EIS-41000
Instructions for Continued Airworthiness

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CHICAGO AIRCRAFT CERTIFICATION OFFICE
CENTRAL REGION

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General:

This Instruction for Continued Airworthiness contains the necessary information required for the operation of an electronic ignition system (EIS) as installed on 4-cylinder Continental A65, A75, A80, C85, C90, O-200, and IO-240 series engines along with Lycoming O-235, O-290, O/IO-320, O/IO360, and IO/AEIO-390 series engines.

A. FUNCTIONAL OVERVIEW

The Electroair EIS-41000 Electronic Ignition System is a single magneto replacement. The aircraft is now equipped with an EIS-41000 and a single magneto; both units make up the dual ignition system. The EIS-41000 kit consists of the following components: Controller (EA-1000), Coil Pack (EA-2000), MAP Sensor (EA-5000), Spark Plug Wires (EA-4000), Wire Harness (EA-6000), and Trigger Mechanism (EA-3000(LH)1(I)C).

The EIS-41000 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-41000 and a magneto, permits more an efficient operation of the engine.

The EIS-41000 is operated by DC power provided by the aircraft’s power bus. There are two circuit protection devices used for the EIS-41000; reference table one for the type and size of the protection devices. These circuit protection devices are not normally accessed during flight.

The EIS-41000 is controlled by using the switch labeled “EIS”. The EIS-41000 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.

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>IDENT</th>
<th>RATING</th>
<th>BUS</th>
<th>POWER SUPPLY</th>
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<tr>
<td>EA-1000 Power</td>
<td>EIS</td>
<td>2.0 AMP</td>
<td>Aircraft Power</td>
<td>12/24VDC</td>
</tr>
<tr>
<td>EA-2000 Power</td>
<td>EIS</td>
<td>10.0 AMP</td>
<td>Aircraft Power</td>
<td>12/24VDC</td>
</tr>
</tbody>
</table>

Table One: DC Circuit Protection
B. SYSTEM OPERATION

Under normal operating conditions, the EIS-41000 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 this document. If there are any questions or concerns please contact Electroair before starting. (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.
- 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.
- Use care when not using an Electroair spark plug, during gapping the outer electrode may become over stressed and break.
- Since each wire in the spark plug assembly will make 2 spark plug wires, use care 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:

<table>
<thead>
<tr>
<th>Make</th>
<th>Lycoming</th>
<th>Continental</th>
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<tbody>
<tr>
<td>Model</td>
<td>235 4-cylinder series</td>
<td>65 4-cylinder series</td>
</tr>
<tr>
<td></td>
<td>290 4-cylinder series</td>
<td>75 4-cylinder series</td>
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<tr>
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<td>320 4-cylinder series</td>
<td>80 4-cylinder series</td>
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<td>360 4-cylinder series</td>
<td>85 4-cylinder series</td>
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<td>390 4-cylinder series</td>
<td>90 4-cylinder series</td>
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<td></td>
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<td>200 4-cylinder series</td>
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<tr>
<td></td>
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<td>240 4-cylinder series</td>
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</tbody>
</table>

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

### Manual Reference:

<table>
<thead>
<tr>
<th>Electroair Kit Part Number</th>
<th>Installation Manual Number</th>
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<tbody>
<tr>
<td>EIS-41000</td>
<td>IM EIS-41000</td>
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<tr>
<td>EIS-41000T</td>
<td>IM EIS-41000</td>
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</tr>
<tr>
<td>EIS-41000TLHIC</td>
<td>IM EIS-41000</td>
</tr>
</tbody>
</table>

(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. If the packaging is damaged, refuse the shipment.
2. Open the package; and, review the contents of the package to the content listing on the package.
3. 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. (517-552-9390 or sales@electroair.com)
4. Review the controller and MAP sensor for damage to the aluminum housing.
5. Review the wires for nicks and cracks.
6. Review the coil pack and plate for external damage.
7. Review the CSTW/MTH for external damage.
8. Are all materials acceptable?
   a. Yes, proceed with installation.
   b. No, contact the factory. Have the serial number of the kit available when contacting. (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. The installation manual can be found online at http://electroair.net/pdfs/EIS_41000_Installation_Manual.pdf. 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 bus.
3. Inspect “Gasket” area on MAG Time Housing/Magneto Plug. 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.
   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.

5. Inspect all spark plug wires for exterior damage. If any wires look damaged in any way the wires 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](http://electroair.net/sparkplugs.html) for the resistance values)
   b. Verify spark plug gap at this time. Adjust as required.

   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 placards no longer exist or are no longer legible, 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-4000(T) for spark plug wire and EA-4000REM or EA-4000RHM/RHB for the attaching hardware combination. The (T) denotes an additional wire length for twin aircraft.

**At Engine Overhaul or Sudden Stoppage:**

1. Replace MAG Timing Housing, if installed, with a new Electroair MAG Timing Housing part number EA-3000(LH)(IC).

2. Inspect CSTW and brackets. Replace the CSTW and/or bracket if damage suspected. 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 removal follow the EIS-41000 Installation Manual in reverse order.

2. For instructions on reinstalling individual EIS-41000 components or the entire system, refer to the EIS-41000 Installation Manual that was included with the EIS-41000 kit. If the original installation 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.
3. After re-installation follow the instructions for start-up in the AFMS to verify the operation of the EIS system.
**Miscellaneous Information:**

- For impulse coupled applications record:
  - Donor magneto model number: ______________
  - Donor magneto part number: ______________
  - Donor magneto serial number: ______________
- For updated versions of this and other documents Electroair documents; refer to the company website: [www.electroair.net](http://www.electroair.net).
- Announcements regarding updates will be made via the Electroair page on [www.facebook.com](http://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
<table>
<thead>
<tr>
<th>Revision</th>
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<th>Description of Revision</th>
<th>Approved by</th>
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<td>Added TCM 4 cylinder models</td>
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<td>03</td>
<td>10/07/2013</td>
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<td>KP</td>
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<td>Added handling information.</td>
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