FAA APPROVED

AIRCRAFT FLIGHT MANUAL SUPPLEMENT

For

SYSTEM INSTALLATION

Of

EIS-41000 ELECTRONIC IGNITION SYSTEMS

Registration No. _____

Serial No. _____

This supplement must be attached to the FAA approved Aircraft Flight Manual when the Electroair electronic ignition system has been installed per FAA STC #SA02987CH.

The information contained herein supplements or supersedes the basic Aircraft Flight Manual only in those areas listed. For limitations, procedures, and performance information not contained in this supplement, consult the basic Aircraft Flight Manual.

FAA APPROVED: Ronald D. McElroy
for Steven L. Lardinois
Manager, Systems and Flight Test Branch
Chicago Aircraft Certification Office
Federal Aviation Administration

Log of Revisions:

Revision	Date of Revision	Description of Revision	Approved by	Date of Approval
00		Skipped		
01		Initial Release		
02				
03			Joseph Miess	07/05/2011
04			Joseph Miess	02/06/2012
05	03/12/2012		Joseph Miess	04/02/2012
06	03/14/2014	Updated for format changes made to the 6 cylinder AFMS	RDM Elley	MAR 3 1 2014

Table of Contents:

Section 1: General:

This Aircraft Flight Manual Supplement contains the necessary information required for the operation of an electronic ignition system (EIS) as installed on 4 cylinder Continental A65, A75, C75, A80, C85, C90, O-200, and IO-240 series engines along with Lycoming O-235, O-290, O or IO-320, and O or IO-360 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).

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-41000 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.

FUNCTION	IDENT	RATING	BUS	POWER SUPPLY
EA-1000 Power	EIS	2.0 AMP	Aircraft Power	12/24VDC
EA-2000 Power	EIS	10.0 AMP	Aircraft Power	12/24VDC

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 shall be updated by adding the task of turning ON the system (EIS) after the Master Switch is turned ON; and by turning OFF the system (EIS) prior to the Master Switch being turned OFF (reference Section 4: Normal Procedures for AFM updates). The AFM shall also be updated in the magneto trouble-shooting section to change wording to reflect the fact than an Electronic Ignition System has been installed (reference Section 3: Emergency/Abnormal Procedures for AFM updates).

Section 2: Limitations:

VOLTAGE

System voltage to EIS-41000 shall be at least 8VDC, or EIS will not function.

PLACARDS

Ignition system will be placarded in accordance with installation instructions, identifying the magneto and the EIS.

Section 3: Emergency/Abnormal Procedures:

Emergency Procedures

No Change

Abnormal Procedures

Alternator/Generator Failure:

No Change

Note: It is important to take into consideration that the EIS-41000(s) will be drawing power from the aircraft's remaining power supply. For load shedding calculations, use the value of 0.75 Amps for what one EIS-41000 will draw. It is NOT recommended to load shed the EIS.

Problem: Rough running engine and/or high CHTs:

Perform in-flight troubleshooting in accordance with POH. Determine if one of the ignition systems is bad and isolate the bad/suspected ignition system.

Problem: Severe loss in engine power and/or low CHTs, engine operating smoothly:

Perform in-flight troubleshooting in accordance with POH. Determine if one of the ignition systems is bad and isolate the bad/suspected ignition system.

Section 4: Normal Procedures:

I. Preflight:

Update the POH to include turn "EIS-ON" after turn Master Switch ON.

II. Starting:

"EIS Switch – ON" Procedure:

Verify the switch labeled "EIS" to the ON position.

III. Ignition Check:

Procedure, With Rotary or Key Switch:

The ignition check shall be made at the same RPM as defined in the AFM.

Ignition switch to "BOTH" position
Ignition switch to "R" position – Note RPM Drop _____
Ignition switch to "BOTH"
Ignition switch to "L" position – Note RPM Drop _____
Ignition to "BOTH" position

Magneto RPM drop should not exceed the RPM defined in the AFM. EIS RPM drop is defined below. If there is a doubt concerning operation of the ignition systems, RPM checks at higher engine speeds will usually confirm whether a deficiency exists. At the end of the ignition check move ignition switch back to "BOTH" position.

RPM Drops:

Magneto – as defined in POH.
EIS – 30-40 RPM max

Procedure, With Standard or Rocker Switch:

The ignition check shall be made at the same RPM as defined in the AFM.

Ignition BOTH ON
EIS OFF – Note RPM Drop _____
EIS ON
Magneto OFF – Note RPM Drop _____
Magneto ON

Magneto RPM drop should not exceed the RPM defined in the POH. EIS RPM drop is defined below. If there is a doubt concerning operation of the ignition systems, RPM checks at higher engine speeds will usually confirm whether a deficiency exists. At the end of the ignition check move ignition switches back to "ON" position.

RPM Drops:

Magneto – as defined in POH.
EIS – 30-40 RPM max

IV. Takeoff:

No Change

V. Cruise:

No Change

VI. Descent:

No Change

VII. Landing:

No Change

VIII. Shutdown:

"EIS Switch – OFF" Procedure:

In the POH, add turn the switch labeled "EIS" to the OFF position before turn Master Switch OFF.

IX. Post-flight:

No Change

Section 5: Performance:

No Changes

Section 6: Weight and Balance:

The installation of the EIS-41000 requires the removal of one Magneto and the installation of the six EIS-41000 components. This installation results in a change to the aircraft's weight and balance. A new weight and balance should be calculated for the aircraft after the installation of the EIS-41000(s). All future loading calculations should use the updated aircraft weight and balance. The individual EA part weights are below. NOTE: For the twin engine aircrafts the weight and balance must include the weights of both sets of EIS-41000 components.

1. EA-1000: 0.8 pounds (Controller)
2. EA-2000: 2.9 pounds (Coil Pack)
3. EA-3000: 1.5 pounds (Mag Timing Housing)
4. EA-4000: 1.1 pounds (Spark Plug Wires)
5. EA-5000: 0.4 pounds (MAP Sensor)
6. EA-6000: 0.8 pounds (Controller Wire Harness)

Section 7: 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
APU – Auxiliary Power Unit
BTDC – Before Top Dead Center
CFR – Code of Federal Regulations
CSTW – Crank Shaft Trigger Wheel
EIS – Electronic Ignition System
FAA – Federal Aviation Administration
Ignition Timing – is the process of setting the angle relative to piston position and crankshaft angular velocity that a spark will occur in the combustion chamber near the end of the compression stroke.
MAG – magneto
MAP – Manifold Absolute Pressure
May/Should – an optional requirement
MTH – Mag Timing Housing
Must/Shall – a mandatory requirement
RPM – Revolutions Per Minute
POH – Pilot's Operating Handbook
STC – Supplemental Type Certificate
TDC – Top Dead Center