

electroair
ELECTRONIC IGNITION SYSTEMS

EIS-61000
Instructions for Continued
Airworthiness

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Table of Contents

General:	3
Precautionary Statements:	5
Eligibility:	6
Manual Reference:	6
Airworthiness Limitations Section (ALS):.....	7
Receiving and Acceptance Checking of EIS Kit:	7
Inspections:	7
Annually:	7
Each 1000 hours or five years:.....	8
At Engine Overhaul or Sudden Stoppage:	8
Lightning Strikes, Engine Fires, Water Damage, Etc.:.....	8
Re-Installation:	8
Miscellaneous Information:.....	9
Glossary and Abbreviations:	9
Revision Log	10

General:

This Instruction for Continued Airworthiness contains the necessary information required for the operation of an electronic ignition system (EIS) as installed on 6-cylinder Continental 360, 470, 520, and 550 naturally aspirated and turbocharged series engines along with Lycoming 540 naturally aspirated series engines.

A. FUNCTIONAL OVERVIEW

The Electroair EIS-61000 Electronic Ignition System is a single magneto replacement. The aircraft is now equipped with an EIS-61000 and a single magneto; both units make up the dual ignition system. The EIS-61000 kit consists of the following components: Controller (EA-7000), Coil Pack (EA-8000), MAP Sensor (EA-5000), Spark Plug Wires (EA-4000T), Wire Harness (EA-6000), and Trigger Mechanism (EA-11000, EA-9000A, or EA-10000).

The EIS-61000 Electronic Ignition System performs its function by delivering energy generated by the coil pack to each spark plug attached to the system. This high voltage from the coil pack (on the order of 70,000V), creates a high intensity, long duration spark which more effectively ignites a wide range of fuel/air mixtures inside of the cylinder. The EIS-61000 is also able to vary the ignition timing (spark event) during the combustion cycle so as to more closely have the peak pressure as a result of combustion occur at an optimal range for a piston engine. The adjustment of ignition timing is based on MAP inside the engine. The combination of a high energy spark and variable timing, the two principle differences between the EIS-61000 and a magneto, permits more an efficient operation of the engine.

The EIS-61000 is operated by DC power provided by the aircraft's power bus. There are two circuit protection devices used for the EIS-61000; reference table one for the type and size of the protection devices. These circuit protection devices are not normally accessed during flight.

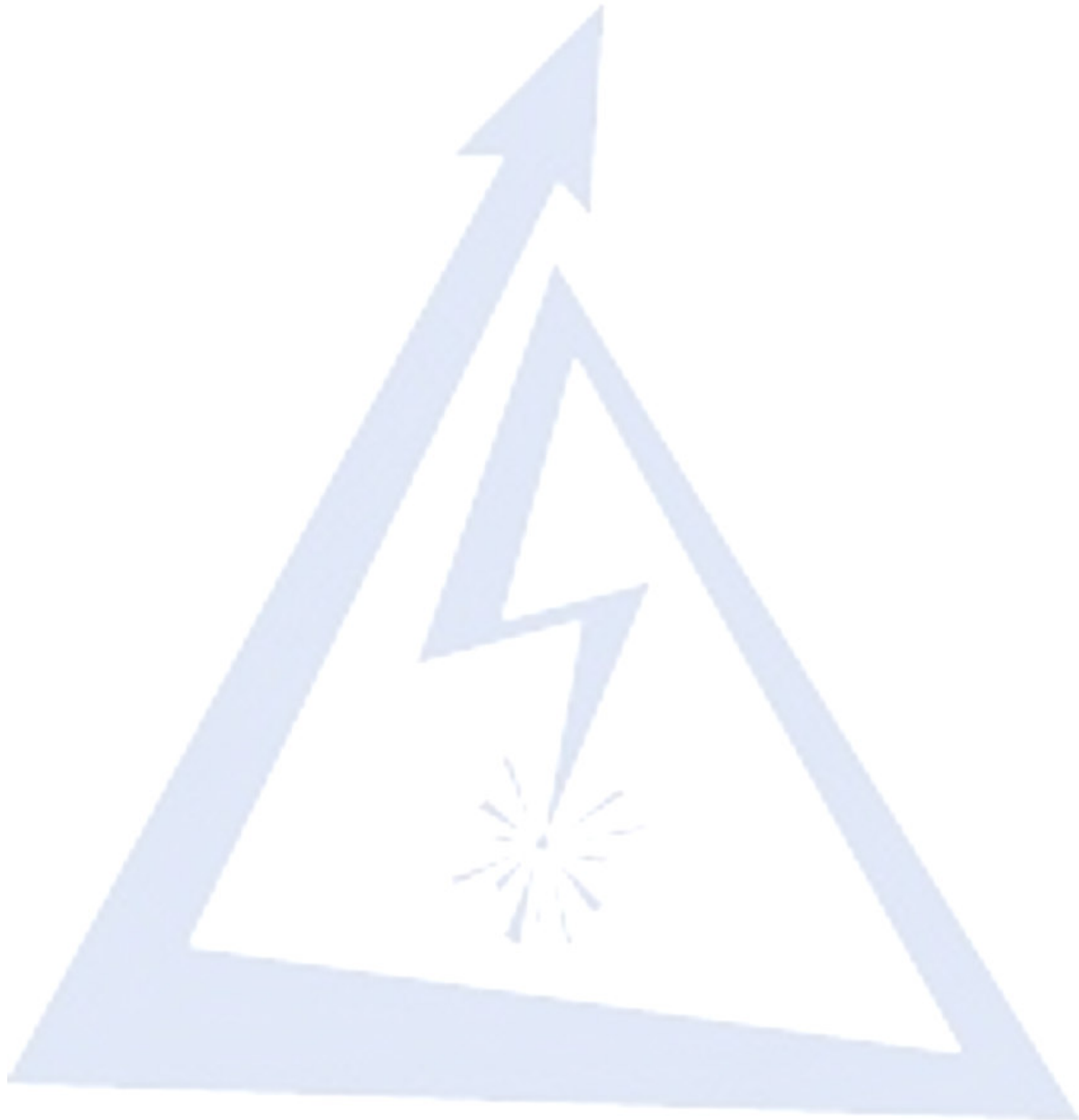
The EIS-61000 is controlled by using the switch labeled "EIS". The EIS-61000 may be disabled by setting the switch labeled "EIS" to the OFF position. The pilot should familiarize him/herself with the location of the "EIS" before proceeding with the pre-flight checklist.

FUNCTION	IDENT	RATING	BUS	POWER SUPPLY
EA-7000 Power	EIS	2.0 AMP	Aircraft Power	12/24VDC
EA-8000 Power	EIS	10.0 AMP	Aircraft Power	12/24VDC

Table One: DC Circuit Protection

B. SYSTEM OPERATION

Under normal operating conditions, the EIS-61000 Electronic Ignition System will be controlled by the flight crew in the same manner as the magneto that was previously installed. The AFM has been updated to reflect the change to the aircraft ignition system.



Precautionary Statements:

- Read this entire document before starting any processes listed within. If there are any questions please contact Electroair before starting to resolve them. (517-552-9390 or sales@electroair.net)
- If an EIS is improperly installed or misfired; the EIS, the aircraft, or the installer could be seriously damaged.
- Always use appropriate work and safety practices.
- On some engines like the Lycoming 540 series or Continental 470 and 520; the magneto drive gear is not attached to the magneto and must be secured or it could damage the engine.
- The exposed section of the crankshaft is tin plated; using an abrasive will remove the plating. It is recommended to use a liquid cleaner/degreaser to clean this area.
- Do not tighten the CSTW screws to the point where there is no gap between the halves.
- Do not leave the feeler gauge in the gap between the CSTW and the magnetic pick-up when rotating the engine.
- Be careful when not using an Electroair plug, when gapping the outer electrode, this electrode can become over stressed and break.
- Since each wire in the spark plug assembly will make 2 spark plug wires, be careful when determining spark plug wire length.
- Spark plug leads shall be disconnected from the ignition system before inspection.
- **DO NOT NEGLECT** the required maintenance of the remaining magneto or pressurize magneto.
- For the latest up to date information refer to www.electroair.net (ICA, AML, Installation Manual, AFMS, etc.)
- For abnormal operation, for ignition systems that have a suspected failure, refer to the Electroair Trouble Shooting Instructions at http://electroair.net/pdfs/troubleshooting_the_EIS.pdf

Eligibility:

Make:	Lycoming	Continental
Model:	540 6-cylinder series	360 6-cylinder series
		470 6-cylinder series
		520 6-cylinder series
		550 6-cylinder series

(See approved model list (AML) for exact model numbers)

Manual Reference:

Electroair Kit Part Number	Installation Manual Number
EIS-61000-1C	IM EIS-61000
EIS-61000-T1C	IM EIS-61000
EIS-61000-5C	IM EIS-61000
EIS-61000-T5C	IM EIS-61000
EIS-61000-TTT5C	IM EIS-61000

(See approved model list (AML) for kit part number applicability)

Airworthiness Limitations Section (ALS):

The Airworthiness Limitations section is FAA approved and specifies maintenance required under §§43.16 and 91.403 of Title 14 of the Code of Federal Regulations unless an alternative program has been FAA approved. There are no FAA mandated inspection or replacement intervals for this STC.

Receiving and Acceptance Checking of EIS Kit:

1. Review the packaging before acceptance from the freight carrier.
 - a. If damaged refuse.
2. Open the package.
3. Review the contents of the package to the content listing on the package.
4. Are all of the materials there?
 - a. Yes, proceed to step 5.
 - b. No, contact the factory. Have the serial number of the kit available when contacting. (factory 517-552-9390 or sales@electroair.com)
5. Review the controller and MAP sensor for damage to the aluminum housing.
6. Review the wires for nicks and cracks.
7. Review the coil pack and plate for external damage.
8. Review the CSTW for external damage.
9. Are all materials acceptable?
 - a. Yes, proceed with installation.
 - b. No, contact the factory. Have the serial number of the kit available when contacting. (factory 517-552-9390 or sales@electroair.com)

If possible, store parts in original packaging when not in use. If not possible, wrap parts in cushioning material and place in one location. Review as above prior to reinstallation.

Inspections:

Refer to the installation manual for required tooling. Note: Installation of the EIS system does NOT eliminate the requirement to comply with applicable airworthiness directives (ADs).

Annually:

1. Inspect all wire connectors. Verify connections are still competent.
2. Inspect all ground connections. Verify they are competent and have continuity with the ground terminal on the aircraft battery or other acceptable ground buss.
3. Inspect "Gasket" area on MAG Time Housing, if installed. Ensure no oil leaks coming from the gasket area. If a new gasket is required contact the factory for a replacement.
4. Inspect for oil seal failures if MTH installed.
 - a. Remove the MTH cover.
 - b. Inspect for oil pooling. Note: A thin film of oil does not indicate a failure.

- c. Replace the cover in the same orientation it was removed. For units that have a yellow triangle on the MTH cover label, the yellow triangle shall point towards the magnetic sensor when installed.
 - d. **NOTE:** The MTH is not a field serviceable or repairable unit.
 - e. **NOTE:** The MTH is aluminum and the cover screws are brass use care when re-installing the cover and screws after inspection.
5. Inspect all spark plug wires to check for exterior damage. If any wires look damaged in any way they MUST be replaced.
 6. Remove and inspect spark plugs.
 - a. Replace if fouled or out of acceptable resistance range (refer to <http://electroair.net/sparkplugs.html> for resistance values).
 - b. Verify spark plug gap at this time. Adjust as required.
 - c. The spark plug gap for the EIS is 0.036 inches.
 7. Inspect MAP Sensor hose connection. Verify no vacuum leaks.
 - a. Pass: No vacuum leaks.
 - b. Fail: Vacuum leaks. Address connections to vacuum system. Contact the factory (517-552-9390 or sales@electroair.net) if further assistance is needed.
 8. Inspect all placards and labels for existence and legibility. If missing or no longer readable, replace.
 9. If fuses were used instead of circuit breakers, inspect for the existence of readily accessible spare fuses. (Note: 14CFR 91.205(c)(6) applies when using fuses.)

Each 1000 hours or five years:

1. Replace spark plug wires and attaching hardware with new Electroair spark plug wires and attaching hardware. Use Electroair part number EA-4000T for spark plug wire and specify attaching spark plug hardware combination.

At Engine Overhaul or Sudden Stoppage:

1. Replace MAG Timing Housing, if installed, with a new Electroair MAG Timing Housing part number EA-10000 series appropriate for the engine.
2. Inspect CSTW and brackets. Replace if suspect. Replace magnetic sensor.

Lightning Strikes, Engine Fires, Water Damage, Etc.:

1. Inspect the EIS wiring harness, controller, and MAP sensor.
2. If there is obvious damage, replace the damaged parts.
3. If there is no obvious damage, perform a ground run-up. If no problems are found, continue with the standard procedures as stated in the AFMS.
4. If unsure, contact factory (517-552-9390 or sales@electroair.net)

Re-Installation:

1. For instructions on reinstalling individual EIS-61000 components or the entire system, refer to the EIS-61000 Installation Manual that was included with the EIS-61000 kit. If the original manual is not with the system, contact the factory for an up to date replacement installation manual (517-552-9390 or sales@electroair.net) or retrieve from the factory's website www.electroair.net.

2. After re-install follow the instruction for start-up in the AFMS to verify the operation of the EIS system.

Miscellaneous Information:

- For impulse coupled applications record:
 - Sacrificed magneto model number: _____
 - Sacrificed magneto part number: _____
 - Sacrificed magneto serial number: _____
- For updated versions of this and other documents Electroair documents; refer to the company website: www.electroair.net.
- Announcements regarding updates will be made via the Electroair page on www.facebook.com and constant contact.
- Use of a high tension lead tester is acceptable as long as all applicable precautions have been taken.

Glossary and Abbreviations:

- AD(s) – airworthiness directive(s)
- AFM – aircraft flight manual
- AFMS – aircraft flight manual supplement
- ALS – aircraft limitations section
- AML – approved model list
- BTDC – before top dead center
- CFR – code of federal regulations
- CSTW – crankshaft trigger wheel
- EIS – electronic ignition system
- FAA – federal aviation administration
- MAG -- magneto
- MAP – manifold absolute pressure
- May/Should – an optional requirement
- MTH – mag timing housing
- Must/Shall – a mandatory requirement
- RPM – revolutions per minute
- STC – Supplemental Type Certificate
- TDC – top dead center

Revision Log

Revision	Date of Revision	Description of Revision	Approved by	Date of Approval
00	08/26/2013	Initial Release	KP	08/26/2013
01	09/30/2013	Document Maintenance	KP	09/30/2013
02	10/01/2013	Corrected issues from FAA memo dated 08/30/2013 and received 09/30/2013	KP	10/01/2013
03	11/01/2013	Added handling information.	KP	11/04/2013
04	11/25/2013	Corrected issues from AEG follow up email dated 11/22/2013.	KP	11/25/2013
05	11/25/2013	Added information regarding MTH cover orientation to annual inspection.	KP	11/25/2013
06	05/06/2014	ECO 1116-0050	KP	05/06/2014
07	09/03/2014	ECO 1116-0071	KP	10/01/2014