CHECK FLIGHT CERTIFICATE

Cessna 441 Conquest **CFS 191 Issue 1**
(TPE 331-8-401S or –8-402S Engines)

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	-70	-70	fpm

Airfield:

Start Weight Kg/Lbs*:

Takeoff cg:

Performance:

SATIS/UNSATIS/NOT APPLICABLE*

*(delete as applicable)**

Defects

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

Only CAA personnel or pilots specifically briefed to carry out CAA check flights may conduct the test.
General notes on test conduct can be found in the CAA Check Flight Handbook.
This sheet replaces any check flight certificate given in the schedule.
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

A full description of climb analysis is given in the CAA Check Flight Handbook.
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 CFS 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 check flights on 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 a check flight within the last 4 years.

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

CHECK FLIGHT SCHEDULE

Cessna 441 Conquest **CFS 191 Issue 1**
(TPE 331-8-401S OR –8-402S ENGINES)

Registration	
Flight Date	

INTRODUCTION

This schedule is applicable only to Cessna 441 aircraft. It is based on the assumption that the everyday operation of the aeroplane serves as a continuous check on the functioning of all normal services. On this check flight, however, the pilot is expected generally to monitor the behaviour of all equipment and report any unserviceable items. In addition of completing all the tests in this schedule, any characteristics which are considered to be unsafe or undesirable must be recorded.

The minimum crew for the check flight shall be one pilot, and one observer to record the results of the tests. The tests should, if possible, be carried out in the sequence of this schedule; altitude conditions must be observed. Except where otherwise indicated, the flight techniques are those associated with normal operation of the aeroplane. The limitations and procedures of the Pilot's Operating Handbook and British Airplane Flight Manual must be observed.

Commanders are reminded that it is illegal to carry passengers on a check flight made under 'A' Conditions, except where they are required to perform duties in the aircraft in connection with the flight. While it is legal to carry passengers on a test flight of an aircraft with a valid Certificate of Airworthiness, the practice is not recommended. If passengers are carried, however, they should be informed that the risk is greater than on an ordinary flight.

The data contained in this schedule is correct at the time of writing, but may not be in agreement with subsequent Pilots Operating Handbook and Flight Manual amendments. In cases of conflict the current Manuals are overriding; CAA Flight Department be informed of the conflict.

LOADING

The aircraft is to be loaded with fuel up to but not exceeding maximum landing weight.

Record:

Weight		Cg Position	

Where the aircraft weight is required to be recorded for particular tests, it should be calculated from the fuel gauges; the aircraft must be in steady level flight when they are read.

PRE-FLIGHT INFORMATION

Record:

Total airframe hours	

		LEFT	RIGHT
Engine serial number	**S/N**		
Engine hours run	**TSN**		

POST-FLIGHT ACTION

A check flight schedule, containing the results of all the tests specified in this schedule, the statement of defects and the Check Flight Certificate must be passed to the CAA Area Office.

CHECK FLIGHT SCHEDULE

1. PRE-FLIGHT CHECKS

1.1 Oxygen System

Check oxygen quantity adequate and that pilot's oxygen masks and microphones function correctly. Restrain any passenger oxygen overhead panels not required for use so that operation of solenoids can be confirmed, but without allowing the doors to open fully and the masks to drop.

1.2 V_{MO} pointers

Check and record both pilots' V_{MO} pointer reading (241-249 kt)

CAPTAIN	CO-PILOT
kts	kts

2. TAKE-OFF

Carry out a normal take-off using the normal schedule take-off speeds. Select 10,000 ft cabin altitude in preparation for test 4.

Record:

Propeller rpm after unstick, while maintaining take-off power (101% max)	
Any unusual characteristics	

3. PERFORMANCE AND FUNCTIONING

Recommended FL 40
(limits 3,000' AGL to FL150)

3.1 En Route Climb, Engine Out

Carry out an en-route climb for five minutes with the port engine inoperative. The recording of instrument readings should not be started until the aircraft is in a steady climb in the required configuration. Airspeed should be kept within 3 kt of the required speed and a constant heading maintained throughout the climb. The climb should not be carried out in turbulent air or near cloud.

Configuration:

- gear and flaps up
- PROP SYNC switch OFF
- starboard engine Power lever – TAKE-OFF POWER: Torque 1,669 lb ft at 100% rpm
  Condition lever – TAKE-OFF CLIMB AND LANDING unless limited by EGT at 450°C
- port engine Condition lever – EMER SHUT-OFF
  Firewall Shut off - CLOSED
  Engine Securing Procedure completed
- cabin air bleed ON
- windshield and engine inlet anti-ice OFF
- one power unit inoperative en-route climb speed = 120 KIAS
- 3°-4° bank to starboard with $^{2}/_{3}$–$^{3}/_{4}$ slip ball dia to starboard.

Record:

TIME MINS	CAPTAINS ALTITUDE	IAS KNOTS	IOAT °C	INDICATED TORQUE
0				
$^{1}/_{2}$				
1				
$1^{1}/_{2}$				
2				
$2^{1}/_{2}$				
3				
$3^{1}/_{2}$				
4				
$4^{1}/_{2}$				
5				

FUEL QUANTITY	1	LBS
	2	LBS
TOTAL FUEL		LBS
AIRCRAFT ZFW		LBS
AIRCRAFT WT		LBS

ELEVATOR TRIM	
RUDDER TRIM	
AILERON TRIM	

CAPTAIN ASI	
CO-PILOTS ASI	

(Max. difference 5kts)

ENGINE DATA	
TORQUE	
PROP RPM	
EGT	
FUEL FLOW	
OIL TEMP.	
OIL PRESS.	

FUEL QUANTITY	1	
	2	
TOTAL FUEL		
AIRCRAFT ZFW		
AIRCRAFT WT		

3.2 Engine Relight

On completing the climb carry out a Training Airstart at 120 KIAS using the unfeathering pump switch.

Record:

Time from pushing Engine Start Button to EGT rise (20 sec Max)	
Max EGT	
Satisfactory acceleration to 100% rpm	SAT/UNSAT

Fuel crossfeed Selector as required to maintain fuel balance.

4. FUNCTIONING

Recommended FL 170
limits FL 150 to FL 200

4.1 Cabin altitude warning and emergency oxygen system

With pilots on oxygen select Pressurisation Source Selector OFF.

Check and record:

Cabin Altitude captain illumination (10,900 ± 500 ft)	
Passenger oxygen overhead panels release (14,500 ± 500 ft).	

Reselect PRESS SOURCE to BOTH and set the cabin altitude to sea level in preparation for test 8.

5. FLYING CONTROLS

Climb to and at FL 240

Set up a cruise climb with landing gear and flaps retracted, windshield and engine anti-ice OFF, condition levers 96%, power levers 1,738 ft 1b torque unless limited by EGT at 450°C, speed 160 KIAS.

Operate ailerons, rudder and elevator in turn and assess each control for:

Backlash, breakout forces, centring, weight and response.	SAT/UNSAT
Operate each trimmer in turn and assess for: backlash, friction and response.	SAT/UNSAT

6. CRUISE

At FL 240

Establish a normal cruise, check and record:

	ASI	V_{MO} POINTER (230-238 kt)	ALTIMETER
CAPTAIN			
CO-PILOT			

ENGINE	TORQUE	RPM	EGT	OIL T	OIL P
LEFT					
RIGHT					

7. ENGINE SHUT-DOWN AND RELIGHT

At FL 200

Shut down the starboard engine using the Engine Securing Procedure. When EGT below 200°C, relight the engine by a Training Airstart at 100 KIAS using the unfeathering pump switch.

Check and record:

Time from pushing Engine Start Button to EGT rise (20 sec max)	
Max EGT	
Satisfactory acceleration to 100% rpm	

8. FUNCTIONING

Recommended FL 200 limits FL 150 to FL 240

8.1 Pressurisation

With SL cabin altitude selected, check and record:

Stabilised cabin differential pressure with PRESS SOURCE SELECT on BOTH (6.3 +0/-0.2 psi)	
Stabilised cabin differential pressure with PRESS SOURCE on LH	
Stabilised cabin differential pressure with PRESS SOURCE on RH	

Confirm operation of selector by noting transient changes in cabin rate-of-climb indication (max reduction in cabin pressure on selecting LH or RH from BOTH = 0.1 psi).

Reset PRESS SOURCE SELECT to BOTH and select 3,000 ft cabin altitude in preparation for item 11.

8.2 Cabin Temperature

Check manual control of cabin temperature by selecting AUTO TEMP SELECT to MAN and MAN TEMP CONT to HEAT or COOL for at least 15 secs.

Check:

Cabin temperature responds in selected sense.	SAT/UNSAT

Revert AUTO TEMP SELECT from MAN.

9. V_{MO} POINTERS AND HIGH IAS

Recommended FL 150 limits FL 200 to FL 50

	PILOT	CO-PILOT
Check and record both pilots' V_{MO} pointer reading (241-249 kt). Increase speed slowly to 245 KIAS, **check and record:**		

Weight and response of flying controls over small angles of deflection	SAT/UNSAT
General behaviour of airframe, engines and propellers.	SAT/UNSAT

At 245 KIAS slowly move the power levers to flight idle.

Check and record:

	LEFT	RIGHT
Behaviour of engines and propellers including any tendency to overspeed.	SAT/UNSAT	SAT/UNSAT

10. STALLS: LANDING GEAR AND FLAP OPERATING TIMES

Recommended FL 80
limits FL 100 to 5,000' AGL

Carry out the following stalls and functioning checks in the order shown:

Select PROP SYNC switch OFF throughout.
Prior to each stall, trim the aircraft with throttles closed at 1.5 times the stall speed for the weight (See page 17). Then reduce speed at approximately 1 kt per second until the aircraft stalls.

Stall the aircraft with flaps up and gear up

AIRCRAFT WEIGHT		
TRIM SPEED		
ELEVATOR TRIMMER		
STALL WARNING		
SCHEDULEED STALL SPEED		
ACHIEVED STALL SPEED		± 4^{x} of SCHEDULED
BEHAVIOUR AT STALL e.g. nose, wing drop or stick hard back		
ANY ABNORMAL BUFFET		
SW MARGIN (SW + STALL)		Minimum 5 KNOTS
Time the flaps from UP to TO at 150 KIAS (10 sec max)		
Time the gear extension at 140 KIAS (7 sec max)		

Stall the aircraft with flaps TO, gear down

AIRCRAFT WEIGHT		
TRIM SPEED		
ELEVATOR TRIMMER		
STALL WARNING		
SCHEDULEED STALL SPEED		
ACHIEVED STALL SPEED		± 4^{x} of SCHEDULED
BEHAVIOUR AT STALL e.g. nose, wing drop or stick hard back		
ANY ABNORMAL BUFFET		
SW MARGIN (SW + STALL)		Minimum 5 KNOTS
Time the flaps from TO to LAND at 120 KIAS (8 sec max)		

Stall the aircraft with gear down and flaps LAND

AIRCRAFT WEIGHT		
TRIM SPEED		
ELEVATOR TRIMMER		
STALL WARNING		
SCHEDULEED STALL SPEED		
ACHIEVED STALL SPEED		± 4^{x} of SCHEDULED
BEHAVIOUR AT STALL e.g. nose, wing drop or stick hard back		
ANY ABNORMAL BUFFET		
SW MARGIN (SW + STALL)		Minimum 5 KNOTS
Time the flaps from LAND to TO at 100 KIAS (6 sec max)		
Time the gear retraction at 120 KIAS (6 sec max)		
Time the flaps from TO to UP at 140 KIAS (12 sec max)		

11. FUNCTIONING

As convenient between FL 60 and 3,000' AGL

11.1 Manual Fuel Control

In level flight with 800 lb ft torque/engine, select fuel computer switches OFF and note FUEL COMP OFF lights on.

Check and record:

Torque Loss

Set up a simulated landing approach with landing gear down, flaps LAND, 100 KIAS and torque 600 lb ft/engine.

Reset torque to 200 lb ft and when stabilised fly a go-around manoeuvre, advancing the power levers smoothly.

Check that both engines accelerate smoothly and reasonable symmetrically (lever stagger not more than ¾ dia of a lever knob) up to max torque or max allowable EGT in manual mode as indicated on the EGT scale of the OAT gauge.

SAT/UNSAT

Select landing gear and flaps up and set torque to 400 lb ft/engine.

Reset fuel computer switches ON and note FUEL COMP OFF lights out.

SAT/UNSAT

Check and record:

Torque increase

11.2 Cabin Pressurisation Toggle Valve

Select cabin pressurisation toggle valve to DEPRESS. Check that cabin differential pressure falls to zero.

SAT/UNSAT

11.3 Cabin Vent Control

Turn PRESS SOURCE SELECT to OFF and confirm that there is not airflow from the air distribution outlets. Pull CABIN VENT knob and check that air is entering the cabin. Push in CABIN VENT knob and check that ventilation flow has stopped. Revert PRESS SOURCE SELECT to BOTH. Select cabin altitude control to field elevation + 200 ft.

SAT/UNSAT

11.4 Emergency Pressurisation

Turn PRESS SOURCE SELECT to EMER and check that emergency air supply is audibly entering the cabin and confirm by reference to the cabin VSI. Reselect PRESS SOURCE SELECT to BOTH and set cabin altitude control to field elevation + 200 ft.

SAT/UNSAT

12. LANDING

Carry out a normal landing, using the scheduled landing speeds. Use reverse thrust after touchdown within limitations. Discontinue reverse thrust before speed has dropped to 40 KIAS.

Record:

Any unusual characteristics**.**	SAT/UNSAT

13. AFTER LANDING

13.1 Placards

Check airframe and engine placards and colour coding for presence, accuracy and legibility.	SAT/UNSAT

13.2 Manual operation of emergency oxygen system

	SAT/UNSAT

Reset one passenger oxygen overhead panel

Select oxygen system switch to DEPLOY and check that reset panel releases.	SAT/UNSAT

STALL SPEEDS AND
TRIM SPEEDS FOR STALLS KIAS

Weight lb	Gear up/Flaps up		Gear down/Flaps TO		Gear down/Flaps LAND	
	Trim	Stall	Trim	Stall	Trim	Stall
9,800	133	89	124	82.5	112	75
9,600	132	88	123	82	111	74
9,400	131	87.5	122	81	110	73.5
9,200	130	87	121	80.5	108	72.5
9,000	129	86.5	120	80	107	71.5
8,800	128	86	118	79	105	70.5
8,600	127	85	117	78.5	104	69.5
8,400	126	84.5	116	77.5	102	68.5
8,200	126	84	115	77	101	67.5
8,000	125	83.5	114	76	99	66.5
7,800	124	82.5	113	75.5	98	65.5
7,600	123	82	112	75	97	65
7,400	122	81.5	111	74	96	64
7,200	121	81	110	73.5	94	63
7,000	120	80	109	73	93	62