RECEIPT OF AIRCRAFT DOCUMENTATION

I, Henry B. Bush hereby state that I have excepted receipt of the
(Print Name)
following documentation, for aircraft registration number: N254CC,
Serial number: 2902.

I further state, that I am a authorized representative of the owner of the above aircraft and that I have been given full authority to except this documentation. I fully realize that any falsification on my part is in violation of federal law, and that I may be prosecuted as such.

1) one black bag
2) one green Airframe Logbook
3) one black Engine Logbook
4) one gray Propeller Logbook
5) one AD's List Folder
6) _____
7) _____
8) _____
9) _____

(LIST ALL DOCUMENTATION RECEIVED)

By signing below, recipient acknowledges all responsibility for the above documentation as listed and has excepted this documentation as is, with no warranty as to their completeness, and in no way holds ADVANCED AIRCRAFT CENTER, INC. or it's employees, responsible for any deficiencies there of.

I hereby state that I have examined the above listed documentation and except receipt in accordance with the provisions of this document.

_____ DATE: 03-21-2018
(signature of recipient)

Issue No. SB No. CAA No. Effective Date	Description	CAW	Amendment No. Method of Compliance/Applicability	Recurring	Next Due	1. Facility 2. Cert. Type 3. Cert. No. 4. Authorized By
Issue# 2009-26-01 **SB# --** **CAA# --** **12/21/2009**	To detect and correct anti-ice fluid distribution lines with improperly installed compression fittings,contd.	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Aircraft Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2008-14-13 **SB# --** **CAA# --** **08/14/2008**	To prevent in-flight failure of the cabin door, which could result in door separation from the airplane	02/09/2018 Hrs: 1489.9 C: --	-- PCW on 4-22-08 at Flight T. 90.8 by Advanced Aircraft Center.	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2008-03-16 **SB# --** **CAA# --** **03/11/2008**	To prevent the possibility of jamming of the rudder-aileron interconnect system, which may result in loss of,contd.	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Aircraft Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2007-24-13 **SB# --** **CAA# --** **12/04/2007**	To prevent moisture from accumulating along the wing shear web where it may freeze in certain conditions	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Aircraft Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:

Effective Date						4. Authorized By
Issue# 2007-14-03 **SB# --** **CAA# --** **08/16/2007**	To correct pick-up collar support fasteners of the CAPS, which could result in the premature separataion ,contd.	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Aircraft Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2006-21-03 **SB# --** **CAA# --** **11/17/2006**	To detect, correct, & prevent overheating damage to the brake caliper piston O-ring seals, which could,contd.	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Aircraft Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2006-19-10 **SB# --** **CAA# --** **10/24/2006**	To prevent the crew seats from folding forward during emergency landing with dynamic loads with consequent,contd.	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Aircraft Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2006-07-06 **SB# --** **CAA# --** **05/11/2006**	To detect, correct, & prevent damage to the fuel line and wire bundles, which could result in fuel leaks	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Aircraft Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2005-17-19 **C** **SB# --** **CAA# --** **10/13/2005**	Superseded by 2006-19-10	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Aircraft Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:

SB No. CAA No. Effective Date	Description	C/W	Amendment No Method of Compliance/Applicability	Recurring	Next Due	3. Cert. No. 4. Authorized By
Issue# 2002-24-08 **SB# --** **CAA# --** **01/24/2003**	To prevent failure of the Cirrus Airplane Parachute System (CAPS) activation system in an emergency,contd.	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Aircraft Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2002-21-02 **SB# --** **CAA# --** **11/08/2002**	To prevent loss of the self-locking retaining nut on the roll and yaw trim cartridges during flight, which,contd.	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Aircraft Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2002-05-05 **SB# --** **CAA# --** **03/19/2002**	Superseded by 2002-24-08	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Aircraft Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2001-25-03 **SB# --** **CAA# --** **12/17/2001**	To detect and replace understrength rivets in the elevator and rudder, which could result in failure,contd.	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Aircraft Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:

Issue No. SB No. CAA No. Effective Date	Description	C/W	Amendment No. Method of Compliance/Applicability	Recurring	Next Due	1. Cert. Type 2. Cert. Type 3. Cert. No. 4. Authorized By
Issue# 2016-16-12 **SB# --** **CAA# --** **09/15/2016**	To prevent failure of the cylinder assemblies, which could lead to failure of the engine, in-flight,contd.	02/02/2018 Hrs: 1489.9 C: --	-- DNA , TCM Cylinders are installed, No Further Actions.	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2014-05-29 **SB# --** **CAA# --** **04/25/2014**	[Recurring] To prevent the separation of the cylinder head, damage to the engine, and damage to the airplane	02/02/2018 Hrs: 1489.9 C: --	-- DNA , No Superior Air Parts Cylinder Assemblies Installed.	Yes	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2012-10-13 **SB# --** **CAA# --** **06/08/2012**	To prevent starter adapter gear shaft failure which could cause oil scavenge pump failure and engine,contd.	02/02/2018 Hrs: 1489.9 C: --	-- DNA - Per Date or Starter Adapter Overhaul of 09/19/2013	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2012-03-06 **C** **SB# --** **CAA# --** **02/24/2012**	To prevent an in-flight engine shutdown due to a failed fuel servo diaphragm, and damage to the airplane	02/02/2018 Hrs: 1489.9 C: --	-- DNA - No AvStar Fuel Systems Installed	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:

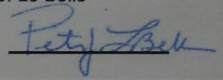
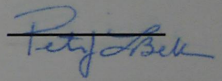
1. CAA No Effective Date	Description	Cmp	Method of Compliance/Applicability	Recurring	Next Due	3. Cert. No. 4. Authorized By
Issue# 2011-25-51 E **SB# --** **CAA# --** **11/29/2011**	Superseded by 2012-10-13	02/02/2018 Hrs: 1489.9 C: --	-- Superseded	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2010-11-04 **SB# --** **CAA# --** **06/16/2010**	To prevent excessive hydraulic lifter wear, which can result in loss of engine power & loss of control of the airplane	02/02/2018 Hrs: 1489.9 C: --	-- DNA- Engine Has Not Had Any Hydraulic Lifters Replaced After June 19th, 2009.	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2009-24-52 E **SB# --** **CAA# --** **11/18/2009**	Superseded by 2010-11-04	02/02/2018 Hrs: 1489.9 C: --	-- Superseded	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2007-16-10 **SB# --** **CAA# --** **08/23/2007**	To prevent the turbine rotor from separating from the shaft of the turbocharger due to a machining defect in the,contd.	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Turbo Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:

Effective Date			Compliance Description			Cert No 4. Authorized By
Issue# 2004-08-10 **SB# --** **CAA# --** **05/05/2004**	To prevent loss of engine power due to cracks in the cylinder head & possible engine failure caused,contd.	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Engine Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 00-00-01 **SB# --** **CAA# --** **01/22/2001**	Important for Cessna Oil Filter Adapter Assemblies listed in AD 96-12-22	02/02/2018 Hrs: 1489.9 C: --	-- DNA - Per Engine Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2000-23-21 **SB# --** **CAA# --** **12/12/2000**	To prevent crankshaft connecting rod journal fracture, which could result in total engine power,contd.	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Engine Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2000-08-51 E **SB# --** **CAA# --** **04/28/2000**	Superseded by 2000-23-21	02/02/2018 Hrs: 1489.9 C: --	-- Superseded	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 99-19-01 **SB# --** **CAA# --** **09/30/1999**	To prevent crankshaft failure due to crankshaft cheek cracks, which could result in total engine power loss,contd.	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Engine Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:

CAA No. Effective Date	Description	CMI	Method of Compliance/Applicability	Recurring	Next Due	3. Cert. No. 4. Authorized By
Issue# 99-09-17 L SB# -- CAA# -- 04/22/1999	Superseded by 99-19-01	02/02/2018 Hrs: 1489.9 C: --	-- Superseded	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 96-12-22 SB# -- CAA# -- 07/31/1996	[Recurring] TO PREVENT LOSS OF ENGINE OIL CAUSED BY LOOSE OR SEPARATED OIL FILTER ADAPTERS, WHICH COULD RESULT IN ENGINE,CONTD.	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Engine Serial Number	Yes	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 93-08-17 SB# -- CAA# -- 08/23/1993	TO PREVENT AN ENGINE FAILURE	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Engine Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 93-10-02 SB# -- CAA# -- 08/12/1993	TO PREVENT AN ENGINE FAILURE DUE TO A MISSING CYLINDER VALVE RETAINER KEY	02/02/2018 Hrs: 1489.9 C: --	-- DNA - Per Engine Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 91-19-03 SB# -- CAA# -- 09/29/1991	TO PREVENT OPERATION WITH COLLAPSED OIL FILTER ELEMENTS, WHICH CAN RESULT IN LOSS OF OIL PRESSURE, CONTD.	02/02/2018 Hrs: 1489.9 C: --	-- DNA - Per Engine Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:

SB No. CAA No. Effective Date	Description	C/W	Method of Compliance/Applicability	Recurring	Next Due	3. Cert. No. 4. Authorized By
Issue# 88-03-06 SB# -- CAA# -- 04/15/1988	TO PREVENT POSSIBLE LOSS OF ENGINE OIL AND SUBSEQUENT ENGINE FAILURE	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Engine Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed: Peter J Lo Bello
Issue# 86-13-04 R3 SB# -- CAA# -- 02/24/1988	[Recurring] TO PREVENT POSSIBLE CYLINDER HEAD TO BARREL SEPARATION, ENGINE FAILURE AND/OR ENGINE COMPARTMENT FIRE	02/02/2018 Hrs: 1489.9 C: --	-- DNA- Per Engine Serial Number	Yes	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed: Peter J Lo Bello

Issue No. SB No. CAA No. Effective Date	Description	C/W	Amendment No. Method of Compliance/Applicability	Recurring	Next Due	1. Facility 2. Cert. Type 3. Cert. No. 4. Authorized By
Issue# 2007-26-09 **SB# --** **CAA# --** **01/30/2008**	To prevent failure of the propeller blade from fatigue cracks in the aluminum blade shank radius, which can,contd.	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Propeller Blade Type	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2005-14-11 **SB# --** **CAA# --** **08/17/2005**	To prevent blade failure that could result in separation of a propeller blade and loss of control of the airplane	02/02/2018 Hrs: 1489.9 C: --	-- DNA Per Propeller Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2002-09-08 **SB# --** **CAA# --** **06/13/2002**	Superseded by 2007-26-09	02/02/2018 Hrs: 1489.9 C: --	-- DNA- Per Propeller Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:
Issue# 2001-07-03 **C** **SB# --** **CAA# --** **06/04/2001**	To prevent propeller failure of the propellers returned to service by BASCO, & possible loss of airplane control	02/02/2018 Hrs: 1489.9 C: --	-- DNA- Per Propeller Serial Number	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed:

Issue No. SB No. CAA No. Effective Date	Description	C/W	Amendment No. Method of Compliance/Applicability	Recurring	Next Due	1. Facility 2. Cert. Type 3. Cert. No. 4. Authorized By
Issue# 2009-05-05 SB# -- CAA# -- 04/03/2009	To prevent certain conditions from existing when PFDs display incorrect attitude, altitude, and airspeed,contd.	02/02/2018 Hrs: 1489.9 C: --	-- DNA per PFD serial # 20021487	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed: 
Issue# 2008-06-28 R1 SB# -- CAA# -- 04/10/2008	Superseded by 2009-05-05	02/02/2018 Hrs: 1489.9 C: --	-- Superseded by 2009-05-05	No	-- Hrs: -- C: --	1. Advanced Aircraft Center, Inc. 2. AP & IA 3. 073543036 4. Peter J. Lo Bello Signed: 

Form 0637 Rev. 2/07

ENGINE MODEL IO550 N50B

IBER 691483

ION DATE 11-17-07

ION EXPIRES 05-17-08

Part Number
14057-011
ENGINE, IO-550-N50B
PLATINUM EDITION,

Serial Number
691483

Receiver Number
331777

Qty:

PO #: 78447

Receipt Date 11/19/07

E ENGINE AFTER EXPIRATION DATE

NEW Y

REBUILT

A/C 2902

United States Of America

Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

Number SA10588SC

This Certificate issued to Engine Technologies, Inc.
400 Airport Road
Ada, OK 74820

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 23 *of the* Federal Aviation Regulations.

Original Product Type Certificate Number: A00009CH

Make: Cirrus Design Corporation

Model: SR22

Description of Type Design Change: Installation of modified Teledyne Continental Motors IO-550-N engine equipped with turbonormalizing system in accordance with Engine Technologies, Inc. Master Drawing List Number ETI-G2-1, Rev. NC, dated November 1, 2006, or later FAA approved revision.

Limitations and Conditions:

1. Installation of STC SE10589SC is required.
2. Approval of this change in type design applies to the above model aircraft only. This approval should not be extended to aircraft of this model on which other previously approved modifications are incorporated unless it is determined that the interrelationship between this change and any of those other previously approved modifications, including changes in type design, will introduce no adverse effect upon the airworthiness of that aircraft. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

(See continuation sheet 3 of 3)

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: August 27, 2004

Date of issuance: November 08, 2006

Date reissued:

Date amended:

By direction of the Administrator

(Signature)

S. Frances Cox
Manager, Special Certification Office
Southwest Region

(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47

United States Of America

Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number **SA10588SC**

Date of Issuance: November 08, 2006

Limitations and Conditions (Continued):

3. A copy of this Certificate and the FAA approved Flight Manual Supplement, Engine Technologies, Inc. Report 215-6, dated November 8, 2006, or later FAA approved revision, must be maintained as part of the permanent records of the modified aircraft.

4. An oxygen system meeting the requirements of 14 CFR Part 23, Secs. 23.1441 through 23.1449 must be installed in conjunction with this STC.

Certification Basis: The type certification basis is as shown on TCDS A00009CH plus the equivalent level of safety to FAR 23.1091(b)(4) number ACE-06-06.

-End-

United States Of America

Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

th Number **SE10589SC**

This Certificate issued to Engine Technologies, Inc.
400 Airport Road
Ada, OK 74820

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 33 *of the* Federal Aviation *Regulations.*

Original Product Type Certificate Number: E3SO

Make: Teledyne Continental Motors

Model: IO-550-N

Description of Type Design Change: Installation of turbonormalizing system in accordance with Engine Technologies, Inc. Master Drawing List Number ETI-G2-1, Rev. NC, dated November 1, 2006, or later FAA approved revision.

Limitations and Conditions:

1. Approval of this change in type design applies to the above model engine only. This approval should not be extended to engines of this model on which other previously approved modifications are incorporated unless it is determined that the interrelationship between this change and any of those other previouslyapproved modifications, including changes in typedesign, will introduce no adverse effect upon the airworthiness of that engine. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.
2. A copy of this Certificate must be maintained as part of the permanent records of the modified engine.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: August 27, 2004

Date of issuance: November 08, 2006

Date reissued:

Date amended:

By direction of the Administrator

(Signature)

S. Frances Cox
Manager, Special Certification Office
Southwest Region

(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.

United States of America

Department of Transportation—Federal Aviation Administration

Supplemental Type Certificate

Number **SA01708SE**

This certificate, issued to

Precise Flight, Inc.
63354 Powell Butte Rd.
Bend, OR 97760

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 23 *of the* Federal Aviation *Regulations.*

Original Product—Type Certificate Number: A00009CH

Make: Cirrus Design Corporation

Model: SR22

Description of the Type Design Change: Installation of the fixed oxygen system manufactured in accordance with Precise Flight Engineering Drawing Lists: 102N0000 Revision A, 100N0000 Revision X, 027N0000 Revision C, 026N0000 Revision C, 020N0000 Revision F, 010N0000 Revision H, and 009N0000 Revision B or later FAA approved revisions. Installed in accordance with Precise Flight Engineering Drawing List 102N0000 revision A or later FAA approved revision. Maintained in accordance with the Instructions for Continued Airworthiness Precise Flight Document 102NMAN0003 Revision A, dated October 3, 2006 or later approved revision or document.

Limitations and Conditions: Approval of this change in type design applies to the above model aircraft only. This approval should not be extended to other aircraft of these models on which other previously approved modifications are incorporated unless it is determined that the relationship between this change and any of those other previously approved modifications, including changes in type design, will introduce no adverse effect upon the airworthiness of that aircraft.

See Continuation Sheet, page 3

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: August 1, 2006 *Date reissued:*

Date of issuance: October 4, 2006 *Date amended:*

By direction of the Administrator

(Signature)

Acting Manager, Seattle Aircraft Certification Office

(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.

FAA Form 8110-2(10-68)

United States of America

Department of Transportation—Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number **SA01708SE**

Precise Flight, Inc.
Reissued:
Amended:

Limitations and Conditions: (cont'd)

A copy of this Certificate and the FAA approved Airplane Flight Manual Supplement (AFMS), Precise Flight Document 102NMAN0001, dated October 2, 2006 or later approved revision, must be maintained as part of the permanent records for the modified aircraft. This oxygen system installation is qualified to operate up to 25,000 ft MSL but, this installation does not change the maximum operating altitude of the airplane on which it is installed.

If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

- END -

PRECISE FLIGHT
Essentials for Safety and Performance.

Document Number: 102NPMAN0003

Aircraft Serial Number: _____

STC Number:

63354 POWELL BUTTE ROAD
BEND, OR 97701, USA
800- 547-2558

Instructions for Continued Airworthiness
Cirrus SR20/SR22 Built-In Oxygen System
STC Number SA01708SE

NOTICE

The Airworthiness Limitations Section (Section 2.0) is FAA Approved and specifies maintenance required under Sections 43.16 and 91.403 of the Federal Aviation Regulations, unless an alternative program has been FAA Approved.

These documents must be kept with the aircraft records.

PRECISE FLIGHT
Essentials for Safety and Performance
63354 POWELL BUTTE ROAD
BEND, OR 97701
800- 547-2558
Document Number: 102NMAN0003

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS – STC SA01708SE
Cirrus Design SR20 and SR22 Built-In Oxygen System

TABLE OF CONTENTS

PRECISE FLIGHT
Essentials for Safety and Performance.

63354 POWELL BUTTE ROAD
BEND, OR 97701
800- 547-2558

Document Number: 102NMAN0003

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS – STC SA01708SE

Cirrus Design SR20 and SR22 Built-In Oxygen System

REVISIONS

Rev.	DESCRIPTION OF CHANGES	Author	Date	Approved By	Approved Date
-	Original Release	STP	9/7/2006	JNS	9/7/2006
A	Revised document to include remote filler, and final oxygen system wire routing.	JNS	9/27/2006	JNS FAA	9/27/2006 10/3/2006

LIST OF ACTIVE PAGES

ORIGINAL		ADDED PAGES					
PG	REV	PG	REV	PG	REV	PG	REV
1	A						
2	A						
3	A						
4	A						
5	A						
6	A						
7	A						
8	A						
9	A						
10	A						
11	A						
		12	A				

ORIGINAL		ADDED PAGES					
PG	REV	PG	REV	PG	REV	PG	REV

1.0 Overview

1.1 Purpose

The Built-In Oxygen System ("Oxygen System" or "System"), is installed to provide supplemental oxygen for the pilot and passengers. The System consists of the following:

1. A 77 cu ft composite wrapped cylinder mounted in the aft fuselage of the aircraft
2. An oxygen regulator which is connected to the bottle and contains:
   a. An overpressure discharge
   b. A high pressure transducer
3. A Remote Filler Assembly located in the aft center of the baggage compartment and contains:
   a. A service port for filling the Oxygen System
   b. A manual pressure gauge
4. Associated plumbing and fittings
5. A center console panel display and System actuation switch
   6.An overhead distribution manifold with low pressure transducer and integrated interior LED dome light
7. Breathing devices and flowmeters with cannulas, or masks

Setting the oxygen switch to ON illuminates the display showing oxygen quantity and energizes the System to allow oxygen to reach the overhead distribution manifold. Additionally the System annunciates if oxygen should be used in the aircraft as well as oxygen pressure or electrical faults. Four (4) manually operated oxygen flowmeters can be connected to the oxygen distribution manifold. The flow controls are calibrated and adjustable for altitude by the user. The following flow controls can be one of the following:

- A4 Flowmeters and Standard or Oxygen Conserving Cannulas -- Up to 18,000 Ft
- A4 Flowmeters and Masks (Standard and Microphone) -- Up to 25,000 Ft

1.2 ICA Revisions

To ensure the maintenance of your existing aircraft, possible revisions to Section 2.0 Instructions for Continued Airworthiness may require updating over the life of the aircraft. Per the applicable Federal Aviation Regulations, an update process is required to properly maintain these instructions in addition to the aircraft itself. Because of this, it is imperative to complete the registration card for the aircraft once the System has been installed.

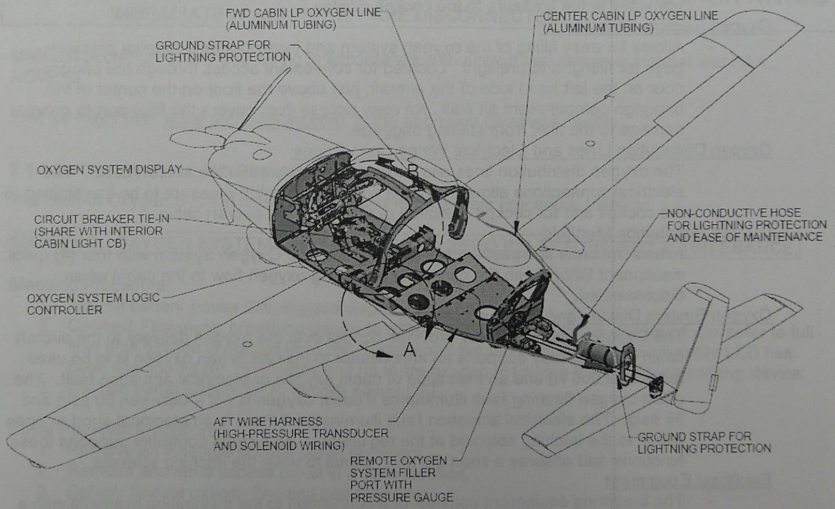
Revisions can be made by a service letter from Precise Flight Inc., an Airworthiness Directive as issued by the Administrator, by single page updates, or by a complete replacement of all pages of the manual. It must be clearly noted as to the revision level of the pages listed in the List of Active Pages. If a single sheet(s) is replaced, replace the List of Active Pages with the new one provided, or update the list manually and initial and date the list.

2.0 INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

2.1 INTRODUCTION

The contents of this section provide the instructions for continued airworthiness for the Cirrus SR20 and SR22 Built-In Oxygen System. The majority of the installation does not affect the standard airworthiness of the aircraft; only the key Oxygen System items that exist different are noted in this section. All structure and general maintenance must be performed in accordance with existing approved maintenance practices, the aircraft maintenance manual or other FAA Approved document(s).

2.2 SYSTEM DESCRIPTION



INSTRUCTIONS FOR CONTINUED AIRWORTHINESS – STC SA01708SE
Cirrus Design SR20 and SR22 Built-In Oxygen System

The Built-In Oxygen System consists of a few simple components for supplying sufficient oxygen to the crew and passengers of the Cirrus SR20 or SR22 aircraft. These components follow:

Oxygen Bottle
- Stores 77 cu ft of Oxygen at 1800 psig

Regulator Assembly
- Converts the high bottle pressure to a usable 65 psig for cabin distribution. This is actuated through a latching solenoid assembly with an electrical connection to the aircraft cockpit. The regulator assembly allows the bottle to be filled through a separate fill port and a fill gage. The fill gage allows the maintenance personnel to monitor the fill operation. An overpressure burst disc is incorporated to dissipate excess pressure and protect the bottle. A high pressure transducer electrically transmits bottle pressure to the cockpit display.

Oxygen Remote Filler Station
- Allows for easy filling of the oxygen system and incorporates a manual pressure gage for filling, and preflight. Located for convenient access through the baggage door on the left hand side of the aircraft, just above the floor on the center of the baggage compartment aft wall. An easy access door covers the filler port to prevent damage to the filler from shifting baggage.

Oxygen Distribution Lines and Electrical Wiring Connections
- The oxygen distribution lines allow oxygen to safely enter the aircraft cabin. The electrical connections allow the bottle and oxygen cabin pressure to be transmitted to the cockpit and for cockpit selection of oxygen in the aircraft cabin.

Oxygen Distribution Manifold
- Allows the crew and passengers to connect to the Oxygen System with four (4) quick disconnect fittings with the capability of sealing oxygen flow to the cabin when disconnected.

Oxygen System Display and Oxygen Controller
- The Oxygen System display provides control over the oxygen delivery to the aircraft cabin. This display supports an annunciator to indicate when oxygen is to be used (above 12,000 ft) and an indication of cabin oxygen or electrical actuation fault. The cabin oxygen flashing fault illuminates if cabin oxygen is not – between 60 psig and 85 psig. The electrical actuation fault illuminates if there is an electrical short or open circuit to the latching solenoid at the regulator. The oxygen controller supports these functions and ensures a short duration signal to drive the latching solenoid.

Breathing Equipment
- The breathing equipment consists of a connection to the distribution manifold with a constant flow device or "Flowmeter" to indicate the flow of oxygen with an integral valve to control the quantity of oxygen reaching the crew or passenger. The flow indicator on this flow device is labeled with appropriate oxygen flow for increasing aircraft altitude. The flowmeter is attached to the appropriate approved mask or cannula to deliver oxygen to the crew or passengers

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS – STC SA01708SE
Cirrus Design SR20 and SR22 Built-In Oxygen System

2.3 Special Tools Required

-Plastic reservoir hand pump
-Chemical-resistant gloves
-Protective eyewear with side shields

Refer to the installation instructions, or drawings for the Precise Flight Built-In Oxygen System.

2.4 Maintenance Instructions

CAUTION: INSTALL PROTECTIVE COVERS ON ALL OPEN LINES AND COMPONENT FITTINGS IMMEADIATELY AFTER THEY ARE DISCONNECTED.

Maintain aircraft structure and wiring in accordance with aircraft maintenance manual and FAA AC43.13.

Precise Flight Inc., www.preciseflight.com, is the approved Overhaul Facility

2.4.1 Bottle Removal and Replacement

The Built-In Oxygen System bottle removal and replacement procedure follows:

WARNING: OXYGEN SYSTEM MUST BE BLED TO ZERO PSI BEFORE ANY MAINTENANCE.

Bleeding Procedure:

1. Aircraft battery power ON, oxygen display panel ON.
2. Connect Flowmeter breathing device to overhead distribution panel and turn Flowmeter to full flow until oxygen is purged from the System and the flashing red 200 PSI quantity LED has been illuminated for 10 minutes and no more oxygen is flowing through the breathing device.
3. Oxygen panel display OFF, aircraft power OFF.

Bottle Removal Procedure:

1. Remove aft fuselage access panel fasteners.
2. Remove and store access panel in a safe location.
3. Detach flexible oxygen line and cap both lines.
4. Disconnect electrical harness.
5. Release the two band clamp restraints.
6. Remove bottle and regulator assembly by first moving the assembly forward and to the left. Remove bottle and regulator assembly aft end of the bottle first.
7. Installation is opposite of removal – Tighten wing nuts until snug and then two more turns to ensure proper tension on clamp bolt.
8. Perform a functional system check following installation (purging per next step can be accomplished during the functional test).

9. Purge the oxygen system by filling the main tank to a minimum of 500psig and bleeding the system down between 50-100psig by following the bleeding procedure prior to filling the system for use.

2.4.2 Filler Station Cleaning

The filler port requires cleaning periodically, and prior to filling, to keep clean of dirt, dust, and oils to prevent fire.

2.4.3 Line Cleaning

Line Cleaning Procedure:

1. Preparation
   a. Obtain a suitable container for collecting fluid waste.
   b. Wear protective gloves and eyewear.
   c. Assemble a reservoir pump and drain line, see Fig 1.
2. Flushing
   a. Fill 2 qt reservoir with 1% Alconox or Liquinox detergent solution. www.alconox.com
   b. Attach reservoir pump to cabin oxygen line.
   c. Pump 2 qt Alconox or Liquinox through oxygen line.
   d. Undo pump connection and rinse pump with clear water.
   e. Fill 2 qt reservoir with clear tap water.
   f. Attach reservoir pump to cabin oxygen line.
   g. Pump 2 qt water through oxygen line.
   h. Repeat steps A through D, rinsing the pump with the next cleaning material.
   i. Pump 1 qt Methyl Alcohol through oxygen line.
   j. Pump 1 qt ASAHIKLIN AK-225 through oxygen line. www.agcchem.com
   k. Purge the line of AK-225 by passing clean dry air through the line.
   l. With the air still flowing, sniff the air exiting the drain line. The absence of odors will verify the line is free of AK-225.
   m. Reconnect lines and restore System to service.

2.4.4 Functional Test

The following test procedure will evaluate the Built-In Oxygen System installation in the aircraft:

1. Check wiring and connections before applying aircraft battery power.
2. Fill Oxygen System with aviators oxygen (see Maintenance Manual or Flight Manual Supplement), leave access panel open.
3. Switch the Oxygen System ON at the oxygen control panel and verify that the Oxygen System quantity display indicates the same oxygen pressure shown at the aft fill port gauge.
4. Connect Flowmeter breathing device to overhead distribution panel.
5. Ensure oxygen flow through a breathing device.
6. Switch the Oxygen System OFF at the oxygen control panel.
7. Turn aircraft battery power off.

2.4.5 Oxygen System Installation

Refer to Precise Flight Inc. drawing list 102N0000 Cirrus Design Built-In Oxygen System for installation and removal of the oxygen system components.

2.5 Trouble Shooting Guide

2.5.1 Oxygen System Fails to Operate

a. Check circuit breaker.
b. Check connector plugs for security and contact insertion.
c. Check wiring diagram against aircraft installation. See Section 2.8.

2.5.2 Additional Technical Assistance

Please call Precise Flight, Inc., www.preciseflight.com, 800-547-2558 or 541-382-8684.

2.6 Airworthiness Limitations

This Airworthiness Limitations Section is FAA Approved and Specifies maintenance required under Sections 43.16 and 91.403 of the Federal Aviation Regulations, unless an alternative program has been FAA Approved.

None – The operation of the Built-In Oxygen System does not impact the airworthiness limitations, and is not required for normal flight.

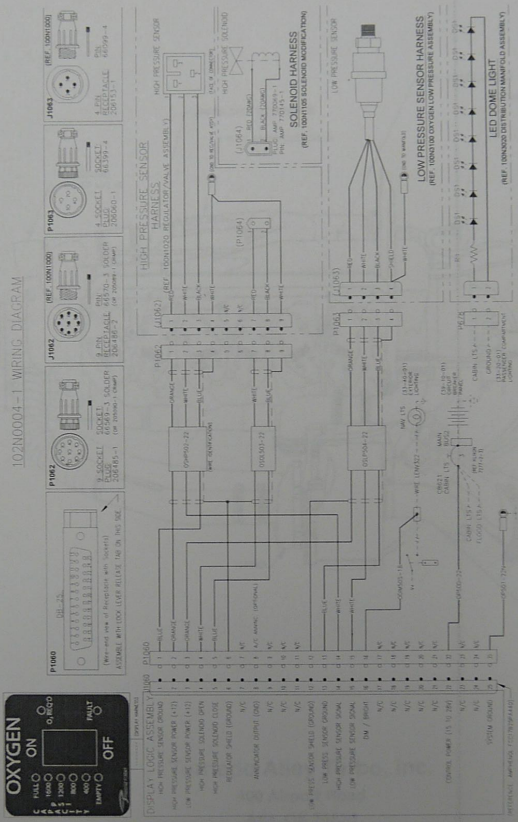
Note:	**To maintain the altitude capability of the aircraft, the Scheduled Maintenance Intervals and Inspections must be maintained.**

2.7 SCHEDULED MAINTENANCE INTERVALS AND INSPECTIONS FOR CONTINUED AIRWORTHINESS

Table 1 - Scheduled Maintenance Intervals and Inspections

Cirrus Design SR20 and SR22 BUILT-IN OXYGEN SYSTEM	EACH 50 HOURS	EACH 200 HOURS	EACH 500 HOURS	ANNUALLY	3 YEARS	15 YEARS
1. Check flexible lines for security of connections, kinks or tube discoloration.				•		
2. Replace oxygen cannulas and/or oxygen masks.		•			•	
3. Replace or overhaul microphone oxygen mask.			•			
4. a. Perform functional test per Section 2.4.3. b. Follow Cirrus Maintenance Manual and this document for general aircraft wiring system checks and headliner removal. Oxygen Wiring Diagram is in the Appendix. c. Check security of oxygen bottle mounting; re-torque wing nuts to snug and two turns tight. d. If contamination is found, clean oxygen lines. See 2.4.2. e. Check security of oxygen lines, and check bonding continuity on cabin oxygen line to ensure resistance to aircraft ground is no more than 0.003 ohms at any place on the System. f. Clean and check condition of the filler port and insure filler cap is present. g. Confirm that "O2 REQ"D" annunciator illuminates at 12,000 ft ± 500 ft				•		
5. Replace O-Ring in CPC Connector Assembly on the breathing stations.					•	
6. a. Purge Oxygen System. See Maintenance Manual. b. Remove and hydrostatically test the oxygen cylinders from date marked on cylinder. c. Overhaul regulator/valve assembly – replace O-Rings, verify regulator pressure setting. d. If contamination is found, clean oxygen lines. See 2.4.2. e. Inspect oxygen lines and fittings for leaks, cracks or damage. Leak check with Snoop or equivalent. wwww.swagelok.com. f. Replace flexible oxygen lines on breathing stations. g. Replace O-Ring in CPC connector assembly identified on the breathing stations. h. Overhaul A4 Flowmeters.					•	
7. a. Replace composite wrapped oxygen cylinder. b. Overhaul regulator/valve assembly – replace O-Rings, verify regulator pressure setting. c. Inspect oxygen lines and fittings for cracks, leaks or damage. d. Purge Oxygen System. e. Replace flexible oxygen lines on breathing stations. f. Replace O-Ring in CPC connector assembly identified on the breathing stations. g. Overhaul A4 Flowmeters.						•

2.8 System Wiring Diagram

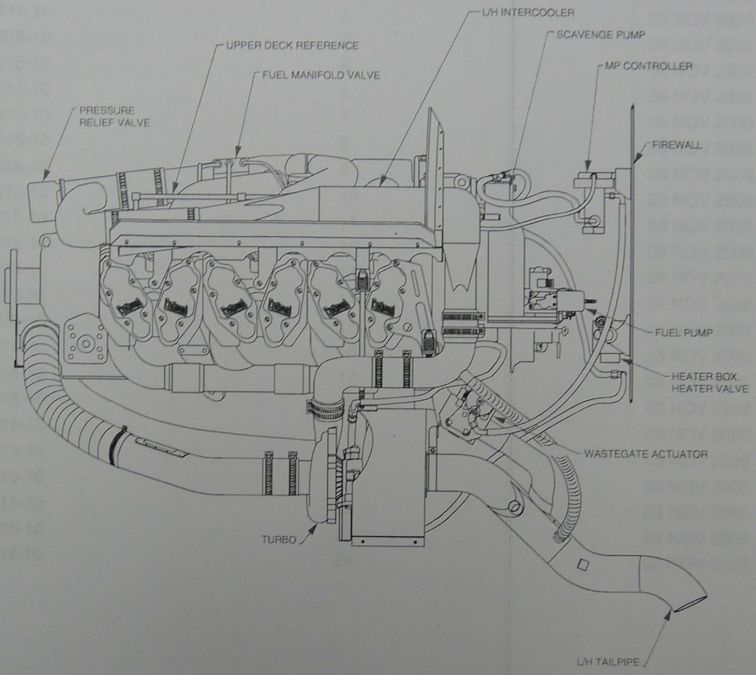


TORNADO ALLEY TURBO, INC.

MAINTENANCE MANUAL with TROUBLE SHOOTING MANUAL

For the

TURBONORMALIZED CIRRUS DESIGN SR22 Series Airplane



Tornado Alley Turbo, Inc.

400 Airport Road

Ada, OK 74820

P/N Report 215-10

ISSUED Nov, 2006

LIST OF EFFECTIVE PAGES

Part	Page	Date
REPORT 215-10-LOEP	1	08 NOV 2006
REPORT 215-10-LOEP	2	08 NOV 2006
REPORT 215-10-TOC	1	08 NOV 2006
REPORT 215-10-TOC	2	08 NOV 2006
REPORT 215-10	1	08 NOV 2006
REPORT 215-10	2	08 NOV 2006
REPORT 215-10	3	08 NOV 2006
REPORT 215-10	4	08 NOV 2006
REPORT 215-10	5	08 NOV 2006
REPORT 215-10	6	08 NOV 2006
REPORT 215-10	7	08 NOV 2006
REPORT 215-10	8	08 NOV 2006
REPORT 215-10	9	08 NOV 2006
REPORT 215-10	10	08 NOV 2006
REPORT 215-10	11	08 NOV 2006
REPORT 215-10	12	08 NOV 2006
REPORT 215-10	13	08 NOV 2006
REPORT 215-10	14	08 NOV 2006
REPORT 215-10	15	08 NOV 2006
REPORT 215-10	16	08 NOV 2006
REPORT 215-10	17	08 NOV 2006
REPORT 215-10	18	08 NOV 2006
REPORT 215-10	19	08 NOV 2006
REPORT 215-10	20	08 NOV 2006
REPORT 215-10	21	08 NOV 2006
REPORT 215-10	22	08 NOV 2006
REPORT 215-10	23	08 NOV 2006
REPORT 215-10	24	08 NOV 2006

TABLE OF CONTENTS

AIRWORTHINESS LIMITATIONS

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

A. There are no limiting inspections and/or maintenance items.

FAA Approved _____ **Date** NOV 08 2006

S. Frances Cox
Special Certification Office
Federal Aviation Administration
Fort Worth, Texas 76193-0190

EFFECTIVITY:
All

DESCRIPTION AND OPERATION

The Tornado Alley Turbonormalizing System (See Figure Report 215-10-1) utilizes two Kelly Aerospace turbonormalizers with a Kelly absolute manifold pressure controller, and a Kelly pressure relief valve. The turbonormalizers are new generation turbonormalizers designed to provide the same boost as older design turbonormalizers but with lower compressor discharge temperatures. This increase in efficiency is due to the improved design of the compressor blades and compressor housing. However, to further reduce engine induction temperatures, two side baffle mounted intercoolers are also installed in the system.

The absolute controller and wastegates work in conjunction with each other to provide proper boost pressure to the engine. The wastegate is actuated using engine oil pressure to actuate a small hydraulic cylinder which redirects the engine by-pass exhaust flow around the turbonormalizers. The absolute pressure controller utilizes an aneroid bellows and spring connected to a valve that regulates the amount of oil flowing out of the wastegate actuator hydraulic control cylinder. The aneroid bellows are located inside a housing that is connected to the output air produced by the compressors.

As compressor outlet pressure increases, the bellows are forced down, opening the normally closed oil control valve. When open, the valve allows metered oil to bypass the wastegate which, in turn, is spring loaded to the open position. Oil passing through the absolute controller is returned to the engine oil sump. The left hand wastegate is a master wastegate connected to a slave wastegate on the right side of the engine. The right hand wastegate is the same as the left hand wastegate, but is slaved to the hydraulic actuator on the left hand wastegate. The two wastegates are mechanically synchronized and move in parallel with each other.

Each wastegate incorporates a typical butterfly exhaust bypass valve. It is operated by a hydraulic actuator utilizing engine oil for operation. The wastegate is spring loaded to the open position. Increasing oil pressure from the engine causes the actuator to work against the spring to close the butterfly valve. The wastegate is located in the exhaust system ahead of the turbonormalizer turbine. As the butterfly valve opens, it allows exhaust gasses to bypass the turbonormalizer turbine, thereby controlling the speed and output of the turbonormalizer. The wastegate helps provide even control of the turbonormalizer speed and output so that the engine can maintain sea level manifold pressure well into the flight levels. As turbonormalizer compressor outlet pressure rises, the aneroid bellows in the absolute pressure controller senses the increase in pressure. When at high engine speed and load and the proper absolute pressure is reached, the force on the aneroid bellows opens the normally closed metering valve. When the oil pressure in the waste gate actuator cylinder is lowered sufficiently, the waste gate actuator spring forces the mechanical linkage to open the waste gates. A portion of the exhaust gases then bypasses the turbonormalizer turbines, thus preventing further increase of turbonormalizer speed and holding the compressor outlet absolute pressure to the desired value. Conversely, at engine idle, the turbonormalizer runs slowly with low compressor pressure output; therefore, the low pressure applied to the aneroid bellows is not sufficient to affect the unseating of the normally closed metering valve. Consequently, engine oil pressure keeps the waste gates closed and all of the exhaust flows through the turbonormalizer turbine sections.

A. Alternate Air Door

The system is equipped with a magnet latched alternate air door on the left side of the induction system. When any restriction of the air filter is encountered, such as from ice or ice crystal formation, the alternate air door will open automatically. The MFD and PFD will provide a message alerting the pilot that the alternate air door is open. The alternate air door provides an alternate path for warm air from the lower side of the engine compartment to go to both turbonormalizers when the air filter becomes blocked. After the air filter blockage is removed, the alternate air door may be closed by simply retarding the power lever momentarily and the door will re-latch automatically. In some instances, if there is an unusual surge in engine power, especially at high altitude, the alternate air door may become unlatched. In that event, again, simply retarding the throttle momentarily will re-latch the alternate air door.

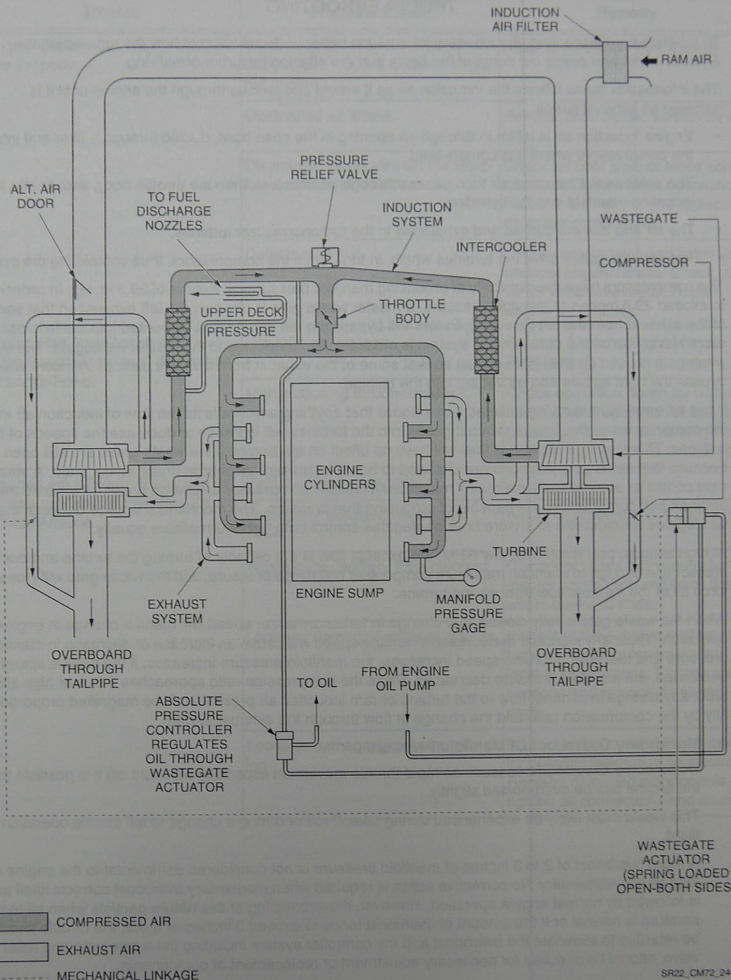


Figure Report 215-10-1
System Schematic

TROUBLESHOOTING

To facilitate troubleshooting, the following information better understanding of how the turbonormalizer System works and points out some of the items that are affected by turbonormalizing.

The information below follows the induction air as it enters and passes through the engine until it is expelled as exhaust gases.

- Engine induction air is taken in through an opening in the nose bowl, ducted through a filter and into the compressors where it is compressed.
- The pressurized induction air then passes through intercoolers, then the throttle body, and, finally, the induction manifold into the cylinders.
- The air and fuel are burned and exhausted to the turbonormalizer turbines.
- The exhaust gases drive the turbines which, in turn, drive the compressors, thus completing the cycle.

The compressors have the capability of producing manifold pressures in excess of 29.5 in. Hg. In order not to exceed 29.5 inches of manifold pressure, a master waste gate is used on the left exhaust so that some of the exhaust from the left bank of cylinders will bypass the left turbine and be vented into the tailpipe. A slave wastegate on the right exhaust system is mechanically connected to the master wastegate. The right wastegate is used on the right exhaust so that some of the exhaust from the right bank of cylinders will bypass the right turbine and be vented into the tailpipe.

It can be seen from studying bulleted items above that anything which affects the flow of induction air into the compressors or the flow of exhaust gases into the turbines will increase or decrease the speeds of the turbines. This resultant change in flow will have no effect on the engine if the waste gates are still open because the waste gate positions are changed to hold compressor discharge pressure constant. A waste gate controller automatically maintains maximum allowable compressor discharge pressure anytime the turbines and compressors are capable of producing that pressure. The mechanical linkage between the wastegates is adjustable to ensure both wastegates control both turbonormalizers equally.

At high altitude, part throttle, or low RPM, the exhaust flow is not capable of turning the turbine and compressor fast enough to maintain maximum compressor discharge pressure, and the waste gate will close to force all of the exhaust flow through the turbine.

When the waste gate is fully closed, any change in turbonormalizer speed will mean a change in engine operation. Thus, any increase or decrease in turbine speed will cause an increase or decrease in manifold pressure and fuel flow. If turbine speed increases, the manifold pressure increases; if the turbine speed decreases, the manifold pressure decreases. Since the compression ratio approaches 3 to 1 at high altitude, any change in exhaust flow to the turbine or ram induction air pressure will be magnified proportionally by the compression ratio and the change in flow through the exhaust system.

A. Momentary Overshoot Of Manifold Pressure

Under some circumstances (such as rapid throttle movement especially with cold oil) it is possible that the engine can be overboosted slightly.

This would most likely be experienced during takeoff roll or during a change to full throttle operation in flight.

A slight overboost of 2 to 3 inches of manifold pressure is not considered detrimental to the engine as long as it is momentary. No corrective action is required when momentary overboost corrects itself and is followed by normal engine operation. However, if overboosting of this nature persists when oil temperature is normal or if the amount of overboost tends to exceed 3 inches or more, the throttle should be retarded to eliminate the overboost and the controller system including the waste gate and relief valve, should be checked for necessary adjustment or replacement of components.

Trouble	Probable Cause	Remedy
Engine Starts But Dies, Or Will Not Idle Properly	Vaporized fuel in system. (Most likely to occur in hot weather with a hot engine.)	Refer to Airplane Flight Manual
	Obstructed air intake.	Remove obstruction; service air filter.
	Discharge nozzle air vent manifolding restricted or defective.	Check for bent lines or loose connections. Tighten loose connections Remove restrictions and replace defective components.
	Defective engine.	Check compression and listen for unusual engine noises. Check oil filter for excessive metal. Repair engine as required.
Engine Has Poor Acceleration, Runs Rough At Speeds Above Idle Or Lacks Power	Idle mixture too lean.	Refer to Airplane Flight Manual Supplement.
	Malfunctioning turbonormalizer.	Check operation, listen for unusual noise. Check operation of waste gate valve and for exhaust system defects. Tighten loose connections.
Engine Lacks Power, Reduction In Maximum Manifold Pressure Or Critical Altitude	Defective ignition system.	
	Improperly adjusted waste gate valve.	Adjust or replace waste gate valve.
	Waste gate capillary tube plugged.	Disconnect lines from controller to master waste gate and back flush waste gate and lines.
	Loose or damaged exhaust system.	Inspect entire exhaust system to turbonormalizers for cracks and leaking connections. Tighten connections and replace damaged parts.
	Loose or damaged intake manifolding.	Inspect entire manifolding system for possible leakage at connections. Replace damaged components, tighten all connections and clamps.

Trouble	Probable Cause	Remedy
Engine Lacks Power, Reduction In Maximum Manifold Pressure Or Critical Altitude	Malfunctioning turbonormalizer.	Check for unusual noise in turbonormalizers. If malfunction is suspected remove tailpipe and/or air inlet connections and check rotor assembly, for possible rubbing in housing, damaged rotor blades or defective bearings. Replace turbocharger if damage is noted
	Fuel discharge nozzle defective.	Inspect fuel discharge nozzle vent manifolding for leaking connections. Tighten and repair as required. Check for restricted nozzles and lines and clean and replace as necessary.
	Controller not getting enough oil pressure to close the waste gate.	Check oil pump outlet pressure, oil filter and external lines for obstructions. Clean lines and replace if defective. Replace oil filter.
	Controller out of adjustment or defective.	Replace controller if defective.
	Defective waste gate actuator. Turbo coking, oil forced through seal of turbine housing.	Replace actuator. Clean or change turbonormalizer.
Engine Surges Or Smokes		
	Defective scavenge pump.	Replace if defective.
	Defective controller.	Replace if defective.
	Waste gate actuator linkage binding.	Replace if not adjustable.
	Waste gate actuator leaking oil.	Replace actuator.
Turbonormalizer Noisy With Plenty Of Power	Turbonormalizer overspeeding from defective or improperly adjusted controller.	Replace controller if defective.
	Waste gate sticking closed.	Correct cause of sticking. Replace defective parts.
	Turbo drain line (oil return to engine sump) plugged	Clean line and check valve. Replace if defective.

Trouble	Probable Cause	Remedy
Engine Power Increases Slowly Or Severe Manifold Pressure Fluctuations When Throttle Advanced Engine Power Increases Rapidly And Manifold Pressure Overboosts When Power Lever Advanced	Overboost control valve out of adjustment or defective.	Replace if defective.
	Waste gate operation is sluggish.	Replace if defective. Correct cause of sluggish operation.
	Overboost control valve out of adjustment or defective.	Replace if defective.
	Waste gate operation is sluggish.	Replace if defective. Correct cause of sluggish operation.
	Power lever advanced too rapidly.	Advance power lever smoothly. Refer to Cirrus SR22 Service Manual
High Cylinder Head Temperature	Defective cylinder head temperature indicating system.	
	Clogged or dirty fuel injection nozzles.	Clean nozzles and replace if defective.
	Engine baffles loose, bent or missing.	Install baffles properly. Repair or replace if defective.
	Dirt accumulated on cylinder cooling fins.	Clean thoroughly.
	Incorrect grade of fuel.	Drain and refill with proper fuel. Advance power lever smoothly.
Alternate Air Door Opens When Power Lever Advanced	Power lever advanced too rapidly.	
	Air filter obstructed.	Remove obstruction; Service or replace air filter.

Trouble	Probable Cause	Remedy
Engine Has Poor Acceleration, Runs Rough At Speeds Above Idle Or Lacks Power (Cont.)	Improper fuel-air mixture.	Check intake manifold connections for leaks. Check fuel controls and linkage for setting and adjustment. Replace worn elements of control linkage. Service air filter.
	Tighten loose connections	
	Turbonormalizer wheels rubbing.	Replace turbonormalizer.
	Improperly adjusted or defective waste gate controller.	Adjust or replace absolute controller as required.
	Leak in turbonormalizer discharge pressure system.	Correct cause of leaks. Repair or replace damaged parts.
	Manifold pressure overshoot. (Most likely to occur when engine is accelerated too rapidly.)	Smoothly move throttle about two-thirds open. Let engine accelerate and peak. Smoothly move throttle to full open.
	Engine oil viscosity too high for ambient air.	Replace oil with proper grade of oil.
	Exhaust system leakage	Refer to Cirrus SR22 Service Manual for exhaust system inspection procedures. Inspect spark plugs for fouled electrodes, heavy carbon deposits, erosion of electrodes, improperly adjusted electrode gaps and cracked porcelains. Test plugs for regular firing under pressure. Replace damaged or misfiring plugs.

MAINTENANCE PRACTICES

TIME LIMITS AND MAINTENANCE CHECKS

A. Overhaul And Replacement Schedule

The following items must be overhauled or replaced at the following intervals unless otherwise noted. To ensure correct observation of these times, the date of removal, installation, or overhaul of such components as well as the airplanes flight hours must be entered into the Service Time Record filed in the Airplane Maintenance Log.

	Item	Interval	Replc.	O'haul	Notes
1.	Flexible Turbo System Lines	5 Years	❍		
2.	Turbonormalizer	At Engine Overhaul		❍	
3.	Waste Gate and Controller	At Engine Overhaul		❍	

B. Scheduled Maintenance Checks

	Engine Group	25 Hrs	50 Hrs	100 Hrs	200 Hrs or 2 Years Whichever First
1.	All external surfaces for signs of exhaust leaks: Flat gray, gray-white or light gray powdering, or a sooty appearance indicate exhaust leakage. Signs of deterioration include warping, deformation, thinning, collapse, dents, cracking, tears, separation, scaling, weld separation, discoloration, corrosion, metal pitting or burn-thru	❍			
2.	All external joints, clamps, and couplings for misalignment, warpage, broken, loose or missing fasteners, clamps, and abnormal wear.	❍			
3.	All interior areas for blockage, restrictions, dents or protrusions into the exhaust flow path. Using a flashlight, look in the interior of the tailpipe for loose or displaced baffles, cones or diffusers.	❍			
4.	Visually inspect muffler, heat exchanger, and shrouds for condition.	❍			
5.	Visually inspect exhaust stack to flange interface for cracks in welds or weld heat affected area, blown out or missing gaskets.	❍			
6.	Visually inspect all welds and area adjacent to the weld for cracks or weld separation.	❍			
7.	Visually inspect tailpipes, for erosion, thinning, bulging or burn through.	❍			
8.	Visually inspect bracing, supports and support attach lugs on other structures for security.	❍			

	Engine Group (Continued)	25 Hrs	50 Hrs	100 Hrs	200 Hrs or 2 Years Whichever First
9.	Visually inspect surrounding structures for discoloration, heat damage, or burning	○			
10.	Engine Oil Drain and change every 50 hours or 6 months, whichever occurs first.		○		
11.	Cold and Hot Air Hoses Visual Inspection for leaks, security, and condition.		○		
12.	Engine Baffling and Seals Visual Inspection for cracks, tears, and rips.		○		
13.	Air Intake Ducts Visual Inspection for general condition.		○		
14.	Fuel Injection System Visual Inspection for leaks, security, and condition.		○		
15.	Turbonormalizer Mounting Bracket Visual Inspection for security and condition.		○		
16.	Vent Lines to Fuel Pump and Discharge Nozzles Visual Inspection for chafing, obstruction, security, and general condition.		○		
17.	Engine Heat Shields Visual Inspection for security and condition.		○		
18.	Engine Mount Isolators Visual Inspection for cracking, splitting, and general condition.			○	
19.	Turbonormalizer Visual inspection of turbine for coking, carbonization, oil deposits, and turbine impeller damage. Visual inspection of compressor wheel for damage, interference, and free rotation.			○	
20.	Flexible Turbo System Lines Visual Inspection for chafing, obstruction, security, and general condition.			○	
21.	Waste Gate and Controller Visual Inspection for security and condition.			○	
22.	Exhaust Muffler/Heat Exchanger Borescopic inspection of tailpipe sections adjacent to heat exchanger for signs of cracking. Repair or replace on condition.			○	
23.	Cabin Heat Mixing Valve Visual Inspection for security and condition.				○

C. Progressive Inspection Program

The following inspections are to be performed in addition to the Routine and Detailed Inspection for the Engine Group defined in Chapter 5, Section 21 of the SR22 AMM.

	Engine Group Routine Inspection Criteria	Chap-Sect Reference
1.	Induction System Hoses and Couplings Visual Inspection for security, leaks, and condition	Refer to AMM 5-20
2.	Turbochargers Visual inspection of turbines for coking, carbonization, oil deposits, and turbine impeller damage. Visual inspection of compressor wheels for damage, interference, and free rotation.	Refer to AMM 5-20
3.	Turbocharger Mounting Brackets Visual Inspection for security and condition.	Refer to AMM 5-20
4.	Flexible Turbo System Lines Visual Inspection for chafing, obstruction, security, and general condition.	Refer to AMM 5-20
5.	Waste Gate and Controller Visual Inspection for security and condition.	Refer to AMM 5-20
6.	Vent Lines to Fuel Pump and Discharge Nozzles Visual Inspection for chafing, obstruction, security, and general condition.	Refer to AMM 5-20
7.	Engine Heat Shields Visual Inspection for security and condition.	Refer to AMM 5-20
8.	Exhaust Muffler/Heat Exchanger Borescopic inspection of tailpipe sections adjacent to heat exchanger for signs of cracking. Repair or replace on condition.	Refer to AMM 5-20

	Engine Group Detailed Inspection Criteria	Chap-Sect Reference
1.	Induction System Hoses and Couplings Visual Inspection for security, leaks, and condition. Tighten hose clamps as required.	Refer to AMM 5-20
2.	Turbochargers Visual inspection of turbines for coking, carbonization, oil deposits, and turbine impeller damage. Visual inspection of compressor wheels for damage, interference, and free rotation.	Kelly Aerospace Troubleshooting Reference Guide 400888-0000
3.	Turbocharger Mounting Brackets Visual Inspection for security and condition. Replace any cracked or damaged brackets.	Refer to AMM 5-20

	Engine Group Detailed Inspection Criteria (Continued)	Chap-Sect Reference
4.	Flexible Turbo System Lines Visual Inspection for chafing, obstruction, security, and general condition.	Refer to AMM 5-20
5.	Waste Gate and Controller Visual Inspection for security and condition. Lubricate wastegate butterflies with Mouse Milk®	Refer to AMM 5-20
6.	Vent Lines to Fuel Pump and Discharge Nozzles Visual Inspection for chafing, obstruction, security, and general condition.	Refer to AMM 5-20
7.	Engine Heat Shields Visual Inspection for security and condition.	Refer to AMM 5-20
8.	Exhaust Muffler/Heat Exchanger Borescopic inspection of tailpipe sections adjacent to heat exchanger for signs of cracking. Repair or replace on condition.	Refer to AMM 5-20
9.	Induction System Filter Clean and re-oil filter at each inspection period or when filter is more than 50% covered by foreign material. Clean per K&N Air Filter Service Instruction 18627	K&N Air Filter Service Instruction 18627
10.	Alternate Air Door Visual Inspect for secure closing. Check for loose fasteners or rivets that may enter turbocharger. Verify that alternate air door indicator circuit is working by opening alternate air door and checking that alternate air door light is ON on MFD. Clean area around alternate air door.	Refer to AMM 5-20
11.	Fuel Injection Nozzles Visual inspect nozzles and manifold valve for fuel stains, security, and proper sealing of upper deck reference manifolds. Remove and clean injector nozzles every 5 years or 500 hours, whichever comes first. Remove, clean, and replace per GAMI Installation Procedure No. IP-2001-02.	GAMI Installation Procedure No. IP-2001-02

TURBONORMALIZERS

The turbonormalizers are exhaust gas driven compressors, or air pumps, which provide high air mass flow to the engine intake manifold. Each turbonormalizer is composed of a turbine wheel, compressor wheel, turbine housing and compressor housing. The turbine, compressor wheel, and interconnecting drive shaft comprise one complete assembly and are the only moving parts in the turbonormalizer. Turbonormalizer bearings are lubricated with filtered oil supplied from the engine oil system. Engine exhaust gas enters the turbine housing to drive the turbine wheel. The turbine wheel, in turn, drives the compressor wheel, producing high density air entering the engine induction manifold. Exhaust gas is then dumped overboard through the exhaust outlet of the turbine housing and exhaust tailpipe. Air is drawn into the compressor through the induction air filter and is forced out of the compressor housing through a tangential outlet to the intake manifold. The degree of compression is varied by means of waste gate valve, which varies the amount of exhaust gas allowed to bypass the turbine.

(1) Removal And Installation

(a) Disconnect and tag oil lines from controller and plug or cap open lines and fittings.

(b) Disconnect compressor outlet pressure sensing lines from controller and plug or cap open lines and fittings.

(c) Remove two bolts attaching controller to mounting bracket on firewall.

(d) Remove controller from aircraft, being careful not to drop controller unit.

(e) Installation of the controller may be accomplished by reversing the preceding steps.

ABSOLUTE CONTROLLER

The waste gate actuator and controller use engine oil for power supply. The turbonormalizer is controlled by the waste gate, waste gate actuator, the absolute pressure controller and overboost control valves. The waste gate bypasses engine exhaust gas around the turbonormalizer turbine inlet. The waste gate actuator, which is physically connected to the waste gate by mechanical linkage, controls the position of the waste gate butterfly valve. The absolute pressure controller controls the maximum turbonormalizer compressor discharge pressure. The overboost control valve prevents an excessive pressure increase from the turbonormalizer compressor.

The master waste gate actuator is spring-loaded to position the waste gate to the normally open position when there is not adequate oil pressure in the waste gate actuator power cylinder during engine shut down. When the engine is started, oil pressure is fed into the waste gate actuator power cylinder through the capillary tube. This automatically fills the waste gate actuator power cylinder and lines leading to the controller, blocking the flow of oil by normally closed metering and/or poppet valves. As oil pressure builds up in the waste gate actuator power cylinder, it overcomes the force of the waste gate open spring, closing the waste gate. When the waste gate begins to close, the exhaust gases causes the turbonormalizer to rotate faster, raising the turbonormalizer compressor outlet pressure. As the compressor outlet pressure rises, the aneroid bellows in the absolute pressure controller senses the increase in pressure. When at high engine speed and load and the proper absolute pressure is reached, the force on the aneroid bellows opens the normally closed metering valve. When the oil pressure in the waste gate actuator power cylinder is lowered sufficiently, the waste gate actuator open spring forces the mechanical linkage to open the waste gate. A portion of the exhaust gases then bypasses the turbonormalizer turbine, thus preventing further increase of turbonormalizer speed and holding the compressor discharge absolute pressure to the desired value. Conversely, at engine idle, the turbonormalizer runs slowly with low compressor pressure output; therefore, the low pressure applied to aneroid bellows is not sufficient to affect the unseating of the normally closed metering valve. Consequently, engine oil pressure keeps the waste gate closed. The overboost control valve acts as a pressure relief valve and will open to prevent any excessive pressure increase from the turbonormalizer compressor.

A. Removal and Installation -Absolute Controller

(1) Disconnect and tag oil lines from controller and plug or cap open lines and fittings.
(2) Disconnect compressor outlet pressure sensing lines from controller and plug or cap open lines and fittings.
(3) Remove two bolts attaching controller to mounting bracket on firewall.
(4) Remove controller from aircraft, being careful not to drop controller unit.
(5) Installation of the controller may be accomplished by reversing the preceding steps.

B. Adjustment - Absolute Controller

(1) With engine oil temperature at middle of green arc, slowly open throttle and note maximum manifold pressure obtainable. Do not exceed 29.5 in. Hg.
(2) Cut safety wire and remove plug from bottom of absolute controller. (If a small
(3) amount of oil is encountered upon removal of the plug, there is no need for alarm.)
(4) Using a flat blade screw driver, rotate metering valve seat clockwise to increase manifold pressure and counterclockwise to decrease manifold pressure. Lightly tap the unit after each adjustment to seat internal parts.

Note: When adjusting, rotate in VERY small increments as this is an extremely sensitive Approximately 13 degrees rotation will change the manifold pressure reading about one inch Hg.

(5) Install plug in absolute controller, then operate engine as in step "a" to ascertain that adjustment has not caused radical change in manifold pressure.

Note: When making adjustment on the ground, the hotter the engine gets, the lower the manifold pressure will be.

(6) After each adjustment, the aircraft must be flight tested to check results.
(7) Repeat this procedure until desired results are obtained.
(8) Safety controller plug.

MASTER WASTE GATE ACTUATOR

A. Removal and Installation -Master Waste Gate Actuator

(1) Disconnect and tag oil lines from actuator and plug or cap open lines and fittings. Disconnect linkage to slave waste gate.
(2) Remove clamps holding wastegate manifold assembly to exhaust system.
(3) Remove bolts, washers, and nuts attaching wastegate manifold assembly to the turbonormalizer.
(4) Loosen clamp attaching tailpipe to turbine exhaust outlet and work waste gate and manifold from exhaust system.
(5) Remove the assembly from aircraft being careful not to drop the unit.
(6) Installation may be accomplished by reversing the preceding steps

Note: When installing the assembly, be sure the gaskets at inlet and outlet of valve are installed and are in good condition. Replace gaskets if damaged.

B. Adjustment - Master Waste Gate Actuator

If adjustment of waste gate actuator is required, remove waste gate actuator in accordance with "Removal and Installation of Waste Gate Actuator" instructions and send to an approved facility for repair or overhaul of waste gate actuators.

SLAVE WASTE GATE

A. Removal And Installation Of Slave Waste Gate

(1) Disconnect linkage to master waste gate.
(2) Remove clamps holding wastegate manifold assembly to exhaust system.
(3) Remove bolts, washers, and nuts attaching wastegate manifold assembly to the turbonormalizer.
(4) Loosen clamp attaching tailpipe to turbine exhaust outlet and work waste gate and manifold from exhaust system.
(5) Installation may be accomplished by reversing the preceding steps.

Note: When installing the assembly, be sure the gaskets at inlet and outlet of valve are installed and are in good condition. Replace gaskets if damaged.

PRESSURE RELIEF VALVE

A. Removal And Installation Of Pressure Relief Valve

(1) Remove bolts, washers, and nuts holding pressure relief valve to induction manifold assembly.
(2) Remove pressure relief valve from induction manifold assembly.
(3) Check condition of O-ring on face of pressure relief valve before installation.
(4) Clean surface of induction manifold assembly, verify that the surface is smooth and free from nicks, gouges, or burrs that may damage the O-ring or prevent proper seal of the pressure relief valve.
(5) Install the pressure relief valve by lining up the holes in the pressure relief valve with the holes in the induction manifold assembly and installing bolts, washers, and nuts in the same orientation as when removed. Tighten nuts to 20 to 25 in-lb (2.3 - 2.8 Nm) net torque.

ENGINE

A. Removal and Overhaul - Engine

If the engine is to be removed, the turbochargers and their accessories should be removed in accordance with the following steps before removing engine mount bolts. All other procedures for engine removal listed in the Cirrus SR22 service manual apply.

(1) Disconnect hoses to the intercoolers.
(2) Remove waste gates in accordance with "Removal and Installation of Master Waste Gate Actuator" and "Removal and Installation of Slave Waste Gate" instructions.
(3) Remove turbonormalizers in accordance with Turbonormalizer "Removal and Installation" instructions.

Note: If the engine is to be sent out for overhaul, be sure the overhauler knows that the engine has different fuel injection nozzles, a different engine-driven fuel pump, and a scavenge pump to accommodate the turbonormalizing system. The turbonormalizer, scavenge pump, fuel pump, waste gates, waste gate actuator, and absolute controller should be overhauled by approved facilities at the same time as the engine overhaul.

B. Installation - Engine

Note: After tightening V-band clamps, fly aircraft. Re-torque after flight.

Component	Torque
Turbine Housing Bolts	160 - 190 in-lb (18 - 21 Nm)
Fuel Injector Nozzle	55 - 65 in-lb (6 - 7 Nm)
Fuel Injector Nozzle Line Nut	40 - 50 in-lb (5 - 6 Nm)
V-band Clamps:	
Compressor Housing[a]	40 - 60 in-lb (5 - 7 Nm) net torque[a]
Exhaust Manifold[a]	30 - 35 in-lb (3 - 4 Nm) net torque[a]
Tailpipe[a]	40 - 60 in-lb (5 - 7 Nm) net torque[a]

a. Net torque = torque in addition to torque required to overcome resistance of locknut.

C. Inspection - Post Engine Overhaul / Installation

After overhaul and reinstallation of the engine and turbonormalizing system a final inspection is required.

Inspect the following for security, signs of chaffing, leaking, and general condition:

(1) All hose connections, routing, and security.
(2) All clamps, and couplings for proper engagement and alignment.
(3) Induction tubing for current and possible chafe problems.
(4) Tightness of all exhaust mounting hardware and v-band clamps.
(5) Clearance of exhaust through cowling and below firewall.
(6) Wiring chafe and heat related problems.
(7) Engine probe wiring to exhaust clearance.
(8) Cylinder lower fuel drain plumbing clearance to exhaust and heat shields.
(9) Heat shield clearance off of exhaust components.
(10) Turbo supports for security and safety wire.
(11) Wastegate linkage clearance and safety wire.
(12) Turbo air inlet sceet to front cowling clearance.
(13) Throttle, Propeller, and mixture control lever full travel.

D. Servicing - Post Engine Overhaul / Installation

After overhaul and reinstallation of the engine and turbonormalizing system, pre-oil the engine as described below.

(1) Remove all lower sparkplugs.
(2) Ground all ignition leads to engine.
(3) Clear engine and propeller area from obstacles.
(4) Ensure proper oil level.
(5) Turn on battery power.
(6) With security person outside, crank engine and monitor indicated oil pressure. Crank engine for no more than 30 seconds at a time. When a higher than 10 psi is consistently indicated on oil pressure indicator the turbo will be considered to be pre-oiled.
(7) At this time, also make a fuel prime operation check.
(8) Activate fuel prime switch and observe fuel flow for positive indication of flow.
(9) Turn off battery.
(10) Inspect engine area for any oil leaks and any fuel leaks.
(11) Reinstall sparkplugs and leads.

E. Adjustments - Post Engine Overhaul / Installation

Make the following adjustments as required prior to first flight after reinstallation of turbonormalizing system during overhaul or maintenance of turbonormalizing system components.

Note: All adjustments need to be made with full operating RPM (2700). Fuel Flow, Manifold Pressure, Turbo Inlet Temperature, and Oil Pressure, to be measured at full RPM. If needed, make adjustments at the propeller governor.

(1) Engine Setup

(a) RPM

1 All adjustments need to be made with full operating RPM (2700). Fuel Flow, Manifold Pressure, Turbo Inlet Temperature, and Oil Pressure, to be measured at full RPM. If needed, make adjustments at the propeller governor.

Note: Every airplane may not make full RPM on the ground, so make adjustments as close as possible, then fly and readjust after flight per pilot information.

(b) Fuel Flow

1 For the IO-550-N turbonormalized engine, the target full RPM fuel flow is 33.5 GPH + or - 1.5 GPH. To achieve these indicated target amounts adjustments may need to be made at the high power aneroid adjustment screw. Because of the special combination of fuel nozzles and turbonormalized fuel pump, the TCM service bulletin is a guide for adjustments, but the target GPH is the desired outcome. If an adjustment is necessary, the aneroid adjuster screw will need to be turned OUT (CCW) for an increase in fuel flow, or IN (CW) for a decrease in fuel flow. One turn will equal around 1.5 GPH. To make and adjustment loosen jam nut, turn screw, snug up jam nut.

Note: Fuel flow is relative to RPM, Manifold Pressure, and Oil Temperature. Given targets are set at engine operating oil temperature, engine operating RPM, and indicated 29.6 inches of manifold pressure. Cooler oil will make higher manifold pressure which will make higher fuel flow. It is suggested that fuel flows be set on the high side of the scale.

(c) Manifold Pressure

1 Maximum manifold pressure setting is 29.6 inches at full throttle with normal engine operating oil temperature. Make adjustments to manifold pressure according to "Absolute Controller Adjustments" section above.

Note: Manifold pressure is relative to oil temperature. If the oil temp is cooler the manifold pressure may indicate higher. Be sure to make adjustments according to engine operating temperature.

(d) Oil Pressure

1 There should not be a need to make oil pressure adjustment, but if the oil pressure is below red line at idle, it is suggested that the oil pressure be increased enough to keep a good oil flow through the turbo at idle speeds. The turbo inlet oil pressure valve is preset to 10 PSI. If oil pressure is lower than this, the turbo will "starve" for oil.

Note: Make oil pressure adjustment according to TCM maintenance manual instructions.

F. Operational Inspection - First Flight Run-Up

Perform the following Run-Up Procedure prior to first flight after reinstallation of turbonormalizing system during overhaul or maintenance of turbonormalizing system components.

With upper and lower cowling removed, fireguard and observer present:

(1) Start engine using normal staring procedures.
(2) Keeping RPM below 1700 rpm, monitor oil pressure, fuel flow, manifold pressure, and engine temperatures for normal operation.
(3) Run engine for a short time, only long enough to check all indications and ensure no fuel or oil leakage.
(4) Shut engine down, inspect engine and turbo system for any sign of leakage, chafing, or heat damage.
(5) Install complete cowling.
(6) Perform normal engine start and operation to achieve proper operating temperatures.
(7) Perform magneto operational check.
(8) Perform high power operation check.
(9) Monitor engine operating parameters and make adjustments as necessary.
(10) After the achievement of desired operating parameters, inspect engine compartment for leakage, chafing, and heat damage.
(11) Release aircraft for service flight.

G. Functional Inspection - Return to Service Flight

Perform the following Return to Service Flight after reinstallation of turbonormalizing system during overhaul or maintenance of turbonormalizing system components.

(1) Pilot should perform normal start up, taxi, engine parameter checks and any ground operational checks not related to the turbo system.
(2) Utilizing normal Cirrus before flight checklist perform additional full power performance operational check prior to releasing the brakes for take off. Take note of: engine RPM, fuel flow, tit, manifold pressure and oil temperature.
(3) Depending on oil temperature the parameters may vary. Optimally, 2700 RPM, 29.6 inches MP, 35 GPH at normal operating oil temperature.
(4) Because of a direct correlation between oil temperature and manifold pressure at lower than normal operating oil temperature, manifold pressure will indicate higher than redline.
(5) Because of a direct correlation between manifold pressure and fuel flow higher manifold pressure will give higher fuel flow.
(6) TIT should remain relatively the same.
(7) Utilize normal Cirrus engine break-in procedures, Keeping in mind the turbo parameters and the addition of more possible fuel and oil leak points.

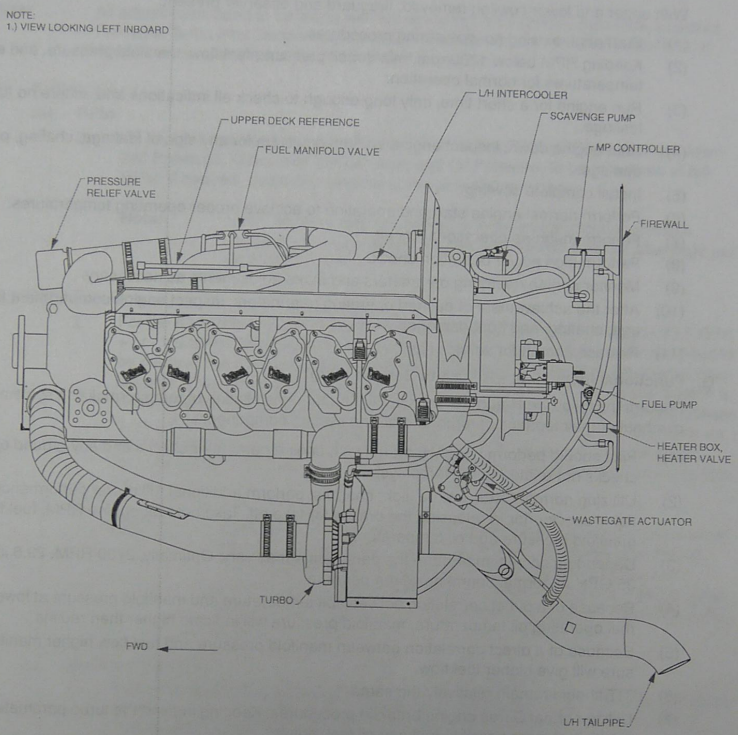


Figure Report 215-10-2
Turbo System Layout

EFFECTIVITY:
All

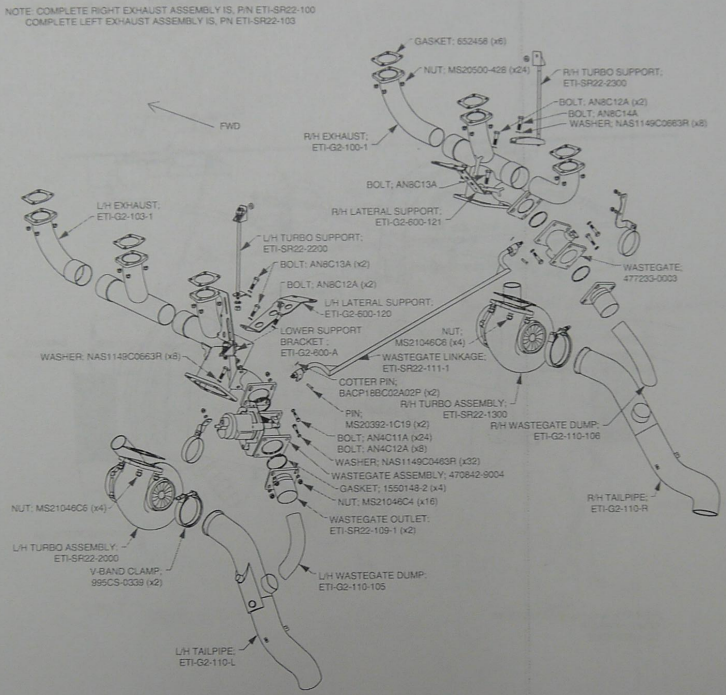


Figure Report 215-10-3
Exhaust System Layout

EFFECTIVITY:
All

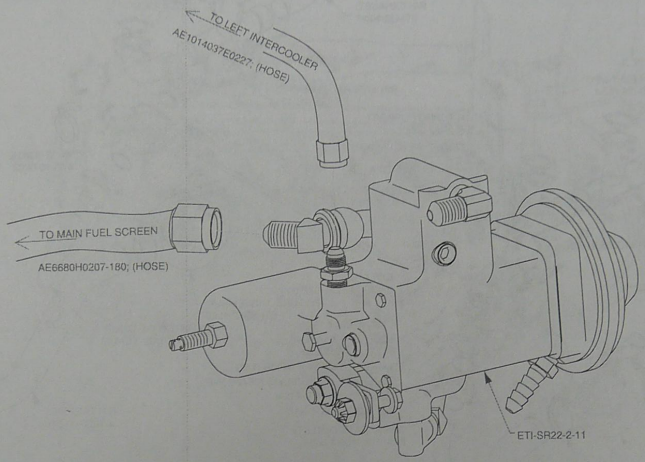


Figure Report 215-10-4
Fuel Pump

EFFECTIVITY:
All

NOTES:

1.) FITTING IS ON LOWER RIGHT SIDE OF MP CONTROLLER
2.) FITTING IS ON LOWER LEFT SIDE OF MP CONTROLLER
3.) ORIFICE FITTING
4.) RELOCATE FACTORY OIL PRESSURE TRANSDUCER

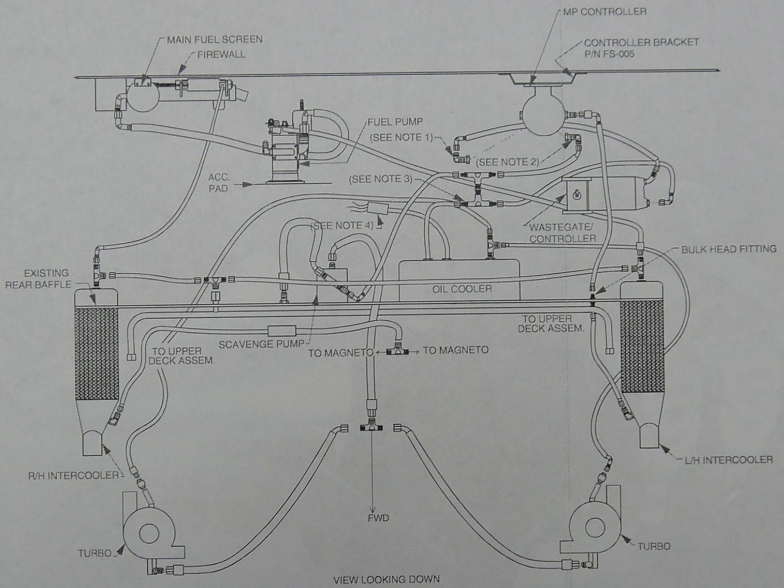


Figure Report 215-10-5
Hose Layout

EFFECTIVITY:
All