

the subjects of allegations confidence that their rights are protected and that the mere filing of an allegation of research misconduct will not result in an adverse action. Safeguards include timely written notice regarding substantive allegations against them, a description of the allegation and reasonable access to any evidence submitted to support the allegation or developed in response to an allegation and notice of any findings of research misconduct.

(2) *Objectivity and Expertise.* The contractor shall select individual(s) to inquire, investigate, and adjudicate allegations of research misconduct who have appropriate expertise and have no unresolved conflict of interest. The individual(s) who conducts an adjudication must not be the same individual(s) who conducted the inquiry or investigation, and must be separate organizationally from the element that conducted the inquiry or investigation.

(3) *Timeliness.* The contractor shall coordinate, inquire, investigate and adjudicate allegations of research misconduct promptly, but thoroughly. Generally, an investigation should be completed within 120 days of initiation, and adjudication should be complete within 60 days of receipt of the record of investigation.

(4) *Confidentiality.* To the extent possible, consistent with fair and thorough processing of allegations of research misconduct and applicable law and regulation, knowledge about the identity of the subjects of allegations and informants should be limited to those with a need to know.

(5) *Remediation and Sanction.* If the contractor finds that research misconduct has occurred, it shall assess the seriousness of the misconduct and its impact on the research completed or in process. The contractor must take all necessary corrective actions. Such action may include but are not limited to, correcting the research record and as appropriate imposing restrictions, controls, or other parameters on research in process or to be conducted in the future. The contractor must coordinate remedial actions with the contracting officer. The contractor must also consider whether personnel sanctions are appropriate. Any such sanction must be considered and effected consistent with any applicable personnel laws, policies, and procedures, and shall take into account the seriousness of the misconduct and its impact, whether it was done knowingly or intentionally, and whether it was an isolated event or pattern of conduct.

(e) DOE reserves the right to pursue such remedies and other actions as it deems appropriate, consistent with the terms and conditions of the award instrument and applicable laws and regulations. However, the contractor's good faith administration of this clause and the effectiveness of its remedial actions and sanctions shall be positive considerations and shall be taken into account as mitigating factors in assessing the need for such actions. If DOE pursues any such action, it will inform the subject of the action of the outcome and any applicable appeal procedures.

(f) *Definitions.*

*Adjudication* means a formal review of a record of investigation of alleged research

misconduct to determine whether and what corrective actions and sanctions should be taken.

*Fabrication* means making up data or results and recording or reporting them.

*Falsification* means manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record.

*Finding of Research Misconduct* means a determination, based on a preponderance of the evidence, that research misconduct has occurred. Such a finding requires a conclusion that there has been a significant departure from accepted practices of the relevant research community and that it be knowingly, intentionally, or recklessly committed.

*Inquiry* means information gathering and initial fact-finding to determine whether an allegation or apparent instance of misconduct warrants an investigation.

*Investigation* means the formal examination and evaluation of the relevant facts.

*Plagiarism* means the appropriation of another person's ideas, processes, results, or words without giving appropriate credit.

*Research* means all basic, applied, and demonstration research in all fields of science, medicine, engineering, and mathematics, including, but not limited to, research in economics, education, linguistics, medicine, psychology, social sciences statistics, and research involving human subjects or animals.

*Research Misconduct* means fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results, but does not include honest error or differences of opinion.

*Research record* means the record of all data or results that embody the facts resulting from scientists' inquiries, including, but not limited to, research proposals, laboratory records, both physical and electronic, progress reports, abstracts, theses, oral presentations, internal reports, and journal articles.

(g) By executing this contract, the contractor provides its assurance that it has established an administrative process for performing an inquiry, mediating if possible, or investigating, and reporting allegations of research misconduct; and that it will comply with its own administrative process and the requirements of 10 CFR part 733 for performing an inquiry, possible mediation, investigation and reporting of research misconduct.

(h) The contractor must insert or have inserted the substance of this clause, including paragraph (g), in subcontracts at all tiers that involve research.

(End of Clause)

## PART 970—MANAGEMENT AND OPERATING CONTRACTS

■ 7. The authority citation for part 970 continues to read as follows:

**Authority:** 42 U.S.C. 2201, 2282a, 2282b, 2282c; 42 U.S.C. 7101 *et seq.*; 41 U.S.C. 418b; 50 U.S.C. 2401 *et seq.*

■ 8. Section 970.5204–3 is amended by revising paragraph (b)(1) to read as follows:

### 970.5204–3 Access to and ownership of records.

\* \* \* \* \*

(b) \* \* \*

(1) Employment-related records (such as worker's compensation files; employee relations records, records on salary and employee benefits; drug testing records, labor negotiation records; records on ethics, employee concerns; records generated during the course of responding to allegations of research misconduct; records generated during other employee related investigations conducted under an expectation of confidentiality; employee assistance program records; and personnel and medical/health-related records and similar files), and non-employee patient medical/health-related records, except for those records described by the contract as being maintained in Privacy Act systems of records.

\* \* \* \* \*

[FR Doc. 05–12645 Filed 6–27–05; 8:45 am]

BILLING CODE 6450–01–P

## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 23

[Docket No. CE227; Special Condition No. 23–169–SC]

### Special Conditions: Diamond Aircraft Industries, DA–42; Diesel Cycle Engine Using Turbine (Jet) Fuel

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final special conditions; request for comments.

**SUMMARY:** These special conditions are issued for the Diamond Aircraft Industries (DAI) DA–42 airplane. This airplane will have a novel or unusual design feature(s) associated with the installation of a diesel cycle engine utilizing turbine (jet) fuel. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for installation of this new technology engine. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards. **DATES:** The effective date of these special conditions is June 22, 2005.

Comments must be received on or before July 28, 2005.

**ADDRESSES:** Comments on these special conditions may be mailed in duplicate to: Federal Aviation Administration, Regional Counsel, ACE-7, Attention: Rules Docket, Docket No. CE227, 901 Locust, Room 506, Kansas City, Missouri 64106, or delivered in duplicate to the Regional Counsel at the above address. Comments must be marked: CE227. Comments may be inspected in the Rules Docket weekdays, except Federal holidays, between 7:30 a.m. and 4 p.m.

**FOR FURTHER INFORMATION CONTACT:** Peter L. Rouse, Federal Aviation Administration, Aircraft Certification Service, Small Airplane Directorate, ACE-111, 901 Locust, Kansas City, Missouri, 816-329-4135, fax 816-329-4090.

**SUPPLEMENTARY INFORMATION:** The FAA has determined that notice and opportunity for prior public comment hereon are impracticable because these procedures would significantly delay issuance of the approval design and thus delivery of the affected aircraft. The FAA therefore finds that good cause exists for making these special conditions effective upon issuance.

#### Comments Invited

Interested persons are invited to submit such written data, views, or arguments, as they may desire. Communications should identify the regulatory docket or special condition number and be submitted in duplicate to the address specified above. All communications received on or before the closing date for comments will be considered by the Administrator. The special conditions may be changed in light of the comments received. All comments received will be available in the Rules Docket for examination by interested persons, both before and after the closing date for comments. A report summarizing each substantive public contact with FAA personnel concerning this rulemaking will be filed in the docket. Persons wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must include with those comments a self-addressed, stamped postcard on which the following statement is made: "Comments to CE227." The postcard will be date stamped and returned to the commenter.

#### Background

Under the Bilateral Airworthiness Agreement (BAA) between the USA and the Austrian Exporting Civil Aviation Authority (ECAA), the Austro Control

GmbH (ACG), the DAI applied for U.S. Type Certification of Diamond Aircraft Industries (DAI) Model DA-42 on August 2, 2004, through the European Aviation Safety Agency (EASA). The DAI DA-42 aircraft is a new fully composite, four place, twin-engine airplane with retractable gear, cantilever low wing and T-tail. EASA certified the airplane on type certificate number A005, dated May 13, 2004. The airplane is powered by two Thielert Aircraft Engines GmbH (Thielert) TAE 125-01 aircraft diesel engines (ADE), type certificated in the United States, type certificate number E00069EN.

Expecting the reintroduction of diesel engine technology into the small airplane fleet, the FAA issued Policy Statement PS-ACE100-2002-004 on May 15, 2004, which identified areas of technological concern involving introduction of new technology diesel engines into small airplanes. For a more detailed summary of the FAA's development of diesel engine requirements, refer to this policy.

The general areas of concern involved the power characteristics of the diesel engines, the use of turbine fuel in an airplane class that has typically been powered by gasoline fueled engines, the vibration characteristics and failure modes of diesel engines. These concerns were identified after a review of the record of diesel engine use in aircraft and a review of the 14 CFR part 23 regulations, which identified specific regulatory areas that needed to be evaluated for applicability to diesel engine installations. These concerns are not considered universally applicable to all types of possible diesel engines and diesel engine installations. However, after review of the DAI installation, the Thielert engine type, and the requirements applied by the ACG, and after applying the provisions of the diesel policy, the FAA proposes these fuel system and engine related special conditions. Other special conditions issued in a separate notice include special conditions for HIRF and application of § 23.1309 provisions to the Full Authority Digital Engine Control (FADEC).

#### Discussion

Several major concerns were identified in developing FAA policy. These include installing the diesel engine and noting its vibration levels under both normal operating conditions and when one cylinder is inoperative. The concerns also include accommodating turbine fuels in airplane systems that have generally evolved based on gasoline requirements, anticipated use of a FADEC to control

the engine, and appropriate limitations and indications for a diesel engine powered airplane. The general concerns associated with the aircraft diesel engine installation are as follows: Installation and Vibration Requirements, Fuel and Fuel System Related Requirements, FADEC and Electrical System Requirements, Limitations and Indications.

**Installation and Vibration Requirements:** These special conditions include requirements similar to the requirements of § 23.901(d)(1) for turbine engines. In addition to the requirements of § 23.901 applied to reciprocating engines, the applicant will be required to construct and arrange each diesel engine installation to result in vibration characteristics that do not exceed those established during the type certification of the engine. These vibration levels must not exceed vibration characteristics that a previously certificated airframe structure has been approved for, unless such vibration characteristics are shown to have no effect on safety or continued airworthiness. The engine limit torque design requirements as specified in § 23.361 are also modified.

An additional requirement to consider vibration levels and/or effects of an inoperative cylinder was imposed. Also, a requirement to evaluate the engine design for the possibility of, or effect of, liberating high-energy engine fragments, in the event of a catastrophic engine failure, requirements was added.

**Fuel and Fuel System Related Requirements:** Due to the use of turbine fuel, this airplane must comply with the requirements in § 23.951(c).

Section 23.961 will be complied with using the turbine fuel requirements. These requirements will be substantiated by flight-testing as described in Advisory Circular AC 23-8B, Flight Test Guide for Certification of Part 23 Airplanes.

This special condition specifically requires testing to show compliance to § 23.961 and adds the possibility of testing non-aviation diesel fuels.

To ensure fuel system compatibility and reduce the possibility of misfueling, and discounting the first clause of § 23.973(f) referring to turbine engines, the applicant will comply with § 23.973(f).

Due to the use of turbine fuel, the applicant will comply with § 23.977(a)(2), and § 23.977(a)(1) will not apply. "Turbine engines" will be interpreted to mean "aircraft diesel engine" for this requirement. An additional requirement to consider the possibility of fuel freezing was imposed.

Due to the use of turbine fuel, the applicant will comply with § 23.1305(c)(8).

Due to the use of turbine fuel, the applicant must comply with § 23.1557(c)(1)(ii). Section 23.1557(c)(1)(ii) will not apply. "Turbine engine" is interpreted to mean "aircraft diesel engine" for this requirement.

**FADEC and Electrical System Requirements:** The electrical system must comply with the following:

- In case of failure of one power supply of the electrical system, there will be no significant engine power change. The electrical power supply to the FADEC must remain stable in such a failure.

- The transition from the actual engine electrical network (FADEC) to the remaining electrical system with the consumer's, avionics, communication, etc., should be made by a single point only. If several transitions (e.g., for redundancy reasons) are needed, then the number of the transitions must be kept as small as possible.

- There must be the ability to separate the FADEC power supply (alternator) from the battery and from the remaining electrical system.

- In case of loss of alternator power, the installation must guarantee that the battery will provide the power for an appropriate time after appropriate warning to the pilot.

- FADEC, alternator, and battery must be interconnected in an appropriate way so, in case of loss of battery power, the supply of the FADEC is guaranteed by the alternator.

#### *Limitations and Indications*

Section 23.1305(a) and § 23.1305(b)(2) will apply, except that propeller revolutions per minute (RPM) will be displayed. Sections 23.1305(b)(4), 23.1305(b)(5), and 23.1305(b)(7) are deleted.

Additional critical engine parameters for this installation that will be displayed include:

- (1) Power setting, in percentage, and
- (2) Fuel temperature.

Due to the use of turbine fuel, the requirements for § 23.1521(d), as applicable to fuel designation for turbine engines, will apply.

#### **Type Certification Basis**

Under the provisions of 14 CFR 21.17, Diamond Aircraft Industries must show that the DA-42 meets the applicable provisions of part 23, as amended by Amendments 23-1 through 23-51 thereto. In addition, the certification basis includes special conditions and equivalent levels of safety for the following:

#### Special Conditions:

- Engine torque (Provisions similar to § 23.361, paragraphs (b)(1) and (c)(3))

- Powerplant—Installation (Provisions similar to § 23.901(d)(1) for turbine engines)

- Powerplant—Fuel System—Fuel system with water saturated fuel (Compliance with § 23.951 requirements)

- Powerplant—Fuel System—Fuel system hot weather operation (Compliance with § 23.961 requirements)

- Powerplant—Fuel system—Fuel tank filler connection (Compliance with § 23.973(f) requirements)

- Powerplant—Fuel system—Fuel tank outlet (Compliance with § 23.977 requirements)

- Powerplant—Powerplant Controls and Accessories—Engine ignition systems (Compliance with § 23.1165 requirements)

- Equipment—General—Powerplant Instruments (Compliance with § 23.1305 requirements)

- Operating Limitations and Information—Powerplant limitations—Fuel grade or designation (Compliance with § 23.1521(d) requirements)

- Markings And Placards—Miscellaneous markings and placards—Fuel, oil, and coolant filler openings (Compliance with § 23.1557(c)(1) requirements)

- Powerplant—Fuel system—Fuel-Freezing

- Powerplant Installation—Vibration levels

- Powerplant Installation—One cylinder inoperative

- Powerplant Installation—High Energy Engine Fragments

Equivalent levels of safety for:

- Cockpit controls—23.777(d)
- Motion and effect of cockpit controls—23.779(b)

- Liquid Cooling—Installation—23.1061

- Ignition switches—23.1145

The type certification basis includes exemptions, if any; equivalent level of safety findings, if any; and the special conditions adopted by this rulemaking action.

If the Administrator finds that the applicable airworthiness regulations (i.e., part 23) do not contain adequate or appropriate safety standards for the Diamond Aircraft Industries DA-42 because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

In addition to the applicable airworthiness regulations and special conditions, the Diamond Aircraft Industries DA-42 must comply with the

part 23 noise certification requirements of 14 CFR part 36.

Special conditions, as appropriate, as defined in § 11.19, are issued in accordance with § 11.38, and become part of the type certification basis in accordance with § 21.17.

Special conditions are initially applicable to the model for which they are issued. Should the applicant apply for a supplemental type certificate to modify any other model included on the same type certificate to incorporate the same novel or unusual design feature, the special conditions would also apply to the other model under the provisions of § 21.101.

#### **Novel or Unusual Design Features**

The Diamond Aircraft Industries DA-42 will incorporate the following novel or unusual design feature:

The Diamond Aircraft Industries DA-42 will incorporate an aircraft diesel engine using turbine (jet) fuel.

#### **Applicability**

As discussed above, these special conditions are applicable to the Diamond Aircraft Industries DA-42. Should Diamond Aircraft Industries apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, the special condition would apply to that model as well under the provisions of § 21.101.

#### **Conclusion**

This action affects only certain novel or unusual design features on one model series of airplane. It is not a rule of general applicability, and it affects only the applicant who applied to the FAA for approval of these features on the airplane.

The substance of these special conditions has been subjected to the notice and comment period in a prior instance and has been derived without substantive change from those previously issued. It is unlikely that prior public comment would result in a significant change from the substance contained herein. For this reason, and because a delay would significantly affect the certification of the airplane, which is imminent, the FAA has determined that prior public notice and comment are unnecessary and impracticable, and good cause exists for adopting these special conditions upon issuance. The FAA is requesting comments to allow interested persons to submit views that may not have been submitted in response to the prior opportunity for comment described above.

**List of Subjects in 14 CFR Part 23**

Aircraft, Aviation safety, Signs and symbols.

**Citation**

The authority citation for these special conditions is as follows:

**Authority:** 49 U.S.C. 106(g), 40113 and 44701; 14 CFR 21.16 and 21.17; and 14 CFR 11.38 and 11.19.

**The Special Conditions**

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for Diamond Aircraft Industries DA-42 airplane.

1. Engine torque (Provisions similar to § 23.361, paragraphs (b)(1) and (c)(3)):

a. For diesel engine installations, the engine mounts and supporting structure must be designed to withstand the following:

(1) A limit engine torque load imposed by sudden engine stoppage due to malfunction or structural failure.

(a) The effects of sudden engine stoppage may alternatively be mitigated to an acceptable level by utilization of isolators, dampers clutches, and similar provisions, so unacceptable load levels are not imposed on the previously certificated structure.

b. The limit engine torque to be considered under § 23.361(a) must be obtained by multiplying the mean torque by a factor of four for diesel cycle engines.

(1) If a factor of less than four is used, it must be shown that the limit torque imposed on the engine mount is consistent with the provisions of § 23.361(c). In other words, it must be shown that the use of the factors listed in § 23.361(c)(3) will result in limit torques on the mount that are equivalent to or less than those imposed by a conventional gasoline reciprocating engine.

2. Powerplant—Installation (Provisions similar to § 23.901(d)(1) for turbine engines):

Considering the vibration characteristics of diesel engines, the applicant must comply with the following:

a. Each diesel engine installation must be constructed and arranged to result in vibration characteristics that—

(1) Do not exceed those established during the type certification of the engine; and

(2) Do not exceed vibration characteristics that a previously certificated airframe structure has been approved for—

(i) Unless such vibration characteristics are shown to have no

effect on safety or continued airworthiness, or

(ii) Unless mitigated to an acceptable level by utilization of isolators, dampers clutches, and similar provisions, so that unacceptable vibration levels are not imposed on the previously certificated structure.

3. Powerplant—Fuel System—Fuel system with water saturated fuel (Compliance with § 23.951 requirements):

Considering the fuel types used by diesel engines, the applicant must comply with the following:

a. Each fuel system for a diesel engine must be capable of sustained operation throughout its flow and pressure range with fuel initially saturated with water at 80° F and having 0.75cc of free water per gallon added and cooled to the most critical condition for icing likely to be encountered in operation.

b. Methods of compliance that are acceptable for turbine engine fuel systems requirements of § 23.951(c) are also considered acceptable for this requirement.

4. Powerplant—Fuel System—Fuel system hot weather operation (Compliance with § 23.961 requirements):

In place of compliance with § 23.961, the applicant must comply with the following:

a. Each fuel system must be free from vapor lock when using fuel at its critical temperature, with respect to vapor formation, when operating the airplane in all critical operating and environmental conditions for which approval is requested. For turbine fuel, or for aircraft equipped with diesel cycle engines that use turbine or diesel type fuels, the initial temperature must be 110 °F, -0°, +5° or the maximum outside air temperature for which approval is requested, whichever is more critical.

b. The fuel system must be in an operational configuration that will yield the most adverse, that is, conservative results.

c. To comply with this requirement, the applicant must use the turbine fuel requirements and must substantiate these by flight-testing, as described in Advisory Circular AC 23-8B, Flight Test Guide for Certification of Part 23 Airplanes.

5. Powerplant—Fuel system—Fuel tank filler connection (Compliance with § 23.973(f) requirements):

In place of compliance with § 23.973(e) and (f), the applicant must comply with the following:

For airplanes that operate on turbine or diesel type fuels, the inside diameter

of the fuel filler opening must be no smaller than 2.95 inches.

6. Powerplant—Fuel system—Fuel tank outlet (Compliance with § 23.977 requirements):

In place of compliance with § 23.977(a)(1) and (a)(2), the applicant will comply with the following:

There must be a fuel strainer for the fuel tank outlet or for the booster pump. This strainer must, for diesel engine powered airplanes, prevent the passage of any object that could restrict fuel flow or damage any fuel system component.

7. Powerplant—Powerplant Controls and Accessories—Engine ignition systems (Compliance with § 23.1165 requirements):

Considering that the FADEC provides the same function as an ignition system for this diesel engine, in place of compliance to § 23.1165, the applicant will comply with the following:

a. The electrical system must comply with the following requirements:

(1) In case of failure of one power supply of the electrical system, there will be no significant engine power change. The electrical power supply to the FADEC must remain stable in such a failure.

(2) The transition from the actual engine electrical network (FADEC network) to the remaining electrical system should be made at a single point only. If several transitions (for example, redundancy reasons) are needed, then the number of the transitions must be kept as small as possible.

(3) There must be the ability to separate the FADEC power supply (alternator) from the battery and from the remaining electrical system.

(4) In case of loss of alternator power, the installation must guarantee the battery will provide the power for an appropriate time after appropriate warning to the pilot. This period must be at least 30 minutes required, 60 minutes desired.

(5) FADEC, alternator, and battery must be interconnected in an appropriate way so, in case of loss of battery power, the supply of the FADEC is guaranteed by the alternator.

8. Equipment—General—Powerplant Instruments (Compliance with § 23.1305 and 91.205 requirements):

a. In place of compliance with § 23.1305, the applicant will comply with the following:

(1) The following are required powerplant instruments:

(a) A fuel quantity indicator for each fuel tank, installed in accordance with § 23.1337(b).

(b) An oil pressure indicator.

(c) An oil temperature indicator.

(d) A tachometer indicating propeller speed.

(e) A coolant temperature indicator.  
 (f) An indicating means for the fuel strainer or filter required by § 23.997 to indicate the occurrence of contamination of the strainer or filter before it reaches the capacity established in accordance with § 23.997(d).

1. No indicator is required if the engine can operate normally for a specified period with the fuel strainer exposed to the maximum fuel contamination as specified in MIL-5007D and provisions for replacing the fuel filter at this specified period (or a shorter period) are included in the maintenance schedule for the engine installation.

(g) Power setting, in percentage.

(h) Fuel temperature.

(i) Fuel flow (engine fuel consumption).

b. In place of compliance with § 91.205, the following will be complied with: The diesel engine has no manifold pressure gauge as required by § 91.205, in its place, the engine instrumentation as installed is to be approved as equivalent. TCDS is to be modified to show power indication will be accepted to be equivalent to the manifold pressure indication.

9. Operating Limitations and Information—Powerplant limitations—Fuel grade or designation (Compliance with § 23.1521(d) requirements):

Instead of compliance with § 23.1521(d), the applicant must comply with the following:

The minimum fuel designation (for diesel engines) must be established so it is not less than that required for the operation of the engines within the limitations in paragraphs (b) and (c) of § 23.1521.

10. Markings And Placards—Miscellaneous markings and placards—Fuel, oil, and coolant filler openings (Compliance with § 23.1557(c)(1) requirements):

Instead of compliance with § 23.1557(c)(1), the applicant must comply with the following:

a. Fuel filler openings must be marked at or near the filler cover with—

(1) For diesel engine-powered airplanes—

(a) The words “Jet Fuel”; and

(b) The permissible fuel designations, or references to the Airplane Flight Manual (AFM) for permissible fuel designations.

(c) A warning placard or note that states the following or similar:

“Warning—this airplane equipped with an aircraft diesel engine, service with approved fuels only.”

The colors of this warning placard should be black and white.

11. Powerplant—Fuel system—Fuel-Freezing:

If the fuel in the tanks cannot be shown to flow suitably under all possible temperature conditions, then fuel temperature limitations are required. These will be considered as part of the essential operating parameters for the aircraft and must be limitations.

a. The takeoff temperature limitation must be determined by testing or analysis to define the minimum cold-soaked temperature of the fuel that the airplane can operate on.

b. The minimum operating temperature limitation must be determined by testing to define the minimum operating temperature acceptable after takeoff (with minimum takeoff temperature established in (1) above).

12. Powerplant Installation—Vibration levels:

a. Vibration levels throughout the engine operating range must be evaluated and:

(1) Vibration levels imposed on the airframe must be less than or equivalent to those of the gasoline engine; or

(2) Any vibration level that is higher than that imposed on the airframe by the replaced gasoline engine must be considered in the modification and the effects on the technical areas covered by the following paragraphs must be investigated: 14 CFR part 23, 23.251; 23.613; 23.627; 23.629 (or CAR 3.159, as applicable to various models); 23.572; 23.573; 23.574 and 23.901.

b. Vibration levels imposed on the airframe can be mitigated to an acceptable level by use of isolators, dampers clutches, and similar provisions, so unacceptable vibration levels are not imposed on the previously certificated structure.

13. Powerplant Installation—One cylinder inoperative:

It must be shown by test or analysis, or by a combination of methods, that the airframe can withstand the shaking or vibratory forces imposed by the engine if a cylinder becomes inoperative. Diesel engines of conventional design typically have extremely high levels of vibration when a cylinder becomes inoperative. Data must be provided to the airframe installer/modifier so either appropriate design considerations or operating procedures, or both, can be developed to prevent airframe and propeller damage.

14. Powerplant Installation—High Energy Engine Fragments:

It may be possible for diesel engine cylinders (or portions thereof) to fail and physically separate from the engine at high velocity (due to the high internal pressures). This failure mode will be

considered possible in engine designs with removable cylinders or other non-integral block designs. The following is required:

a. It must be shown that the engine construction type (massive or integral block with non-removable cylinders) is inherently resistant to liberating high energy fragments in the event of a catastrophic engine failure; or,

b. It must be shown by the design of the engine, that engine cylinders, other engine components or portions thereof (fragments) cannot be shed or blown off the engine in the event of a catastrophic engine failure; or

c. It must be shown that all possible liberated engine parts or components do not have adequate energy to penetrate engine cowlings; or

d. Assuming infinite fragment energy, and analyzing the trajectory of the probable fragments and components, any hazard due to liberated engine parts or components will be minimized and the possibility of crew injury is eliminated. Minimization must be considered during initial design and not presented as an analysis after design completion.

Issued in Kansas City, Missouri on June 22, 2005.

**John Colomy,**

*Acting Manager, Small Airplane Directorate, Aircraft Certification Service.*

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**BILLING CODE 4910-13-P**

## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 39

[Docket No. 2003-NM-127-AD; Amendment 39-14168; AD 2005-13-31]

**RIN 2120-AA64**

#### **Airworthiness Directives; Short Brothers Model SD3-60 Airplanes**

**AGENCY:** Federal Aviation Administration, Department of Transportation.

**ACTION:** Final rule.

**SUMMARY:** This amendment adopts a new airworthiness directive (AD), applicable to all Short Brothers Model SD3-60 airplanes, that requires performing repetitive inspections of the shear attachment fittings of the vertical stabilizer for corrosion, and performing corrective actions if necessary. The actions specified by this AD are intended to detect and correct corrosion in the area of the main spar web fittings of the vertical stabilizer, which could