



KELLY AEROSPACE

Thermal Systems

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1.0 SECTION: INTRODUCTION

This document identifies the instructions for continued airworthiness for the modification of the above aircraft by installation of the Kelly Aerospace Backup Alternator System.

Applicability: Applies to aircraft altered by installation of Kelly Aerospace Backup Alternator System

Distribution: This document should be a permanent aircraft record.

2.0 SECTION: DESCRIPTION OF THE ALTERATION

The Cessna 206H & T206H aircraft has a single alternator, single bus electrical system. The system uses a 9910592-3 (24 Volt 95 Amp) alternator, which is mounted on the left front side of the engine. The Kelly Backup Alternator Kit installed a second alternator, a Hartzell ES-7024-13 (24 Volt 70 Amp) alternator. The backup alternator is installed on the right front side. The backup alternator is integrated into the existing aircraft electrical system through a single pole double throw relay mounted on the firewall. The relay connects the backup alternator to the bus in place of the primary alternator. A field relay directs the regulators' field output to the proper alternator. A toggle switch in the cockpit allows the selection of the backup alternator. The system is designed to disconnect the primary alternator before the backup alternator is connected. It is not possible for both alternators to put power on the bus at the same time.

The alternator is belt driven, similar to the existing primary alternator. The drive pulley for the backup alternator is mounted to the front of the flywheel.

The system uses a Lamar Technologies AC2101 Regulator mounted in the aircraft J-Box on the firewall. The Kelly Backup Alternator Kit installed a second regulator, a Lamar Technologies DGR3-1. The backup regulator is installed on the firewall covered by the J-Box assembly. A toggle switch in the cockpit allows the selection of the backup regulator. The system is set up with single pole multiple throw relays that will disconnect the primary regulator before the backup regulator is connected.

3.0 SECTION: CONTROL / OPERATION INFORMATION

A low voltage failure of the primary alternator is indicated by a low voltage and battery discharge on the PFD and MFD. When the backup alternator is selected, the low voltage and battery discharge indication on the PFD and MFD will go away. Load shedding may be required if the electrical system is drawing more than 70 amps.

A high voltage failure of the primary alternator is indicated by a high volts annunciation or main battery amp draw of more than 40 amps or an open Alt Field Circuit Breaker. When the backup alternator is selected the pilot will need to reset the Alt Field circuit breaker (if tripped) and the high volts annunciation or main battery amp draw will go away. Load shedding may be required if the electrical system is drawing more than 70 amps.

A low voltage failure of the primary regulator is indicated by a low voltage and battery discharge on the PFD and MFD. When the backup regulator is selected, the low voltage and battery discharge indication on the PFD and MFD will go away.

A high voltage failure of the primary regulator is indicated by a high volts annunciation or main battery amp draw of more than 40 amps or an open Alt Field Circuit Breaker. When the backup regulator is selected the pilot will need to reset the Alt Field circuit breaker (if tripped) and the high volts annunciation or main battery amp draw will go away.

The primary alternator can be used with the either primary or backup regulator and the secondary alternator can be used with either the primary or backup regulator.

It is not often immediately clear whether there is an alternator or a regulator failure. The pilot should follow the emergency procedures in NC-15-011 AFMS to resolve the low voltage or high voltage condition.

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4.0 SECTION: MAINTENANCE / SERVICING INSTRUCTIONS

Note: Before inspections or maintenance are performed it is the responsibility of the owner/operator and maintenance agency to assure that they are in possession of the latest revision of the applicable documentation and drawings.

ALTERNATOR

Every 100 hours or during annual an inspection is required. Ensure that the alternator and its brackets are secure and in good condition. Check the electrical connections and make sure they are secure. Inspect the alternator belt for condition and tension. Make proper adjustments as needed. Refer to Cessna Maintenance Manual Section 24-20-00 for belt tensioning procedures. The belt tension for the back-up alternator should be identical to that of the primary alternator.

ELECTRICAL

Every 100 hours or during annual an inspection is required. Inspect wiring for chaffing, mounting, attachment, proper routing, fraying and arcing. Ensure all connections are tight, verify all components are secure.

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5.0 SECTION: TROUBLESHOOTING

Refer to Kelly Aerospace Drawing AL-00195 for Backup Alternator System wiring diagram.

Failures of the Kelly Aerospace Backup Alternator System can include but may not be limited to the following situations:

- 1) No output voltage from alternator
 - a. Possible Failure of the DGR3-1 Voltage Regulator. Characterized by unreliable fluctuating voltage output or no voltage output from alternator. Ensure connections are made correctly; may need to replace voltage regulator.
 - b. Possible Failure of the alternator. Characterized by no output voltage from alternator. Check connections to alternator. May need to replace alternator.
- 2) Power is output from the alternator but is not making it to the aircraft bus. Characterized by voltage to main DC Contactor but not to the main bus when backup alternator system is turned on.
 - a. Ensure connections are made correctly to DC Contactor, Field Relay, Voltage Regulator Relay and Switches.
 - b. Possible failure of DC Contactor or one of the Relays. May require replacement of DC Contactor or one of the Relays.
 - c. Possible failure of Toggle Switch. The indicator light should always align with the position of the Toggle Switch.

6.0 SECTION: REMOVAL AND REPLACEMENT INFORMATION

Refer to the Kelly Aerospace Backup Alternator System Installation Manual document NC-15-013.

7.0 SECTION: DIAGRAMS

Lists of all applicable diagrams are in document NC-15-007.

All drawings and diagrams will be provided by Kelly Aerospace Thermal Systems. These may be obtained by contacting Kelly Aerospace by calling 440-951-4744.

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8.0 SECTION: SPECIAL INSPECTION REQUIREMENTS

Inspect the system during 100 Hr and/or Annual inspections. There are no servicing requirements for the Back-Up Alternator System outside of normal 100hr/Annual inspection intervals or during routine maintenance.

Remove necessary access covers per the ASM.

During the annual or 100 hr inspections check for the following items:

1. Security of attachment of all components.
2. Loose or missing hardware.
3. Check wires for chaffing, mounting, attachment, proper routing, fraying and arcing.
4. Check Belt Tension. Set to identical values, listed in the Cessna Maintenance Manual Section 24-20-00, specified for the primary alternator belt.

9.0 SECTION: OVERHAUL PERIOD

No additional overhaul periods required.

10.0 SECTION: AIRWORTHINESS LIMITATIONS

The Airworthiness Limitations Section is FAA APPROVED and Specifies maintenance required under FARs parts 43.16 and 91.403 unless an alternate program has been FAA APPROVED. There are no additional Airworthiness Limitations as a result of this alteration.

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