

American Airlines Airbus A319, A320, A321 Notes

Takeoff

Two takeoff profiles. *Note: Rolling takeoffs are normal, expected and will meet all performance requirements.*

Takeoff Procedure	Thrust Reduction Altitude (THR RED)	Acceleration Altitude (ACC)
Normal Takeoff Profile (NADP 2)	1,000 AFL	1,000 AFL
Noise Abatement Profile (NADP 1)	1,500 AFL	3,000 AFL

Crew will use the Normal Takeoff Profile (NADP 2) except when specifically required to use the Noise Abatement Profile (NADP 1).

NADP 2 will indicate LVR CLB (set thrust levers to CLB) at 1000 feet AFL and will adjust pitch to accelerate to 250 or as set.

NADP 1 will indicate LVR CLB (set thrust levers to CLB) at 1500 feet AFL but will maintain pitch to hold $V_2 + 10$ until 3000 feet AFL, then it will lower pitch to accelerate to 250 or as set.

①*Make your flight instructor happy!:* When setting power for takeoff, the thrust levers should be set to 50% N1 (CFM) or 1.05 EPR (IAE) on the TLA (doughnut) and once both engines stabilize then position both levers to FLEX or TOGA. Make an initial setting on the thrust levers and then adjust on the TLA to 50% or 1.05 EPR. Set takeoff thrust by 40 kts. (OM 2d.1.2)

①*Make your flight instructor happy!:* If not a rolling takeoff release the brakes once the initial 50% or 1.05 EPR is set. If you go to full takeoff power before releasing the brakes it will be a rather abrupt jolt that you and your passengers won't like! This is a jet not a little prop plane!

Note: Allow at least 5 minutes for engine warm up before applying takeoff thrust for first flight of day. After first flight of day use a minimum of 3 mins. warm up if engine is shut down 1 ½ hrs. or less.

Do not use aileron into the wind during a crosswind (AOM I 6.1.1). During a takeoff with crosswind component exceeding 20 kts. or tailwind apply full forward sidestick to be taken out by 80 to 100 kts. During all normal takeoffs use half forward sidestick pressure until 80 to 100 kts. Ensure the aileron is neutralized by looking at the "control pointer cross" on the PFD or relax the sidestick to center during the takeoff roll. This will ensure that you do not have any roll in the initial rotation and liftoff. During crosswind takeoff let engines stabilize at (CFM) 50% then increase to 70% N1 and above 15 kts ground speed increase to FLEX or TOGA by 40 kts. ground speed or (IAE) 1.05 EPR and stabilize, then increase to

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FLEX or TOGA by 40 kts. ground speed. Slowly release any rudder being held during crosswind takeoff during the rotation. By liftoff you should have rudder neutral during a crosswind takeoff.

① *Airbus Gotcha:* If on taxi out you do not have the V speeds showing in your PFD (after entry in MCDU), make sure that your Flight Director is turned on.

Note: If no FLEX temp is set (TOGA) and thrust levers are set to FLEX on takeoff the thrust will go to TOGA at 80 kts. This is to avoid an underperformance takeoff.

On takeoff, PF should have the PERF-TAKEOFF page, PM the F-PLN page

Use a radar tilt of 5-8° UP if radar required during takeoff.

When required set a departure heading for selection at 400'. *Note:* set the heading you will need at 400'. If you are using a SID departure where NAV is required NAV mode will engage at 30' automatically, do not set a heading for NAV departure.

Use ARC or ROSE NAV on takeoff on your EFIS ND settings. Do not fly around in PLAN. Only use PLAN as a momentary reference in-flight.

Captain makes all takeoffs when visibility is less than either 1600 RVR or ¼ mile visibility if no RVR reported.

On takeoff the aircraft will “blend” from direct to normal law as it goes from ground mode to flight mode. This means that the backpressure that you need to hold the nose up will reduce to zero once normal law autotrim activates. You will usually not really notice this change as the aircraft will be climbing quickly but you will learn to release the backpressure around 100 to 200 ft. as the trim kicks in or the nose will “balloon”. A good Airbus pilot quickly learns to minimize input as many times the pilot is inducing a slight amount of sidestick pressure without realizing it. Remember, the less input on the stick the better. You don't want to “confuse” the computers (or the pilot!).

New Airbus pilots tend to get into the habit of “slapping” the Thrust Levers back from TOGA or FLX/MCT to the CL detent. This isn't the best technique and can be very noticeable in back to the passengers and harder on the engines when using TOGA or minimal FLEX reductions. When the FLEX temp is around 60° there will be little or no power reduction when coming out of FLX/MCT to CL and this is why pilots get used to just “slapping” the levers back. At TOGA or less FLEX the immediate reduction is very noticeable. Ease the thrust levers back from FLX/MCT or TOGA to the CL detent slowly just as you would on any other aircraft. Your passengers and engines will appreciate it!

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PF	PM
<p>Begin Takeoff Roll:</p> <ul style="list-style-type: none"> -Advance Thrust Levers to about 50% N₁ (CFM) 1.05 EPR (IAE) -Advance thrust levers to FLX or TOGA -Check MAN FLX or MAN TOGA annunciated on FMA 	
“FLEX” or “TOGA”	Verify proper takeoff thrust set “Thrust set”
<i>Note: Captain will assume/maintain control of thrust levers after thrust set for possible Rejected Takeoff.</i>	
At 80 kts	“80” (check STBY speed)
“Checked”	
<i>Note: Captain will remove hand from thrust levers at V₁</i>	“V₁”
Rotate at 3° per second up to 15°	“Rotate”
Verify positive rate of climb “Gear Up”	Verify positive rate of climb “Positive Rate” Position Gear Selector UP
Above 100 AFL “Autopilot 1” or “Autopilot 2”	Select Autopilot ON as requested
At or above 400 AFL “Heading_____” as required	Select HDG as requested
At thrust reduction altitude LVR CLB flashes, Move Thrust Levers to CLB detent “Climb”	Verify Thrust set to CLB “Climb Set”
Follow pitch guidance to reduce pitch and accelerate at Acceleration Altitude. When at or above F Speed and accelerating- “Flaps 1”	<i>Note: Flaps 1 retraction is only used on Flaps 2 or Flaps 3 takeoffs.</i> Check airspeed above F Speed Select Flaps 1
When at or above S Speed- “Flaps Up, After Takeoff Checklist”	Check airspeed above S speed Select Flaps 0 Disarm Spoilers

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RTO – Rejected Takeoff (AOM 6.4)

ECAM will inhibit all warnings/cautions that are not paramount from 80 kts. to 1500' AGL. All rejects done by captain.

- The captain calls **“Reject, My Aircraft”**
- F/O calls **“Your Aircraft”** (if control transferred)
- Thrust Levers idle (when the thrust levers go to idle the ground spoilers extend, which then trigger the autobrakes, ensure maximum braking)
- Select Full Reverse
- F/O call (if applicable) **“Single Reverse”** or **“No Reverse”**
- F/O monitor autobrakes, call **“Autobrakes OFF”** if they do not engage or when they are disengaged
- F/O notify tower
- F/O call **“80”**
- F/O call **“60”**
- Maintain slight forward pressure on sidestick
- Stop aircraft
- If evacuation NOT IMMEDIATELY required - Capt. inform passengers and flight attendants “This is the captain, remain seated”, etc.
- If evacuation IMMEDIATELY required – Call for QRH Evacuation procedure.

After Reject consider:

- Aircraft condition
- Clear the runway if helpful (if autobrakes MAX used, release brakes by disarming spoilers)
- Passenger evacuation or not

Hot Brakes – (OM 6.4.6) AML entry and maintenance action is required if:

- 150° C difference in brake temps on the same strut *and* one brake 600° or greater *or* 60° or less
- a mean 200° C difference between different trucks
- fuse plug melted
- brake temp exceeds 900° C (800° - A321)

Note: If necessary, maximum reverse may be used until aircraft comes to complete stop. Also, if aircraft comes to full stop with Autobrakes you must disarm the spoilers to taxi.

Note: Autobrakes will not activate below 72 kts.

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Max Rate of Climb: (AOM 7.3.4)

A319: 260 KIAS / .76M

A320: 260 KIAS / .76M

A321: 280 KIAS / .76M

Max Climb Angle: Slow to Green Dot Speed with OP CLB. EXPED climb pb will give maximum climb angle by applying maximum climb thrust and controlling speed to down to green dot. *Note:* EXPED pb can produce a rapid change and is not intended for routine use. Use above FL 250 should be avoided.

V1 Cuts (AOM 6.5)

Pick a line and stick to it no matter what on every takeoff. You will find that you will just naturally put in the correct rudder for V1 cuts if you practice this on every takeoff. You don't have to hit the centerline lights but stay right on the centerline. You should have the aircraft already stabilized with rudder before rotation (assuming the cut is before the Rotate call). Bring the nose up to 12.5° (park it on the 12.5° "shelf") and hold it. Then follow the flight director. The only real Gotcha here is that the aircraft takes off in Direct mode. It will then blend to Normal. This means that you will have autotrim kicking in just after takeoff. Remember in direct you will be holding back pressure to keep the nose at 12.5° until Normal law with autotrim comes in and then you will need to release the back pressure on the sidestick. In fact this is what happens on every takeoff. Be sure that you don't try to trim off the rudder so quickly that you are diverted from flying during the blend from direct to normal as the trim coming in will cause you to pitch up if you aren't watching for it. Since technically the autopilot can be put on at 100' some folks try to show how good they are and start trimming rudder right away. Better to wait until the blend is complete around a few hundred feet first and then trim the rudder and then get it on autopilot. You don't get any bonus points for a quick rudder trim while losing speed and pitch control!

Note: If taking off in FLEX the PF has the discretion to leave thrust levers in FLEX or to increase to TOGA. If aircraft is heavy, runway is short, aircraft must be maneuvered for obstacle clearance, aircraft is on fire or has other time critical problem pilot should consider using TOGA if not already selected. Thrust should be increased to TOGA in a slow, deliberate manner in order to not destabilize the situation. You may do this while on the runway. If airborne it is best to do this once on autopilot. If increasing to TOGA while airborne do it while on autopilot and below 1000 ft and still climbing. Once level you should only reduce from FLEX to CLB and then back to MCT.

Note: If thrust levers are left in FLEX during engine out takeoff then they must be positioned to CLB or TOGA and reset back to MCT (same detent as FLEX) when engine out procedures call for reduction to MCT. This is due to the fact that the

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same detent is used for FLEX and MCT. By selecting from FLEX to CL or TOGA and then back to the MCT detent the logic is satisfied for the FMGC.

FMS Engine Failure Procedures

American uses FMS Engine Failure Procedures for takeoff. Engine Failure Procedures are used at airports with difficult terrain or departure issues such as Reno (KRNO), Washington DC (KDCA), San Francisco (KSFO), San Diego (KSAN) among many that have these procedures. The procedure is listed in the Jepp app under the Company (CO) pages. They will be named RWY ___ TO ___. This lists the runway and shows it is a takeoff procedure for which aircraft. For SAN runway 09 they use RWY 09 TO ALL AIRCRAFT. This reads as Runway 09 Takeoff All Aircraft. For KDCA they use RWY 01 TO A32F. This shows it is a procedure for Runway 01 Takeoff for the A320 Family (A319, 320, 321). This procedure will be named at the top of the page using AA and the runway if the procedure is available as an FMS procedure. For example at Reno the procedure is AA34L for runway 34L.

You should select SEC F-PLN, then INIT and enter the departure airport for both airport codes. For example for Reno enter KRNO/KRNO. Then select the runway in the SEC F-PLN and use the Engine Failure Procedure as the departure (SID). This will make the procedure available if you have engine failure on takeoff. Just have the PM select the SEC FLT PLAN and ACTIVATE it. You can then easily fly the Engine Failure Procedure on managed autopilot.

Not all procedures have an FMS departure built. You may want to use the FIX INFO page to build a reference on the PFD. For example at KSAN you could use a radius of 7 nm from MZB to build a reference circle for the turn at MZB D7.0 to turn to heading 220.

At KPHX you can build the departure using fixes that are already built and made. Just use the names they give. For example runway 08 uses fixes of PHX01 and PHX02 while runway 07L uses PHX03 and PHX04.

Note: American does not build separate procedures into the FMGC for Engine Failure on Missed Approach. If a procedure is listed for Missed Approach (MA) it typically will be the same as the takeoff procedure. There is a separate engine failure procedure for missed approach you will normally have to load the takeoff procedure. This means you will have to load the arrival city just as you did the departure city in the SEC F-PLN. For example if you are flying from PHX to RNO you would enter KRNO/KRNO in the SEC F-PLN to initialize it. Then enter the procedure as listed. You may need to DELETE the current SEC F-PLN if you had one already loaded for a different airport. Do not use the CLR key to try to change the airport codes. Just use the DELETE command.