

Attachment 4

**Operations Group Chairman's
Factual Report**

DCA06MA009

Normal Landing Operations

Normal Operations
Landing

Chapter 3
Section 22

Normal Landing

Do not make unnecessary changes to flightdeck systems below 1000 feet.

The intention is for both Pilots to remain focused on flying/monitoring the aircraft. Do not perform discretionary tasks such as cancelling RA lights, making FMC changes, or presetting ATC ground control frequencies.

Essential changes are permitted (for example, operating windshield wipers).

(PF) Plan to touch down between 1000 and 1500 feet from the Landing threshold with the runway centerline between the main landing gear.

Keep the aircraft in trim while on final. Avoid rapid control column movements, pumping, or trimming in the flare. These actions could increase the chances for a tailstrike.

OPC "Approx Stop Margin" information is based on the assumption that aircraft touchdown occurs not later than 1500 feet from the usable end of the runway. If the aircraft lands beyond the 1500 foot mark, the OPC computed stopping margin will be invalid, and in some cases, the runway length will be insufficient to stop the aircraft. If the OPC AIII button is selected, the OPC subtracts 1000 feet from the stopping margins to account for the possibility of a long landing due to AIII flare guidance.

If touchdown occurs beyond 1500 feet, the ability to stop on the remaining runway may be compromised. Also, if the current conditions are significantly different than the anticipated conditions at the time of OPC programming (e.g., wet runway vs. dry runway, tailwind vs. calm wind), the OPC computed stopping margin may be invalid.

If a landing is made in either of these situations, higher than planned braking may be needed to account for the reduced stopping margin. The situation becomes more critical on shorter runways, and in some cases, a go-around may be the better option.

(PF) Normally, avoid touching down with thrust above idle.

At touchdown, verify that the automatic speedbrakes deploy.

- (CA) If the automatic speedbrakes do not deploy, deploy them manually.
- (FO) If the CA fails to detect the automatic speedbrake deployment failure, make an informative callout.

(PF) Immediately fly the nose wheel to the runway by relaxing aft control pressure. Do not attempt to hold the nose wheel off the runway.

Holding the nose up after touchdown for aerodynamic braking is not an effective braking technique.

Caution: Do not use full forward control column pressure because this may exceed nose gear structural limits.

(PF) Initiate reverse thrust.

Raise the reverse thrust levers to the reverse idle interlocks. After the interlocks release, modulate reverse thrust, as required. Avoid exceeding engine limits. Minimum reverse thrust is 65% N_1 . When required, reverse thrust to engine limits may be used. Initiating reverse thrust at touchdown is an important factor in minimizing brake temperatures, minimizing brake and tire wear, and reducing stopping distances.

Maintain awareness of the remaining runway stopping distance.

Night considerations: For runways with standard centerline lighting (CL), the centerline lights alternate red and white starting at 3000 feet remaining. The runway edge lights illuminate amber starting at 2000 feet remaining. The centerline lights illuminate all red starting at 1000 feet remaining.

Anytime stopping distance concerns arise, minimum stopping distance may be achieved by immediately applying maximum manual wheel braking.

Rubber and oil deposits can make the last portion of the runway extremely slippery. Respect this hazard and slow to a safe taxi speed prior to reaching this portion of the runway.

(PF) Begin manual wheel braking no later than 80 knots.

Anytime Min(2) stopping margin is less than 500 feet on the OPC Landing Output screen, and auto brakes are either inoperative or not used, begin manual wheel braking immediately after nose-wheel touchdown.

When using the auto brake system for landing, if the Auto Brake Disarm light illuminates prior to manual wheel braking, a system malfunction is indicated, and manual wheel braking corresponding to the selected auto brake setting should be commenced immediately. If stopping distance concerns arise, minimum stopping distance may be achieved by immediately applying maximum manual wheel braking.

Transition to manual wheel braking at approximately 80 knots. Apply brake pedal pressure to override the auto brake system and achieve the same (or greater) deceleration rate. The higher the level of auto brakes selected, the more aggressive the override attempt must be to disarm the system and achieve a comparable deceleration rate. Auto brake disarm is indicated by the illumination of the Auto Brake Disarm light and/or the PM's "auto brake disarm" callout. If the auto brakes do not disarm after manual brake application, it may be because the applied pedal pressure is insufficient. Increasing pedal pressure should result in auto brake disarm.

(PM) At 80 knots, call, "80 knots."

(PF) At 80 knots, gradually start reducing reverse thrust to achieve idle forward thrust by taxi speed.

Stowing the reversers smoothly prevents an unintended surge of forward thrust when the reversers are stowed at higher thrust levels.

CA Landing: Maintain the runway centerline between the two main gear assemblies until reaching taxi speed.

FO Landing: Maintain the runway centerline between the two main gear assemblies until the CA announces, "I have the aircraft." The FO will reply, "You have the aircraft."

(FO) Do not attempt to steer the aircraft toward the turnoff taxiway.

Normally, do not acknowledge ATC radio transmissions until reaching taxi speed.

Wait until slowing to taxi speed to reply to ATC calls.

Exiting the Runway

(CA) Exit the runway at a safe speed.

Avoid excessive braking or turning at higher speeds to make a turn-off taxiway. This often results in excessive side force loading on the nose wheel and an uncomfortable experience for the passengers.

The choice of an exit speed is dependent on conditions and taxiway configuration (high-speed versus 90 degree turn-off).

Normally, ATC expects you to exit at the first available taxiway after normal slowing. ATC may request that you exit at a particular taxiway. If able, comply with this request, but do not exceed normal braking.

Normally, do not advance thrust to expedite exiting the runway.

Do not exit a runway before reaching a safe taxi speed. Anticipate reduced braking effectiveness when approaching the far end of the runway, which may be very slippery due to the presence of heavy rubber, deice fluids, oil deposits, the absence of grooved pavement, and/or painted runway markings.

(FO) When directed by the Tower controller, change to Ground Control frequency. State the aircraft's position and obtain a Taxi clearance.

The Tower will issue instructions, if required, to resolve potential conflicts with other ground traffic prior to advising the Pilot to contact Ground Control.

Do not exit the landing runway onto another active runway unless authorized by ATC.