Kelly Aerospace
Willoughby, OH
NC-10-088, Rev. A

FAA APPROVED

AIRPLANE FLIGHT MANUAL SUPPLEMENT

FOR

PA-44-180

AIR CONDITIONING SYSTEM

Aircraft SN: _____

Aircraft Registration Number: _____

This supplement must be attached to the FAA approved flight manual when the Kelly Aerospace Air Conditioning system is installed in accordance with STC SA03093CH . The information contained in this document supplements or supersedes the basic manual only in those areas listed. For limitations, procedures, performance, and loading information not contained in this supplement, consult the basic FAA Airplane Flight Manual.

FAA-Approved

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Manager, Southwest Flight Test Section, AIR 713
Federal Aviation Administration
Ft. Worth, TX

LOG OF REVISIONS

REV.	PAGES	DESCRIPTION	APPROVED BY	DATE
1	1 - 11	Complete Supplement	Michael Ward For Steven L. Lardinois Manager, Systems & Flight Test, Chicago ACO, Des Plaines, Il	3 May 2012
A	7-8 11	Replace A1235 Controller Instructions with CB-2 Instructions Add 3 amp breaker description	Manager, AIR-713 FAA Ft. Worth, TX	5/23/18

TABLE OF CONTENTS

SECTION 1
GENERAL

This Airplane Flight Manual Supplement describes the operation of the PA-44-180 airplane with the optional Kelly Aerospace Air Conditioning System installed by this STC SA03093CH .

Electrical power for operation of the Air Conditioning System is supplied via an independent 60-amp, +28VDC, Auxiliary Bus (AUX BUS) installed by STC SA03092CH . The auxiliary electrical bus is powered by its own belt-driven alternator installed on the left engine and includes a small lead-acid storage battery. The +28 Volt ground power receptacle, located in the nose on the left side, is available to power the Aux Bus during air conditioning system ground operations.

NOTE: The Auxiliary Bus is independent of the aircraft's existing dual alternator, +14 Volt direct-current electrical system.

SECTION 2
LIMITATIONS

1) Maximum Current draw on the Auxiliary Bus is 60 amps.
2) Minimum left engine speed is 1000 RPM when the Air Conditioning is ON to ensure adequate alternator output to the Auxiliary Bus.
3) Air Conditioning use is prohibited during Takeoff, Landing and Single Engine operations.
4) Required Placards -
   In full view of the pilot, in the area of the air conditioner controls:

"WARNING
AIR CONDITIONER and AUX BUS MUST BE OFF DURING TAKEOFF, LANDING and SINGLE ENGINE OPERATIONS."

In the area of the Aux Bus Ammeter in full view of the pilot:

"AUX BUS MAX
60 AMPS"

SECTION 3
EMERGENCY PROCEDURES

"AUX BUS" AMMETER INDICATING 60 AMPS or MORE

1) AUX BUS rocker switch to OFF.
2) Inspect and perform required maintenance after the flight.

SECTION 4
NORMAL PROCEDURES

+28 VOLT EXTERNAL POWER

The Air Conditioning System can only be powered when the left engine is operating unless the AUX BUS is energized via +28 volt external power.

1) Ensure AUX BUS rocker switch is OFF
2) External Power Plug.....INSERT in +28 VDC RECEPTACLE
3) Operate Air Conditioning system in FAN or AC Mode as desired.

CAUTION

AUX BUS rocker switch must remain OFF during operation of the Air Conditioning system with external power to prevent possible overcharging of the Auxiliary Bus 24V storage battery.

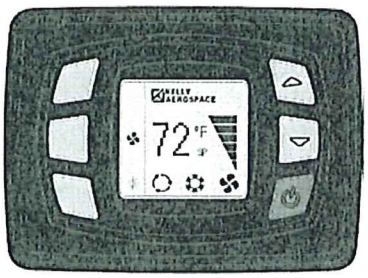
BEFORE ENGINE START

1) Ensure AUX BUS rocker switch is OFF by verifying that there is nothing displayed on the CB-2 Temperature Controller.
2) Follow normal procedures for engine start-up.

SECTION 4
NORMAL PROCEDURES (Continued)

AIR CONDITIONING AC MODE

1) Press the lower right button on the CB-2 Climate Controller, the display will first show the logo and software version; then it will show temperature set point, fan speed bar graph, and mode display.
2) Press the bottom left button and toggle between modes with the middle right button.
3) After selecting AC mode, either press the bottom right button to enter or wait 3 seconds and the display will return to the main screen. The snow flake symbol in the bottom center of the display will indicate Air Conditioning mode.



CB-2 Temperature Controller

Climate Controller Front Panel – AC Mode

NOTE: Left engine minimum idle speed 1000 RPM with AC in use.

AIR CONDITIONING FAN ONLY MODE

1) Press the bottom left button and toggle between modes with the middle right button.
2) After selecting fan mode, either press the bottom right button to enter or wait 3 seconds and the display will return to the main screen.

SECTION 4
NORMAL PROCEDURES (Continued)

TO CONTROL FAN SPEED

1) Press the middle left button to bring up the fan speed screen.
2) Toggle the fan speed up or down using the middle and upper right buttons. Speed Range is 1 to 3.
3) After selecting desired fan speed press the bottom right button to enter or wait 3 seconds and the display will return to the main screen. The fan speed bar graph on the right side of the screen will show selected fan speed. Fan speed can be controlled in both AC and Fan Only modes.

CHANGING TEMPERATURE SET POINT

1) Press the top or middle right buttons to adjust the temperature set point up or down.
2) The set point temperature will be displayed with an SP indication. The CB-2 display will default to the temperature set point.

TO DISPLAY CABIN TEMPERATURE

1) Press and release the bottom right button, the cabin temperature will be displayed with a TEMP indication. After a few seconds the temperature set point will be displayed again.

TO TURN AIR CONDITIONING SYSTEM OFF

1) Press and hold lower right button.

BEFORE ENGINE SHUT-DOWN

1) Turn "OFF" all components connected to the auxiliary bus.
2) Ensure AUX BUS rocker switch is OFF
3) Follow normal procedures for engine shut-down

SECTION 4
NORMAL PROCEDURES (Continued)

VOLTMETER / AMMETER OPERATION

1) The VA200 instrument displays voltage and ampere values associated with the auxiliary electrical bus power generation and usage. Display colors (Green/Red) are determined by the following range values:

   Low operating voltage = 22V

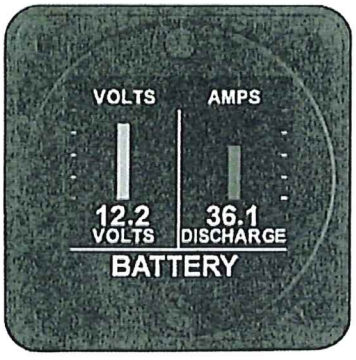
   High operating voltage = 30V

   Red Line voltage = 32V

   Max charge current = 48A

   Max alternator capacity = 60A

2) If the ammeter indicates discharge (red) from the battery, the AUX BUS switch should be switched OFF.



SECTION 5
PERFORMANCE

Airplane Flight Manual performance charts are unchanged for installation of the Air Conditioning System based on limiting system use during the Takeoff, Landing and Single Engine Operation segments. A measureable decrease in performance would otherwise be expected with the use of the Air Conditioning system.

SECTION 6
LOADING INFORMATION

The addition of the Air Conditioning System has been accounted for/included in the aircraft's basic empty weight and center of gravity. The Standard Aircraft Loading and CG envelope remain unchanged. Proper weight and balance calculations must be performed prior to flight to insure aircraft is properly loaded and within operating limitations.

SECTION 7
DESCRIPTION AND OPERATION

DESCRIPTION

The Air Conditioning system directs cool dry air through the headliner and out vents near the pilot, co-pilot and passenger seats. A climate controller located on the co-pilots instrument panel is used to set cabin fan speed and desired air temperature. Using R134a refrigerant, the air conditioning system is comprised of an evaporator, condenser, condenser fan, and electric compressor mounted in the system plenum underneath and to the rear of the hat rack on the left side of the aircraft.

Electrical power is supplied to the Air Conditioning system through a 28 VDC Auxiliary Bus (Aux Bus) by means of an independent belt-driven alternator mounted on the left engine. The Auxiliary Bus system consists of a 60 amp alternator, a small 24 volt storage battery and associated control and monitoring devices. The voltage regulator and 60 amp current limiter are mounted on the left engine firewall. Alternator output is passed through a shunt to connect an Aux Bus voltmeter / ammeter, located on the copilots instrument panel. The ammeter indicates bus voltage and total amps from the battery and the alternator. A small lead-acid storage battery, 24 Volt, 0.7 ampere hour, is mounted next to the main aircraft battery in the nose. This battery is used to absorb any voltage spikes produced by the alternator and protects any equipment connected to the bus. It is not intended that the battery be used to power any items on the bus.

SECTION 7
DESCRIPTION AND OPERATION (Continued)

OPERATION

The Air Conditioning system is required to be turned OFF during engine startup. The system can then be turned ON when the aircraft left engine is brought up to a 1000 RPM idle. The system is powered when the left engine is running and the AUX BUS rocker switch is ON and the AC Mode is activated on the climate controller. Desired cabin temperature and fan speed is also set on the climate controller using the TEMP and FAN buttons.

The AUX BUS can also be energized by external power using the 28 volt external power receptacle located on the left side of the nose of the aircraft. An external power supply capable of supplying 50 amps should be utilized.

Nominal operating current is 35 amps, measured at the compressor. Peak current draw is 45 amps when maximum cooling is required. If an electrical overload condition occurs, the air conditioning unit circuit breakers will trip. Four (4) Air Conditioning system breakers are located on the Air Conditioning system Plenum in the rear tail cone area of the aircraft. A 60 Amp breaker controls power to the compressor. A 7.5 Amp breaker controls power to the condenser fan. A 10 Amp breaker controls power to the evaporator blower. A 3 Amp breaker controls power to the CB-2 Temperature Controller. These breakers are only accessible by maintenance personnel through the block off panel behind the hat rack.