BOEING 737
NEXT GENERATION

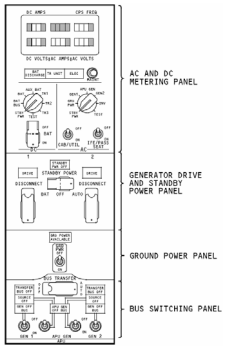
MALEV VIRTUAL

Course overview

- Airplane General
- Air Systems
- Warning Systems, Communications, Ice & Rain Protection
- Electrical
- Engines, APU, Fuel System
- Hydraulics, Flight Controls, Landing Gear, Brakes
- Flight Instruments & Displays
- Automatic Flight
- Flight Management, Navigation
- Normal Operations

Topics

Electrical system
- Overview
- System components
- Controls & indicators
  - AC and DC metering panel
  - Generator drive, standby power panel
  - Ground power, bus switching panel
- AC power system
- DC power system
- AC and DC power controls & monitoring
- Standby power system
- Non-normal procedures



Electrical System

Overview

Primary electrical power is provided by two engine integrated drive generators (IDGs) which supply three-phase, 115 volt, 400 cycle alternating current. Each IDG supplies its own bus system in normal operation and can also supply essential and non-essential loads of the opposite side bus system when one IDG is inoperative. Transformer rectifier (TR) units and the main battery/battery charger supply DC power. The main and auxiliary batteries also provide backup power for the AC and DC standby system. The APU operates a generator and can supply power to both AC transfer busses on the ground or in flight.

There are two basic rules of operation for the 737 electrical system:

- **There is no paralleling of the AC sources of power: only one source can be supplying each transfer bus at any given time.**
- **The source of power being connected to a transfer bus automatically disconnects an existing source.**

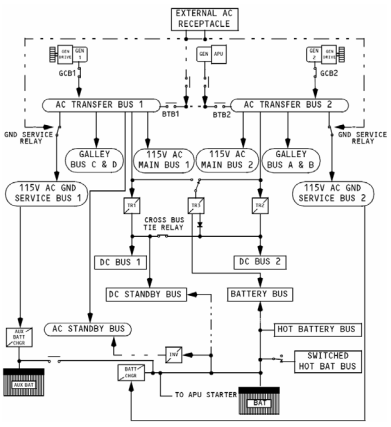
The electrical power system may be categorized into three main divisions:

- AC power system
- DC power system
- Standby power system

Electrical System

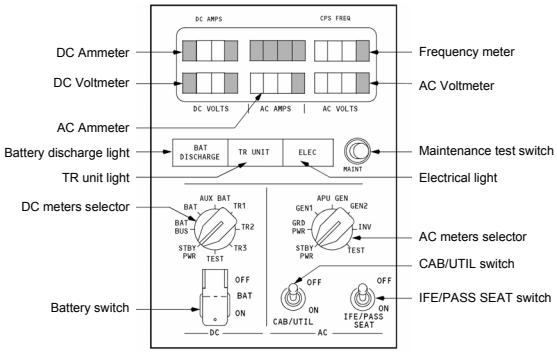
System Components

Sources:
- Engine generator
- APU generator
- External power



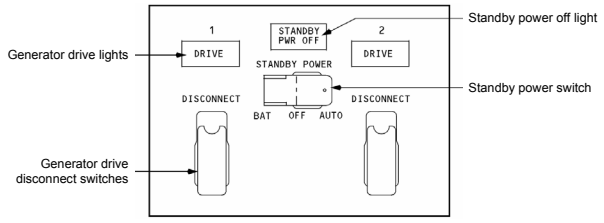
Electrical System

Controls & indicators: AC and DC metering panel



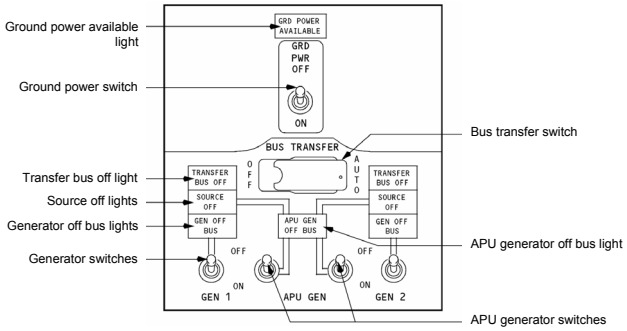
Electrical System

Controls & indicators: Generator drive, standby power panel



Electrical System

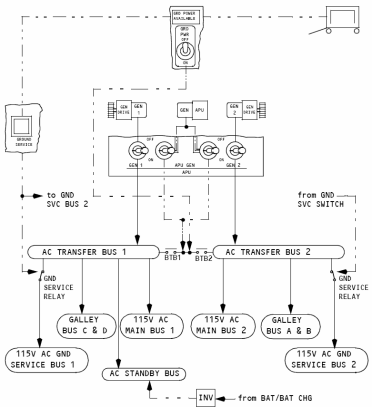
Controls & indicators: Ground power, bus switching panel



Electrical System

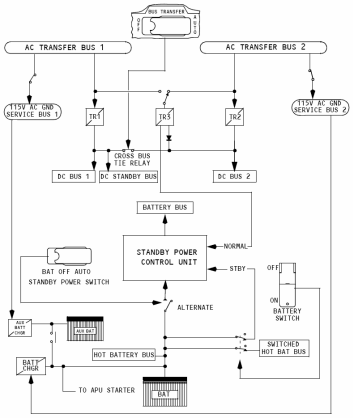
AC power system

AC system components:
- Transfer buses
- Main buses
- Galley buses
- AC standby bus
- Ground service buses



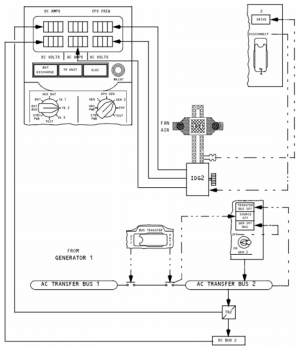
Electrical System

DC power system



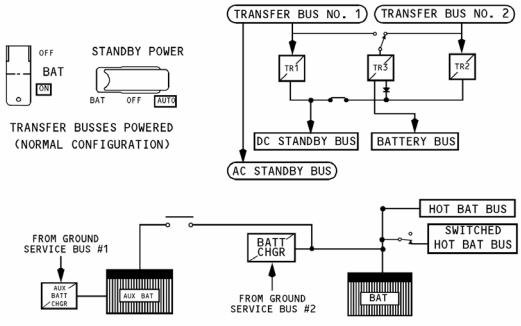
Electrical System

AC and DC power controls and monitoring



Electrical System

Standby power system: Normal configuration



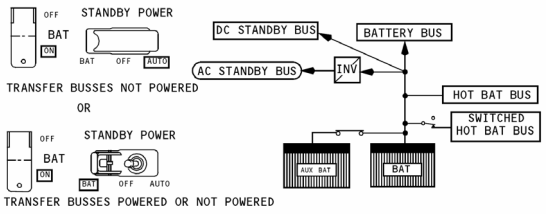
Electrical System

Standby power system

Battery switch: ON
Standby power switch: AUTO
Transfer buses: not powered

OR

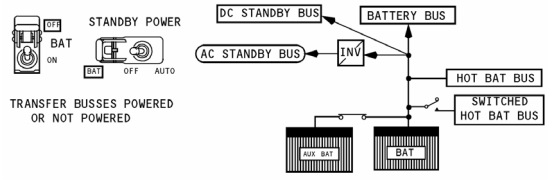
Battery switch: ON
Standby power switch: BAT
Transfer buses: powered or not powered



Electrical System

Standby power system

Standby power switch: BAT
Battery switch: OFF
Transfer buses powered or not powered



Electrical System

Non-normal procedures: All generators inoperative

Airplane General
- standby compass light
- white dome lights
- emergency instrument flood lights
- flight crew oxygen
- passenger oxygen

Air Systems
- A/C pack valves
- BLEED TRIP OFF lights
- manual pressurization control
- altitude warning horn
- PACK TRIP OFF lights

Anti-Ice
- Captain's pitot probe heat

Communications
- flight interphone system
- passenger address system
- VHF No. 1

Electrical
- STANDBY POWER OFF light

Engines, APU
- upper display unit

N1, N2, fuel flow, EGT, fuel quantity, oil pressure, oil temperature, oil quantity, hydraulic pressure, hydraulic quantity
- thrust reversers
- starter valves
- right igniters
- APU operation (start attempts not recommended above 25,000 feet)

Fire Protection
- APU and engine fire extinguisher bottles
- APU and engine fire detection system
- Cargo fire extinguisher bottles

Flight Instruments
- Captain's outboard display unit mach/airspeed indicator, RDMI, attitude indicator, HSI
- Captain's inboard display unit altimeter, vertical speed indicator, navigation display
- clocks
- left EFIS control panel
- Standby instruments integrated standby flight instrument display (ISFD), radio magnetic indicator (RMI), standby magnetic compass

Flight Management, Navigation
- left FMC
- left CDU
- radio distance magnetic indicator (RDMI)
- full horizontal situation indicator (HSI)
- VHF NAV No. 1
- ILS No. 1
- left IRS
- left GPS
- marker beacon
- ADF No. 1
- transponder No. 1
- DME No. 1

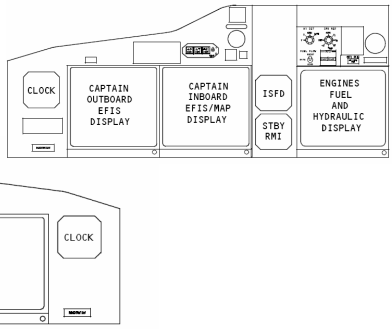
Fire Protection
- APU and engine fire extinguisher bottles
- APU and engine fire detection system
- Cargo fire extinguisher bottles

Landing Gear
- inboard antiskid system
- ANTISKID INOP light
- parking brake
- air/ground system

Warnings
- stall warning system
- aural warnings
- master caution light recall

Electrical System

Non-normal procedures:
Basic equipment operating



FLIGHT DECK COMMUNICATION

Audio Selector Panels
Flight Interphone
Passenger Address System

FLIGHT DECK LIGHTS

Standby Instrument Floodlight
White Dome Light
Magnetic Compass Light

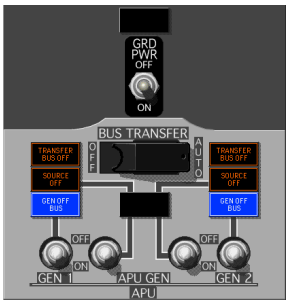
Electrical System

Non-normal procedures: Loss of engine generator sources in flight (1)

Autopilot disengages automatically, and can not be engaged until a generator source is connected to the transfer buses.

Master caution light illuminates: ELEC.
Other illuminated master caution items are related to deenergized items.
STEP 1: Reset master caution system.

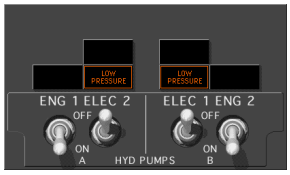
TRANSFER BUS OFF
SOURCE OFF
GEN OFF BUS LIGHT
annunciators illuminate for both generators.
STEP 2: Try to reconnect the generators.

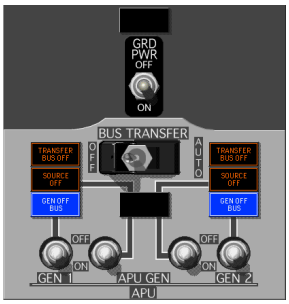


Electrical System

Non-normal procedures: Loss of engine generator sources in flight (2)

If unsuccessful, and SOURCE OFF lights remain illuminated, prevent high electrical loads before a generator is connected to the system:
STEP 3: Set the bus transfer switch to OFF
STEP 4: Set the electrical hydraulic pump switches to OFF





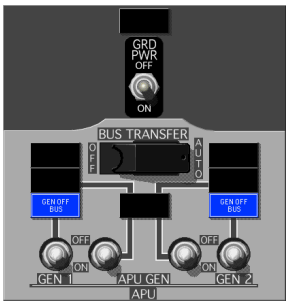
BOEING 737 NEXT GENERATION
ELECTRICAL SYSTEM

Electrical System
Non-normal procedures: Loss of engine generator sources in flight (3)

If available, start APU. With the bus transfer switch in OFF, connect the APU GEN to only 1 transfer bus at a time.

STEP 5: Start APU

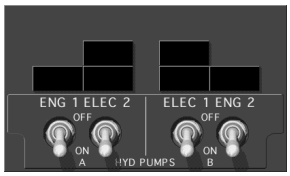
STEP 6: Connect APU GEN to transfer bus 1
STEP 7: Most BUS TRANSFER switch to AUTO, thus energizing transfer bus 2
STEP 8: Move APU GEN 2 switch to ON



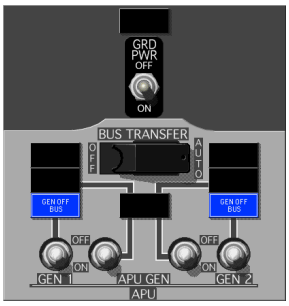
BOEING 737 NEXT GENERATION
ELECTRICAL SYSTEM

Electrical System
Non-normal procedures: Loss of engine generator sources in flight (4)

STEP 9: Turn on all electric hydraulic pumps



If SOURCE OFF lights do not extinguish, battery power is the only source. Land at the nearest suitable airport.



BOEING 737 NEXT GENERATION
ELECTRICAL SYSTEM

Electrical System
Non-normal procedures: Faults & indications

BAT DISCHARGE	Battery discharge rate is excessive with BAT switch ON.
BUS OFF	Generator bus and associated main bus is inactive.
DRIVE	Generator drive low oil pressure condition exists.
ELEC	A fault exists in the DC power system or standby power system.
SOURCE OFF	No source has been manually selected to power the related transfer bus.
STANDBY PWR OFF	AC standby, DC standby or battery bus is inactive.
TRANSFER BUS OFF	Transfer bus is not powered.
TR UNIT	TR1 or TR2+TR3 has failed in flight, or any TR unit on the ground.

BOEING 737 NEXT GENERATION

Köszönöm a figyelmet!

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