

SUPPLEMENT ORIGINAL ISSUE

Precise Flight Oxygen System

Pilot's Operating Handbook
and
Airplane Flight Manual Supplement

Original Issue

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**Insert the Following Pages Into The Supplement
Section Of
The Pilot's Operating Handbook**

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**Pilot's Operating Handbook and
FAA-Approved Airplane Flight Manual Supplement
For**

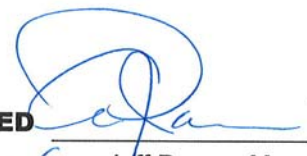
**Supplementary Type Certificate Number:
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**Precise Flight, Inc.
Cirrus SR20/SR22 Fixed Oxygen System**

Aircraft Serial Number:	
Aircraft Registration Number:	

When supplemental oxygen is required by the applicable operating rules (FAR Part 23, FAR Part 91, or FAR Part 135), this Flight Manual Supplement ("Supplement") is applicable and must be inserted in Section 9 of the Pilot's Operating Handbook ("Handbook"). Information in this Supplement adds to, supersedes, or deletes information in the basic handbook.

FAA-APPROVED



DATE October 2, 2006

Jeff Duven, Manager
Seattle Aircraft Certification Office
Federal Aviation Administration

Fixed Oxygen System

Table of Revisions

Use the Table of Revisions to determine the current status of this Supplement. Pages affected by the current revision are indicated by an asterisk (*) preceding the page number.

This Supplement is an addition to the primary FAA-Approved Flight Manual Supplement /Pilots Operating Handbook (AFM/POH) and contains the same sections as found in the Primary document. This table summarizes the applicable revisions by page number.

Revision Level/ Date	Page	Revision Level/ Date	Page	Revision Level/ Date	Page	Revision Level/ Date	Page
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Service Bulletin Configuration List

The following is a list of service bulletins applicable to the operation of the airplane, and have been incorporated into this Supplement. This list contains only those service bulletins that are currently active.

Number	Title	Airplane Serial Effectivity	Revision Incorporated	Incorporated in Airplane

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Fixed Oxygen System

Section 1 – General System Overview

This Supplement provides information that should be observed when operating the Precise Flight, Inc. Fixed Oxygen System. The System is designed to provide supplemental oxygen for the pilot and passengers. The System consists of a 77 cu ft bottle and a pressure regulator assembly located in the aft fuselage, a four (4)-place distribution manifold located in the headliner, a control panel located in the center console next to the flap switch, a filler port with a manual pressure gage located in the aft wall of the baggage compartment, and the related oxygen lines and System electrical lines.

The cockpit control electrically actuates the regulator allowing oxygen flow into the aircraft cabin. The cockpit control will annunciate O₂ REQ'D if the System is not selected ON and the aircraft is above approx. 12,000 ft PA to alert the requirement of oxygen in the cabin. Once the oxygen is selected ON, the quantity display illuminates indicating the presence of oxygen in the cabin. The constant flow controls are calibrated and adjustable for altitude to supply oxygen to either oxygen conserving cannulas, standard cannulas, or masks. The oxygen delivery systems are for altitudes up to the maximum operating altitude of the aircraft, or 25,000 ft MSL, which ever is lower. System faults are indicated by the FAULT annunciator. Steady fault indication signifies a problem with the aircraft wiring and will disable the System. When a steady fault indication is present, the System is disabled and will not reset until power is cycled to the controller. This can be done by cycling the OXYGEN / CABIN LTS circuit breaker, or by cycling aircraft power. Flashing LED FAULT indication specifies an oxygen pressure fault to the distribution manifold. The oxygen quantity display will flash red if the bottle pressure falls below 200 psig.

■ **Note** ■

When the System is first engaged, the FAULT light may briefly flash until proper pressure is sensed at the overhead distribution manifold. This is normal, as pressure may bleed off when not in use.

■ **Note** ■

In the event of an electrical failure on Bus 1, oxygen will remain on in the cabin. Aircraft electrical power is required ONLY to turn the System ON and OFF. The System is designed to remain ON during an electrical failure, but oxygen quantity indication will be lost. Disconnecting the lines from the manifold will prevent the free flow of oxygen in the cabin.

Prior to flight, the pilot should turn System ON to ensure sufficient oxygen quantity (pressure) exists for the flight and for passenger requirements using the duration charts included in this Supplement. The System is selected ON at the oxygen control at pilot discretion to meet personal physiological or FAA flight rule requirements. The System requires the user(s) don an oxymizer cannula, a standard cannula, or an oxygen mask for the constant flowmeters. All users will subsequently set the flowmeter ball to the pressure altitude indicated on the primary flight display, or above that altitude to meet the pilot or passenger physiological requirements if additional oxygen is needed.

The constant flowmeters provide the means to distribute the appropriate amount of oxygen for the pressure altitude of flight and indicate the presence of flowing oxygen to the pilot and users. All delivery systems must be checked periodically (recommended intervals of less than 10 min.) to ensure flow and correct settings, as well as the oxygen control panel quantity indication.

All delivery systems must be properly set to the corresponding altitude with each change in pressure altitude.

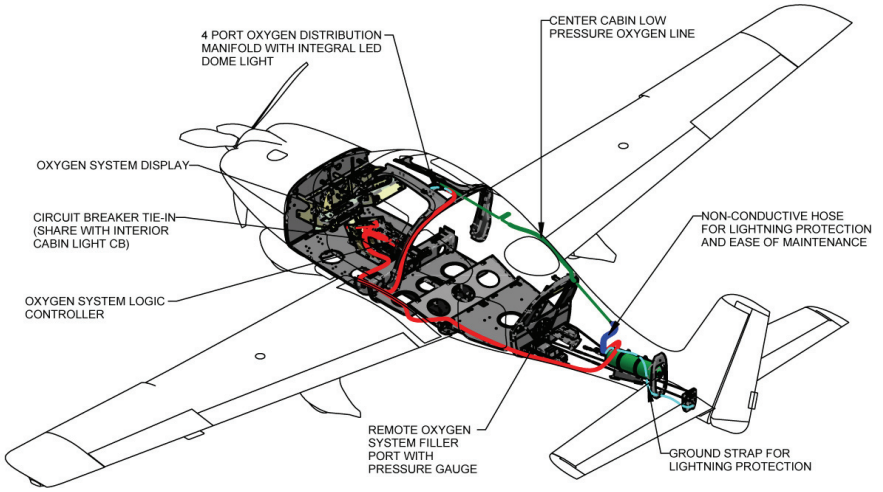


Figure 1 – Oxygen System Installation

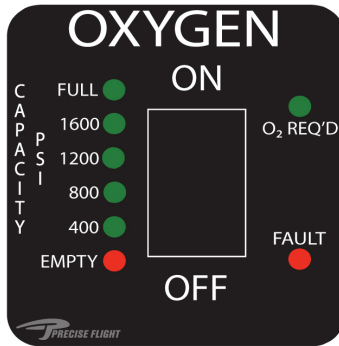


Figure 2 – Oxygen Control Panel

1.1 – Constant Flowmeters

The flow controls are calibrated and adjustable for altitude to supply oxygen to either oxygen conserving cannulas or masks for altitudes up to the maximum operating altitude of the installed aircraft, or a maximum of 25,000 ft MSL. The System requires the pilot and passengers to don either an oxymizer cannula, standard cannula, or an oxygen mask first, then the pilot and passengers will open the oxygen valve, noting oxygen quantity, and subsequently set the flowmeter ball to the pressure altitude chosen for flight, or at a setting above the altitude chosen to meet the physiological requirements of the pilot.



Figure 3 – A4 Constant Flow Oxygen Flowmeter

The flowmeters provide the means to distribute the appropriate amount of oxygen for the pressure altitude of flight and indicate the presence of oxygen flowing to the pilot and/or passengers. The flowmeter should be checked periodically (recommended intervals of less than 10 min) as well as the oxygen quantity gauge. The flowmeter should be readjusted with each change in pressure altitude or physiological requirement.

This Supplement is applicable when supplemental oxygen is required by the applicable operating rules, and provides mounting instructions.



Figure 4 – Oxygen Flowmeter

■ Caution ■

Use of cannulas is recommended only for persons with a demonstrated ability to be properly oxygenated using these types of delivery devices. Precise Flight, Inc. encourages the use of a pulse oximeter while using a supplemental oxygen system, as a person's physiological differences may alter oxygen saturation, and these effects may change day-to-day depending on health or respiratory challenges such as allergies, etc.

■ Note ■

When using a face mask, ensure a tight seal around the face.
Users with facial hair should not use a face mask.

1.3 – Optional Pulse Oximeter (FlightStat) - Optional

The Nonin Medical “FlightStat” Pulse Oximeter (Figure 5 / Figure 6) emits red and infrared light through the finger and detects the fluctuating signals caused by the pulsating blood flow. Pulse rate is determined from the signals received by a light detector. The ratio of the fluctuation between red and infrared light signals is used to calculate blood oxygen saturation (%SpO₂) of hemoglobin. A pulse oximeter indicates what percent of hemoglobin molecules are carrying oxygen; blood oxygen saturation or %SpO₂. A %SpO₂ reading of 97 indicates that 97% of your hemoglobin molecules are carrying oxygen.

At higher altitudes, %SpO₂ decreases due to less oxygen available because of the decrease in air pressure. Physical exertion at high altitude may be difficult because of the reduced oxygen level.



Figure 5 – FlightStat Pulse Oximeter

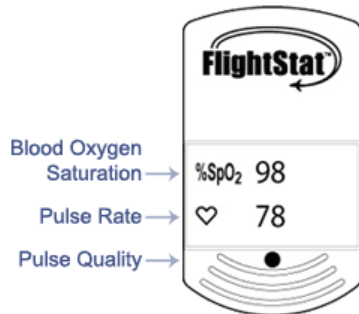


Figure 6 - FlightStat Key Features

Two AAA-size batteries power the FlightStat for approximately 1,600 spot checks; it may be stored for approximately nine months. When the batteries are low, the numeric displays flashes once per second. To conserve battery life, the FlightStat will automatically shut off approximately ten seconds after the finger is removed.

This unit's advanced digital circuitry requires no calibration or periodic maintenance other than periodic battery replacement.

1.3.1 - How to Use and Read the FlightStat

It is important to understand what each symbol and display means (See Figure 5):

Blood Oxygen Saturation: Displays %SpO₂ of blood.

Pulse Rate: Displays the number of pulses per minute.

Pulse Quality: Blinks green, yellow, or red to indicate changes in pulse quality.

Inserting a finger into the FlightStat will automatically activate the device. Once the unit has been activated and has had time to determine the %SpO₂ and pulse rate, the information is displayed. Precise Flight recommends periodic checks of the crew and passengers during flight at altitude, and adjusting oxygen use accordingly by increasing the altitude setting if a person feels any effects of hypoxia, or if the oxygen saturation is low.

Section 2 – Limitations

The installation of this equipment does not affect or change the limitations of the airplane, which are detailed in Section 2 of the primary portion of the AFM/POH. However, the following limitations apply to operation of the Fixed Oxygen System.

1. Oxymizer Cannula and A4 Flowmeter to be used up to 18,000 ft MSL ONLY.
2. Standard Cannula and A4 Flowmeter to be used up to 18,000 ft MSL ONLY.
3. An appropriate mask with the A4 must be used by persons experiencing nasal congestion, and above 18,000 ft MSL and up to 25,000 ft MSL.
4. Oxygen mask and A4 Flowmeter to be used up to 25,000 ft MSL ONLY.
5. Smoking is not permitted in any aircraft with oxygen in use.
6. Placards – On the individual oxygen masks and cannulas.

■ **Note** ■

Do not use oxygen while utilizing lipstick, Chapstick, petroleum jelly or any other product containing oil or grease.

■ **Note** ■

If the aircraft is being operated under IFR and the pilot has nasal congestion, a mask containing a microphone should be used.

■ **Note** ■

Smoking is not permitted while using the Oxygen System.

The following oxygen systems dispensing units are approved for use:

Table 1 – FAA-Approved Cirrus Fixed Oxygen System Components

Model(s)	Supplier	Capacity	Delivery Options	Dispensing Unit Options
A4	Precise Flight, Inc. Bend, Oregon, United States of America	77 cu ft	A4	Oxymizer Cannula Standard Cannula Standard Constant Flow Mask Microphone Constant Flow Mask

■ **Note** ■

The FAA, under 14 CFR Part 23 Regulations, require the complete Oxygen System (including the breathing stations, flowmeters, cannulas, and masks) be certified as a complete System. The use of other breathing equipment in conjunction with the built-in portion of the System has not been tested, nor is it FAA-Approved.

Section 3 – Emergency Procedures

3.1 – General

If the Precise Flight Oxygen System ceases to provide adequate oxygen for the altitude indicated on the flowmeter, safely descend immediately below 12,500 FT PA. Close the oxygen supply valve.

If the System indicates a pressure or electrical malfunction on the FAULT annunciator or the System is not performing properly, do not attempt to identify or analyze the problem. Safely descend immediately below 12,500 FT PA. Turn Oxygen System OFF.

The installation of this equipment does not affect or change the emergency procedures of the airplane, which are detailed in Section 3 of the primary portion of the Pilot's Operating Handbook.

1. Oxygen OFF or as required for smoke in the cabin.
2. Oxygen OFF for a cabin fire.

■ Caution ■

It is the pilot's responsibility to safely descend to a lower altitude. The pilot may have to reroute flight path to avoid terrain or other hazards.

3.2 – Smoke and Fume Elimination

In addition to the procedures outlined in the basic handbook, pilot and passengers should don masks and use oxygen at the maximum flow rate until smoke and fumes have cleared.

■ Note ■

The pilot must use their discretion in oxygen use as not to cause a hazard in the event of an in-cabin fire.

Section 4 – Normal Procedures

4.1 – General

The normal procedures for takeoff, climb, cruise, descent, and landing, which are detailed in Section 4 of the Pilot's Operating Handbook should be used. The following additional items must be incorporated into the normal checklists as applicable when the Oxygen System is in-use. The installation of this equipment does not affect or change the normal procedures or performance of the airplane, which is detailed in Section 4 of the primary portion of AFM/POH, except as noted above.

■ **Note** ■

Refer to Section 5 - Performance for duration at various altitudes and passengers using oxygen.

4.2 – Preflight

1. Oxygen Control ON Check Quantity and Ensure Pressure at Distribution Manifold - Check for adequate quantity/pressure for flight
2. Oxygen Masks and/or Cannulas - Check for rips, tears, or blockage
3. Oxygen Masks and/or Cannulas - Test connection to overhead distribution manifold
4. Flowmeter - Internal ball moves when held vertical
5. Oxygen Control OFF - If oxygen is not required or preferred

■ **Note** ■

The flowmeter must be held vertically when adjusting flow rate or reading.

■ **Note** ■

Reading is taken at the midpoint of the ball.

4.3 – Before Starting Engine (If oxygen is required or preferred)

1. Passengers - Brief on Oxygen System operation.

■ **Note** ■

Briefing to include oxygen mask/cannula donning, flowmeter adjustment, and connection to oxygen bottle regulator.

2. Oxygen Masks & Cannulas - Don
3. Flowmeter - Set to the intended cruise altitude.

4.4 – In Route (if oxygen is required or preferred)

1. Flowmeter - Periodically check the flowmeter.

■ **Note** ■

Check the flowmeter at intervals of less than every 10 min intervals to ensure proper settings.

■ **Note** ■

The flowmeter must be held vertically when adjusting flow rate or reading.

■ **Note** ■

Reading is taken at the midpoint of the ball.

2. Flowmeter - Adjust as necessary.
3. Flexible Oxygen Lines - Ensure free flow of oxygen.
4. Pilot & Passengers - Limit conversation.
5. Pilot & Passengers - Breath through the nose if using a cannula or face mask.

■ **Note** ■

If an electrical fault has been detected during flight, the OXYGEN/CABIN LTS circuit breaker must be reset to operate the oxygen system.

4.5 – Shutdown (if oxygen is required or preferred)

1. Oxygen Control OFF - Close
2. Flowmeter - Leave open until pressure is relieved.
3. Lines, Flowmeters, and Masks - Stow safely until next flight.

■ **Note** ■

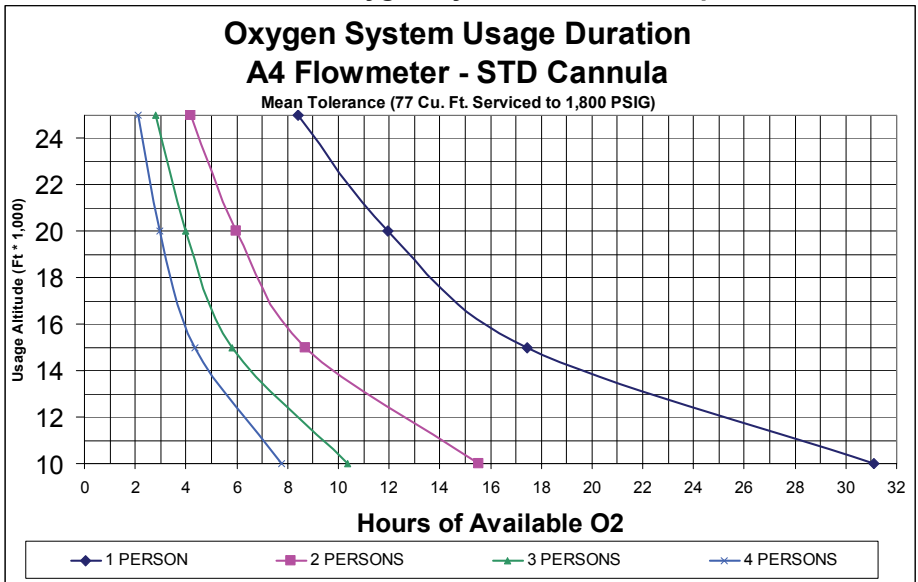
The flexible oxygen line in the aft fuselage compartment that is utilized to provide lightning protection for the Oxygen System is not gas tight in that the small oxygen molecules will slowly leak through this line. Ensure the Oxygen System is turned OFF prior to aircraft shutdown to preserve oxygen quantity.

Section 5 – Performance

Oxygen duration charts in this section are provided below for flight planning purposes.

5.1 – A4 Constant Flow Meter with Standard Cannula or Constant Flow Mask

Table 2 – Fixed Oxygen System Duration Graph



Duration Chart Notes:

- Duration chart values are based on a 77 cu ft bottle capacity.
- Residual oxygen below 200 PSI has been factored out of the total oxygen quantity.
- Bottle capacity has been reduced five percent for safety.
- The installation of this equipment does not affect or change the performance characteristics of the airplane, which are detailed in Section 5 of the primary portion of the Pilot's Operating Handbook. No change from the basic handbook.

Section 6 – Weight & Balance

If the aircraft is equipped with and the Oxygen System is installed, it is the pilot's responsibility to verify the weight and balance of the aircraft is within limits with the System installed prior to flight.

The weight, arm, and moment for fully charged systems (1800 – 2200 psi) are provided in Table 3.

Table 3 - Weight and Balance Information

	Weight - lb	Arm	Moment/1000
Empty	17.4	262.3	4565.7
Full	23.8	265.3	6316.4

Section 7 – System Description

The general operating procedures for use of the Fixed Oxygen System is discussed in the Section 1 - General System Overview of this Supplement.

Section 8 – Handling, Service, & Maintenance

8.1 – Refilling the Oxygen Bottle

1. Aircraft Electrical Power ON. Ensure Oxygen Cockpit Control OFF.
2. Aircraft Electrical Power OFF.
3. Locate Refill panel in the aft baggage bulkhead near aircraft center.
4. Access the filler port and pressure gauge by opening the door cover.
5. Oxygen regulator and fill port are located in the center of the fuselage towards the aft edge of the opening. Remove Cap.

■ **Caution** ■

Clean both the oxygen supply line and the filler port to ensure it is clear of oils, dirt, etc., that may create a fire hazard during refilling. Check threads and ensure the filling port fitting threads are not damaged.

6. Connect oxygen cart or oxygen supply line to the AN fitting.
7. Open oxygen supply and slowly, at a rate of 200 psi per minute, fill bottle to 2200 psi maximum.

■ **Caution** ■

Excessive fill rates create heat build up in the high pressure parts of the System, especially the bottle. Excessive heat build up will result in damage to the bottle, and may lead to fire. Care must be taken during refilling of the Oxygen System.

8. Close oxygen supply.
9. Important: Bleed pressure from supply line.
10. Remove oxygen supply line.
11. Refit cap to fill port.
12. Close door cover.

8.2 – Oxygen Component Cleaning

Periodically clean the oxygen breathing equipment with Purell <http://www.pfizerch.com> or warm water. As you clean the equipment pay close attention to the condition of the lines and silicone moldings to ensure no tears or kinks have occurred. Carefully restore oxygen components.

8.3 – Oxygen Bottle Removal

See FAA-Approved Instructions for Continued Airworthiness for the Precise Flight Oxygen System for oxygen bottle removal instructions.