CHECK FLIGHT CERTIFICATE

DORNIER 328-110 (P&W 119B engines) **CFS 284 Issue 1**

Registration:

Date:	Crew:	Observer:

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	-80	-100	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 flight test 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 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 CFS on a test flight not directly under their control.

CHECK FLIGHT SCHEDULE

DORNIER 328-110 (P&W 119B engines) **CFS 284 Issue 1**

Registration	

Flight Date	

INTRODUCTION

This schedule is applicable only to the Dornier 328-110 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 these test flights, however, the crew are expected generally to monitor the behaviour of all equipment and to report any unserviceable items. In addition to completing all the required tests in the schedule, any characteristics which are considered unsafe or undesirable must be recorded.

MINIMUM CREW

The minimum crew shall be increased by one observer to record the results of the tests. The pilot conducting the tests shall be specifically approved by the CAA (SRG) for airworthiness flight testing of the Dornier 328-110.

PASSENGERS

While is it 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.

TEST SCHEDULE

The pilot conducting the tests must be familiar with the contents of this schedule before flight. All members of the required minimum crew must be provided with copies of the schedule for use in flight.

The data contained in this schedule is correct at the time of writing, but might not be in agreement with subsequent Flight Manual amendments; in cases of conflict, the Flight Manual is overriding, and CAA (SRG) Flight Department must be informed. The altitude conditions in the schedule must be observed to ensure adequate safety and validity of the test results. The tests should, if possible, be carried out in the sequence as written.

Registration			
Flight Date			
Operator/ Maintenance Organisation			
Aerodrome	Pressure Altitude	Tower Temperature	QNH
Pilots			
Observer			

LOADING AND CALCULATION OF WEIGHT

The aircraft is to be loaded with full fuel, with the C.G. within the Flight Manual limits, and ramp weight below Maximum Landing Weight.

RECORD:	Zero Fuel Weight :	
	Aircraft Ramp Weight :	
	CG :	

1. **Pre-start**

Check:

- Placards for presence, accuracy, legibility SAT/UNSAT
- Crew oxygen masks for flow and intercomm SAT/UNSAT
- Standby Elevator Trim SAT/UNSAT
- Standby Aileron Trim SAT/UNSAT
- Stall Warning and Stick Pusher SAT/UNSAT

Pressurisation:

- Set a high land altitude

2. **After Engine Start**

2.1 Engine Data: Power Levers F/I
Condition Levers MIN
Bleeds and Packs ON
X-Bleed OFF
ECS ECON

	LEFT	RIGHT	
Tq (27-33%)			
Np (65.5 - 66.5%)			
N_H (81.0 - 85.0%)			SAT/UNSAT

2.2 TOCW
Condition Levers MAX

Check that warning sounds with the Power Levers advanced with each of the following conditions set in turn:

Flaps 0, 20° SAT/UNSAT
Elevator Trim outside each end of T.O. green band SAT/UNSAT
Park Brake ON SAT/UNSAT
Each Condition Lever below MAX in turn SAT/UNSAT

Carry out the following checks in accordance with the Flight Manual Procedures.

2.3 Np overspeed governor check SAT/UNSAT

2.4 Autofeather check SAT/UNSAT

Reset trim, flaps and Condition Levers for Take-off.

3. **Normal Take-off**

Record V_1, V_R, V_2	V_1	V_R	V_2
Elevator trim.			
Any unusual characteristics			

4. **T.O. Climb Performance** **Start above 3000 ft agl and below FL100**

Shut down the left engine and feather the propeller. Carry out an engine out take-off climb for 5 minutes on a constant heading, clear of cloud, turbulence, wave effects and inversions, using not more than 5° bank towards the live engine. Control forces must be trimmed out as far as possible.

Flaps	12°	
Gear	UP	
Left Engine	Inoperative, propeller feathered	
X-Bleed	OFF	
ECS	HIGH	
Ice Protection Systems	OFF	
Airspeed	V_2 min	(Fig. 1)
Right Engine	MTOP (Np 100%)	(Fig. 2)
Altimeter	1013 Hpa	

T.O. Climb Performance

Record:

Ramp Weight		
Fuel Used		
Start Weight		

Scheduled V_2	

TIME (mins)	ALTIMETER (feet)	IAS (knots)	SAT (°C)	TORQUE %
0				
½				
1				
1½				
2				
2½				
3				
3½				
4				
4½				
5				

TRIMMER SETTINGS

ELEVATOR	
RUDDER	
AILERON	

ASI COMPARISON

CAPTAIN	
CO-PILOT	

ENGINE READINGS AT 3 MINS

	RIGHT
TQ	
Np	
ITT	
N_H	
Fuel Flow	

Ramp weight		
Fuel used		
Finish weight		

Mean Climb Weight

Weather	

5. **Left Engine Airstart** **Below 15000 ft**

Restart the left engine at V_2 using the normal starter assist procedure.

Record:

Time to ITT Rise	
Time to F/I	
Maximum ITT	

SAT/UNSAT

Accelerate and retract Flaps to 0°.

6. En-route Climb Performance — Start FL80 - FL150

Shut down the right engine and feather the propeller. Carry out an engine out en-route climb for 5 minutes on a constant heading, clear of cloud, turbulence, wave effects and inversions, using not more than 5° bank towards the live engine. Control forces should be trimmed to zero.

Flaps	0°	
Gear	UP	
Right Engine	Inoperative, propeller feathered	
X-Bleed	OFF	
ECS	HIGH	
Ice Protection Systems	OFF	
Airspeed	E/R Climb Speed	(Fig. 3)
Left Engine	MCP (Np 100%)	(Fig. 4)
Altimeter	1013 Hpa	

Record:

Ramp Weight	
Fuel Used	
Start Weight	

En-route Climb Speed	

TIME (mins)	ALTIMETER (feet)	IAS (knots)	SAT (°C)	TORQUE %
0				
½				
1				
1½				
2				
2½				
3				
3½				
4				
4½				
5				

TRIMMER SETTINGS

ELEVATOR	
RUDDER	
AILERON	

ASI COMPARISON

CAPTAIN	
CO-PILOT	

ENGINE READINGS AT 3 MINS

	LEFT
TQ	
Np	
ITT	
N_H	
Fuel Flow	

Ramp weight		
Fuel used		
Finish weight		

Mean Climb Weight

Weather	

ECS ON (ECON)

7. **Relight Right Engine Airstart** **Below 20000 ft**

Restart the right engine at the en-route climb speed, using the normal starter assist procedure.

Time to ITT Rise	
Time to F/I	
Maximum ITT	

SAT/UNSAT

8. **Depressurisation** **Not above FL200**

Select pressurisation control mode to MAN.
Use MAN CAB ALT knob to set cabin to approximately 1000 ft/min rate of climb.

Record Cabin Altitude at triple chime. (9500 ± 200 ft)		SAT/UNSAT
Continue depressurisation until Passenger O_2 mask dropout (13800 ± 700 ft)		SAT/UNSAT
Record masks which fail to drop.		SAT/UNSAT

Use **MAN CAB ALT** to repressurise and remain in **MANUAL** mode in preparation for Item 10.

9. **Climb to FL200**

During the climb assess the controls for friction, weight, response, backlash and centring.

Elevator	SAT/UNSAT
Ailerons	SAT/UNSAT
Rudder	SAT/UNSAT

Remarks	

10. **Pressurisation - Cabin Pressure Relief** **FL200**

ECS Pressurisation control mode MAN

Use MAN CAB ALT knob to set cabin Rate of Descent to approximately 1000 ft/min.

Monitor cabin differential pressure and observe cabin pressure relief
(cabin Rate of Descent reverses to Rate of Climb).

DO NOT EXCEED 7.1 psi

Record Cabin Differential at Pressure Relief (6.9 to 7.1 psi) [ ] SAT/UNSAT

Reduce cabin differential pressure using the MAN CAB ALT knob.

Select Pressurisation Control Mode AUTO.

Set landing elevation as required.

11. **Flight at High IAS** **Below FL200**

Using a high Torque, accelerate in a gentle dive to V_{MO} = 270 kt and
continue to accelerate until the overspeed warning sounds.

DO NOT EXCEED 280 kt

Check controls and airframe for freedom from buffet and vibration.
Check propeller governing on power reduction.

Record :

Altitude		
Warning	L	R
IAS (kt)		

SAT/UNSAT

12. Engine Handling FL 150

12.1 Engine Acceleration

Table: MCP Tq for 15000 ft., 160 kt., Bleed Off.

SAT °C	-22 and below	-20	-18	-16	-14	-12	-10
MCP Tq	-85.0	84.3	83.0	82.0	80.5	79.6	78.4

-8	-6	-4	-2	0	+2
77.1	75.8	74.5	73.2	72.2	71.0

+4	+6	+8	+10
69.8	68.7	67.7	66.8

At 160 kt check satisfactory engine acceleration characteristics and propeller governing on each engine in turn:-

Np	100%
Cross Bleed	OFF
ECS	ECON
Left Bleed	CLOSED
Left CL	MAX.
Left PL	F/I
Right Torque	As required

Move Left PL to MCP Torque (see Table) in one second.

Record:

SAT		
Left F/I Tq		
Left MCP Tq		
Characteristics		SAT/UNSAT

Left Bleed	OPEN
Left Torque	As required
Right Bleed	CLOSED
Right CL	MAX.
Right PL	F/I

Move Right PL to MCP Torque in one second.

Record:

SAT		
Right F/I Tq		
Right MCP Tq		
Characteristics		SAT/UNSAT

Right Bleed	OPEN
PLs and CLs	As required

12.2 ECU Off

At 140 kt., check characteristics on each engine in turn with ECU Off.

ECS	ECON
Cross-Bleed	OFF
Condition Levers	MIN.
Power Lever (test engine)	F/I

	LEFT		RIGHT	
	ECU ON	ECU OFF	ECU ON	ECU OFF
Tq %				
ITT °C				
Fuel Flow kg/hr				

SAT/UNSAT

13. **Stalling And Functioning** **(Below FL 150 but not below 8000 ft agl)**

For each stall, the aircraft should be trimmed at 1.23 V_{S1G} with Condition Levers MAX. and Power Levers at Flight Idle. Make a smooth 1 kt/sec. deceleration until the stick pusher operates. (Fig. 5)

DO NOT DECELERATE BELOW (SCHEDULED PUSHER SPEED - 3 KT) IF NO PUSHER ACTIVATION OCCURS.

13.1 Clean Stall:

Ramp Weight kg		
Fuel Gone kg		
Test Weight kg		
Scheduled Trim Speed		
Indicated Trim Speed	Capt.	F/O
Trim Setting		
Stall Warning	Scheduled	Achieved
Stick Pusher	Scheduled	Achieved

Any abnormalities	

SAT/UNSAT

13.2 12° Flap Gear Up Stall

Ramp Weight kg		
Fuel Gone kg		
Test Weight kg		
Scheduled Trim Speed		
Indicated Trim Speed	Capt.	F/O
Trim Setting		
Stall Warning	Scheduled	Achieved
Stick Pusher	Scheduled	Achieved

Any abnormalities	

SAT/UNSAT

13.3 32° Flap Gear Down Stall

Ramp Weight kg		
Fuel Gone kg		
Test Weight kg		
Scheduled Trim Speed		
Indicated Trim Speed	Capt.	F/O
Trim Setting		
Stall Warning	Scheduled	Achieved
Stick Pusher	Scheduled	Achieved

Any abnormalities	

SAT/UNSAT

Select Elevator Horn Anti-Ice ON
Check 'SHAKER-PUSHER ICE' status message on EICAS SAT/UNSAT

13.4 32° Flap Gear Down Stall - Icing Speeds

Ramp Weight kg		
Fuel Gone kg		
Test Weight kg		
Scheduled Trim Speed		
Indicated Trim Speed	Capt.	F/O
Trim Setting		
Stall Warning	Scheduled	Achieved

Any abnormalities	

SAT/UNSAT

Elevator Horn Anti-IceOFF

Reset Flaps and Gear as required.

CL As required

14. **Gear Extension On Handpump** **Below 10000 ft**

Gear Handle	UP
Priority Valve Switch	ROLL
Anti Skid	OFF
Brakes	Cycle until Priority Valve closes (Systems Page)
Hand Pump Cover	OPEN
Hand Pump	OPERATE (3 greens, 3 reds)
Gear Handle	DOWN (reds extinguish)
Hand Pump Cover	CLOSE
Priority Valve	AUTO
Anti Skid	ON
Gear Handle	UP

SAT/UNSAT

15. **Cabin pressure dump**

With pressurisation in AUTO mode, wait until cabin differential is approximately 1 psi, then :

CAB DUMP P/B	DUMP	
Check differential pressure	approx. 0 psi	
CAB DUMP P/B	NORMAL	SAT/UNSAT

16. **Normal Landing 32° Flap**

Use Full Reverse.

Any Unusual Characteristics.

17. **After Landing**

17.1 Emergency Brakes SAT/UNSAT

17.2 Pusher Override SAT/UNSAT

17.3 TRU

Aircraft Stationary. Both Engines running.

Electrical Page	SELECT	
TRU	Unlatch L **or** R	
Check ESS BUS Powered (DU 1, 2, 3 Operative)		
TRU	Check ON	SAT/UNSAT

Return Systems to Normal.

Note: Electrical transients on reinstating the electrical system to normal may lead to loss of some systems (e.g. Nose Wheel Steering). Check normal system operation.

18. **Post Flight Actions**

18.1 Performance Climb Analysis

Plot the results of the performance climbs and compare the measured rates of climb with the gross data scheduled in the Flight Manual. Attach plots to report and summarise results on the front page.

18.2 Flight Test Certificate

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

18.3 Pass the completed Check Flight schedule to the CAA.

FIGURE 1

V_{2MIN} KIAS

Weight KG x 1000	OAT °C						Press Alt (FT)
	-30	-20	-10	0	+10	+20	
10.5	114	113	112	112	109	106	5000
11.0	114	113	112	112	109	106	
11.5	114	113	112	112	109	107	
12.0	114	113	112	112	110	109	
12.5	114	113	112	112	111	111	
13.0	114	113	113	113	113	113	
10.5	113	113	112	110	107	105	6000
11.0	113	112	112	110	107	105	
11.5	113	112	112	110	108	107	
12.0	113	112	112	110	109	109	
12.5	113	112	112	111	111	111	
13.0	113	113	113	113	113	113	
10.5	113	112	111	109	106	105	7000
11.0	113	112	111	109	106	105	
11.5	113	112	111	109	107	107	
12.0	113	112	111	109	109	109	
12.5	113	112	111	111	111	111	
13.0	113	113	113	113	113	113	
10.5	112	111	109	107	105	105	8000
11.0	112	111	109	107	105	105	
11.5	112	111	109	107	107	107	
12.0	112	111	110	109	109	109	
12.5	112	111	111	111	111	111	
13.0	113	113	113	113	113	113	
10.5	111	110	107	106	105	104	9000
11.0	111	110	107	105	105	105	
11.5	111	110	108	107	107	107	
12.0	111	110	109	109	109	109	
12.5	111	111	111	111	111	111	
13.0	113	113	113	113	113	113	
10.5	110	108	106	105	105	104	10000
11.0	110	108	106	105	105	105	
11.5	110	108	107	107	107	107	
12.0	110	109	109	109	109	109	
12.5	111	111	111	111	111	111	
13.0	113	113	113	113	113	113	

FIGURE 2

MAXIMUM TAKE-OFF POWER

SEE AIRCRAFT FLIGHT MANUAL

SECTION 06-01-01 Fig. 8

FIGURE 3

En-Route Climb Speed - Single Engine

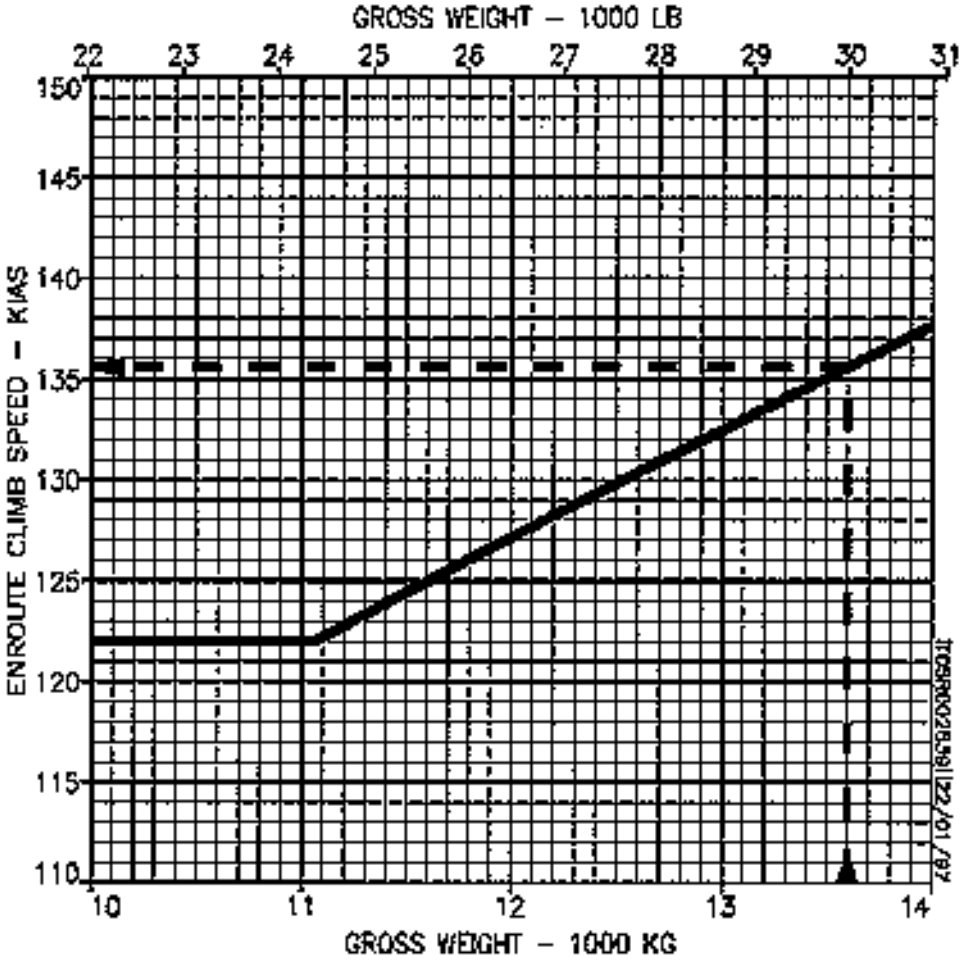

FIGURE 4

MAXIMUM CONTINUOUS POWER

SEE AIRCRAFT FLIGHT MANUAL

SECTION 06-01-01 Fig. 11

FIGURE 5

Trim and Stall Speeds

Weight Kg x 1000	0° Flap Gear Up		12° Flap Gear Up		32° Flap Gear Down	
	Trim	V_{S1G}	Trim	V_{S1G}	Trim	V_{S1G}
10.0	119	97	108	88	95	77
10.5	122	99	111	90	97	79
11.0	125	101	114	92	100	81
11.5	127	104	116	94	102	83
12.0	130	106	119	96	104	84
12.5	133	108	121	98	106	86
13.0	135	110	123	100	108	88

In the event that no stick pusher activation occurs, do not continue the deceleration below (scheduled V_{S1G} -2 kt.)