



B777 Ops. Severe Turbulence & Windshear

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0 Record of Amendments

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Contents

0	Record of Amendments	2
1	Severe Turbulence.....	4
1.1	Climb, Cruise and Descent Considerations	4
1.1.1	Disconnecting the auto throttles.....	4
1.1.2	Manual Flight in Severe Turbulence	4
2	Windshear.....	5
2.1	Avoidance.....	5
2.2	Precautions	5
2.2.1	Take Off.....	5
2.2.2	Approach and Landing	5
2.3	Recovery	6
2.3.1	Windshear Escape Manoeuvre.....	6

1 Severe Turbulence

Passenger Signs.....ON

The Passenger Signs should be turned on prior to entering areas of reported or anticipated turbulence.

1.1 Climb, Cruise and Descent Considerations

After take-off and having reached a clean configuration (After Take-off Checklist), the use of the autopilot is recommended for flight through turbulence.

During the climb and descent, using VNAV or FLCH may result in excessive pitch changes as the aircraft attempts to fly speed with the elevators, therefore it is recommended that V/S for climb and descent in severe turbulence is used, as this flies speed on the auto throttles.

During the cruise phase, VNAV and altitude hold modes both fly speed on auto throttles, so they can be used in this phase during turbulence.

1.1.1 Disconnecting the auto throttles.

During severe turbulence in the cruise, it may be necessary to disengage the auto throttles, this would be to prevent excessive thrust change. When VNAV is engaged, the thrust setting guidance is visible on the N1 gauge, N1 should be set at or slightly above the target N1 indication. Change the thrust setting only if required to modify an unacceptable speed trend.

1.1.2 Manual Flight in Severe Turbulence

Should it be necessary to fly manual flight due to severe turbulence, control the airplane pitch attitude with the elevators and use the attitude indicator as the primary instrument. Do not make sudden large control inputs. Corrective actions to regain the desired attitude should be smooth and deliberate. Altitude variations are likely in severe turbulence and should be allowed to occur, if terrain clearance is adequate.

2 Windshear

2.1 Avoidance

Pilots should search for clues that could indicate the presence of windshear in the flight path ahead. Signs that windshear could be present include:

1. Thunderstorm Activity.
2. Reports from other pilots.
3. The Low level windshear alerting warnings

Stay clear of thunderstorm cells and areas of heavy precipitation and areas of known windshear. If windshear is confirmed, delay the take-off, or do not continue the approach.

2.2 Precautions

If windshear is suspected, precautionary actions are recommended. Whenever windshear is reported or anticipated that may adversely compromise take-off or initial climb performance, full thrust should be used. If severe windshear is indicated to be present, **do not take-off**.

2.2.1 Take Off

- Use flaps 20 for take-off, unless limited by obstacles or climb gradient. Flaps 15 may be used as a precautionary setting and will provide nearly equal performance to Flaps 20.
- Use the longest suitable runway, provided it is clear of known windshear.
- Use the flight director after take-off.
- Be alert for airspeed fluctuations, this may be the first indication of windshear.
- Closely monitor instruments such as V/S and altimeters.
- If stick shaker is encountered, reduce pitch attitude.

2.2.2 Approach and Landing

- Select Flap 25 or 30 for landing.
- Establish a stabilized approach no lower than 1000ft above the airport.
- Use the most suitable runway that avoids the areas of suspected windshear, that is in compliant with the Crosswind and Tailwind limitations.
- Use ILS G/S, VNAV path or the PAPI indications to detect flight path deviations to help with detection of windshear.
- If the auto throttle is disengaged, or is planned to be disengaged before touch down, add an appropriate airspeed correction, up to a maximum of 20kts.

- Avoid large thrust reductions or trim changes in airspeed increases, due to the fact these may be followed by airspeed decreases.

2.3 Recovery

2.3.1 Windshear Escape Manoeuvre.

2.3.1.1 Manual Flight

- Call "WINDSHEAR, GO-AROUND"
- Disengage autopilot
- Push TOGA
- Aggressively apply maximum thrust and verify maximum thrust set.
- Roll wings level and rotate toward an initial pitch of 15°
- Retract speedbrakes.
- DO NOT change gear or flap configuration until windshear is no longer a factor.
- DO NOT attempt to regain lost airspeed until windshear is no longer a factor.

2.3.1.2 Automatic Flight

- Call "WINDSHEAR, GO-AROUND"
- Push TOGA
- Verify GA thrust
- Retract speedbrakes
- Monitor system performance.
- DO NOT change gear or flap configuration until windshear is no longer a factor.
- DO NOT attempt to regain lost airspeed until windshear is no longer a factor.

Severe windshear may exceed the performance capability of the AFDS. Pilots must be prepared to disengage the autopilot and auto throttle and fly manually. If TO/GA is not available, pilots must disengage these and fly manually.