

4.4 Takeoff

Line-Up

PF:

- Align aircraft with runway centerline

PM:

- Confirms runway and clearance
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Takeoff Clearance

PM: Confirms ATC clearance

PF: "Takeoff"

Thrust Application

1. Thrust Levers → ~50% N1 (stabilization)
 2. Then → FLEX/MCT or TOGA
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Standard Callouts (PM)

- "MAN FLEX / MAN TOGA"
 - "Thrust Set"
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Takeoff Roll

PM Callouts:

- "100 knots"
 - "V1"
 - "Rotate"
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Rotation

PF:

- Smooth pitch input ($\sim 2-3^\circ/\text{sec}$)
 - Target pitch $\sim 15^\circ$
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Liftoff

PM:

- "Positive Climb"

PF:

- "Gear Up"
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Initial Climb

- Maintain runway track
 - Follow FD (Flight Director)
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After Takeoff

- At acceleration altitude:
 - Pitch down
 - Flaps retract according to schedule
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Climb Thrust

- Thrust Levers \rightarrow CL detent
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Autopilot Engagement

The autopilot may only be engaged when the aircraft is properly stabilized and following the Flight Director.

Conditions for Autopilot Engagement:

- Aircraft is in a stable climb
- No excessive pitch or bank
- **Flight Director crossbars are aligned (aircraft follows FD commands)**
- No abnormal flight parameters

Recommendation:

- Typical engagement above 500-1000 ft AGL
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Key Principle

“Follow the Flight Director first - then engage the autopilot.”

Engaging the autopilot while not aligned with the Flight Director may result in:

- Abrupt aircraft movements
 - Unstable flight path
 - Loss of situational awareness
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Philosophy

A stabilized and disciplined takeoff ensures:

- Safe departure
 - Proper energy management
 - Smooth transition into climb phase
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