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

Transport Airplane Directorate
1601 Lind Ave, SW.
Renton, Washington 98057-3356

Regulatory Docket No. FAA-2012-0657
Exemption No. 10617

August 29, 2012

Mr. Kenneth B. Buchanan
Certification Manager
Aviation Partners, Inc.
7299 Perimeter Road South
Seattle, WA, 98108

Dear Mr. Buchanan:

This letter is to inform you that we have granted your request for exemption. It transmits our decision and explains its basis.

The Basis for Our Decision

By letter API-F5-12-015, dated June 12, 2012, Mr. Kenneth B. Buchanan, on behalf of Aviation Partners, Inc. (API), petitioned the Federal Aviation Administration (FAA) for an exemption from certain requirements of Title 14, Code of Federal Regulations (14 CFR) 25.671(c)(2) with respect to wing/aileron flutter. This exemption is requested for Dassault Model Falcon 50 series airplanes equipped with API blended winglets.

The FAA has determined that good cause exists for not publishing a summary of the petition in the Federal Register because the requested exemption would not set a precedent, the FAA has not received public comments on other petitions for exemption from § 25.671(c)(2) relative to wing/aileron flutter, and any delay in acting on this petition would be detrimental to API.

The FAA has issued several grants of exemption in circumstances similar in all material respects to those presented in your petition. In Grant of Exemption No. 10347 (copy enclosed), the FAA found that, in both the baseline model and the API winglet-modified Dassault Model Falcon 900 airplane, in the event of any dual hydraulic system failure, or any single failure in combination with any probable hydraulic failure, the airplane does not have design features that would positively trap hydraulic fluid in the aileron control-system

actuators and thereby provide sufficient restraint to prevent flutter. This is a characteristic of the baseline airplane and is not affected by the addition of API winglets.

Having reviewed your reasons for requesting an exemption, I find that—

- they don't differ materially from those presented by the petitioner in the enclosed grant of exemption;
- the reasons stated by the FAA for granting the enclosed exemption also apply to the situation you present; and
- a grant of exemption is in the public interest.

Our Decision

In consideration of the foregoing, I find that a grant of an exemption to API is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 40113 and 44701, delegated to me by the Administrator, API is hereby granted an exemption from 14 CFR 25.671(c)(2).

Sincerely,

/s/ John Piccola

John Piccola
Acting Manager, Transport Airplane Directorate
Aircraft Certification Service

Exemption No. 10347

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98057-3356

In the matter of the petition of **Aviation Partners, Inc.** for an exemption from §§ 25.671(c)(2) of Title 14, Code of Federal Regulations	**Regulatory Docket No. FAA-2011-0580**

GRANT OF EXEMPTION

By letter API-F9-11-022 dated May 24, 2011, to the Department of Transportation's Federal Docket Management System (FDMS), Mr. Hank Thompson, Chief Operating Officer, Aviation Partners, Inc., 7299 Perimeter Road South, Seattle, Washington, 98108, petitioned the Federal Aviation Administration (FAA) for an exemption from the requirements of Title 14, Code of Federal Regulations (14 CFR) 25.671(c)(2). This exemption is requested for Dassault Falcon 900 series airplanes equipped with Aviation Partners, Inc. blended winglets.

The petitioner requests relief from the following regulation:

Section 25.671(c)(2) requires that an airplane be capable of continued safe flight and landing, following a dual hydraulic-system failure or any single failure in combination with a probable hydraulic failure.

The petitioner supports its request with the following information:

This section quotes the relevant information from the petitioner's request. The complete petition is available at the Department of Transportation's Federal Docket Management System, on the Internet, at http://www.regulations.gov, in docket no. FAA-2011-0580.

The extent of the sought relief and the reason for seeking this relief.

That the Dassault Falcon 900 series airplanes, when equipped with Aviation Partners Incorporated (API) blended winglets be exempted from certain elements of 14 CFR § 25.671(c)(2). This regulation requires the airplane to be capable of

continued safe flight and landing following a dual hydraulic system failure, or any single failure in combination with any probable hydraulic failure. These failure conditions must be considered regardless of numerical probability. The FAA does not consider hydraulic failures including loss of fluid to be extremely improbable. With regard to potential wing/aileron flutter, API proposes to exempt the dual hydraulic failure scenario with loss of fluid, and the single failure combined with hydraulic failure scenario with loss of fluid. API has determined that these failure combinations are numerically extremely improbable.

The reasons why granting the request would be in the public interest; that is, how it would benefit the public as a whole.

Allowing this exemption would be in the public interest. The winglets installation improves the fuel mileage of the airplane by about 5%, reducing fuel burn by that amount on every flight. Thus, the winglets reduce the demand on crude oil from the world's supply. Therefore, they also reduce the environmental effects of CO_2 and NO_X emissions. Additionally, it does not impact the level of safety relative to the current airplane.

The reasons why granting the exemption would not adversely affect safety.

Allowing this exemption will have no material effect on the level of safety of the Falcon 900 airplanes.

API will show the airplane capable of continued safe flight and landing considering all combinations of failures not shown to be numerically extremely improbable (having a probability of occurrence less than 10^{-9} per flight hour). This would provide the same failure scenarios and level of safety as the basic airplane before the addition of winglets.

API analysis shows the Dassault Falcon 900 series of airplanes to have design features that make complete loss of system hydraulic fluid, and the resulting loss of control system stiffness and damping to prevent flutter, numerically extremely improbable. Analysis also shows that the hydraulic system is protected from particular risks such as uncontained engine failures, bird strike, and wheel and tire failures. The airplanes do not, however, contain design features that positively trap hydraulic fluid in the aileron control system actuators to provide sufficient restraint to prevent flutter regardless of probability. This is a feature of the basic airplane and is not affected by the addition of API blended winglets.

With a complete loss of fluid from both hydraulic systems, or with the single failure combined with hydraulic failure scenario with loss of fluid, API is unable to show the baseline Falcon 900 compliant with the latest FAA requirements or with the original certification basis and, therefore, API cannot show the winglet airplane compliant.

Both the baseline Falcon 900 and the airplane equipped with winglets have aileron surfaces that are not mass-balanced. The airplane with installation of blended winglets meets all of the aeroelastic stability requirements of the original certification basis for all cases up to and including failures not shown to be numerically extremely improbable and relative to particular risks. This is the same certification standard as the unmodified Falcon 900 series of airplanes is capable of meeting. Also, the characteristics of the airplane following total loss of dual hydraulic fluid failures are no worse with the winglets.

The reason to exercise the privileges of the requested exemption outside the United States, if needed.

The current Falcon 900 series airplanes already operate extensively outside the United States, and fifty per cent of the airplanes are registered outside of the United States. The exemption requested would allow the Falcon 900 airplanes to continue to be operated outside the United States after the installation of winglets.

Federal Register publication

A summary of the petition was published in the *Federal Register* on July 7, 2011 [76 FR 39976]. No comments were received.

The FAA's analysis

The FAA has reviewed the information provided by Aviation Partners, Inc. (API) and has concluded that granting this exemption is in the public interest for the reasons discussed below.

Section 25.671(c)(2) requires that an airplane be capable of continued safe flight and landing, following any dual hydraulic system failure, or any single failure in combination with any probable hydraulic failure. These failure conditions must be assumed to occur regardless of calculated numerical probability. In addition, the FAA assumes that hydraulic failure includes loss of hydraulic fluid, unless provisions are in place to positively trap the fluid.

As described above, API is not able to show the baseline Falcon 900, nor the API-modified airplane, compliant with § 25.671(c)(2) for these failure conditions. This is because, in the event of hydraulic failure and loss of fluid, the airplane does not have design features that would positively trap hydraulic fluid in the aileron control-system actuators and thereby provide sufficient restraint to prevent flutter. This is a characteristic of the baseline airplane and is not affected by the addition of API winglets.

The FAA is currently working with the European Aviation Safety Agency (EASA) to determine the rationale behind EASA's aileron control-system actuator compliance determination.

The above notwithstanding, with respect to the API petition, the FAA finds that granting the exemption would not adversely affect safety for the following reasons:

1) While the regulations require that the noted hydraulic failure conditions be assumed to occur, API analysis does show these failure conditions to be numerically extremely improbable.

2) Our review indicates that the service history of the Dassault Falcon 900 hydraulic system and aileron actuators has been satisfactory, and that the addition of winglets does not degrade the safety relative to the baseline airplane.

3) The fleet size and fleet life of the modified airplanes will be relatively limited.

The FAA notes that all three of these reasons are necessary for the finding that safety is not adversely affected. Thus, a petition for exemption on a new type-certificate program would not be granted.

Lastly, the FAA recognizes that this winglet project will result in increased economic activity within the United States, while also reducing fuel consumption on the Falcon 900 airplanes with winglets installed.

The FAA's decision

In consideration of the foregoing, I find that a grant of an exemption to API is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator, API is hereby granted an exemption from 14 CFR 25.671(c)(2).

Issued in Renton, Washington, on August 31, 2011.

/s/ Ali Bahrami

Ali Bahrami
Manager, Transport Airplane Directorate
Aircraft Certification Service