CHECK FLIGHT CERTIFICATE

Shorts SD3-60 (PT6A-65R) **CFS 220 Issue 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	-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 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 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

Shorts SD3-60 (PT6A-65R) **CFS 220 Issue 1**

Registration	
Flight Date	

INTRODUCTION

This schedule is applicable only to Shorts SD3-60 aircraft. It 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 check flights, however, the crew are expected generally to monitor the behaviour of all equipment and report any unserviceable items. In addition to completing all the required tests in this schedule, any characteristics which are considered unsafe or undesirable must be recorded.

MINIMUM CREW

The minimum flight crew shall be increased by one flight observer to record the results of the tests. The pilot conducting the tests shall be specifically approved by the CAA (SRG) for carrying out check flights on Shorts SD3-60 aircraft.

PASSENGERS

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 flight test 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.

CHECK FLIGHT 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 Airworthiness Directives, Flight Manual amendments or Operations Manual Bulletins; in cases of conflict, the current information 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.

PRE-FLIGHT INFORMATION

Aircraft Registration	
Date	
Total airframe hours	

Engine Serial Nos.	Left	Right

LOADING AND CALCULATION OF WEIGHT

The aircraft is to be loaded with full fuel and ballast as required to ensure the CG is at all times within the forward limit and not aft of 28% SMC.

Where the aircraft weight is required to be known for particular tests, add the “fuel remaining” indication, or the sum of the fuel contents gauges to the zero fuel weight. If the contents gauges are used, the aircraft must be in a level attitude and at a steady speed.

Zero Fuel Weight	lb/kg	
Fuel Contents	Fwd lb/kg	Aft lb/kg
Ramp Weight	lb/kg	
Ramp cg	% SMC	

CHECK FLIGHT SCHEDULE

1. PRE TAKE-OFF

1.1 Check the following systems as detailed in Section 4 of the Flight Manual :

1.1.1 Autofeather SAT/UNSAT

1.1.2 Low blade angle secondary stop and reverse pitch indication SAT/UNSAT

1.1.3 Reserve power SAT/UNSAT

1.1.4 Propeller overspeed governor SAT/UNSAT

1.1.5 AC auto-transfer.
Switch each inverter OFF in turn and checking that the load is transferred to the standby inverter. SAT/UNSAT

Re-select to main

1.1.6 Fuel crossfeed check

Crossfeed valve lever:	OPEN	
Booster pumps	OFF in turn Check Left/Right FUEL PRESS warning lights do not illuminate	SAT/UNSAT
Crossfeed valve lever	SHUT	

1.2 Engine Data

1.2.1 With power levers at FLIGHT IDLE, fuel levers at GROUND, air conditioning OFF, record:

Ng (70-72%)	Left %	Right %	
Np (930-970 rpm)	Left rpm	Right rpm	

1.2.2 With power levers at FLIGHT IDLE, fuel levers at FLIGHT, Taxy RPM selected and all bleeds OFF, record;

Ng (79-80%)	Left %	Right %	
Np (1250 max.)	Left rpm	Right rpm	

1.2.3 With power levers at GROUND IDLE, fuel levers at FLIGHT, with the aircraft on level ground and crosswind., check that the aircraft does not roll forward when the brakes are released

SAT/UNSAT

1.2.3 Gust Lock.

With the gust lock engaged, check that it is not possible to move the power lever beyond the max. taxi position (approximately 50% power). SAT/UNSAT

2. TAKE-OFF

Make a normal max. power take-off with 15 flap and Reserve Power System Armed.

Record any unusual characteristics

SAT/UNSAT

3. PERFORMANCE AND FUNCTIONING

Recommended FL50
Limits 3000 agl to FL90

3.1 LEFT Engine shut-down (autofeather) and Reserve Power check.

At the chosen test altitude, clear of cloud, at 110 kt, note IOAT. Record the scheduled MTOP and RTOP torques (Figs 1 and 2)

Altitude (1013mb)	ft
IOAT	ºC

Scheduled Torque MTOP	lb-ft
Scheduled Torque RTOP	lb-ft

Descend to at least 1500ft below the test altitude. Set:

Flaps	5
Gear	UP
Speed	110 kt
Air conditioning and anti-icing	OFF
LEFT shedding bus	O/RIDE
LEFT generator	COUPLE
Reserve Power System	ARMED
Propeller RPMs	MAX
Power	RIGHT engine MTOP
	LEFT engine Tq to arm A/F and RTOP

	Np	TORQUE	ITT	Ng
Right MTOP	rpm	lb-ft	ºC	%

Approaching test altitude, move fuel lever of LEFT engine to OFF
Check satisfactory operation of the autofeather and the reserve power system

	Np	TORQUE	ITT	Ng
Auto RTOP	rpm	lb-ft	ºC	%

SAT/UNSAT

If scheduled RTOP is not achieved automatically, check ability to achieve RTOP manually (or maximum achievable torque, if less) within engine limitations.

	Np	TORQUE	ITT	Ng
Manual RTOP	rpm	lb-ft	ºC	%

Complete shut-down of LEFT engine as detailed in the Flight Manual

3.2 Take-off Climb, RIGHT Engine MTOP

Recommended FL 50

Carry out a max. power climb on a constant heading for 5 minutes, clear of cloud or turbulent air and away from areas likely to be affected by standing waves. Trim the aircraft on a steady heading with wings level and rudder force trimmed out.

Configuration :	Flaps	15
	Gear	UP
	Propeller Synchroniser	OFF
	LEFT engine fuel lever	OFF
	LEFT propeller lever	FEATHER
	Engine intake de-icing	OFF
	Engine anti-ice vane switches	LEFT ON
		RIGHT OFF
	Wing and tail bleed air switches	NORMAL
	De-ice boots (visual check)	DEFLATED
	Air conditioning switches	OFF
	Reserve power system	OFF
	RIGHT engine (Max Np)	MTOP (Fig 1)
	V_2 for the weight (Fig 4)	kt.
	Altimeter set to 1013mb	

TAKE-OFF CLIMB RIGHT ENGINE MTOP

START WEIGHT

Zero Fuel Weight	lb/kg	Fuel Remaining	lb
Aircraft Weight	lb/kg		

TIME Min	ALTITUDE ft	IAS P1 kt	IOAT ºC	TORQUE lb-ft
0				
½				
1				
1½				
2				
2½				
3				
3½				
4				
4½				
5				

TRIM POSITIONS

AILERON	
RUDDER	
ELEVATOR	

ASI CROSS-CHECK

Capt	F/O
kt	kt

RIGHT ENGINE DATA AT 3 MIN

ITT	ºC	FUEL FLOW	lb/hr
Np	rpm	OIL PRESSURE	psi
Ng	%	OIL TEMPERATURE	ºC

FINISH WEIGHT

Zero Fuel Weight	lb/kg	Fuel Remaining	lb
Aircraft Weight	lb/kg		

MEAN WEIGHT lb/kg

3.3 LEFT Engine Relight (Starter Assist)

With flaps 15, at 100 kt, relight LEFT engine using the normal (starter assist) procedure as detailed in the Flight Manual.

Time from fuel lever selected to Ground to ITT rise	sec
Max ITT	^{o}C
Any abnormality during relight, spool up and un-feathering	
	SAT/UNSAT

3.4 RIGHT Engine shut-down (autofeather) and Reserve Power check.

At the chosen test altitude, clear of cloud, at 110 kt, note IOAT. Record the scheduled MTOP and RTOP torques (Figs 1 and 2)

Altitude (1013mb)	ft
IOAT	ºC

Scheduled Torque MTOP	lb-ft
Scheduled Torque RTOP	lb-ft

Descend to at least 1500ft below the test altitude. Set:

Flaps	5
Gear	UP
Speed	110 kt
Air conditioning and anti-icing	OFF
RIGHT shedding bus	O/RIDE
RIGHT generator	COUPLE
Reserve Power System	ARMED
Propeller RPMs	MAX
Power	LEFT engine MTOP
	RIGHT engine Tq to arm A/F and RTOP

	Np	TORQUE	ITT	Ng
Left MTOP	rpm	lb-ft	ºC	%

Approaching test altitude, move fuel lever of RIGHT engine to OFF
Check satisfactory operation of the autofeather and the reserve power system

SAT/UNSAT

	Np	TORQUE	ITT	Ng
Auto RTOP	rpm	lb-ft	ºC	%

SAT/UNSAT

If scheduled RTOP is not achieved automatically, check ability to achieve RTOP manually (or maximum achievable torque, if less) within engine limitations.

	Np	TORQUE	ITT	Ng
Manual RTOP	rpm	lb-ft	ºC	%

Complete shut-down of RIGHT engine as detailed in the Flight Manual

3.5 En-Route Climb, LEFT Engine MCP

Recommended FL 50

Carry out a max. power climb on a constant heading for 5 minutes, clear of cloud or turbulent air and away from areas likely to be affected by standing waves. Trim the aircraft on a steady heading with wings level and rudder force trimmed out.

Configuration :	Flaps	5
	Gear	UP
	Propeller Synchroniser	OFF
	RIGHT engine fuel lever	OFF
	RIGHT propeller lever	FEATHER
	Engine intake de-icing	OFF
	Engine anti-ice vane switches	RIGHT ON
		LEFT OFF
	Wing and tail bleed air switches	NORMAL
	De-ice boots (visual check)	DEFLATED
	Air conditioning switches	OFF
	Reserve power system	OFF
	LEFT engine (Max Np)	MCP (Fig 3)
	En –route climb speed for the weight (Fig 5)	kt.

Altimeter set to 1013mb

EN-ROUTE CLIMB LEFT ENGINE MCP
START WEIGHT

Zero Fuel Weight	lb/kg	Fuel Remaining	lb
Aircraft Weight	lb/kg		

TIME Min	ALTITUDE ft	IAS P1 kt	IOAT ºC	TORQUE lb-ft
0				
½				
1				
1½				
2				
2½				
3				
3½				
4				
4½				
5				

TRIM POSITIONS

AILERON	
RUDDER	
ELEVATOR	

ASI CROSS-CHECK

Capt	F/O
kt	kt

LEFT ENGINE DATA AT 3 MIN

ITT	ºC	FUEL FLOW	lb/hr
Np	rpm	OIL PRESSURE	psi
Ng	%	OIL TEMPERATURE	ºC

FINISH WEIGHT

Zero Fuel Weight	lb/kg	Fuel Remaining	lb
Aircraft Weight	lb/kg		

MEAN WEIGHT lb/kg

3.6 RIGHT Engine Relight (Starter Assist)

With flaps 15, at 100 kt, relight RIGHT engine using the normal (starter assist) procedure as detailed in the Flight Manual.

Time from fuel lever selected to Ground to ITT rise	sec
Max ITT	ºC
Any abnormality during relight, spool up and un-feathering	SAT/UNSAT

3.7 Engine Bleeds

Recommended FL100

160 kt
Power for level flight at 1300 Np
All de-icing OFF.
Record:

Altitude (1013mb) ft IAS kt IOAT ˚C

Air conditioning bleeds OFF, Record

Torque lb-ft	
Left	Right

ITT ºC	
Left	Right

Air conditioning bleeds ON, Record

Torque lb-ft	
Left	Right

ITT ºC	
Left	Right

Torque fall (approx. 150 ft/lb per engine) SAT/UNSAT

Switch bleeds OFF and check torques return to previous values SAT/UNSAT

4. FLYING CONTROLS

Recommended FL100
Limits FL80 to FL100

Set up a normal cruise with landing gear and flaps retracted. 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

5. HIGH IAS

Between FL100 and FL80

At a high power setting with Np below 1450 rpm, accelerate until the high speed warning sounds (199-205 kt). Do not exceed 210 kt.

Record speed at which warning sounds. kt

SAT/UNSAT

At V_{MO} check and record :

Elevator, aileron and rudder forces over small angles and aircraft response. SAT/UNSAT

Any buffet or unusual vibrations. SAT/UNSAT

Engine behaviour and propeller governing. SAT/UNSAT

During deceleration slowly move the power levers to FLIGHT IDLE. Check and record engine and propeller governor behaviour

SAT/UNSAT

6. STALLS, LANDING GEAR AND FLAP OPERATING TIMES

Recommended FL80
Limits FL100 to 5000ft AGL

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

Propeller synchronisation OFF

Prior to each stall, with power levers at FLIGHT IDLE and Propeller RPM to MAX, trim the aircraft for the appropriate weight and configuration (see Fig. 6). Then reduce speed at approximately 1 kt/sec until the aircraft stalls or the elevator reaches full travel. Using rudder to prevent sideslip and rapid aileron inputs to contain rolling tendencies, it should be possible to stall and recover without bank angle exceeding 30 degrees.

Note that for each stall, the minimum margin between stall warning and stall is 5 kt and the stall should be within 4 kt of the scheduled speed.

Pull stall warning horn and stick shaker circuit breakers on co-pilots sidewall panel

6.1 Stall with Flap up and Gear up

Zero Fuel Weight	lb/kg	Fuel Remaining	lb/kg
Aircraft Weight	lb/kg		
Trim Speed	kt	Elevator Trim	
Schedule Stall Warning	kt	Actual Stall Warning	kt
Schedule Stall Speed	kt	Stall Speed	kt
		Stall Warning Margin	kt
Stall Behaviour			

SAT/UNSAT

At 145 kt, time flap extension from UP to 5 (2-4 sec)	sec.
At 140 kt, time flap extension from 5 to 15 (2-4 sec)	sec.

Remake stall warning and stick shaker circuit breakers on co-pilot's sidewall panel and pull corresponding circuit breakers on captain's sidewall panel.

6.2 Stall with Flap 15 and Gear up

Zero Fuel Weight	lb/kg	Fuel Remaining	lb/kg
Aircraft Weight	lb/kg		
Trim Speed	kt	Elevator Trim	
Schedule Stall Warning	kt	Actual Stall Warning	kt
Schedule Stall Speed	kt	Stall Speed	kt
		Stall Warning Margin	kt
Stall Behaviour			

SAT/UNSAT

Remake Stall Warning horn and Stick Shaker circuit breakers on Captain's sidewall panel.

At 140 kt, time gear extension (6 sec max.)		sec
At 130 kt, time flap extension from 15 to 30 (7-10 sec)		sec

6.3 Stall with Flap 30, Gear down.

Zero Fuel Weight	lb/kg	Fuel Remaining	lb/kg
Aircraft Weight	lb/kg		
Trim Speed	kt	Elevator Trim	
Schedule Stall Warning	kt	Actual Stall Warning	kt
Schedule Stall Speed	kt	Stall Speed	kt
		Stall Warning Margin	kt
Stall Behaviour			

SAT/UNSAT

At 100 kt

Time Flap retraction from 30 to 15 (7-10 sec)		sec
Time Gear retraction (3-4 sec)		sec
Time Flap retraction from 15 to 5 (3-5 sec)		sec

At 105 kt, time Flap retraction from 5 to UP (2-4 sec)	sec

7. FUNCTIONING

Engine intake inertial separators
At 160 kt select separator switches ON
Check EIs OPEN SAT/UNSAT

Record Torque decreases and ITT increases with Separators ON

	Torque lb-ft		ITT ºC	
	Left	Right	Left	Right
Separator OFF				
Separator ON				
Differences				

Select separator switches OFF, and check torques revert to previous values SAT/UNSAT

8. APPROACH AND LANDING

Make a normal landing
Note any unusual characteristics SAT/UNSAT

9. POST-FLIGHT FUNCTIONING

9.1 Emergency Brakes

When taxying in and well clear of any obstacles, select the emergency brake lever to EMERGENCY.

Check satisfactory operation of the brakes SAT/UNSAT

Restore the normal system

9.2 Emergency Lighting

Check that by leaving switch in the ARMED position that the following lights illuminate automatically when the engines are shut down and batteries are OFF.

Flight deck emergency lights SAT/UNSAT

10. POST-FLIGHT ACTIONS

10.1 Placards

Check all cockpit placards and warning notices for presence, accuracy and legibility. SAT/UNSAT

10.2 Performance Climb Analysis

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

10.3 Flight Test Certificate

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

10.4 Pass the completed Flight Test report to the Regional Manager of the CAA Regional Office.

Fig 1

MTOP Torque

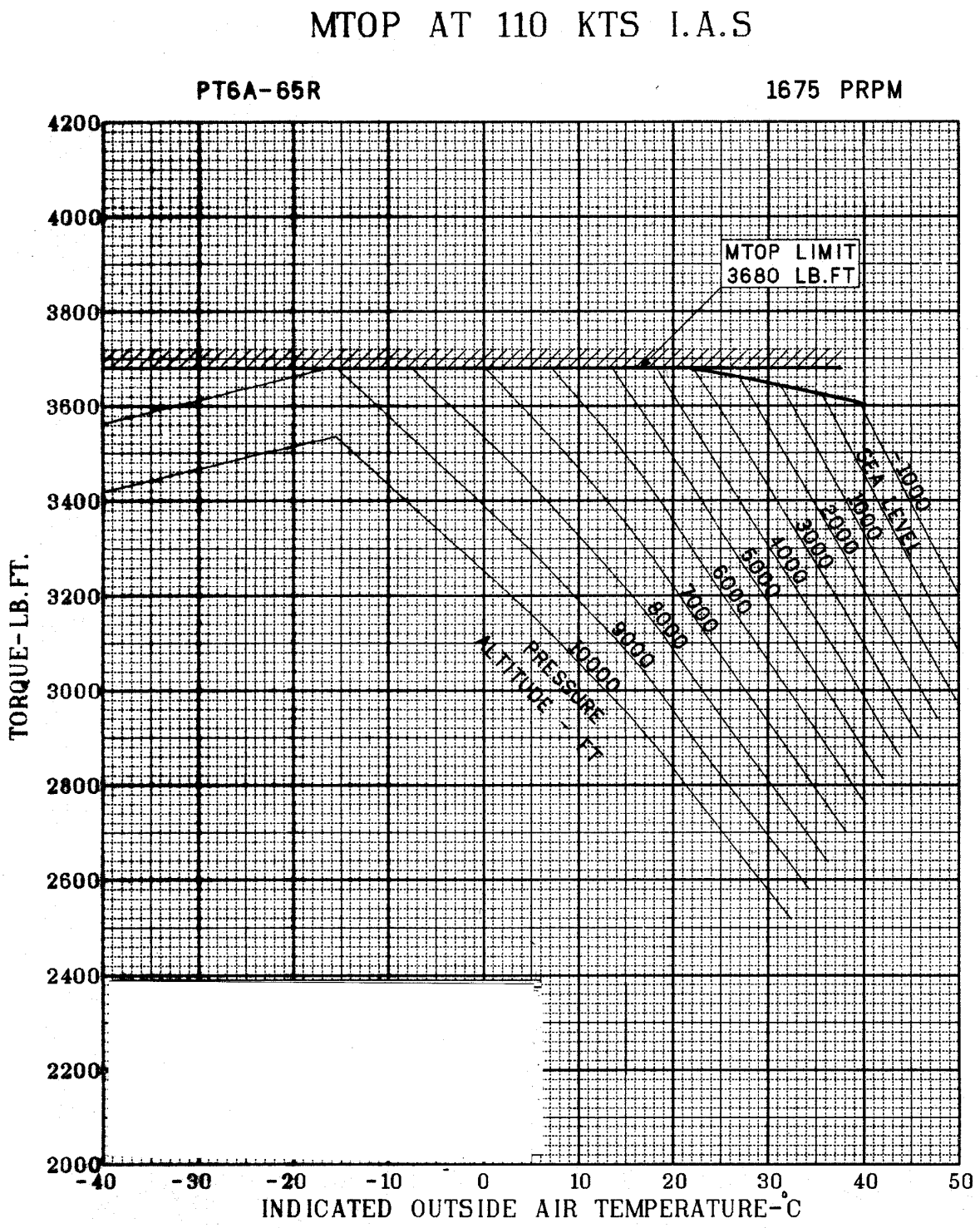

Fig 2

RTOP Torque

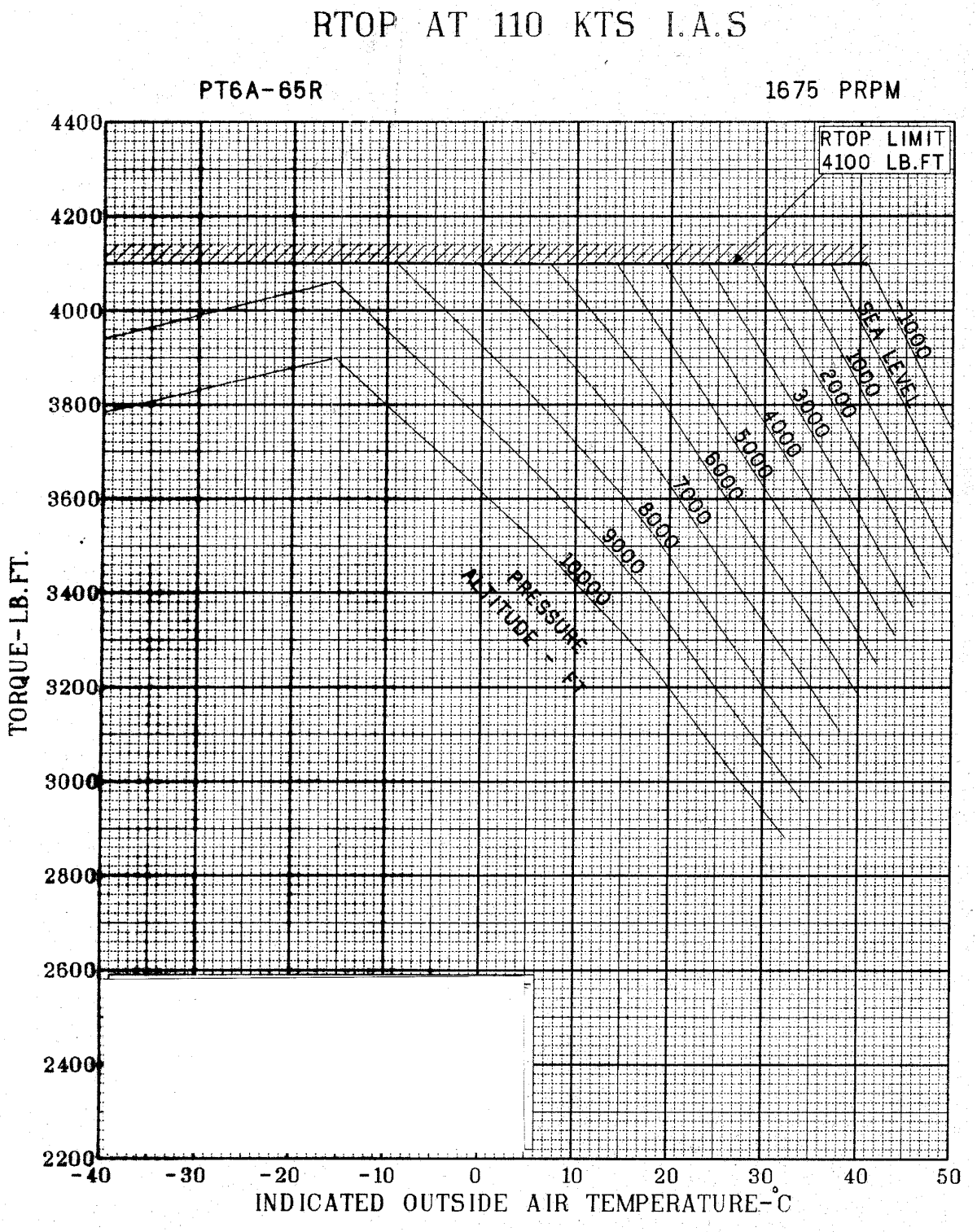

Fig 3

MCP Torque

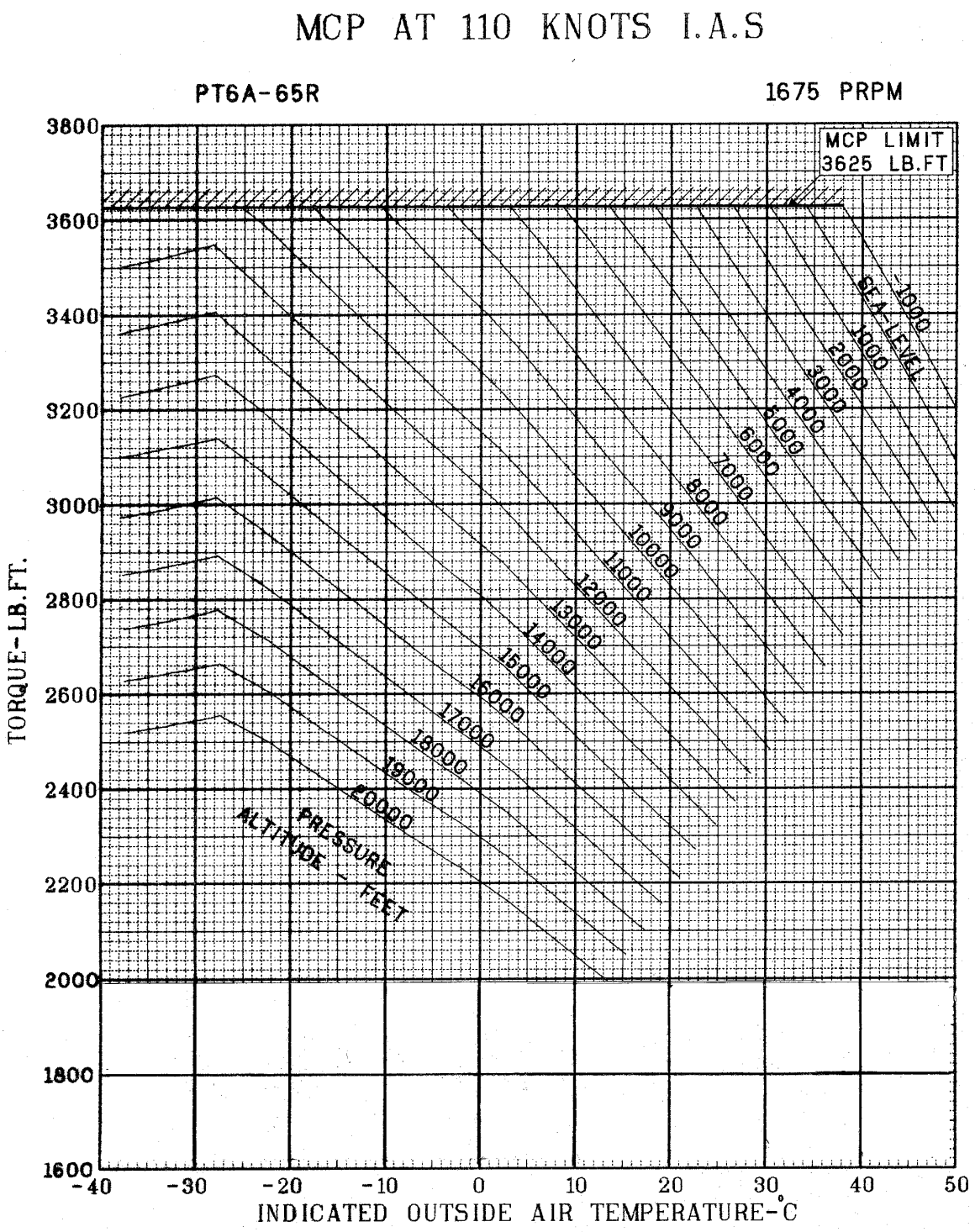

Fig 4

Take-off Climb Speed 15º Flap V2

Kg	V2 kt
10500	97
10000	95
9500	93
9350 and below	92

Fig 5

En –Route Climb Speed 5º Flap

Kg	V e/r kt
10500	105
10000	102
9500	100
9000	98
8400 and below	95

Fig 6

Trim, Stall Warning and Stall Speeds - Kt

	0º				15º				30º		
Kg	Trim	Shaker	Stall		Trim	Shaker	Stall		Trim	Shaker	Stall
10500	126	97	90		114	87	81		107	83	76
10000	124	95	88		112	85	79		106	81	75
9500	122	93	86		109	83	77		104	79	73
9000	119	91	84		107	81	75		102	77	71
8500	117	88	82		105	79	73		100	76	69
8000	115	86	80		103	77	72		99	74	68
7500	114	84	78		101	75	70		97	72	66