

Flying The Embraer Brasilia (EMB-120)

This section includes Pilot's Operating Handbook and Checklists. The POH section is first, followed by the Checklists.

FOM:

This section includes performance data on the Embraer Brasilia (EMB-120). Information consists of:

1. Critical Airspeeds
 2. Operating NOTAMS
 3. Fuel Loading Formula
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1. Critical Airspeeds

Taxi:

- Max. 25 Knots on straight taxiways
- Max. 15 Knots in turns
- Max. 10 Knots approaching gates/parking areas

Takeoff:

- V1 - Decision Speed = 115 Knots
- Vr - Rotate Speed = 125 Knots

Climb Rate:

- Climb Rate: Set to 1,800 ft./min.

Climb Airspeed:

- Departure Altitude to 10,000 ft. - no greater than 250 KIAS
- Above 10,000 ft. - Fly Mach Number = .43 to .47 Mach
- Vne/Mmo - Never Exceed/Maximum Mach Number = .49

Cruise Airspeed:

- Mach .43 to .47

Descent Information:

- To calculate **Top Of Descent** point (the point at which you need to begin your descent to reach the desired altitude at the desired time): Use 5 miles per minute (at Mach .41 in descent) as the basis. If you are cruising at 25,000 ft. and wish to descend to 5,000 ft. at the next waypoint, at a descent rate of 1,800 ft./min., you need to figure the time to descend 20,000 ft. (25,000 - 5,000). Divide 20,000 ft. by 1,800 ft./min. and you will get 11.12 minutes. At 5 miles per minute, you need to begin your descent at 55.6 miles from the next waypoint (11.12 minutes multiplied by 5 miles per minute). This is a "No Wind" calculation. If you have a tailwind, the miles per minute will be greater; if you have a headwind, the miles per minute will be lower.
- Descend with throttles at idle at initial descent. Increase throttles to hold descent airspeed of Mach .41.
- Set descent rate to 1,800 ft./min
- NOTAM: Set descent rate to 1,500 ft./min. or less when you are within 2,000 ft. of your desired altitude. This Embraer Brasilia (EMB-120) will descend below the assigned altitude if the descent rate is set higher than 1,500 ft./min. During turns, while descending, the EMB-120 can descend below the assigned altitude. To correct,

apply slight back pressure to assist autopilot in leveling off at the assigned altitude.

Approach Information:

- Approach Airspeed: 7NM from airport - 190 to 200 KIAS - deploy flaps to 8
- At Outer Marker: Lower Landing gear and deploy flaps fully (deploy flaps using two additional increments - do not deploy flaps directly from 8 to full flaps).

Landing:

- Minimum Runway Length: 3,000 ft.
- Target Landing Airspeed: 137 KIAS
- Check flaps full and gear down at 500 ft. above airport altitude.
- Upon landing (all gear on runway)
 - Engage Reverse Thrust
 - Apply brakes
- Disengage Reverse Thrust at (approx.) 30 Knots; or as needed for conditions
- Exit runway at 15 Knots or less (unless high speed turnoffs are available - if so maximum exit speed is 25 knots)

2. Operating NOTAMS:

- The Embraer Brasilia (EMB-120) will lose altitude at bank angles greater than those used by the autopilot. To prevent loss of altitude, apply slight back pressure, as needed, to maintain altitude.
- The Embraer Brasilia (EMB-120) needs only small and smooth control inputs...if large or abrupt inputs are used, the aircraft will react abruptly. Use elevator trim to hold desired body angles on approach and landing.
- The aircraft may continue, at times, to descend below the altitude assigned in the autopilot. This usually occurs during descending turns at lower altitudes (usually on approach). If the aircraft does not begin to level off at the assigned altitude automatically, the pilot will need to assist the autopilot by applying slight back pressure to the yoke/joystick; this will level the aircraft off enough for the autopilot to capture and hold the assigned altitude.

3. Fuel Loading Formula

- Range = 1545 NM
- Max. Takeoff Weight = 26,432 pounds
- Aircraft + Payload (minus fuel) Weight = 23,133 pounds
- Max. Fuel Load Weight = 3300 pounds (500 gallons)
- Fuel Burn Rate Factor = 0.0892857
- Fuel Base Amount = 362 gallons (this is the basic fuel load per flight and includes fuel for taxi, climb, descent and reserves)

Fuel Loading Formula:

$((\text{Fuel Base Amount}) + (\text{Trip Distance} * \text{Fuel Burn Rate Factor})) / 2 = \text{Fuel Load Per Tank}$

Example:

- Example: 300 NM Trip Distance

$((362 \text{ gallons}) + (300 \text{ NM} * 0.0892857)) / 2 = 194.4 \text{ Gallons Per Tank}$ - This is the amount that needs to be loaded for this flight.

- To load fuel, choose **Aircraft, Aircraft Settings, Fuel** to bring up the fuel loading window...enter amount of

194.4 gallons in the appropriate box.

NOTAM: Be sure that you load this figure in the gallons box, not the percent box.

Checklists:

Pre-Flight:

- Select departure airport and position aircraft at gate (use slew mode - press “Y” to enter and “Y” to exit slew mode). Engines off (engines are on when MSFS starts - press Ctrl.-Shift-F1 to shut engines down)
- Set airspeed indicator to read Indicated Airspeed (Options, Preferences, Display, Instrument - ensure mark in box next to indicated airspeed - if none, click to tell MSFS to display indicated airspeed)
- Flight plan completed
- Fuel Load computed and loaded
- Departure procedures reviewed and charts/documents at hand
- Weather for flight set (if you set your weather to other than the default weather provided by MSFS)

Pre-Engine Start:

- Parking Brake Set
- Waypoints loaded into FMS (Flight Management System)
- Nav Radios Set
- Com Radios Set
- Copy ATIS

Engine Start:

- Parking Brake Set
- Props/Engine Area Clear
- Throttle Set to Idle
- Start Fuel Flow (Ctrl-Shift-F4)
- Start Engines (press “J”, “+”, “1” then “J”, “+”, “2”)
- Check Engine Operating Normally

Pre-Taxi:

- Flaps 8
- Push Back (Enter slew mode to simulate push back - press “Y” to enter slew mode, apply slight back pressure to stick/yoke to “push back from gate”, once pushed back - exit slew mode - press “Y”)
- Release Parking Brake (“.”)
- Taxi to departure runway - set parking brake when holding short of departure runway

Pre-Takeoff:

- Check parking brake set
- Check Set to Flaps 8
- Check engine operating normally
- Taxi into position and hold

Takeoff:

- Release Parking Brake

- Set power to maximum thrust (full throttle)
- $V_1 = 115$ Knots (Decision Speed)
- $V_r = 125$ Knots (Rotate Speed)
- Initial climb at 15 BA (Body Angle)
- Positive Rate Of Climb - Gear Up
- Retract Flaps at 150 KIAS (Knots Indicated Airspeed)

Post Takeoff:

- Check gear up
- Check flaps up
- Throttle set to hold airspeed at 250 KIAS or below

Climb:

- Rate of Climb - 1,800 ft./min.
- Airspeed
 - 225-250 KIAS under 10,000 ft.
 - Mach .43 - .47 above 10,000 ft.
- Increase throttle as needed to hold published climb airspeed

Cruise:

- Airspeed
 - Mach .43 to .47
 - V_{ne}/M_{mo} - Mach .49 (Never Exceed/Maximum Mach Number)
- Ensure On Course Navigation

Descent:

- Throttles Idle
- “Cleared To” Altitude Set (the altitude to which you will be descending)
- Increase power to hold Mach .41 for descent

Pre-Approach

- Approach Plate Out
- Approach Brief (Brief yourself on the approach, how you plan to execute it, missed approach procedures, approach and landing configuration review - when to set flaps and lower gear, altitude at approach fixes and any other relevant information to ensure full understanding of approach)
- ILS Freq. Set (Once turned/cleared for approach - do not set ILS freq. if you are still tracking an en-route or approach procedure NAV Aid)

Approach:

- Fly published approach as briefed.
- Normal Approach Airspeed:
 - 135-145 KIAS
- Landing Configuration set at outer marker
 - Gear Down
 - Flaps Full

EXECUTE MISSED APPROACH if you can not establish a stabilized approach or if you deviate significantly from

the ILS localizer and/or glideslope.

Landing:

- Target Airspeed: 137 KIAS
- After touchdown:
 - Engage reverse thrust (Numberpad “3”)
 - Apply Brakes
 - Disengage Reverse Thrust at 30 Knots
 - Exit Runway at 15 Knots or less

Post Landing:

- Flaps Ups
- Taxi To Terminal/Ramp

Parking:

Parking Brake Set

Flaps Up

Spoilers Retracted

Engines Off (Ctrl-Shift-F1)

Log flight time in MSFS logbook or other record. Exit MSFS or set up for another flight.