

Concorde – Take-Off Procedure & Technique

INITIAL CLIMB

After rotation the aircraft is accelerated by keeping it at the pitch attitude θ_2 set before take-off. The acceleration should be continued to reach V_{MO} or to reach the TMA climb speed.

The Flight Engineer selects reheat OFF at 500 feet and FLIGHT at 1000 feet on command, unless there is a specific Noise Abatement procedure for that departure in which case it is done at a pre-selected time rather than altitude.

NOISE ABATEMENT

After rotation the aircraft is accelerated by keeping it at the pitch attitude θ_2 until airspeed approaches the noise abatement speed, V_N . Pitch attitude is then increased so that V_N is maintained. At noise abatement time power is reduced and pitch attitude is decreased to continue at V_N . The amount of anticipation required during the acceleration to V_N and the pitch attitude required to maintain V_N vary with power, aircraft weight, pressure altitude and air temperature. Airspeed values given to provide anticipation guidance are approximations, less anticipation may be required. Pitch attitude values given for guidance are likewise approximations.

TYPICAL HEAVY TAKE-OFF WEIGHTS

Initial Climb - After rotation the aircraft is accelerated by keeping it at the pitch attitude θ_2 set before take-off. At 240 knots or soon after, pitch attitude should be increased to ensure that the noise abatement speed of 250 knots is not exceeded. 18° pitch attitude is a useful approximate target, but this will rarely be the exact attitude required, it may be greater or less. Having increased pitch attitude, adjustments in attitude should be made as necessary to maintain 250 knots.

Power reduction - At noise abatement time the Flight Engineer selects reheat OFF and immediately reduces power to the noise abatement setting. The pilot flying should decrease the pitch attitude to approximately 12° and then adjust the aircraft about that attitude to maintain 250 knots. 12° pitch attitude is a useful approximate target, a higher figure is not normally required but at low take-off weights a lower figure will be. The reheat must not be selected OFF and the power must not be reduced if the speed is lower than 240 knots.

Speed - During the noise abatement procedure the speed of 250 knots should be maintained. If a lower speed is inadvertently achieved, the attitude should be cross checked and adjusted as necessary to achieve 250 knots. If the rate of climb is significantly less than 700 feet per minute sufficient power should then be applied to re-establish the required climb and to slowly regain speed. A one-per-cent (1%) increase in N_2 will counteract a shortfall of about 200 feet per minute. If the speed is allowed to fall below 240 knots after reheat off selection and power reduction, the desired noise abatement gradient will not be achieved. In this case the attempt to carry out a noise abatement procedure should be discontinued, and a gross power increase made.

If the speed is allowed to increase to above 250 knots, it should be brought back to 250 knots.

LIGHT TAKE-OFF WEIGHTS

Initial Climb - After rotation the aircraft is accelerated by keeping it at the pitch attitude θ_2 set before take-off. At 240 knots approximately, pitch attitude should be increased to ensure that the noise abatement speed of 250 knots is not exceeded. At light weight with take-off power and reheat, a pitch attitude of up to 27° would be required to maintain V_N but in practice it is unlikely that a pitch attitude greater than 22° will be reached before a decrease in pitch attitude is required at noise abatement time.

Power reduction - At noise abatement time the Flight Engineer selects reheat OFF and immediately reduces power to the noise abatement setting. The pilot flying should decrease the pitch attitude to approximately 10° and then adjust the aircraft about that attitude to maintain 250 knots. 10° pitch attitude is a useful approximate target, a higher figure, up to 12° , may be required.

UNREHEATED TAKE-OFF

Initial Climb - After rotation the aircraft is accelerated by keeping it at the pitch attitude θ_2 set before take-off. At 215 knots or soon after, pitch attitude should be increased to ensure that the noise abatement speed of 225 knots is not exceeded. 18° pitch attitude is a useful approximate target, but this will rarely be the exact attitude required, it may be greater or less. Having increased pitch attitude, adjustments in attitude should be made as necessary to maintain 225 knots.

Power reduction - At noise abatement time the Flight Engineer immediately reduces power to the noise abatement setting. The pilot flying should decrease the pitch attitude to approximately 12° and then adjust the aircraft about that attitude to maintain 225 knots. 12° pitch attitude is a useful approximate target, a higher figure is not normally required but at low take-off weights a lower figure will be.

POWER RESTORATION

At the end of the noise abatement procedure the Flight Engineer selects FLIGHT and on command advances the throttle levers fully to give climb power. Alternatively, over noise sensitive areas, the power may be increased using the following schedule of N_2 against altitude; 93% at 3000 ft, 95% at 4000 ft, 97% at 5000 ft, 99% at 6000 ft, 101% at 7000 ft, and full CLIMB power at 8000 ft. The pilot flying should decrease the attitude (to about 10° initially) to accelerate to the TMA climbing speed.

The above was taken from a Forum Sticky post, which has now been removed.