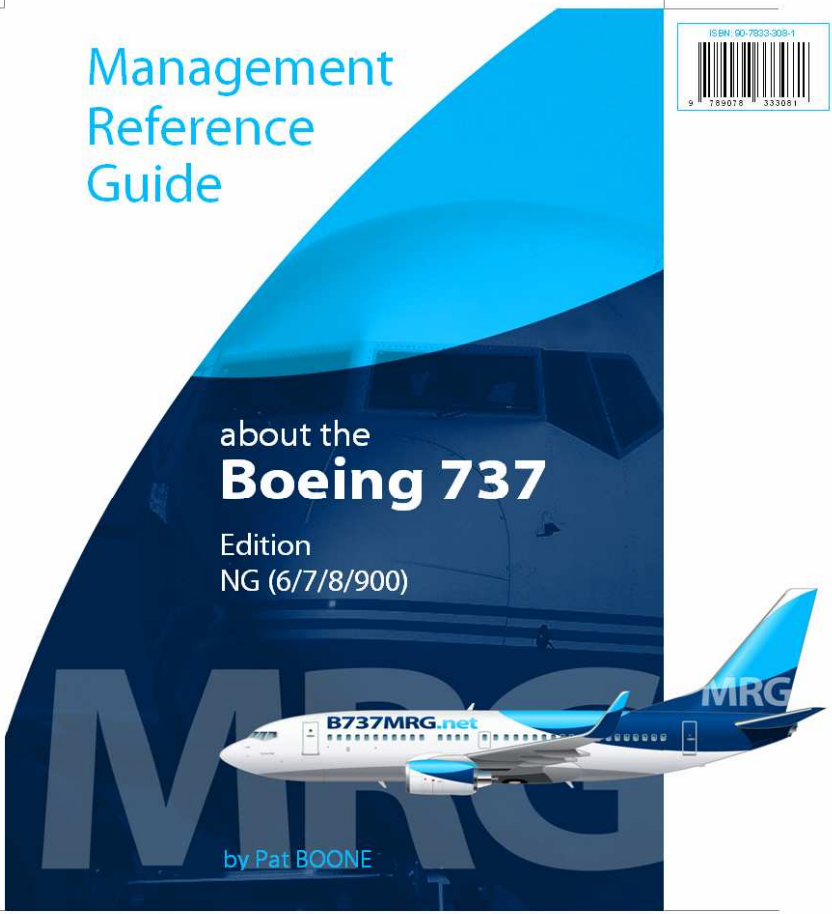
MRG Guide Preview



demo 1

The **B737MRG** covers
all QRH non-normals
and many more

(over 300 non-normals in total)

Toilet / Water System Malfunctions

Airstair Fail

BLEED TRIP OFF

Trim Air Fail — 400-800-900

WING ANTI-ICE VALVE OPEN

MCP Faults

Radio Continuous Transmit (Stuck Microphone Switch)

BAT DISCHARGE — NG

TR Failure - DC BUS OFF

EEC ALTERNATE MODE — NG

Nitrogen Generator System Fail

LOW IDLE — CL

CARGO FIRE DETECTOR FAULT

FSEU Fail — NG

Stabilizer Trim Inoperative

CDS MAINT - CDS FAULT — NG

Radio Altimeter Fail

IRS / ADIRU Drift

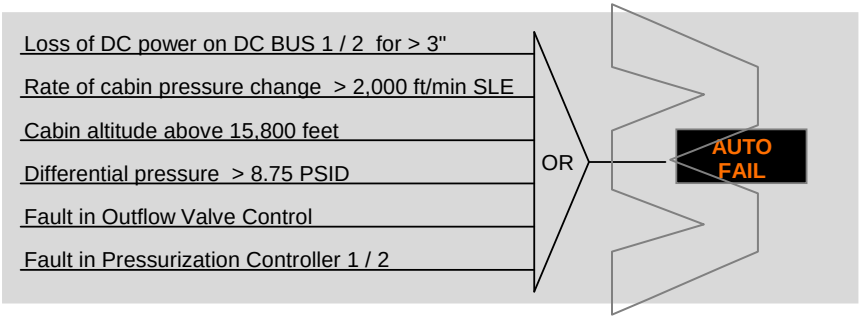
GEAR DISAGREE

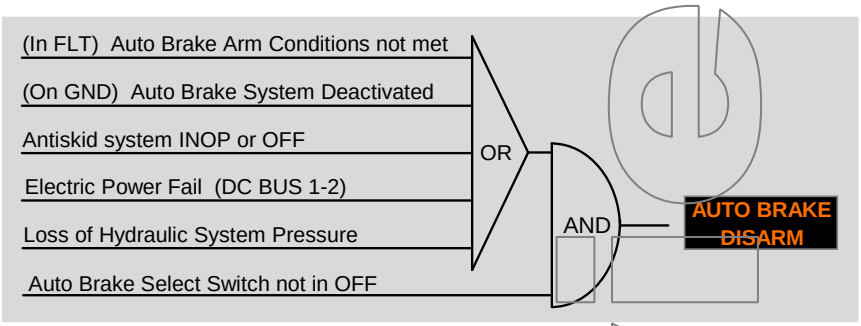
PSEU — NG

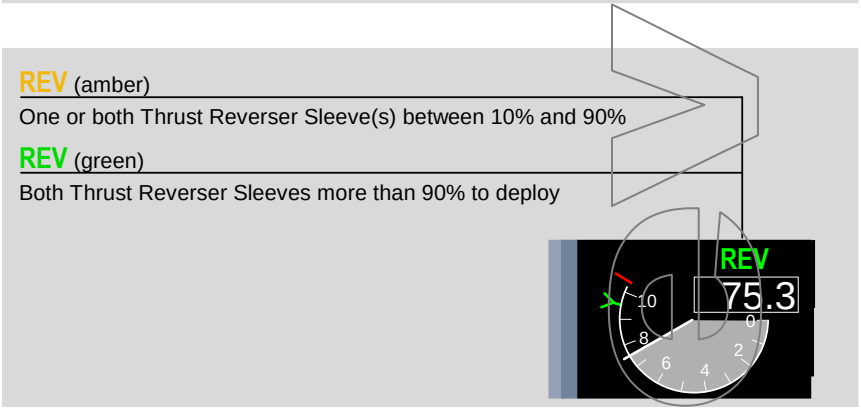
demo 2

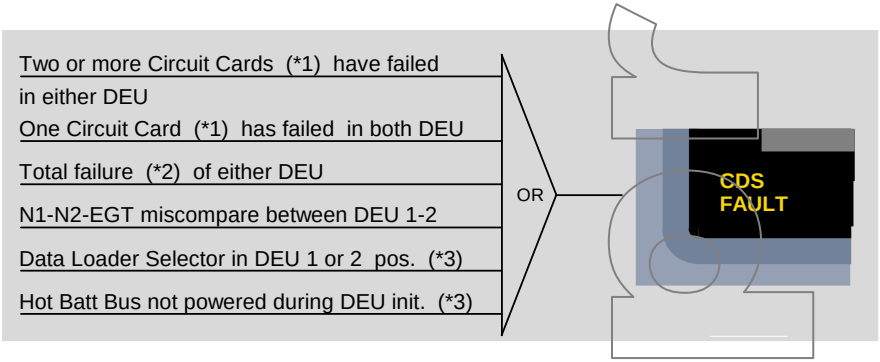
The **B737MRG** displays
a logic gate for all
amber, green, red and blue
flight deck lights

(and there are many lights…)


Loss of DC power on DC BUS 1 / 2 for > 3"
Rate of cabin pressure change > 2,000 ft/min SLE
Cabin altitude above 15,800 feet
Differential pressure > 8.75 PSID
Fault in Outflow Valve Control
Fault in Pressurization Controller 1 / 2
OR
AUTO FAIL


(In FLT) Auto Brake Arm Conditions not met
(On GND) Auto Brake System Deactivated
Antiskid system INOP or OFF
Electric Power Fail (DC BUS 1-2)
Loss of Hydraulic System Pressure
Auto Brake Select Switch not in OFF
OR
AND
AUTO BRAKE DISARM

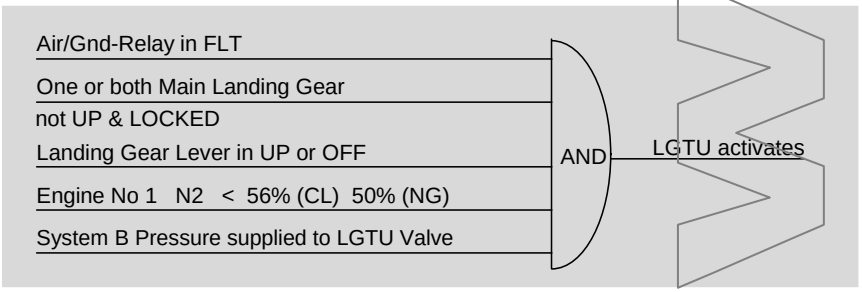

REV (amber)
One or both Thrust Reverser Sleeve(s) between 10% and 90%
REV (green)
Both Thrust Reverser Sleeves more than 90% to deploy
REV
75.3
10
8
6
4
2
0

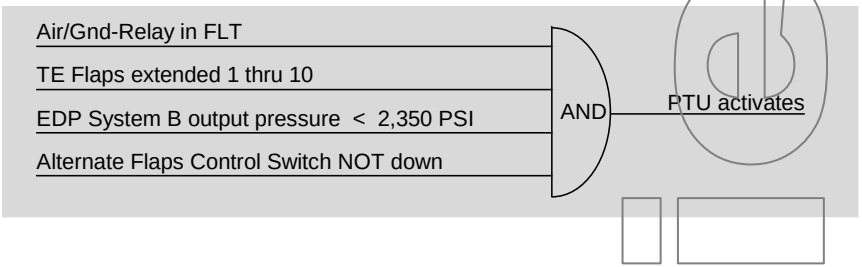

Two or more Circuit Cards (*1) have failed in either DEU
One Circuit Card (*1) has failed in both DEU
Total failure (*2) of either DEU
N1-N2-EGT miscompare between DEU 1-2
Data Loader Selector in DEU 1 or 2 pos. (*3)
Hot Batt Bus not powered during DEU init. (*3)
OR
CDS FAULT

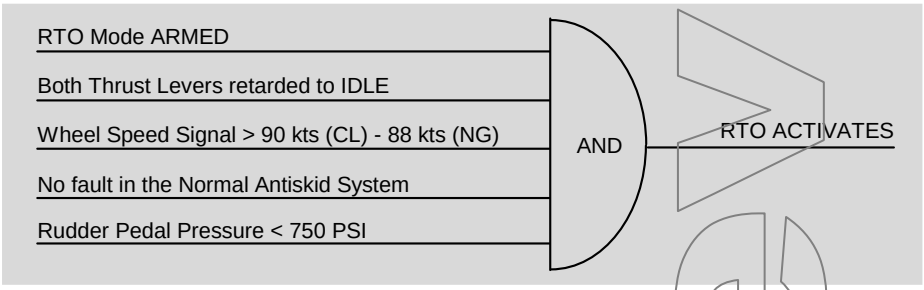
demo 3

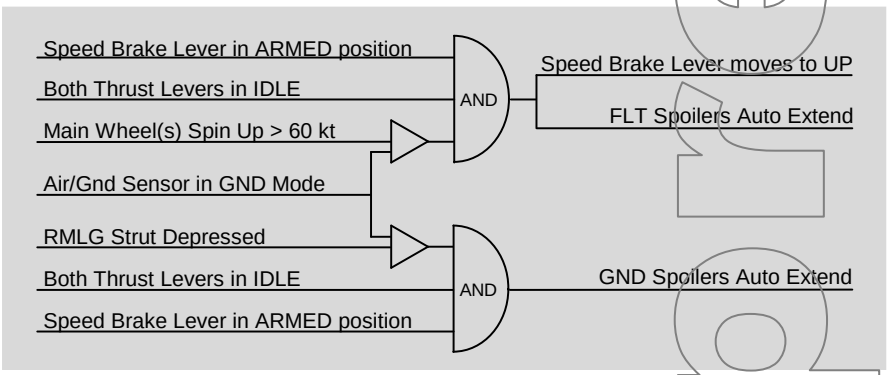
The **B737MRG** displays a logic gate for many system operations

(based on the Maintenance Manuals)


Air/Gnd-Relay in FLT
One or both Main Landing Gear not UP & LOCKED
Landing Gear Lever in UP or OFF
Engine No 1 N2 < 56% (CL) 50% (NG)
System B Pressure supplied to LGTU Valve
AND
LGTU activates


Air/Gnd-Relay in FLT
TE Flaps extended 1 thru 10
EDP System B output pressure < 2,350 PSI
Alternate Flaps Control Switch NOT down
AND
PTU activates


RTO Mode ARMED
Both Thrust Levers retarded to IDLE
Wheel Speed Signal > 90 kts (CL) - 88 kts (NG)
No fault in the Normal Antiskid System
Rudder Pedal Pressure < 750 PSI
AND
RTO ACTIVATES

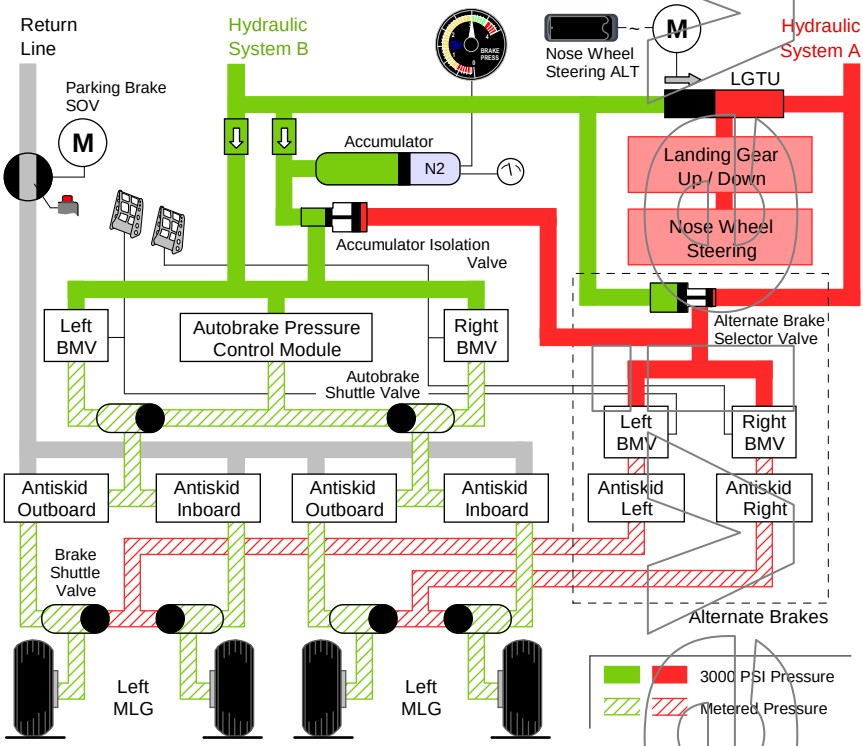

Speed Brake Lever in ARMED position
Both Thrust Levers in IDLE
Main Wheel(s) Spin Up > 60 kt
AND
Speed Brake Lever moves to UP
FLT Spoilers Auto Extend
Air/Gnd Sensor in GND Mode
RMLG Strut Depressed
Both Thrust Levers in IDLE
Speed Brake Lever in ARMED position
AND
GND Spoilers Auto Extend

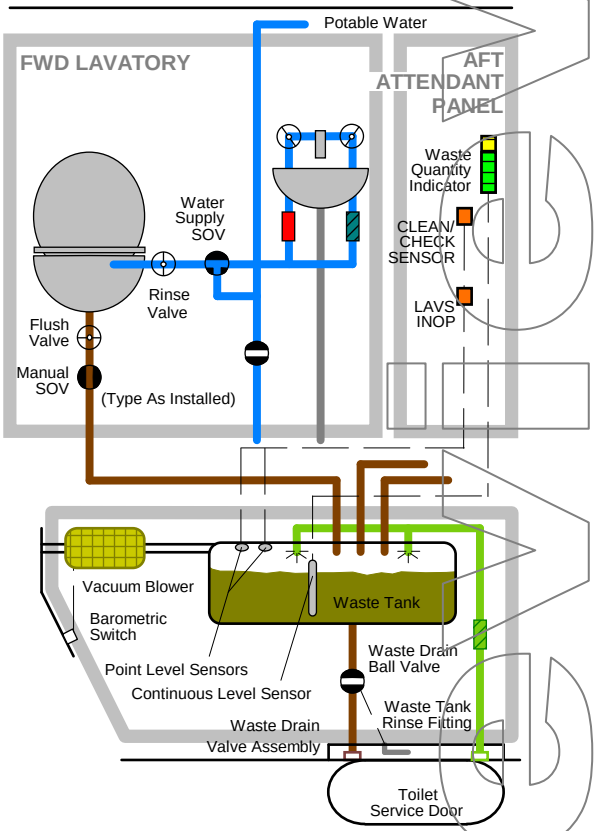
demo 4

The **B737MRG** has many full color drawings and diagrams

(all hand made by the author)

Brake System Schematic




Potable Water
FWD LAVATORY
AFT ATTENDANT PANEL
Waste Quantity Indicator
CLEAN/ CHECK SENSOR
LAVS INOP
Water Supply SOV
Rinse Valve
Flush Valve
Manual SOV
(Type As Installed)
Vacuum Blower
Barometric Switch
Waste Tank
Point Level Sensors
Continuous Level Sensor
Waste Drain Ball Valve
Waste Tank Rinse Fitting
Waste Drain Valve Assembly
Toilet Service Door

Antenna Location

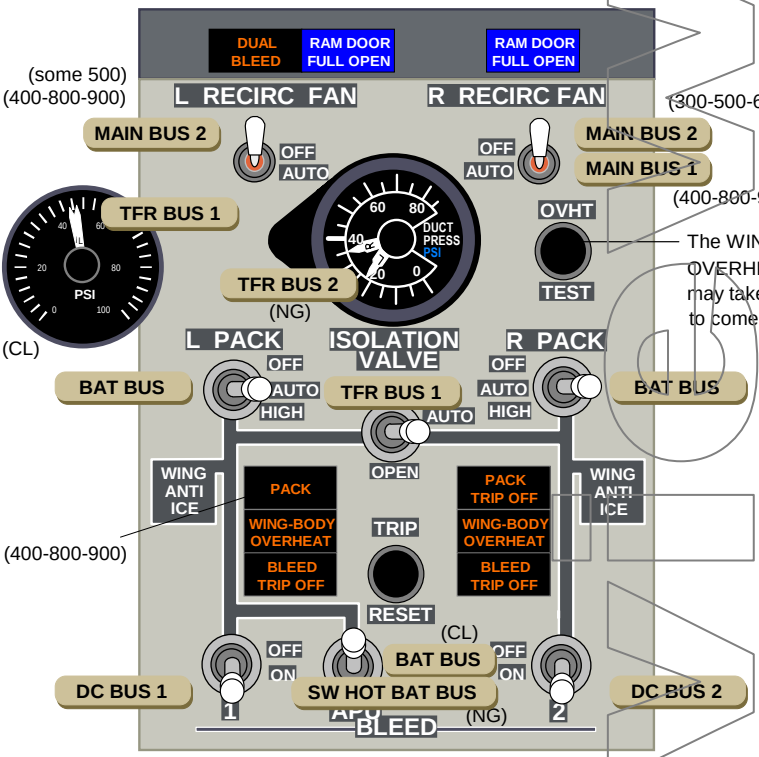
All antenna equipment is covered by MEL 23 [Communications] and MEL 34 [Navigation]

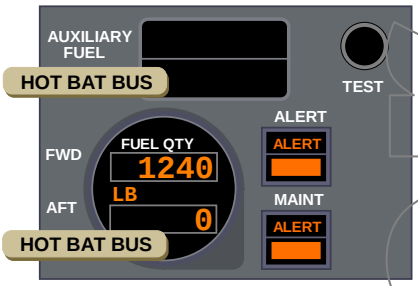
For missing or broken DME and Marker Beacon Antennas refer to CDL 23-61

demo 5

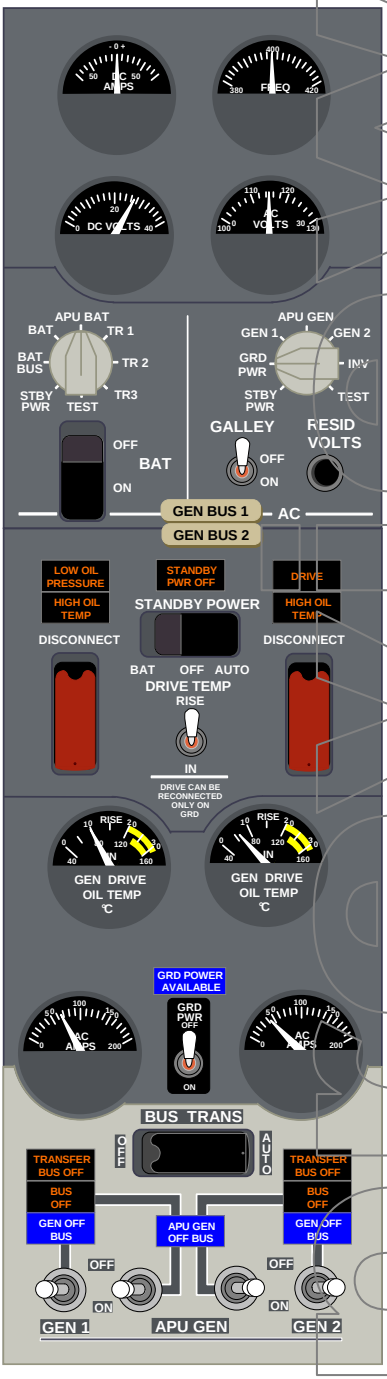
The **B737MRG** contains several full color flight deck panels

(I have spent maaaany hours on these drawings…)





BBJ auxiliary fuel panel


APU BAT
BAT
TR 1
BAT BUS
TR 2
STBY PWR
TEST
TR3
APU GEN
GEN 1
GEN 2
GRD PWR
INV
STBY PWR
TEST
GALLEY
OFF
ON
RESID VOLTS
OFF
BAT
ON
GEN BUS 1
AC
GEN BUS 2
LOW OIL PRESSURE
HIGH OIL TEMP
STANDBY PWR OFF
STANDBY POWER
DRIVE
HIGH OIL TEMP
DISCONNECT
DISCONNECT
BAT OFF AUTO
DRIVE TEMP RISE
IN
DRIVE CAN BE RECONNECTED ONLY ON GRD
RISE
IN
GEN DRIVE OIL TEMP ℃
RISE
IN
GEN DRIVE OIL TEMP ℃
GRD POWER AVAILABLE
GRD PWR OFF
ON
AC AMPS
AC AMPS
BUS TRANS
OFF
AUTO
TRANSFER BUS OFF
BUS OFF
GEN OFF BUS
APU GEN OFF BUS
TRANSFER BUS OFF
BUS OFF
GEN OFF BUS
OFF
ON
OFF
ON
GEN 1
APU GEN
GEN 2

demo 6

The **B737MRG** gives you guidelines how to manage non-normals

(based on simulator and line experience)

FCTM 8.x [Leading Edge or Trailing Edge Device Malfunctions]

Section	Remarks
Approach	Request radar vectors for 15 miles final with wide turns due to 15° bank angle limit
	With a published procedure turn, adjust outbound leg heading or timing due to limited bank !
	Expect impression of being high on profile due to a high nose-up attitude
Landing	Burn off fuel to practical minimum in order to reduce landing weight
	No flare, positive landing. Apply forward column pressure after touchdown !
	Autobrakes are not recommended, use maximum reverse thrust and gentle braking
	High speed tires maximum 195 kts ground speed. Verify tire condition with external inspection.
	Be ready to take over with nose wheel steering for directional control upon roll-out
	Choose RWY : - Weather forecast at ETA (= after fuel burn-off) and landing minima CAT I - Refer to PI [Adv. Info - Non-Normal Configuration Landing Distance] - Avoid wet runway and crosswind - Verify obstacles for straight ahead go-around
Go-Around	Go-around with Flaps UP
	Limit bank angle to 15° when speed is below Flaps UP-speed
ATC	"PAN-PAN : Technical problem - No flaps - Landing at high speed"
	Request : - Weather forecast at ETA (= after fuel burn-off) - Straight ahead go-around due to limited bank - Fire brigade inspect landing gear after landing Report : - Holding time required to burn-off fuel and prepare for approach - Souls on board - Fuel upon landing - Any or no dangerous goods on board
Cabin Crew	OPS - Brief the CCM in line with company procedures
	Refer to MRG p.**Error! Bookmark not defined.** [RISK LEVEL] for guidelines : with a long dry RWY available, a precautionary landing is suggested.
Passengers	OPS - Reassure passengers in line with company guidelines
	Example : "Technical problem, airplane under control. Remain in holding for x time to reduce fuel. Follow Cabin Crew instructions."

NO AUTOMATIC STARTER CUTOUT

Condition : Start Switch does not move back to OFF at 46% (CL) - 56% (NG) N2

Manually position the Start Switch to OFF or AUTO. If the Start Valve does not close, accomplish the NNC [START VALVE OPEN]. In this case, **do not shutdown the engine by recall**, because you will blow-up the starter !

EARLY STARTER CUTOUT

Condition : Start Switch moves back to OFF before N2 reaches 46% (CL) - 56% (NG)

An early starter cutout may result in a **HOT** or **HUNG start !**

- Start Switch fails
- Start valve tripped : P6-2A (CL) P18-2B P6-2C (NG)
- N2-indicator failure (CL) : P6-2D MEL 77-03 (**NOGO** - Eng. No 1)

Apply MEL 80-02 [Engine Starter Auto Cutout]

The start valve is electrically controlled, pneumatically operated and spring-loaded closed. Premature removal of the ground or APU air source may also cause an early starter cutout.

NO ENGINE ROTATION

Condition : Engine RPM remains at zero with normal Start valve OPEN indication and normal duct pressure drop (CL) - rise (NG).

- N2 zero :
  - Mechanical failure in the starter (e.g. shaft shear) or inside the engine (N2 rotor seize up)
  - Failure of the N2 indicator / tachometer - MEL 77-03 (CL) ▶▶ Refer to MRG p.**Error! Bookmark not defined.** [Engine Indicating]
  - Excessive use of bleed air (make sure both packs and wing anti-ice are switched off !)
- N1 zero :
  - Mechanical failure in the engine (N1 rotor seize up)
  - Failure of the N1 indicator / tachometer - MEL 77-02

FUEL FLOW ZERO or LOW

Condition : Fuel flow shows zero or below normal values (0.30 kg / 0.65 lbs per hour) when start lever is raised to IDLE.

- FCU fails : None → **NOGO**
- Fuel SOV closed : Verify P6-3D (CL) - P6-3B P6-3C (NG)

FCTM 8.x [Approach and Landing on Standby Power]

(CL)

Do NOT connect GEN on bus by recall !

A number of systems must first be switched OFF to avoid current peak

Do NOT abort takeoff

- Antiskid is INOP (V1 for antiskid INOP is roughly 20 kts lower)
- RTO is INOP
- No immediate awareness of aircraft speed versus V1
- No automatic extension of speed brakes

- Switch on cockpit dome light bright as soon as practical
- Monitor standby ASI for actual speed versus V1
- The standby horizon displays a flag due to power loss, however instrument is reliable for rotation (gyro spooldown takes a while)

Once airborne

- Captain is PF
- Electrical trim INOP
- Maintain takeoff flaps setting (Flap Position Indicator INOP)
- Level-off at minimum safe altitude since airplane is unpressurized ! (caution : there is no aural altitude alert to level-off !)
- Call ATC - "PAN-PAN" (3x) - Request radar vectors
- Fly raw navigation (full rose) due to possible IRS drift
- Autothrottle is disconnected !
- Maintain speed between speed-tape yellow bars on EADI

Once airborne, STBY AC BUS and STBY DC BUS automatically switch to their back-up source. The STANDBY PWR OFF amber light should not be illuminated !

APU ..... start and on bus

- connect preferable on GEN BUS No 2 to supply TR3
- if unable to connect the APU to GEN BUS No 2, connect it to GEN BUS No 1
- if the loss of both generators was caused by an engine failure, connect the APU to the bus of the **operating** engine in order to recover both hydraulic systems!
- only one APU start attempt is recommended to preserve battery life. A second start attempt could be considered below 25,000 feet, as the probability of a successful start increases. (especially Garret APU)

If unable to recover any GEN BUS :

- "MAYDAY" (3x)
- Land within 30 minutes (45 min with APU BAT installed)
- Above FL300 thrust deterioration or engine flameout may occur

(continued…)

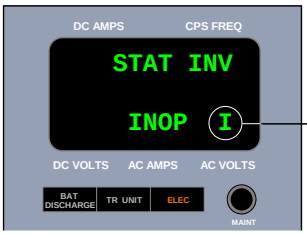
demo 7

The **B737MRG** leads you through basic maintenance tips & tricks to obtain more info on a failure

(or to reset a system)

On GND

Refer to MEL 24-16 [ELEC light] for the amber light itself.
The ELEC amber light illuminated is a **NOGO**.



Additional information on the electrical fault can be obtained from the LAD on the electrical panel as follows :

(**I** indicates the fault is intermittent and not set at this time)

Select **both AC and DC Meter Selectors to TEST** and temporarily push the MAINT switch.

The BITE will first illuminate all segments of the LAD (takes about 15 seconds) and then show the fault information. To bypass the BITE display test, push the MAINT switch just after test begins. If there are no faults, the message **NO FAULTS STORED** will appear.

When pushing the MAINT switch again, the next fault will be displayed, if any. Continue until all faults have been displayed and **HOLD BUTTON CLEAR FAULTS** is announced.

Press the MAINT switch for approx. 6 seconds (until **FAULTS CLEARED** appears) to reset all faults. Except for GEN1-2 FAULT, the fault cannot be cleared by pressing the MAINT switch, when the fault still exists. In this case return to gate.

ENGINE DRIVEN PUMP DOES NOT ENGAGE (with engine running)

- the depressurization solenoid valve remains powered while it should not be fed when the EDP switch is selected ON. This failure can be confirmed by removing electrical power from the solenoid : Pump Depress Valve P6-2AB

- the hydraulic pump is inoperative or the pump SOV is inadvertently closed : (the latter would be the case with the associated Engine Fire Switch not properly stowed, but then the engine would not be running...)

  Dispatch as per MEL 29-10 [System A Pumps]
  MEL 29-02 [System B Pumps]

Your company SOP may require the **EDP** for CAT II-III. Verify the Lower Landing Minimum Requirements Table.

ENGINE DRIVEN PUMP DOES NOT DISENGAGE (with engine not running)

- the pressure module check valve may be inoperative

  The pressure module check valve prevents hydraulic backflow through the pressure filter in case EDP output pressure is low. It also isolates the EDP pressure switch. If the check valve fails, the EDP pressure switch senses system pressure.
  Check valve failure is confirmed if the LOW PRESSURE amber light of the EDP illuminates by turning off the associated EMDP.

ELECTRIC MOTOR PUMP DOES NOT ENGAGE (when selected ON)

- the opposite Generator Bus (CL) - Transfer Bus (NG) is not powered

- the EMDP has tripped : (CL) P6-2A P6-11C P6-12C (NG) P91CF P92CF

- the pump is in "ground fault" or overcurrent :

  To reset the "ground fault" :

(cont'd)

demo 8

The **B737MRG** alerts for subsequent failures

(can be nasty in the simulator)

SUBSEQUENT FAILURE(S)

PACK TRIP OFF / PACK opposite side

Pressurization is lost

Position the failed Pack Switch to OFF, causing the Isolation Valve to open. Use the remaining pack with the opposite engine.

ENGINE FAILURE or BLEED TRIP OFF opposite side

- Pressurization is lost
- Main Outflow Valve will drive to fully closed position
- Cabin pressure altitude will climb at 1,000 to 2,000 fpm
- Advise ATC for immediate descent
- Descend in the airway to single engine service altitude or 17,000 feet where the APU may be used as an alternate air source
- Select Engine No 1 Bleed Air to OFF (to extinguish DUAL BLEED amber light)

WING-BODY OVERHEAT opposite side

The checklist calls to switch off the affected engine bleed air. However, since this will result in a loss of both packs and thus loss of pressurization, consider to :

- Retard thrust on the respective engine
- Advise ATC for immediate descent
- Accomplish the NNC [WING-BODY OVERHEAT]
- Left WING-BODY OVERHEAT :
  - Descend to 10,000 feet (or minimum safe altitude if higher)
  - Continue unpressurized to destination or diversion field (trip fuel at 10,000 feet is approximately 10 x distance)
- Right WING-BODY OVERHEAT :
  - Descend to FL 170 in airway
  - Use the APU as an alternate air source

If this event occurs at low altitude, you can indeed switch-off the affected engine bleed air immediately. The cabin pressure altitude will climb at 1,000 to 2,000 fpm, and it should not reach 10,000 feet before the airplane is at FL 100.

WING ANTI-ICE VALVE OPEN opposite side

Checklist calls for switching off the affected engine bleed air and pack. However, since this will result in a loss of pressurization, consider to :

(cont'd)

demo 9

The **B737MRG** refers to DDG-MEL, QRH, JAR-FAR/FC, FCOM, FCTM, FAM, etc.

(according to the new Boeing SOP)

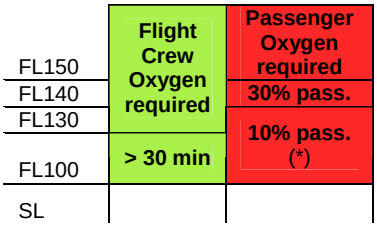
MEL 35-5 [Passenger Oxygen System] The aircraft can be dispatched at FL250 with passengers on board with the passengers oxygen system INOP.
Flight crew oxygen, however, must always meet minimum dispatch requirements for smoke protection in flight.

DISPATCH REQUIREMENTS

JAR 8.8.1 [Oxygen Requirements]
FAR 91.211 [Supplemental Oxygen]

IN FLIGHT OXYGEN REQUIREMENTS

JAR 8.8.1 - JAR OPS-1.770 - FAR 121.329/333 - Supplemental oxygen for emergency descent and first aid on turbine engine airplanes with pressurized cabin :



(*) For aircraft certification oxygen supply is required between FL100 and FL140 for 10% of the passenger capacity. Since the passenger oxygen system cannot comply with this requirement, the level-off altitude in the NNC [Emergency Descent] has been lowered to 10,000 feet while 14,000 feet for the B737-200.

JAR/FAR 25.1447 requires that the flight crew oxygen dispensing unit can be placed from the stowed position on the face with one hand within five seconds.

OXYGEN BOTTLE REFILL OR REPLACEMENT

Special safety precautions apply when replenishing or replacing the crew oxygen bottle, including ;

demo 10

The **B737MRG** contains several tables with valuable numbers

(based on FCOM, FPPM and AMM)

	(CL)			(NG)			
Sys	**USG**	**Indication**		**USG**	**Ind.**	**Pressure**	**Status**
A				6.80	106%		Max. capacity - Overfill
	4.80	F	100%	5.70	100%	3000 PSI	Full
	4.20	RFL	88%	4.70	76%	3000 PSI	Refill limit
	4.00		83%	4.00	70%	3000 PSI	Gear Up - In FLT
	1.80	<1/4	22%	2.30	20%	3000 PSI	Leak in EDP System OK
	1.00	0	0%	1.00	0%	> 0 PSI	Zero QTY indication
	0.00			0.00		0 PSI	Leak in EMDP or lines Loss of System A
B				10.70	106%		Max. Capacity - Overfill
	7.20	F	100%	8.20	100%		Full
	6.40	RFL	88%	6.90	76%	3000 PSI	Refill Limit
	4.95	>1/2	64%	6.60	72%	3000 PSI	Leak in STBY System Loss of STBY System
	3.50	<1/2	40%	1.30	0%	3000 PSI (CL)	Leak in EDP System OK (CL)
	1.30	>0	5%			> 0 PSI	Leak in EMDP or lines Loss of System B but sufficient for PTU
	1.00	0	0%			> 0 PSI	Zero QTY indication
	0.00			0.00		0 PSI	Leak in PTU Loss of System B + PTU
STBY	2.80	-	-	3.60	-		
	1.40	LOW QTY		1.80	LOW		Loss of STBY System

demo 11

The **B737MRG** contains
listings with all
breakers and power sources

(based on the AMM and WDM)

TRANSFER BUS 1 - 115 VAC

Air Cond Isolation Valve
APU SCU
CDU 1 (*)
Engine 1 EEC
Equip Cool Supply Fan Power Altn
Galley Bus C-D
GPWS
Hyd Sys EMDP 1 Sys B
Radio Navigation DME 1 (*)
Radio Navigation Radio Altm 1
TCAS
TRU 1
Vacuum Waste Blower
Yaw Damper Indicator

XFR BUS 1 SECT 1 - 28 VAC

Lights - Pass. Cabin Reading Left
Yaw Damper AC

XFR BUS 1 SECT 1 - 115 VAC

AFCS Stabilizer Trim
AFCS Sys A Mach Trim AC
AFCS Sys A Sensor Excitation AC
ATC 1 (*)
Communications HF 1
Data Loader
Engine Anti-Ice Valve
Engine 1 Altn PWR Chan A - B
Engine 1 Ignition Left
Flight Recorder AC
FMCS Computer 1 (*)
FMCS MCDU 1 (*)
Heaters Alpha Vane Left
Heaters Captain Pitot (*)
Heaters Elev Pitot Left
Heaters Temp Probe
Lights - Ext. Anti Collision Red
Lights - Ext. Anti Collision White
Lights - Ext. Landing Left Fixed
Lights - Ext. Landing Right Retractable
Window Heat Control Left Front AC
Window Heat Control Right Side AC
Wing Anti-Ice Valves

TRANSFER BUS 2 - 115 VAC

ATC 2 (*)
CDU 2
Engine 2 EEC

1. Airplane General, Emergency Equipment, Doors, Windows

Air Stair	P18-1	C, D
Door Lock, Warning	P6-3	C1, A2
Galley Aft	P6-12	C7-9
Galley Forward	P6-11	C7-9
Lavatory Flush Motors	P18-4	B3,B6,C6
Lavatory Water Heaters	P18-4	A5-7
Lights		
Anti Collision	P18-3	C15-16
Landing	P18-3	A13-16
Taxi Nose Gear	P18-3	D14
Position	P18-3	B15,B16
runway Turnoff	P18-3	D15-16
Service	P18-3	E14-16
		F14-16
Wing	P18-3	B13
AFCS Flood	P6-3	E12,E14
Control Cabin	P6-3	A9-15
Emergency Exit	P18-3	A12
Entry (dim)	P6-5	B6
Lav Dome-Mirror	P18-3	F10-11
Lav Mirror Ext Power	P6-3	D1
Master Dim Bus Ind	P6-3	B13-B15
		C13-C15
		D13-15
No Smoke/Seat Belts	P18-3	A9-10
Overhead Panel	P6-3	E9,E1
		F9-14
Instrument Pane	P6-3	B11-B12
		C9,C11-12
Pass. Signs Control	P18-3	A11
Galley	P18-3	B8,C6
		D6,E6,F12
Pass. Window	P18-3	B6-7
Oxygen System	P18-3	F6-9
Service Outlets	P6-3	E1,F1
Vacuum Cleaner Recep	P18-4	C1-2
Water Quantity Ind	P18-4	A2

2 Air Systems

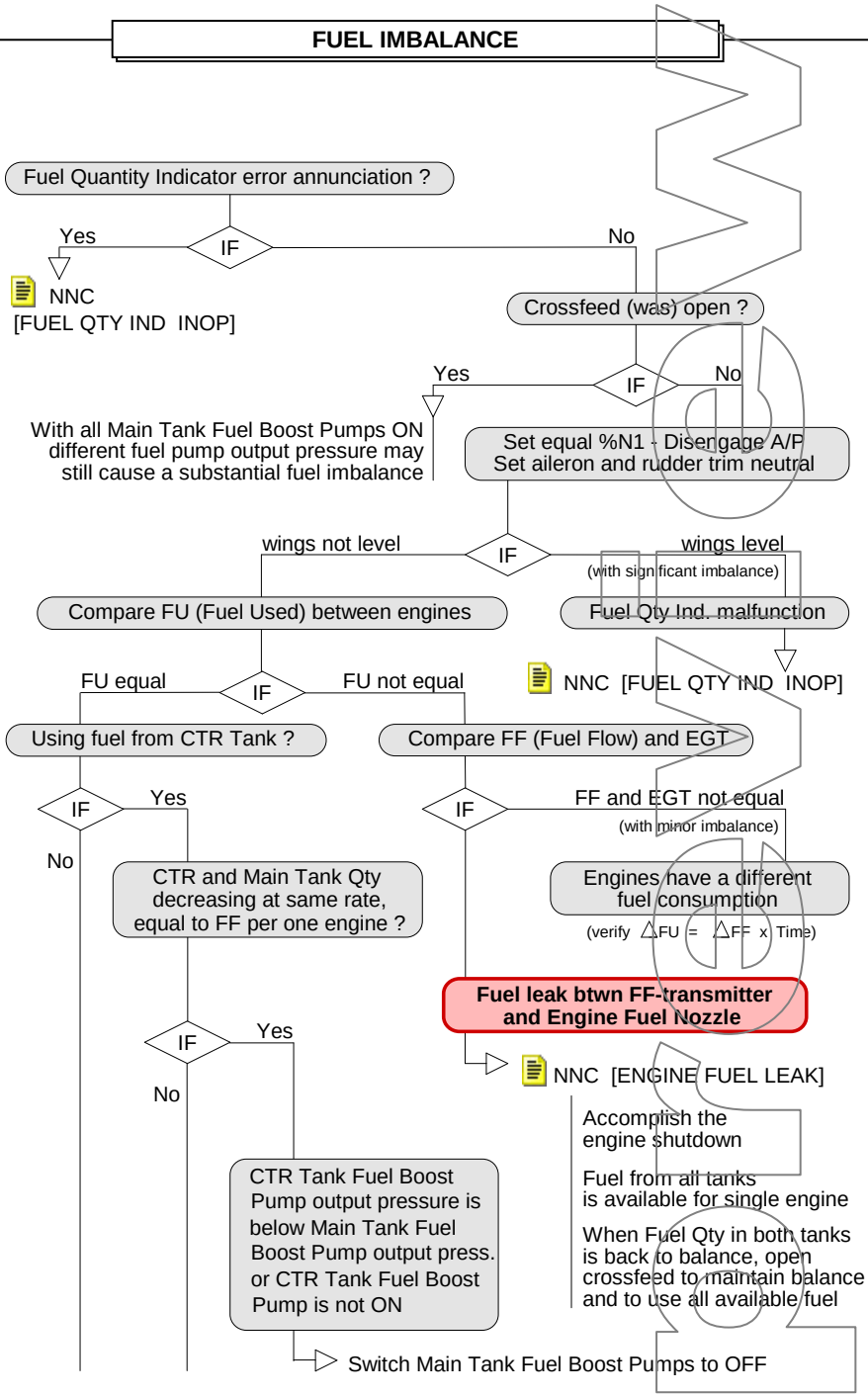
Bleed Air Valves	P6-4	B1-3
Cabin Air Recirculation	P6-4	E5
Equipment Cooling	P18-3	A18,B18
		C18,D18
		E18
Fan Control Supply	P18-3	F17-18
Forward Outflow Valve	P6-4	C5

demo 12

The **B737MRG** contains several flow charts to analyze the non-normal

(and to help you manage the non-normal)

FUEL IMBALANCE



NNC [ENGINE FAILURE AND SHUTDOWN]

Verify fuel leak after engine shutdown

Leak stops — IF — Leak continues

Leak in engine pylon btwn Spar Fuel SOV and FF - transmitter

NNC [ENGINE FUEL LEAK]

The engine remains shutdown

Fuel from all tanks is available for single engine

When fuel qty in both tanks is back to balance, open crossfeed to maintain balance and to use all available fuel

Switch affected Main Fuel Tank Boost Pumps to OFF

IF — Leak continues at same rate

Fuel leak in Main Tank

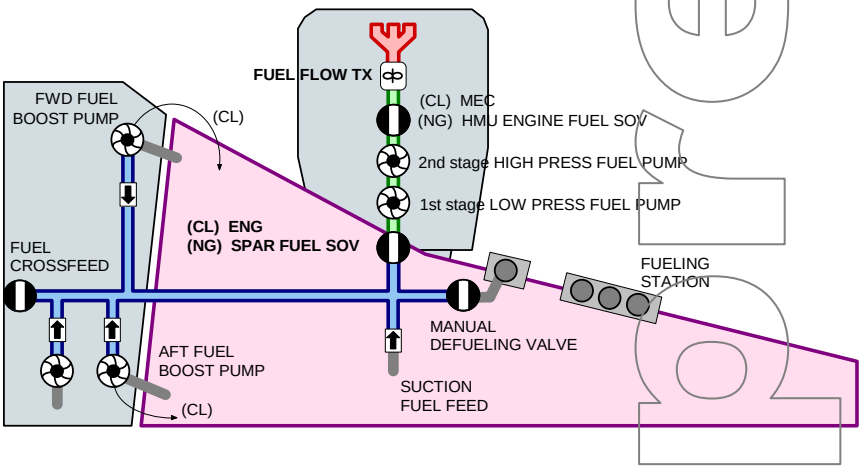
Fuel leak in pipelines to Spar Fuel SOV

Switch boost pumps OFF to decrease the leak rate

Keep crossfeed closed !

Consider an engine relight using fuel from main tank until engine fuel starvation

If enough fuel remains until after landing, shutdown engine during roll-out to avoid fire



demo 13

The **B737MRG** contains several rules of thumb

(both general and aircraft related)

Rule of Thumb to crosscheck proper pressurization of the cabin during climb :

At FL 100 the needles should point approximately 1 and 4

(valid for cruising levels > FL250)

Rule of Thumb to verify whether cabin pressure can follow airplane descent :

CABIN ALT / 100 = NAUTICAL MILES REQUIRED

e.g. The cabin altitude pressure shows 4,000 feet, then the controller requires circa 40 NM to descend to sea level
If distance to destination is 40 NM or more, remain in Auto Mode. If track miles to destination is less than 40 NM, select Standby Mode and increase rate of descent.

If destination elevation is well above SL, subtract Land ALT from the Cabin ALT :

(**CABIN ALT - LAND ALT) / 100 = NAUTICAL MILES REQUIRED**

e.g. The cabin altitude pressure shows 4,000 feet and destination elevation is 1,500 feet, then the controller requires circa 25 NM to descend to airport elevation.

Memorize this 1/60 table (speed in NM / min)

speed (kt)	120	150	180	210	240	270	300	330	360
speed number	2	2½	3	3½	4	4½	5	5½	6

1) SAT out of TAT

SAT (°C) = TAT (°C) - 3 x Mach

TAT = -17 °C Mach 0.64
SAT = -17 - (3 x 6) = -17 - 18 = -35 °C

2) SAT out of TAT for higher Mach and lower Temp

SAT (°C) = TAT (°C) - ((100 x Mach) - 50)

TAT = -31 °C Mach 0.74 → You have 24 above M 0.50
SAT = -31 -24 = -55 °C

3) Level Off procedure if R/C ≤ 1,000 feet/min (also for descent R/D)

$$\Delta \text{ feet} = \frac{\text{R/C (feet/min)}}{10}$$

Climbing to FL 210 R/C = 2,000 feet/min
Δ feet = 200 feet → start level off at 20,800 feet

4) Level Off procedure if R/C > 1,000 feet/min (also for descent R/D)

$$\Delta \text{ feet} = 2 \times \frac{\text{R/C (feet/min)}}{10}$$

Climbing to FL 300 R/C = 2,500 feet/min
Δ feet = 500 feet → start level off at 29,500 feet

5) Cruise Flight Level computation

Cruise FL = Trip Distance (NM)

EBBR-EBOS = 60 NM
Optimum is FL 60

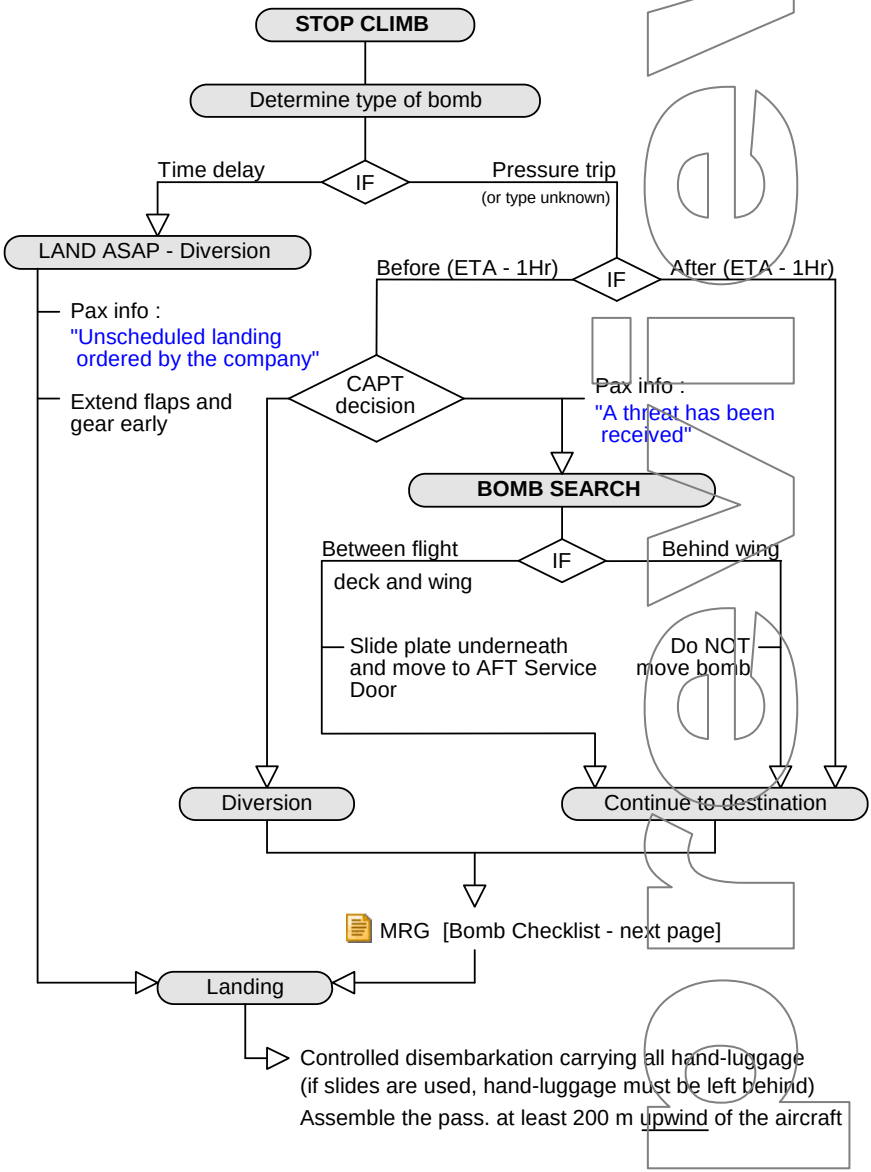
demo 14

The **B737MRG** contains additional management guidelines

(non-technical related non-normals)

FAM Your airline may have special procedures for bomb search and handling

JAR 10.2.4



FIRE DRILL

Refer to FAM 9.x [Fire Fighting] for additional info
MRG p.**Error! Bookmark not defined.** [SMOKE] for additional information

FIRE / SMOKE IN OVERHEAD STORAGE BIN

- move passengers away
- remove seat covers, life vests and other materials
- extinguish the fire / smoke
- remove objects from the adjacent bins
- remove the fire / smoke source from the bin

Remove all flammable items in the vicinity that might catch fire, such as passenger hand-luggage, cushions, news papers, etc. including seat covers and life vests.

Push down all seat-backs for about 3 rows in vicinity and cover them with wet blankets. These blankets will not only protect the seats, but will also catch, muffle up and dampen any burning item falling out of the bin.

(cont'd)

LASER ILLUMINATION

Although not inherently dangerous, continuous laser illumination can cause distraction, discomfort and injury to the eyes, including glare, temporary blindness and after-image.

- **Do not stare at the laser in an attempt to locate its position**
- Advise ATC and **request a turn away from the laser source**
- Hand-over flight controls to the non-exposed pilot and/or engage the autopilot
- **Do not rub your eyes**, this will make it worse and may cause corneal abrasion
- After flight, file a report on the event and seek medical help if necessary

Sunglasses and flight deck sun blinds do not provide protection against laser illumination !

end