

EASA	COMMENT RESPONSE DOCUMENT
	<p>Proposed Equivalent Safety Finding on CS 25.161(a) - (c)(3) – Trim Applicable to Boeing 747-8 / -8F</p> <p>Issue 2</p>

Commenter 1 : CAA-UK

Comment # [1] – Statement of Issue

The text lacks technical precision.

Comment :

The parameters defining the flight envelope where the issue arises need to be quantified; how 'light is 'light weight'? Similarly, 'aft' CG and airspeed 'near' VMO need quantifying.

EASA response:

EASA disagrees with the comment.

To provide a meaningful set of parameters to quantitatively describe this flight envelope would require the disclosure of Boeing Proprietary data. These Boeing Proprietary parameters defining the envelope where the issue arises have been thoroughly quantified in GW, cg, speed, and altitude, and have been shared with both EASA and the FAA for their understanding and acceptance.

Comment # [2] – Applicant Safety Equivalency Demonstration – 2. Compensating Flight Crew Procedures

Request for switch location illustration as the inability for the left hand pilot to be able to operate the alternate trim switch could produce an unsafe condition.

Comment :

Notwithstanding that the requirements of 25.161 “do not specify the method of trim, nor do they state that when multiple pilot trim control paths exist that they must each independently be able to trim the airplane throughout the flight envelope”, and assuming that the aeroplane is to be flown equably from both pilot’s stations, the alternative trim switch has to be readily accessible from the left pilot’s seat as well as the right. An illustration of the switch location would be useful so that the ease with which either pilot can access the switch can be assessed.

Also, the approved operating procedures will need to be designed such that they can be carried out by either pilot.

EASA response:

EASA disagrees with the comment.

Human Factors analysis has been done by the applicant to verify that from the left hand seat , the smallest pilot (5 ft 2 in pilot) is able to reach across to the aisle stand trim switches to command the stabilizer motion while flying the airplane.

Comment # [3] – Applicant Safety Equivalency Demonstration - 3. Compensating Airline Operational Factors - Limited GW/CG Exposure Envelope

Consideration of the specific 'freighter' case and GW/CG envelope.

Comment :

For the freighter variant in particular, it is not correct that “The conditions during which thumb switch (manual electric trim mode) electric trim limits are encountered are not very likely to occur in-service based on how operators load the airplane.” Freighters are not always flown at high loadings, and in any case, all parts of the operating envelope must be adequately protected.

In addition, for both variants, it is not correct that “Operators will typically load the airplane to mid or forward cg’s, especially as the gross weight increases, which limits the exposure area of the GW/CG envelope where aisle stand trim inputs are required.” The improved fuel burn associated with aft CG loadings is well known and operators will typically load the aeroplane to take advantage of this.

EASA response:

EASA disagrees with the comment.

Should an airline operate the airplane in the GW, cg, altitude, and speed range where use of the aislestand trim switches is required, there is enough stabilizer trim available to trim the airplane. This means that all parts of the GW/CG envelope are adequately protected because trim can always be achieved.

Commenter 2: Embraer

Comment # [1] – General

ESF aim / need.

Comment :

Embraer agrees completely with EASA's and Boeing's assessment of the acceptability of the trim characteristics of the Boeing 747-8 /

-8F, and agree that there is nothing in CS 25 or the associated policy that states or even suggests that the trim requirements of 25.161 must be met by any trim system installed on the airplane. Accordingly, we do not understand why this is treated as an equivalent safety finding because the type design is directly compliant with 25.161 as written.

***EASA response:
EASA takes note of this comment.***

In the interest of a common certification basis for B747-8F, EASA, as Validation Authority, has adopted the same philosophy as the Certification Authority, and then issued an ESF to CS 25.161(a)-(c)(3) "Longitudinal Trim at Vmo".