2 distance)
13. Marker lights
14. Altimeter
15. Vertical speed indicator (VSI)
16. Anti-skid and spoiler position caution lights
17. Clock
18. Outside air temperature

For a clearer view of the instruments, toggle the yoke visibility using the PITCH TRIM COMP switch mounted to the left of the centre console, in front of the NO STEP placard.

There are three ASI units in the cockpit: those of the Captain, First Officer and Navigator. They all function in the same way. The ASI has setting bugs for V-speeds fixed around the bezel. To set these, click and drag or use the mouse-wheel. The red bug setter is for maximum speed (VMO) and the red light will illuminate when this set speed is exceeded.



The artificial horizon indicator is fitted with a flight director (FD). The instrument has a control knob to activate the different functions – OFF, HDG (heading) and V/L (VOR LOC). The yellow wing-shaped flight director indicator that displays within the AHF will indicate the direction in which to turn or bank the aircraft to establish the turn necessary to achieve a given heading (set by the heading control knob on the HSI) or to intercept the radial for VOR navigation and ILS approaches indicated by the RMI).



The RMI has dual-function needles. Using the two control knobs at the base of the instrument, you can select either VOR or ADF functions for each needle. The large white needle indicates either NAV 1 or ADF 1 depending on the position of the corresponding control knob. When the needle is indicating NAV 1, a light in the top of the instrument will illuminate. Similarly, the yellow needle indicates either NAV 2 or ADF 2 and has its own control knob and warning light.



The HSI can be driven either by NAV 1 or NAV 2, depending on the position of the switch at the bottom of the gauge.



The altimeter replicates a real-world type used in early DC-8s. The barometric pressure setting can be changed by left- or right-clicking the knob (or using the mouse-wheel). The needle reads off the height in 100-foot increments and the drum reads off the height in 1,000-foot increments up to 40,000 feet where the instrument becomes unreliable.



## First Officer's panel



The First Officer's panel closely mirrors the Captain's panel in its layout. The differences are listed below.

1. Anti-skid switch
2. Maximum airspeed warning light
3. Flap position indicator
4. Autopilot servo indicators (aileron, elevator and rudder)
5. Wing slats caution light

## Centre panel

1. Master caution light (push to reset)
2. Master fire warning light (push to reset)
3. Hydraulic brake pressure gauge
4. Altitude alerter
5. Standby AHI
6. Engine oil pressure warning lights
7. Engine Pressure Ratio (EPR) gauges
8. Exhaust Gas Temperature (EGT) gauges
9. N1 RPM gauges
10. Fuel flow gauges
11. Landing gear lever
12. Landing gear door warning lights
13. Landing gear test light switch

## EPR gauges



The EPR gauge indicates a power setting for a given engine. This is used in combination with special EPR tables to establish the correct throttle settings for a given cruise altitude and speed. The EPR bugs can be set to the desired thrust reading using left- or right-click (or the mouse-wheel), and the selected setting is indicated in the tumbler window. Throttles can then be adjusted to achieve the desired thrust range.

## Forward centre console



1. ADF 1 radio
2. COM 1 radio
3. Weather radar
4. ADF 2 radio
5. COM 2 radio

## Weather radar

With the increasing amount of third-party radar add-ons becoming available, we have placed a placeholder gauge tile in the centre screen of the weather radar (WXR) unit. The panel CFG file has an entry for a radar gauge to allow you to install a third-party radar gauge into this virtual cockpit.

A third-party radar add-on will usually be supplied with an entry for the panel CFG. We have provided a placeholder entry which can be replaced with the entry supplied by the add-on.

This is how the entry currently looks in the CFG:

```
//-----  
[Vcockpit11]  
Background_color=0,0,0  
size_mm=1024,1024  
visible=1  
pixel_size=1024,1024  
texture=$AH_WXR  
gauge00=dc8_WRradar!wrxradar, 123,84,769,769  
//-----
```

**Note:** *The gauge we have listed and provided in the folder is just a placeholder weather map.*

Please note the texture file name \$AH\_WXR. This is the gauge surface you will use to 'mount' your new gauge.

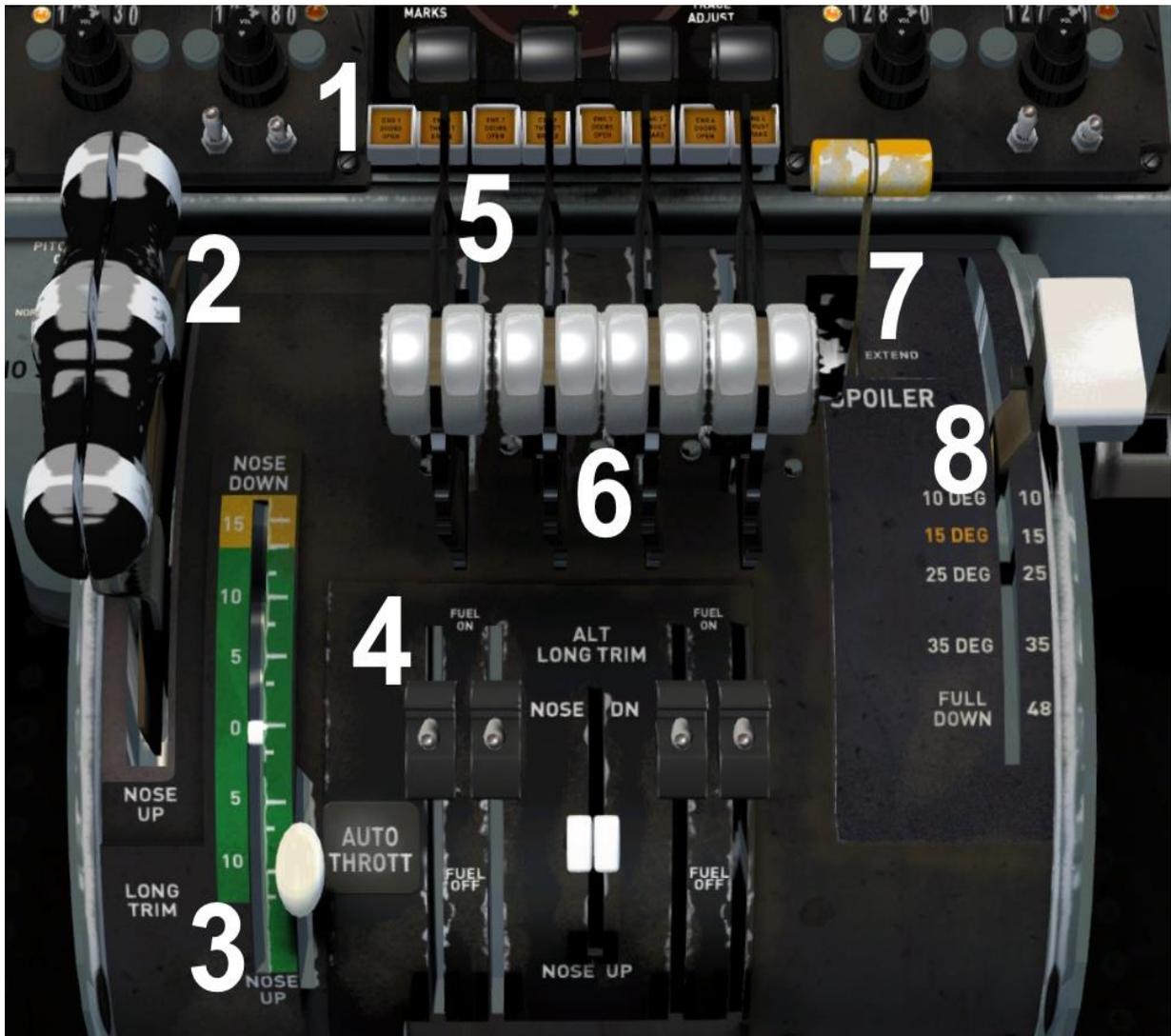
So, the entry should be edited to:

*Gauge00=Source for new gauge! NewgaugeName, xposition,y position,size,size*

You should now see your gauge displayed in the virtual cockpit radar unit.

Adjustment will be required to get the correct size, orientation etc., depending on the type of gauge you are using.

## Throttle quadrant



1. Thrust reverse bucket/door indicators
2. Elevator trim lever
3. Elevator trim indicator
4. Fuel shut-off levers
5. Thrust reverse levers
6. Throttle levers
7. Spoiler lever
8. Flap lever

Please ensure that the fuel shut-off switches are in the OPEN position before starting the engines.

The flaps are normally set to between 15 and 20 degrees for take-off, with full flaps only used in emergencies.

## Aft centre console



1. Autopilot
2. NAV 1 radio
3. NAV 2 radio
4. COM/MIC controls (non-functional)
5. Rudder trim knob
6. Aileron trim knob

## Autopilot panel



The aircraft is fitted with an independent autopilot and flight director. This means that you can select different modes on the flight director and autopilot at the same time, for example HDG mode on the autopilot and VOR LOC mode on the flight director.

The autopilot has the following modes:

- **MAN** (manual) – the aircraft's pitch and roll can be controlled with the vert(ical) speed wheel and turn knob
- **HDG** – the autopilot will hold the heading selected by the bug on the HSI
- **VOR LOC** – navigation hold mode (VOR/LOC hold with NAV selected, or GPS hold with GPS selected)
- **AUTO GS / MAN GS** – approach hold mode

The vertical speed wheel will control aircraft pitch if MAN mode is selected and the ALTITUDE knob is set to PITCH HOLD. If the ALTITUDE knob is set to VERT HOLD, it will control vertical speed. The tooltip will change to reflect whether pitch or VS is being selected. To hold your current altitude, select VERT HOLD and then rotate the vertical speed wheel until the tooltip shows '0ft/min'.

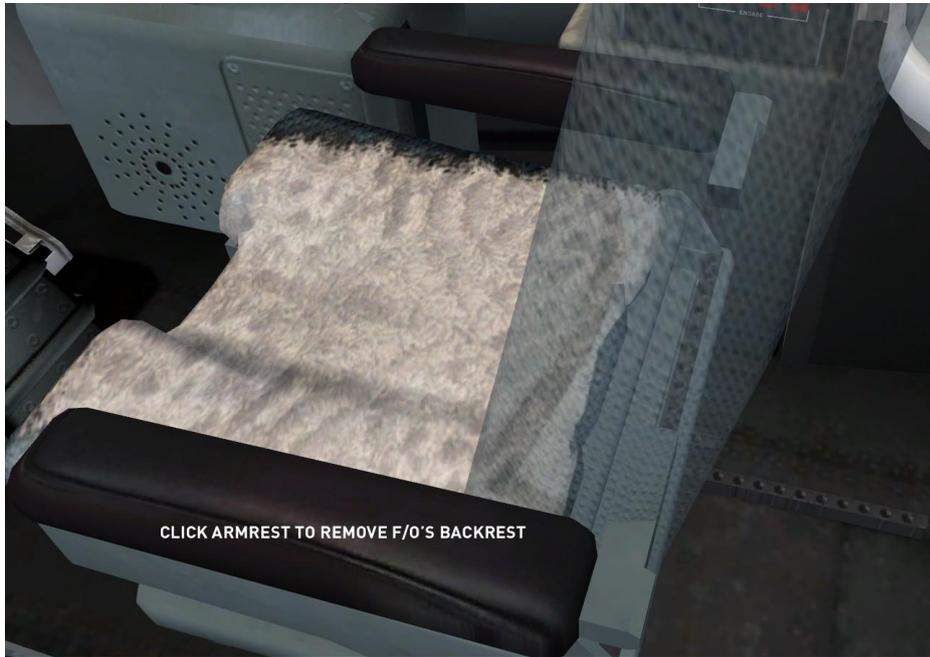
The servo lever has three positions:

- **AUTOPILOT** – autopilot and yaw damper engaged
- **OFF** – autopilot and yaw damper disengaged
- **DAMPER** – autopilot disengaged, yaw damper engaged

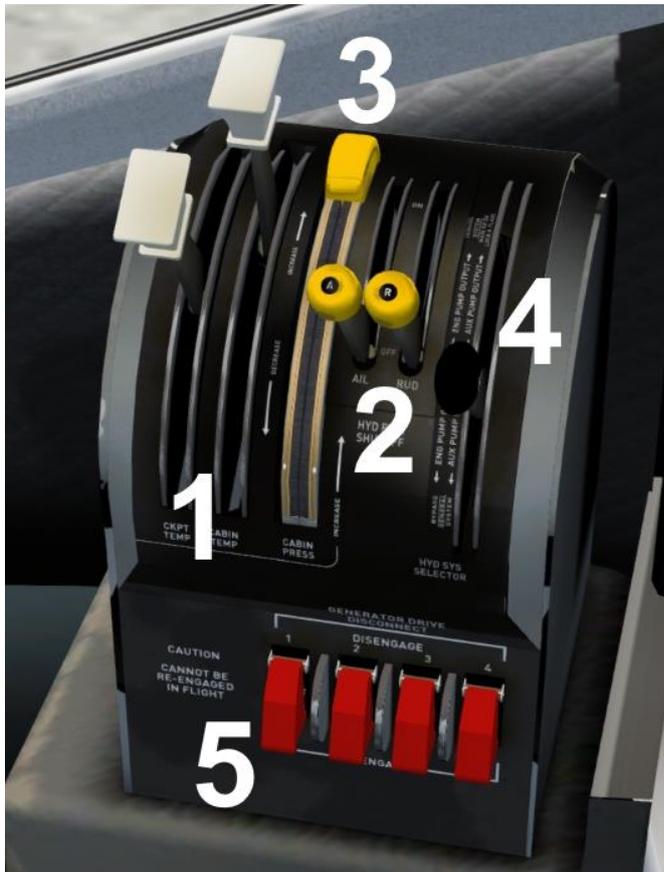
The autopilot and flight director are compatible with the default control assignments: [Z], [Ctrl]+[Z], [Ctrl]+[H] etc.

## Flight Engineer's panel

You can toggle the First Officer's seat back by clicking on the armrest for better access to the Flight Engineer's panel.

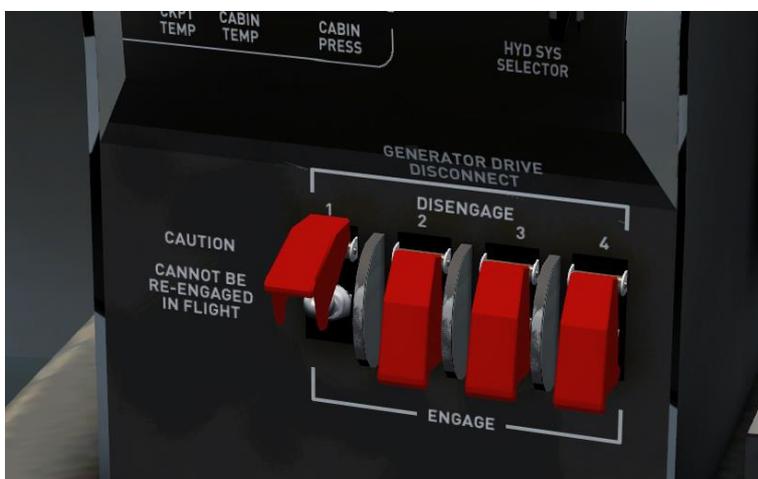


## Engineer's control pedestal



1. Cabin temperature setting levers (selected setting shown on gauges)
2. Aileron and rudder hydraulic levers (set to maximum/up position prior to flight)
3. Cabin pressure lever (selected setting shown on gauges)
4. Hydraulic pump lever
5. Generator disconnect switches

As per the real aircraft, the generator disconnect switches can only be used once during a flight. You will not be able to put the affected generator back online until you are back on the ground.



## Electrical subpanel



1. Power switch
2. DC BUS switch
3. AC BUS switch
4. DC generator gauges (load/volts)
5. Generator temperature gauges
6. Generator warning annunciators
7. AC generator gauges (load)
8. Generator switches
9. Bus fail annunciators
10. Emergency bus power switches

## 11. AC voltmeter

The three-way POWER switch (BATT/OFF/EXT PWR) controls the electrical power source. The master battery is selected when the switch is in the BATT (up) position. This will turn on the main batteries, allowing power to be used by systems such as instrumentation and engine starters etc. and energising the bus system switches for AC and DC circuitry.

The DC BUS SWITCH under the red cover must be set to the 'Normal' position (its default position). This switch brings the DC system online and is indicated through the DC gauges on the electrical panel.

Similarly, the AC BUS SWITCH must be set to 'Normal' to bring the AC power circuit (generators) online, indicated by the AC instruments on the electrical panel.

When the aircraft is powered up, the DC and AC BUS switches under the red safety covers are designed to isolate these systems in an emergency and should not be used in normal operation thereafter.

Switching the three-way POWER switch to the 'OFF' position powers down the aircraft electrical systems at shutdown.

Switching to the 'EXT PWR' position brings the GPU (Ground Power Unit) online for charging the batteries and engine start. The GPU and starter truck will appear beside the nose gear.



With engines running and voltages stabilised, the ground power switch should be returned to the BATT position and the blue annunciator will no longer be illuminated.

The top row of gauges show the DC generator load outputs for each individual generator. If you knock a generator offline, the other generators that remain in operation will increase their loads accordingly to compensate and this will be indicated on these gauges. Also, the affected generator will generate fault conditions

on the annunciators for drive oil and general failures. The gauge at the extreme right of this row is the battery voltage indicator.

The next row of gauges displays the running temperatures for the generators.

Immediately below the annunciators you will find the AC load read-outs for each generator. Again, taking a generator offline will have an impact on the read-outs for the other generators which are still online.

An AC voltmeter is supplied. This instrument serves all four generators and the read-outs are selected for each one by rotating the knob immediately below to the desired generator. The knob also has a position for the battery, which will indicate the state of charge. This should be in the region of 30 volts with four generators running.

There are four generator switches. These will take a generator online or offline as indicated by the state of the BUS PWR FAIL annunciator. BUS power switches are also provided below the annunciators. Switching off BUS power will disconnect the generator without taking it offline. The annunciator will light to show the state of that BUS circuit.

## Hydraulics subpanel



1. Fire warning annunciators and test lights
2. Passenger oxygen venting and supply switch
3. Cockpit flight recorder switch (set to ON before flight)
4. Fire test switches
5. Fire/smoke detector test system
6. Hydraulic system gauges
7. Main gear spoiler test
8. Hydraulic control switches
9. Vibration monitor gauges
10. Vibration warning light and test
11. N1 RPM gauges
12. Hydraulic fluid quantity gauge

Fire warning annunciators can be tested for correct operation by using their individual test switches found immediately below each of the annunciators. In the case of a real fire, these annunciators will illuminate depending on the engine affected by the fire in conjunction with the master fire warning annunciator. Fire annunciators are fully automatic and will no longer be illuminated once the fire is out. No resetting is required.

There are five smoke detectors in the cargo holds and the warning annunciator serves all five. Turning the test knob will test each in turn. Return the knob to the **OFF/NORMAL** position for flight.

To the right, immediately below the engine fire test switches, are the hydraulics monitoring gauges: a gauge for the hydraulic fluid temperature, one for hydraulic oil quantity and four hydraulic pressure gauges, one for each engine. Hydraulic pump switches must be **ON** before engine start.

The **BYPASS HYDRAULIC PUMP** switches are isolated from each other and only affect the hydraulic system gauge. Moving the hydraulic power levers for the aileron and rudder on the Engineer's control pedestal will cause the annunciators to extinguish on this panel, showing that the system is operating normally.

Below these are the engine vibration read-outs for each engine. An abnormal read-out will indicate a fault with that engine, making it run erratically. A read-out ranging from around 0.5 to as much as 2.0 can be considered within normal operating range.

N1 RPM gauges are below, together with a gauge showing the total engine oil quantity.

## Engine management subpanel



1. Engine oil quantity gauges
2. Engine oil pressure gauges
3. Engine oil temperature gauges
4. Oil cooler door switches
5. Fuel annunciator lights
6. Engine temperature setting control
7. Engine auto/manual switch
8. Airframe temperature setting control
9. Airframe auto/manual switch
10. Tail surface de-icing switch and test

To configure the de-icing system, turn the control knob to the current temperature (usually during flight unless you are flying in the Antarctic!). Switch to manual mode to activate or leave everything on auto and let the system handle it for you.

Tail de-icing is manually controlled using the switch.

The engine oil quantity for each engine is shown in the top four gauges of this section. Below these are gauges for oil pressure and temperatures for each engine. Should the oil temperature rise, particularly at idle when on the ground, switch the oil cooler doors to **OPEN**.

At the bottom of this panel you will see a number of blue annunciator buttons. These indicate the state or position of the various fuel tank valves. Once you are comfortable with the operation of the fuel management panel, they will serve as handy reminders of the fuel set-up that you are currently running.

## Cabin subpanel



All the various gauges, buttons and switches are animated but some are non-functional in this simulation.

Air pressure is available on engine start and is monitored using the manifold pressure and air temperature gauges.

There are four air conditioning compressors which are activated individually by the four cabin compressor switches. Warning annunciators will glow if there is a problem with any part of this system.

Excess pressure can be released by using the fan unloader switch which will open a special vent in the underside of the aircraft's tail.

A cabin temperature gauge will display the temperature in the passenger cabin or the flight deck by using the appropriate switch to the left.

Immediately below is a vertical speed indicator (VSI).

Also on this part of the Engineer's panel are conventional lighting switches for the cabin and cockpit and, to the left, a small subpanel carrying switches for emergency rudder power and ground spoiler power should the servos fail.

## Fuel subpanel



1. Fuel tank selector levers
2. Crossfeed levers
3. Fuel tank boost pump switches
4. Fuel tank fill valve switches
5. Fuel tank automatic shut-off indicators and test selector switch
6. Engine fuel temperature switch and indicator
7. Fuel pressure indicators
8. Fuel tank quantity indicators
9. Engine fuel pump low pressure lights
10. Alternate tank quantity low indicating lights



11. Fuel dump nozzles handle

## GENERAL

The fuel system provides the engines with fuel and is designed to maintain structural integrity while keeping the aircraft's centre of gravity within limits.

The DC-8-10 to -21 variants are fitted with eight fuel tanks: four main tanks with corresponding alternate tanks. The DC-8-32 and -42 variants are fitted with an additional centre wing auxiliary tank, increasing the range of these variants. The tanks are arranged in four independent fuel systems with a main and an alternate tank for each engine.

Fuel is normally supplied to an engine from its main tank. First the auxiliary tank and then the alternate tanks should be used to maintain the main tanks at the required fuel levels. Fuel from the centre wing auxiliary tank is pumped through a selector valve to a crossfeed manifold to replenish the main tanks. Fuel from the alternate tanks is pumped into the corresponding main tank through its fill valve.

Each tank is provided with an electronically driven boost pump to be used for fuel transfer and, when necessary, to provide adequate fuel flow and pressure to an engine-driven boost pump.

**Note:** *The centre wing auxiliary tank controls and indicators are present on the earlier variants of the DC-8 but they serve no purpose due to the absence of that fuel tank. The fuel subpanel also features controls and indicators for a forward auxiliary tank, but these too are inoperative as the forward auxiliary tank was only fitted to later variants of the DC-8, as featured in Just Flight's DC-8 Jetliner Series 50 to 70 add-on.*

## **FUEL MANAGEMENT**

The fuel system should be managed to ensure a fuel loading which will provide proper structural integrity while keeping the aircraft's centre of gravity within limits. To maintain the required fuel loading, the fuel usage sequence should be as follows:

- Fuel from the centre wing auxiliary tank is used to maintain the main tanks at the required level until the auxiliary tank fuel is depleted.
- When the auxiliary tank fuel is depleted, the inboard alternate tanks are used to keep the inboard main tanks full and fuel is used from the outboard main tanks.
- When the inboard alternate tanks are empty, fuel is used from the inboard main tanks and the outboard alternate tank fuel is used to maintain the outboard main tanks at approximately 7,000lb until the outboard alternate fuel is depleted.
- At this point all main tanks should contain the same of fuel.

## **FUEL TANK AUTOMATIC SHUT-OFF**

A fuel tank automatic shut-off system is installed, which will automatically shut off the flow of fuel:

- To each fuel tank during fuel transfer when the tank is filled to capacity  
or
- To the main tanks No.1 and No.4 when they are being replenished by their alternate tanks and they reach approximately 7,000lb.

## **FIRE SHUT-OFF LEVERS**

Fire shut-off levers, located on the overhead panel, control fuel fire shut-off valves installed on the main fuel supply lines to the engines. When closed, the valve stops the flow of fuel to the engine.

## **FUEL SHUT-OFF LEVERS**

Four fuel shut-off levers, one for each engine, are located aft of the throttles. Each lever has the positions FUEL ON and FUEL OFF. Each lever is connected to the fuel shut-off lever on its respective fuel control unit. When a lever is moved to the FUEL ON position, the switch for the corresponding engine ignition system is actuated and fuel is allowed to flow from the engine fuel control unit to the engine.

Moving the shut-off lever to the FUEL OFF position stops the flow of fuel into the fuel control unit and de-energises the ignition system if it is still on.

## **FUEL TANK SELECTOR LEVERS**

The fuel subpanel has six fuel tank selector levers, one for each engine fuel system and one for the centre wing auxiliary tank and forward auxiliary tank. The levers are connected to their corresponding tank selector valve.

The main tank selector levers have positions labelled MAIN, ALT and OFF. When a selector lever is moved to the MAIN position, the valve routes fuel to the engine from its corresponding main tank. When a selector is moved to the ALT position, the valve routes fuel from the alternate tank directly to the corresponding engine. When a selector is moved to the OFF position, the valve shuts off fuel flow from both the corresponding main and alternate tanks.

The centre wing auxiliary tank selector lever has positions labelled OFF and CENTER WING AUX. When the selector is in the CENTER WING AUX position, the selector valve is positioned to allow fuel to enter the

crossfeed manifold where it is then available to the tank fill valves for replenishing the tanks or the crossfeed valves for direct crossfeed to an engine.

### **CROSSFEED LEVERS**

The fuel subpanel has four crossfeed levers which are connected to their corresponding crossfeed valve. Each lever has the positions NORMAL and CROSSFEED. When a lever is in the NORMAL position, the corresponding crossfeed valve is closed. Moving the lever to the CROSSFEED position opens the crossfeed valve, permitting fuel flow either to or from the crossfeed manifold.

Each crossfeed valve is located between the crossfeed manifold and the engine fuel supply line. Normally there is no fuel flow from the manifold to the engine supply line. However, if you wish to use fuel from one engine fuel system for another engine, the crossfeed lever can be used to route fuel into the crossfeed manifold. Fuel from the crossfeed manifold can then be used to supply:

- Any or all of the engines directly through their corresponding crossfeed valves or
- Any or all tanks through their corresponding fill valves.

### **FUEL TANK BOOST PUMP SWITCHES**

The fuel subpanel has four main tank, four alternate tank, and one auxiliary tank boost pump switches. Placing a switch in the BOOST (up) position energises an electrically driven fuel tank boost pump.

The corresponding fuel tank boost pump switch must be turned on to transfer fuel from an alternate or auxiliary tank to a main tank and, when necessary, provide adequate fuel flow and pressure to the engine-driven fuel boost pump.

### **FUEL TANK FILL VALVE SWITCHES**

The fuel subpanel has ten fuel tank fill valve switches, one switch for each tank. The main tank switches are rotary types, and the alternate and auxiliary tank switches are toggle types. Each switch has a labelled FILL position. The off position is unmarked.

Moving the switch for a particular tank to the FILL position opens the electric fill valve of that tank. When the electric fill valve is open, fuel can be pumped into the tank from the crossfeed manifold, through the fuel level shut-off valve. When the tank is full, the fuel level shut-off valve will automatically close. Moving the switch to the off position closes the electric fill valve.

## **FUEL TANK AUTOMATIC SHUT-OFF INDICATORS AND TEST SELECTOR SWITCH**

A fuel tank automatic shut-off system indication and test selector switch located above the fuel subpanel has positions labelled TEST, NORM and VALVE CLOSED.

When the switch is placed in the TEST position, a valve in the crossfeed manifold opens, allowing fuel flow into a small tank. When the tank fills, the valve closes (simulating a full tank condition), the fuel level shut-off valve closes, and the fuel tank automatic shut-off closed indicating light illuminates. The time from switch operation to light indication is approximately three seconds.

When the selector switch is placed in the VALVE CLOSED INDICATION position, the fuel tank automatic shut-off closed indicating light illuminates when the fuel level shut-off valve closes.

When the selector switch is placed in the NORM position, the fuel tank automatic shut-off closed indicating light circuit is de-energised.

## **FUEL PRESSURE INDICATORS**

The fuel subpanel has four fuel pressure indicators which indicate the inlet pressure at the corresponding engine main fuel pump. Each indicator is calibrated in PSIG with a green and red bank to indicate normal and maximum values.

## **FUEL TANK QUANTITY INDICATORS**

The fuel subpanel has ten fuel tank quantity indicators, one for each fuel tank. Each indicator has a pointer and is calibrated in thousands of pounds.

## **FUEL TANK AUTOMATIC SHUT-OFF CLOSED INDICATING LIGHTS**

Blue fuel tank automatic shut-off closed indicating lights, one for each tank, illuminate when the corresponding fuel level shut-off valve is closed, provided the fuel tank automatic shut-off system indicating and test selector switch is in either the TEST or VALVE CLOSED position. The light extinguishes when the corresponding fuel level shut-off valve is opened or when the automatic shut-off system indicating and test selector switch is placed in the NORM position.

## **ALTERNATE TANK QUANTITY LOW INDICATING LIGHTS**

Two amber alternate tank quantity low indicating lights, one for each outboard alternate tank (No.1 and No.4), illuminate if the fuel level in an outboard alternate tank drops approximately 500lb below full while there is more than 7,500lb of fuel in the corresponding outbound main tank.

# Overhead panel



1. Fuel dump switch
2. Attendant call button
3. Mech call button
4. Lighting switches
5. Transponders
6. Emergency lighting test
7. No smoking/Seatbelt sign switches
8. Navigation lights switch
9. Pitot heat switch and selector
10. Taxi lights switch
11. Landing light switches
12. Engine start buttons
13. Engine starter arm selector
14. Engine ignition switch

The taxi light switches have three positions:

- OFF – the system is off
- TAXI – a lower intensity light is turned on for taxiing
- LAND – a higher intensity lamp is turned on as a landing light

Similarly, the landing light switches have three positions:

- OFF – the system is retracted and off
- EXTEND – the light-pods are extended
- LAND – the light is turned on

A floodlight switch is provided, immediately to the right of the landing lights. This is a two-way switch: WING and GROUND FLOOD. With WING selected, the wing inspection lights mounted high on the fuselage forward sides are illuminated. With GROUND selected, two floodlights mounted in the wing roots will illuminate the ground at 45 degrees from the forward line, to assist ground crews at night.

By pressing the centre ATTENDANT CALL button, you can call up the passenger stairs truck which positions itself at the rear passenger door on the port side. Press [Shift]+[E] to open the door and [Shift]+[E]+[3] to extend the air stairs to the correct door height.



Press the MECH CALL button to toggle the chocks and flags whilst on the ground.



The procedure for engine start requires that you first arm the ignition, followed by the ignition switch, before pressing the starters. You will find that unless you follow this procedure you will not be able to use the starter buttons.

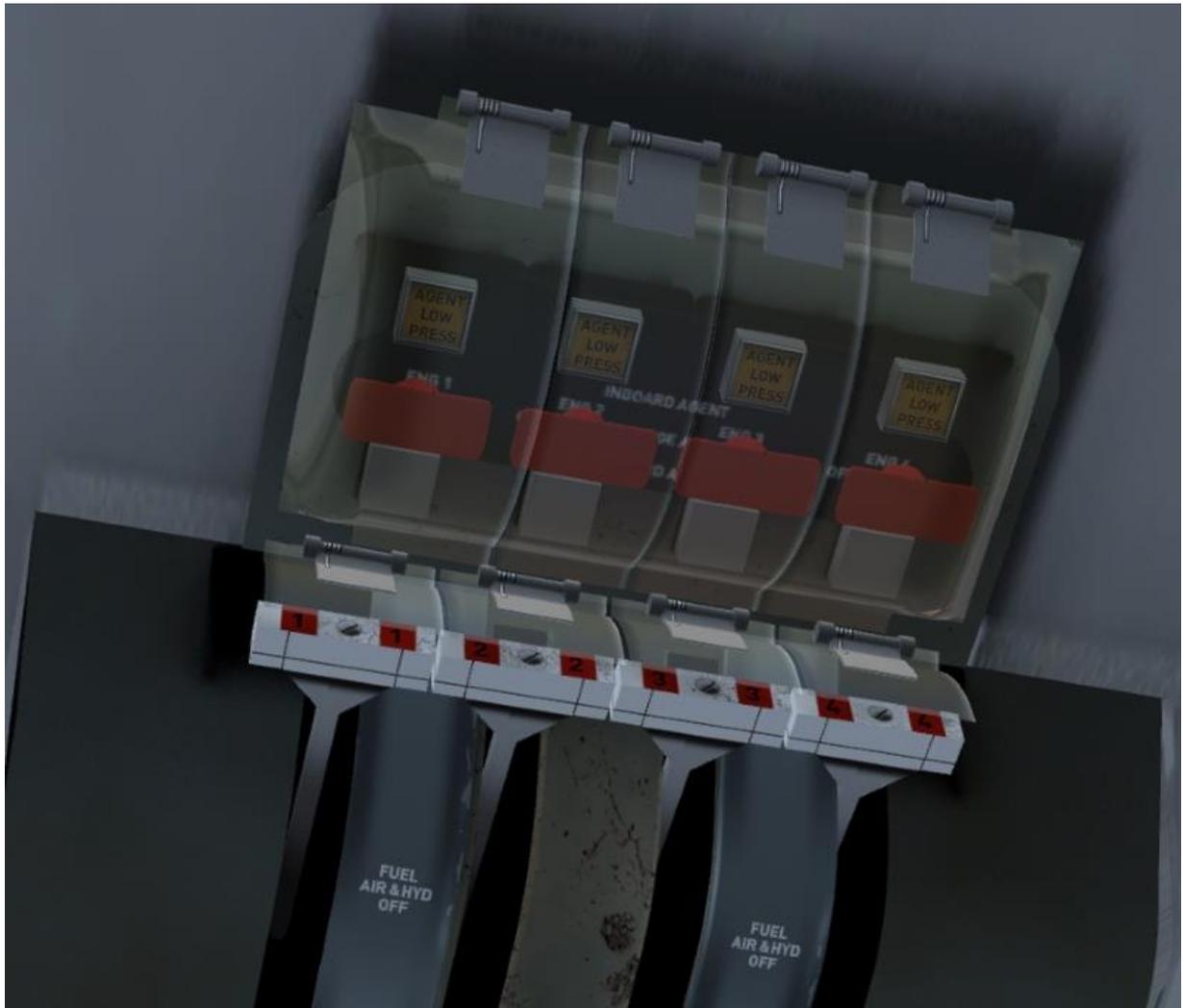
To start the engines, you need to select external power (EXT PWR) using the three-way power switch on the Engineer's panel. You can start all four engines using external power or, alternatively, one engine can be started and then the power switch can be returned to the battery (BATT) position before starting the remaining three engines using cross-bleed.

You can also use [Ctrl]+[E] to automatically start all four engines.

Remember to crank the fuel dump nozzles down (using the handle on the Flight Engineer's desk) before using the fuel dump switch. You will not be able to use the switch unless you do. This prevents accidental dumping when the nozzles are stowed and allows for the draining of the system before and after use.

## Fire control system

The fire control system is functional in this simulation. Unlike in the real aircraft, however, you have the option of resetting it once used.



To operate the system, lift the clear perspex cover for the affected engine (1 through 4, left to right). Click on the red lever. The lever will swing down to the discharge position as will the agent/select lever. To reset the system, simply click on the red lever again and close the cover.

Reset the master fire warning on the glareshield panel. The fire warning annunciators on the Flight Engineer's panel will reset automatically once the fire is extinguished.

## Navigator's panel



1. Passenger oxygen control panel
2. LORAN (LONg RANGE Navigation system) control (non-functional)
3. COM and MIC panel (non-functional)
4. Clock
5. Drift meter (non-functional)
6. VOR/RMI gauge
7. Radio altimeter
8. Airspeed indicator (ASI)
9. Altimeter

# TUTORIAL – FLYING THE DC-8

## (Dallas/Fort Worth to Kansas City)

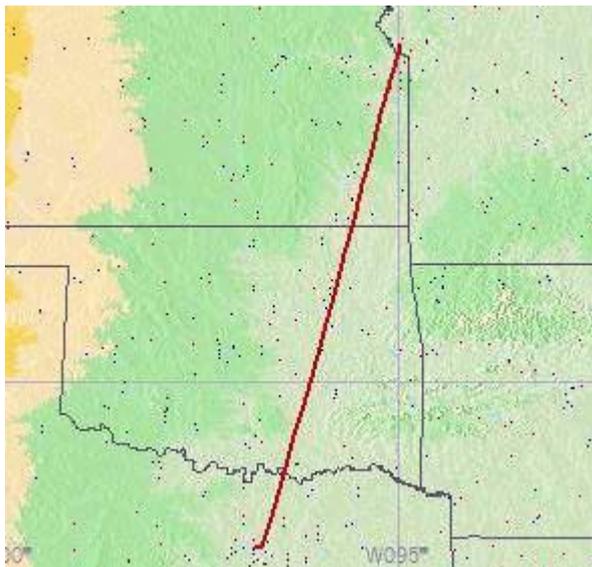
For this tutorial flight we will be departing from Dallas/Fort Worth International Airport (KDFW) in Texas, USA. We will be heading north-east, flying over Tulsa, before beginning our approach into Kansas City from the south.

Covering a distance of approximately 400 nautical miles, this route is the ideal length for learning about the various systems on board the DC-8. For this flight we will be piloting a Delta Air Lines DC-8-10 (N801E), powered by four Pratt & Whitney JT3C engines, each producing 13,500lb of thrust.

Here are the details for today's flight:

## Flight plan

KDFW – CVE (116.20) – TUL (114.40) – DO (359.0) – KMCI



**Estimated time en route:** One hour (subject to weather)

**Route distance:** 405 nautical miles

**Departure time:** 1300 (local time)

**Cruise altitude:** 25,000 feet

**Weather:** Clear

Now that we are prepared for the flight we can proceed to the cockpit to begin our pre-flight checks.

To load up the DC-8 tutorial flight:

1. FSX: Steam Edition.
2. If you are using FSX:SE, select the **Free Flight** menu.
3. Choose **Load**.
4. Select **DC-8 tutorial flight** from the list of saved flights.
5. Click on **Fly Now!**

You should now find yourself sitting in the cockpit of a DC-8-21 located at Dallas/Fort Worth International, gate A15. The cockpit is currently in a 'cold and dark' state, i.e. all the cockpit systems are switched off, just as you would find the aircraft prior to the first flight of the day. This means we will need to spend some additional time setting up the cockpit, but doing so will allow you to learn a considerable amount about the features and functions on board this classic jet airliner.

You can, of course, jump straight into the DC-8 and start the engines using **[Ctrl]+[E]** in the usual manner, but there are certain features which you will miss if you choose to do this. For example, the DC-8's complex multi-tank fuel delivery and crossfeed systems have been faithfully replicated.

## Getting started

Press the MECH CALL button in the centre of the overhead panel to ensure that the 'remove before flight' flags and wheel chocks are in place, then press the ATTENDANT CALL button to enable the air stairs.

The first thing we need to do is get the aircraft ready for passenger boarding and cargo loading. Press **[Ctrl]+[J]** to request the jetway and, once it has docked with the aircraft, press **[Shift]+[E]** to open the main passenger door and **[Shift]+[E]+[2]** to open the cargo doors.

The cabin crew and ground handlers can now begin their preparations for passenger boarding and cargo loading while we continue setting up the aircraft ready for the flight ahead.

We can now power up the aircraft.

Cycle through the views using the **[S]** key until you reach the 'Virtual Cockpit' viewpoint and then press **[A]** until the 'Engineer Station' viewpoint is selected.

The electrical system on the DC-8 has an internal battery and an external (ground) power supply option. The external power supply can be switched on by setting the power supply switch on the Engineer's panel to the **EXT PWR** (down) position. A blue annunciator button will illuminate to indicate that external power is being used.

We will later use external power to start engine 3 and then switch to battery power and use cross-bleed to start engines 1, 2 and 4.



There are four generators, one per engine. No.1 generator is responsible for bringing the power bus online so that avionics and major electrical supplies can be energised. The engine start procedure calls for engine No.3 to be started first, so turn on both the No.1 and No.3 generators.



Before moving on from the electrical panel, ensure that the four Bus Power switches are in the **ON** (up) position.



Move across to the top right of the Engineer's panel.

Open the red safety cover, move the FLIGHT RECORD switch to the **ON** (up) position and then close the cover.



Now switch on the GALLEY PWR and set the monitoring switch to **AUTO**.



Before moving down the panel, test the engine fire and cargo smoke warning lights, using the four ENG FIRE WARN TEST switches and the SMOKE DETECT knob.



As you move down the panel, make sure that the hydraulic quantity (HYD QTY) needle is within the normal range.



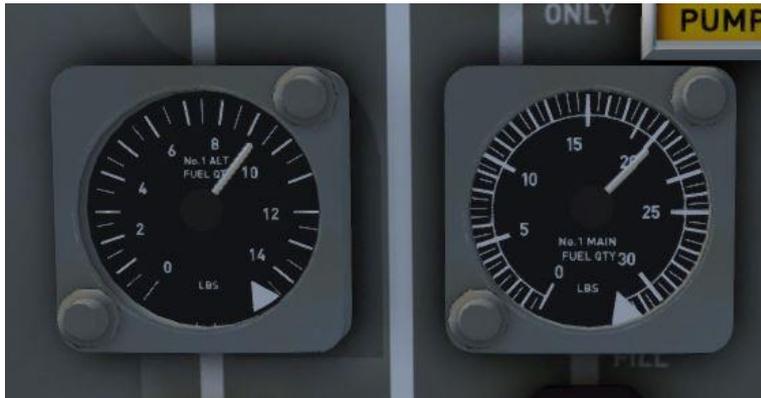
Start the AUX HYD PUMP (auxiliary hydraulic pump) and ensure that the hydraulic pressure rises.



Switch off the auxiliary hydraulic pump before moving on to the engine management panel, checking that the engine oil quantity for each of the four engines is at its maximum value.



On the large fuel panel, verify that you have sufficient fuel for this flight.



Proceeding up the left-hand side of the panel, move the four CABIN COMPRESSOR switches to the **ON** position. Check that the needles on the corresponding gauges, located above the switches, rise but remain below the red marker lines.



Finally, move the three RECIRCULATING FANS switches to the **ON/AUTO** position and the two FREON COMPRESSORS to the **NORM** position.



We now need to focus on the overhead panel, so press the **[A]** key to cycle through the viewpoints until you reach 'Overhead Panel'.

Switch **ON** the PROBE HEATERS and check that the PITOT AMPS needle rises.



On the right side of the panel, make sure that the EMER (emergency) LIGHTS are set to **ARM** and both the FASTEN SEATBELTS and NO SMOKING switches are set to **ON**.



Switch **ON** the position and beacon lights.



The final checklist items prior to engine start relate to navigation following departure.

Toggle the NAV/GPS switch to **GPS**. This will allow us to hold the GPS flight plan with the autopilot.



On the HSI (Horizontal Situation Indicator), rotate the HDG bug to **174 degrees**. This will be our initial heading following take-off.



To adjust the HDG bug more easily, you might need to toggle the yoke visibility. To do this, click on the PITCH TRIM COMP switch located to the right of the Captain's knee.



Finally, tune the frequency of the first waypoint on our route (CVE VOR – **116.20**) into the NAV 1 radio. We will make a turn towards the VOR before commanding the autopilot to maintain our GPS flight plan.



## Starting the engines

Before starting the engines we need to secure the aircraft. Request the jetway to disconnect by pressing **[Ctrl]+[J]** and then press **[Shift]+[E]** and **[Shift]+[E]+[2]** to close the doors.

Moving over to the fuel subpanel on the Engineer's station, confirm that:

- The engine 1, 2, 3 and 4 tank levers are in the MAIN (up) position.
- The four crossfeed levers are in the NORMAL (up) position.
- The fill valve switches are all set to OFF.
- The main tank boost pump switches are all set to BOOST & FEED (up).

This configuration will allow fuel to flow from each of the main tanks to their corresponding engines during start, taxi, take-off and climb.

To enable the engine start buttons, rotate the ignition arming knob to the **ARMED** position and switch **ON** the ignition over-ride switch.



Push the engine No.3 start switch in. When the engine begins to spool up, ensure that the engine No.3 fuel shut-off lever (located aft of the throttle levers) is set to **ON**. Once the engine has started, return the engine No.3 start switch to the **OFF** (out) position.



Moving the power switch on the Engineer's panel to the **BATT** (up) position with another left mouse-click will bring the internal battery supply online.



Rotate the VOLT & FREQ knob to the **BATT** position and verify that the battery is supplying voltage.



Now start engines 4, 2 and then 1 using the same procedure as before.

Once all four engines have been successfully started, switch **OFF** the ignition override switch and rotate the ignition arming knob to the **OFF** position.

On the Engineer's panel, switch **ON** generators 2 and 4.



Switch **ON** the anti-skid system.



Finally, switch **ON** the taxi lights ready for pushback.



## Taxi

We are now ready to push back from the gate.

Set the flaps to **15 degrees**, release the parking brake and then press **[Shift]+[P]** to begin pushback from the gate.

Although it is not essential, it is a courtesy to extend the ejectors to limit engine noise. Use the switches on the overhead panel to control the ejectors.



Once the aircraft has been pushed back far enough from the terminal building for you to carry out a turn onto the taxiway, press **[Shift]+[P]** to stop pushback.

We can now taxi to the runway. Release the parking brake and then taxi to the threshold of runway 17R using this route:



## Take-off

Having received clearance for take-off, taxi onto the runway and switch **ON** the landing lights. Retract both the inboard and outboard ejectors.

Line up with the runway centre line and then come to a stop. Bring the throttle levers forward to around 25%, check that the engines are stable using the engine instrument gauges and then advance the throttles to apply full power.

As the aircraft starts to gather speed, keep it running down the centre line with small rudder inputs. As you approach **140 knots** start to raise the nose of the aircraft. Slowly bring the nose up to approximately 10 degrees as you lift off the runway.

The aircraft will begin to climb away from the runway and you should be clear of the ground by the time you reach 160 knots. Raise the undercarriage using the **[G]** key and adjust the elevator trim as required to maintain a 15-degree pitch, manually holding the runway heading (174 degrees).



Passing through 185 knots, retract flaps to 10 degrees then retract them fully as you pass 215 knots.



Reduce power and maintain **220** knots indicated. Climb at approximately **1,500** feet per minute by adjusting power and climb rate.

We can now engage the autopilot to maintain the climb. Engage the autopilot by moving the servo lever to the **AUTOPILOT** position. The autopilot will maintain the aircraft's current pitch and hold wings level.



Rotate the ALTITUDE knob to the **VERT HOLD** position and then rotate the VERT SPEED wheel to select **+2500 (feet per minute)**. Finally, rotate the AP SELECT knob to the **HDG** position. The autopilot will now maintain the heading selected using the HSI bug (174 degrees).



Now rotate the HSI bug to make a turn towards the CVE VOR that we tuned in before departure. Use the RMI pointer to judge what heading is required.



Once the aircraft has stabilised on a direct course towards the VOR, rotate the AP SELECT knob to select navigation hold mode (**LOC/VOR**). The aircraft will turn to intercept your GPS flight plan to Kansas City.



When the aircraft has finished intercepting the course, which can be verified by checking the GPS, increase your speed from 220 knots to **250 knots**.

Passing through 10,000ft, switch off the landing lights and increase your speed to **280 knots**.

## Cruise

We should reach our cruising altitude somewhere north of Dallas. As you begin to approach the cruise altitude (25,000ft), use the vert speed wheel to gradually reduce the rate of climb. On reaching 25,000 feet, reduce the vertical speed to 0ft/min (level flight).

Allow the aircraft to accelerate before adjusting power to maintain **280 knots**.

Turn **OFF** the No Smoking and Seatbelt signs, and monitor and balance the fuel load by referring to the [fuel sequence](#) in the cockpit guide section of this manual.



Whilst in the cruise, take some time to explore the cockpit further and review the functionality covered in the [COCKPIT GUIDE](#) of this manual.

## Descent

As you approach approximately 80 nautical miles from your destination (KMCI), as displayed on the GPS unit, you should begin your descent. Reduce your airspeed to **250 knots** and then use the vert speed wheel to select a vertical speed of **-1,500ft/min**.



To reduce the workload on approach, we will tune the ILS frequency and select the course for runway 01L at Kansas City now.

Using the CRS knob on the HSI, select a course of **009 degrees**. As GPS mode is currently selected, the selected course won't be shown on the HSI itself, but it will become visible when we switch back to NAV mode.



Now tune the ILS frequency (**110.50**) into the NAV1 radio. You will need to select the frequency on the STBY box before using the ACT/STBY switch to flip it over to the ACTIVE box.



Finally, rotate the flight director mode knob to the **V/L** position to display guidance for the localiser.

As you pass through 18,000 feet, turn **ON** the No Smoking and Seatbelt signs.

## Approach

You should reach 10,000ft approximately 20 miles south of the DOTTE NDB (DO) waypoint. Reduce your airspeed to **220 knots** and initiate a descent to **3,500ft** at **-1,800ft/min**.

Spoilers are not used on the descent for normal flight, but reverse thrust is permitted for air braking on engines 3 and 4 only.



Extend the ejectors for engines 3 and 4 by using the INBD ENG INJECTORS switch on the overhead panel.

Use the speed brake control lever or keyboard assignment for the spoilers to extend the reverser buckets. Use the system sparingly and always return to normal flight operation when the desired speed is reached.

**Note:** For convenience, the ejectors can be extended and retracted using keystrokes. Inner ejectors can be operated using a keystroke for 'Ballast Valve' and the outer ejectors can be operated using a keystroke for 'Water Rudder'. Both of these assignments can be set in the FSX Control Settings menu.

As you approach **10nm** from DOTTE NDB (DO), move the NAV/GPS switch to the **NAV** position. The aircraft will begin a shallow bank to intercept the localiser for runway 01L.

The aircraft will stabilise on the localiser and continue descending towards 3,500ft. As the glideslope needle on the attitude indicator and HSI moves up the gauge and reaches the central position, rotate the AP SELECT knob to select **GS AUTO** (approach) mode.



If you are slightly below the glideslope, use the vertical speed wheel to reduce your rate of descent to intercept it.

After a short time, you should stabilise with a descent rate of approximately **-800ft/min.**

Once stable on the approach, begin slowing to your approach speed of **150 knots**. Set the flaps to **15 degrees** as you slow through 215 knots and **25 degrees** at 205 knots indicated. Lower your landing gear as you pass through **190 knots**.

Extend the landing light pods using **[Shift]+[E]+[3]** and turn on the landing lights once you are on final approach.

On reaching 500ft, as indicated on the radio altimeter, disengage the autopilot and hand-fly the remainder of the approach, making use of the PAPI lights to remain on the glideslope.

## Landing

As you pass over the runway threshold, retard the throttle levers to idle to achieve a touchdown speed of approximately 135 knots.

As the nose-gear touches down, apply reverse thrust and extend the ground spoilers using the speedbrake lever or keyboard assignment.

As you slow to below 80 knots, disengage reverse thrust and slow the aircraft to 20 knots before exiting the runway.

Retract the flaps and ejectors, and lower the spoilers once you have vacated the runway. Switch **OFF** your landing lights and switch **ON** your taxi lights before taxiing to the nearest available gate.

Once you have reached the gate and set the parking brakes, switch **OFF** your taxi lights, move the four fuel shut-off levers just aft of the throttle levers to the **OFF** position and set the beacon light switch on the overhead panel to **OFF**.



On the Engineer's panel, move the engine 1, 2, 3 and 4 tank levers to the **OFF** (down) position and switch **OFF** the boost pump switches.



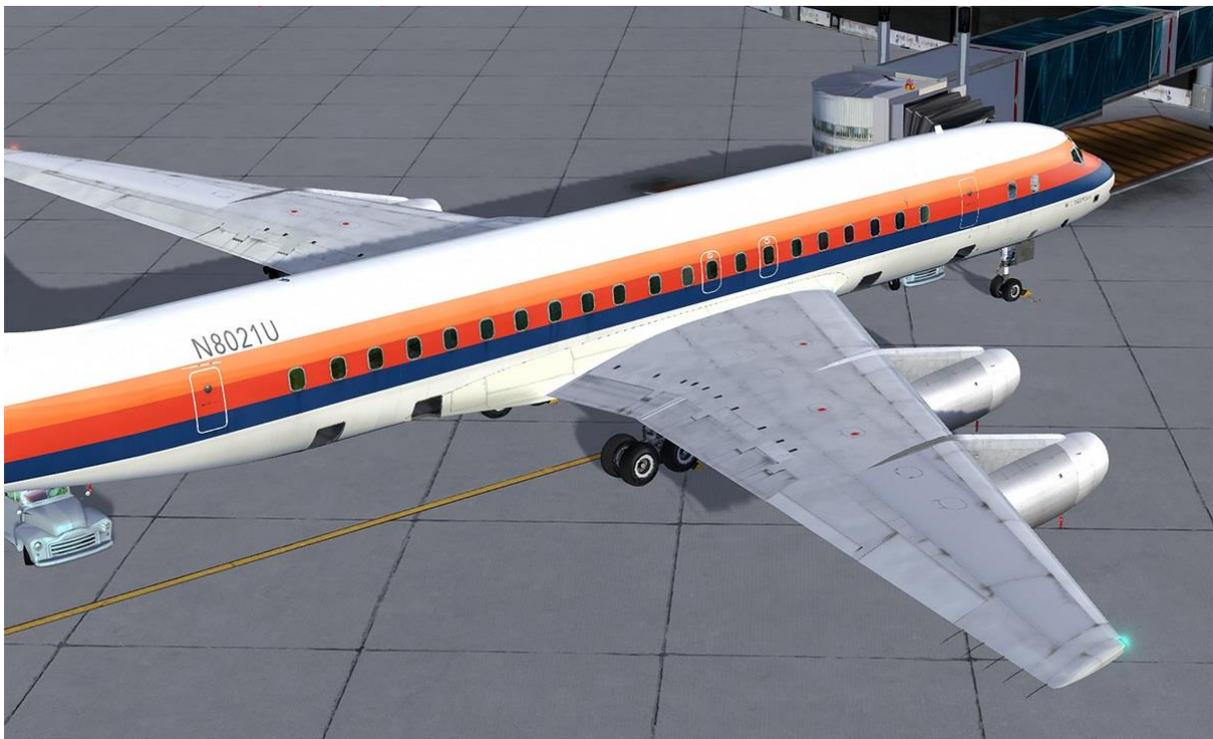
Release the passengers from their seats by switching **OFF** the Seatbelt signs.

On the overhead panel, press the ATTENDANT CALL and MECH CALL buttons to enable the ground equipment.



Finally, request the jetway and then open the passenger and cargo doors using **[Ctrl]+[J]**, **[Shift]+[E]** and **[Shift]+[E]+[2]**.

Congratulations – you have completed the DC-8 tutorial flight!



## FUEL DUMP

The DC-8's fuel dump system is replicated in this simulation. You must first extend the nozzles below each wing by using the crank at the end of the Flight Engineer's desk, then you can use the dump activation switch on the overhead panel. Fuel dumping is rapid so remember to turn it off once fuel reaches the required level!

You must use the master switch on the overhead panel to stop the fuel dump prior to cranking up the dump nozzles.



## CHECKLISTS

The following checklists are also available in the DC-8 kneeboard.

### Before start

PARKING BRAKE

BATTERY SWITCH

BATTERY VOLTAGE

HYDRAULIC QUANTITY

**SET**

**EXTERNAL POWER**

**CHECKED**

**CHECKED**

AUXILIARY HYDRAULIC PUMP	START
AUTOPILOT	CHECKED/ OFF
STABILISER TRIM	CHECKED
AUX HYD PUMP PRESSURE	CHECKED
AUX HYD PUMP	OFF
OIL QUANTITY	CHECKED
FUEL LOAD	CHECKED
FIRE WARNING	CHECKED
W/S HEAT	WARM UP
COCKPIT INST LIGHTS	SET
PITOT HEAT	CHECKED/OFF
CABIN SIGNS	ON
IGNITION	OFF
START SELECTOR SWITCH	OFF
EMERGENCY EXIT LIGHTS	ARMED/LIGHT OUT
CAPT'S FLT INST & WARNING LIGHTS	PUSH/TEST
CAPT'S ALTIMETER	CHECKED
CAPT'S RADIO ALTIMETER	CHECKED
ADFs	CHECKED/SET
TRANSPONDER	STANDBY
MARKER BEACON	ON
EMERGENCY AIR BRAKE HANDLE	SAFETIED/OFF
STATIC SELECTORS	NORMAL
ANTI-SKID SWITCH	CHECKED/OFF
ENG INST & WARNING LIGHTS	CHECKED

REVERSER LIGHTS	<b>TEST</b>
SPOILER LEVER	<b>RETRACTED/OFF</b>
POWER LEVERS	<b>IDLE</b>
FUEL SHUT-OFF LEVERS	<b>OFF</b>
WEATHER RADAR (WHERE FITTED)	<b>STANDBY</b>
RUDDER/AILERON TRIM	<b>CHECKED</b>
FO FLT INST & WARNING LIGHTS	<b>CHECKED</b>
FO ALTIMETER	<b>SET/CHECKED</b>
FO RADIO ALTIMETER	<b>SET/CHECKED</b>
FO RAIN REMOVAL	<b>OFF</b>
FO NAV/RADIO SWITCH	<b>RADIO</b>
EMERGENCY LIGHTS	<b>ARMED</b>
COMPASSES	<b>SYNCED &amp; CROSS-CHECKED</b>
HYDRAULIC PRESSURE & QUANTITY	<b>CHECKED</b>
HYDRAULIC SYSTEM SELECTOR	<b>NORMAL</b>
CABIN PRESSURISATION	<b>SET &amp; AUTO</b>

## Start

FUEL SYSTEM	<b>MAIN TANKS, CROSSFEED OFF, PUMPS ON</b>
STABILISER & TRIM TABS	<b>SET</b>
PARKING BRAKE	<b>SET</b>
START ARM SW	<b>ARMED</b>
MASTER IGNITION OVERRIDE	<b>SET</b>
ANTI-COLLISION LIGHTS	<b>ON</b>

GALLEY POWER	OFF
START SW PER ENGINE	PULL (RETURN AFTER ENGINE STARTS)
FUEL SHUT-OFF LEVERS PER ENGINE	ON
RAIN REMOVAL LEVER	CHECKED
ELECTRICAL SYSTEM	CHECKED
HYDRAULIC SYSTEM	CHECKED
COCKPIT HEAT	AS REQUIRED
ENGINE GAUGES	CHECKED NORMAL
BATTERY SWITCH	BATTERY

## Taxi

FLIGHT CONTROLS	CHECKED
ANTI-ICE & DE-ICE	AS REQUIRED
PITOT HEAT	ON/WARN LIGHTS OUT
OAT	CHECKED
YAW DAMPER	CHECKED
STABILISER & TRIM TABS	SET
FLAPS AND SLOTS	SET/CHECKED
FLIGHT INSTRUMENTS/NAVs	SET/CHECKED
ALT/RADIO ALT	SET/CHECKED
FLIGHT RECORDER	ON
OBTAIN CLEARANCES	AS REQUIRED

## Before take-off

TRANSPONDER	<b>SET ON</b>
ANTI-SKID	<b>ARMED</b>
EXTERIOR LIGHTS	<b>ON</b>
FLAPS	<b>SET/CHECKED</b>
AUTOPILOT	<b>CHECK/OFF</b>
AUTOTHROTTLE	<b>CHECK/OFF</b>

## Take-off [H2]

THROTTLES	<b>80% N2</b>
PARKING BRAKE	<b>RELEASED</b>
THROTTLES	<b>100%</b>
V1, V2	<b>AS DIRECTED</b>

## Climb

GEAR	<b>UP (ABOVE 120 KIAS)</b>
FLAPS & SLOTS	<b>UP</b>
CABIN SIGNS	<b>AS REQUIRED</b>
FUEL MANAGEMENT	<b>CHECKED/SET</b>
GALLEY POWER	<b>ON</b>
CABIN CHIME – 10,000 FT	<b>3 CHIMES</b>
EXTERIOR LIGHTS	<b>AS REQUIRED</b>

## Descent

CABIN SIGNS	ON
ALTIMETERS	SET/CHECKED
HYDRAULIC PUMPS & PRESSURE	CHECKED
COCKPIT HEAT / A/C SYSTEM	AS REQUIRED
FUEL MANAGEMENT	CHECKED

## Approach

FLAPS & SLOTS	SET – LIGHT CHECKED
FLIGHT INSTRUMENTS & NAVs	SET/CHECKED
GPS/NAV SWITCH	NAV
ALTIMETERS	SET/CHECKED

## Before landing

GEAR	DOWN – 3 GREEN LIGHTS
SPOILERS (REVERSERS 3 & 4)	AS REQUIRED
HYDRAULIC SYSTEM	CHECKED
YAW DAMPER	OFF
FUEL SYSTEM	SET
LANDING FLAPS	SET (FULL EMRG. ONLY)
ANTI-SKID	ON
LANDING LIGHTS	EXTEND & ON ([SHIFT]+[E]+[3])

## After landing

FLAPS & SPOILERS	<b>RETRACTED</b>
WINDSHIELD & PITOT HEAT	<b>OFF</b>
EXTERIOR LIGHTS	<b>AS REQUIRED</b>
BOOST PUMPS	<b>OFF</b>
GALLEY POWER/MAST HEAT	<b>OFF</b>
AUTOTHROTTLE	<b>OFF/CHECK</b>

## Parking

PARKING BRAKE	<b>SET/ON</b>
LANDING/TAXI LIGHTS	<b>RETRACTED/OFF</b>
CABIN SIGNS	<b>OFF</b>
ANTI-COLLISION LIGHTS	<b>OFF</b>
STANDBY ATTITUDE INDICATOR	<b>CAGE</b>
RADIOS	<b>OFF</b>
COCKPIT HEAT / A/C SYSTEM	<b>OFF</b>
BATTERY SWITCH	<b>OFF/EXT PWR</b>
FLIGHT RECORDER	<b>OFF</b>
EMERGENCY EXIT LIGHTS	<b>OFF/CHECKED</b>
IGNITIONS	<b>OFF</b>
EXTERIOR LIGHTS	<b>OFF</b>

## Shutdown

PARKING BRAKE

**SET/ON**

THROTTLES

**IDLE**

FUEL CUT-OFF LEVERS PER ENGINE

**OFF**

IGNITION MASTER AND ENGINE SEL

**OFF/DISABLED**

FUEL SYSTEM

**TANKS OFF, CROSSFEED  
OFF, PUMPS OFF**

## CREDITS

Models and textures – Aeroplane Heaven  
Cockpit coding – Aeroplane Heaven, Martyn Northall  
Liveries – Dave Sweetman  
Flight dynamics – Wayne Tudor  
Sounds – Turbine Sound Studios  
Project Management – Martyn Northall, Alex Ford  
Installer – Martin Wright  
Design – Fink Creative

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