

## Boeing 767-200/200ER/300 Procedures

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## **TAXIING**

Use the ADI ground speed readout to monitor taxi speed. Maximum recommended speed for normal straight taxi and for turns up to 45 degrees is 25 knots. When making turns greater than 45 degrees, slow to 10 knots or less to avoid excessive side loads on gear and tires. During the landing roll, a high speed turn off may be executed up to 60 knots, but ground speed should be down to 10 knots for a subsequent turn of more than 45 degrees.

Engine operation with the airplane stationary is limited to a maximum of 1.08 EPR with a tailwind exceeding 5 knots or a crosswind component greater than 15 knots, except when starting takeoff roll. When adding thrust to start moving, 35% N1 is the normal limit without ground clearance of the area behind the airplane.

The minimum pavement width needed for a 180° turn is 129 feet.

## **THROTTLE TECHNIQUE**

Use slow and steady throttle movement when applying or reducing thrust. The rate at which thrust is applied has a direct relationship to the EGT reached when applying takeoff thrust. When setting takeoff thrust, allow EGTs to stabilize after initial movement of the throttles to approximately 1.10 EPR before throttles are advanced further. If autothrottle is used, following EGT stabilization at approximately 1.10 EPR, push the EPR switch and observe the throttles advance to the takeoff setting, backing up the throttles with your hand to the takeoff thrust position.

## **TAKEOFFS**

### **Airspeed Bugs**

During cockpit preparation, the Captain should confirm the V-speeds either through table consultation or the following rule of thumb:

- The 260.0 gross weight V2 for flaps 5 equals 140 knots, and varies 5 knots/20,000 pounds or 1 knot/4000 pounds.

Verify that the internal airspeed bug is set to V2 and set one external airspeed bug to V1 and one to Vr.

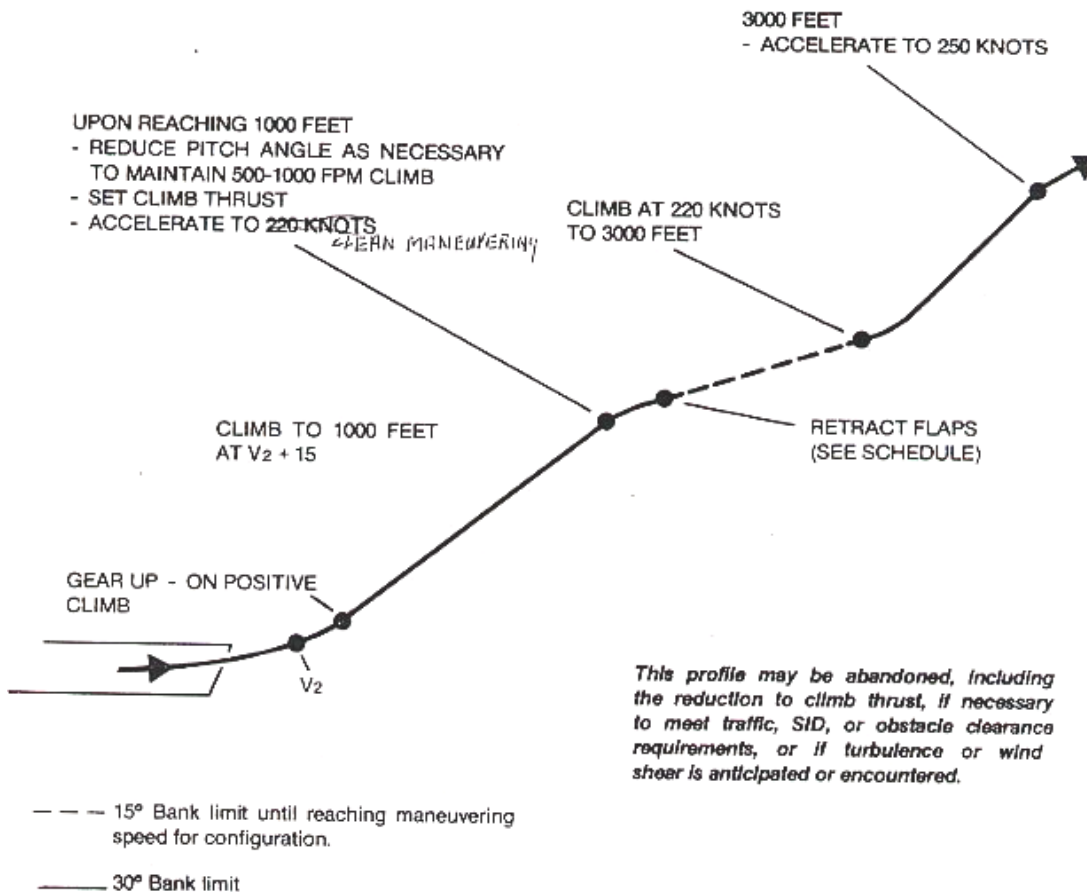
### **Normal Takeoff**

- Advance the throttles, and set takeoff thrust as indicated in throttle technique. Thrust is to be set by 80 knots. After takeoff thrust is set, the Captain's hand must be on the throttles until the V1 call is initiated.
- At the start of the takeoff, maintain forward pressure on the control column. Just prior to Vr speed, relax this pressure to begin rotation at Vr speed. Rotate the airplane smoothly and continuously (approximately 3° per second) until a stabilized climb speed of V2 + 15 is reached. During a proper rotation, you will reach V2 at 35 feet above the runway. In gusty or windshear conditions, consider delaying rotation and increasing initial climbout speed.
- Climb to 1000 feet at V2 + 15. When body angles over 20° are required to maintain V2 + 15, the Captain may elect to limit the body angle to 20°.
- At 1000 feet, reduce pitch angle by not more than 1/2 of that required to maintain V2 + 15. Set climb mode (climb thrust, FL CH, speed 220). Retract flaps on schedule.

- When flaps up is ordered, climb at 220 knots to 3000 feet.
- At 3000 feet, accelerate to 250 KIAS.

## 767 Normal Takeoff Profile

TAKEOFF FLAP RETRACTION SCHEDULE WHILE ACCELERATING	
AT	SELECT FLAPS
160	5
180	1
200	UP



### NORMAL TAKEOFF FLAPS 1, 5, 15, OR 20

## NORMAL DESCENT

Descent rates of less than 4000 feet per minute are sufficient for all normal operations. A descent rate of 1000 fpm is about the maximum that allows a precise, comfortable leveloff.

The normal descent is with throttles in idle. Add 20-25% to descent distance if anti-ice is to be used, to compensate for higher thrust.

## **APPROACHES**

### **General**

In most cases, final flaps should be extended and the approach stabilized prior to 1000 feet AFE. On visual approaches, the approach should be stabilized prior to 500 feet AFE. On non-precision approaches, extend final flaps prior to leaving the final approach fix.

### **Stabilized Approach Technique**

Airframe buffeting and leading edge flap and slat actuator fatigue will be minimized if the airplane is decelerated to near the clean maneuvering speed before extending flaps. Extend the landing gear and accomplish the Final Descent checklist prior to the final approach fix or VFR equivalent, with progressive flap extensions as dictated by airspeed, altitude and other factors. The fully stabilized approach with engines spooled up must be established by no later than 1000 feet AFE or 500 feet AFE on visual approaches.

Normal rates of descent should be about 600-800 fpm.

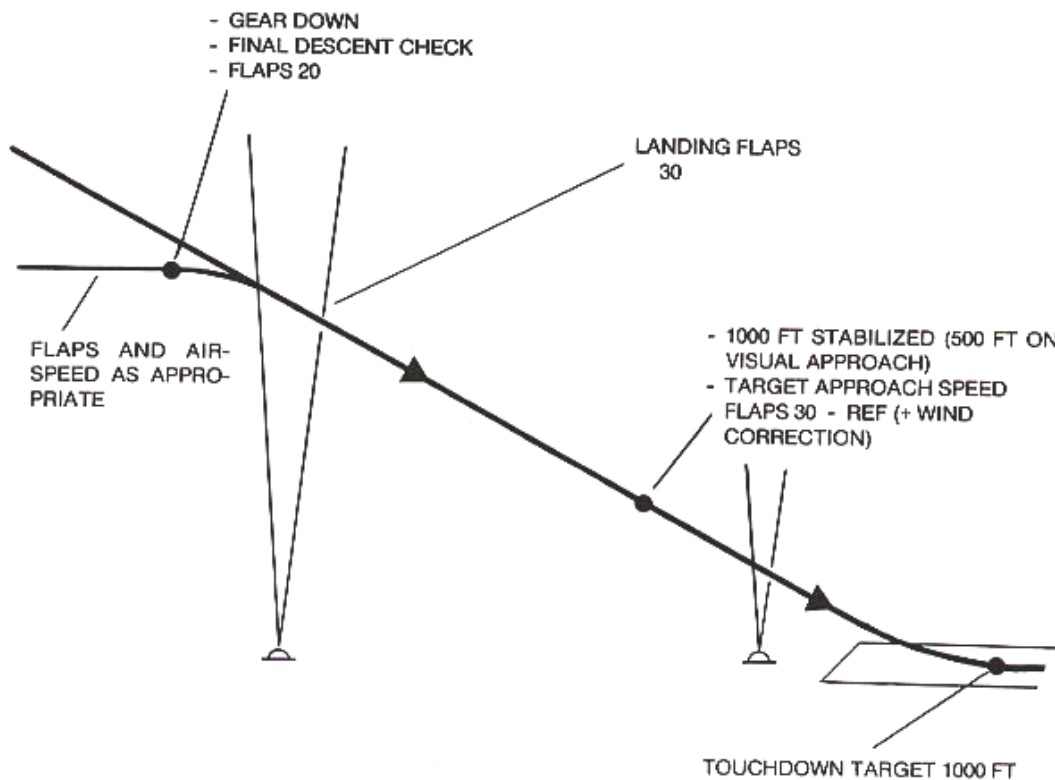
During the final 200 feet of descent, feel free to add thrust as needed, but be reluctant to reduce thrust. It is recommended that autothrottle not be used on final in conditions of high wind, gusts, or turbulence.

### **Normal ILS**

The 767 must use autoland when the weather is below Cat I minimums. Extend the landing gear and flaps 20 when the glide slope pointer starts to move.

## 767 Normal ILS Approach

MINIMUM MANEUVERING SPEEDS	
SELECTED FLAPS	SPEED
UP	220
1	200
5	180
15/20	160



### ILS APPROACH TWO ENGINE

#### Single-Engine ILS Approach

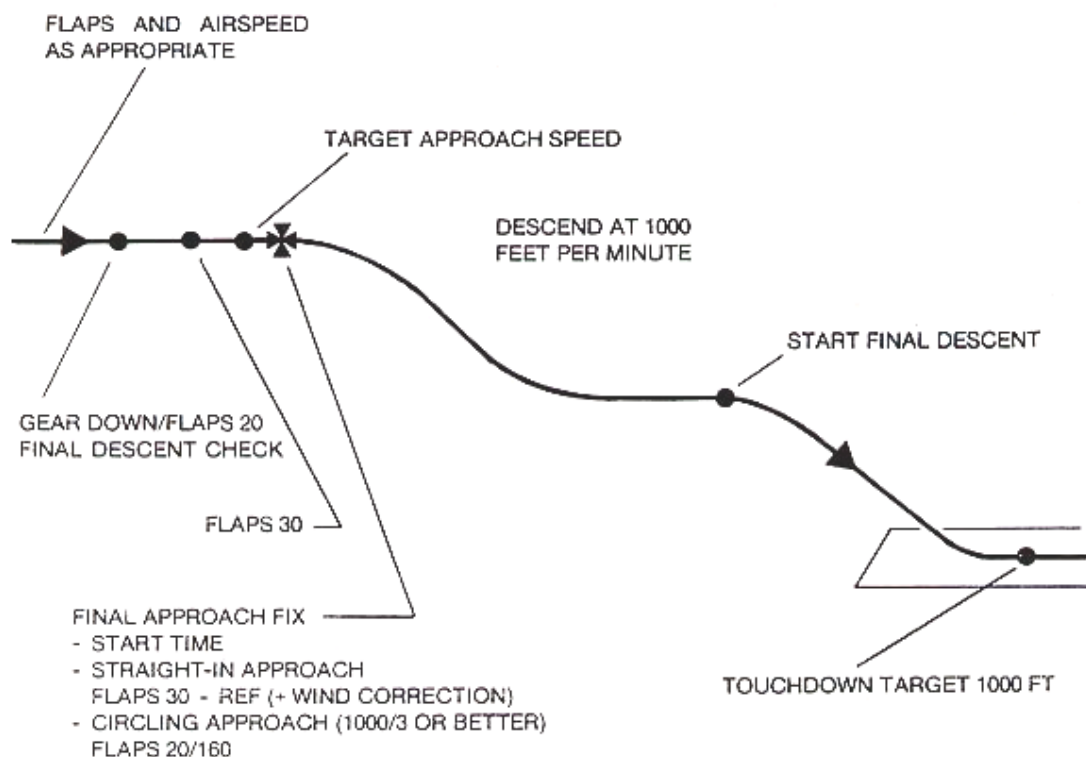
Flaps 20 and REF +10 should be used for the approach. This configuration protects go-around capability.

#### Non-Precision Approach

Extend flaps and reduce speed prior to starting descent to MDA. Flaps 30, REF is recommended on two engine approaches.

## 767 Non-Precision Approach

MINIMUM MANEUVERING SPEED	
SELECTED FLAPS	SPEED
UP	220
1	200
5	180
15/20	160



### NONPRECISION APPROACH TWO ENGINE

#### Missed Approach

Set flaps to 20. Initial go-around attitude is 15°, increasing as appropriate to maintain climb speed. If executing a go-around on one engine, set flaps to 5.

#### LANDINGS

##### Normal Landing

Landing flare is normally initiated at approximately 30 feet above the runway, but can vary depending on descent rate, wind and other factors. Body attitude at touchdown is approximately 4

to 5°. Do not allow the airplane to float just off the surface, but onto the runway. Prolonging the flare increases landing distance and usually results in an airspeed well below REF prior to touchdown. Fuselage contact with the runway occurs at approximately 11° pitch attitude, and can occur at 10° on a firm touchdown. Flaps 30 on landing provides about one foot additional aft fuselage clearance over flaps 25.

### **Crosswind Landing**

The basic crosswind correction technique is a crab correction on final and a de-crab maneuver during the flare. The most dangerous condition is an excessively early de-crab which results in the combination of high body angle and steep wing down at touchdown. The danger is damage to the outboard flaps or slats.

### **Touchdown Body Attitude**

Body attitude on final approach - approx 3°

Body attitude on touchdown - 4 to 5°

### **Automatic Brakes**

It is estimated that manual braking techniques frequently involve a four to five second delay between main gear touchdown and brake pedal application even when actual conditions reflect the need for a more rapid initiation of braking. This delayed braking can result in the loss of 800 to 1,000 feet of runway. Autobrakes will be used for every landing. During the final descent, set the AUTO BRAKES selector as desired. Normally, Level 1 is selected for braking on dry runways or where braking action is reported as good. Level 2 is recommended when the runway is wet or braking action is reported as fair.

Select Level 3 or 4 when braking action is reported poor, or MAX AUTO with braking action nil. Auto brakes may be positioned off for landing where runway length and exit plan will not require normal braking, i.e. planned roll to the end.

The transition from autobraking to manual should be made around 60 knots.

### **Reversing**

Reverse thrust should be used early in the landing rollout. Because of excellent rudder responsiveness, it is not necessary to wait until nose gear touchdown to initiate reversing.

## **AUTOPILOT/FLIGHT DIRECTOR SYSTEM (AFDS), Highlights**

### **Command Speed Bug**

Always set the command speed bug (IAS/MACH) indicator to the steady state speed, whether or not the autothrottle is engaged. The exceptions are when VNAV is engaged and the bug is automatically set, and on takeoff when V2 is set.

### **Autothrottle**

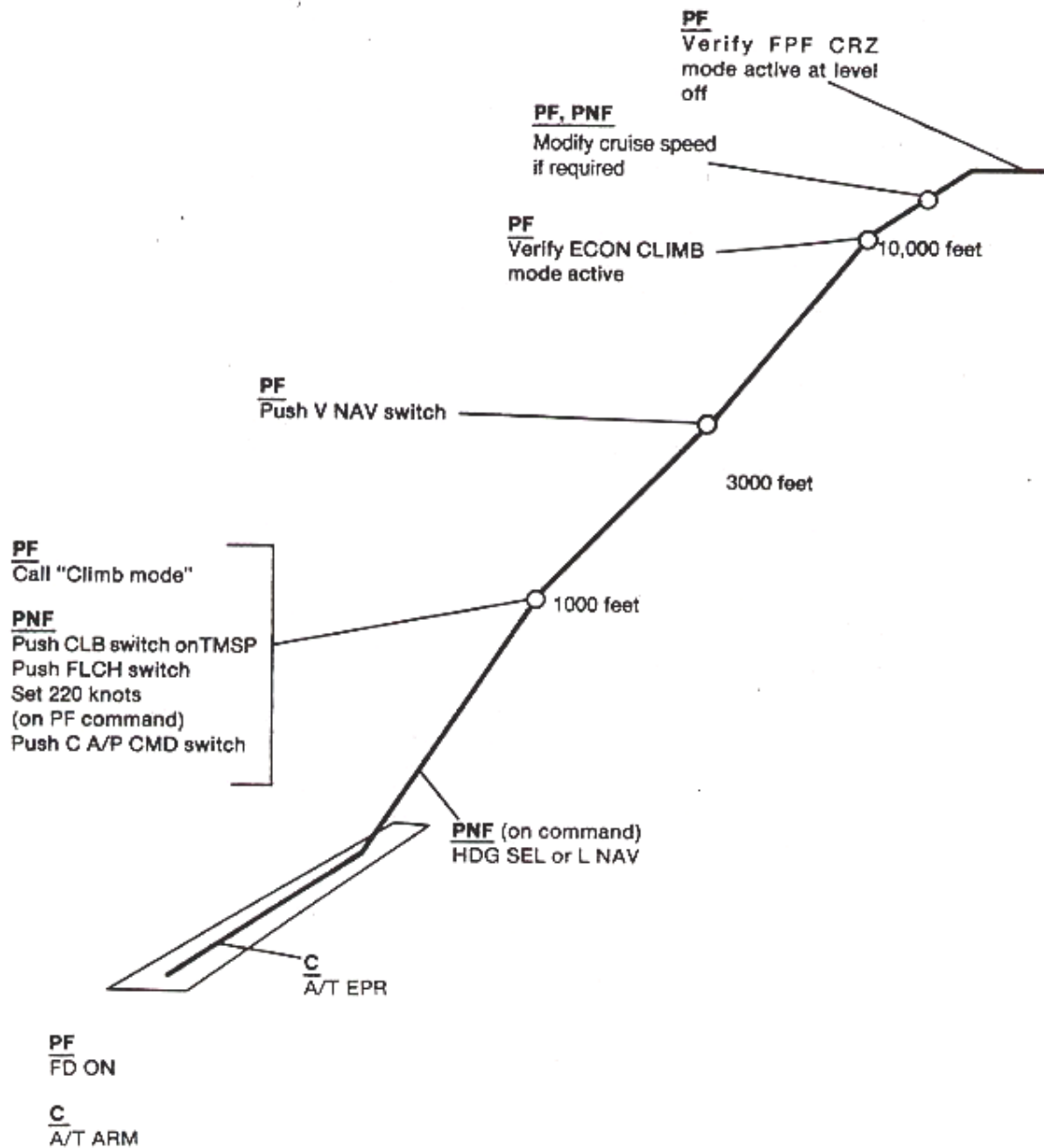
With a few exceptions, leave the autothrottle engaged at all times. The exceptions are: during those conditions which cause excessive hunting such as mountain wave action; on automatic approaches if throttle action is excessive; and when hand flying the approach.

### **Flight Level Change (FLCH)**

Use FLCH for its intended purpose of changing altitude up to about 4000 feet and not as a substitute for VNAV in extended climbs and descents. It may also be used for transitioning to second segment climb after takeoff. FLCH provides alpha protection which V/S mode does not. In FLCH, vertical speed is sacrificed to maintain airspeed.

## 767 Autoflight Profile

### PROFILE - AUTOFLIGHT





## 767 Autoflight Profile (cont't)

### PROFILE - AUTOFLIGHT (Cont'd)

