



U.S. Department
of Transportation
**Federal Aviation
Administration**

DHL

MEMORANDUM

AIRCRAFT CERTIFICATION OFFICE
c/o American Embassy
APO New York 09667-1011

Subject: ACTION: Equivalent Level of Safety of Piaggio Date: March 21, 1990
P-180, Fuel Pressure Indicator, Finding No. ACE-90-2

From: Manager, Aircraft Certification Office, AEU-100 Reply to: CM/1043:90

To: Manager, Aircraft Certification Service, ACE-100

Background:

Rinaldo Piaggio, manufacturer of the P-180 "Avanti" airplane, proposes to use amber caution light annunciators in lieu of pressure gages.

Applicable Regulations:

The applicable Federal Aviation Regulation (FAR) paragraph states:

"23.1305 The following are required powerplant instruments:

(g) A fuel pressure indicator for pump-fed engine."

Applicant's Position:

Each Pratt & Whitney PT6A-66 engine installed on the P-180 utilizes a pressure sensor at the engine fuel pump inlet, and a corresponding "Left/Right Fuel Pressure" amber caution light annunciator in lieu of a pressure gages. The fuel pressure annunciator lights are approximately in the middle of the main annunciator panel and are adjacent and to the right of the engine instrument panel.

In addition to the pump inlet fuel pressure sensor, which activates at 10 pounds per square inch (psi), a second pressure sensor is installed at the output of each main boost pump, in accordance with regulatory requirement of paragraph 23.991(b). These latter sensors will automatically activate the standby boost pump in the event fuel pressure drops below 6 psi.

Whenever the fuel pressure caution light illuminates, the pilot can manually select standby pump operation, prior to the automatic activation of this standby pump.

The fuel pressure caution light system provides the crew with the essential information to manage the fuel system by providing the maximum time interval between the initial low fuel pressure annunciation and the point at which the standby boost pump is automatically activated, while a change in fuel pressure indicated on a gage may not be noticed by the crew for some time period.

The Master Caution light also illuminates whenever either fuel pressure caution light is activated.

FAA's Position:

A caution light illuminating will attract the flight crew's attention more quickly than a gage needle moving across a dial. A conventional pressure indicator must be continuously monitored to detect a pump failure or system malfunction.

Service experience with caution light annunciation system installations, approved by an equivalent level of safety determination, have been satisfactory.

Piaggio proposes to locate the "Left/Right Fuel Pressure" amber caution annunciator lights adjacent and to the right of the engine instrument panel.

Precedence for the use of a low fuel pressure warning annunciator in lieu of a gage has been established by similar equivalent level of safety findings on the Fairchild Aircraft Corporation Model SA227-PC, and the Beech Aircraft Model 2000 airplanes.

The Small Airplane Directorate Review Program Notice No. 3 expects to incorporate Part 23 Review Conference Proposal No. 429 revising paragraph 23.1305(g) by adding the phrase "or low fuel pressure warning" into the current rule.

Compensating Features:

Based upon:

a. The annunciator caution light provides a positive visual alert to the crew of a low fuel pressure condition; and

b. The instantaneous warning provides the pilot with the maximum time interval between the initial low fuel pressure annunciation and the point at which the standby boost pump is automatically activated.

Recommendation:

We concur that the Piaggio proposed use of a "Left/Right Fuel Pressure" amber caution light annunciator in lieu of a pressure gage is considered as providing an equivalent level of safety as envisioned by the regulations and thus meets the requirements of paragraph 23.1305(g) of the FAR.

Concurred by:

Fred K. Regnier
for E. Pittman Manager
Brussels Aircraft Certification Staff, AEU-100

MAR 21, 1990
Date

Joseph H. Smithoff
for Standards Office, ACE-100 Manager

3-29-90
Date

Barry D. Clements
for Small Airplane Directorate Manager
Aircraft Certification Service

3/29/90
Date

Attachment