SUPPLEMENT
ORIGINAL ISSUE

Precise Flight Fixed Oxygen System
For The Cirrus SR22/SR22T

Pilot's Operating Handbook
and
Airplane Flight Manual Supplement

Original Issue
Date: October 2, 2006

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:

SA01708SE

Precise Flight, Inc.
Cirrus SR22/SR22T Fixed Oxygen System

Aircraft Serial Number: _____

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** 12-29-11

FOR Manager
Seattle Aircraft Certification Office
Federal Aviation Administration

Fixed Oxygen System

Revision History

Rev.	Description of Changes	PFI Approved By	PFI Approved Date	FAA Approved Sign/Date
C	Updated revision history table; Added List of Active Pages; Updated AFMS Footers; Updated Section 1.3 to allow Nonin "GO_2 Achieve" Pulse Oximeter as alternative option	W. Ashforth	10/01/09	
		W. Ashforth	10-01-09	10/04/09
D	Added SR22T to document; Updated format of Section 4.0; Updated format of Section 8.0;	W. Ashforth	2/22/10	
				03/12/10
E	Updated Section 1.3 to recommend Oxi-Go Quickcheck Pro Pulse Oximeter as an alternative option	J.Ruhl	01/20/2011	
		J. Ruhl	01/20/2011	05/31/11
F	Added FAA approval column to revision history table, changed 'List of Active Pages' to 'List of Effective Pages' on page 5, added reference to 5 port manifold in section 1, formatted section 2 to remove blank space on page 35 (page numbers from 34 on shifted due to format change), added 5th person to duration tables in section 5.3 figure 26. Repaginated TOC	R. Norris	12/02/2011	12-21-11
		CRB	12/02/2011	EASA

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		CRB	*12/02/2011*	

List of Effective Pages

ORIGINAL		ADDED PAGES		ORIGINAL		ADDED PAGES	
PAGE	REV	PAGE	REV	PAGE	REV	PAGE	REV
1	E			41	F		
2	E			42	F		
3	E			43	F		
4	F			44	F		
5	F			45	F		
6	E			46	F		
7	F			47	F		
8	F			48	F		
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35	F						
36	F						
37	F						
38	F						
39	F						
40	F						

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

Table of Contents

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) or five (5) 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, related oxygen lines and System electrical lines, and up to five (5) flow devices consisting of either constant flow meters, or demand regulators, with either a cannula or face mask for each user.

The FAA Approved flow devices consist only of Precise Flight A4 or A5 constant flowmeters, or the Precise Flight demand flow conserver. The A4 and A5 flowmeters are constant flowmeter options that are calibrated and adjustable for altitude to supply oxygen to either oxygen conserving cannulas, standard cannula, up to 18,000ft, or masks for altitudes up to the maximum operating altitude of the Cirrus SR22 /SR22T or 25,000ft whichever is less. The PreciseFlow® demand flow conservers are calibrated and adjusted by the user for altitude to supply oxygen to either dual lumen cannulas up to 18,000ft, or dual sensing masks for use to altitudes up to the maximum operating altitude for the Cirrus SR22/ SR22T or 25,000ft whichever is less.

■ Note ■

Facemasks covering the nose and mouth are required above 18,000ft per 14 CFR Part §23.1447.

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. 12,000ft 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.

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 400 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 Main Bus 2, 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 or the altitude knob on the PreciseFlow® 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 flow devices 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 flow devices 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.

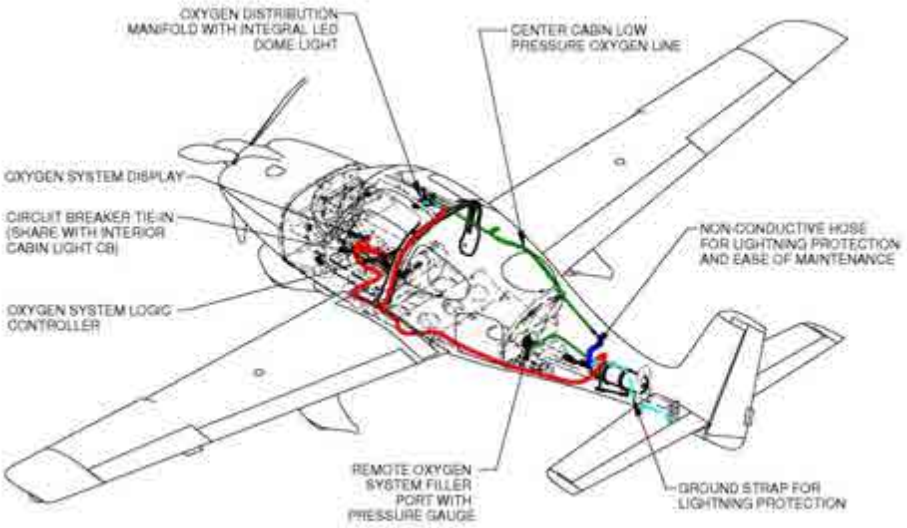

Figure 1 – Oxygen System Installation

Figure 2 – Oxygen Control Panel

1.1 – OPTIONAL – Cirrus Perspective by Garmin

■ Note ■

This section is for information only.

The primary oxygen information display is the Oxygen Display Panel in the center console to the left of the flap switch.

Please refer to the Garmin P/N: 190-00820-00 “The Cirrus Perspective by Garmin Integrated Avionics System Pilot’s Guide for the SR22/ SR22T” Original Release or Later Approved Document for full Garmin interface information.

An optional output is provided from the Precise Flight Oxygen System Display/Logic Controller located in the center console that provides pressure (quantity), indication, and warning signals to the Garmin GEA 71 airframe interface on the Cirrus Perspective equipped aircraft for secondary information only.

Figure 3 - Optional Garmin GEA 71

The primary oxygen system display is provided by the oxygen display located in the Integrated Flap Panel to the left of the Flap Switch. The display looks similar to that shown in Figure 2. In the Cirrus Perspective, the display text is back-lit and dim control is provided with the aircraft dim control.

With this option installed, the MFD engine page displays the Oxygen Bottle Pressure (high pressure) that directly indicates oxygen Quantity as shown in Figure 4, and detailed in Figure 5.

Figure 4 – Typical Cirrus Perspective MFD Engine Page

Figure 5 - MFD Oxygen Pressure Indicator Detail as Shown on Cirrus Perspective MFD Engine Page

1.1.1 – EIS Display in Reversionary Mode

Secondary pressure indication is provided on the System Display side display when in reversionary mode as shown in Figure 6.

Figure 6 – Oxygen Quantity as shown on the Reversionary Mode System Display Page

1.1.2 – Oxygen System Aircraft Alerts

WARNING

The Cirrus Perspective Aircraft Alerts are considered Secondary Annunciation and the primary warning and advisory annunciation is provided on the Oxygen System Display.

The Garmin display will display a steady caution OXYGEN QTY when the bottle pressure is between 400psig-800psig, and the Garmin MFD engine page oxygen quantity gauge has a caution (amber) marking between 400psig-800psig. This is different than the primary display located next to the flap switch which will show green indication from 400psig-800psig.
The Garmin display will display a steady warning OXYGEN QTY when the bottle pressure is less than 400psig. This is different than the primary display located next to the flap switch which will show a flashing red EMPTY light at below 400psig.

The Garmin display will only display the Oxygen warnings

OXYGEN FAULT, OXYGEN QTY, or Caution OXYGEN QTY when the system is ON, or the aircraft is above 10,000ft, and the conditions exist for the warning. This is different than the primary display which will not display pressure, or pressure warnings, unless the system is ON.

Both systems will provide the Oxygen Required warning if the system is OFF, or there is insufficient outlet pressure with the system ON, above 12,000ft PA.

The Cirrus Perspective provides secondary annunciation on the PFD in the Alerts Window with Audio Alerts. The three types of Alerts are Warning, Caution and Advisory as shown in Figure 7.

Figure 7 - Cirrus Perspective Warning, Caution and Advisory Alerts

Each type of Oxygen System Alert has one of three audio alert responses; repeating double chime, double chime or no aural as shown in Table 1.

Table 1 - Oxygen System Audio Alerts

Annunciation Window Text	Alert Type	Audio Alert
OXYGEN FAULT	WARNING	Repeating Double Chime
OXYGEN QTY	WARNING	Repeating Double Chime
OXYGEN QTY	CAUTION	Double Chime
OXYGEN RQD	CAUTION	Double Chime
OXYGEN QTY	ADVISORY	No Aural
OXYGEN LEFT ON	ADVISORY	Double Chime

Table 2 shows the descriptive text and logic for each Oxygen System Alert the Cirrus Perspective provides.

Table 2 - Oxygen System Alert – Descriptive Text and Logic

Text	Descriptive Text	Logic
OXYGEN FAULT	Oxygen System Fault	O2 Low Output or O2 solenoid Fail Discrete
OXYGEN QTY	Oxygen Quantity is Low	System ON or Alt ≤ 10K and PSI ≤ 400
OXYGEN QTY	Oxygen Quantity is Low	System ON or Alt ≤ 10K and PSI ≤ 800
OXYGEN QTY	Oxygen Quantity is Low	System OFF and Alt < 10K and PSI ≤ 800
OXYGEN RQD	Oxygen is Required	O2 Required Discrete from PSI
OXYGEN LEFT ON	Oxygen System is Left on After Shutdown	RPM = 0 after shutdown and System ON And On Ground

1.2 – Constant Flowmeters

The constant flowmeters are calibrated and adjustable for altitude to supply oxygen to either oxygen conserving, or standard, cannulas up to a maximum altitude of 18,000ft MSL, or masks for altitudes up to a maximum of altitude of 25,000ft MSL , or the maximum operating altitude of the aircraft whichever is lower. 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 8 – A4 Constant Flow Oxygen Flowmeter

Figure 9 – A5 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.

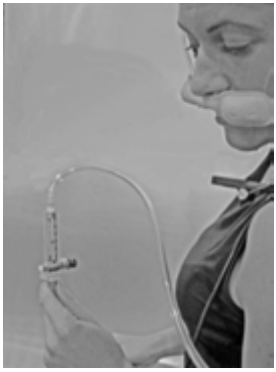

Figure 10 – Oxygen Flowmeter

■ 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 – PreciseFlow® Oxygen Conservers (PFOC)

The PreciseFlow® Oxygen Conserver is a Demand Regulator calibrated and adjustable for altitude to supply oxygen to Standard Dual Lumen Cannulas up to a maximum altitude of 18,000ft MSL, or Dual Supply PFOC Masks up to a maximum operating altitude of 25,000ft MSL, or the maximum operating altitude of the aircraft whichever is lower. The system requires the pilot to don either a Dual Lumen Cannula or a PFOC Mask first, then the pilot will open the Oxygen Valve, noting oxygen quantity, and subsequently set the Altitude Dial to the pressure altitude chosen for flight, or at a setting above the altitude chosen to meet the pilot physiological requirements. Additionally the PreciseFlow® Oxygen Conserver can be set to constant flow for additional oxygen when required.

■ Note ■

Facemasks covering the nose and mouth are required above 18,000ft MSL per 14 CFR Part §23.1447.

■ Note ■

PreciseFlow® with Inline Regulator must be used with the Cirrus SR22/SR22T built in system.

Figure 11 - PreciseFlow® Oxygen Conserver Breathing Station Kit (with Dual Lumen Cannula and Standard Dual Supply Mask Shown)

There are three major reasons for using the PreciseFlow® Oxygen Conserver on a general aviation aircraft. One is the conservation of oxygen, allowing smaller portable or fixed oxygen bottles to be used or to increase the duration of usable oxygen for a given volume. The second is that the manner of delivery for a demand conserver is physiologically better. Third being that interrupted flow is better for the user's nasal passages.

Conservation - Utilizing demand flow and interrupting the flow of oxygen can provide a potential savings of 3 fold over continuous flow systems. The three fold savings is derived from a standard breathing cycle with 1/3 of the cycle being inhalation and exhalation taking the remaining 2/3. The PreciseFlow conserver defaults to constant flow with rapid breathing (breathing over 22 breaths per minute) as hysteresis in the mechanical system defaults the unit to constant flow.
Delivery – The ability to deliver a bolus of oxygen improves oxygen saturation by allowing the first air of the inhalation cycle to be more fully enriched with oxygen. It is this gas that participates in gas exchange in the lungs with the remainder of the breath providing the pressure to allow the gas to exchange across the lung surface into the blood. This bolus of oxygen can be felt and encourages the user to breath through the nose.
Comfort – The ability to interrupt flow keeps the dry oxygen gas from flowing over the nasal passages continually. The lack of dry gas flow allows the nasal passages to remain moist. The comfort level encourages oxygen usage for people with sensitivity to nasal discomfort.

The PreciseFlow® Oxygen Conserver provides the means to efficiently distribute the appropriate amount of oxygen for the pressure altitude of flight, and indicate the presence of flowing oxygen to the pilot or passengers. The PreciseFlow® Oxygen Conserver Flow Indicator and oxygen quantity gauge should be checked periodically at an interval of no more than every 10 min. The PreciseFlow® Oxygen Conserver should be set for each change in pressure altitude or for personal physiological requirements. This supplement is applicable when supplemental oxygen is required by the applicable operating rules, and provides mounting instructions.

The different mode combinations for the PreciseFlow® Oxygen Conserver unit are shown in Figure 12 where the first picture shows a typical operation setting for flight between 16,000ft and 22,000ft. The unit is set to conserve using the

mode select dial, and the altitude is set to '16K'. Instructions provided to the user state that the PreciseFlow® Oxygen Conserver should be adjusted to the next higher altitude from where flight is being conducted. Above 18,000 ft where a mask is required, **constant** flow is to be selected with a dual supply mask as indicated with a box around the altitudes on the altitude selection knob, and the 'constant' on the mode select knob. If physiological requirements differ for the user, the 'constant' mode, or a higher altitude setting may be selected at any altitude. The **THP** setting is calibrated to flow 4LPM of Oxygen. This far exceeds the minimum flow requirement of 2.3LPM at 25,000ft should additional oxygen be required by the user.

The conserve mode process is accomplished by an internal flow control disk that controls the flow of oxygen and a valve system controlled on the inhalation and exhalation cycles of the user within the unit. This breath cycle is sensed through the use of a dual lumen cannula, or the dual port mask. A calibrated orifice controls the flow rate is set by the altitude knob at the end of the unit.

Figure 12 – PreciseFlow® Oxygen Conserver – Mode Combinations

■ Caution ■

Use of cannulas recommended only for person who have demonstrated the ability to be properly oxygenated with these delivery devices. Precise Flight Inc. encourages the use of a pulse oximeter while using supplemental oxygen system as people's physiological differences can alter oxygen saturations from person to person.

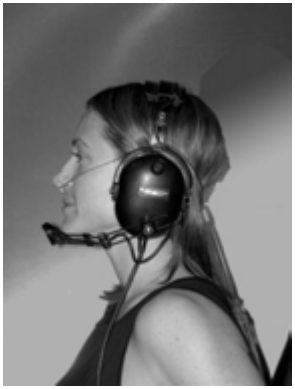

Figure 13 – PreciseFlow® Oxygen Conserver

1.3.1 – Dual Lumen Cannula Use

The Dual Lumen Cannula (See Figure 14) is for use with the PreciseFlow® Oxygen Conserver only, and should not be used with other breathing equipment. This cannula is unique in that it provides both oxygen delivery and sensing to the PreciseFlow® Oxygen Conserver. The sensing port is required to provide a pressure drop to the PreciseFlow® during inhalation, signaling the conserver to provide oxygen through the deliver line.

Figure 14 - Dual Lumen Cannula

First attach the Dual Lumen Cannula to the PreciseFlow® Oxygen Conserver, one tube connector to the **Delivery** side, and the other to the **Sensing** side as shown in Figure 15.

Figure 15 - Attachment of the Dual Lumen Cannula to the PreciseFlow® Oxygen Conserver

1. Please make sure you are wearing the cannula with the tab pointing down (found at the base of the nasal prongs - see Figure 16).

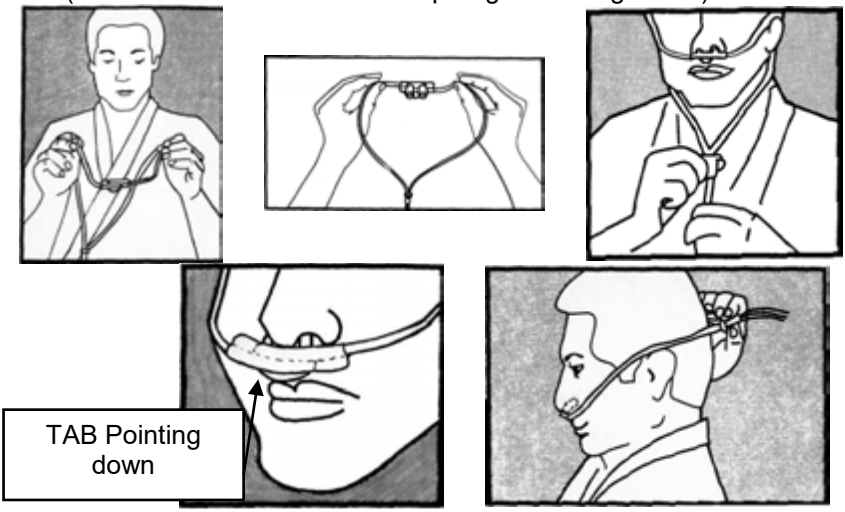

Figure 16 - PreciseFlow Conserver Cannula Usage

2. Flow can be restricted if the small diameter tubes that lead to the nasal prongs on the cannula get pinched under a headset. The best solution is to put the cannula on over your headset so the tubes rest on the outside of the earpieces.
3. Adjust the PreciseFlow Oxygen Conserver to the desired altitude and breathe through the nose.

■ Note ■

Proper Oxygenation above 16,000 feet using the PreciseFlow Conserver and Dual Lumen cannula requires deliberate and consistent deep breathing through the nose.

■ Note ■

Cannulas are limited to a maximum altitude of 18,000ft MSL per 14 CFR Part §23.1447.

1.3.2 – Dual Supply Demand Mask Use

There are two dual supply mask options for use with the PreciseFlow Oxygen Conserver.

Figure 17 – Dual Supply Standard Mask

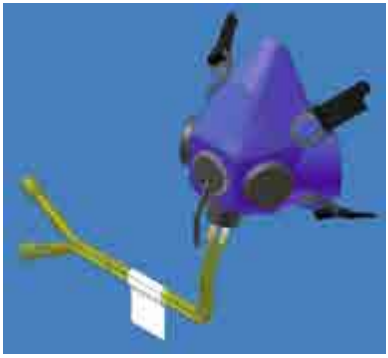

Figure 18 – Dual Supply Mask with Microphone

To use a facemask, the PreciseFlow Oxygen Conserver must be set in the "**Constant**" flow mode. First attach the Dual Supply Mask to the PreciseFlow Oxygen Conserver, one tube connector to the **Delivery** side, and the other to the **Sensing** side as shown in Figure 19.

Figure 19 - Attachment of the Dual Lumen Cannula to the PreciseFlow Oxygen Conserver

Wear the Face Mask per the instructions provided with the mask, and check the flow indicator to ensure that oxygen is flowing through the system.

■ Note ■

Do not use the PreciseFlow Oxygen Conserver with a bag reservoir Face Mask. Only Precise Flight Face Masks with a delivery and sensing line are approved for use with the PreciseFlow Conserver.

■ Note ■

When using a Face Mask, ensure a tight seal around the face. Users with Facial hair should not use a Face Mask.

■ 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 (See Section 1.3) 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.

1.4 – OPTIONAL – Pulse Oximeter

Precise Flight Inc. recommends the following Pulse Oximeter models:

- Nonin Medical "FlightStat" Pulse Oximeter
- Nonin Medical "GO_2 Achieve" Pulse Oximeter
- Oxi-Go "Quick Check Pro"

1.4.1 – Optional Nonin Medical "FlightStat" Pulse Oximeter

■ Caution ■

Pulse Oximeter will read Carbon Monoxide as Oxygen and show false level of oxygen saturation.

■ Caution ■

This is a tool, and not a replacement for diligence of the user to notice the physiological signs of the onset of hypoxia caused by lack of oxygen, carbon monoxide poisoning, or other factors.

The Nonin "FlightStat" Pulse Oximeter 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 a relative 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.

Pictoral of FlightStat | **FlightStat Key Features**

Figure 20 - Nonin Medical FlightStat Pulse Oximeter

Two AAA-size batteries power the FlightStat for approximately 18 hours of measurement time (1,600 spot checks calculated at 40 seconds per spot check); it may be stored for approximately nine months. When the batteries are low, the numeric display 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.

1.4.1.1 – How to Use and Read the FlightStat[1]

It is important to understand what each symbol and display means. (See Figure 20.)

- **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.

[1] For more information on the Nonin FlightStat visit http://www.flightstat.nonin.com/

Inserting a finger into the FlightStat (see Figure 21) 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.

Figure 21 –Finger Orientation For The FlightStat

■ Note ■

The FlightStat must be used on a bare finger without gloves, bandages, etc. as it requires a clear light path through the finger to properly function.

1.4.2 – Optional Nonin Medical "GO2 Achieve" Pulse Oximeter

■ Caution ■

Pulse Oximeter will read Carbon Monoxide as Oxygen and show false level of oxygen saturation.

■ Caution ■

This is a tool, and not a replacement for diligence of the user to notice the physiological signs of the onset of hypoxia caused by lack of oxygen, carbon monoxide poisoning, or other factors.

The Nonin "GO_2 Achieve" Pulse Oximeter 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 a relative 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.

Pictoral of GO_2 Achieve | **GO_2 Achieve Key Features**

Figure 22 - Nonin Medical GO_2 Achieve Pulse Oximeter

One AAA-size battery powers the GO_2 Achieve for approximately 21 hours of measurement time (2,400 spot checks calculated at 30 seconds per spot check); it may be stored for approximately six months. A battery indicator bar located in the lower portion of the front screen indicates the current battery charge level. To conserve battery life, the GO_2 Achieve 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.

1.4.2.1 – How to Use and Read the Nonin GO2 Achieve[2]

It is important to understand what each symbol and display means (See Figure 22):

- **Blood Oxygen Saturation:** Displays %SpO2 of blood.
- **Pulse Rate:** Displays the number of pulses per minute.
- **Pulse Quality:** Displays changes in pulse quality.

Inserting a finger into the Nonin GO_2 Achieve (see Figure 23) 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.

Figure 23 –Finger Orientation For The GO_2 Achieve

■ Note ■

The GO_2 Achieve must be used on a bare finger without gloves, bandages, etc. as it requires a clear light path through the finger to properly function.

[2] For more information on the Nonin GO_2 Achieve visit http://www.go2nonin.com/

1.4.3 – Optional Oximeter Plus "Oxi-Go Quick Check Pro" Pulse Oximeter

■ Caution ■

Pulse Oximeter will read Carbon Monoxide as Oxygen and show false level of oxygen saturation.

■ Caution ■

This is a tool, and not a replacement for diligence of the user to notice the physiological signs of the onset of hypoxia caused by lack of oxygen, carbon monoxide poisoning, or other factors.

The "Oxi-Go Quick Check Pro" Pulse Oximeter 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 a relative percent of hemoglobin molecules that 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.

Pictoral of Quickcheck Pro

Quickcheck Pro Key Features

Figure 24 – Oxi-Go "Quickcheck Pro" Pulse Oximeter

Two AAA-size batteries power the Oxi-Go Quick Check Pro. A low power indicator bar is located on the front screen indicating when the current battery charge is low. To conserve battery life, the Oxi-Go Quickcheck Pro will automatically shut off approximately eight seconds after the finger is removed.

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

1.4.3.1 – How to Use and Read the Oxi-Go Quickcheck Pro

It is important to understand what each symbol and display means (See Figure 24):

- **Oxygen Saturation Level:** Displays %SpO2 of blood.
- **Pulse Rate:** Displays the number of pulses per minute.

Inserting a finger into the Oxi-Go Quickcheck Pro (see Figure 25) will automatically activate the device after the unit is powered up. 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.

Figure 25 –Finger Orientation For The Oxi-Go Quickcheck Pro

[3] For more information on the "Oxi-Go Quickcheck Pro" visit: http://oximeterplus.com

The Oxi-Go Quickcheck Pro must be used on a bare finger without gloves, bandages, etc. as it requires a clear light path through the finger to properly function.

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 Flowmeter to be used up to 18,000ft MSL ONLY.
2. Standard Cannula and Flowmeter to be used up to 18,000ft MSL ONLY.
3. Dual Lumen Cannula and PreciseFlow® to be used up to 18,000ft MSL ONLY.
4. An appropriate mask with a Flowmeter must be used by persons experiencing nasal congestion, and above 18,000 ft MSL and up to 25,000ft MSL.
5. Oxygen mask and Flowmeter or PreciseFlow® to be used up to 25,000ft MSL ONLY.
6. The PreciseFlow® to be used with a PFOC Mask and in Constant Mode ONLY above 18,000ft up to and including 25,000ft
7. Smoking is not permitted in any aircraft with oxygen in use.
8. Placards – On the individual oxygen masks and cannulas.

WARNING

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

WARNING

Smoking is not permitted while using the Oxygen System.

Note

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

The following oxygen systems dispensing units are approved for use:

Table 3 – FAA-Approved Cirrus Fixed Oxygen System Components

Supplier	Capacity	Delivery Options	Dispensing Unit Options
Precise Flight, Inc. Bend, Oregon, United States of America	77 cuft	A4 or A5 Flowmeter	Oxymizer Cannula Standard Cannula Standard Constant Flow Mask Microphone Constant Flow Mask
		PreciseFlow® with Inline Regulator	Dual Lumen Cannula PFOC Standard Mask PFOC Microphone Mask
* STC Installation Kits noted, and Dispensing Units listed may be replaced individually by the Precise Flight, Inc. Products listed. See Table 5 for specific PFI part number options.			

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.

Note

PreciseFlow® with Inline Regulator must be used with the Cirrus SR22/SR22T built in system.

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 12,500ft 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 12,500ft 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 are 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 a. Check Quantity b. Outlet Pressure	Switch to ON Enough for Planned Flight with Reserve Ensure Pressure at Distribution Manifold
1. Oxygen Masks or Cannulas	Check for Rips, Tears, or Blockage
2. Oxygen Masks or Cannulas	Connected to Regulator
3. Flowmeter (If Applicable)	Internal Ball Moves when Held Vertically
4. PreciseFlow® (If Applicable)	Flow indicator indicating flow during inhale
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 and/or PreciseFlow® adjustment, and connection to oxygen bottle regulator.	
2. Oxygen Masks & Cannulas	Don mask or cannulas
3. Flowmeter (If Applicable)	Set to the intended cruise altitude
4. PreciseFlow® (If Applicable)	Set to the intended cruise altitude

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

1. Flowmeter (If Applicable)	Periodically check the flowmeter
Note Check the flowmeter or flow indicator at intervals of less than every 10 min intervals to ensure proper settings. **Note** The flowmeter must be held vertically when adjusting or reading flow rate. Reading is taken at the midpoint of the ball.	
2. Flowmeter (If Applicable)	Adjust as necessary
3. PreciseFlow®(If Applicable)	Periodically Check the Flow Indicator
4. PreciseFlow®(If Applicable)	Adjust as Necessary
5. Flexible Oxygen Lines	Ensure free flow of oxygen
6. Pilot & Passengers	Limit conversation
7. Pilot & Passengers	Breathe 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 (If Applicable)	Leave open until pressure is relieved
3. PreciseFlow® (If Applicable)	Turn to Constant Mode to relieve pressure
4. Lines, Flowmeters, PreciseFlow® 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. 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 AFM/POH.

5.1 – Oxygen Bottle Capacity vs. Pressure

Following Boyle's law, the bottle pressure vs. capacity is linear thus the actual quantity left (bottle Pressure) can be noted and the duration charts in this section adjusted.

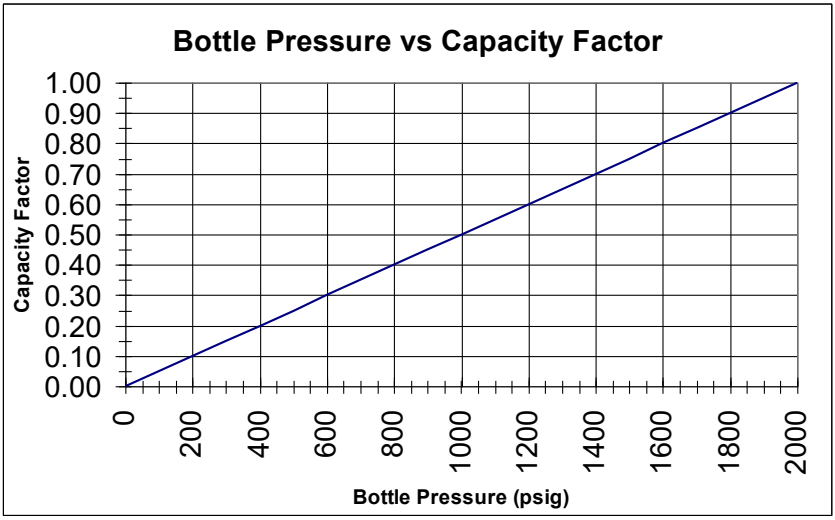

Figure 24 - Bottle Pressure/Capacity Factor Graph

EXAMPLE:

The pilot and 1 passenger are planning a flight at 16,000ft, using 2 PFOC Demand Conservers in the Conserver Mode with a Bottle Pressure of 1500psig. What is the available duration at this setting?

From Figure 24, for 1500psig the Capacity Factor is 0.75. From Figure 27 the duration for two active users is 17hrs. The duration available is calculated by multiplying the duration by the Capacity Factor.

Thus the actual available duration is **17hrs * 0.75 = 12.75hrs** for this flight.

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

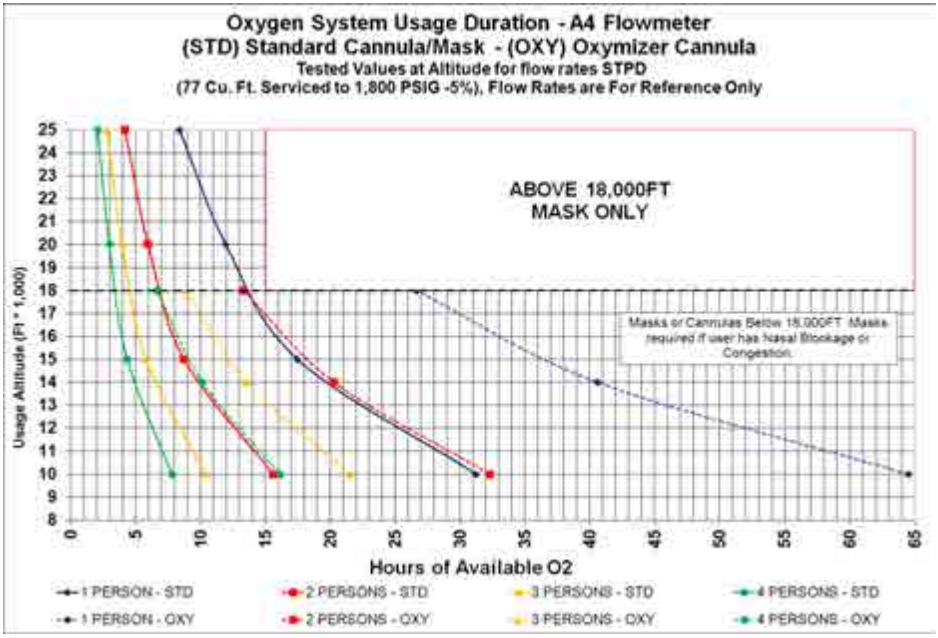

Figure 25 - A4 Flowmeter (Oxymizer and STD Scales)

Duration Chart Notes:

- Duration chart values are based on a 77 cu ft bottle capacity.
- A4 not approved for use with 5 port manifold.
- 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.

5.3 – A5 Constant Flow Meter with Standard Cannula or Constant Flow Mask

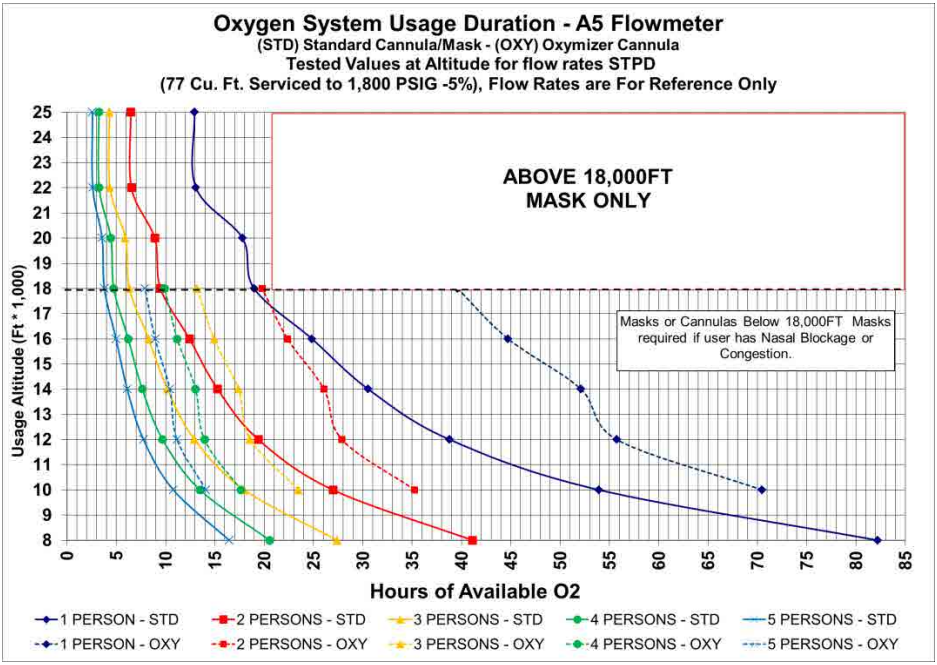

Figure 26 - A5 Flowmeter (Oxymizer and Standard Scales)

Duration Chart Notes:

- Duration chart values are based on a 77 cu ft bottle capacity.
- A5 is the only flow device approved with the 5 port manifold.
- 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.

5.4 – PreciseFlow Oxygen Conserver (PFOC) Normal Operation

Note

Pilot should calculate flow consumption based on Active use for flight crew. Actual flow consumption rates will vary from person to person when in conserve mode.

Caution

Mask and Constant Flow Mode required above 18,000ft.

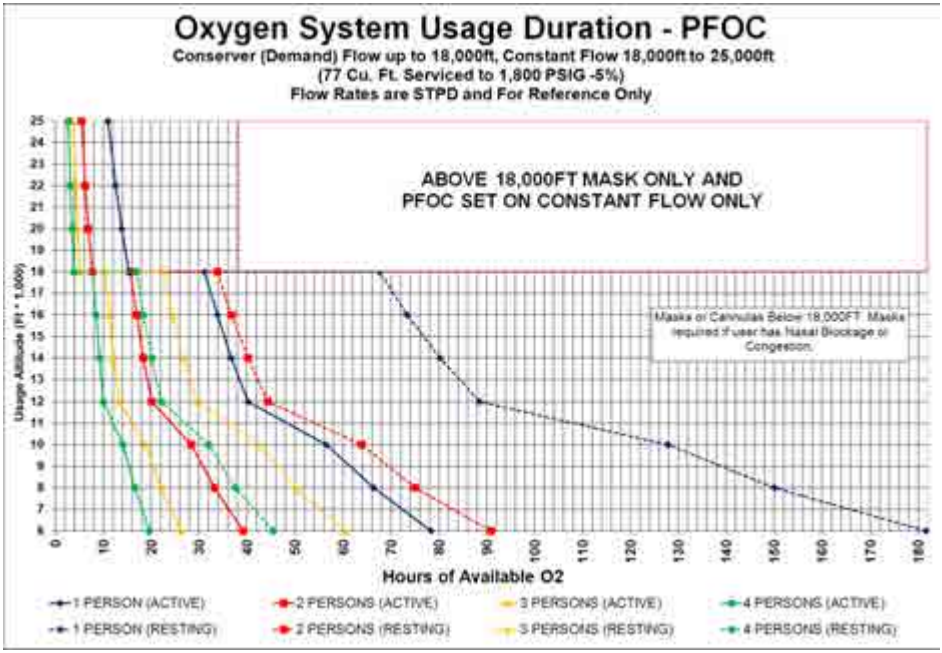

Figure 27 - PreciseFlow Oxygen Conserver

Duration Chart Notes:

- Bottle Capacity has been reduced 5% for safety
- PFOC not approved for use with 5 port manifold.
- 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 basic Handbook.

Section 6 – Weight & Balance

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

The weight, arm, and moment for fully charged systems (1800psig) are provided in Table 4. The total weight of oxygen in the system is 6.4lb and the actual weight and moment can be determined by oxygen pressure per Figure 24.

Table 4 - 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.
2. Ensure Oxygen Cockpit Control is OFF.
3. Aircraft Electrical Power OFF.
4. Locate Refill panel in the aft baggage bulkhead near aircraft center. 5. Access the filler port and pressure gauge by opening the door cover. 6. 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.
7. Connect oxygen cart or oxygen supply line to the AN fitting.
8. Open oxygen supply and slowly, at a rate of 200 psi per minute, fill bottle to 1800 psi maximum.
■ Caution ■ Excessive fill rates create heat buildup in the high pressure parts of the System, especially the bottle. Excessive heat buildup will result in damage to the bottle, and may lead to fire. Care must be taken during refilling of the Oxygen System.
9. Close oxygen supply.
■ 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.

8.2.1 – Flowmeter Anti-Static

Periodic anti-static treatment may be required on the flow meter should the ball act 'sticky' or function erratically. This is caused by the handling of the flowmeter and a simple cleaning is required. The use of de-ionized water with a very mild oxygen and breathing safe detergent is needed. Remove the cannula or mask and add a few drops of this solution in the end of the tube and let it reach the tapered tube of the flowmeter. Then run clean oxygen through the flowmeter until dry. The flowmeter is then ready for use

8.3 – Oxygen Bottle Removal

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

8.4 – Replacement Components

Table 5 – Options/Replacement FAA-Approved Breathing Station Components

PFI P/N	Description
A4 Constant Flowmeter Options Note: For replacements, the A4 is superseded by A5 options below.	
027N0202-1	A4 Breathing Station Kit with CPC (Oxymizer Cannula and Standard Face Mask)
027N0203-1	A4 Breathing Station Kit with CPC (Oxymizer Cannula and Face Mask with Microphone)
027N0002-1	A4 Assembly with CPC (No Mask or Cannula)
020N0007-1	Standard Cannula
020N0001-1	Oxymizer Cannula
020N0002-1	Standard Facemask
020N0005-1	Facemask with Microphone
A5 Constant Flowmeter Options	
027N0302-1	A5 Breathing Station Kit with CPC (Oxymizer Cannula and Standard Face Mask)
027N0303-1	A5 Breathing Station Kit with CPC (Oxymizer Cannula and Face Mask with Microphone)
027N0003-1	A5 Assembly with CPC (No Mask or Cannula)
020N0007-1	Standard Cannula
020N0001-1	Oxymizer Cannula
020N0002-1	Standard Facemask
020N0005-1	Facemask with Microphone
PreciseFlow® Options	
027N1101-6	PreciseFlow® (PFOC) Breathing Station Kit with Inline Regulator (Dual Lumen Cannula, and Standard PFOC Mask)
027N1102-6	PreciseFlow® (PFOC) Breathing Station Kit with Inline Regulator (Dual Lumen Cannula, and PFOC Mask with Microphone)
027N1002-1	PreciseFlow® (PFOC) with Inline Regulator and CPC (No Mask or Cannula)
020N0050-1	PreciseFlow® (PFOC) Dual Lumen Cannula
020N0060-1	PreciseFlow® (PFOC) Face Mask
020N0070-1	PreciseFlow® (PFOC) Face Mask with Microphone

Note

Constant flow cannulas and facemasks are NOT compatible with the PreciseFlow® cannulas and facemasks.

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