CHECK FLIGHT CERTIFICATE

HS 748 SERIES 1, 2, 2A AND SERIES 1 WITH 533-2 ENGINES	**CFS114 Issue 1**	Registration:

Date:	Crew:	Observer:

Performance

	Climb #1	Climb #2	Climb #3	
Average Weight				
Average Altitude				ft
Average Temp.				°C
Speed				KIAS
Achieved Rate				fpm
Scheduled Rate				fpm
Margin				fpm
Permitted Margin	-70	-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 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, second and third 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 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

HS.748 Series 1, 2, 2A and Series 1 with 533-2 Engines No. 114, Issue 1

Registration	
Date	

INTRODUCTION

This schedule is applicable only to HS.748 Series 1, 2, 2A and Series 1 with 533-2 Engines aircraft. It is based on the assumption that the aircraft under test fully incorporates all the Modifications which may be required for UK type certification and it is essential in the interests of flight safety that no attempt be made to test an aircraft to this schedule if it is not so compliant. The tests are intended to cover items, including emergency systems, which are not routinely checked; however, the crew are expected generally to monitor the behaviour of all equipment and report any unserviceable items. In addition to noting items arising directly from tests in the schedule, any other characteristics which are considered unsafe or undesirable must be recorded.

The aircraft and its engines must be operated at all times within its Flight Manual limitations. Unless specified in this Schedule, normal operating procedures and checks should be used.

The minimum flight crew for this test should, whenever possible, be increased by one observer to record the results of the tests. When tests are scheduled above FL100, oxygen shall be available for all persons on board. The tests should be carried out in the sequence as written; altitude conditions must be observed.

Aircraft commanders are reminded that it is illegal to carry passengers on a flight made under 'A' Conditions and that while it is legal to carry passengers on a test flight made with a valid Certificate of Airworthiness, the practice is not recommended. If passengers are carried, they must be informed that the risk is greater than that on a normal scheduled 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 current Flight Manual is over-riding and CAA (Flight Department) should be informed.

The crew of the aircraft must be familiar with the contents of this schedule before flight and the pilot conducting the tests must be specifically approved by the CAA for Check Flights on HS.748 Series 1, 2, 2A and Series 1 with 533-2 Engines aircraft.

LOADING

The aircraft should be loaded with to achieve at take-off – Series 1 and Series 1 with 533-2 engine, the weight above 35,000 lb. (15850 kg); CG at or forward of 68" AOD and Series 2 and 2A, the weight between 38,000 lb. (17200 kg to 18150 kg); CG at or forward of 66" AOD.

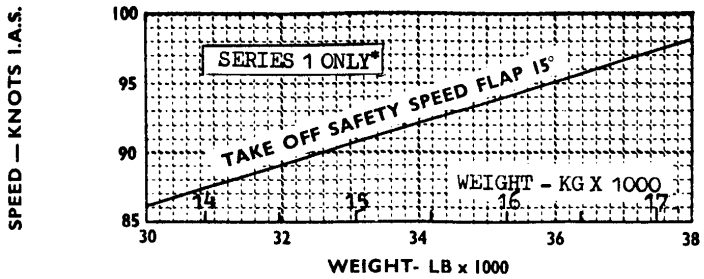
PRE FLIGHT ACTION

If passenger oxygen masks are fitted and are to be deployed, it is acceptable to prevent their complete deployment by the use of appropriate clips or tape; any such mechanism must, however, allow sufficient movement to verify correct functioning of the system.

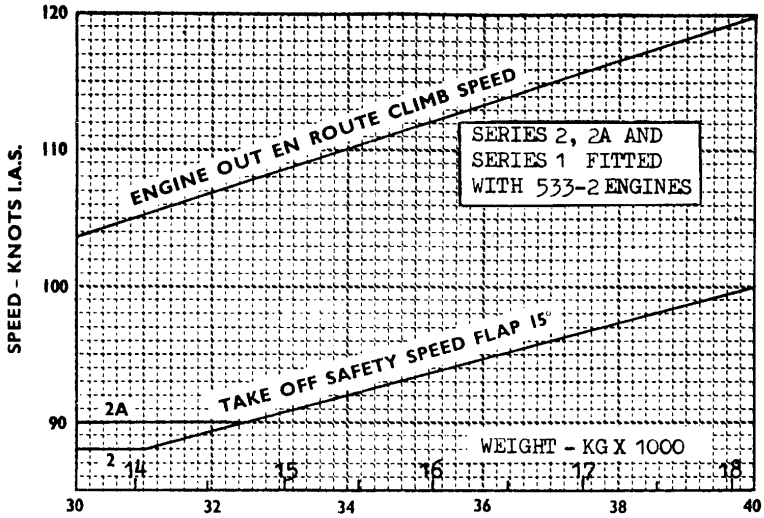
POST FLIGHT ACTION

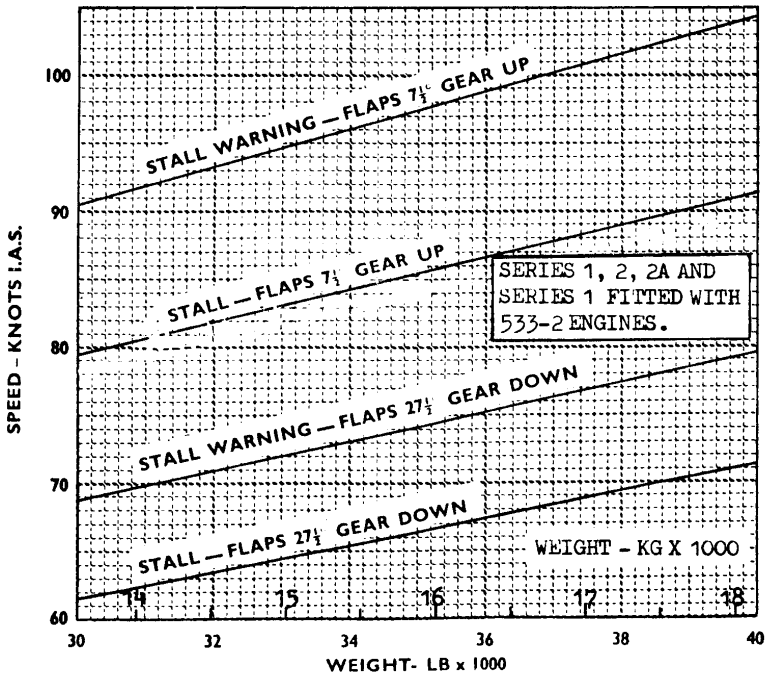
The Check Flight Schedule and Check Flight Certificate must be completed and signed by the pilot carrying out the test.

H.S. 748 — SERIES 1, 2 and 2A
GRAPH OF STANDARD SPEEDS
AIRWORTHINESS FLIGHT TEST SCHEDULE 114 ISSUE 5



* Series 1 fitted with Mk.533-2 engines must operate to Series 2 performance speeds.





The weight and c.g. must remain within Flight Manual limitations at all times.

The actual values shall be recorded; where specific tests require the aircraft weight to be recorded, it shall be calculated from the fuel gauges or “fuel gone” indicators.

1. PRE TAKE-OFF

1.1 Before Engine Start

Check each control trimmer for satisfactory operation over its full range — SAT/UNSAT

With 28V D.C. supplies on, check autofeather operation, by opening both H.P. cocks and advancing one throttle lever. As the lever passes the position equivalent to about 12,000 rpm the propeller should autofeather. Manually underfeather and repeat the check on the other propeller.

2. TAKE-OFF

Carry out a normal take-off using the normal scheduled take-off speeds.

Record any unusual characteristics, including Stall Warning activation, if any.

3. PERFORMANCE – TAKE-OFF CLIMB

5000' AGL to FL100

3.1 Carry out an engine out en-route climb, recording the results for 5 minutes; the climb should be made on a constant heading, clear of cloud, turbulence, wave effects and inversions, Commence the climb from any convenient flight level, but not below 5000 ft above terrain.

Before commencing the test climb, a normal twin-engined climb to approximately 10,000 ft is to be carried out, noting the ambient temperature every 500 ft. A starting height for the test climb will then be selected, avoiding temperature inversions, and so that the test can be completed before 10,000 ft is reached, but starting not below 5,000 ft about terrain.

On the descent from 10,000 ft to the test starting height selected, the test engine must be set to zero thrust (40 psi torque) for not less than five minutes. The end of this five minute period should be made to coincide, as near as possible, with arrival at the selected test starting height so that the other engine may be feathered and the test climb commenced immediately.

With
- pressurisation off
- engine and propeller de-icing as required
- gear up, flaps 15°
- No. 2 feathered
- No. 1 at maximum take-off power within placard limitations, water methanol on. Fuel trim must be set by computer for conditions when commencing climb, and not increased thereafter.
- take-off safety speed for the weight (see page 2)
- Captain's altimeter set to 1013 mbar.

Record
- aircraft weight at start and finish of climb
- Captain's altimeter reading every half minute
- Captain's ASI reading and OAT every half minute
- flying control trimmer settings when trimmed out (some residual rudder pedal force will be required) with approx. 3°, but not more than 5° bank towards the live engine
- functioning of water methanol cross feed
- both ASI readings at any one moment (max. difference 5 knots)
- degree of turbulence

After 3 minutes record:

- all live engine instrument readings.

3.1 Engine Out En-route Climb

Starting Altitude 5000ft agl-FL100

START WEIGHT kg

V_{ER} kts

TIME MINS	ALTITUDE - FT.	IAS - KTS	SAT °C	TGT/JPT
0				
0.5				
1.0				
1.5				
2.0				
2.5				
3.0				
3.5				
4.0				
4.5				
5.0				

RUDDER TRIM

NO. 1 ENGINE DATA AT 3 MINUTES

N1	%	N2	%
EGT	°C	FUEL FLOW	kg/hr

FINISH WEIGHT kg

MEAN CLIMB WEIGHT kg

3.2 Engine Relight

On completion, re-light and unfeather No. 2 below 160 KIAS and time to 10,000 rpm using throttle as necessary. .

Altitude	ft	
Time to TGT/JPT rise	sec	
Max TGT/JPT	°C	
Time to unfeather	sec	(15 sec max)

Set cabin altitude controller to sea level in preparation for test 5.3

4. PERFORMANCE – EN-ROUTE CLIMB

5000' AGL to FL100

4.1 Carry out an engine out en-route climb, recording the results for 5 minutes; the climb should be made on a constant heading, clear of cloud, turbulence, wave effects and inversions, Commence the climb from any convenient flight level, but not below 5000 ft above terrain.

With
- pressurisation on
- engine and propeller de-icing as required (on if IOAT is less than +10°C)
- gear up, flaps up
- No. 1 feathered (record time as stated below)
- No. 2 at maximum continuous power (series 1) or intermediate power (series 2,2A and series 1 with 533-2 engines) adjusting fuel trimmer continuously to maximum TGT or JPT
- IAS
  - 115 KIAS (Series 1)
  - engine out en route climb speed for the weight (Series 2, 2A and Series 1 with 533-2 engines)
- Captain's altimeter set to 1013 mbar.

Record:
- feathering time to sudden drop on oil pressure gauge (4 sec. max)
- aircraft weight at start and finish of climb
- Captain's ASI reading, OAT and fuel trimmer every minute
- flying control trimmer settings when trimmed out, with approx. 1° bank towards the live engine
- degree of turbulence

After 3 minutes record :

- all live engine instrument readings.

4.1 Engine Out En-route Climb

Starting Altitude 5000ft agl-FL100

START WEIGHT kg

V_{ER} kts

TIME MINS	ALTITUDE - FT.	IAS - KTS	SAT °C	TGT/JPT
0				
0.5				
1.0				
1.5				
2.0				
2.5				
3.0				
3.5				
4.0				
4.5				
5.0				

RUDDER TRIM

NO. 2 ENGINE DATA AT 3 MINUTES

N1	%	N2	%
EGT	°C	FUEL FLOW	kg/hr

FINISH WEIGHT kg

MEAN CLIMB WEIGHT kg

4.2 Engine Relight

On completion, re-light and unfeather No. 1 below 160 KIAS and time to 10,000 rpm using throttle as necessary. .

Altitude	ft	
Time to TGT/JPT rise	sec	
Max TGT/JPT	°C	
Time to unfeather	sec	(15 sec max)

4.3 Carry out a further climb with No. 2 feathered, following the conditions and recording the results as in 4.1.

4.4 Engine Out En-route Climb

Starting Altitude 5000ft agl-FL100

START WEIGHT _____ kg

V_{ER} _____ kts

TIME MINS	ALTITUDE - FT.	IAS - KTS	SAT °C	TGT/JPT
0				
0.5				
1.0				
1.5				
2.0				
2.5				
3.0				
3.5				
4.0				
4.5				
5.0				

RUDDER TRIM _____

NO. 1 ENGINE DATA AT 3 MINUTES

N1	%	N2	%
EGT	°C	FUEL FLOW	kg/hr

FINISH WEIGHT _____ kg

MEAN CLIMB WEIGHT _____ kg

4.5 Engine Relight

On completion, re-light and unfeather No. 2 below 160 KIAS and time to 10,000 rpm using throttle as necessary. .

Altitude	ft	
Time to TGT/JPT rise	sec	
Max TGT/JPT	°C	
Time to unfeather	sec	(15 sec max)

5. CRUISE

Recommended FL110
above 5000' AGL and above FL100

5.1 Pressurisation

Check - dump valve by opening it sufficiently to see the cabin altitude begin to rise and then select it back to closed.

5.2 Aircraft Trim, Controls and Trimmers

Trim the aircraft accurately about all three axes and record the three trimmer readings (rudder and aileron trims not more than 1 division from neutral).

Check controls for backlash, centering (friction), weight and response.

Check trimmers for backlash, friction and response.

5.3 Engines, Propellers, Hydraulics and Cabin Compressors

Record in the following sequence :

- note cabin differential pressure
- feather No. 1 – no recording necessary
- gear extension time (13 secs max)
- stabilised cabin differential pressure (not lower than previous reading)
- gear retraction time at 120 KIAS with TO power (8 secs max)
- wing de-icing vacuum (2-9 psi) and pressure (8-23 psi)
- re-light and unfeather No. 1 – no recording necessary.

Repeat all the tests above with No. 2 feathered.

6. MAXIMUM SPEED TEST

Recommended Start at least
8000' AGL

From the trimmed cruise increase speed progressively to V_{NE} and check :

- controls over small angles for response and weight
- general airframe, engine and propeller behaviour.

7. STALLS

FL110 to 6000' AGL

In each of the following configurations :

- gear up, flaps 7½°, power off
- gear down, flaps 27½°, power off

trim the aircraft at about 40% above the scheduled stalling speed and do not trim thereafter. Reduce speed slowly (approx. 1 kt/sec.) until the aircraft stalls. Do not stall below 6000 ft a.g.l.

Record
- elevator trimmer position
- scheduled and indicated stick shaker speeds
- scheduled and indicated stalling speeds
- stalling characteristics
- aircraft mean weight.

All indicated speeds should be within ±3 knots of their scheduled values and the margin between stall warning and stall must not be less than 5 knots.

8. FUNCTIONING

Any convenient FL

8.1 Crossfeeds

With crossfeed open, switch off fuel booster pumps for each engine in turn and check that the fuel low pressure warning lights do not illuminate.

8.2 Flap Operating Times

At 115 KIAS, time - extension 0° to 27½° (18 secs max)
- retraction 27½° to 0° (18 secs max)

8.3 De-icing System

Check - heavy and light ice airframe de-icing cycles (approx. 1 min. and 4 min. respectively, timed between cycles of any particular de-icing boot section).

8.4 Emergency Gear Lowering

- Reduce speed to about 100 KIAS
- Pull the emergency gear lowering handle fully aft to the EMERGENCY DOWN position (indicated by a white fully extended mark).
- If the landing gear does not lock down (three green lights illuminate), accelerate to 160 KIAS and pitch the aircraft gently nose up and nose down.
- After the gear has locked down or if the gear fails to lock down, place the normal landing gear selector lever to DOWN.
- Return the emergency gear lowering handle fully forward to the normal IN position.
- Check normal retraction of the gear using the normal selector.

8.5 Emergency Flap Extension

- With the flaps selected up, pull circuit breaker 63.
- Engage the emergency flap handle (stowed above the forward cargo door) in the socket under the access panel marked FLAP in the centre cabin gangway.
- Push the handle in against the spring which disengages the electric motor and rotate the handle clockwise. After about 70 turns, visually observe that the flaps have extended to approximately the 7½° setting.
- Remove and stow the flap handle, and reinstate CB 63.
- Check that the flaps return to the up position.

9. LANDING

Carry out a normal landing. Record any unusual characteristics and landing weight.

10. AFTER LANDING

10.1 Flight Fine Pitch Stop Warning

Check - F.F.P.S. warning horn (by checking audible warning within 8 secs of nosewheel touchdown when FFPS not withdrawn. Keep watch on TGTs which will start rising about 30 secs after landing if FFPS not withdrawn before this time).

10.2 Electrics

Check
- alternator transfer system
- inverter transfer system
- split each bus-bar in turn and kill its appropriate generator and check that the appropriate services are lost from the isolated bus-bar. Switch off dead inverter before recoupling the bus-bar.

10.3 Placards and Labelling

Check and record engine and airframe placards, and cockpit labelling generally for presence, accuracy and legibility.