**B737NG GENERIC LIMITATIONS**

- **ALTITUDE**: Maximum ZP 41 000 ft
  
  Maximum ZP for T/O and Landing  8400 ft (Runway slopes : ± 2% )

- **WIND**: Max tailwind for T/O & Landing……………………….…10 kt
  Max demonstrated crosswind (runway dry or wet) ………36 kt
  Automatic landing (dual channel CAT2 or CAT3 approach):
  - tailwind ……………………. 10 kt
  - crosswind …………………..20 kt
  - headwind …………………. 25 kt

- **CABIN PRESS**: Max cabin differential pressure (top of yellow band)…………9.1 psi
  Max cabin differential pressure for takeoff & landing……….0.125 psi

  With engine bleed air switches ON, do not operate the air conditioning packs in HIGH for takeoff, approach or landing.

- **AUTOPILOT**: - Do not engage A/P for takeoff < 400 ft AGL
  - The A/P must be disengaged before the airplane descends more than 50 ft below the MDA (Minimum Descent Altitude) unless it is coupled to an ILS glide slope & localizer or in the go-around mode.
  - No ailerons trim with A/P engaged
  - The Minimum Use Height (MUH) for single channel autopilot operation is 158 ft AGL

- **MAX AIRSPEED LIMITS & FLIGHT CONTROLS**
  - Speedbrake may not be deployed in flight below 1000 ft radio altitude
  - Holding in icing conditions with flaps extended is prohibited.
  - Flaps 15 normal landings are prohibited. A Flap 15 landing may be performed when required by a non normal procedure.
    - VMO / MMO ………………………..….....…340 kt / .82M
    - Turbulence* ………………………. 280 KIAS / .76M
    - Maximal Flap extension altitude………………… 20 000 ft
    - Flaps 1………………………………………….. 250 kt
    - Flaps 2…………………………………………. 250 kt
    - Flaps 5…………………………………………. 250 kt
    - Flaps 10………………………………………. 210 kt
    - Flaps 15………………………………………. 200 kt
    - Flaps 25……………………………………… 190 kt
    - Flaps 30………………………………………. 175 kt
    - Flaps 40………………………………………. 162 kt

  - Alternate Flap duty cycle in flight:
    - Flaps 0 -15 ……………………..…one cycle, 5 min. off
    - Flaps greater than 15 ………………one cycle, 25 min. off

  - Window heat inoperative (< 10000 ft)** ………… 250 kt
  - Max speed with Mach Trim inoperative…. 280 KIAS/ .82

  * Below 15000 ft, at less than Maximum Landing Weight, a speed of 250 kt provides adequate buffet margin
  ** Window heat should be ON 10 min. before takeoff
**FUEL:**
- Max Fuel temperature is +49°C
- Use of Wide Cut Fuels per Class B of GE Specification D50TF2, JP-4 or Jet B is prohibited

<table>
<thead>
<tr>
<th>FUEL</th>
<th>FREEZING POINT (°C)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>JET A1 (JP1)</td>
<td>-47</td>
</tr>
<tr>
<td>JET A</td>
<td>-40</td>
</tr>
<tr>
<td>JP-5</td>
<td>-46</td>
</tr>
<tr>
<td>JP-8</td>
<td>-47</td>
</tr>
</tbody>
</table>

*Inflight, The fuel temperature must be maintained +3°C above freezing point

<table>
<thead>
<tr>
<th>TANKS</th>
<th>MAXIMUM USABLE FUEL*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>USG</td>
</tr>
<tr>
<td>Left + Right</td>
<td>2576</td>
</tr>
<tr>
<td>Center</td>
<td>4299</td>
</tr>
<tr>
<td>Non measurable</td>
<td>N/A</td>
</tr>
<tr>
<td>usable fuel</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>6875</td>
</tr>
</tbody>
</table>

*fuel density = 0.80

Max imbalance between L & R tanks ………………………………………..453 kg (1000 lbs)
- Fuel crossfeed must be closed for takeoff & landing
- Main tanks 1 & 2 must be full if center tank contains more than 453 kg (1000 lbs)

**LANDING GEAR:**
Max extension …………………………………………………………..270 kt / M.82
Max retraction …………………………………………………………….235 kt
Max with gear extended……………………………………………….320 kt / M.82
Max Tyres Speed …………………………………………………………225 MPH or 195 kt
Tyres Specifications
(Main LDG) H44.5 x 16.5-21/28PR/225
(Nose Gear) 27 x 7.75-15-12PR
- Do not apply brakes until after touchdown
- Operation with assumed temperature reduced takeoff thrust is not permitted
  with antiskid inoperative.
- Towing operations without the use of a tow bar is restricted to tow vehicles that are
  designed and operated to preclude damage to the airplane steering system or which
  provide a reliable and unmistakable warning when damage to the steering system
  may have occurred.

Gear extension and retraction times :
Normal retraction………………………………………………………14 sec
Normal extension……………………………………………………..17 sec
Alternate extension…………………………………………………..19 sec

Parking brake holding time
(fully charged accumulator 3000 PSI).…………………………..8 hours
Precharge pressure…………………………………………………...1000 psi

**ELECTRICAL:**
AC Power system (115 V, 400 Hz, 3-phase)
- Voltage :
  - Normal…………………………………………………………115V
  - Maximum……………………………………………………..120V
  - Minimum……………………………………………………..110V
- Frequency :
  - Normal………………………………………………………400Hz
  - Maximum…………………………………………………….410 Hz
  - Minimum…………………………………………………….390 Hz
- Load limit:
  - IDGs + APU Generator + External Power.................90 kVA

- IDG:
  - Max oil temperature........................................182°C
  - Mini oil pressure...........................................165 psi

DC Power system
- Voltage:
  - Normal.........................................................26V
  - Maximum.....................................................30V
  - Minimum......................................................22V

Battery power
- Capacity.......................................................40Ah
- Voltage...........................................................24V

Miscellaneous
AC service outlets
  (cabin, cockpit, equipt rack).........................115 V, 400 Hz, 1000 W
DC service outlet (cockpit).................................28 V

● HYDRAULICS:
  Minimum range................................................2800 psi
  Normal range .................................................3000 psi
  Maximum (relief valve setting)........................3500 psi
  Precharge pressure........................................1000 psi
  Minimum fuel for ground operation of electric pumps .......750 kg

Hydraulics quantity:
  Refill level (Sys A)...........................................6.0 / 4.7 (RFL or 76%)
  Refill level (Sys B)...........................................8.5 / 6.9 (RFL or 76%)
  EIS ........................................................................100% / 88% (on ground only)

● ENGINES:
- Maximum & minimum limits are red while caution limits are amber
- Engine ignition must be CONT for:
  - Takeoff & landing
  - Operation in moderate or heavy rain
  - Anti-ice operation

Maxi N1 ..............................................................104%
Maxi N2 ..............................................................105%
Max startup EGT .................................................725°C
Max T/O EGT ....................................................950°C (10 min.)
Max continuous EGT ............................................895°C
Mini oil press .....................................................13 psi
Mini oil press during takeoff. .........................Above Yellow Arc
Mini oil quantity prior to engine start ................3.2 USG / 60%
Oil consumption........................................maximum 0.5 l /hour

Max oil temperature:
- Maximum momentary ...........................................165°C
- Maximum for 15 min.................................160 - 165°C
- Maximum continuous .......................................160°C

Starter Duty Cycle:
- First attempt ...........................................2 min. ON & 20 sec. OFF
- Second & subsequent attempts ..........2 min. ON & 3 min. OFF
- Maximum Starter Re-engage RPM .................20% N2

Reverse Thrust:
- For Landing or rejected takeoff only
- Intentional use of reverse thrust in flight or during taxi prohibited.
- Engine Start limitations:
  1) Observe initial EGT rise + EGT within limits
  2) Abort start:
     a) if EGT fails to rise within 10 sec. of selecting IDLE or EGT rising quickly or approaching limits
     b) if no N1 rotation before the engine start lever is raised to IDLE
     c) if no oil pressure by the time the engine is stabilized at idle.
     d) If no increase in, a very slow increase in N1 or N2 after EGT indication.

- APU:
  - APU bleed valve may be open during engine start, but avoid engine power above idle.
  - APU BLEED + ELECTRICAL load ......................................................... until 10000 ft
  - APU BLEED .......................................................................................... until 17000 ft
  - APU ELECTRICAL ................................................................. until 41000 ft (has always priority on Bleed air)
  - Minimum RPM for power delivery.......................................................... 95%
  - Normal Operation.................................................................................. 100 - 101 %
  - Overspeed Limit...................................................................................... 107 %
  - Electrical supply.................................................................................... 90 kVA

- NAVIGATION & COMMUNICATION SYSTEM:
  - During VOR approaches, one pilot must have raw data from the VOR associated with the approach displayed in the HSI VOR mode no later than the FAF
  - Do not operate the weather radar in a hangar or within 50 feet of any personnel or a fuel spill.
    (The hangar and personnel restrictions do not apply to the weather radar test mode).
  - Do not use LNAV & VNAV for QFE operation
  - Do not use terrain display for navigation
  - Use of terrain alerting & display functions are prohibited for QFE operation
  - Use of terrain alerting & terrain display functions are prohibited within 15 NM & approaching to land at an airport not contained in the GPWS terrain database.
  - ADIRU alignment must not be attempted at latitudes greater than 78° 15’.
  - Because of unacceptable Electro Magnetic Interference between Electronic Engine Control (EEC) and the VHF Comm. No. 2 & No. 3 antenna, do not use VHF Comm. No. 2 & No. 3 on 120.000 MHz as primary means of communications. If frequency 120.000 MHz is required, use Comm. No. 1.
  - VHF Power requirements ................................................................. 28V DC
  - HF Power requirements........................................................................ 115 V AC, 400 Hz, 3-phase

- PNEUMATICS:
  - Minimum pressure for engine start ...................... 30 psi at Sea Level (-0,5 psi/1000 ft)
  - External Pneumatic Source:
    - Maximum Pressure .............................................................................. 60 psi
    - Maximum temperature........................................................................... 232°C

- ACCELERATION LIMITS:
  - Flaps UP .................................................................+2.5 g to - 1.0 g
  - Flaps DOWN ......................................................................................+2.5 g to - 1.0 g

- FIRE PROTECTION:
  - All Fire agents.................................................................................. Halon
  - Cargo Fire agent protection duration.............................................. 195 minutes

- PASSENGER EVACUATION:
  - Main door emergency evacuation slide systems must be armed and engagement of each girt bar with the still fitting verified, prior to taxi, T/O and landing whenever passengers are carried.

- WATER & WASTE:
  - Water tank capacity........................................................................... 235 lit. / 62.5 USG
● CARGO DOORS:

<table>
<thead>
<tr>
<th>TYPE</th>
<th>DIMENSIONS (m)</th>
<th>DIMENSIONS (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Cargo</td>
<td>0.89 x 1.22</td>
<td>35 x 48</td>
</tr>
<tr>
<td>Aft Cargo</td>
<td>0.84 x 1.22</td>
<td>33 x 48</td>
</tr>
</tbody>
</table>

- Do not operate the cargo door or let the cargo door stay open in winds of 65 kt or more.
- For cargo door ops with winds ≥ 40 kt, damage to the cargo door could happen