CHECK FLIGHT CERTIFICATE

Bell Long Ranger Model 206L, 206L-1, 206L-3, 206L-4 **CFS 250 Issue 1**
Allison Turbine Model 250-C20B/J, C28B, C30P

Date:	Crew:	Observer:	Registration:

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

Bell Long Ranger Model 206L, 206L-1, 206L-3, 206L-4 **CFS 250 Issue 1**
Allison Turbine Model 250-C20B/J, C28B, C30P

Registration	
Flight Date	

1. INTRODUCTION

This schedule is applicable only to Bell 206L, 206L-1, 206L-3 and 206L-4 Helicopters. It is based on the assumption that the every day operation of the helicopter services as a continuous check on the functioning of all normal services.

The Flight Test must be carried out by an experienced pilot acceptable to the CAA in accordance with this schedule and the general guidance given in the CAA Check Flight Handbook. 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 this schedule any characteristics which are considered to be unsafe or undesirable must be recorded.

The minimum crew for this flight is to be increased by a flight observer.

WARNING

1. It is illegal to carry passengers on a check flight made under "A" or "B" conditions except passengers performing duties in the aircraft in connection with the flight. Although it may be legal to carry passengers on a test flight with a Certification of Airworthiness in force it is strongly recommended, for Check Flights and other tests entailing greater risk than normal flight, that:

1) It is preferable to use ballast, and

2) Before accepting any passengers on a check 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.

3. If a clipboard or kneeboard is used to record the results there is a possibility of fouling the controls especially the duals, if fitted. To reduce this possibility, the pilot must have briefed the observer on the need to ensure that the clipboard is well clear of the controls especially during manoeuvres requiring large control deflections such as low speed envelope and autorotation. The pilot should monitor the position of the clipboard during the flight to ensure that it is not in a potentially hazardous position. Whenever possible, flexible, rather than rigid, clipboards should be used. Consideration should be given to removing the dual controls if flying with an inexperienced observer.

Should there be any query about the Check Flight or its results, the local CAA Surveyor or the Helicopter Flight Test Section, Flight Department, Aviation House, Gatwick must be consulted.

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

Operator/Maintenance Organisation		Registration	
		Flight Date	
Aerodrome		Pilot	
		Observer	

Aerodrome pressure altitude		QFE/QNH	
Wind velocity/direction		Ground Temp	
Weather			

Take-off time		Landing Time	

2. LOADING

The aircraft is to be loaded with full fuel and any necessary ballast to achieve a take-off weight of 4000 lb (206L), 4050 lb (206L-1), 4150 lb (206L-3), 4450 lb (206L-4). The C.G. should be approximately in the neutral position.

Take-off weight (actual)		lb
Fuel contents		
C.G. position		inches aft of datum

3. PRE-FLIGHT INFORMATION

Aircraft model (delete as appropriate)	
Constructors No.	
Total airframe hours	

Landing gear type/floats	

Particle separator fitted?	

Engine model	
Serial number	
Hours run since new	
Hours run since overhaul	

4. PRE-FLIGHT CHECKS

Carry out the normal external inspection, but in addition check the freedom of the main rotor by turning it opposite to its normal rotation.

Carry out the normal pre-flight inspection.

Doors and transparencies: Conditions and operation	
Seats and harnesses	
Placarding: Legibility and accuracy	

Instruments: Legibility and accuracy of colour bands and markings. General condition.

ASI	
Dual Tachometer	
TOT	
Gas Producer	
All other instruments	

Freedom, range of travel, friction of:

- Cyclic control :	
- Collective control:	
The correct functioning of the (Flight) Idle Stop (twist grip detent). Check that the detent spring is adequate to resist any closing forces.	

Throttle movement over full range.	

Freedom, range of travel, adjustment of yaw control	

With battery switch on, check:

The engine failure AUDIO/VISUAL warning systems	
All cockpit instruments and warning lights	

Engine Start:

During engine start up, check and record:

Residual TOT	
Maximum TOT	

Gas Producer speed at commencement of Main Rotor rotation (25% maximum)	

ENG OUT light extinguishes at 55 ± 3% N_1.	

Adequate acceleration of N_1 between 50% and 60% (206L)	

Flight Idle N_1 (62-64% 206L, 206L-1) (63-65% 206L-3/4)	

With collective pitch fully down and throttle fully OPEN, check and record:

Power Turbine (N_2) governing range between:

97% - 100% 206L, L-1, L-3	- %
99% - 101% 206L-4	- %

Set 100%

Anti-Ice Check:

206L, L-3, L-4. Check TOT rise when selecting anti-ice switch ON.	

206L-1 Check TOT rise at OAT above 20°C and TOT decrease below +20°C when ENGINE DEICING switched ON.	

Freedom of flight controls with Hydraulic Boost ON and OFF (small movements only)..	

With Hydraulic Boost selected OFF, trip circuit breaker and check for satisfactory reversion to servo power, then reinstate for normal operation.	

- fuel pressure with both pumps operative and with each pump selected off in turn.

Both	LEFT ON	RIGHT ON

- With both pumps selected off check for nil fuel pressure and no change in N_1, then reinstate system for normal operation.

Snap the throttle closed to Flight Idle, note stabilised N_1 before N_R and N_2 are synchronised if possible. Advance throttle to full open.

Before Take-off Checks:

Engine and transmission oil temperatures		
Engine and transmission oil pressures		
N_2 and Rotor RPM		
N_1 RPM and TOT		

5. HOVER CHECKS

Take-off to low hover (approximately 2.5 ft) and record the following:

Take-off time

Torque	
TOT	
N_1	
N_R	
OAT	

6. LOW SPEED ENVELOPE

See Appendix 1 for test method.

Assess the vibration level, control response and position (adequate control margin) during the following manoeuvres:-

Turns on the spot.

Sideways flight left and right up to an estimated 17 kts.

Rearward flight up to 17 kts.

7. PERFORMANCE - EN-ROUTE CLIMB

With the altimeter set to 1013 mb climb at Maximum Continuous power at the scheduled en-route climb speed (Vy) for three minutes. Anti ice OFF unless operationally required. Climbs should be carried out in stable, non-turbulent conditions away from clouds. Do not start to record until established in the climb on condition.

Associated conditions:

206L C20B/J Engine

Torque	-	88%
TOT	-	738°C
N_1	-	105%
V_Y	-	52 kts (60 mph)
N_R	-	100%

206L-1 C28B Engine

Torque	-	85%
TOT	-	741°C
N_1	-	104%
V_Y	-	57 kts (66 MPH)
N_R	-	100%

206L-3 C30P Engine

Torque	-	85%
TOT	-	716°C
N_1	-	105%
V_Y	-	57 kts (66 MPH)
N_R	-	100%

206L-4

Torque	-	75%
TOT	-	716°C
N_1	-	105%
V_Y	-	57 kts (66 MPH)
N_R	-	100%

7.1 CLIMB PERFORMANCE

Time	Alt	OAT	IAS	Torque	TOT	N_1	N_R	Engine Oil Temp	Engine Oil Press	Trans Temp	Trans Press	Fuel
0												
0.30												
1.00												
1.30												
2.00												
2.30												
3.00												

Anti-Ice	ON	OFF

After the climb, obtain an accurate OAT by flying at approximately mid-climb altitude at 57 Kts in level flight for 1 min. to allow OAT to stabilise

Alt	
OAT	

8. POWER ASSURANCE

206L

Carry out check as detailed in Section 5 of the Flight Manual. If a TOT greater than 738°C cannot be achieved in an in ground effect hover the check should be carried out in a climb at 52 KIAS (60 MPH) at the take-off power rating:

Torque	-	100%
TOT	-	810°C
N_1	-	105%
N_2	-	100%
Anti-ice	-	OFF
Heater	-	OFF

See Section 13.2 of this Schedule for analysis of results.

206L-1, 206L-3, 206L-4

Carry out check as detailed in the Flight Manual. In temperate conditions (eg. the UK) the check should be carried out in a climb at 57 KIAS (66 MPH) at the take-off power rating in order to achieve a high torque and TOT. Note the 100% torque/speed limitation in the Flight Manual.

206L-1

Torque	-	100%
TOT	-	791°C
N_1	-	104%
N_2	-	100%
Anti-ice	-	OFF
Heater	-	OFF

206L-3 206L-4

Torque	-	100%
TOT	-	768°C
N_1	-	105%
N_2	-	100%
Anti-ice	-	OFF
Heater	-	OFF

Allow conditions to stabilise then record.

PRESS ALT	OAT	TORQUE	TOT	N_1	N_2

Note: More accurate power assurance checks are achieved with a high TOT. To avoid exceeding engine torque limits this may require the test to be carried out at medium altitude.

9. HANDLING

Note:-

It is permissible to carry out 9.3 (autorotation) before 9.1 and 9.2 if the helicopter is at high altitude after performing items 7 and 8.

9.1 Cruise

9.1.1 At a normal cruising speed and power, check and record the following items:

ALT	OAT	ASI	TORQUE	TOT	N_1	N_2	FUEL

9.1.2 Gradually remove both feet from yaw pedals, check for absence of pedal creep.

9.1.3 Carry out steep turns L & R (approx 45°) at normal cruise speed and power. Do not exceed 30° of bank at speeds close to Vne.

Note: Vibration level

Control response

CAUTION

Do not confuse hydraulic boost and fuel shut off switches.

9.1.4 Reduce speed to 70 Kts, check satisfactory control response with hydraulic boost off in straight flight and gentle turns L & R (20° bank).

Increase speed to 90 Kts, gentle turns. Reduce speed to 70 Kts and reset Boost ON.

9.2 Maximum Speed Test

9.2.1 Increase speed progressively to **placarded** V_{NE} using maximum Continuous power.

9.2.2 Carry out gentle turns L & R (20° bank)

Note: Vibration level

Control response

9.3 Autorotation

NOTE 1

Several separate autorotations may be required to complete the items listed below; in particular do not attempt the rapid recovery (9.3.3) unless there is adequate height to recover from a possible engine problem such as surge.

NOTE 2

Care must be taken not to increase collective too quickly during the rapid recovery; carry out practice collective pulls at a slow rate first and progressively increase rate.

9.3.1 Carry out a steady autorotative descent at 61 kts (70 mph) with the collective lever fully down. Close the throttle to Flight Idle (206L) or idle stop (206L-1, L-3, L-4) and record the following when stabilised.

ALT	OAT	IAS	N_R	N_1 (IDLE)	FUEL STATE

NOTE:

Do not exceed power off rotor rpm limitations (90 to 107%).

9.3.2 Carry out turns L&R in autorotation (20° bank).

OPEN THROTTLE FULLY

9.3.3 Carry out rapid recovery from autorotation (needles just joined to 60% torque in not less than 3 seconds).

Note: Engine response

Transient droop N_R%

10. FUNCTIONING

Check the following items for satisfactory functioning:

Windscreen demisting system	
Heater	

11. LANDING

Landing time.	

12. SHUTDOWN

12.1 Increase collective slightly to arm rotor rpm low system (if necessary) and reduce throttle to check correct operation of ROTOR LOW RPM light and horn.

Note:	RPM for activation of system. (90% ± 3%)	

12.2 Shutdown the engine.

Note N_1 at which ENG OUT light and audio comes on (55 ± 3%)	
12.3 If rotor brake is fitted check for satisfactory operation.	
Cockpit lighting.	
Navigation lights	
Anti-collision light(s)	

13. POST FLIGHT ACTION

13.1 Performance Climb

Plot out the data on the analysis sheet provided and determine the achieved rate of climb (RoC). The scheduled performance must be obtained from the flight manual and compared with the achieved performance.

NOTE (206L-4 Only)

If the mid-climb weight was between 4151 and 4450 Lb the rate of climb determined from the flight manual must be adjusted to allow for the lack of precise scheduling against varying weight. The rate of climb is determined as follows:

Scheduled RoC = RoC from Fig 4-7 (Sheet 5 or 6) + [4450 - Actual Weight] x 0.93

Example:

Weight = 4350 Lb, Altitude 3000 ft, OAT +0°C, Anti-Ice off,
Achieved RoC = 785 fpm

RoC from Fig 4-7 sheet 5 = 634 fpm

Scheduled RoC = 634 + [4450 - 4350] x 0.93

= 727 fpm

Achieved - Scheduled = + 58 fpm

Achieved rate of climb - Scheduled RoC = [ ]

Tolerance = - 20 fpm, no action required, up to – 70 fpm investigation required but may be acceptable. Greater than – 70 fpm not acceptable.

13.2 Power Assurance

Use the Power Check Chart in the Flight Manual to determine the scheduled torque.

Achieved torque - Scheduled torque = [ ]

NOTE

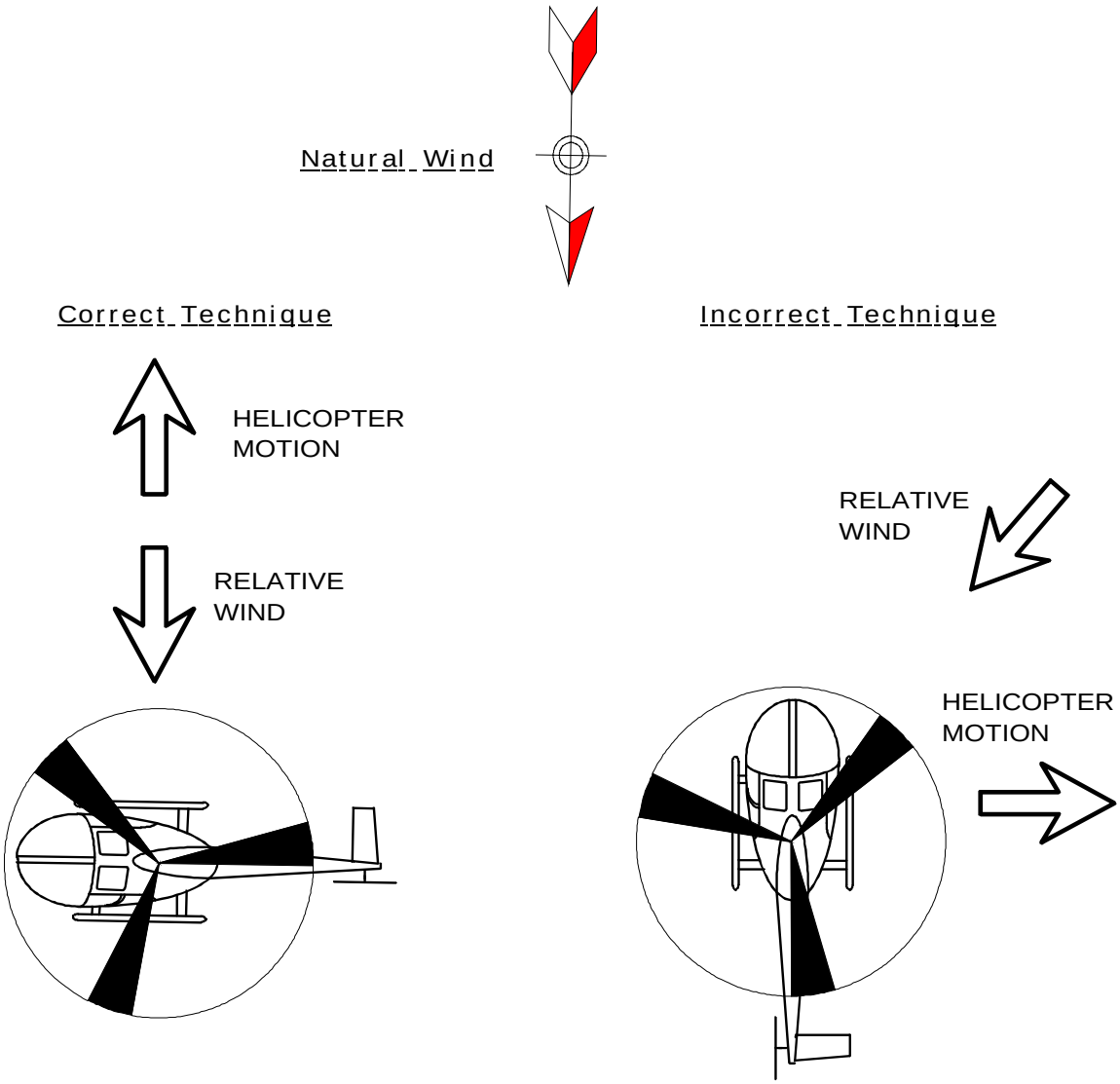
For the 206L power assurance analysis 1.5% torque should be added to the chart percent torque reading to allow for ram air effect if the check was carried out in a climb at 52 kts.

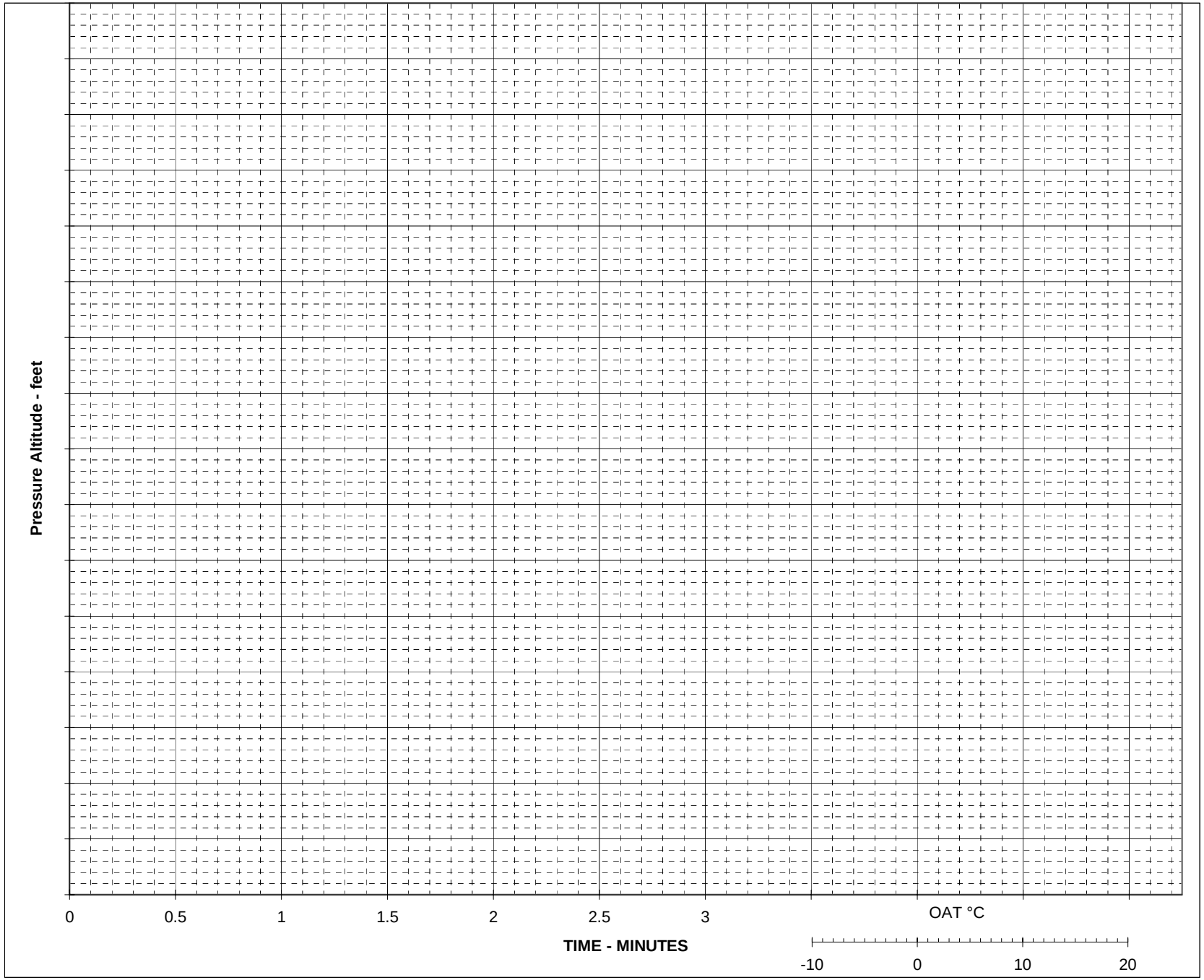
For the 206L-1, L-3 and L-4 subtract 1% from the chart percent torque reading if the check was carried out in a 57 KIAS climb.

SIDEWAYS AND REARWARDS FLIGHT

For the sideways flight tests the helicopter should be rotated so that the natural wind is on the side of the aircraft and then gently accelerated into the wind and stabilised. The mean natural wind speed should be added to the estimated ground speed to give the required relative air speed.

For rearwards flight the helicopter should be lined up tail into wind and gently accelerated rearwards to achieve the required relative air speed.





AIRCRAFT TYPE
REGISTRATION
DATE OF TEST

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