AUTHENTICATED U.S. GOVERNMENT INFORMATION GPO

Frequency	Field strength (volts per meter)	
	Peak	Average
10 kHz–100 kHz	50	50
100 kHz–500 kHz	50	50
500 kHz–2 MHz	50	50
2 MHz–30 MHz	100	100
30 MHz–70 MHz	50	50
70 MHz–100 MHz	50	50
100 MHz–200 MHz	100	100
200 MHz–400 MHz	100	100
400 MHz–700 MHz	700	50
700 MHz–1 GHz	700	100
1 GHz–2 GHz	2000	200
2 GHz–4 GHz	3000	200
4 GHz–6 GHz	3000	200
6 GHz–8 GHz	1000	200
8 GHz–12 GHz	3000	300
12 GHz–18 GHz	2000	200
18 GHz–40 GHz	600	200

The field strengths are expressed in terms of peak root-mean-square (rms) values.

or,

(2) The applicant may demonstrate by a system test and analysis that the electrical and electronic systems that perform critical functions can withstand a minimum threat of 100 volts per meter, electrical field strength, from 10 kHz to 18 GHz. When using this test to show compliance with the HIRF requirements, no credit is given for signal attenuation due to installation.

A preliminary hazard analysis must be performed by the applicant, for approval by the FAA, to identify either electrical or electronic systems that perform critical functions. The term ''critical'' means those functions whose failure would contribute to, or cause, a failure condition that would prevent the continued safe flight and landing of the airplane. The systems identified by the hazard analysis that perform critical functions are candidates for the application of HIRF requirements. A system may perform both critical and non-critical functions. Primary electronic flight display systems, and their associated components, perform critical functions such as attitude, altitude, and airspeed indication. The HIRF requirements apply only to critical functions.

Compliance with HIRF requirements may be demonstrated by tests, analysis, models, similarity with existing systems, or any combination of these. Service experience alone is not acceptable since normal flight operations may not include an exposure to the HIRF environment. Reliance on a system with similar design features for redundancy as a means of protection against the effects of external HIRF is generally insufficient since all elements of a redundant system are likely to be exposed to the fields concurrently.

Applicability

As discussed above, these special conditions are applicable to one modification to the airplane models listed under the heading ''Type Certification Basis.'' Should Cirrus Design Corporation apply at a later date for a supplemental type certificate to modify any other model on the same type certificate to incorporate the same novel or unusual design feature, the special conditions would apply to that model as well under the provisions of § 21.101.

Conclusion

This action affects only certain novel or unusual design features of one modification to several models of airplanes. It is not a rule of general applicability and 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 several prior instances 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 some airplane models, 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 opportunities 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 21.101; 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 airplane models listed under the ''Type Certification Basis'' heading modified by Cirrus Design Corporation to add an EFIS.

1. *Protection of Electrical and Electronic Systems from High Intensity Radiated Fields (HIRF).* Each system that performs critical functions must be designed and installed to ensure that the operations, and operational capabilities of these systems to perform critical functions, are not adversely affected when the airplane is exposed to high intensity radiated electromagnetic fields external to the airplane.

2. For the purpose of these special conditions, the following definition applies: *Critical Functions:* Functions whose failure would contribute to, or cause, a failure condition that would prevent the continued safe flight and landing of the airplane.

Issued in Kansas City, Missouri on July 11, 2006.

Steve W. Thompson,
Acting Manager, Small Airplane Directorate, Aircraft Certification Service.

[FR Doc. E6–11483 Filed 7–19–06; 8:45 am]
BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 23

[Docket No. CE239; Special Condition No. 23–179–SC]

Special Conditions: Societe de Motorisation Aeronautiques (SMA) Engines, Inc., Cessna Models 182Q and 182R; Diesel Cycle Engine Using Turbine (Jet) Fuel

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for the Cessna Models 182Q and 182R airplanes with a Societe de Motorisation Aeronautiques (SMA) Model SR305–230 aircraft diesel engine (ADE). 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: *Effective Date:* July 11, 2006.

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:

Background

On March 19, 2004, SMA Engines, Inc., applied for a supplemental type certificate for the installation of an SMA Model SR305–230 ADE, type certificated in the United States, type certificate number E00067EN, in the Cessna Models 182Q and 182R airplanes. The Cessna Models 182Q and 182R airplanes, approved under Type Certificate No. 3A13, are four-place, single engine airplanes.

In anticipation of 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, and the vibration characteristics and failure modes of diesel engines. These concerns were identified after review of the historical record of diesel engine used 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 SMA installation, and applying the provisions of the diesel policy, the FAA proposed 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).

Type Certification Basis

Under the provisions of § 21.101, SMA Engines, Inc., must show that the Cessna Models 182Q and 182R airplanes with the installation of an SMA Model SR305–230 ADE meet the applicable provisions of 14 CFR part 23, as amended by Amendments 23–1 through 23–51 and CAR 3 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)).
- Flutter (Compliance with § 23.629, paragraphs (e)(1) and (2)).
- 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).
- 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).
- 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 Cessna Models 182Q and 182R airplanes with the installation of an SMA Model SR305–230 ADE 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 Cessna Models 182Q and 182R airplanes with the installation of an SMA Model SR305–230 ADE must comply with the fuel vent and exhaust emission requirements of 14 CFR part 34 and the 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 § 21.101(b)(2).

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(a)(1).

Novel or Unusual Design Features

The Cessna Models 182Q and 182R airplanes with the installation of an SMA Model SR305–230 will incorporate the following novel or unusual design features:

The Cessna Models 182Q and 182R airplanes with the installation of an SMA Model SR305–230 will incorporate an aircraft diesel engine utilizing turbine (jet) fuel.

Discussion of Comments

A notice of proposed special conditions No. 23–06–01–SC for the Cessna Models 182Q and 182R airplanes with a SMA Model SR305–230 ADE was published on February 17, 2006 (71 FR 8543). No comments were received, and the special conditions are adopted as proposed.

Applicability

As discussed above, these special conditions are applicable to the Cessna Models 182Q and 182R airplanes with an SMA Model SR305–230 ADE. Should SMA apply at a later date for a supplemental type certificate to modify any other model included on Type Certificate No. 3A13 to incorporate the same novel or unusual design feature, the special conditions would apply to that model as well under the provisions of § 21.101(a)(1).

Conclusion

This action affects only certain novel or unusual design features on the Cessna Models 182Q and 182R airplanes with a SMA Model SR305–230 ADE. 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.

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 21.101 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 the Cessna Models 182Q and 182R airplanes with an SMA Model SR305–230 ADE.

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.

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

(b) The limit engine torque obtained in CAR 3.195(a)(1) and (a)(2) or 14 CFR 23.361(a)(1) and (a)(2) must be obtained by multiplying the mean torque by a factor of four in lieu of the factor of two required by CAR 3.195(b) and 14 CFR 23.361(c)(3).

2. Flutter—(Compliance With § 23.629 (e)(1) and (e)(2) Requirements)

The flutter evaluation of the airplane done in accordance with 14 CFR 23.629 must include—

(a) Whirl mode degree of freedom, which takes into account the stability of the plane of rotation of the propeller and significant elastic, inertial, and aerodynamic forces, and

(b) Propeller, engine, engine mount, and airplane structure stiffness, and damping variations appropriate to the particular configuration, and

(c) Showing the airplane is free from flutter with one cylinder inoperative.

3. 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.

4. 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:

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.

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

5. Powerplant—Fuel System—Fuel Flow (Compliance With § 23.955(c) Requirements)

In lieu of 14 CFR 23.955(c), engine fuel system must provide at least 100 percent of the fuel flow required by the engine, or the fuel flow required to prevent engine damage, if that flow is greater than 100 percent. The fuel flow rate must be available to the engine under each intended operating condition and maneuver. The conditions may be simulated in a suitable mockup. This flow must be shown in the most adverse fuel feed condition with respect to altitudes, attitudes, and any other condition that is expected in operation.

6. 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:

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.

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

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.

7. 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.

8. 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.

9. Equipment—General—Powerplant Instruments (Compliance With § 23.1305)

In addition to compliance with § 23.1305, the applicant will comply with the following:

The following are required in addition to the powerplant instruments required in § 23.1305:

(a) A fuel temperature indicator.

(b) An outside air temperature (OAT) indicator.

(c) 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).

Alternately, 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.

10. Operating Limitations and Information—Powerplant Limitations—Fuel Grade or Designation (Compliance With § 23.1521 Requirements)

All engine parameters that have limits specified by the engine manufacturer for takeoff or continuous operation must be investigated to ensure they remain within those limits throughout the expected flight and ground envelopes (e.g., maximum and minimum fuel temperatures, ambient temperatures, as applicable, etc.). This is in addition to the existing requirements specified by 14 CFR 23.1521(b) and (c). If any of those limits can be exceeded, there must be continuous indication to the flight crew of the status of that parameter with appropriate limitation markings.

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 that it is not less than that required for the operation of the engines within the limitations in paragraphs (b) and (c) of § 23.1521.

11. 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:

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

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.

12. 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 minimum takeoff temperature limitation will be determined by testing to establish the minimum cold-soaked temperature at which the airplane can operate. The minimum operating temperature will be determined by testing to establish the minimum operating temperature acceptable after takeoff from the minimum takeoff temperature. If low temperature limits are not established by testing, then a minimum takeoff and operating fuel temperature limit of 5 °F above the gelling temperature of Jet A will be imposed along with a display in the cockpit of the fuel temperature. Fuel temperature sensors will be located in the coldest part of the tank if applicable.

13. Powerplant Installation—Vibration Levels

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 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.

Vibration levels imposed on the airframe can be 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.

14. 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.

No unsafe condition will exist in the case of an inoperative cylinder before the engine can be shut down. The resistance of the airframe structure, propeller, and engine mount to shaking moment and vibration damage must be investigated. It must be shown by test or analysis, or by a combination of methods, that shaking and vibration damage from the engine with an inoperative cylinder will not cause a catastrophic airframe, propeller, or engine mount failure.

15. 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:

(1) 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 of the engine in the event of a catastrophic engine failure; or

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

(3) 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 eliminated. Minimization must be considered during initial design and not presented as an analysis after design completion.

Issued in Kansas City, Missouri, on July 11, 2006.

Steve W. Thompson,

Acting Manager, Small Airplane Directorate, Aircraft Certification Service.

[FR Doc. E6–11474 Filed 7–19–06; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 23

[Docket No. CE244, Special Condition 23–184A–SC]

Special Condition; Avidyne Corporation, Inc.; Various Airplane Models; Protection of Systems for High Intensity Radiated Fields (HIRF)

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Amended final special conditions; request for comments.

SUMMARY: These amended special conditions are issued to Avidyne Corporation, 55 Old Bedford Road, Lincoln, MA 01773. This is an amendment to special condition 23–184–SC, which was published on May 23, 2006 (71 FR 29574), for installation of an EFIS manufactured by Avidyne on various models. The original issue left off the Cirrus Design Corporation SR22, which was the first model to be certified under the STC.

The airplanes listed under this multi-model approval will have novel and unusual design features when compared