## TRAINING TOUCH-AND-GO

With the nosewheel on ground, pitch trim automatically resets to 4° UP : This normally occurs 5 seconds after the pitch attitude is less than 2.5°, and if the ground spoilers are retracted. The pilot should select CONF 2 and add thrust. He must always move the thrust levers to TOGA to bring up the speed reference system (SRS), and then reduce to a lower thrust (not less than CL), if he chooses. Takeoff may be a little out of trim, which may affect the rotation slightly, but once the aircraft is off the ground, the control law holds the "out of trim", then retrims at 50 feet, provided the aircraft has transitioned to flight law.

## STALL WARNING

An aural "STALL, STALL" warning continuously sounds at low speeds in ALTN or DIRECT laws. However, spurious stall warning may sound in NORMAL law just after lift-off, if an Angle-Of-Attack (AoA) is damaged. In any cases, upon hearing it, the pilot must return to the normal operating speed by taking conventional actions with the controls :

■ **At lift-off :**

THRUST LEVERS . . . . . TOGA
At the same time :
PITCH ATTITUDE . . . . . 12.5°
BANK ANGLE . . . . . ROLL WINGS LEVEL
SPEEDBRAKES . . . . . CHECK RETRACTED

*Note : When a safe flight path and speed are achieved and maintained, if stall warning is still activated, consider a spurious stall warning*

■ **During any other flight phases after lift-off :**

THRUST LEVERS . . . . . TOGA
At the same time :
PITCH ATTITUDE . . . . . REDUCE
BANK ANGLE . . . . . ROLL WINGS LEVEL
SPEEDBRAKES . . . . . CHECK RETRACTED

CAUTION

If a risk of ground contact exists, reduce pitch attitude no more than necessary to allow airspeed to increase

- **After initial recovery :**
  Maintain the speed close to V Stall Warning speed (VSW), until it is safe to accelerate
- **If in clean configuration and below 20 000 feet :**
  FLAP 1 . . . . . SELECT
- **When out of stall and if no threat of ground contact :**
  LANDING GEAR . . . . . UP
  – Recover normal speeds, and select flaps as required
  – In case of one engine inoperative, use power and rudder with care

The aural stall warning may also sound at high altitude, where it warns that the aircraft is approaching the angle of attack for the onset of buffet. To recover, the pilot must relax the back pressure on the sidestick and reduce bank angle, if necessary. When the stall warning stops, the pilot can increase back pressure again, if necessary, to return to the planned trajectory.

## ABNORMAL CONTROL LAWS – GENERAL

### ALTERNATE LAW

Pitch alternate and roll normal is the first level of degraded control law.
Further failures result in pitch alternate and roll direct.
The autopilot may be available, depending on the cause and type of failure(s).

### DIRECT LAW

The sidestick is directly coupled to the controls via the computers, but without any of the stabilization feedbacks. In effect, this law turns the aircraft into a conventional aircraft, but is compensated for configuration and CG. The pilot must use manual pitch trim, as signaled on the PFD. The autopilot is not available.

### MECHANICAL BACKUP

The pilot can use the pitch trim and rudder to control the aircraft for short periods of total loss of fly-by-wire.

## ABNORMAL CONTROL LAWS – IN DETAIL

### ALTERNATE LAW

Pitch
Alternate law in pitch is almost the same for the pilot, as normal control law.
However, alternate law does not maintain any of the protections, except maneuver protection. As a result, the pilot must fly the aircraft more attentively to avoid inadvertently exceeding the normal limits.
Alternate law reduces MMO to 0.82, and VMO to 330 knots.