



ULTIMATE AEROSTRUCTURES

PRODUCT DEVELOPMENT + MODIFICATION APPROVALS

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INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

REPORT NUMBER: UA032-ICA

REVISION: IR

INSTALLATION, ACORN WELDING HEAT EXCHANGER/MUFFLER

(P/N C1851D, C1851D-1 & C1851D-3)



MAKE:
MODEL:

CESSNA
180, 182, 185
(See ARC P171003 for Complete Eligibility List)

LOG OF REVISIONS AND APPROVALS

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SECTION 1 GENERAL DESCRIPTION

1-1. SCOPE

This document identifies the Instructions for Continued Airworthiness (ICA) for the installation of the Acorn Welding Ltd. Exhaust Heat Exchanger Muffler P/Ns C-1851D, C-1851D-1 or C-1851D-3.

1-2. DEFINITIONS AND ABBREVIATIONS

ICA	Instructions for Continued Airworthiness
IAW	In Accordance With
ULTAero	Ultimate Aerostructures

1-3. DISTRIBUTION

This ICA is to be provided with the installation documentation and must be retained as part of the aircraft records. Any changes in the content or revision level of this document will be made available as required when requested in writing. Requests are to be addressed to:

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FEB 15 2013

SECTION 1

10 January 2013

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SECTION 2 AIRWORTHINESS LIMITATIONS

The airworthiness limitations section is approved by the Minister and specifies maintenance required under any applicable airworthiness or operating rule, unless an alternative program has been approved by the Minister.

2-1. REQUIRED INSPECTIONS

Perform inspection on muffler assembly as described in Section 11-6 of this ICA at intervals not to exceed one year or 150 flight hours, whichever occurs first. A non-cumulative 10-flight-hour tolerance is authorized for the repetitive 150-flight-hour inspection requirement.

Approved By

F.J.B. Wright

Transport Canada Civil Aviation
Prairie and Northern Region

2013/02/13
Date

SECTION 2

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SECTION 11 EXHAUST SYSTEM

11-1. General

The exhaust system consists of two exhaust stacks, one muffler assembly and associated hardware. The muffler assembly is equipped with a heat shroud to provide cabin heat. Intake air is provided either from directly through the cowling openings, through a duct from the engine baffling or through a duct from underneath the oil cooler. This air is heated by the muffler and then proceeds out a duct on the rear co-pilot side of the shroud and is routed to the cabin heat control valve on the firewall. On aircraft with carbureted engines, carburetor heat is provided through a heat capture shroud located on the pilot side exhaust collector.

11-2. Exhaust System Removal

- A. Remove upper and lower engine cowling as needed.
- B. Remove clamp holding cabin heat inlet/outlet hose and carburetor heat inlet/outlet hose. Retain hose and clamp or replace with new as required.
- C. Remove clamp from pilot side rear engine baffle and remove hose to carburetor heat inlet on muffler(if applicable). It is permissible but not required to install a riveted patch in baffle to close off hole.
- D. Remove nuts, washers, and bolts from clamps securing muffler to exhaust stack assemblies. Discard nuts and washers.
- E. Disconnect any Electrical leads from EGT thermocouples(if installed). Refer to associated STC documentation for EGT if installed.
- F. Remove nuts and washers securing exhaust stack to engine cylinders and discard.
- G. Remove exhaust stacks and gaskets. Discard Gaskets.

11-3. Exhaust System Installation

NOTE: If EGT system installed, install per Manufacturer's installation instructions before installing exhaust system on aircraft. It is important to ensure that center exhaust moves freely. Do not install probe through slip joint.

- A. Using a high temperature anti-seize compound, lubricate the center exhaust stack and insert into collector. Using new gaskets, position exhaust stacks on engine cylinders. Do not tighten nuts at this point.
- B. Using the 0750161-24 clamp as a guide, mark the location of the pin in the exhaust stacks. Most common installation is to have the pin perpendicular to the propeller.
- C. Position Acorn Welding Ltd. exhaust muffler(with heat shroud installed)in between exhaust stacks ensuring that the tailpipe is in the correct exit position in the cowling. Test fit cowling before proceeding to next step.
- D. Mark the pin location on the muffler and drill a 0.250 inch hole. After hole is drilled, remove the muffler and ensure that the hole in both the exhaust stack and muffler are de-burred.

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11-3. Exhaust System Installation (Cont'd)

- E. Using AN3C4Abolts, MS21045C3nuts and NAS1149F0363Pwashers(or OEM accepted alternatives), install the 0750161-22 and 0750161-24 clamps on the joint between the exhaust collector and mufflers. Do not tighten bolts all the way at this time.
- F. Tighten the front and aft cylinder inboard nut but do not torque to final torque values. Tighten all clamp hardware between the exhaust stacks and muffler. Then tighten the front and aft cylinder outboard nuts but do not torque to final torque values. Finally, tighten the center cylinder exhaust stub.
- G. Torque all cylinder nuts 100 to 110 inch-pounds.
- H. Using clamps, attach cabin air intake and exhaust ducting to shrouds.
- I. Reattach all electrical leads on EGT thermocouples(if installed).
- J. Reinstall engine cowlng.

11-4. Carburetor Heat Installation

All Non-Fuel Injected engines require Carburetor Heat shroud installation located on the Pilot Side Exhaust Collector. Carburetor heat is provided via a one of three possible heat capture devices: (1) a clamshell style heat shroud attached to the exhaust stack (reference SK180-24); (2) a box type shroud attached to the exhaust stack (reference SK180-24A); and (3) a box type shroud surrounding the exhaust stack that is attached to the engine mount (reference SK182-78). Copies of these kits are available on Cessview and Avantext IML software or upon request from Acorn Welding Ltd.

11-5. Special Tools

- A. No special tools are required for removal or reinstallation of the muffler.

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11-6. Inspection

Incidents involving exhaust gases entering the heating system continue to occur and in some instances result in fatal accidents due to carbon monoxide poisoning of the aircraft occupants.

Complete the following inspection everyone year or 150 flight hours, whichever occurs first. A non-cumulative 10 flight hour tolerance is authorized for the repetitive 150 flight hour inspection requirement.

- A. Remove the heat muffler shroud (refer to Section 11-2 Steps A and B).
- B. Using FAA AC91-59A (or latest approved document) as a guide, complete the following steps.
- C. Inspect the outer surface of the inner core (exhaust pipe) for signs of combustion products.
- D. Thoroughly clean the exhaust pipe of all dirt and corrosion.
- E. Carefully inspect the exhaust pipe, using a hand-held magnifying glass and light/mirror, for signs of cracks and pinholes. Pay particular attention to welds, seams, and their adjacent areas.
- F. Mufflers C-1851D and C-1851D-1 contain flame cones. These mufflers are deemed unserviceable once these cones deteriorate. Note that Muffler C-1851D-3 does not contain flame cones.
- G. Any suspect areas are to be reported for further repair action by Acorn Welding Ltd.
- H. Repair or replace, before further flight, exhaust type heat exchangers containing cracks or holes in the exhaust pipe.

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