

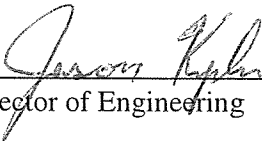
Aero Twin, Inc.  
**Auxiliary Dry Air Pump Kit No. AP8-100**  
For  
Cessna Model 208, 208A, and 208B Caravan Aircraft

**INSTRUCTIONS FOR CONTINUED  
AIRWORTHINESS**

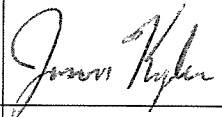
Document No. AP8-ICA

Maintenance Manual  
Airworthiness Limitations

Aero Twin Approved:

  
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Director of Engineering

Rev: E, Dated: September 11, 2013

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A	1/10/98	All pages revised and reissued per ECO AT-50, dated January 10, 1998. Document Number AP8-ICA assigned to this document.	Mike Lovett
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# 1.0 Maintenance Manual

## 1.1 INSPECTION REQUIREMENTS

The auxiliary pump system should be inspected and functionally checked on a regular 100 hr/annual basis. Inspect the following for condition and replace as necessary:

1. Mounting hardware
2. Contactor
3. Pump mounting bracket
4. Pump assembly
5. Hoses, fittings and clamps
6. Manifold and vacuum switches
7. Wire and electrical connectors
8. Elapsed time indicator (ETI)

Accomplish the following inspection of the AP8-100-20 manifold after five years in service, again after ten years in service, and every year thereafter:

1. Temporarily remove hoses from the manifold.
2. Connect a hose from a regulated air source to the manifold inlet (center fitting).
3. Apply air pressure of 3 to 5 PSIG and verify that air is released through both discharge fittings (both ends). If air flows from only one fitting, block flow with finger to verify air will flow from the other discharge fitting. With either discharge fitting blocked, air should flow from the other.
4. Disconnect the air source from the inlet fitting.
5. Connect the air source to one of the discharge fittings.
6. Apply 3 to 5 PSIG air pressure at one of the discharge fittings. Inspect for flow across the check valve by noting any flow out of the inlet fitting or the other discharge fitting. Any flow at either one of these locations is cause for replacement of the manifold assembly.
7. Remove the air source from the vacuum manifold's discharge fitting and connect it to the other discharge fitting. Repeat step 6 to check the other check valve.
8. Remove the air source from the manifold assembly. Inspect the manifold for defects. If the manifold assembly passes the leakage test and no other defects are found, it may be returned to service. Manifolds failing the test or with other defects are to be replaced.
9. Reattach hoses removed in step 1 and perform the operational check in 1.2.

## 1.2 OPERATIONAL CHECK - ENGINE OFF

The Aero Twin auxiliary pump system should be operationally checked every 100hr/annual as follows:

NOTE: If it is required to run auxiliary pump for more than a couple of minutes, it is recommended that the aircraft be connected to an APU.

1. Turn aircraft battery switch "ON".
2. The "VAC OFF" side of auxiliary dry air pump switch should be illuminated, and will remain illuminated until the engine is running (indicating that engine operated ejector pump vacuum is under 3 inches of mercury). If not, trace the system wiring to locate the problem (refer to Figure 1 at the end of Section I).
3. Push the auxiliary dry air pump switch to cycle it to the "ON" position. Switch will stay partially depressed. Do not run the auxiliary pump for more than a couple of minutes unless an APU is connected.
4. Auxiliary pump "AUX ON" light should be illuminated (indicating that the auxiliary system is drawing vacuum). If the light does not illuminate, check that the pump is actually running. If not, trace the wiring to determine the problem. If the pump is running, check for vacuum leaks.
5. The Annunciator Panel "VAC LOW" light should cycle off shortly after pump is turned on (indicating that vacuum in available for the instrument system is greater than 3 inches of mercury).
6. Check suction gauge for proper system vacuum, 4.5 to 5.5 inches of mercury.
7. Push the auxiliary vacuum switch to cycle to the "OFF" position.
8. The auxiliary pump "AUX ON" light should cycle off.
9. The annunciator panel "VAC LOW" light should illuminate.
10. The "VAC OFF" annunciator should remain illuminated for this entire check.
11. Turn the aircraft battery switch "OFF".

### 1.3 IN-SERVICE TIME LIMITS

In order to assure high reliability of the auxiliary pump system as a back-up power supply for vacuum instruments, an in-service time limit has been placed on the pump/motor assembly and system hoses. A 10 year/500 hour overhaul kit, including the ETI, pump/motor, and hoses is available from Aero Twin as P/N AP8-100-10YR.

#### SPECIAL MAINTENANCE NOTE

The pump/motor assembly and all MIL-H-6000 system hoses must be removed from service and replaced at 500 hours cumulative pump operating time as indicated on the elapsed time indicator (ETI) or at 10 years of installed time in the aircraft, whichever occurs first. The ETI is matched to the pump/motor assembly and must be replaced with the pump.

Under normal usage, 500 hours of pump-operating time is equivalent to 8000 hours or more of aircraft operating time. *The pump must be running to read the elapsed time indicator (ETI).*

At the required time, remove and replace the auxiliary pump/motor assembly and ETI as follows:

1. Turn off aircraft master switch and auxiliary pump switch.
2. Disconnect hoses from pump/motor assembly.
3. Disconnect electrical leads at terminals on pump/motor assembly. If a replacement assembly is not to be installed immediately, insulate the lead ends.
4. Loosen band clamps and remove pump/motor assembly from aircraft.
5. Remove fittings from pump/motor assembly. If serviceable, save fittings for use with replacement pump.

**WARNING:** Do not place pump or motor housing in vice. Hold by hand when removing or tightening fittings.

6. Locate the ETI on the pump-mounting bracket and disconnect electrical leads from the contactor. If a replacement ETI is not to be installed immediately, insulate and secure the leads remaining in the aircraft.
7. Remove the ETI. Secure ETI to pump/motor assembly for later disposal.

NOTE: If a replacement auxiliary pump/motor assembly is not installed prior to next flight, cover the auxiliary pump switch, on the instrument panel, with an "INOP" placard.

8. Install replacement auxiliary pump/motor assembly by reversing removal procedures. Install replacement ETI per Section II, paragraph D.2 of the installation instructions.

**CAUTION:** Do not over tighten motor electrical terminal screws.

#### **1.4** INFREQUENT AIRCRAFT OR AUXILIARY PUMP USAGE

If the aircraft has been idle or the auxiliary pump not used for six months or more, the auxiliary pump should be checked out prior to IFR flight as follows:

1. Turn on the auxiliary pump and let it run continuously for approximately 20 minutes. (This can be done in VFR flight, or on the ground with the engine running or an APU attached.)
2. After running the pump continuously for approximately 20 minutes, check the entire system for proper operation according to paragraph 1.2 OPERATIONAL CHECK - ENGINE OFF.

#### **1.5** ROUTINE CLEANING

1. Protect the auxiliary vacuum pump and components when cleaning the engine compartment.

**WARNING:** Failure to protect the motor, pump and components from engine cleaning solvents may result in failure of the motor, pump and/or components within a short period of operation.

2. Prior to washing engine and engine compartment, protect the auxiliary vacuum motor and pump assembly by wrapping a protective covering around assembly.
3. Do not blast motor and pump with cleaning solvents under high pressure. To clean auxiliary pump and associated components, use a cloth wetted with cleaning solvent.

**CAUTION:** Ensure protective devices are removed from the motor and pump assembly after engine area is cleaned.

## **1.6**    MISCELLANEOUS SERVICE

### 1.6.1    Annunciator Lamp Replacement

The annunciator lamps in the auxiliary pump control switch are sub-miniature T-1-3/4 wedge base (commercial type 85) bulbs. To replace the lamps, pull the legend button off the switch and eject the lamps by pulling on the release tabs. Reset the release tabs, insert new lamps and press the switch button back into place.

**NOTE:**    The wedge base T-1-3/4 annunciator lamps are not interchangeable with the flange base MS25237-327 lamps used in other aircraft lights. It is recommended that spare lamps and fuses for the auxiliary air pump system be carried in the aircraft.

### 1.6.2    Pump Motor and Annunciator Circuit Breakers

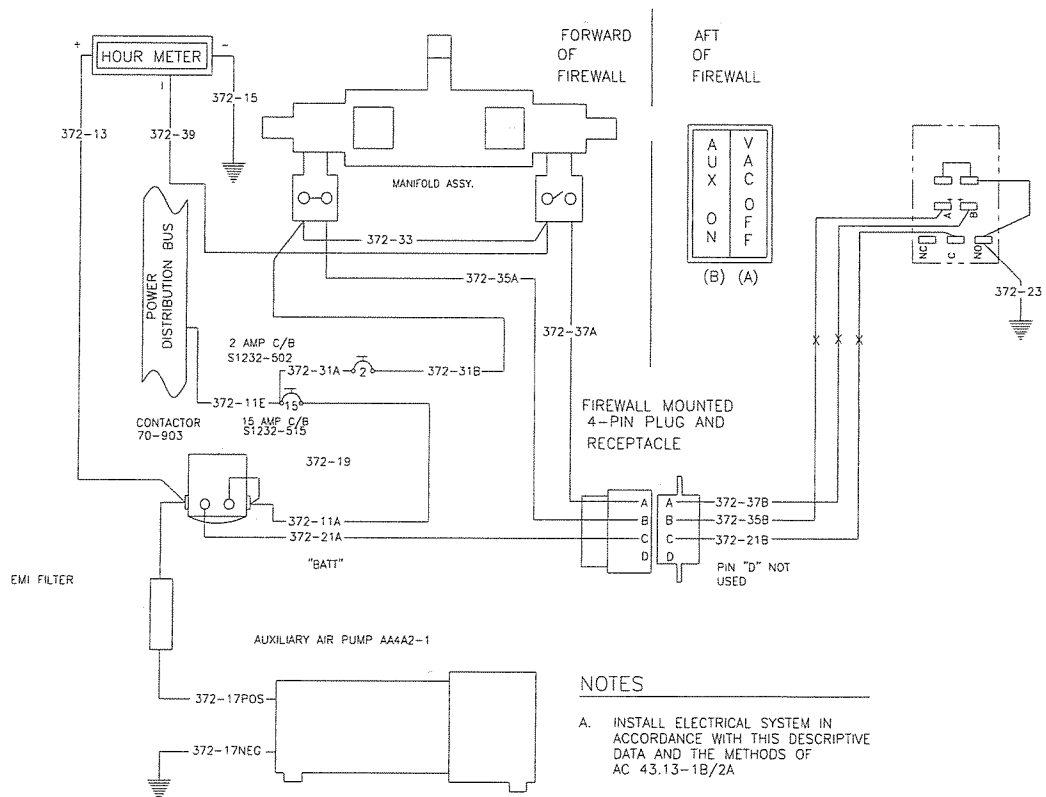
**NOTE:**    Tripped circuit breakers may indicate electrical shorts or other problems. Inspect the auxiliary pump system for defects and repair as necessary.

The circuit breakers are located on the left side of the power box on the forward left side of the firewall. Push circuit breakers in to reset.



Figure 1: System Electrical Schematic and Wire Gauge/Length Chart

WIRE	GAUGE	LENGTH	SPECIFICATION
372-21B	20	60"	MIL-C-22759/16
372-23	20	35"	
372-35B	20	60"	
372-37B	20	60"	
372-21A	16	44"	
372-35B	20	60"	
372-37A	20	60"	
372-11A	16	128"	
372-11E	16	18"	
372-31A	20	4"	
372-31B	20	120"	
372-33	20	4"	
372-39	20	9"	
372-13	16	7.5"	
372-17 POS	16	12"	
372-17 NEG	16	4.5"	
372-15	16	4.5"	
372-19	16	3"	



## 2.0 Airworthiness Limitations

### Auxiliary Dry Air Pump Kit No. AP8-100

The Airworthiness Limitations section is FAA approved and specifies maintenance required under paragraphs 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

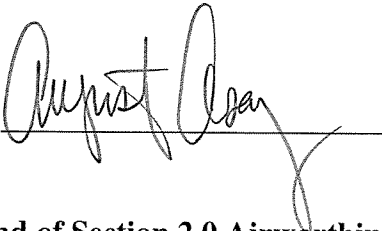
This modification does not affect the airworthiness section of the FAA Approved Maintenance Manual. The limitations of the installation, which contains life limited components, are contained in paragraph 2.1. The installation does not contain fail-safe components.

This section describes required replacement items. When repairs are deemed necessary, follow accepted standard practices and/or specific maintenance instructions in this manual. This section constitutes Component Airworthiness Limitations which apply to the Auxiliary Dry Air Pump installation only.

#### 2.1 Scheduled Replacement Items:

The auxiliary pump/motor assembly, the elapsed time indicator (ETI) assembly, and all 5/8 ID MIL-H-6000 hose installed as part of this installation must be removed and replaced after 500 hours accumulated pump operating time (as established by the ETI) or after 10 years installed time, whichever comes first.

FAA Approved:



-----End of Section 2.0 Airworthiness Limitations-----