CHECK FLIGHT CERTIFICATE

Scottish Aviation Twin Pioneer (Series 1 & 3) **CFS 146 Iss 1**

Date:	Crew:	Observer:	Registration:

Performance	Climb #1	Climb #2	
Average Weight			
Average Altitude			ft
Average Temp.			°C
Speed			KIAS
Achieved Rate			fpm
Scheduled Rate			fpm
Margin			fpm
Permitted Margin	-60	-60	fpm

Airfield:

Start Weigh Kg/Lbs*:

Takeoff cg:

Performance:

SATIS/UNSATIS/NOT APPLICABLE*

*(delete as applicable)**

No.	Defect	-/R/FT	Action?

(use a continuation sheet as necessary)

Conclusions/Comments

I CERTIFY that I have tested the above aircraft and have detailed the deficiencies and unsatisfactory features above. Those items annotated R or FT must be dealt with as shown in the notes on the reverse side.

Name:	Signed:	Date:	Licence No.:
For CAA Use only	Report Logged by:	Date:	Report No.:

NOTES

General
Pilots using this document should be familiar with the tests and techniques needed. If the results are to be submitted to the CAA the pilot must be specifically briefed on techniques and safety considerations by the CAA and must have carried out a Check Flight within the last 4 years.

Registration: If the aircraft is not on the UK register, add the manufacturers serial number and expected UK registration (if known).
Crew: Captain, co-pilot, Flight engineer (where applicable).
Airfield: Departure airfield.
Start Weight: Actual all up weight at first engine start. Also delete Kg or Lbs as appropriate.
Takeoff cg: Actual cg at lift-off, preferably as a % of the Mean Aerodynamic Chord.

Performance
Climb#1/Climb#2: Enter in these columns data from the first and second climbs.
Average Weight: The aircraft all up weight at the midpoint of the measured climb.
Average Altitude: The altitude at which the line drawn to average the measured points passes through at the mid time.
Average Temp: The temperature at which the line drawn to average the measured points passes through at the mid time.
Speed: The target climb speed (Indicated Airspeed.)
Achieved Rate: The climb rate as given by the slope of the line drawn to average the measured altitude points in feet per minute.
Scheduled Rate: The expected gross rate of climb read from the appropriate graph in the Flight Manual with any adjustments for configuration differences. For large aircraft, the basic gross data are normally to be found in a separate supplement labelled 'Additional Flight Test Data'.
Margin: The difference between the Scheduled and Achieved rates of climb (negative if achieved is lower than scheduled).

Defects
Enter all defects from the flight. All defects must also be entered in the Technical Log. Procedural items entered in the Technical Log (such as re-stowing oxygen masks) need not be entered here. Items affecting flight safety which were known before the flight, whether or not they were deferred should be entered. In the latter case, the defect should be annotated accordingly after the details.
No.: The first column is to allow the items to be numbered.
Defect: Enter details of the defect.
-/R/FT: Classify each defect according to its impact on safety, regardless of whether it can be deferred according to the MEL. Any deferrals should be dealt with in the normal way in the Technical Log. Items requiring rectification (or deferral under the MEL) before further flight for hire or reward or before the issue of the CofA should be marked 'R'. Additionally, items that require re-checking in-flight following rectification (such as inadequate climb performance) should be marked 'FT'. Items requiring both should be marked 'R/FT'.
Action?: This column should be left blank unless further information is required from the engineers or the item is considered to be of sufficient import that CAA action is considered necessary, then the person/department/agency from whom further action is required should be noted in this column. Annotate accordingly if an MOR or similar report is to be raised.

Conclusions/Comments
Any conclusions, notes or comments useful for tracking defects may be entered.
Name: Only the pilot who carried out the test may sign this sheet

CAA Check Flight Schedules

All CAA Check Flight Schedules (CFSs) are prepared based on a design standard which, before September 2003, was the UK Type Certificate. Following the creation of EASA there may be different design standards in service within the European Union (EU) - this may include modifications approved in any EU country.

It is the responsibility of the flight crew to ensure that the exercises and limitations in the AFTS are correct for the aircraft under test. The prime source of information will be the aircraft flight manual and in the event of conflict the flight manual should be taken as overriding.

CAA policy is that pilots who conduct airtests on the behalf of the Authority must be acceptable to the Authority, must have been briefed on techniques and safety considerations before carrying out the tests in these schedules and must have carried out an airtest within the last 4 years.

The CAA does not accept responsibility for the use of a CAA AFTS on a test flight not directly under their control.

CHECK FLIGHT SCHEDULE

Scottish Aviation Twin Pioneer (Series 1 & 3) (Alvis Leonides)	CFS 146 Issue 1

Registration [ ] Test Date(s) [ ]

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NOTE: The speeds contained in this schedule only apply at the weight prescribed in the schedule. If any deviation from the recommended weight is essential, the speeds will have to be revised. The Flight Manual contains all the necessary data. The stall trimming speed is 1.4 times the power off stall speed for the configuration.

INTRODUCTION

The data contained in this schedule is correct at the time of issue but may not be in agreement with subsequent Flight Manual Amendments. In cases of conflict the current Flight Manual data is overriding. Any such change should be recorded.

This schedule is applicable to Scottish Aviation Twin Pioneers Series 1 and 3 aircraft. The schedule is based on the assumption that the everyday operation of the aircraft serves as a continuous check on the functioning of all normal services. On this test flight, however, the crew are expected generally to monitor the behaviour of all equipment and report any unserviceable items. In addition to completing all the tests in the schedule any handling or functioning characteristics which are considered to be unsafe, or undesirable, must be recorded.

The minimum flight crew for this test flight must be increased by one flight observer to record the results of the tests.

WARNING

1. For flights without a Certificate of Airworthiness in force, it is illegal to carry a passenger except an occupant performing duties in the aircraft in connection with the flight. For the recording of data on this Schedule, the observer is considered to be necessary for the safe operation of the flight.

   Before accepting any passenger/observer on a test flight the pilot in command should inform them that the risk is greater than on an ordinary flight.

2. Under no circumstances are the limitations contained in the CAA approved Flight Manual to be exceeded.

PERFORMANCE

The climbs should be made clear of cloud and turbulence.

For measuring rates of climb, record altimeter reading on 1013 mbs. And airspeed against time very half minute; record OAT every minute. Note a complete set of engine figures after 3 minutes from the start of the climb.

The climb results should be reduced and compared with the relevant gross performance information scheduled in the relevant Flight Manual.

POST-FLIGHT ACTION

Complete a statement of defects and sign the Flight Test Certificate and state clearly whether or not the aeroplane needs to be reflown.

LOADING AND CALCULATION OF AIRCRAFT WEIGHT

The aircraft is to be loaded near to the following : 14,000 lb AUW and 19” AOD CG.	
Actual AUW	
Actual CG	

PRE-FLIGHT INFORMATION

Total airframe hours		
	Left	Right
Engine serial number		
Engine hours run		

It is recommended that the tests are made in the sequence given. The results are to be written in ink in the spaces provided.

Aerodrome pressure altitude			QFE/QNH	
Wind velocity/direction			Ground Temp	
Weather				
Take-off time			Landing Time	

1 GROUND TESTS

Run up each engine in turn to full throttle and maximum RPM record:

	PORT ENGINE	STBD. ENGINE	
RPM;			Srs 3 – 3,200
Boost;			+8psig/46” Hg
Oil Pressure;			75-85 psig
Oil Temperature;			100°C max
Cylinder Temperature;			Srs 3 - 250°C max
Fuel Pressure;			27 psig ± 2

2 TAKE-OFF

Take-off with the flaps, throttles and propeller controls in the normal take-off positions. As soon as possible after unstick, whilst maintaining maximum take-off power, record:

	PORT	STBD.	
RPM			Srs 3 – 3,200
Boost			+8psig/46” Hg
Oil Pressure			75-85 psig
Oil Temperature			100°C max
Cylinder Temperature			Srs 3 - 250°C max

3 PERFORMANCE

3.1 Climb After Take-Off, Both Power Units Operating

Climb for five minutes in the following configuration:

Power: Both at take-off 3,200 rpm at +8psig/46” Hg
Gills: Fully open
Air Intake: Ram air
Flaps: 14½°
Airspeed: Take-off safety speed appropriate to weight calculated iaw Flight Manual limitations at fig 3-1, AFM Doc No. SH2.7.

During the climb, note the full throttle height for each engine. All control loads should be trimmed out and the trimmer positions noted.

Fuel Contents	
Weight (kg/lb) at start of climb	

Time (min)	Altitude (ft) (1013 mb)	IAS (knots/mph)	OAT (°C)
0			
½			
1			
1½			
2			
2½			
3			
3½			
4			
4½			
5			

NOTE: If no Outside Air Temperature gauge is fitted, obtain the temperature at the climb altitude for the local area from the Meteorological Office. State whether the figure quoted is forecast (F) or indicated (I).

Elevator Trim: [ ] Aileron Trim: [ ] Rudder Trim: [ ]

Note the engine instrument readings before the full throttle height is reached:

RPM		
Boost		
Oil Pressure		
Oil Temperature		
Cylinder Temperature		

3.2 <u>En-route Climb – Port Propeller Feathered</u>

Climb for five minutes from not less than 3,000 feet above terrain in the following configuration:

Power:	Stbd engine at maximum continuous power – 3,000 rpm, 43”Hg/6½ psig to full throttle height
Gills:	Fully open Stbd, fully closed Port
Air Intakes:	Ram air
Flaps:	Retracted
Airspeed:	One power unit inoperative en-route climb speed calculated from Flight Manual Limitations at Fig 3-2, AFM Doc No. SH2.7.

Time to feather left propeller	secs.	(9 seconds max.)

Fuel Contents	
Weight (kg/lb) at start of climb	

Time (min)	Altitude (ft) (1013 mb)	IAS (knots/mph)	OAT (°C)
0			
½			
1			
1½			
2			
2½			
3			
3½			
4			
4½			
5			

NOTE: If no Outside Air Temperature gauge is fitted, obtain the temperature at the climb altitude for the local area from the Meteorological Office. State whether the figure quoted is forecast (F) or indicated (I).

The wings are to be held level and the aircraft is to be trimmed out as far as possible. Note the trimmer positions and any residual forces.

TRIM	**POSITION**	**RESIDUAL FORCES**
AILERON		
ELEVATOR		
RUDDER		

Note also a full set of engine figures after three minutes from start of climb:

RPM:	
Boost:	
Oil Pressure:	
Oil Temperature:	
Cylinder Temperature:	

Restart engine and record:-

Unfeathering time	secs	(10 seconds max.)
Behaviour, including any excessive vibration or roughness		

3.3 <u>En-route Climb – Stbd Propeller Feathered</u>

Climb as for port propeller feathered in the following configuration:

Power:	Port engine at maximum continuous power – 3,000 rpm, 43"Hg/6½ psig to full throttle height
Gills:	Fully open Port, fully closed Stbd
Air Intakes:	Ram air
Flaps:	Retracted
Airspeed:	One power unit inoperative en-route climbing speed calculated from Flight Manual Limitations at Fig 3.2, AFM Doc No. SH2.7.

Time to feather right propeller	secs.	(9 seconds max.)

Fuel Contents	
Weight (kg/lb) at start of climb	

Time (min)	Altitude (ft) (1013 mb)	IAS (knots/mph)	OAT (°C)
0			
½			
1			
1½			
2			
2½			
3			
3½			
4			
4½			
5			

NOTE: If no Outside Air Temperature gauge is fitted, obtain the temperature at the climb altitude for the local area from the Meteorological Office. State whether the figure quoted is forecast (F) or indicated (I).

The wings are to be held level and the aircraft is to be trimmed out as far as possible. Note the trimmer positions and any residual forces.

TRIM	POSITION	RESIDUAL FORCES
AILERON		
ELEVATOR		
RUDDER		

Note also a full set of engine figures after three minutes from start of climb:

RPM:	
Boost:	
Oil Pressure:	
Oil Temperature:	
Cylinder Temperature:	

Restart engine and record:-

Unfeathering time	secs	(10 seconds max.)
Behaviour, including any excessive vibration or roughness		

4 STALLING AND FUNCTIONING

At commencing altitude not below 5,000 feet above terrain for each stall, carry out the following checks in the order shown. The approach rate for the stalls should be approximately 1kt/sec.

- Trim the aircraft at 93 kts, flaps up, power off
- Straight, power off, flaps up stall

Flaps Up Stall:	Aircraft Weight:			
	Schedule Stall Speed:			
	Actual Stall Speed:		Warning Margin:	kts
	Stall Characteristics:			

- Time the flaps from up to fully down, (17 secs max)
- Trim the aircraft at 82 kts, flaps down, power off
- Straight, power off flaps down stall

Flaps Down Stall:	Aircraft Weight:			
	Schedule Stall Speed:			
	Actual Stall Speed:		Warning Margin:	kts
	Stall Characteristics:			

- Time the flaps from down to up, (16 secs max)

5 HIGH IAS (VNE)

This test should not be made in rough air conditions. The aircraft is to be trimmed for level flight at maximum continuous power:

3000 rpm, +6½ psig/43”Hg boost

The speed is then to be increased slowly to VNE = 162 kts and record:

Satisfactory operation of flying controls with small angles for weight and response:	
Maximum rpm and any abnormal behaviour of the powerplants:	
The behaviour of the CSU governing:	

6 FUNCTIONING

6.1 Controls and Trimmers

Check generally at a series of speeds for friction, backlash, weight and response.	SATIS / UNSATIS *

6.2 Engines

Check all engine controls for correct functioning and lining up of throttles. Check for smoothness and response at various rpm and boost.	SATIS / UNSATIS *

* Delete as appropriate

7 LANDING

With wing-flaps in the landing position, carry out a normal landing following an approach at the speed specified in the AFM.

Behaviour during landing: Record any abnormal features, eg., unusual inability to trim, unusual control forces, difficulty in flaring, or porpoising after touch-down.	
Was artificial stall warning triggered?	

8 POST FLIGHT

8.1 Placards

Check that all cockpit, cabin, baggage space and external placards are fitted and legible.	

8.2 Lighting

Check that all external and internal lighting is serviceable.	

8.3 Climb Performance

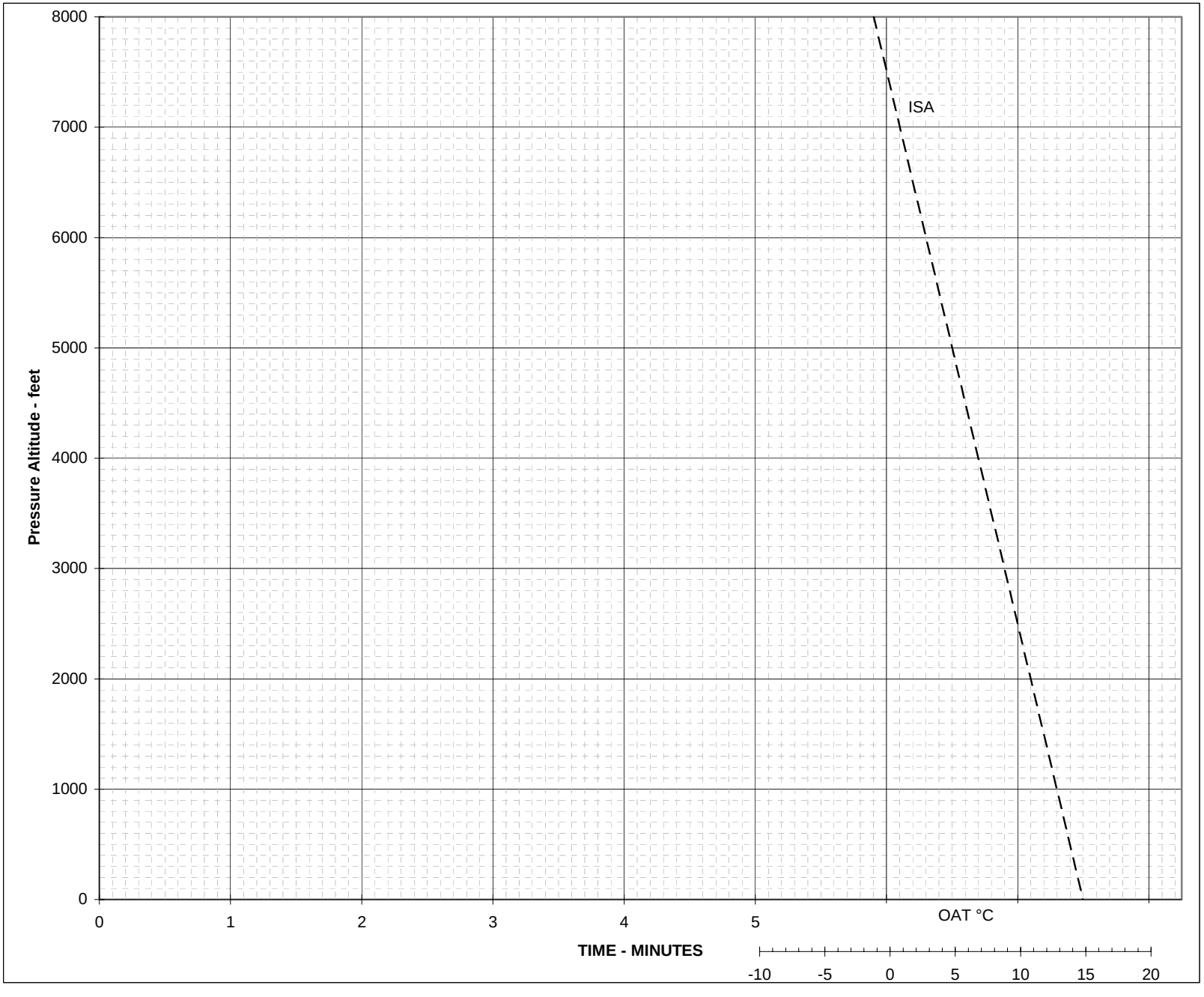
The observed figures for the climbs are to be plotted on the attached graphs and compared with the scheduled performance, (see AFM Doc No. SH2.7). It is important that the results are presented as observed, and that any significant meteorological conditions are noted.

NOTE: Where no correction for temperature is given in the designated Manual, the following temperature correction is to be applied:

When the indicated outside air temperature is above International Standard Atmosphere for the altitude, the scheduled rate of climb may be reduced by 4 ft/min/ºC (2.2ft/min/ºF). When the indicated outside air temperature is below International Standard Atmosphere for the altitude, the scheduled rate of climb is to be increased by the same amount.

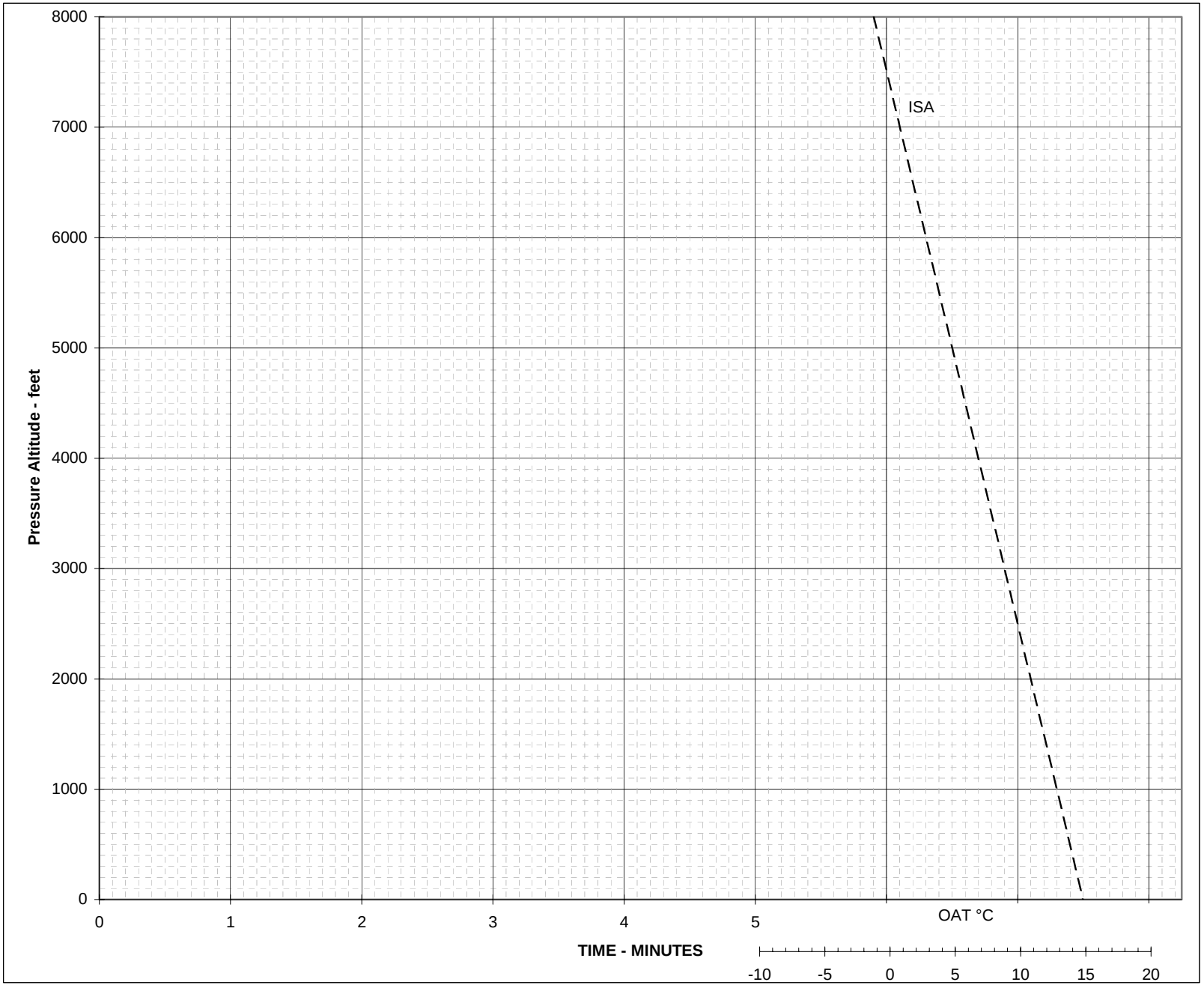
8.4 Check Flight Certificate

Complete the Check Flight Certificate at the front of this document.



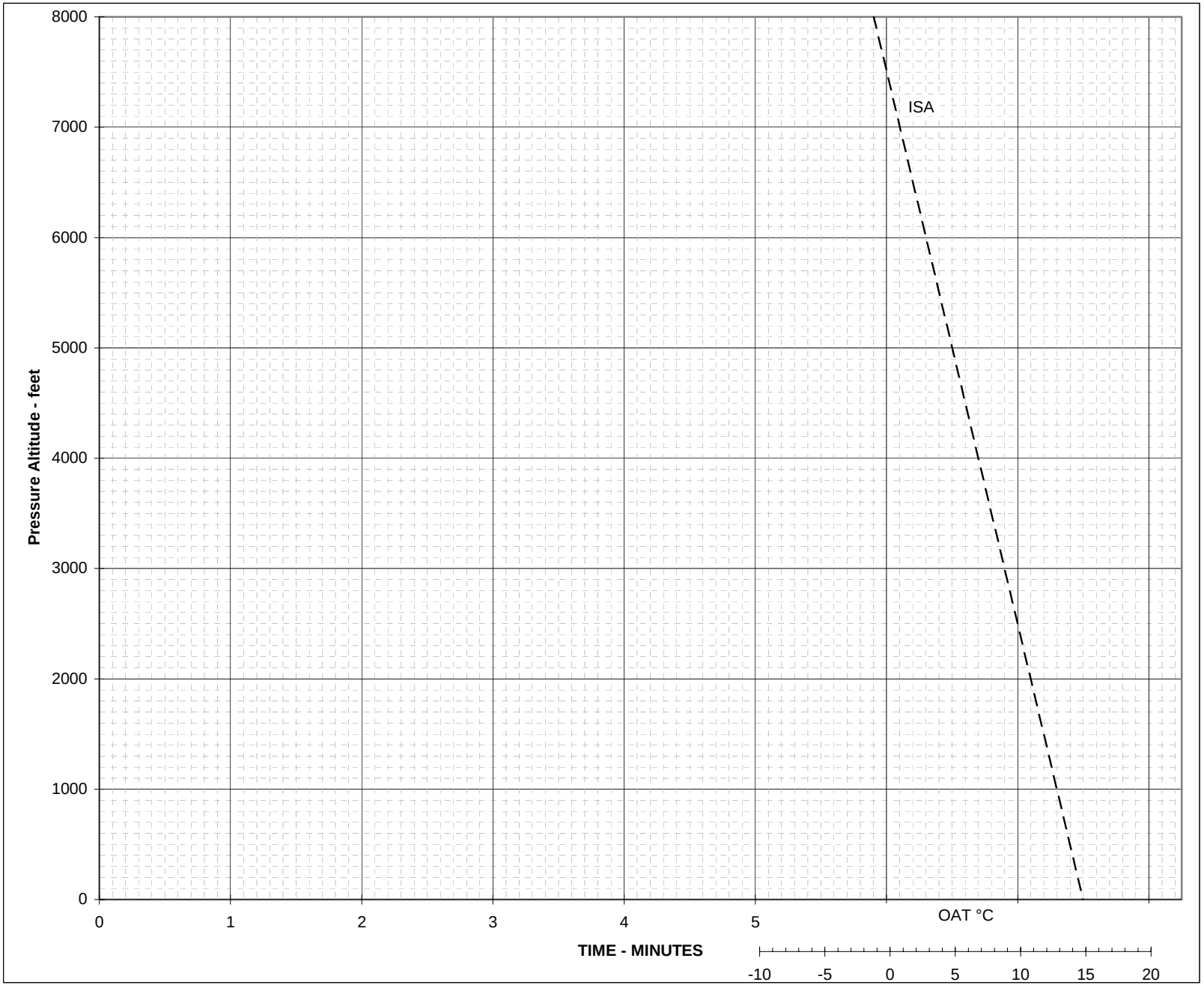
AIRCRAFT TYPE
REGISTRATION
DATE OF TEST

Mean Weight	_____ Kg/lb
Mean Altitude	_____ feet
Mean OAT	_____ °C
SCHEDULED ROC	
Basic	_____ ft/min
Correction	_____ ft/min
Correction	_____ ft/min
Final SROC	_____ ft/min
Observed ROC	_____ ft/min
Difference from Scheduled	_____ ft/min (Observed ROC minus Final SROC)



AIRCRAFT TYPE
REGISTRATION
DATE OF TEST

Mean Weight	_____ Kg/lb
Mean Altitude	_____ feet
Mean OAT	_____ °C
SCHEDULED ROC	
Basic	_____ ft/min
Correction	_____ ft/min
Correction	_____ ft/min
Final SROC	_____ ft/min
Observed ROC	_____ ft/min
Difference from Scheduled	_____ ft/min (Observed ROC minus Final SROC)



AIRCRAFT TYPE
REGISTRATION
DATE OF TEST

Mean Weight	_____ Kg/lb
Mean Altitude	_____ feet
Mean OAT	_____ °C
SCHEDULED ROC	
Basic	_____ ft/min
Correction	_____ ft/min
Correction	_____ ft/min
Final SROC	_____ ft/min
Observed ROC	_____ ft/min
Difference from Scheduled	_____ ft/min (Observed ROC minus Final SROC)