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TERRAIN AVOIDANCE PROCEDURE FOR AIRCRAFT WITH FBW AND WITH CONVENTIONAL FLIGHT CONTROLS

TERRAIN AVOIDANCE PROCEDURES FOR AIRCRAFT WITH FBW AND WITH CONVENTIONAL FLIGHT CONTROLS

1. During daylight VMC when positive visual verification is made that no hazard exists,a GPWS terrain warning may be considered as cautionary. If a GPWS warning occurs and the crew cannot make this visual verification, as in IMC or at night, the crew should immediately and aggressively execute the terrain avoidance procedure applicable to the aircraft type. There should be no attempt to evaluate the warning.

2.1. **For Airbus fly-by-wire aircraft** having full low speed protection, the procedure is as specified on page 2. Push thrust-levers immediately to TOGA and simultaneously pitch nose-up, wings level, disconnecting autopilot. Immediate full aft side-stick will produce maximum performance climb, trading speed for altitude, in the minimum distance. The speed-brakes should be retracted without delay if they are extended. In any case, they will retract automatically when the angle of attack reaches α prot. Maintain gear and flaps position, maintain full back stick until adequate terrain clearance is assured, as indicated by cessation of the GPWS warning and increasing radio altitude. In normal law, the high angle of attack protection will ensure α max is not exceeded, and stall margin is maintained.

2.2. For fly-by-wire aircraft in degraded flight control law, the side-stick should be pulled back, wings level, disconnecting auto-pilot, increasing pitch attitude, if necessary until IAS reaches V_{SW}. Stall warning must be respected to ensure the maintenance of stall margin.

3.1. **For the A300 and A310 families,** with conventional flight control systems, the procedure is as specified on page 3. Apply full rated thrust, disconnect the autothrottle system, and simultaneously pitch up to at least 20°, wings level. Check speed brakes are retracted. Maintain gear and flaps position, monitor the radio altimeter and if necessary, continue to increase pitch attitude smoothly until V_{SS} and / or operation of the stick shaker. Use stick shaker onset to limit pitch attitude. Stick shaker or buffet must be respected at all times to ensure appropriate maneuver and stall margins are maintained. Maintain this pitch until adequate terrain clearance is assured.

3.2. Also on EFIS equiped aircraft, speed trend and Vsw display can help to make a smooth approach to V_{SS}. The FPV may be selected to show climb angle achieved during the maneuver.

4. For both categories of flight control systems, when adequate terrain clearance is assured, smoothly reduce pitch and accelerate, maintaining a positive rate of climb. When adequate IAS is obtained, clean up and reduce thrust as required.

TERRAIN AVOIDANCE PROCEDURE

Applicable to FBW aircraft : A319, A320, A321, A330, A340 in NORMAL LAW

Immediately :

- THRUST LEVERS	TOGA
- A/P	DISCONNECT
- SIDE-STICK*	PULL UP, WINGS LEVEL
- SPD BRK	Check retracted

If necessary, use full back stick and maintain α max speed until terrain clearance is assured, (GPWS warning ceased and radio altitude increasing).

- When flight path is safe, decrease pitch and accelerate.
- When speed above V_{LS} and V/S positive, retract flap and gear as required.

* In pitch alternate or direct law, pull up agressively, wings level. If necessary, maintain speed at stall warning until terrain clearance assured.

TERRAIN AVOIDANCE PROCEDURE

Applicable to : A300, A310 and A300-600 aircraft

Immediately :

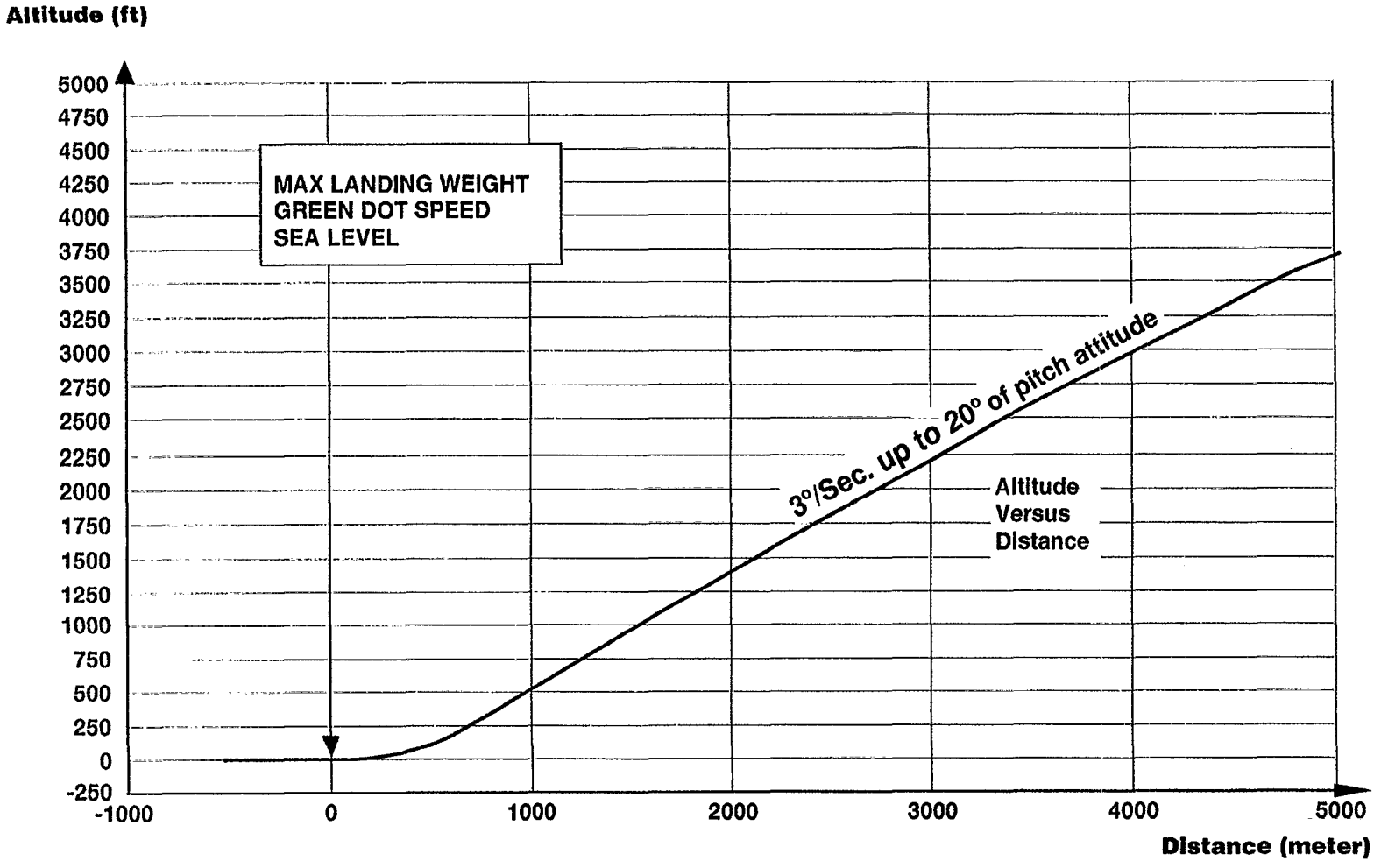
- THROTTLES	FULL FORWARD
- A/THR	DISCONNECT
- A/P	DISCONNECT
- PITCH	At least 20° UP, WINGS LEVEL
- SPD BRK	Check retracted

If necessary, pitch up to V_{SS} on speed scale, maintain until terrain clearance assured (GPWS ceased and radio altitude increasing).

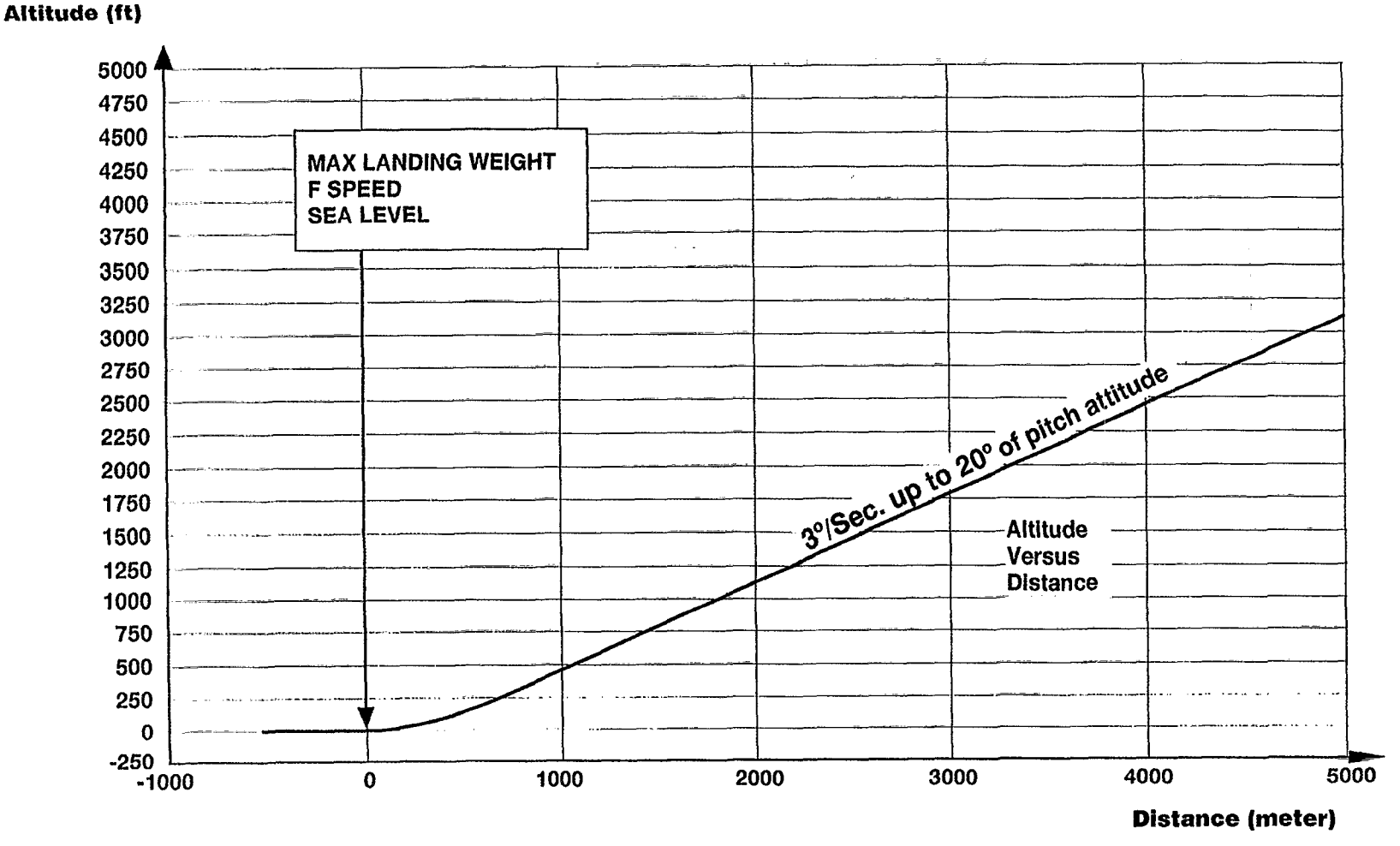
• When flight path is safe, decrease pitch and accelerate.

• When speed above V_{LS} and V/S positive, retract flap and gear as required.

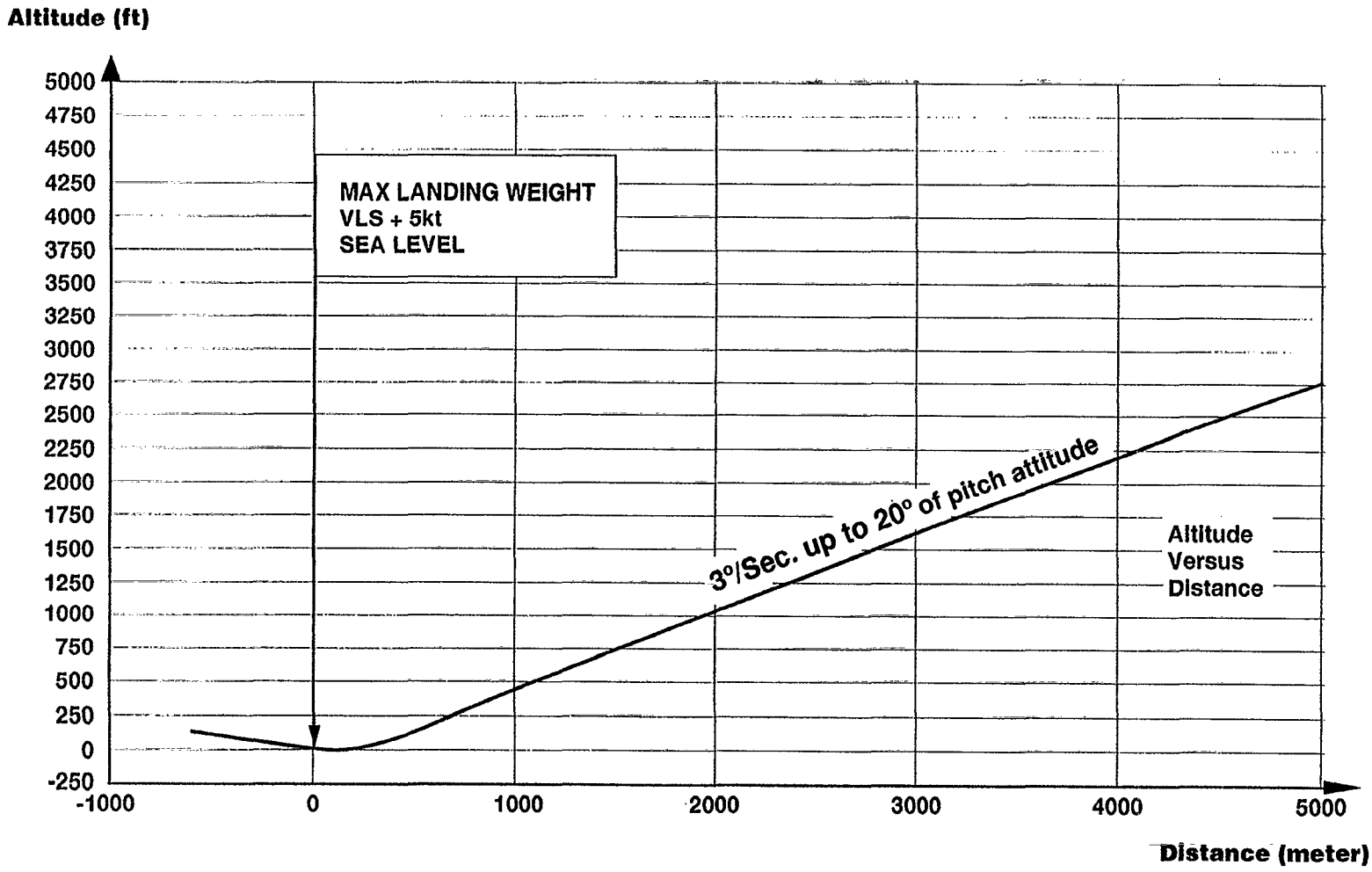
CFIT ESCAPE MANEUVER
A300 B2/B4 FROM LEVEL FLIGHT.
CLEAN CONFIGURATION - GEAR UP



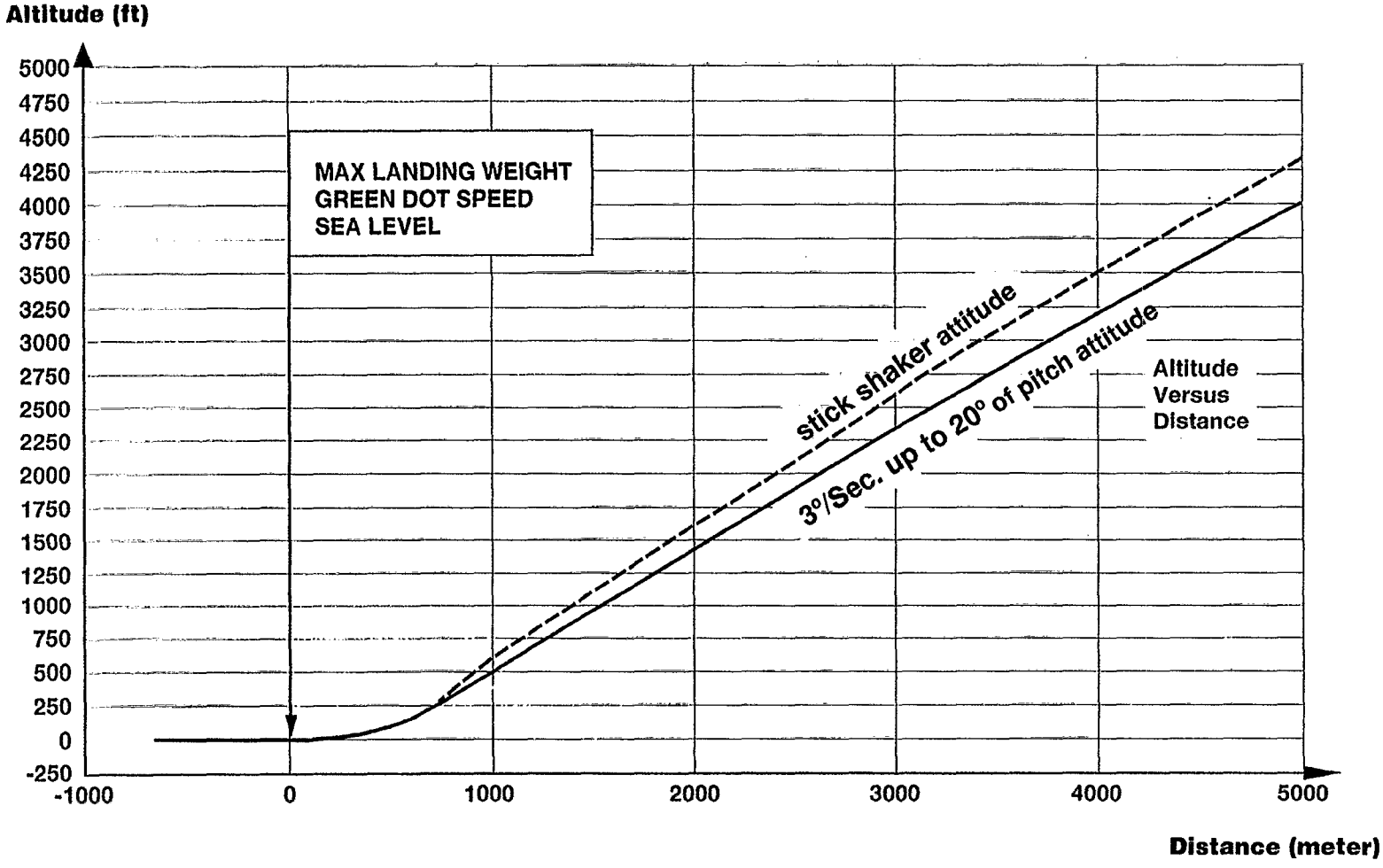
CFIT ESCAPE MANEUVER
A300 B2/B4 FROM LEVEL FLIGHT.
CONFIGURATION 16°/8° - GEAR UP



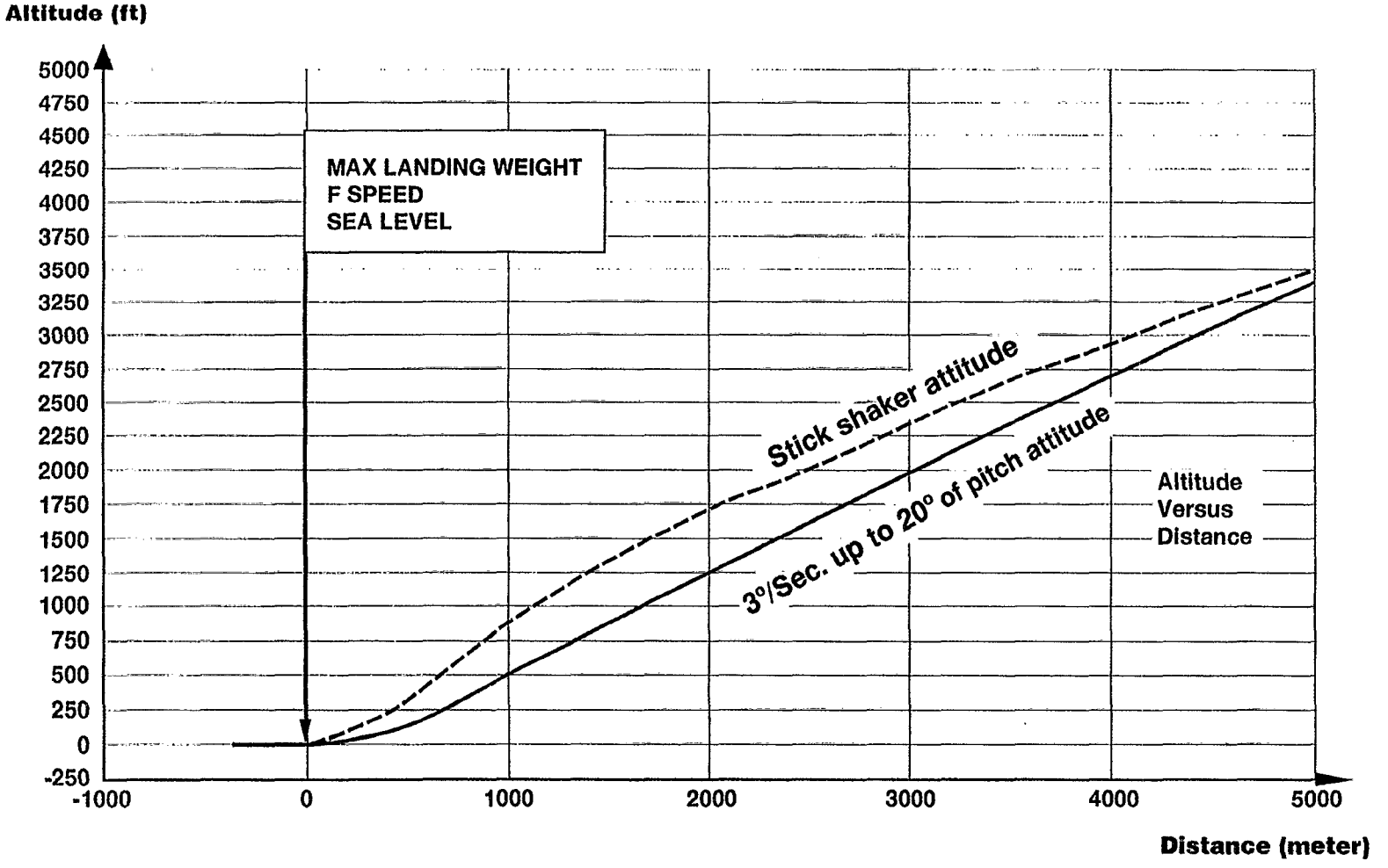
CFIT ESCAPE MANEUVER
A300 B2/B4 FROM 3° GLIDE SLOPE.
CONFIGURATION 25°/25° - GEAR DOWN



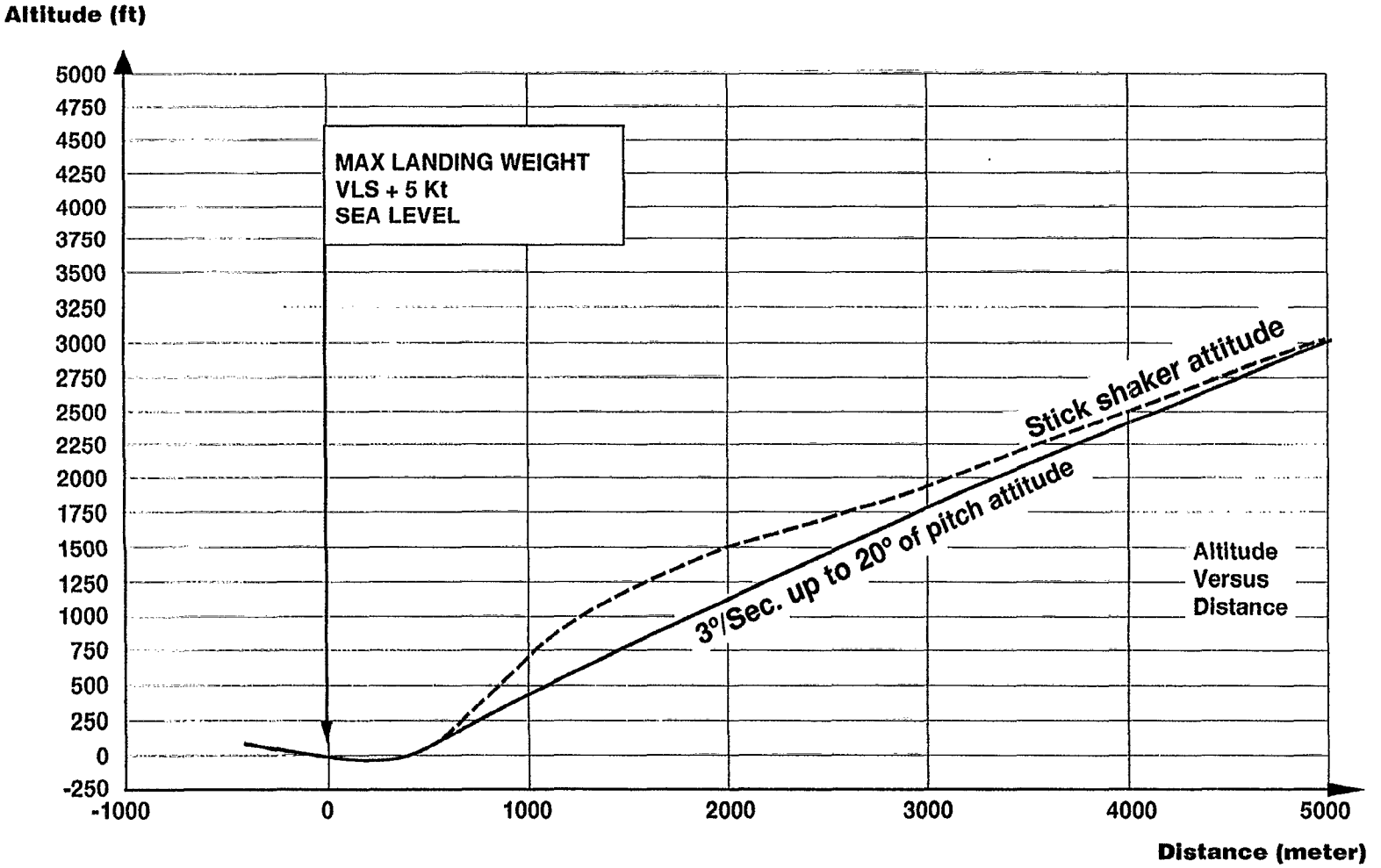
CFIT ESCAPE MANEUVER
A300-600 FROM LEVEL FLIGHT.
CLEAN CONFIGURATION - GEAR UP



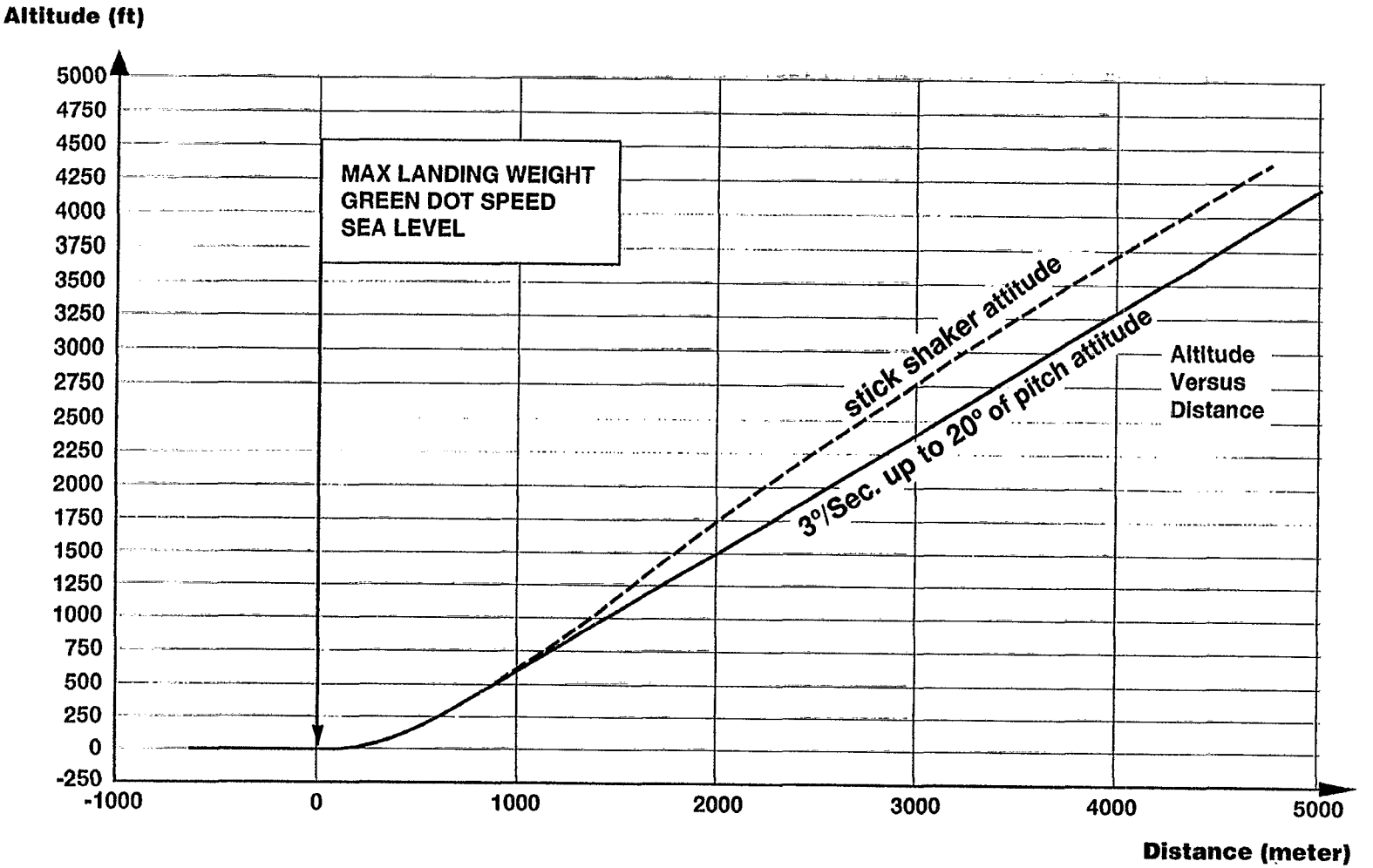
CFIT ESCAPE MANEUVER
A300-600 FROM LEVEL FLIGHT.
CONFIGURATION 15°/15° - GEAR UP



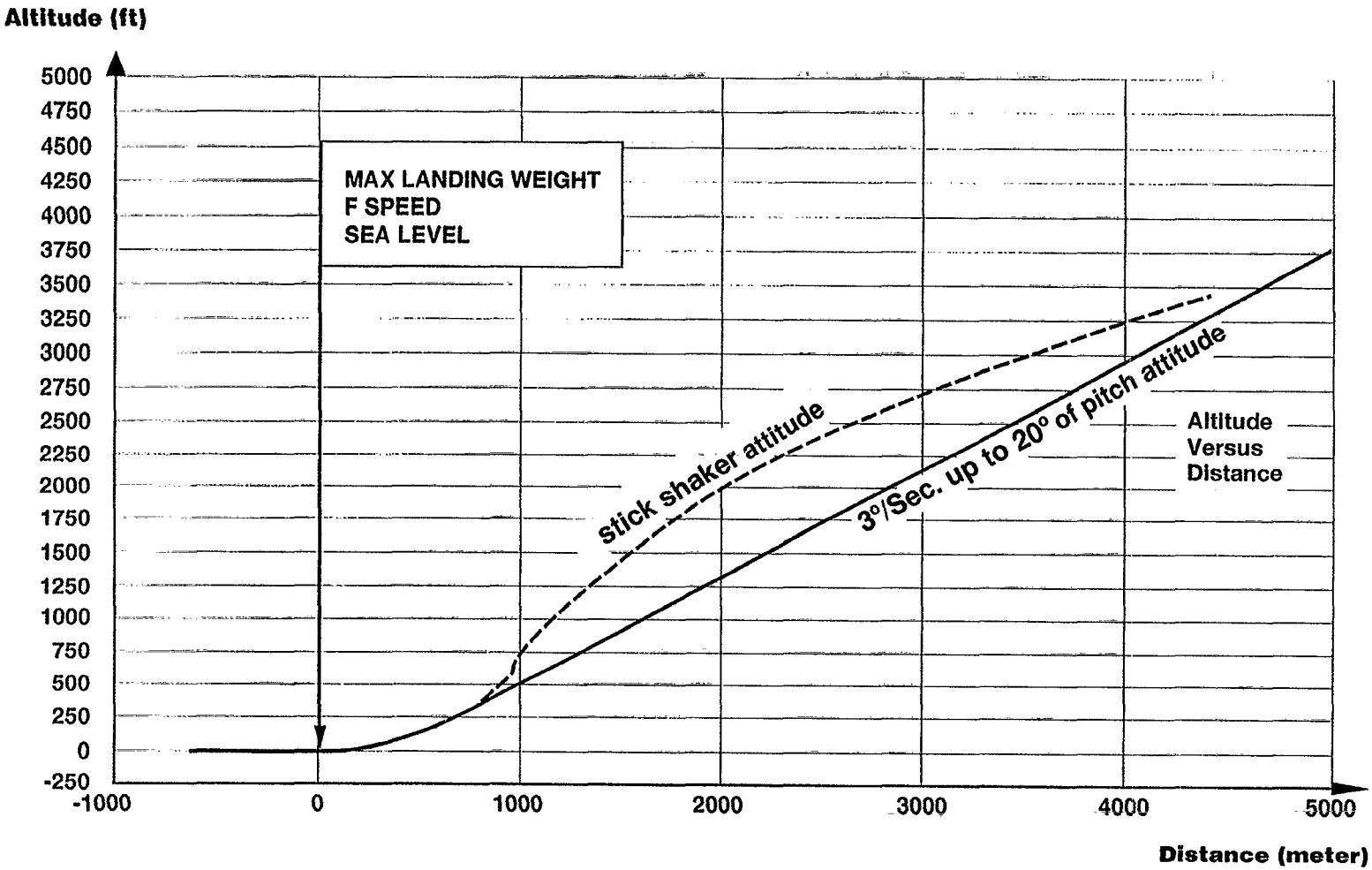
CFIT ESCAPE MANEUVER
A300-600 FROM 3° GLIDE SLOPE.
CONFIGURATION 30°/40° - GEAR DOWN



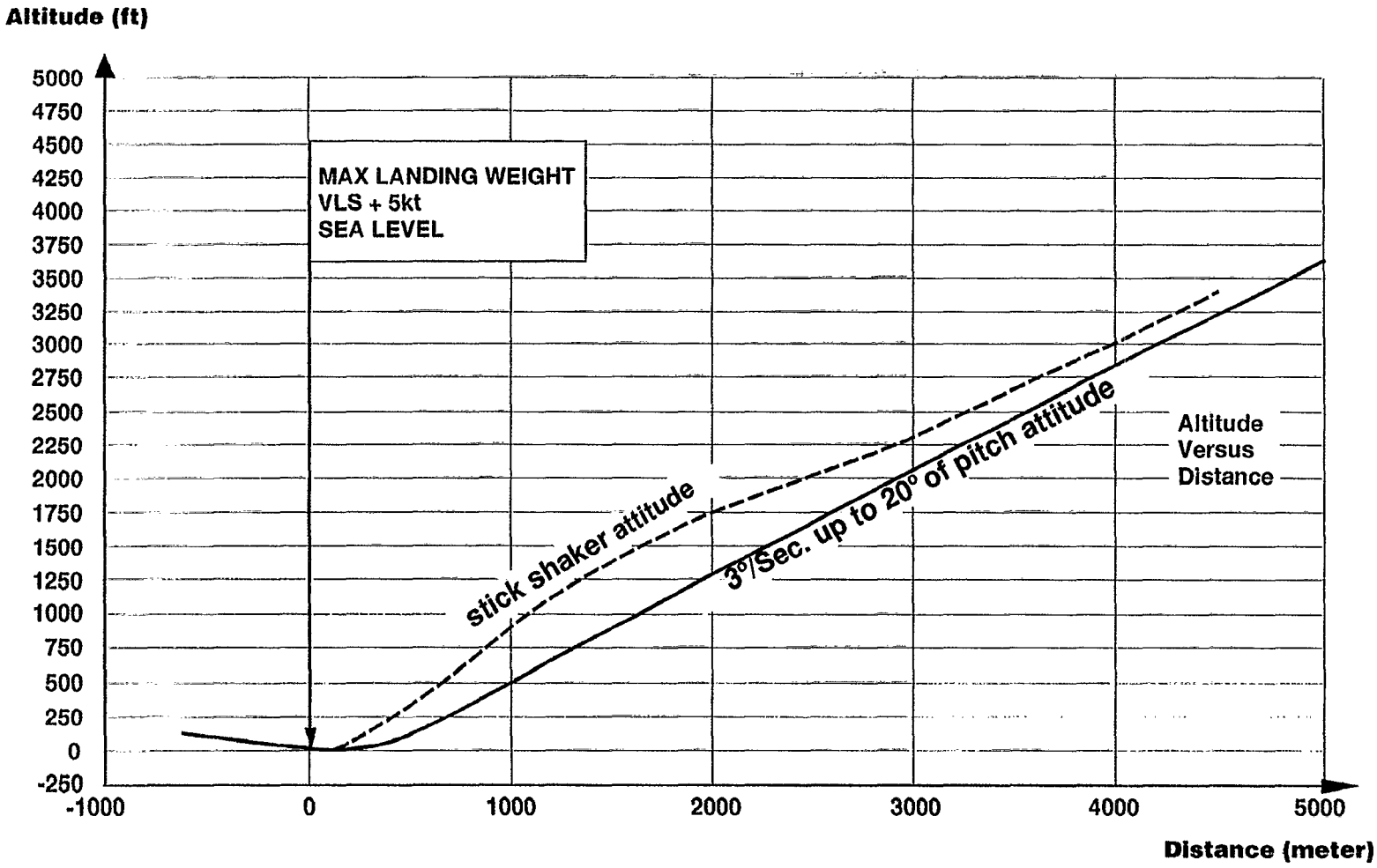
CFIT ESCAPE MANEUVER
A310 FROM LEVEL FLIGHT.
CLEAN CONFIGURATION - GEAR UP



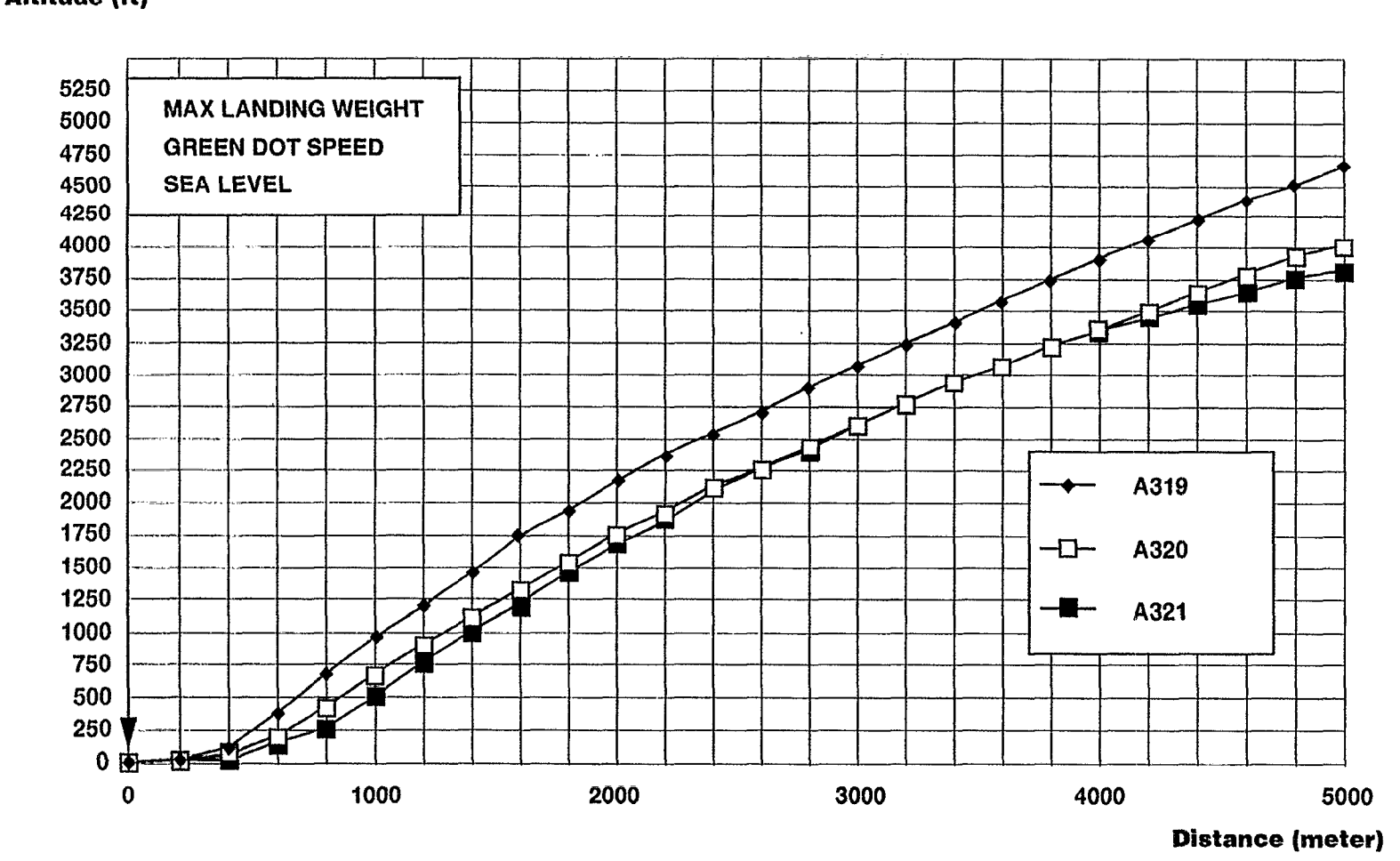
CFIT ESCAPE MANEUVER
A310 FROM LEVEL FLIGHT.
CONFIGURATION 15°/15° - GEAR UP



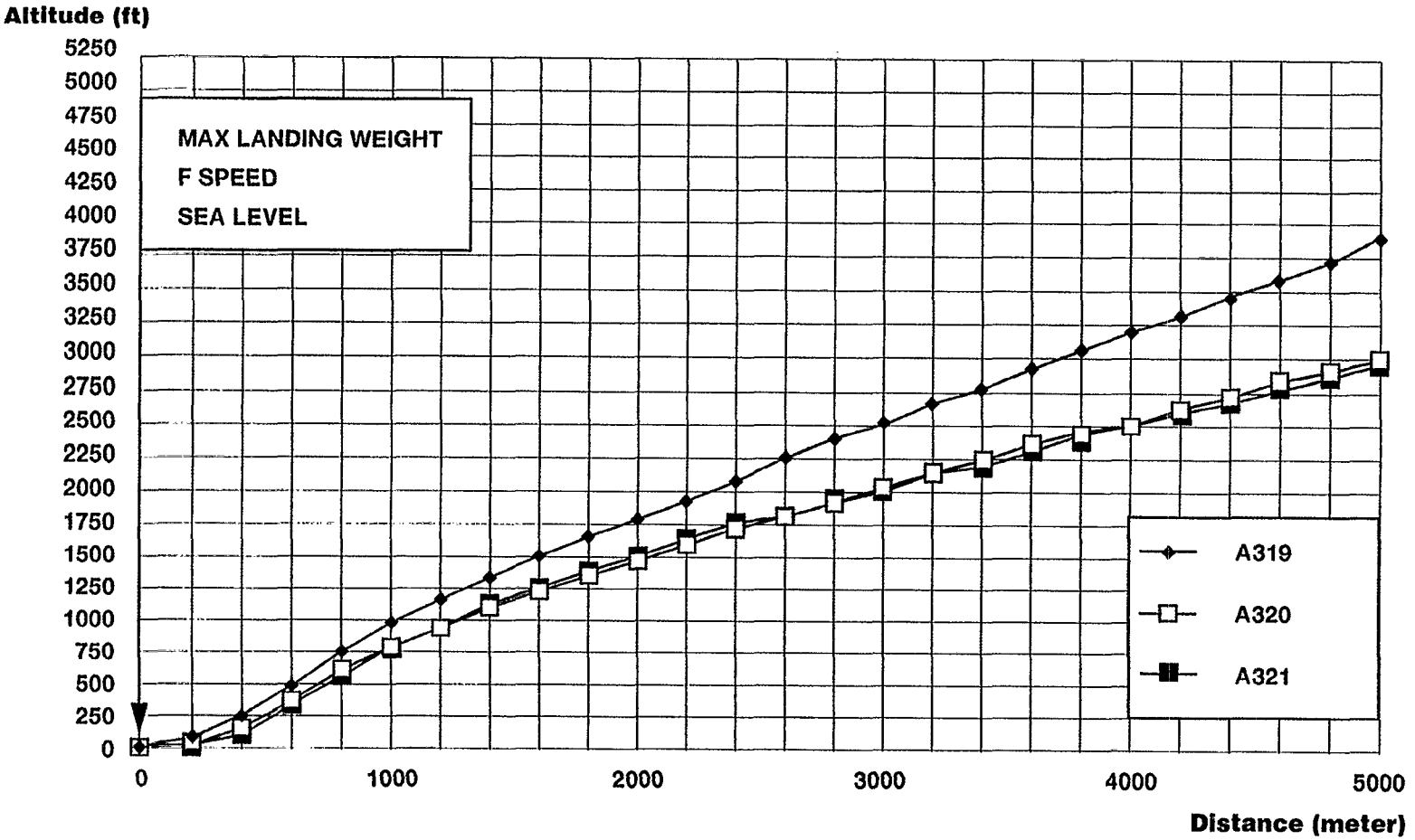
CFIT ESCAPE MANEUVER
A310 FROM 3° GLIDE SLOPE.
CONFIGURATION 30°/40° - GEAR DOWN



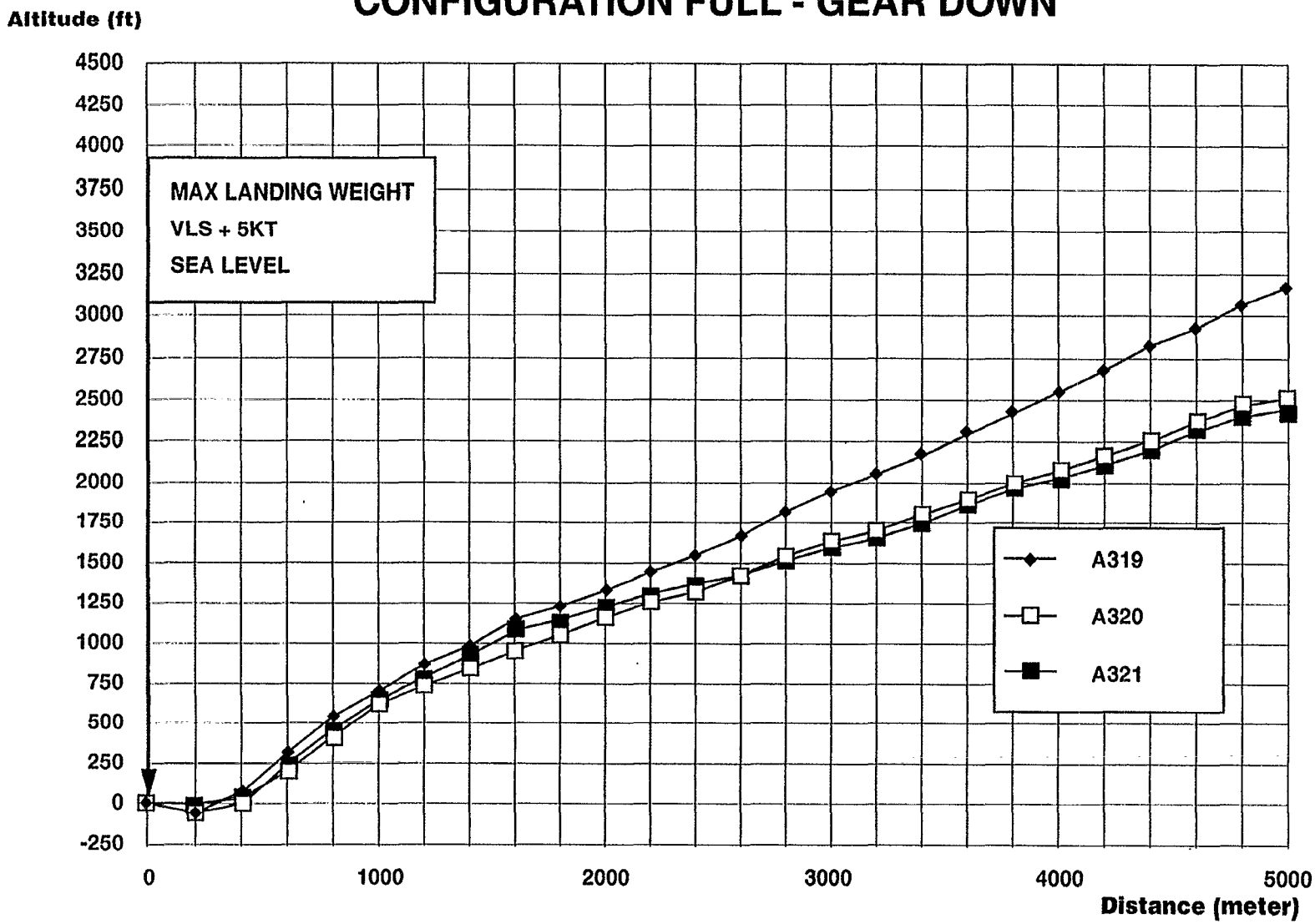
CFIT ESCAPE MANEUVER
A319/A320/A321 FROM LEVEL FLIGHT.
FULL BACK STICK
CLEAN CONFIGURATION - GEAR UP



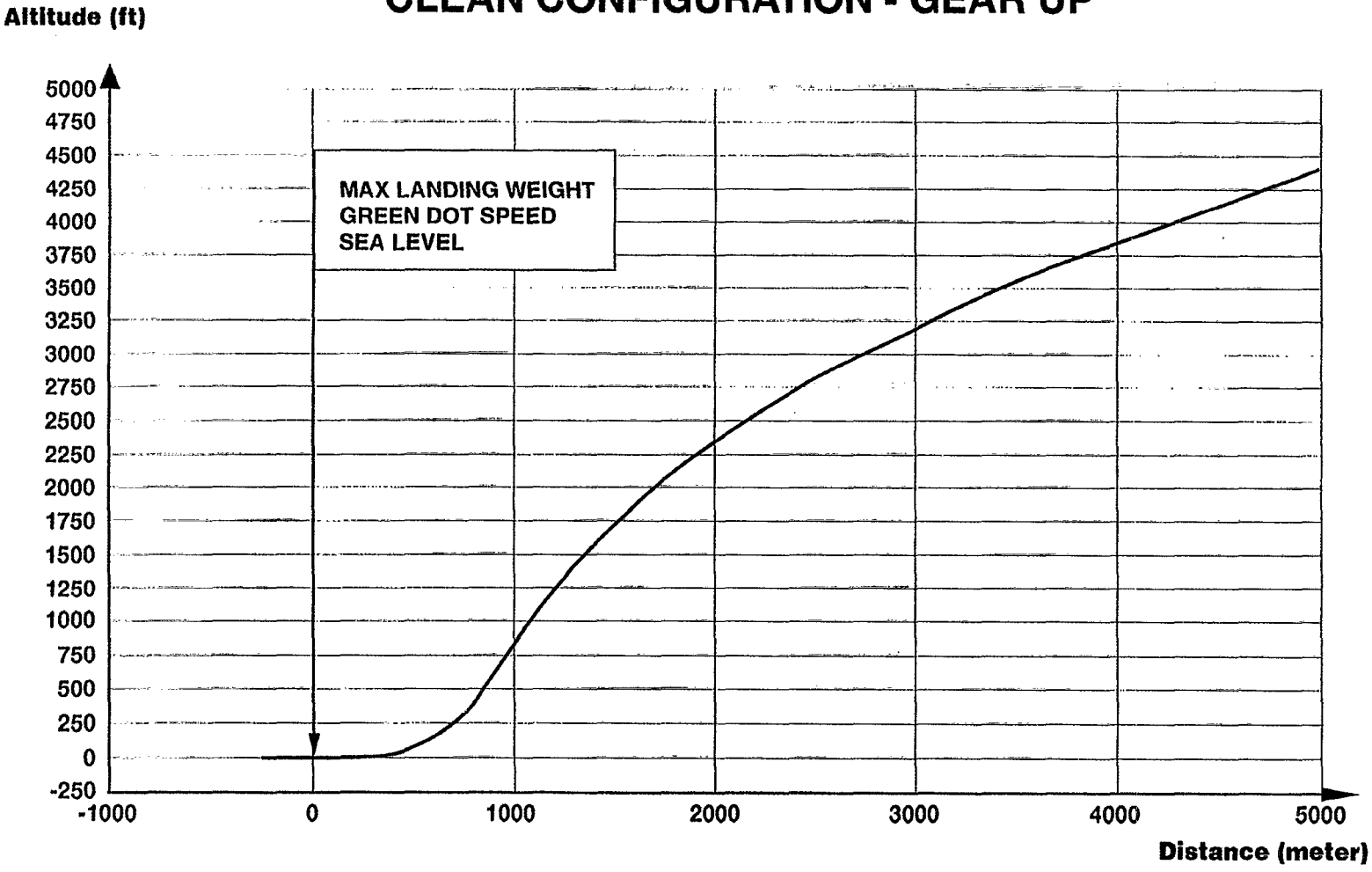
CFIT ESCAPE MANEUVER
A319/A320/A321 FROM LEVEL FLIGHT.
FULL BACK STICK
CONFIGURATION 2 - GEAR UP



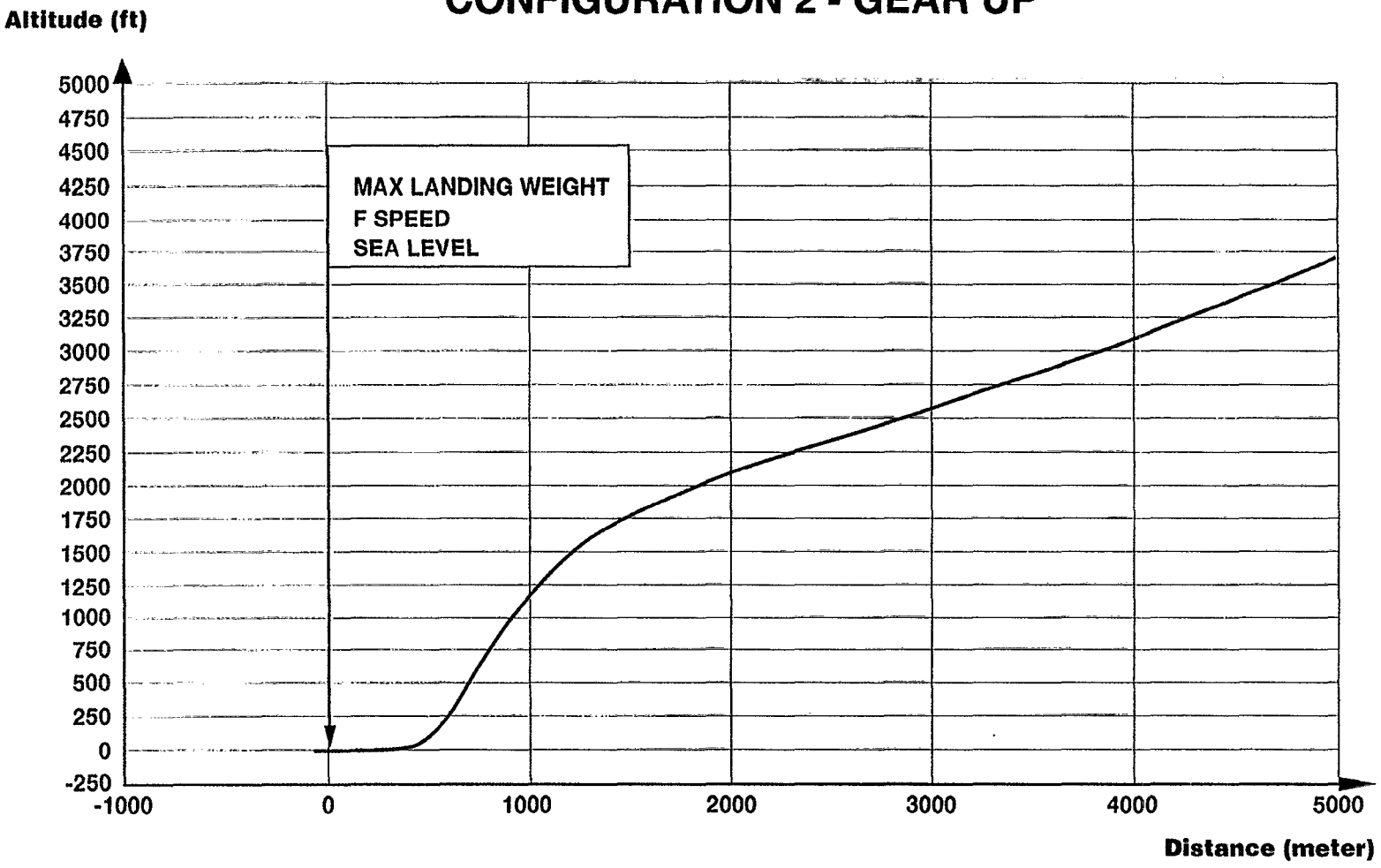
CFIT ESCAPE MANEUVER
A319/A320/A321 FROM 3° GLIDE SLOPE
FULL BACK STICK
CONFIGURATION FULL - GEAR DOWN



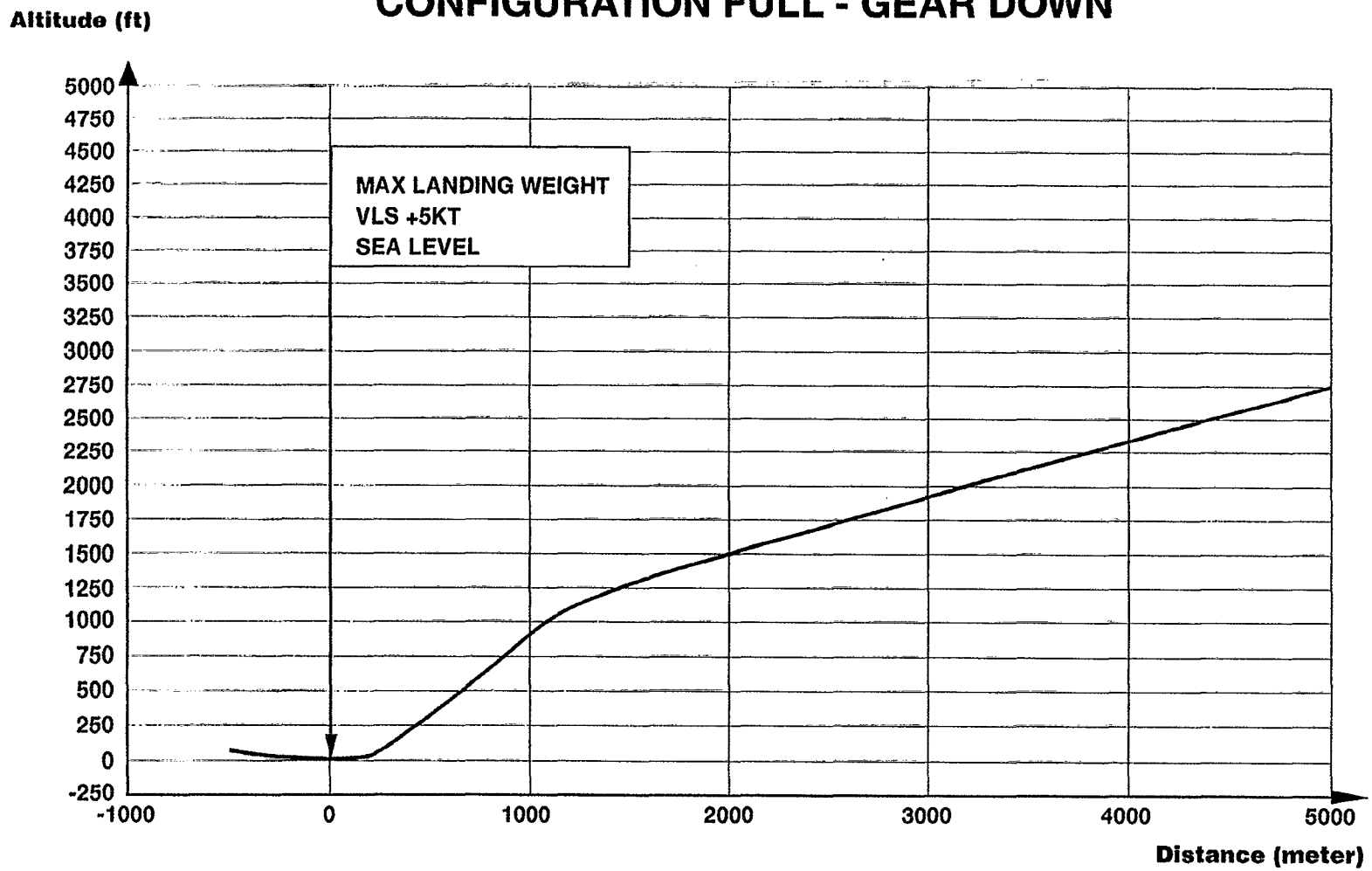
CFIT ESCAPE MANEUVER
A330 FROM LEVEL FLIGHT.
FULL BACK STICK
CLEAN CONFIGURATION - GEAR UP



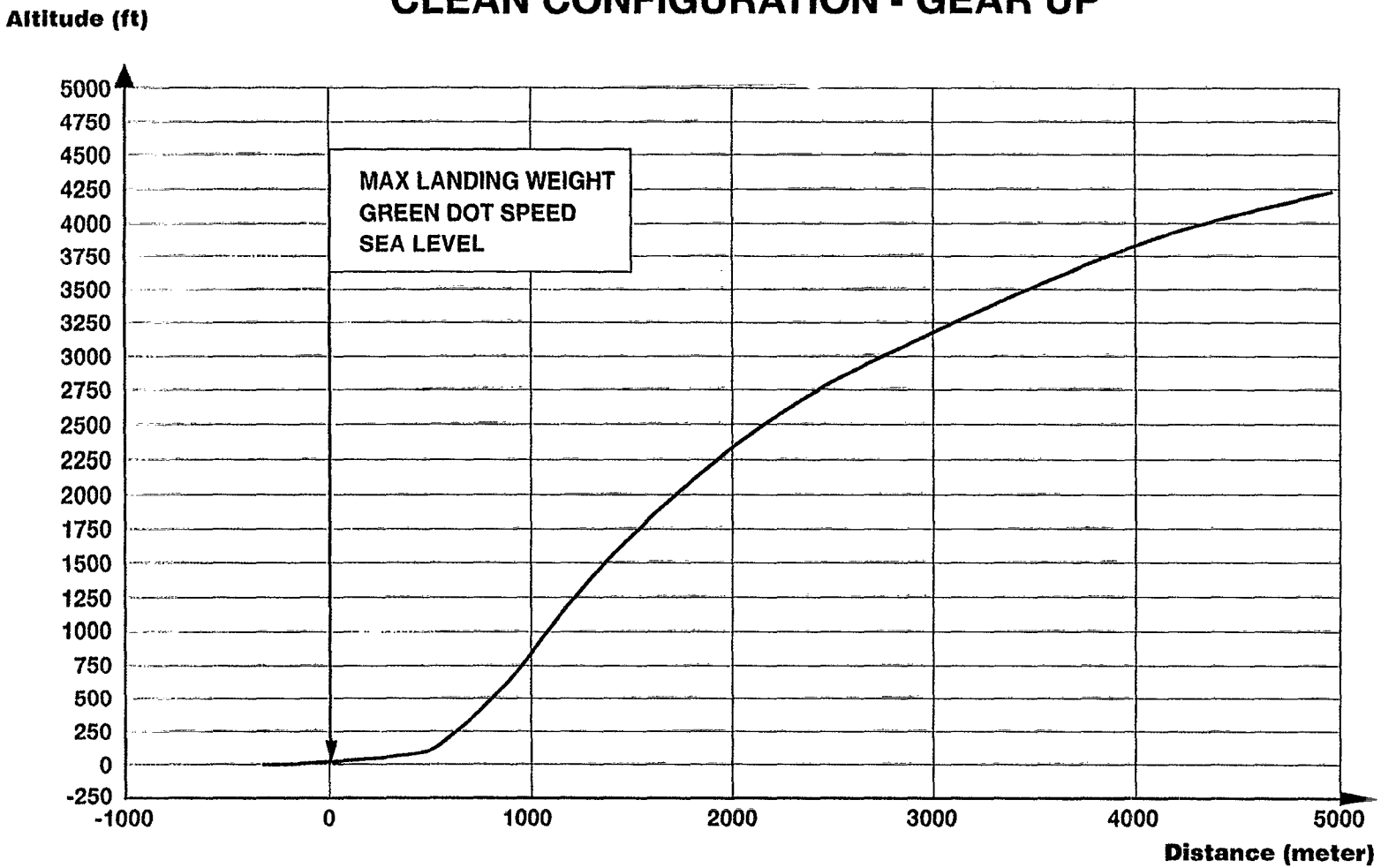
CFIT ESCAPE MANEUVER
A330 FROM LEVEL FLIGHT.
FULL BACK STICK
CONFIGURATION 2 - GEAR UP



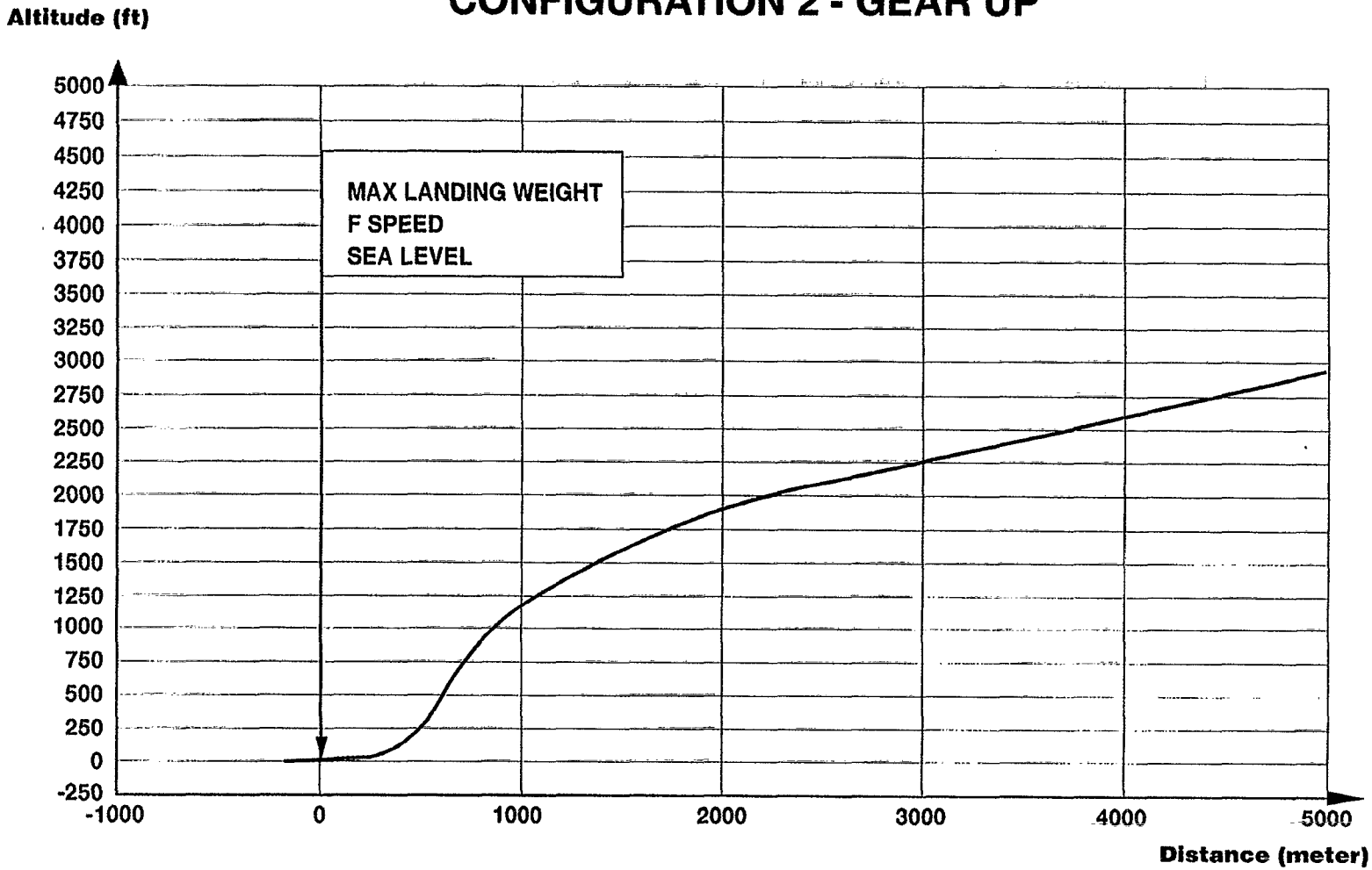
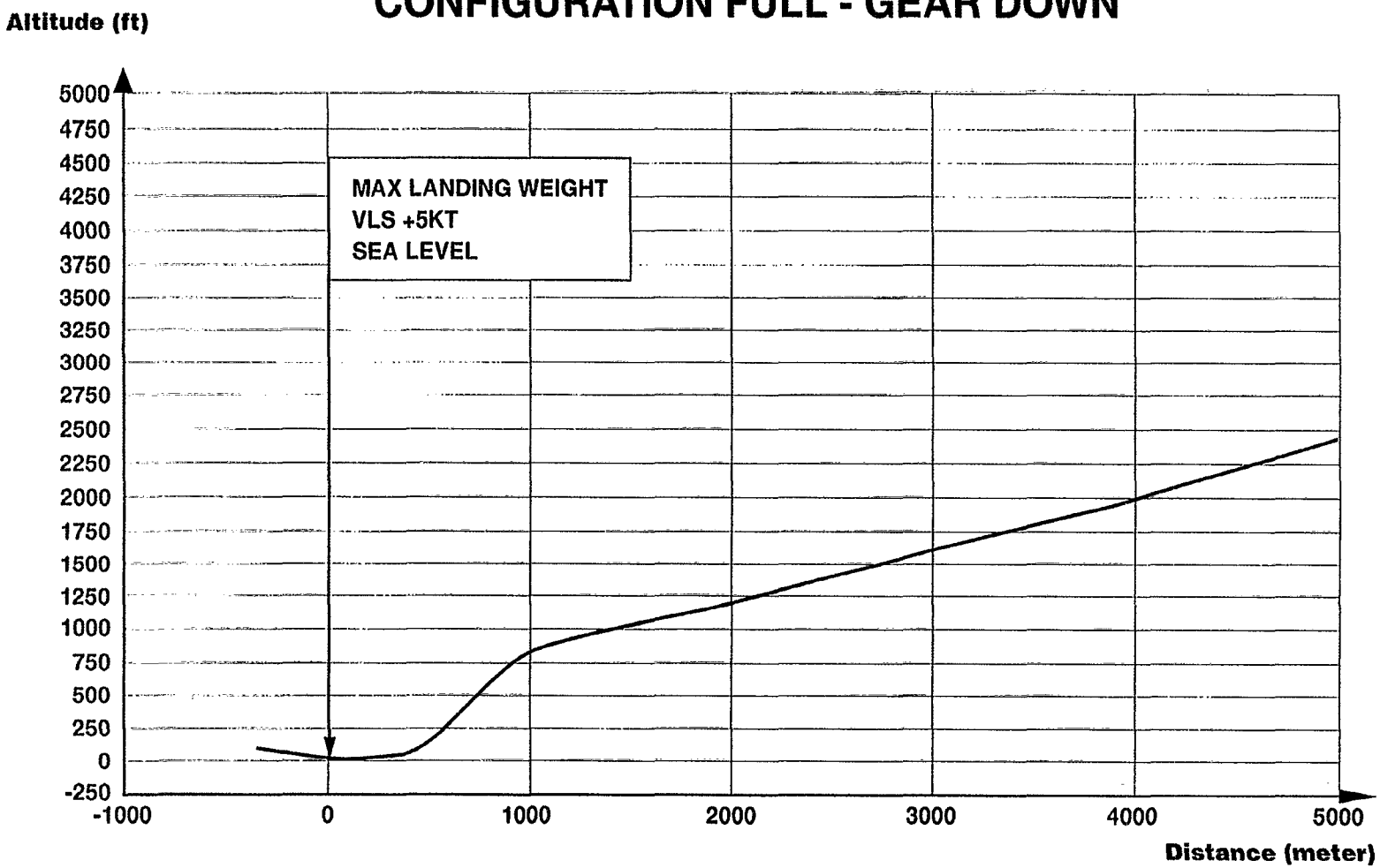
CFIT ESCAPE MANEUVER
A330 FROM 3° GLIDE SLOPE.
FULL BACK STICK
CONFIGURATION FULL - GEAR DOWN



CFIT ESCAPE MANEUVER
A340 FROM LEVEL FLIGHT.
FULL BACK STICK
CLEAN CONFIGURATION - GEAR UP



CFIT ESCAPE MANEUVER
A340 FROM LEVEL FLIGHT.
FULL BACK STICK
CONFIGURATION 2 - GEAR UP



CFIT ESCAPE MANEUVER
A340 FROM 3° GLIDE SLOPE.
FULL BACK STICK
CONFIGURATION FULL - GEAR DOWN