



# RWR Pilot Training



## Malibu - Mirage - Meridian

Insurance Approved Initial & Recurrent Training Programs  
Designed to Make Your Flying Safe and Enjoyable  
Provided When and Where You Choose

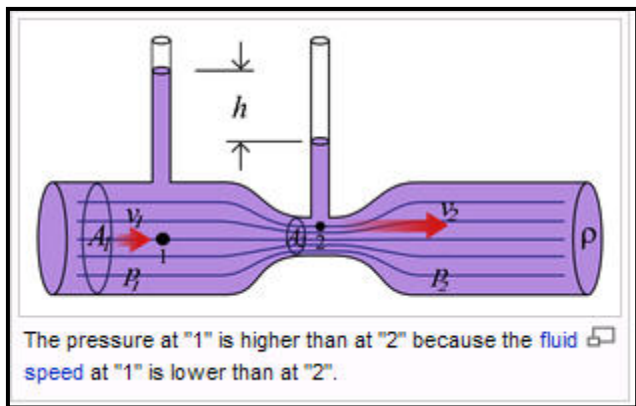
### I'm Glad You Asked

## Alternate Air Door Issues

By Dick Rochfort, ATP, MCFI, CFII, MEI

QUESTION - What is the correct way to use the alternate air door and how do I know it is opening properly?

ANSWER – We all know that induction ice is the bane of the piston pilot. I am surprised by the number of pilots who fail to share my enthusiasm for the mechanics of this sinister phenomenon. The conventional wisdom on the air door insists this door should be closed for takeoff and before landing to prevent ingesting FOD. This is **wrong** and it could lead to a serious accident due to engine stoppage. Remember, the air induction system creates a pressure drop behind the filter which causes the air to cool quickly as it enters. This makes ice possible even at + C temperatures.



**I**f you encounter **any** visible moisture while in flight in a Malibu or Mirage, **open the alternate air door**, regardless of temperature; even in hazy cirrus. Do not wait for a manifold pressure drop to verify induction ice. The aircraft will not know the reason for the loss of airflow to the engine and will presume you are climbing into less dense air. The waste gate controller will then command a new waste gate position to compensate for the loss of airflow. This cycle will continue until the waste gate is fully closed. Once the waste gate is fully closed, the manifold pressure will begin to fall, but that indication is now too late, as the engine

can do no more, being configured as if at critical altitude. Moving the alternate air door at this late stage may send some of the ice clinging to the back of the filter through the turbochargers. Do not close the alternate air door until you are safely on the ground and the turbochargers are spooled down, and you are absolutely sure no residual ice remains behind the filter in the plenum. I even wait until I have stopped the engine in some cases, just to be sure, because there really is no empirical way to know about the presence or absence of ice behind the filter. Be sure to have a qualified and experienced mechanic check the door rigging. Kevin Mead tells me there are a Service Letter (SL 985), two Service Bulletins (SB 852 & SB 961), and one Airworthiness Directive (AD87-04-01). He actually knew these numbers from memory. While all of these have been around for a while, it is entirely possible that they were overlooked.

There is also an issue with the turbocharger inlet hose clamp position. If the clamp is not precisely positioned, it will block the cam on the air door linkage and prevent the door from opening. From the cockpit all will seem well, until the filter begins to clog, as if the door was closed ... because it is closed; even with the lever in the “Down” – “Open” position.

*Fly Safely – Train Often*

Phone 410-435-3333 - Toll Free 866-870-8196 - Fax 410-435-7311

www.rwrpilottraining.com - mail@rwrpilottraining.com

Richard W. Rochfort, ATP, MCFI, CFII, MEI - 6031 Bellona Avenue - Baltimore, Maryland 21212-2923



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The door can be difficult to move, however it is important that you operate it when doctrine calls for it. If you have difficulty, have a qualified mechanic check the rigging per the SBs, SL and AD (they are all attached to this article) and have him check the position of the clamp at the air box on the left turbo inlet hose for correct positioning. This last item is NOT addressed in the service documents; however it WILL cause a loss of power.

If you are unsure about this information, find a good flight instructor and go practice this doctrine in weather.

I hope this information is helpful.

Fly Safely – Train Often

Dick Rochfort, ATP, MCFI, CFII, MEI

410-435-3333

[mail@rwrpilottraining.com](mailto:mail@rwrpilottraining.com)

[www.rwrpilottraining.com](http://www.rwrpilottraining.com)



*“I’m Glad You Asked” is a regular column written by Master Flight Instructor Dick Rochfort. Dick answers questions which come up frequently while conducting training in the Malibu, Mirage and Meridian aircraft. If you have a question for Dick, you can send it to him at [mail@rwrpilottraining.com](mailto:mail@rwrpilottraining.com). He’ll be ... “glad you asked”.*

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### Biography

#### Richard W Rochfort



A former corporate pilot and primary flight instructor, Dick is a full-time Master Certified Flight Instructor providing insurance approved initial and recurrent pilot training in the Piper PA46 Malibu, Mirage, and Meridian aircraft. He is currently flying over 450 hours per year and trains 60-80 pilots every year exclusively in these aircraft.

He holds multi-engine ATP and Gold Seal Flight Instructor Certificates with CFII, MEI and CE-525S ratings. He has been actively involved in flight training since 1991 and has trained pilots all over the US, Canada and Europe.

Dick is an Aviation Safety Counselor for the FAA Baltimore FSDO, a National Industry Member of the FAA Safety Team (FAAST) and has conducted hundreds of programs for the pilot community. He is an instructor for the M/MOPA Safety and Training Foundation and The National Association of Flight Instructors has designated him Master CFI. Less than 1% of all flight instructors have earned this designation.

Dick served as a Staff Sergeant E6 in the US Army Special Forces from 1970 until 1976 as an A team radio operator, training indigenous personnel in field communications. He worked from 1976 until 1991 as an industrial engineer training manufacturing personnel for the production of communication and navigation equipment for US military.

His education includes undergraduate degrees in Clinical Psychology and Engineering and a Masters Degree in Business Administration. Dick lives in Baltimore, Maryland with his wife and two daughters. He is a PADI Certified Scuba Diving Instructor, First Aid Instructor and an Eagle Scout.

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Richard W. Rochfort, ATP, MCFL, CFII, MEI - 6031 Bellona Avenue - Baltimore, Maryland 21212-2923



Piper Aircraft Corporation  
 Vero Beach, Florida, U.S.A.

# SERVICE No. 961 BULLETIN

\*\*\*\*\*  
 \* PIPER CONSIDERS \*  
 \* COMPLIANCE MANDATORY \*  
 \*\*\*\*\*

Date October 21, 1992

**SUBJECT:**

Alternate Air Door Replacement  
 and Control Linkage Inspection

**MODELS AFFECTED:**

PA-46-310P Malibu

PA-46-350P Malibu Mirage

**SERIAL NUMBERS AFFECTED:**

46-8408001 through 46-8608067  
 4608001 through 4608140

4622001 through 4622127

**COMPLIANCE TIME:**

At the next regularly scheduled inspection event, but not to exceed the next fifty (50) hours of operation.

**APPROVAL:**

The technical contents of this Service Bulletin have been approved by the F.A.A.

**PURPOSE:**

Information from a recent Service Difficulty Report and subsequent follow up by Piper, indicate that the lower valve plate in the alternate air door assembly may crack and if not detected through normal inspection, could propagate until portions of the valve plate separate entirely. This may result in large pieces entering and possibly lodging in the induction air duct which could potentially result in a loss of engine power. Examination of these cracks indicate that they have occurred due to stress being placed on the valve plate when the control arm is improperly rigged.

This Service Bulletin requires the replacement of the upper and lower valve plate assemblies with improved assemblies and requires the inspection, adjustment and if necessary replacement of the alternate air control linkage. The new improved valve plate assemblies are made stronger to provide increased tolerance to inadvertent mis-rigging.

(OVER)  
 ATA: 7160

**INSTRUCTIONS:**

(For aircraft serial numbers 46-8408001 through 46-8608033, Service Letter 985 must be complied with prior to accomplishing this Service Bulletin. Service Letter 985 incorporates Service Kit P/N 765-198 which, if purchased after the date of this Service Bulletin, will contain the valve plate assemblies and linkage mentioned in the "materials required" section below.)

1. Remove upper and lower engine cowl and left half of nose bowl.
2. Remove louvered panel and air filter.  
NOTE: All hardware mentioned below should be inspected and replaced as necessary.
3. Refer to Sketch A. Remove existing cable clamps and hardware. Remove existing swivel and retain hardware for re-use except discard cotter pin.
4. Remove existing alternate air valve plates and six (6) each P/N 404-564 washers. Retain only the bolts for re-use.
5. Install the new P/N 89064-14 valve plate (lower) and new P/N 89064-15 valve plate (upper). Use bolts removed per instruction 4 and six (6) new P/N 407-800 washers. Torque the bolts to 33 inch lbs.  
NOTE: aircraft serial numbers 4622117 through 4622127 may have the new P/N 407-800 washers already installed.
6. Inspect alternate air door linkage and hardware thoroughly and replace parts as necessary (P/N 89064-11 linkage and P/N 89064-07 crank). There should be no appreciable "slop" evident before making the rigging adjustments.
7. Make rigging adjustment as necessary. Assure lever meets stop tab when lever is  $.12 + .06/-0$  inch before center. This may be accomplished by making a measurement between the center of the P/N 89064-07 crank bolt and the bolt at the opposite end of the linkage and measuring up  $.12$ " to the center of the center hinge bolt. Make adjustments to jam nuts as required to seal the P/N 89064-14 valve plate. Localized gaps between valve and alternate air inlet flange are not to exceed  $.015$ ". When making this adjustment the linkage should rest on the stop with no pressure on the lower valve plate. In order to assure that no distortion is present, it will be necessary to remove the two induction air hoses located on either side of the air box. With a strong light observe the plate with the alternate air selected and deselected. There should not be any distortion in the plate when engaging the door. Tighten jam nuts and safety wire together. Use  $.032$  stainless steel wire.
8. Re-install existing cable clamp, bolt, washer (under nut) and nut. Position alternate air cable so that approximately  $1/4$  inch extends from cable clamp. Tighten nut.
9. Position alternate air selector in the "primary" position. Fasten alternate air cable wire to crank. Use swivel retained per Instruction 3. Insure that the alternate air valve is in the closed position (valve against alternate air inlet flange) and the linkage is before center resting on the stop tab (reference Instruction 7). Tighten swivel nut so that cable wire is bent approximately 15 degrees and install a P/N 424-051 cotter pin.
10. Operate the alternate air selector through full travel and verify that the cable wire end does not interfere with any surrounding parts. Bend wire end as required to provide clearance. Insure that the alternate air valve linkage does not go over center when selector is in the "primary" position. Make adjustment to cable if required (reference Instruction 8 and 9).
11. Re-install air filter and cover removed per Instruction 2. CAUTION: Be sure that no foreign materials or debris are in the air induction box or inlet hoses prior to closing.
12. Re-install upper and lower engine cowl and left half of nose bowl removed per Instruction 1.
13. Make appropriate logbook entries.

**MATERIAL REQUIRED:** Per Aircraft: One (1) ea. P/N 89064-14 Lower Valve Plate assembly, one (1) ea. P/N 89064-15 Upper Valve Plate assembly, one (1) Cotter Pin P/N 424-051, and six (6) ea. P/N 407-800 (AN970-3) Washers. As required by inspection: one each P/N 89064-11 Linkage assembly and one (1) each Lever P/N 84032-07.

**AVAILABILITY OF PARTS:** Your Piper Field Service Facility.

**EFFECTIVITY DATE:** This Service Bulletin is effective upon receipt.

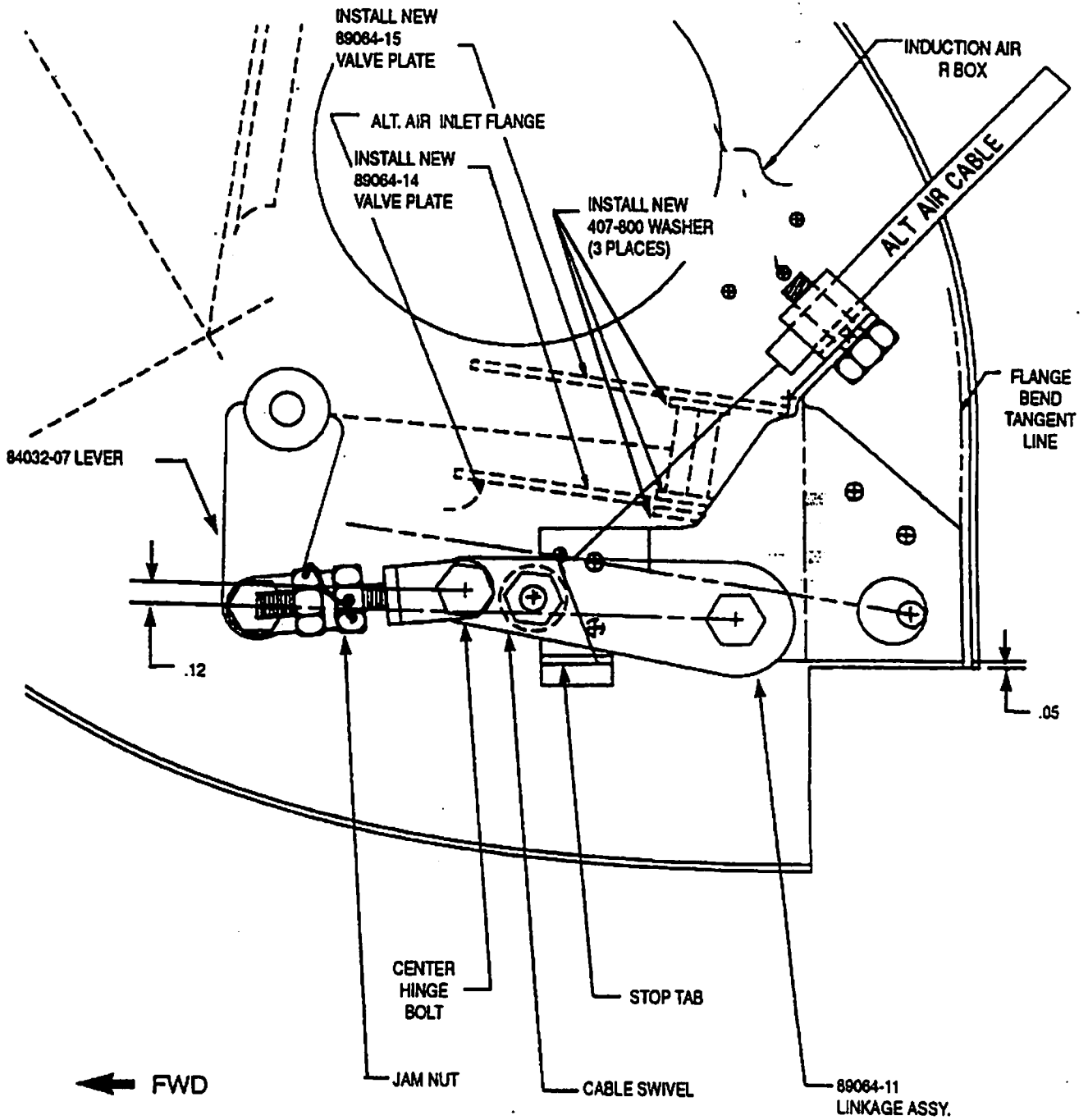
**SUMMARY:** Any applicable Factory Participation will remain in effect for a period of time not to exceed 180 days from the date of this Service Bulletin.

Special pricing is in effect for the Upper and Lower Valve Plate assemblies Piper Part Number 89064-15 and 89064-14 for a period of time not to exceed 180 days from the date of this Service Bulletin.

Please contact your Factory Piper Field Service Facility to make arrangements for compliance with this Service Bulletin in accordance with the compliance time indicated.

**NOTE:** If you are no longer in possession of this aircraft, please forward this information to the present Owner/Operator and notify the factory of address/ownership corrections. Changes should include aircraft model, serial number, current owner's name and address. Corrections/changes should be directed to:

PIPER AIRCRAFT CORPORATION  
ATTN: Customer Service  
2926 Piper Drive  
Vero Beach, FL 32960



SKETCH A

[RGL Home](#)

## Airworthiness Directive

### ▶ Federal Register Information

#### ▼ Header Information

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

Amendment 39-5558; AD **87-04-01**

Airworthiness Directives; Piper Model PA-46-310P Airplanes  
**PDF Copy (If Available):**

#### ▼ Preamble Information

AGENCY: Federal Aviation Administration, DOT

DATES: Effective February 24, 1987.

#### ▼ Regulatory Information

**87-04-01 PIPER:** Amendment 39-5558. Applies to Model PA-46-310P (Serial Numbers 46-8408001 through 46-8608067, 4608001 through 4608018, 4608021, 4608023 and 4608025) airplanes certificated in any category.

Compliance: Required within the next 25 hours time-in-service (TIS) after the effective date of this AD, unless already accomplished.

To prevent engine power loss, accomplish the following:



- (a) Remove the top and the lower left-hand engine cowl.
- (b) Determine whether or not the alternate air valve linkage shown in Figure 1. has been installed on the left side of the engine air box.
  - (1) If the alternate air valve linkage shown in Figure 1. is not installed, install the Alternate Air Valve Modification Kit offered in Piper Service Letter 985 dated April 18, 1986, in accordance with the instructions contained within the kit, and verify proper operation in accordance with the instructions in paragraphs (b)(2)(i) through (b)(2)(vii) below.
  - (2) If the alternate air valve linkage shown in Figure 1. is installed, accomplish the following unless already accomplished in accordance with Piper Service Bulletin 852 dated November 14, 1986:
    - (i) Position the alternate air control (located inside the cockpit) approximately mid-way between the primary and the alternate position.
    - (ii) Refer to Figure 1. and bend the stop tab so that the linkage is stopped 0.12 inch plus 0.060 minus 0.000 inch before center. This dimension is determined by measuring the perpendicular distance between a line through the centers of the cable lever and the valve lever hinge bolts and the center point of the center hinge bolt.
    - (iii) Position the alternate air control (located inside the cockpit) in the primary (up position). Insure that the control is in the gate that prevents it from springing downward.
    - (iv) Adjust the cable housing in the cable clamp so that the cable pushes the linkage against the stop tab.
    - (v) Resecure the cable clamp as necessary.
    - (vi) Operate the alternate air control (located inside the cockpit) between the primary and the alternate air positions.
    - (vii) Check for normal operation and that the linkage does not go over-center when the alternate air control (located inside the cockpit) is in the "primary position."
- (c) Reinstall the lower left-hand and the top engine cowl.
- (d) Aircraft may be flown in accordance with FAR 21.197 to a location where this AD may be accomplished.
- (e) An equivalent means of compliance with the requirements of this AD may be used if approved by the Manager, Atlanta Aircraft Certification Office, 1669 Phoenix Parkway, Suite 210, Atlanta, Georgia 30349.

All persons affected by this directive may obtain copies of the document(s)

referred to herein upon request to Piper Aircraft Corporation, 2926 Piper Drive, Vero Beach, Florida 30960; or may examine the document(s) at the FAA, Office of the Regional Counsel, Room 1558, 601 East 12th Street, Kansas City, Missouri 64106.

This amendment becomes effective on February 24, 1987.

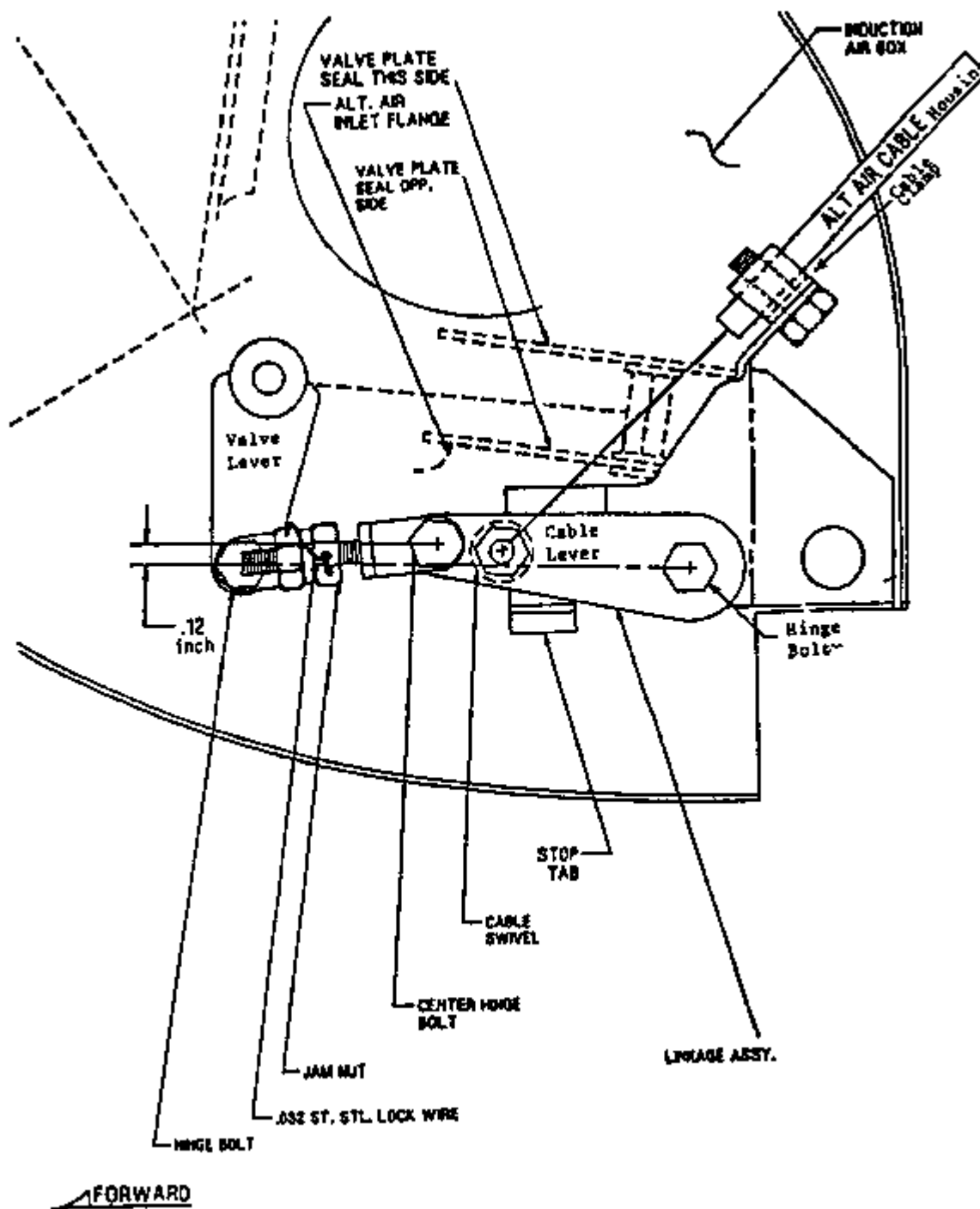


FIGURE 1

AD **87-04-01**

▼ **Footer Information**

▼ **Comments**

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# SERVICE <sup>852</sup> No. BULLETIN

\*\*\*\*\*  
\* PIPER CONSIDERS \*  
\* COMPLIANCE MANDATORY \*  
\*\*\*\*\*  
Date November 14, 1986 S

FAA Approved

SUBJECT: Alternate Air Control Linkage Adjustment

MODELS AFFECTED: SERIAL NUMBERS AFFECTED:

PA-46-310P Malibu

46-8408001 through 46-8608033

Only those above-listed aircraft which have complied with Service Letter No. 985 PART II, dated April 18, 1986, through the installation of the Alternate Air Valve Modification Kit, Piper Part Number 765-198, are affected by this Service Bulletin, and

46-8608034 through 46-8608067, and 4608001 through 4608018, 4608021, 4608023, and 4608025

COMPLIANCE TIME: Prior to further flight, except for flight in low altitude V.F.R. conditions, but not to exceed ten (10) hours of operation.

PURPOSE: Engineering tests indicate that conditions may exist that would prevent selection of alternate induction air when the primary air source is cut off. Two (2) reports of engine power loss have been attributed to this condition.

This Service Bulletin provides instructions for adjusting the alternate air door linkage which, when complied with, will prevent the above described condition.

INSTRUCTIONS:

1. Remove top and lower left hand engine cowl.
2. Locate alternate air valve linkage on left side of engine air box. See Sketch "A" attached.
3. Position the alternate air control (inside the cockpit) approximately mid-way between primary and alternate position.
4. Bend stop tab so that linkage is stopped 0.12 inch + 0.060/- 0.0 inch before center. Take measurement from line between the center of the bolt that is the hinge point for the cable lever and the center of the bolt that is the hinge point for the valve lever.

(over)  
ATA: 7164

INSTRUCTIONS: (Cont'd)

5. Position the alternate air control (inside cockpit) in the primary (up position). Insure that the control is in the gate that prevents it from springing downward.
6. Adjust cable housing in cable clamp so that cable pushes linkage against the stop. Tighten cable clamp.
7. Operate alternate air control (inside cockpit) between primary and alternate air position. Verify that operation is normal and that the linkage does not go over center when control is in the "primary position".
8. Reinstall lower left hand and top engine cowl.
9. Make a logbook entry of compliance with this Service Bulletin.

MATERIAL REQUIRED: Not Applicable.

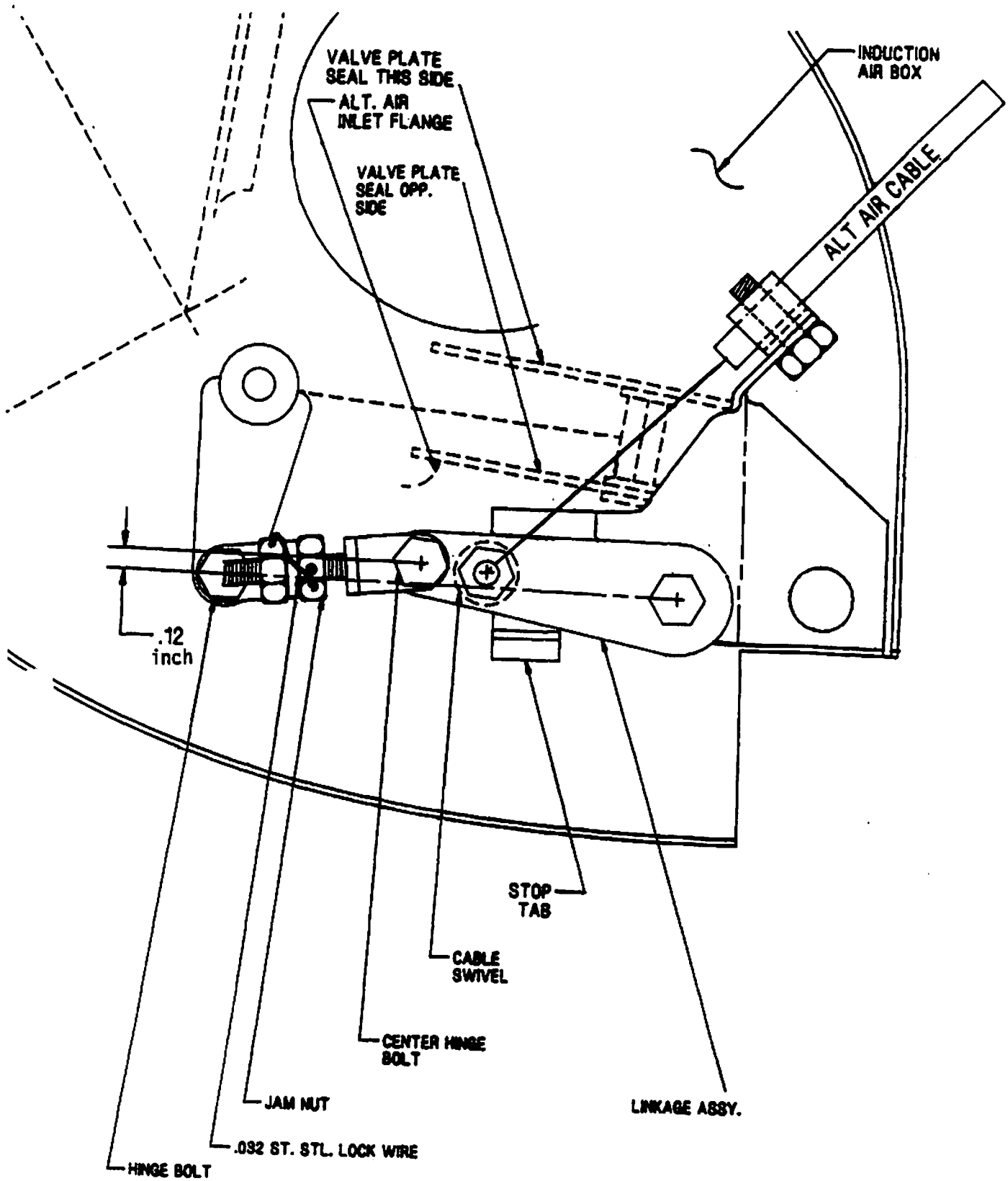
AVAILABILITY OF PARTS: Not Applicable.

EFFECTIVITY DATE: This Service Bulletin is effective upon receipt.

SUMMARY: Please contact your Piper Field Service Facility to make arrangements for compliance with the provisions of this Service Bulletin in accordance with the Compliance Time indicated.

Any applicable factory participation will remain in effect for a period of time not to exceed 180 days from the date of this Service Bulletin.

NOTE: If you are no longer in possession of this aircraft, please forward this information to the current owner.



FORWARD

SKETCH "A"



# SERVICE LETTER

No. 985

Piper Aircraft Corporation

Vero Beach, Florida, U.S.A.

FAA Approved

April 18, 1986

S

This Service Letter is divided into two (2) PARTS. Check each PART for Serial Numbers Affected.

-----  
PART I

ATA: 7230

SUBJECT:

Teledyne Continental Motors Special Service Notice No. 3-86, "TSIO-520BE Engine" (Attached)

MODELS AFFECTED:

PA-46-310P Malibu

SERIAL NUMBERS AFFECTED:

46-8408001 through 46-8608024

COMPLIANCE TIME:

As specified on the attached Teledyne Continental Motors Special Service Notice.

PURPOSE:

To distribute the attached Teledyne Continental Motors Special Service Notice No. 3-86 to all affected Malibu Owners/Operators and Piper Field Service Facilities.

Detailed information is contained in the attached publication.

Piper highly recommends compliance with PART I of this Service Letter in accordance with the specified time frame set forth by Teledyne Continental Motors.

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PART II

ATA: 7160

SUBJECT:

Alternate Air Intake Assembly Modification

MODELS AFFECTED:

PA-46-310P Malibu

SERIAL NUMBERS AFFECTED:

46-8408001 through 46-8608033

COMPLIANCE TIME:

Recommended to be accomplished in conjunction with the inspection portion of Teledyne Continental Motors Special Service Notice No. 3-86 and prior to corrective action, if required by the inspection. If PART I of this Service Letter is not applicable by Serial Number, compliance with PART II of this Service Letter is recommended at the next regularly scheduled inspection event.

(over)

**PURPOSE:** Reports have been received of partially open alternate air doors, when selected to the "closed" or "primary air" position and of premature turbocharger compressor impeller wear due to the possible injection of contamination (i.e. dirt, sand).

**PART II** of this Service Letter announces the availability of an Alternate Air Valve Modification Kit which, when installed, will provide a positive closure of the valve within the intake assembly, and decrease the possibility for the above described conditions.

**INSTRUCTIONS:** All instructions necessary to accomplish the modification are contained in the Alternate Air Valve Modification Kit, Piper Part Number 765-198.

**MATERIAL REQUIRED:** One (1) each Alternate Air Valve Modification Kit, Piper Part Number 765-198, per aircraft.

**AVAILABILITY OF PARTS:** Your Piper Field Service Facility.

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**EFFECTIVITY DATE:** This Service Letter is effective upon receipt.

**SUMMARY:** **PART II** of this Service Letter must be accomplished at an authorized Piper Field Service Facility.

**NOTE:** If you are no longer in possession of the affected aircraft, please forward this publication to the current owner.



 **TELEDYNE  
CONTINENTAL MOTORS  
Aircraft Products Division**

P.O. BOX 90

MOBILE, ALABAMA 36601

(205) 438-3411 CABLE: CONTENT

3 March 1986

SSN 3-86

**AIRCRAFT**

**AFFECTED:** PA-46 310P 46-8408001 through 46-8608024

**SUBJECT: CYLINDER INSPECTION**

**COMPLIANCE:** For engines with less than 200 hours - At the first inspection event after 200 hours are obtained but not to exceed 300 hours total time.

For engines with more than 200 hours - At the next regularly scheduled inspection event, but not to exceed the next 100 hours.

**PURPOSE:** Field reports indicate in some instances a deteriorating cylinder compression and abnormal oil consumption which, if left uncorrected, could result in less than normal cylinder service life.

**ACTION:** Teledyne Continental Motors has determined that each of the above affected aircraft engines shall have a one time inspection. If the inspection determines that corrective action is necessary, the aircraft will be scheduled by Teledyne Continental Motors to have the work performed. This work is to be completed no later than six months after completion of the inspection. Contact Teledyne Continental Motors, Service Department, 205/438-3411 to schedule the inspection.

**WARRANTY:** Compliance with this Service Notice will be at no cost to the customer.