

# CABRI® G2

## Flight Manual

**Helicopter serial N° :** .....

**Helicopter registration :** .....



**EASA Type certificate N°R.145**

Section 2, 3, 4, 5 and 9 are approved by EASA  
Other sections are approved under Hélicoptères Guimbal DOA EASA.21J.211

This flight manual includes the material required to be furnished to the pilot  
by EASA CS 27 and Part 21

This manual should not be used for any operation or instruction,  
unless it is in current status.

The helicopter's operator is responsible for maintaining this manual in a current  
status in accordance with the list of current pages.



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## Section 0 Introduction

This document is the Pilot Operating Handbook and EASA approved rotorcraft Flight Manual of the CABRI G2 Rotorcraft.

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For flight manual supplements tables (approved pages and revisions log), refer to Section 9.

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The reference of this flight manual is J40-001. The revisions are given in the following table :

| Revision number | Page                               | Revision object                                | Approval date | Approval reference (*)                                       |
|-----------------|------------------------------------|------------------------------------------------|---------------|--------------------------------------------------------------|
| -               | -                                  | Original issue                                 | 14/12/2007    | TC EASA.R.145 approved by EASA letter D(2007) CPRO/ALE/55199 |
| 01              | 3-10<br>4-12                       | Carb heat manual test transferred to section 4 | 17/09/2008    | EASA.R.A.01530                                               |
|                 | 4-9<br>4-11                        | Normal procedure correction                    |               |                                                              |
|                 | 4-15                               | Steep descent procedure suppressed             |               |                                                              |
|                 | 3-5<br>3-15<br>4-9<br>4-11         | Addition of a STARTER caution light            |               |                                                              |
|                 | 7-8                                |                                                | 16/09/2008    | Approved under the authority of DOA EASA.21J.211             |
|                 | 7-9                                | Breaker panel update                           |               |                                                              |
|                 | 7-15                               | Low fuel indication                            | 17/09/2008    | EASA.R.A.01530                                               |
|                 | 2-5                                | warning                                        |               |                                                              |
| 02              | 9-1                                | GPS                                            | 19/05/2009    | Approved under DOA EASA.21J.211 according to FSA-09-003      |
|                 | 9-2 to 9-4                         | Night VFR                                      | 19/05/2009    | EASA.R.C.03230                                               |
|                 | 9-5 to 9-10                        | Night VFR                                      | 19/05/2009    | Approved under DOA EASA.21J.211 according to FSA-09-003      |
|                 | 2-10                               | Gage → charge                                  | 19/05/2009    | EASA.R.C.03230                                               |
|                 | 3-15                               | Clutch light                                   |               |                                                              |
|                 | 4-2<br>4-9<br>4-11<br>4-12<br>4-16 | Procedure update                               |               |                                                              |
|                 | 1-3                                | Drive line → gearbox                           | 19/05/2009    | DOA EASA.21J.211                                             |

(\*) EASA reference number or “approved under the authority of DOA EASA.21J.211”

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| 02              | 4-3                     | Tight                                                         | 19/05/2009    | EASA.R.C.03230                                                           |
|                 | 4-7                     | → Lockwiring                                                  |               |                                                                          |
|                 | 4-5                     | Manifold<br>→ distributor                                     |               |                                                                          |
|                 | 4-9                     | Note suppression                                              | 19/05/2009    | Approved under the authority of DOA EASA.21J.211 according to FSA-09-003 |
|                 | 7-5                     | Modified clutching system description                         |               |                                                                          |
|                 | 7-8<br>7-10             | Typos : - battery breaker order<br>- Auxiliaries is push-pull |               |                                                                          |
|                 | 7-7 to<br>7-9 &<br>2-12 | Note for optionals                                            |               |                                                                          |
|                 | 7-10                    | Battery breaker drawing correction.<br>Add on ELT use.        |               |                                                                          |
|                 | 7-12                    | Explanation of EPM restart in welcome page                    |               |                                                                          |
|                 | 7-13                    | Note for brightness equalization                              |               |                                                                          |
|                 | 7-16                    | Explanation of re-initiation of testing sequence              |               |                                                                          |
|                 | 7-18                    | Code procedure update<br>Note update                          |               |                                                                          |

(\*) EASA reference number or "approved under the authority of DOA EASA.21J.211"

| Revision number | Page                                            | Revision object                       | Approval date | Approval reference (*)                                     |
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| 03              | This issue is associated with MOD EPM 10-009.   |                                       |               |                                                            |
|                 | 2.4                                             | Oil P. indicator                      | 21/07/2010    | EASA.R.C.03496<br><br>Major modification approval 10031011 |
|                 | 2-7                                             | MLI supplements                       |               |                                                            |
|                 | 2-10                                            | Carb. Heat proc                       |               |                                                            |
|                 | 2-13                                            | Addition of socket                    |               |                                                            |
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|                 | 3-13                                            | Oil P yellow zone<br>Carb heat suppr. |               |                                                            |
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|                 | 4-12                                            | Carb. Heat proc.                      |               |                                                            |
|                 | 4-15                                            |                                       |               |                                                            |
|                 | 4-19                                            | Proc. correction.                     |               |                                                            |
|                 | 9-1                                             | Limitation update.                    |               |                                                            |
|                 | 6-1, 1-3, 1-i, 7-i, 7-3, C, D                   | Wording                               | 07/06/2010    | Approved under DOA EASA.21J.211 according to FSA 10-003.   |
|                 | 7-11 7-13                                       | Screenshot update                     |               |                                                            |
|                 | 7-16 >7-20                                      | Carb heat, pages shift                |               |                                                            |
|                 | 7-18                                            | Ref to night lights                   |               |                                                            |
| 04              | D, 0-1 to 0-4, Section 9                        | Supplements are managed independently | 05/11/2010    | Approved under DOA EASA.21J.211 according to FSA 10-011.   |
| 05              | 2-2, 4-9/11, 5-4 to -6, 5-8                     | -20°C extension                       | 13/12/2010    | Major modification approval 10032992                       |
|                 | 3-4/5/8/9<br>3-14 - 16<br>4-5/8/16<br>4-20, 2-4 | Procedure update                      |               |                                                            |

| Revision number | Page                                          | Revision object                   | Approval date | Approval reference (*)                                  |
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| 05              | 2-8/9                                         | CG Update                         | 13/12/2010    | Major modification approval 10032992                    |
|                 | 2-13                                          | Correction                        |               |                                                         |
|                 | D, 2-1,<br>0-1/2/3/5<br>0-7, 7-8,<br>7-9, 8-1 | Update                            | 13/12/2010    | Approved under DOA EASA.21J.211 according to FSA 10-018 |
|                 | 6-4/5                                         | Level measurement                 |               |                                                         |
|                 | 6-7/8                                         | Fuel CG Correction                |               |                                                         |
|                 | 7-10                                          | Direct battery breaker correction |               |                                                         |
|                 | 8-i,<br>8-1 à 4                               | Doors removal                     |               |                                                         |

(\*) EASA reference number or "approved under the authority of DOA EASA.21J.211"

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## **Section 1    General**

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## **Introduction**

This Flight Manual is designed as an operating guide for the pilot. It includes material required to be furnished to the pilot by EASA CS 27 and Part 21. It also contains supplementary data supplied by the helicopter manufacturer.

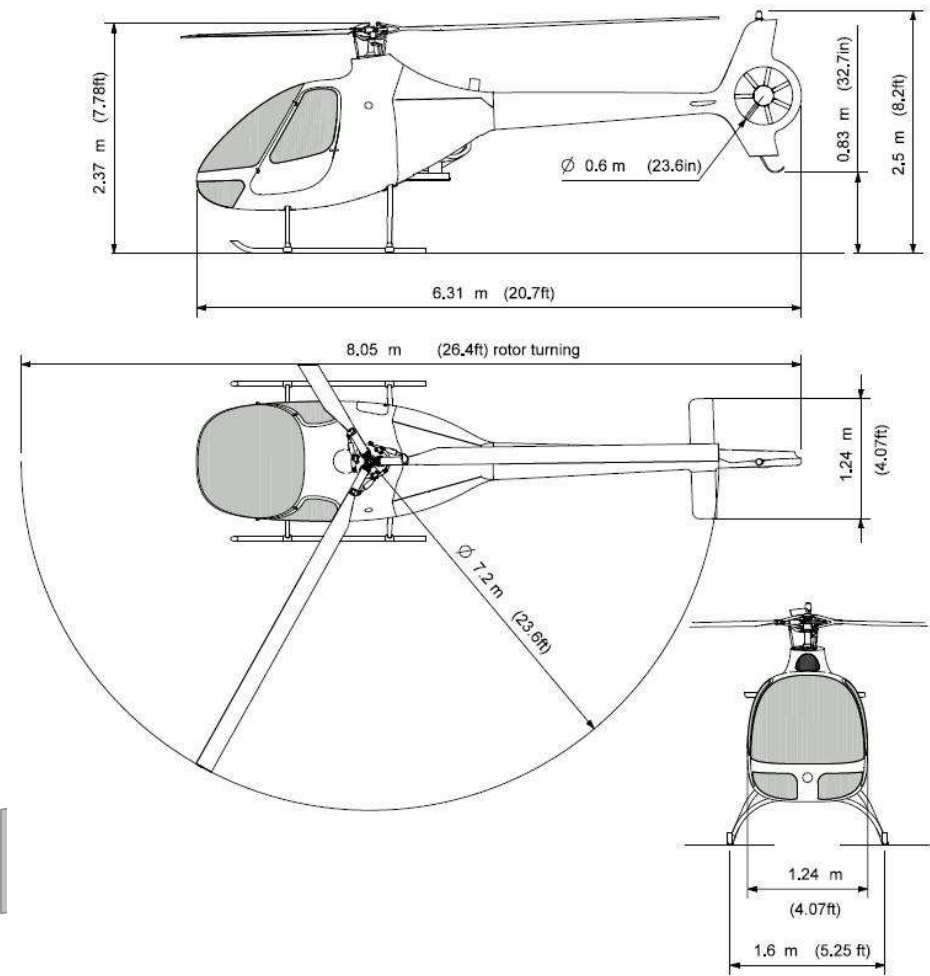
This manual is intended to give the pilot the best possible information and to help him find the best answer to most operational situation. However, it cannot replace pilot's appreciation of each particular situation. Pilot must maintain adequate ground and flight instruction, and good proficiency in the type of helicopter.

To achieve the required level of safety, the helicopter pilot-in-command must be familiar with this manual's content, with other safety-related available information, and with all the regulation covering aircraft operation that are relevant in the country of operation. He is responsible for determining that the helicopter is safe for flight, and for operating it in respect to this manual and above information.

The helicopter's owner is responsible for maintaining the aircraft in approved airworthy condition and for maintaining this manual in a current status in accordance with the list of current pages.

**For information only**

Three-view of the CABRI G2



**Descriptive data**

**Main rotor**

Type ..... **Articulated, soft-in-plane**  
Number of blades ..... **3**  
Diameter ..... **7,20 m**  
(23.6 feet)  
Nominal rotor speed ..... **530 RPM**  
Blade chord ..... **180 mm**  
(7.1 in)

**Tail rotor**

Type ..... **Shrouded**  
Number of blades ..... **7**  
Diameter ..... **600 mm**  
(23.6 in)  
Nominal rotor speed ..... **5148 RPM**  
Blade chord ..... **42 mm**  
(1.6 in)

**Transmission**

Primary transmission ..... **Belt**  
**0.855/1 reducing ratio**  
Main rotor gearbox ..... **Spiral bevel gear**  
**11/47 reducing ratio**  
Tail rotor gearbox ..... **Spiral bevel gear**  
**25/11 increasing ratio**

**Powerplant**

Model ..... **Textron Lycoming O360-J2A**  
**with STC EASA.E.S.01001**

Type ..... Four cylinders, horizontally opposed, direct drive,  
air cooled, normally-aspirated, carburetor-equipped,  
one magneto and one electronic ignition system

Displacement ..... **5,9 L**  
(361 cu.in)

Power rating (continuous) ..... **108 kW @ 2585 through 2700 RPM**  
(145 shp)

Nominal speed ..... **2650 RPM**

Cooling system ..... **Direct drive squirrel-cage blower**

Ignition systems

Magneto ..... **Bendix**

Electronic ignition system..... **LSE Plasma II HG**  
Solid-state capacitor discharge ignition system  
Variable timing advance

**Fuel**

Maximum fuel capacity ..... **170 L**  
(45 U.S. gal)

Unusable fuel ..... **1.5 L**  
(0.4 U.S. gal)

Approved fuel grade ..... **100 LL**

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## **Symbols and abbreviations**

| <b>Symbol or abbreviation</b> | <b>Designation</b> |
|-------------------------------|--------------------|
|-------------------------------|--------------------|

### Speeds

|                       |                          |
|-----------------------|--------------------------|
| CAS .....             | Calibrated airspeed      |
| IAS .....             | Indicated airspeed       |
| TAS .....             | True airspeed            |
| V <sub>NE</sub> ..... | Never-exceed speed       |
| V <sub>y</sub> .....  | Best rate-of-climb speed |

### Meteorology

|                |                                   |
|----------------|-----------------------------------|
| ISA .....      | International standard atmosphere |
| OAT .....      | Outside air temperature           |
| P .....        | Outside air pressure              |
| $\sigma$ ..... | Relative air density              |

### Altitude / Height

|                      |                           |
|----------------------|---------------------------|
| AGL .....            | Above ground level        |
| Z .....              | Geometric altitude        |
| Z <sub>p</sub> ..... | Pressure altitude         |
| Z $\sigma$ .....     | Relative density altitude |
| h .....              | Geometric height          |

### Power / Engine parameters

|           |                                        |
|-----------|----------------------------------------|
| FLO ..... | First MLI limit is Full throttle limit |
| MCP ..... | Maximum continuous power               |
| MLI ..... | Multiple limit indicator               |
| NR .....  | Rotor speed                            |
| NM .....  | Engine speed                           |
| PWR ..... | First MLI limit is Power limit         |

### Hover / Take-off / Landing

|            |                            |
|------------|----------------------------|
| IGE .....  | In ground effect           |
| OGE .....  | Out of ground effect       |
| HIGE ..... | Hover in ground effect     |
| HOGF ..... | Hover out of ground effect |

### Weight and balance

|            |                         |
|------------|-------------------------|
| CG .....   | Centre of gravity       |
| MTOW ..... | Maximum take-off weight |

### Equipment

|                 |                                                                    |
|-----------------|--------------------------------------------------------------------|
| EPM .....       | Electronic Pilot Monitor                                           |
| BARC .....      | Boîtier Alarme Rotor et Carburant<br>(Fuel and rotor alarm device) |
| RRM / GOV ..... | Engine governor                                                    |

Miscellaneous

|           |                        |
|-----------|------------------------|
| BB .....  | Battery breaker        |
| H/V ..... | Height-Velocity        |
| MGB ..... | Main gearbox           |
| RPM ..... | Revolutions per minute |
| TGB ..... | Tail gearbox           |
| VFR ..... | Visual flight rules    |

**Conversion factors**

**Note** : The Cabri G2 EPM display can be set to either Metric or Imperial units. Refer to page 7-13.

**Metric to Imperial units**

| <b>Multiply .....</b>  | <b>By .....</b> | <b>To obtain</b>             |
|------------------------|-----------------|------------------------------|
| millimeters (mm) ..... | 0,0394 .....    | inches (in)                  |
| meters (m) .....       | 3,2808 .....    | feet (ft)                    |
| kilometers (km) .....  | 0,5400 .....    | nautical miles (nm)          |
| kilograms (kg) .....   | 2,2046 .....    | pounds (lb)                  |
| liters (L) .....       | 0,2642 .....    | gallons, U.S. (U.S. gal)     |
| liters (L) .....       | 1,0567 .....    | quarts (qt)                  |
| millibar (mbar) .....  | 0,0295 .....    | inches of mercury (in.hg)    |
| bars (bar) .....       | 14,5038 .....   | pounds per square inch (psi) |

**Imperial to metric units**

| <b>Multiply .....</b>              | <b>By .....</b> | <b>To obtain</b> |
|------------------------------------|-----------------|------------------|
| inches (in) .....                  | 25,40 .....     | millimeters (mm) |
| feet (ft) .....                    | 0,3048 .....    | meters (m)       |
| nautical miles (nm) .....          | 1,8520 .....    | kilometers (km)  |
| pounds (lb) .....                  | 0,4536 .....    | kilograms (kg)   |
| gallons, U.S. (U.S. gal) .....     | 3,7854 .....    | liters (L)       |
| quarts (qt) .....                  | 0,9464 .....    | liters (L)       |
| inches of mercury (in.hg) .....    | 33,86 .....     | millibar (mbar)  |
| pounds per square inch (psi) ..... | 0,0689 .....    | bar (bar)        |

1013,25 mbar = 29.92 in.hg

**Temperature**

Fahrenheit degrees / Celsius degrees

$$F = \frac{9}{5} \cdot C + 32 \qquad C = \frac{5}{9} \cdot (F - 32)$$

## **Section 2    Limitations**

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The information in section 2, Limitations, is approved by EASA.

### **General limitations**

Only day VFR is approved.

Aerobatic flight is prohibited.

Voluntary in-flight engine shut down is prohibited.

Flight in known icing conditions is prohibited.

Flight under snow is prohibited.

Minimum crew is one pilot on the right seat.

Left seat harness must be buckled when seat is empty. In this case, left controls removal is recommended.

Operation is approved with the left seat removed, only if the left controls are removed.

Operation is approved with either or both doors removed, or unlocked and partially open for ventilation.

In these cases, no loose object is allowed in the cabin.

Speed limitations are the same than ones with doors installed and closed.

### **Color code for instrument markings**

|                 |                                                                                                                                                                            |                                                                                                                  |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Red             |                                                                                          | Indicates operating limits. The pointer should not enter red zones or exceed red limits during normal operation. |
| Red cross-hatch |                                                                                         | Indicates power-off $V_{NE}$                                                                                     |
| Yellow or amber | <br> | Precautionary or special operating procedure range                                                               |
| Green           |                                                                                         | Normal operating range                                                                                           |
| White or Blue   | <br> | Other indications                                                                                                |

On the EPM, related numerical values are marked with the same color code.

Flight envelope limitations

**Altitude limitation**

Maximum operating altitude (Zp) ..... **13 000 ft**

**Outside air temperature limitation**

Maximum temperature ..... **ISA + 30°C**  
**limited to + 45°C**  
Minimum operating temperature ..... **- 20°C**  
Minimum storage temperature ..... **- 30°C**

**Airspeed limits**

V<sub>NE</sub> power-on ..... **130 kt IAS**  
-2 kt IAS per 1000 feet Zp  
V<sub>NE</sub> power-off ..... **110 kt IAS**  
-2 kt IAS per 1000 feet Zp  
Caution range ..... **0 – 45 kt IAS**



## Rotor speed limits

### Power-on

|                 |                |
|-----------------|----------------|
| Maximum.....    | 540 RPM        |
| Green arc ..... | 515 to 540 RPM |
| Minimum.....    | 515 RPM        |

### Power-off

|                    |             |
|--------------------|-------------|
| Maximum.....       | 610 RPM     |
| Caution range..... | 540-610 RPM |
| Normal range.....  | 515-540 RPM |
| Caution range..... | 450-515 RPM |
| Minimum.....       | 450 RPM     |

### Rotor brake operation

|              |         |
|--------------|---------|
| Maximum..... | 150 RPM |
|--------------|---------|

High NR horn ..... > 594 RPM

Low NR horn ..... < 466 RPM



**Powerplant limitations**

**Operating limitations**

Engine speed

|                                      |               |
|--------------------------------------|---------------|
| Maximum engine speed .....           | 2700 RPM      |
| Normal range .....                   | 2585-2700 RPM |
| Minimum engine speed, power-on ..... | 2585 RPM      |

Temperature

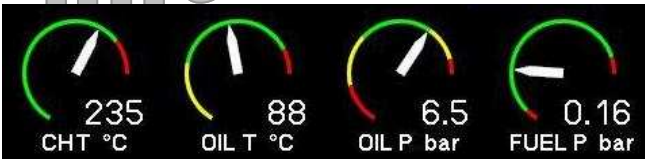
|                                                                      |                  |
|----------------------------------------------------------------------|------------------|
| Maximum cylinder head temperature (CHT) .....                        | 260°C<br>(500°F) |
| Maximum recommended CHT for shut down .....                          | 180°C<br>(356°F) |
| Maximum oil temperature .....                                        | 118°C<br>(245°F) |
| Minimum recommended oil temperature before applying full power ..... | 60°C<br>(140°F)  |

Oil pressure

|                                               |                      |
|-----------------------------------------------|----------------------|
| Maximum .....                                 | 7.9 bar<br>(115 psi) |
| Starting and warm-up range                    |                      |
| Maximum for flight .....                      | 6.6 bar<br>(95 psi)  |
| Minimum for take-off (CLUTCH light OFF) ..... | 3.6 bar<br>(52 psi)  |
| Minimum during idle .....                     | 1.6 bar<br>(25 psi)  |

Fuel pressure

|               |                       |
|---------------|-----------------------|
| Maximum ..... | 0.55 bar<br>(8 psi)   |
| Minimum ..... | 0.02 bar<br>(0.3 psi) |



**Fuel**

Approved grade..... **AVGAS 100LL**

Maximum tank capacity ..... **170 L**  
(45 U.S. gal)

Unusable fuel quantity ..... **1.5 L**  
(0.4 U.S. gal)

**Warning** : Do not rely on fuel quantity indication when Caution light is ON or EPM warning is active.

**Engine Oil**

After break-in, use multigrade oil.....**MIL-L-22851**  
Ashless dispersant  
SAE 15W50 or 20W50

During break-in (50 hours), use straight mineral oil..... **MIL-L-6082B**

| OAT           |                | Grade  |
|---------------|----------------|--------|
| Above 27°C    | (80°F)         | SAE 60 |
| Above 16°C    | (60°F)         | SAE 50 |
| -1°C to 32°C  | (30°F to 90°F) | SAE 40 |
| -18°C to 21°C | (0°F to 70°F)  | SAE 30 |
| Below -12°C   | (10°F)         | SAE 20 |

**Oil quantity**

Oil sump capacity ..... **5.7 L**  
(6 U.S. Quarts)

Minimum oil quantity for take-off..... **3.8 L**  
(4 U.S. Quarts)

**Gearboxes oil**

Use Hélicoptères Guimbal oil referenced **HG30-0039** (85W140).

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### Indicated power on MLI

The Multiple Limits Indicator displays the engine power status, based on engine manifold absolute pressure, with two limits :

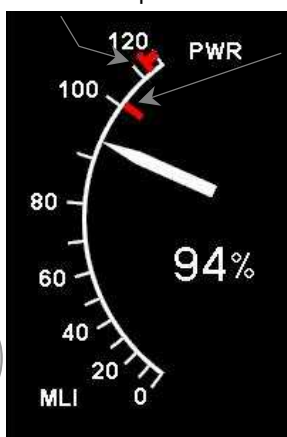
- Power (PWR) limit, which corresponds to the engine rated power of 108 kW (145 hp),
  - Throttle (FLO) limit, which corresponds to full throttle power.  
At sea level in standard conditions, FLO limit corresponds to an engine power of 134 kW (180 hp).
- Their relative positions vary with engine inlet air temperature and altitude,
  - Both limits should not to be exceeded at any time,
  - The indicator (pointer and digits) displays power delivered by the engine in terms of margin to the first of these limits.

**Note 1 :** The red radial PWR mark shows that the limit could be exceeded if the pilot requires too much power. He should control the flight not to exceed it.

**Note 2 :** The red FLO arc warns the pilot that the limit cannot mechanically be exceeded in order to help him anticipate.

Maximum ..... 100 %  
Maximum rated ..... 100 % PWR  
Full throttle ..... 100 % FLO

Full throttle power

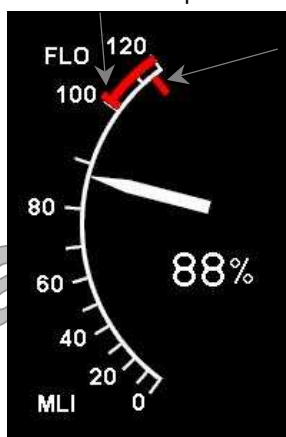


PWR limit mode

Maximum  
rated  
power

Available  
power  
indication

Full throttle power



FLO limit mode

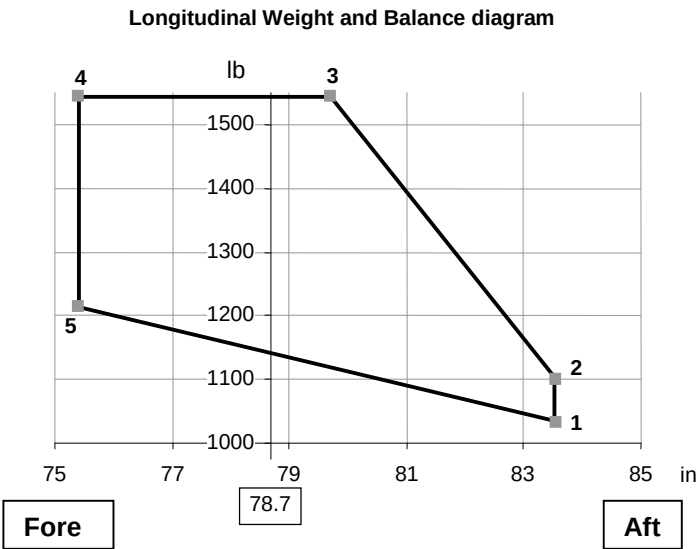
Maximum  
rated  
power

### Transmission limitations

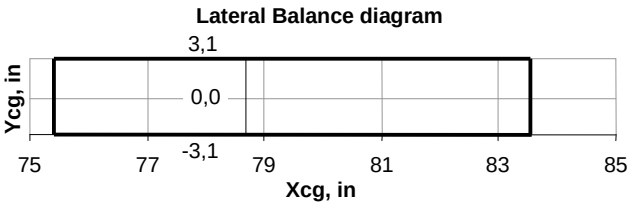
Main Gearbox power limitation..... 100 % PWR on MLI  
Main Gearbox temperature ..... Caution light

Weight and balance limitations (Imperial units)

Maximum Gross Weight .....1543 lb



|         |         |         |
|---------|---------|---------|
| Point 1 | 1036 lb | 83.5 in |
| Point 2 | 1102 lb | 83.5 in |
| Point 3 | 1543 lb | 79.7 in |
| Point 4 | 1543 lb | 75.4 in |
| Point 5 | 1213 lb | 75.4 in |

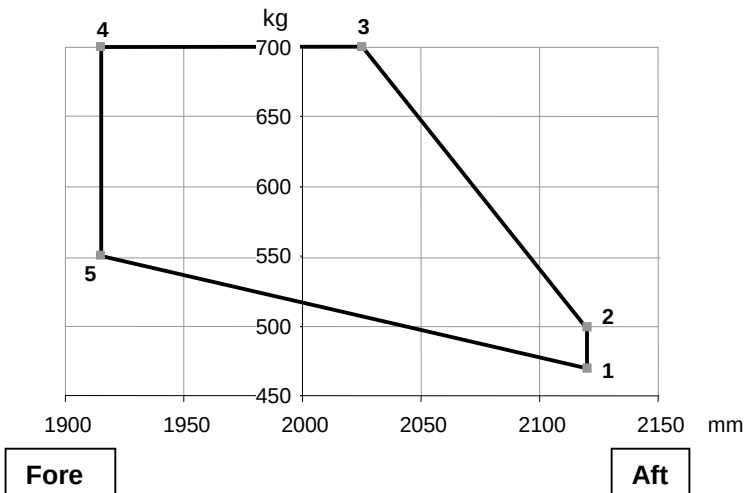


**Note :** Rotor axis is..... X = 78.7 in Y = 0 in

## Weight and balance limitations (metric units)

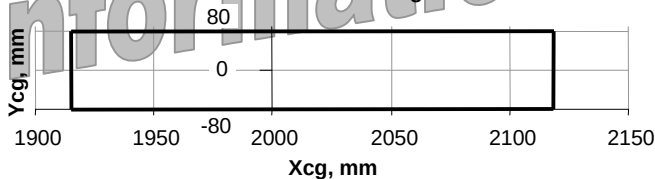
Maximum Gross Weight..... 700 kg

Longitudinal Weight and Balance diagram



Point 1.....470 kg .....2120 mm  
 Point 2.....500 kg .....2120 mm  
 Point 3.....700 kg .....2025 mm  
 Point 4.....700 kg .....1915 mm  
 Point 5.....550 kg .....1915 mm

Lateral Balance diagram



**Note :** Rotor axis is .....X = 2000 mm

Y = 0 mm

### Sensors failures

When the MASTER is switched on, the EPM carries out a self-test and displays a test page (refer to page 7-13).

Only one flight should be performed after one of following parameters are displayed “**Failed**”, with following restrictions :

| Failed parameter   | Flight restriction                                                              |
|--------------------|---------------------------------------------------------------------------------|
| OAT                | Use Section 5 to compute available performance<br>Apply a margin on temperature |
| Pressure           | Limit MLI to 95% PWR and 100% FLO (the smallest)                                |
| T. induction       | Carb. heat test : control through NR drop                                       |
| CHT                | Avoid long hover.                                                               |
| Carb. T            | Control carb. heat manually<br>Use carb. heat below 80% MLI                     |
| ManP               | Use Section 5 to compute available performance                                  |
| Throttle           | Use Section 5 to compute available performance                                  |
| Oil T              | Avoid prolonged hover. Monitor CHT                                              |
| Oil P              | Monitor CLUTCH and OIL P. lights                                                |
| Fuel Q             | Perform an accurate fuel planning                                               |
| MGB/TGB Chips      | Hand-check corresponding plug at take-off                                       |
| Battery charge     | Minimize electrical loads                                                       |
| CO                 | Keep cabin heat closed                                                          |
| Carb. heat control | Control carb. heat manually<br>Use carb. heat below 80% MLI                     |

**Placards**

- On cabin ceiling :

| <b>VNE POWER ON</b>  |          |
|----------------------|----------|
| Zp (ft)              | IAS (kt) |
| 0                    | 130      |
| 2000                 | 126      |
| 4000                 | 122      |
| 6000                 | 118      |
| 8000                 | 114      |
| 10 000               | 110      |
| 12 000               | 106      |
| 13 000               | 104      |
| <b>VNE POWER OFF</b> |          |
| subtract 20 kt       |          |

- On cabin ceiling :

| <b>COMPASS</b> |       |
|----------------|-------|
| DATE :         |       |
| <b>HEADING</b> |       |
| FOR            | STEER |
| 0              |       |
| 45             |       |
| 90             |       |
| 135            |       |
| 180            |       |
| 225            |       |
| 270            |       |
| 315            |       |

- Above the fuel tank filler cap :

**AVGAS 100LL**

**Max. 170 Litres  
45 US Gal**

- Under cabin heater control :

**CLOSE IN CASE  
OF ENGINE FIRE**



- In clear view of all occupants :



**Note** : if the aircraft is approved for night VFR, refer to Section 9 Supplements.

**NO SMOKING**

- On the right and left side of central console :

**No hard object  
under seat**

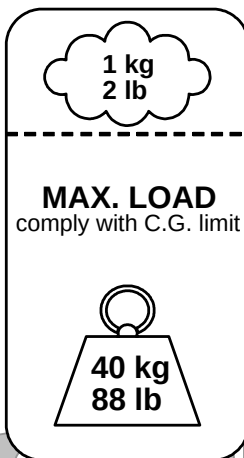
- Forward luggage compartment :

**MAX. LOAD**  
comply with C.G. limit  
**5 kg**  
**11 lb**

- Forward luggage compartment and under pilot seat :

**AUX. 13.7 V D.C.**  
**5A protected**

- Main luggage compartment :



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### **Section 3    Emergency procedures**

|                                                     |      |
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The information in section 3, emergency procedures, is approved by EASA.

## **Introduction**

The following emergency procedures describe the actions the pilot must take, relative to the various possible failures that can occur. However, depending on the many variable external environments, such as the type of terrain flown over, the pilot may have to adapt to the situation according to his experience.

To help the pilot in his decision process, three recommendations are used :

- **LAND IMMEDIATELY**
- **LAND AS SOON AS PRACTICABLE**

Emergency conditions are urgent and require landing at the nearest landing site at which a safe landing can be made.

- **CONTINUE FLIGHT**

Continue flight as planned. Repair at the destination according to maintenance manual.

**Note: Immediate action that the pilot shall take, or main parameters are written in bold characters.**

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## **Power failures**

### **General**

**Engine failure** can be detected by :

- Yaw acceleration, nose to the right,
- Engine noise level decreases,
- Tachometer needles desynchronization on the EPM (engine decreases)
- OIL P warning on the EPM and OIL P red light coming ON.
- Plasma beeper,
- Rotor speed decreasing and “low NR” horn.

**Caution** : A slow decay in engine power, caused by carburetor icing or air filter clogging, is compensated by the governor and can be overlooked by the pilot.  
The MLI indication will not change while in PWR mode, but will rapidly shift to FLO mode, then increase to 100%.

**Primary transmission failure** can be detected by :

- High yaw rate, nose to the right,
- Engine noise level increases,
- Tachometer needles desynchronization on the EPM (engine increases). Eventual engine overspeed only if the governor is OFF
- Rotor speed decreasing and “low NR” horn.

In case of a primary transmission failure, apply following power failure actions. Roll off the twist grip as soon as possible.

**Warning** :

Safe landing may not be possible if the power failure occurs within the “unsafe” zone of the H/V diagram (refer to section 5).

Operation inside this zone should be avoided.

### Power failure - hover below 8 feet AGL

The helicopter will normally exhibit little or no tendency to depart in pitch or roll, hence requiring little correction :

1. Use left pedal input to counter yawing to the right,
2. Cushion landing by raising collective, until high pitch stop if necessary,
3. Once landed, lower the collective.

### Power failure during take-off

Take-off acceleration is the most critical situation for a power failure to occur, requiring moderate and rapid pilot reaction :

1. Use left pedal input to counter yawing to the right,
2. Use aft cyclic to level the helicopter,
3. Before having reached 30 kt IAS, **do not lower the collective,**
4. **If IAS is above 30 kt IAS,** slightly pitch up while slightly lowering the collective, if needed, to prevent climbing,
5. When approaching the ground, raise the collective to cushion contact,
6. Use pedals to minimize ground drift,
7. Once stopped, lower the collective.

### Other in-flight power failures

#### All cases :

1. Lower the collective immediately and maintain full down,
2. Use pedals to control yaw,
3. Maintain **IAS between 30 and 50 kt IAS (50 kt IAS recommended),**
4. Select landing area and manoeuvre to land into the wind,
5. Adjust collective to **centre NR in green arc,**
6. When the landing is ensured, consider engine restarting if enough time is available. Refer to page 3-5.
7. At about 60 feet AGL, apply aft cyclic to raise the helicopter nose smoothly and continuously. **Below 50 kt IAS, this manoeuvre will not stop sink rate.**
8. As ground closes-on, apply forward cyclic to level the helicopter while raising the collective to stop sink rate.
9. Use pedals to minimize ground drift,
10. Once stopped, lower the collective.

**Note :** Average manoeuvre requires about 200 to 300 m (650 to 1000 feet) free of high obstacle.

**Note** : During an emergency autorotation, **always monitor airspeed** carefully.  
Increasing airspeed above 50 kt IAS makes the landing easier, but requires a longer landing area.

**Confined landing area :**

When landing spot is confined, **maintain IAS to 30 kt IAS** in descent. Landing spot can be estimated by looking between the pilot pedals.

**Caution** : Anticipate that **sink rate will not stop** until final collective raise.

**Failure above 2000 feet AGL :**

It may be practicable to increase gliding distance to reach a better landing area.

- Best glide ratio is obtained at airspeed **approximately 80 kt IAS** (no wind). Increase airspeed with high headwind,
- Recommended NR is **mid-yellow arc (480 RPM)**,
- **At about 300 feet AGL**, reduce **IAS between 30 and 50 kt IAS (50 kt IAS recommended)**, check NR in green arc and refer to the above procedure.

Airspeed and rotor speed adjustments will reduce the gliding distance. Expect a **PRACTICAL glide ratio between 2:1 and 3:1** or 0.7 to 1 nautical mile at 2000 feet AGL.

**Ditching**

1. Apply same procedures as for landing,
2. Head equally between the wind and wave direction,
3. Open doors,
4. Reduce forward and vertical speed to minimum possible before contact with water,
5. Keep collective up after contact, to help rotor deceleration.

### **In-flight engine restart**

Attempt engine restart only when the autorotation is stabilized on the trajectory to an appropriate landing area, and sufficient time is available. If successful, power recovery can take only a few seconds.

1. Stabilize autorotation,
2. Check boost pump ON, fuel valve OPEN,
3. Check mixture full forward (RICH),
4. Check both ignition switches ON, upward,
5. Apply about 50 % throttle (90° twist grip),
6. Press starter button.

**Note 1** : Governor may be kept engaged or not.

**Note 2** : Do not worry for engine very fast acceleration. There is no risk of overtorque at re-synchronization. Be prepared to yawing to the left if power recovers.

**Note 3** : In absence of perceivable sound, the STARTER light gives a visual clue that the starter is actually energized.

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## **Engine fire**

Engine fire can be detected when the EPM fire warning lights up:

**FIRE**

### **On the ground :**

1. Shut cabin heater OFF,
2. Shut fuel valve OFF,

*When engine quits :*

3. Switch all switches OFF,
4. Pull rotor brake,
5. Wait for complete rotor stop before evacuating the cabin.

### **In flight :**

Once fire is confirmed :

#### **LAND IMMEDIATELY**

1. Shut cabin heater OFF,
2. Lower the collective to enter autorotation as per procedure page 3-3,
3. Shut fuel valve OFF,
4. Shut fuel pump OFF,
5. Above 8000 feet AGL, increase airspeed to 90 kt IAS to accelerate the descent,
6. Perform an autorotation landing according to pages 3-3 and 3-4
7. Pull rotor brake,
8. Wait for complete rotor stop before evacuating the cabin.

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### **Electrical fire**

Can be detected by a strong smell of burning and/or by smoke.

1. Switch alternator OFF,
2. Switch MASTER OFF,

**Note** : EPM and NR lights are no longer powered.

3. Move NR switch to "Backup" position,
4. Use NR lights (Backup position) to monitor rotor speed.

**Note** : Remaining electrical equipments are those on direct battery : BARC backup and ignition system. Refer to page 7-7 for electrical system description.

If fire source is determined, switch the other systems ON

If electric fire continues, **LAND IMMEDIATELY.**

If not, **LAND AS SOON AS PRACTICABLE.**

**Notes** :

- With MASTER and alternator both OFF, engine still operates with both ignitions, but without the governor.
- With MASTER OFF and NR switch on "Backup", following lights are still operative :
  - ➔ High, Normal and Low NR,
  - ➔ LOW FUEL caution.

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## **Tail rotor failure**

It could consist either in a tail rotor transmission failure, or in a tail rotor loss. This failure can be detected by sudden yaw acceleration - nose to the left - and/or totally ineffective pedals.

**Caution** : Nose to the right : probable engine failure  
Nose to the left : probable tail rotor failure

### **Hovering IGE :**

1. **LAND IMMEDIATELY,**
2. Reduce throttle in order to reduce left yaw rate,
3. Cushion contact with the ground by applying collective pitch up to high stop if necessary.

### **Other flight cases :**

1. Switch governor OFF,
2. Adjust power to maintain 70 to 80 kt IAS,
3. Reach an appropriate surface for an autorotation running landing,
4. Carry out a full autorotation landing. Reduce airspeed as late as you can. Land with as much airspeed as the surface permits.

## **Yaw control failure**

### **Hovering IGE :**

1. **LAND IMMEDIATELY,**
2. Lower the collective slowly enough to land smoothly, while rolling-off throttle to reduce yawing nose to the right.

### **Other flight cases :**

1. **LAND AS SOON AS PRACTICABLE,**
2. Adjust IAS to 70 - 80 kt IAS,
3. Adjust power to minimize sideslip and keep nose to the right,
4. Reach an appropriate surface for a running landing. Carry out a cautious landing. **Reduce airspeed as late as you can.** Land with as much airspeed as the surface permits.

**Note** : Prefer wind from the right.

### **Engine governor failure**

Engine governor failure can be detected by the following :

- Rotor/Engine speed is not regulated in green arc and throttle extreme position is not reached,
- Rotor/Engine speed changes in level flight,
- If there is a doubt, roll the twist grip slightly and check grip's reaction.
- GOV light is blinking,

When it is detected :

1. Hold the twist grip firmly, and overtake the governor action,
2. Switch governor OFF,
3. Regulate Rotor/Engine speed in the middle of green arc with twist grip,
4. **CONTINUE FLIGHT**

**Caution :** Always overtake the governor and stabilize NR in green arc before any other action is taken.

### **EPM failures**

#### **Complete loss of EPM display:**

1. **LAND AS SOON AS PRACTICABLE**
2. Switch NR switch to Back-up position, check green light,
3. Rotor/Engine speed is controlled by the governor and can be checked using high and low NR warning lights.
4. Monitor carburetor heat manually :
  - Select COLD position at high power,
  - Select HOT position at low power
5. In this case, if LOW FUEL lights : **LAND IMMEDIATELY**

#### **Erratic engine / rotor speed de-synchronization :**

Reduce power gradually.

If de-synchronization indication continues :

1. Refer to NR lights indicator for reliable rotor speed,
2. Switch the engine governor OFF,
3. Monitor the rotor speed in the lower green arc,
4. **LAND AS SOON AS PRACTICABLE**

If de-synchronization stops :

1. Consider the EPM is operative, and the transmission is questionable
2. Limit power to avoid any de-synchronization reading
3. **LAND AS SOON AS PRACTICABLE**
4. Conduct a cautious landing, with minimum power, and gradual power increase. Refer to procedure page 3-2.

**MLI failure :**

Detected by the indication **XXX** on MLI

1. Above 5500 feet Zp, you will always be limited by full throttle,  
Below 5500 feet Zp, do not exceed 80 kt IAS in level flight to prevent overpower.

**CONTINUE FLIGHT**

2. Make a cautious landing in conditions requiring not more power than previous take-off.

**MLI degraded modes :**

In case of one of following parameters loss, the MLI shifts automatically to a degraded mode :

- Engine speed,
- Throttle position,
- OAT,
- Ambient air pressure.

Degraded mode is signalled by the MLI indication displayed in yellow.

**CONTINUE FLIGHT**

For information only

**Loss of engine speed sensor :**

Detected by the indication **XXX** on engine EPM indicator and loss of governor (frozen twist-grip).

1. Refer to NR indicator for engine speed indication,
2. Overtake the governor by firmly gripping the twist-grip,
3. Once NR is in green arc, switch governor OFF,
4. Regulate throttle manually to keep the NR in green arc

**CONTINUE FLIGHT**

**Loss of main rotor speed sensor :**

Detected by the indication **XXX** on rotor EPM indicator.

1. Keep powered flight, no de-synchronization (no fast descent, nor autorotation practice),
2. Refer to NM indicator for engine speed indication,

**CONTINUE FLIGHT**

**Loss of automatic carburetor heat regulation :**

Detected by Tcarb warning in flight (Tcarb in yellow zone). Refer to page 3-12.

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## **Aural warnings**

### **Loud horn warning :**

A continuous tone warns the pilot when rotor speed approaches low speed limit.

An intermittent tone warns the pilot when rotor speed approaches high speed limit.

A short tone warns the pilot when the LOW FUEL light goes on.

**Note :** The continuous horn can be temporarily muted by setting the NR switch to MUTE. It reengages itself when the condition disappears.

### **Beeper warning :**

A high-frequency continuous beep warns the pilot in three situations :

- when oil pressure is lost with Plasma ignition ON – in conjunction with OIL P red warning light,
- to warn that engine ignition is HOT at startup,
- to prevent from leaving the Plasma ignition ON when leaving the helicopter (MASTER OFF as well as ON).

## **EPM parameters out of limitations**

**Note:** All EPM parameters are displayed in corresponding colour (inverted), and blink during 10 seconds when exceeding limit.

| Parameter | Exceeds    | Corrective actions                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Carb T    | Yellow arc | 1. Check how much bricks are lightened,<br>2. Move carb heater switch to HOT as necessary,<br>3. Check bricks appears and temp gets out of yellow and <b>CONTINUE FLIGHT</b><br>→ If stays, avoid prolonged flight at low power setting.<br>→ In case of carb. icing (*),<br><b>LAND AS SOON AS PRACTICABLE</b><br>Carry-on a cautious landing.<br>(*) Refer to page 3-2 for detection means |

| Parameter | Exceeds                                           | Corrective actions                                                                                                                                                                                                                                                    |
|-----------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CHT       | Red arc                                           | <ul style="list-style-type: none"> <li>If in hover, land or depart in translation</li> <li>If in translation, reduce power</li> </ul> <p>→ If indication stays into red arc,<br/><b>LAND AS SOON AS PRACTICABLE</b><br/>Once landed, keep nominal NR for cooling</p>  |
| Oil T     | Red arc                                           | <ul style="list-style-type: none"> <li>If in hover, land or depart in translation</li> <li>If in translation, reduce power</li> </ul> <p>→ If indication stays into red arc,<br/><b>LAND AS SOON AS PRACTICABLE</b><br/>Once landed, keep nominal NR for cooling.</p> |
|           | Yellow arc                                        | Wait to apply full power<br>Allow to warm-up.                                                                                                                                                                                                                         |
| Oil P     | Red arc<br>> 7.9 bar<br>(115 PSI)                 | <ul style="list-style-type: none"> <li>Cold starting : allow engine to warm-up</li> <li>Flight : reduce power</li> </ul> <p>If stays into red arc :<br/><b>LAND AS SOON AS PRACTICABLE</b></p>                                                                        |
|           | Yellow arc<br>6.6 < ≤ 7.9 bar<br>(95 < ≤ 115 psi) | <ul style="list-style-type: none"> <li>Normal at cold starting and during engine warm-up,</li> <li>Flight : reduce power.</li> </ul> <p>If stays into yellow arc :<br/><b>LAND AS SOON AS PRACTICABLE</b></p>                                                         |
|           | Yellow arc<br>1.7 < ≤ 3.6 bar<br>(25 < ≤ 52 psi)  | <ul style="list-style-type: none"> <li>Normal at idle,</li> <li>Flight : CLUTCH light should light soon after. Refer to p 3-15 – CLUTCH.</li> </ul>                                                                                                                   |
|           | Red arc<br>< 1.7 bar<br>(25 PSI)                  | <p><b>LAND AS SOON AS PRACTICABLE</b><br/>Monitor OIL P warning light.<br/>→ If ON <b>LAND IMMEDIATELY</b></p>                                                                                                                                                        |
| Fuel P    | Red arc<br>< 0.03 bar<br>(0.5 PSI)                | <ol style="list-style-type: none"> <li>Check boost pump ON</li> <li>Reduce power and reach <b>Vy = 50 kt IAS</b></li> </ol> <p><b>LAND AS SOON AS PRACTICABLE</b></p>                                                                                                 |
|           | Red arc<br>> 0.55 bar<br>(8 PSI)                  | <ol style="list-style-type: none"> <li>Switch boost pump OFF</li> <li>Check a decrease</li> </ol> <p><b>LAND AS SOON AS PRACTICABLE</b></p>                                                                                                                           |

| Parameter                                      | Exceeds                                             | Corrective actions                                                                                                                                                                                                                                    |
|------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>LOW FUEL</b>                                | Display in <b>Red</b> $\leq 10$ L<br>(2.6 U.S. gal) | Check with LOW FUEL warning light<br>→ If ON : <b>LAND IMMEDIATELY</b>                                                                                                                                                                                |
| <b>BATT</b><br><b>Battery</b><br><b>charge</b> | <b>Yellow</b>                                       | Check ALT switch ON.<br>Battery is not being charged. Turn all non essential equipment OFF.<br><b>LAND AS SOON AS PRACTICABLE</b><br><b>Caution</b> : Prolonged flight without alternator can result in loss of electronic and electrical equipments. |

### **EPM Alarms**

| Alarm                                            | Signification                   | Corrective actions                                                                                                                                                                                                          |
|--------------------------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CO</b><br><b>Amber</b>                        | Carbon monoxide cabin pollution | 1. Shut cabin heater OFF<br>2. Open vents<br>3. Ground or hover : change heading<br>4. If symptoms of CO poisoning (headache, drowsiness, dizziness) accompany light,<br><b>LAND IMMEDIATELY</b>                            |
| <b>MGB / TGB</b><br><b>Chips</b><br><b>Amber</b> | Gearbox degradation             | If alarm is accompanied by any indication of a problem such as noise, vibration or MGB temperature light,<br><b>LAND IMMEDIATELY</b><br>If there is no other indication of a problem,<br><b>LAND AS SOON AS PRACTICABLE</b> |
| <b>Fire</b><br><b>Red</b>                        | Engine compartment fire         | Refer to procedure page 3-6<br><b>LAND IMMEDIATELY</b>                                                                                                                                                                      |

**Caution / Warning lights**

| Light                     | Signification                                                     | Corrective actions                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>STARTER</b>            | Starter is energized.                                             | Release starter button as needed                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>STARTER (stays on)</b> | If stays when starter button is released : starter relay is stuck | Immediately pull the mixture OFF to shut the engine down and switch MASTER OFF.<br>Have starting system serviced.                                                                                                                                                                                                                                                                                                                     |
| <b>GOV OFF</b>            | Governor is disengaged                                            | Monitor Engine/Rotor RPM with twist grip.<br><b>CONTINUE FLIGHT</b>                                                                                                                                                                                                                                                                                                                                                                   |
| <b>GOV OFF (blinking)</b> | Governor is inoperative                                           | Disengage governor<br>Monitor Engine/Rotor RPM with twist grip.<br><b>CONTINUE FLIGHT</b>                                                                                                                                                                                                                                                                                                                                             |
| <b>BRAKE</b>              | Rotor brake engaged                                               | Disengage and lock                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>OIL P</b>              | Low oil pressure                                                  | <b>LAND IMMEDIATELY</b>                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>MGB T°</b>             | High gearbox temperature                                          | 1. Move to 50 - 80 kt IAS translation<br>2. If MGB T° stays on and if light is accompanied by any indication of a problem such as noise or vibration,<br><b>LAND AS SOON AS PRACTICABLE</b>                                                                                                                                                                                                                                           |
| <b>LOW FUEL</b>           | About 12 liters (3.2 U.S. gal) remaining                          | <b>LAND AS SOON AS PRACTICABLE</b><br>Avoid : sideslips & sharp maneuvers<br>If <b>EPM reads &lt; 10 liters</b> (2.6 U.S. gal) :<br><b>LAND IMMEDIATELY</b>                                                                                                                                                                                                                                                                           |
| <b>ALT</b>                | Alternator, regulator or battery charging malfunction             | Check charge indicator on EPM (BATT).<br>If <u>green or white</u> : battery is being charged. <b>CONTINUE FLIGHT</b> .<br>Have the alternator regulator serviced after flight.<br>If <u>yellow</u> : battery is not being charged.<br>Turn all non essential equipment OFF.<br><b>LAND AS SOON AS PRACTICABLE</b><br><b>Caution</b> : Prolonged flight without alternator can result in loss of electronic and electrical equipments. |

|               |                                                            |                                                                                                                                                        |
|---------------|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CLUTCH</b> | Belt tensioning (clutching),<br>detensioning (declutching) | Refer to normal procedure                                                                                                                              |
|               | clutch pressure<br>too low<br>or<br>Belt worn out          | Reduce power until light is off.<br>If continuous : Reduce IAS to 50 kt IAS<br><b>LAND AS SOON AS PRACTICABLE</b><br>Be prepared to enter autorotation |

|                                                                                                                                                           |                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| <b>NR (High)</b>                                                                                                                                          | Raise the collective or Reduce throttle   |
| <b>NR (Low)</b>                                                                                                                                           | Lower the collective or Increase throttle |
| <b>Note :</b> Blinking light corresponds to ..... <b>Yellow arc</b>   on EPM<br>Continuous light warns when approaching ... <b>Red limit</b>   tachometer |                                           |

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## **Section 4    Normal procedures**

|                                                               |             |
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The information in section 4, Normal procedures, is approved by EASA.

### **General**

This section contains instructions and procedures for operating the helicopter, from the planning stage through all the mission.

Normal and standard conditions are assumed in these procedures. Pertinent data in other sections is referenced when applicable

The instructions and procedures contained herein are written for the purpose of standardization and are not applicable to all situations.

They cannot replace pilot's appreciation of each particular situation.

### **Airspeeds for safe operation**

Take-off and climbs..... **50 kt IAS**

Best range..... **80 kt IAS**

Autorotation (also see page 3-2)..... **50 kt IAS**

Never-exceed speed ( $V_{NE}$ ), power on ..... **130 kt IAS**  
-2kt IAS per 1000 feet Zp

Never-exceed speed ( $V_{NE}$ ), power off ..... **110 kt IAS**  
-2kt IAS per 1000 feet Zp

### **Doors**

Operation with one or two door(s) removed is allowed with no additional limitation in the whole flight envelope.

Each door is equipped with a restraining strap which enables partial opening for venting purpose.

Operation is allowed with no additional limitation with one or two doors unlatched in this way, partially opened, secured by the restraining strap.

In all these cases, make sure that all harnesses are buckled and secure all loose objects. Warn passenger to keep head, arms and objects inside the cabin to avoid high velocity airstream.

### **Doors-lock and anti-theft**

To unlock / lock the doors, press the corresponding button on the key-ring radio transmitter. Check the flashing strobe light confirmation.

If the transmitter is ineffective, check the “Auxiliaries” breaker inside the battery box.

Unlocking / locking the doors also enables / disables the engine starter, if active (refer to page 7-19).

**Note :** The starter is enabled when the rotor is turning above 400 RPM, whatever the antitheft state.

### **Before flight**

The pilot should be familiar with helicopter limitations detailed in Section 2 of this manual.

The pilot should have checked weight and balance. Refer to Section 2 and Section 6 of this manual.

The pilot should check helicopter performance according to Section 2 of this manual.

The pilot should carry out a pre-flight check before each flight.

### **Daily or Pre-flight checks**

The following check must be carried out before each flight.

However, if the helicopter is operated by a single pilot, or in an organization where checks are done by a qualified mechanic, this check may be carried-out daily, before the first flight of the day.

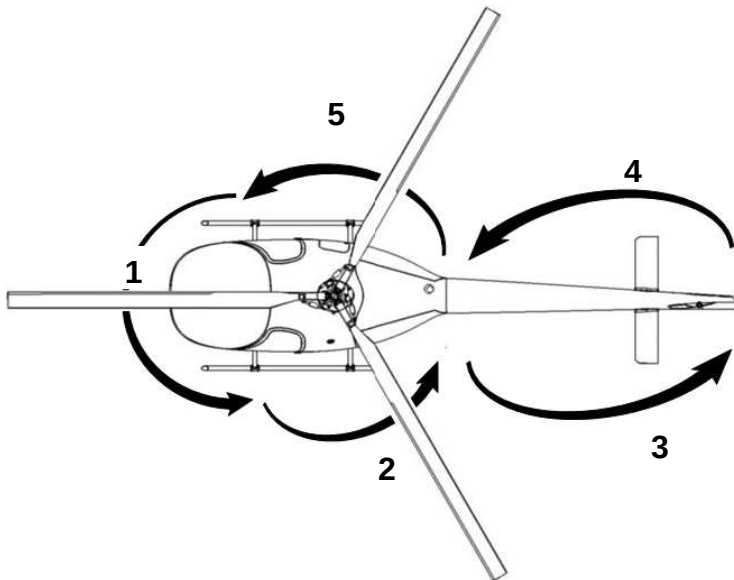
In this case, an inter-flight check should be done between each flight (refer to page 4-7).

#### **Preliminaries**

- Remove airframe covers, pitot and static plugs, blade tie downs and exhaust plug.
- In cold weather, remove all frost, ice or snow.
- Purpose of the following inspection is to :
  - Visually check the helicopter general condition,
  - Detect leakage indications,
  - Detect aluminum fretting marks : dark powder marks,
  - Detect steel fretting marks : black or brown marks/residues,
  - Detect overheating marks (color changing),
  - Detect damages (impacts, scratches, cracks, frictions, corrosion...).

**Note** : All castellated nut must be locked by cotter pin.  
 Lockwire must be tight.  
 Torque-seal marks must be intact.

**Definition of Cabri G2 inspection stations**



**Station 1 :**

*Main rotor blades (each 3) :*

Clean, particularly at leading-edge

Leading edge ..... hand-check for damage or debonding

Tips bolts ..... Check lockwiring

Right door hinges ..... Check

Door hinge safety pins ..... Installed

Windshield condition and cleanliness ..... Check

Sideslip string indicator ..... Check

Lower windows condition and cleanliness ..... Check

Landing light ..... Check

Pitot tube ..... Cover removed, check

Static pressure port ..... Plug removed, check

Front gear bow attachment ..... Check

Left door hinges ..... Check

Door hinge safety pin ..... Installed

**Station 2 :**

|                                             |         |
|---------------------------------------------|---------|
| Fuel cap .....                              | Locked  |
| Navigation lights .....                     | Check   |
| Front and main gear bow condition .....     | Check   |
| Landing gear pants and skid condition ..... | Check   |
| Skid shoes .....                            | Check   |
| Fuel manifold .....                         | No leak |
| Drain valve .....                           | Sample  |
| Cowling hinge .....                         | Check   |

**Open the left engine cowling**

|                                              |                                 |
|----------------------------------------------|---------------------------------|
| Battery strap .....                          | Check                           |
| Battery terminals .....                      | Tightened                       |
| Breakers .....                               | All set                         |
| MAP lines .....                              | Check                           |
| Transmission belt .....                      | Check                           |
| Belt slack .....                             | Check                           |
| Electronic ignition coils attachment .....   | Check                           |
| Ignition wires .....                         | Check                           |
| Engine and baffling general condition .....  | Check                           |
| Engine skirts condition and attachment ..... | Check                           |
| Exhaust pipes .....                          | Check                           |
| Heat muff and hose condition .....           | No cracks                       |
| Mixture control .....                        | Check                           |
| Throttle control .....                       | Check                           |
| Air box attachment .....                     | Check                           |
| Auto carburetor heat .....                   | Check cold                      |
| Engine connector .....                       | Locked                          |
| Engine mount condition .....                 | Inspect for cracks or corrosion |
| Engine rubber mounts .....                   | Check                           |
| Magneto connection .....                     | Check                           |
| Fuel pump and hose .....                     | No leak                         |
| Oil cooler air hose .....                    | Check                           |
| Flexible push-pull control .....             | Check                           |
| Left tail boom attachments .....             | No crack                        |
| Cotter pins .....                            | Installed                       |
| Cowling .....                                | Close and lock front latch      |

**Station 3 :**

|                                             |                   |
|---------------------------------------------|-------------------|
| Left tail boom side general condition ..... | No damage         |
| Horizontal stabilizer .....                 | Shake and inspect |
| Strobe light .....                          | Check             |
| Rotor duct .....                            | Clean             |
| Tail rotor blades condition .....           | Clean, no impact  |
| Tail rotor blades slack .....               | Check all 7       |
| Tail skid and attachment .....              | Check             |

**Station 4 :**

Tripod attachments ..... Check  
Tail gearbox oil level ..... Check – Minimum is mid-sight gage  
Chip detector ..... Locked  
Pitch lever and rod end ..... Check free-play  
Horizontal stabilizer ..... Check  
Rear transmission tube ..... Check while turning main rotor  
Right tail boom side general condition ..... No damage  
Transmission bearings bolts and plugs ..... Check tight

**Station 5 :**

Muffler exhaust ..... Check and shake  
Right cowling hinge ..... Check

**Open the right engine cowling**

Right tail boom attachments ..... No crack  
Cotter pins ..... Installed  
Muffler ..... No crack or interference with engine frame  
Oil filter ..... Locked, no leak  
Engine oil dipstick ..... Check 4 to 6 Qt and tighten  
Engine mount condition ..... Inspect for cracks or corrosion  
Fuel line condition ..... Check  
Clutch distributor and attachment ..... Tight, no leak  
Oil cooler pipes ..... No leak  
VHF antenna ..... Check  
Engine cooling intake screen ..... Inspect and clean  
Ignition wires ..... Check  
Engine and baffling general condition ..... Check  
Rotor brake ..... Check pads and clearance  
Flex coupling and bolts ..... Tight – no crack  
Upper pulley ..... Check  
Clutch actuator ..... Retracted  
Main gearbox oil level ..... Check – Minimum is mid-sight gage  
Chip detector ..... Locked  
Inspection door ..... Closed  
Engine skirts condition and attachment ..... Check  
Exhaust pipes ..... Check  
Carburetor heating hose ..... Check  
Air intake duct and hose ..... Check  
Gascolator drain ..... Sample  
Fuel flow sender ..... Check  
Aft landing gear attachment ..... Check  
Cowling ..... Close and lock both latches  
Front and main gear bow condition ..... Check  
Landing gear pants and skid condition ..... Check  
Skid shoes ..... Check

Navigation lights.....Check

Open the luggage door, step for main rotor examination :

Blade bolts .....Check  
Elastomeric thrust bearings.....Check elastomer condition  
Main rotor hub .....Check nicks or corrosion  
Lead-lag dampers :  
- Elastomer condition .....No crack  
- Rod ends..... Free without looseness  
All control rod-ends ..... Free without looseness  
Droop stop ring..... Visual check  
Rotating and non-rotating scissors.....Free with moderate looseness  
Swashplate.....Check no free-play  
Main gearbox upper fitting .....Check  
Air intake and MGB compartment .....No foreign object  
Engine air intake screen..... Inspect and clean  
Blades leading edge..... No debonding

Step down and slam luggage door

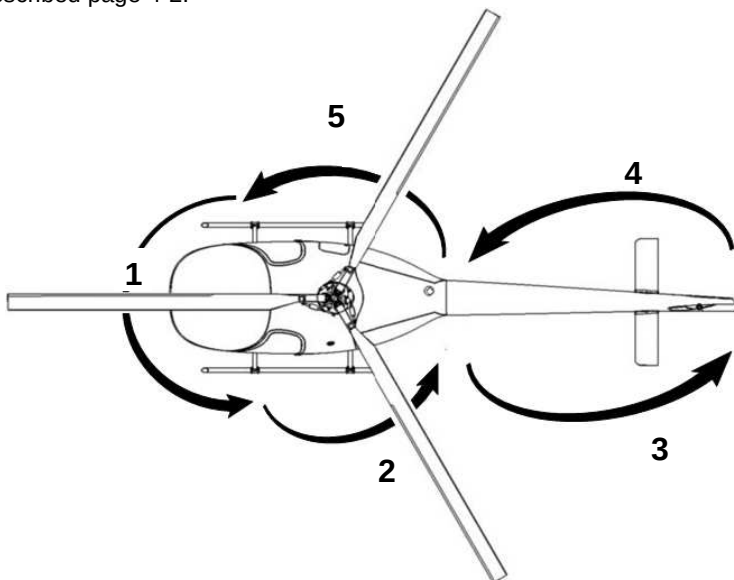
Inside the cockpit

Stroking seats :  
- Upper slide .....Aligned  
- Attachment .....Check  
Harnesses .....Check  
Main controls condition .....Check  
Pedals condition.....Check  
Objects inside.....Stowed  
Removable controls (if installed) .....Check  
Instruments and switches.....Check  
All breakers .....In

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### **Inter-flight check**

This paragraph describes the inter-flight check that should be carried out in the case described page 4-2.



#### **Station 1 :**

*Main rotor blades (each 3) :*

- Leading edge ..... hand-check for damage or debonding
- Right door hinges ..... Check
- Pitot tube ..... Cover removed, check
- Static pressure port ..... Plug removed, check
- Left door hinges ..... Check

#### **Station 2 :**

- Fuel cap ..... Locked
- Front and main gear bow condition ..... Check
- Landing gear pants and skid condition ..... Check
- Skid shoes ..... Check
- Cowling ..... Latched

**Station 3 :**

Left tail boom attachments .....Check  
Horizontal stabilizer ..... Shake and inspect  
Rotor duct ..... Clean  
Tail rotor blades .....No impact  
Tail skid and attachment .....Check

**Station 4 :**

Tripod attachments .....Check  
Tail gearbox oil level ..... Check – Minimum is mid-sight gage  
Chip detector ..... Locked  
Horizontal stabilizer .....Check

**Station 5 :**

Right tail boom attachments .....Check  
Muffler exhaust .....Check  
Cowling ..... Latched  
Front and main gear bow condition .....Check  
Landing gear pants and skid condition .....Check  
Skid shoes .....Check

**Open the luggage door, step for main rotor examination :**

Rotor hub .....General check  
Air intake and MGB compartment .....No foreign object  
Engine air intake screen .....Inspect and clean  
Blades leading edge ..... No debonding

**Step down and slam luggage door**

**Inside the cockpit**

Main controls condition .....Check  
Pedals .....Check  
Objects inside .....Stowed  
Removable controls (if installed) .....Check

## **Before starting engine**

|                                          |                                     |
|------------------------------------------|-------------------------------------|
| Harnesses .....                          | Both fastened                       |
| Cockpit .....                            | All objects correctly secured       |
| Pedals .....                             | Full travel free                    |
| Collective .....                         | Friction released, full travel free |
| Cyclic .....                             | Full travel free                    |
| Breakers .....                           | In                                  |
| Hourmeter .....                          | Checked                             |
| Fuel shut-off valve .....                | Checked ON                          |
| Collective .....                         | Down, friction on                   |
| Altimeter .....                          | Set                                 |
| All switches .....                       | OFF                                 |
| Carburetor heating switch .....          | Auto                                |
| MASTER switch .....                      | ON                                  |
| NR switch .....                          | Backup                              |
| NR green light .....                     | Checked ON                          |
| Lights and NR horn automatic check ..... | Monitored, all working              |
| .....                                    | except STARTER                      |

## **EPM starts**

### **Watch flight log**

Push #2 key to enter configuration page.  
 Set configuration as desired ..... refer to page 7-13  
 Push #1 key to freeze flight log page, push again to carry on.

### **Watch self-test**

If a parameter is failed, the page stays until acknowledged.  
 Refer to page 2-10 for no-go parameters.

### **Watch flight screen**

No alarm except : **OIL P - FUEL P - OIL T - CARB T** (if OAT corresponds)  
 If engine is cold ..... Cross-check OAT - CHT - OIL T - CARB T  
 Fuel quantity ..... Check

Governor ..... OFF, check GOV OFF light ON  
 Mixture ..... Forward, full rich

**Note 1 :** Before starting, NR green light, GOV OFF, OIL P, ALT. lights are on. CLUTCH light may also be ON.

**Note 2 :** The EPM has preflight functions described page 7-11 and following pages.

**Note 3 :** When the helicopter is soaked at very low temperature, (less than -17°C / 0°F) the EPM display may not start at once. Switch MASTER OFF and wait a few minutes in the cabin before switching it back ON.

**Warning :**

- **The clutch may have stayed engaged**, or engage unexpectedly, allowing the rotor to turn at starter engagement.
- **The blades can be very dangerous** particularly at low speed, and with gusts or wind. They are very heavy and flexible.
- ➔ **Never engage the starter** while the area is not completely clear of people and foreign objects in a **6 meter (20 foot) radius**. The blades may turn unexpectedly.
- ➔ **The pilot must not leave the cockpit** as long as the engine or the rotor turns. He must wait complete stop.
- ➔ **Strictly forbid all people presence** in the rotor area – 6 meter (20 foot) radius, while the engine is running or the rotor is turning, unless controlled by the pilot in command as follows :
- ➔ To allow a person enter or exit the cabin or rotor area – 6 meter (20 foot) radius, the pilot must :
  1. Make sure the **wind is less than 20 kt**,
  2. Hold the collective down,
  3. Hold the cyclic slightly aft,
  4. Maintain the RPM steady in the yellow – green arc,
  5. Watch the person in lateral sector and allow by a head sign.  
**Do not move the cyclic while the person has started moving towards the helicopter.**

It is the pilot's responsibility to make sure that take-off and landing area is clear from all people that could be endangered, and that all people approaching the helicopter are well aware of above warnings, and briefed to :

1. Stay clear 6 meters (20 feet) of the helicopter,
2. Watch the pilot and wait his sign before moving into the rotor area,
3. Bend forward and keep hands, cloths and objects low,
4. Move in the lateral area, in pilot's sight.

## Starting the engine

Headset..... ON  
Radio..... ON if needed  
Altimeter setting ..... Correlated with ATC information  
Compass heading indication ..... Verified  
Strobe ..... ON  
Fuel pump ..... ON, check Fuel pressure increase  
Manual fuel injections..... As needed  
Throttle..... Monitor on MLI : START as required between 0% and 15 %  
Rotor brake ..... Apply - check the light - lock forward  
Mixture ..... Full rich forward  
Ignitions, Magneto and Plasma..... ON, check beeper  
Area ..... Clear

### Radio clearance if needed

Starter ..... Activate  
STARTER light..... checked ON and back OFF when switch is released  
After engine starts, Throttle ..... Idle, 0% START on MLI  
Alternator ..... ON, check ALT goes off  
Check oil pressure light..... OFF within 30 seconds of starting  
*If not, shutdown the engine by mixture off*  
Set engine speed to ..... Warm engine : idle  
Cold engine : 1000 RPM  
CLUTCH ..... Engage and lock switch – check light is ON  
Rotor and Engine indicators..... Synchronized  
CLUTCH light..... Wait for OFF

**Note 1 :** Depending on belt condition and temperature, the rotor may slightly engage from engine start. In this case, engage clutch to avoid prolonged belt slippage.

**Note 2 :** As the rotor begins to spin, a cyclic stick rotation may occur. Center the stick smoothly.

**Note 3 :** ALT light may flicker at idle. Check ALT lights goes off above 1500 RPM.

**Note 4 :** When starting an engine soaked at very cold temperature (around -20°C / -4°F), apply not less than 5 fuel injection s and avoid high throttle settings.

**Ignition test :**

Set engine speed to.....2000 RPM (upper purple radial mark)  
Plasma OFF 5 sec. – maximum drop ..... 300 RPM (lower radial mark)  
Magneto OFF 5 sec. – maximum drop ..... 100 RPM

Set rotor speed .....NR < 450 RPM  
Wait for Oil temperature increase as needed.

Set rotor speed to ..... 530 RPM  
Check BARC backup green light lights ON

CARB. HEAT ..... HOT  
Wait for an additional Carb brick to pop  
Check that NR drops

CARB. HEAT ..... COLD  
Wait for the additional Carb brick to disappear  
Check that NR increases

CARB. HEAT ..... AUTO

Roll-off throttle to idle..... Check needles desynchronization  
Check lower BARC light blinks when NR in yellow arc  
Check warning horn when NR approaches lower red limit  
Switch BARC to mute warning horn. This will also switch to  
normal mode  
Check idle stabilization

Governor ON, Roll-in throttle .....  
check governor engages from NR = 400 RPM  
Check rotor speed in green arc

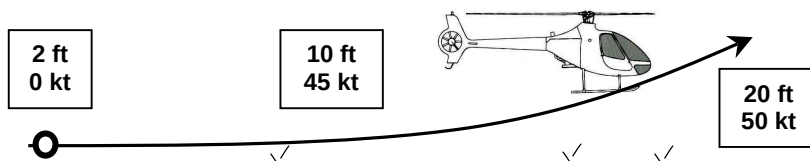
**Before take-off**

Oil temperature..... 30°C (86°F) minimum recommended  
60°C (140°F) minimum for max power  
Doors..... Closed or secured with strap  
Harnesses .....Both fastened  
Pressures and temperatures ..... Green arcs  
Warning and caution lights .....OFF  
Performance calculation ..... first limit checked on MLI  
Landing light and NAV. light .....As needed  
Radio .....As needed  
Collective friction .....Released

**Take-off procedure**

**On clear flat area**

1. Apply collective pitch progressively to stabilize hover at **2 feet skid height**.
2. Adjust cyclic trim.
3. Check engine parameters in green arcs and warning / caution lights OFF.
4. Apply slight forward cyclic to accelerate at a constant height.
5. At 45 kt IAS, rotate to reach and maintain 50 kt IAS.
6. Once climb is stabilized, adjust power as needed. Rate of climb should not exceed 500 ft/min below 100 feet in order to ease piloting in case of an engine failure.
7. Follow take-off profile shown on Height-Velocity diagram shown page 5-3 :



**Note 1 :** Take-off is possible without increasing power in case of a very slow acceleration on hard surface.

**Note 2 :** Take-off run may be shortened, by raising slightly the collective to compensate for height loss, if power margin enables it.

**On other surface** (confined area or surrounded by obstacles)

Refer to HOGE performance page 5-4.

Adapt acceleration procedure to environment by keeping rotor disk above horizon and avoiding as far as possible Height / Velocity limiting area (refer to page 5-3).

## **Climb**

Prescribed climb speed is 50 kt IAS.

Adjust power to obtain desired rate-of-climb. Maximum allowed power is indicated by 100% on MLI.

If full throttle is reached (100 % FLOW on the MLI), the rotor speed may decrease. In this case, slightly lower the collective to recover rotor speed.

## **Cruise and/or Level flight**

All parameters ..... Green arcs

Warning and caution lights .....OFF

Fuel remaining .....Check

Economy cruise is obtained with .....90% on MLI

Fast cruise is obtained with .....100% on MLI

Maximum endurance speed is..... 50 kt IAS

Best range speed is ..... 80 kt IAS

## **Flight time management**

The EPM has two features to ease flight management :

- A fuel flow computer, giving different data described page 7-15,
- A flight time counter, displaying the real flight time to be logged, described page 7-14.

The flight time display is frozen at rotor shutdown, until next start-up, and is stored in the EPM flight log page.

The average fuel flow during ongoing flight is stored in the EPM flight log page.

One flight is counted from rotor start-up, to rotor shutdown.

**Caution** : The fuel gage and fuel flow indication have a lower accuracy than their display.

Always perform a cautious fuel planning, and take adequate reserve for the kind of operation.

Always trust the LOW FUEL warning light as per page 3-15.

**Approach and landing**

Approach with ..... 50 kt IAS and -500 ft/min

Land on clear area

The target is ..... 50 kt IAS / 50 ft AGL / -500 ft/min

Flare gently with cyclic to reduce rate of descent and forward speed.

Gently raise the collective to stop in ground effect, hovering at 2 feet skid height.

For information only

**Engine / Rotor shutdown**

|                                    |                                       |
|------------------------------------|---------------------------------------|
| Collective .....                   | Down, friction on                     |
| Governor.....                      | OFF                                   |
| Engine cooling .....               | 420 < Nr < 450 RPM until CHT ≤ 180°C  |
| Idle.....                          | Stable                                |
| CLUTCH .....                       | Switch to disengage                   |
|                                    | Wait 10 seconds – check light is ON   |
| Mixture.....                       | Pull OFF to shut-down                 |
| Ignition switches .....            | OFF                                   |
| Landing light and NAV. light ..... | OFF                                   |
| Alternator.....                    | OFF                                   |
| Fuel pump.....                     | OFF                                   |
| Rotor brake.....                   | On request under 150 RPM (white mark) |
| Rotor.....                         | Stopped                               |
| Strobe.....                        | OFF                                   |
| Radio .....                        | Cleared and OFF                       |
| Hourmeter and EPM flight time..... | Noted                                 |
| MASTER.....                        | OFF                                   |

**Note :** The CLUTCH switch is active only if the MASTER switch is left ON during a few seconds.

**Disengagement with engine OFF**

If the engine was shut-down or has stalled while it was clutched, switch CLUTCH to disengage.

The MASTER switch can then be switched OFF after a few seconds.

Engine disengaged, the complete declutching can take a few minutes.

## **Training**

**Caution** : The Cabri G2 has a very capable rotor, giving her comparatively permissive autorotation characteristics. This allows efficient training and practice, from different situations and using different piloting techniques.

Following procedures are given as guidelines and should be followed for best safety.

However, pilot and instructor should keep in mind that power failure training is a very demanding practice, requiring a high level of awareness, good health and personal condition, and aircraft in perfect airworthy state.

Power failure practice must be limited to the strict needs of instruction and maintaining good proficiency. Never practice autorotation as a show.

Pilot must stay familiar with procedures described in Section 3 and follow them in case of a real failure.

Smooth and hard surface should be preferred to practice running landings. In order to familiarize with Cabri G2 landing attitude, practice powered running landings before autorotation training.

**Caution** : Before attempting running landings, check thoroughly carbide wear shoes. An unexpected drift during a running landing is a clue to a carbide shoe failure. Always check in case of doubt.

During autorotation training, try to keep the helicopter skids level at touchdown, to avoid unpleasant pitch-down and bouncing.

If the ground is not smooth and if the rotor speed is too low when the helicopter touches the ground, a pitch oscillation can happen, leading to an uncomfortable landing. In that case, the pilot has to keep the cyclic control in the neutral position in order to prevent induced oscillations.

### **Power failure in hover in ground effect practice**

1. Roll-off throttle frankly until on its stop,
2. Counteract yaw motion by applying left pedal,
3. Increase collective as ground approaches, to smooth landing,
4. Push collective down once landed.

**Note 1** : If the helicopter is light, it may bounce after a first touch down.

**Note 2** : The Cabri G2 has no natural tendency to depart in roll or pitch after failure. No systematic corrective cyclic action is needed.  
A slight forward motion at impact is recommended for better control.

**Note 3** : For a forgiving practice, respect a maximum of 5 feet height.

**Note 4** : Avoid practice at maximum gross weight.

### **Autorotation practice**

1. Lower collective full down,
2. Counteract yaw motion by applying left pedal,
3. Roll-off throttle through its spring ramp to its stop,
4. Maintain IAS between **30 and 50 kt IAS (50 kt IAS recommended)** by controlling longitudinal cyclic,
5. Slightly increase collective if required to keep rotor speed in the green arc,
6. At about 60 feet AGL, apply aft cyclic to raise the helicopter nose smoothly and continuously.
7. As ground closes-on, apply forward cyclic to level the helicopter while raising the collective to stop sink rate.
  - With a **50 kt IAS** approach, landing requires a longer distance but is easier to manage. Little action is required on the collective control since the flare will stop the sink rate.
  - A **30 kt IAS** approach needs smaller cleared area for landing but is more difficult to manage.
8. Use pedals to minimize ground drift,
9. Once stopped, lower the collective.

**Note** : When autorotation is stabilized with collective full down, the rotor speed should stay in the authorized range, whatever the weight and the altitude in flight envelope.

**Caution** : If airspeed drops below 30 kt IAS, push frankly the cyclic forward to recover airspeed.

### **Autorotation practice abortion**

If power recovery is decided during autorotation :

1. Roll-in throttle until governor engages,
2. Gradually raise collective pitch to stop autorotation and descent,
3. Control yaw during power recovery with pedals.

**Note** : Do not worry for very fast engine acceleration. There is no risk of overtorque at re-synchronization. Be prepared to yawing to the left when power recovers.

### **EPM failure**

A flight instructor should make the student familiar with the NR lights :

1. Select an appropriate flight phase with little workload,
2. Mask the EPM screen with a paper or the night vision filter,
3. Switch NR to "Backup",
4. Monitor flight in order not to exceed the power limit : moderate the cruise speed and practice cautious landing within this flight take-off conditions.

For information only

### **Engine governor failure practice**

To simulate an engine governor failure in flight, proceed as follows :

1. Switch-off governor,
2. Adjust twist grip in order to maintain engine/rotor speed in the middle of green arc,
3. Carry out a standard landing.

**Note** : The mechanical correlation is designed to minimize pilot workload in case of manual regulation.

For information only

## **Section 5      Performance**

|                                          |      |
|------------------------------------------|------|
| AIRSPPEED CALIBRATION .....              | 5-1  |
| ROTOR STARTING AND STOPPING LIMIT .....  | 5-2  |
| HEIGHT-VELOCITY DIAGRAM .....            | 5-3  |
| HOVER OUT OF GROUND EFFECT .....         | 5-4  |
| HOVER IN GROUND EFFECT .....             | 5-5  |
| RATE OF CLIMB AT $V_Y = 50$ KT IAS ..... | 5-6  |
| TAKE OFF DISTANCE .....                  | 5-10 |
| GLIDE DISTANCE IN AUTOROTATION .....     | 5-10 |
| SOUND EXPOSURE LEVEL .....               | 5-10 |

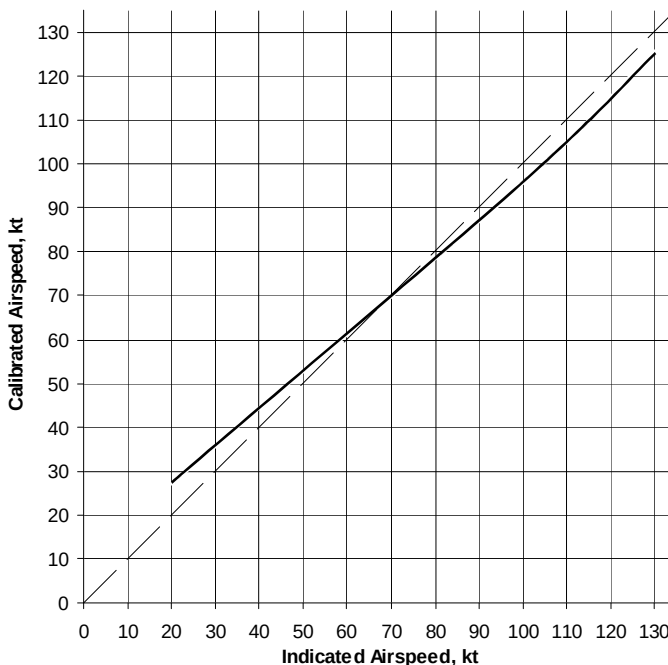
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The information in section 5, Performance, is approved by EASA.

### **Airspeed calibration**



#### **Notes :**

- Calibrated airspeed is equal to true airspeed at sea level in standard conditions.
- Indicated airspeed assumes zero instrument error. Difference with calibrated airspeed is caused by pressure ports installation.

**Rotor starting and stopping limit**

Maximum demonstrated wind for rotor start-up or shut-down : 40 kt, including gusts.

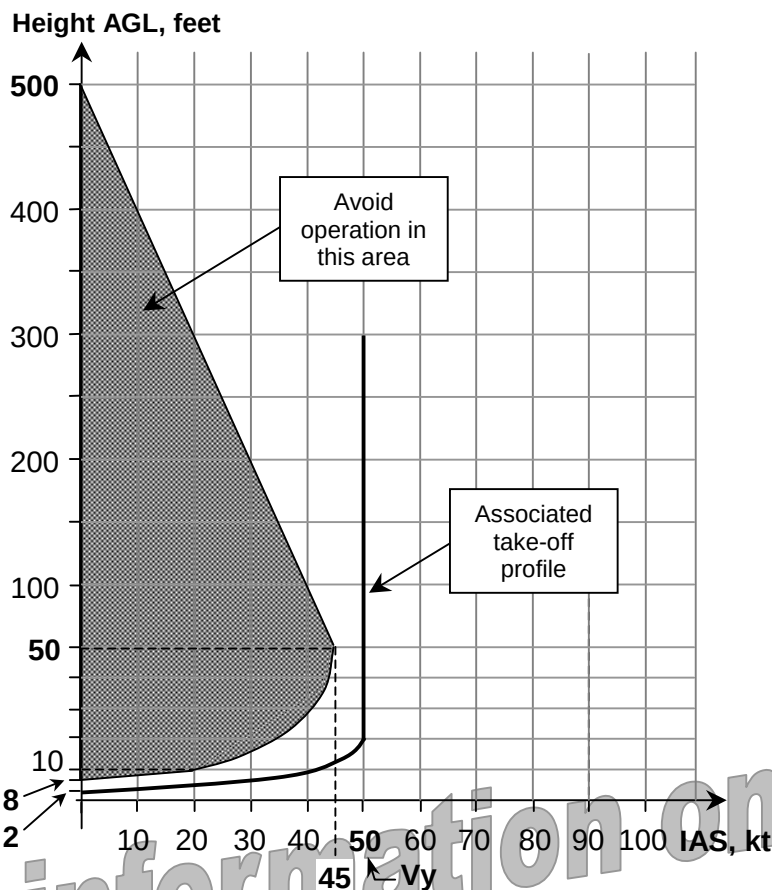
**Caution** : When starting or stopping the rotor in strong wind, lower fully the collective to its stop, and keep the cyclic in neutral position.

Apply rotor brake frankly from the specified speed.

DO NOT release until full stop.

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## Height-Velocity diagram

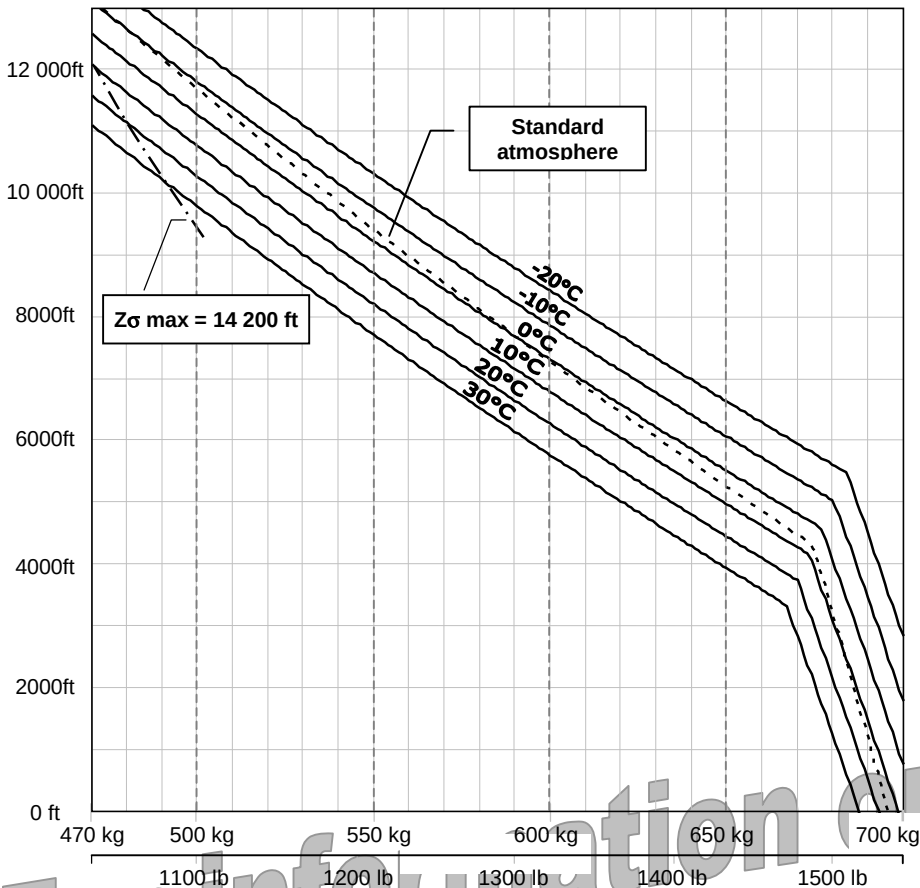


**Note :** With a view to simplicity, the same domain was demonstrated regardless of altitude and temperature. It means that some margin exist at lower altitudes, temperatures and weights.

During take-off, the pilot should pay attention to avoid this zone. In addition, he should limit the rate of climb to a maximum of 500 feet / min below 100 feet AGL, in order to limit the loss of rotor speed in case of power failure (see procedure page 3-3).

**Hover Out of Ground Effect**

**Zp**



**OGE hover performance**

- 20°C ≤ OAT ≤ ISA+30°C

No wind

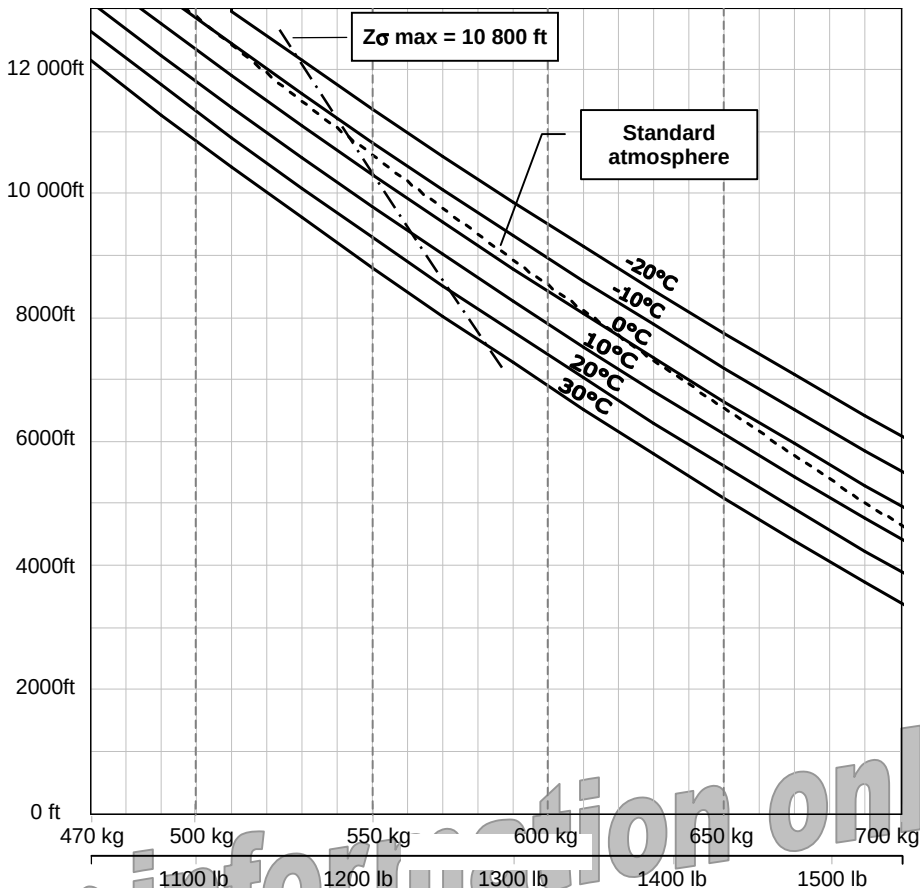
Engine speed = 2650 RPM

Max. Continuous Power

**Gross weight**

**Hover In Ground Effect**

**Zp**



**IGE hover performance**

Skid height = 2 feet - No wind

- 20°C ≤ OAT ≤ ISA+30°C

Engine speed = 2650 RPM

Max. Continuous Power

**Gross weight**

A wind speed of 35 kt at all headings was demonstrated at sea level.

A wind speed of 25 kt at all headings was demonstrated at maximum reduced weight

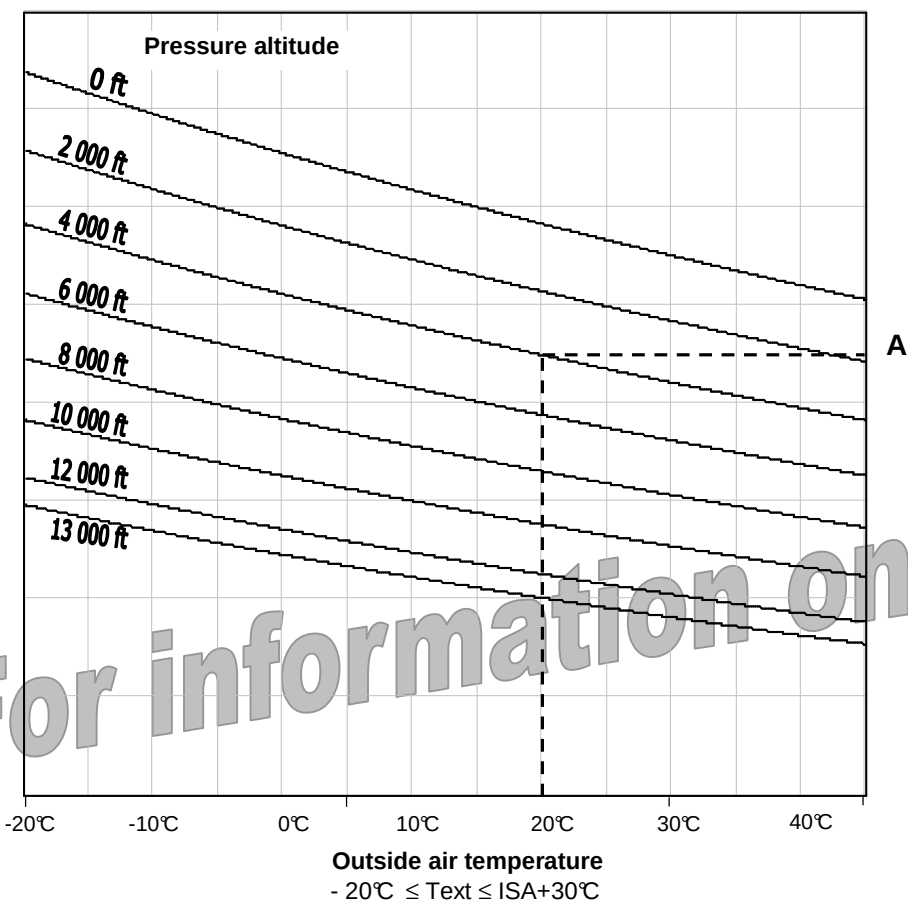
( $M/\sigma_{max}$  = 835 kg, refer to following pages for reduced weight computation).

### Rate of climb at $V_y = 50$ kt IAS

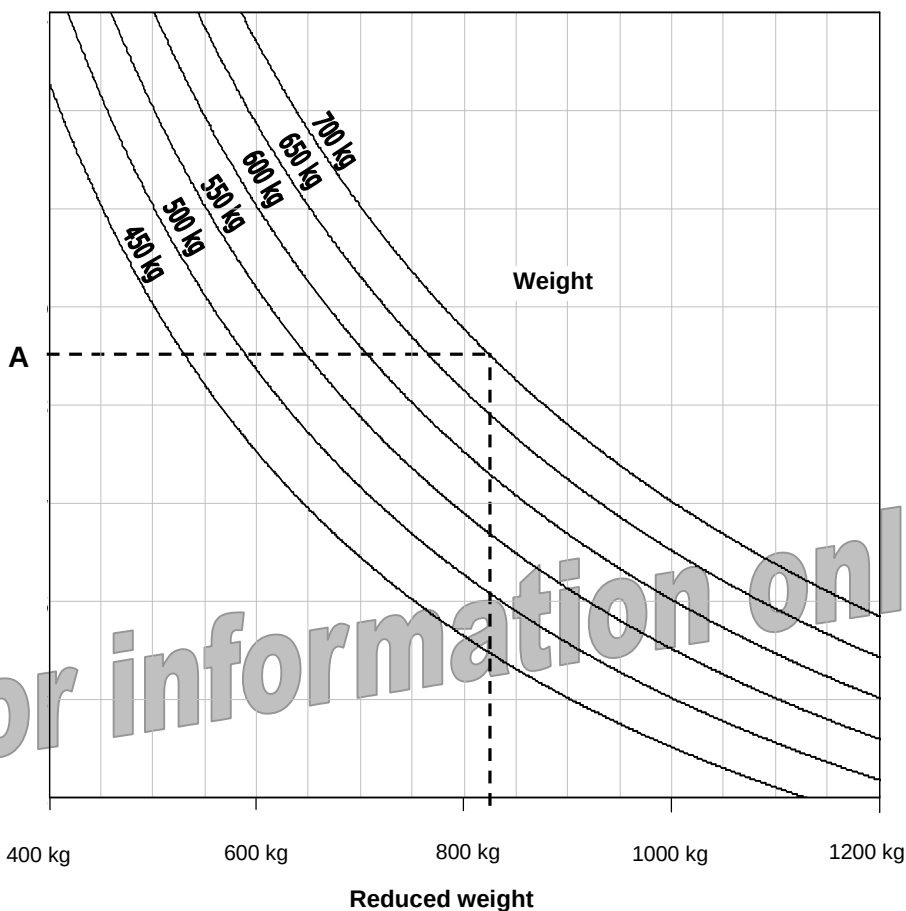
To determine the maximum rate of climb, first determine the reduced weight as follows :

1. Locate A on the left curves from outside temperature and pressure altitude,
2. Report A on the right curves and read the reduced weight from weight.

**Note** : The example is given for  $M = 700$  kg,  $OAT = 20^\circ\text{C}$  and  $Z_p = 4000$  ft.

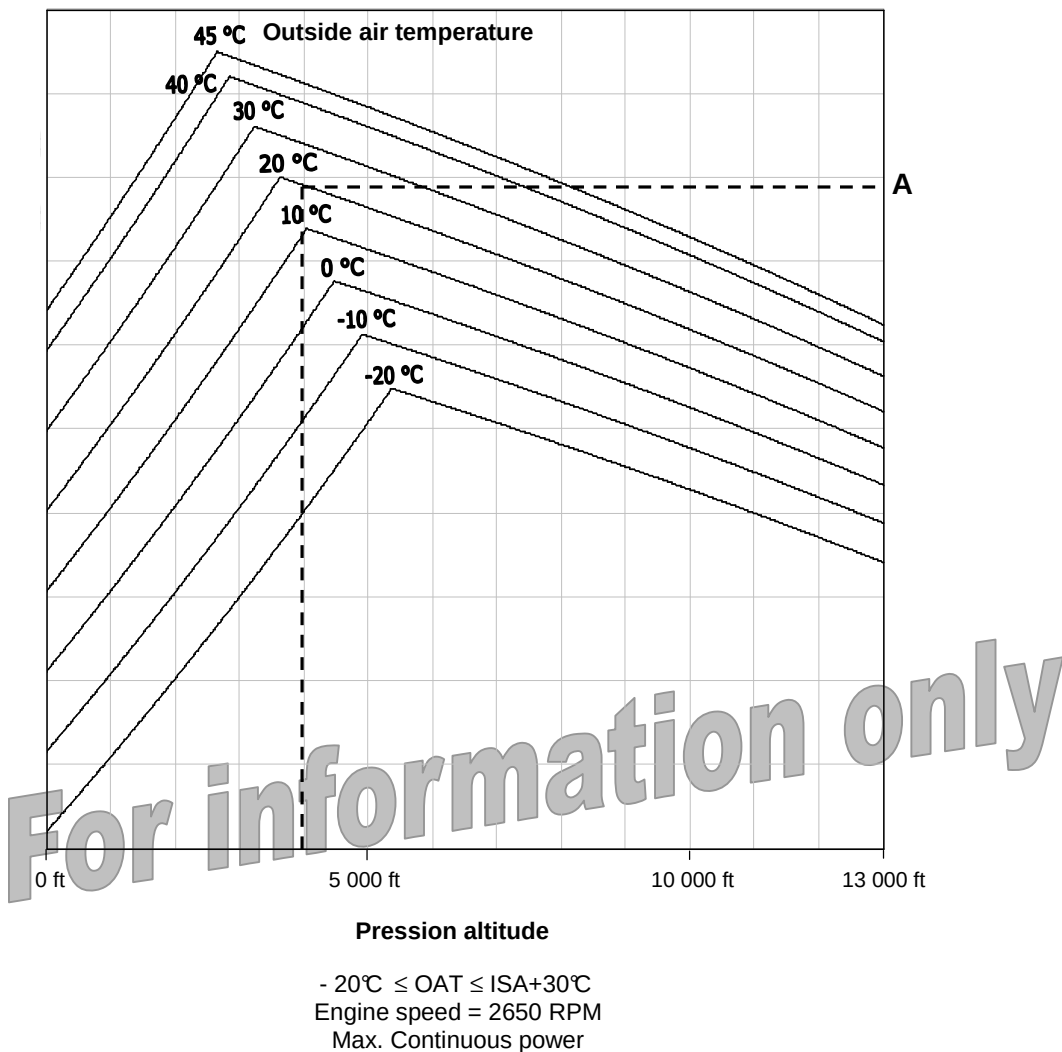


Reduced weight computation

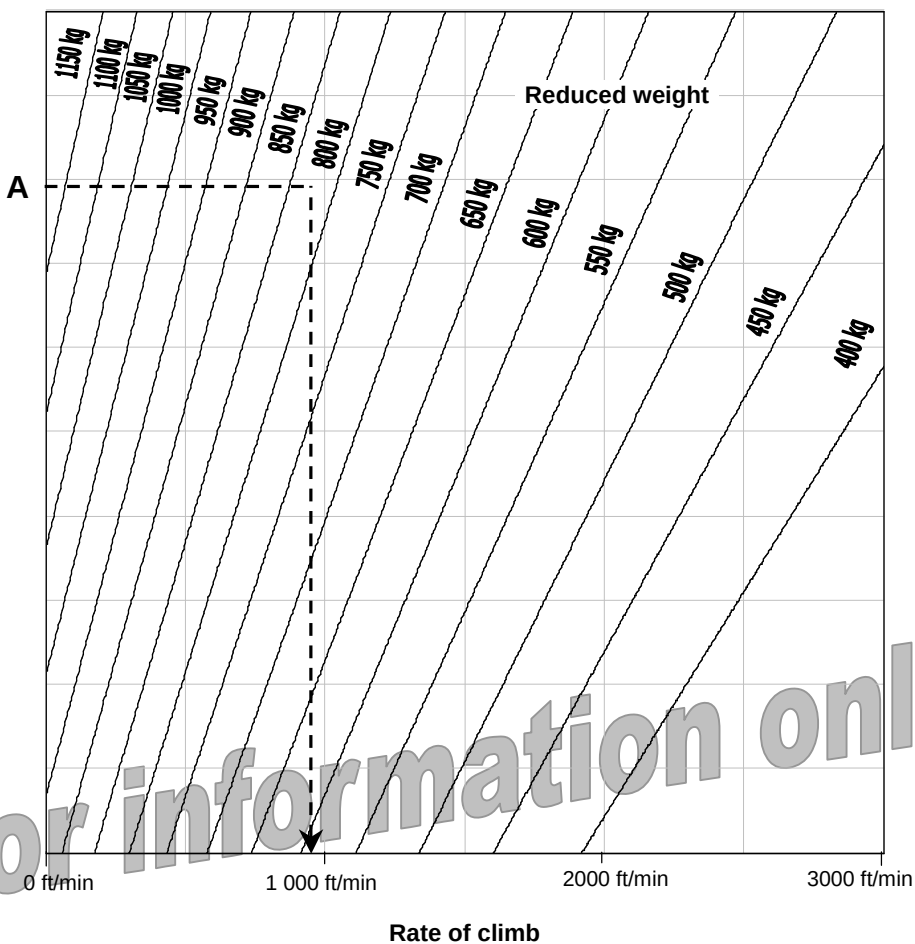


Determine maximum rate of climb as follows :

1. Locate A on the left curves from pressure altitude and outside air temperature,
2. Report A on the right curves and find climb rate from reduced weight.



Rate of climb computation



### **Take off distance**

Take-off distance, following recommended take-off profile described page 5-3 with 50 feet obstacle, at corresponding HIGE maximum gross weight is 330 m (1080 feet).

### **Glide distance in autorotation**

In stabilized autorotation with collective fully down, rotor speed stays within power-off rotor speed range. The following performance is then :

Minimum rate of descent .....1770 feet / min at IAS = 49 kt IAS  
- 0.8 kt IAS per 1000 feet Zp

Best angle of glide ..... 0,60 nm per 1000 feet at IAS = 78 kt IAS  
- 1.3 kt IAS per 1000 feet Zp

### **Sound exposure level**

Cabri G2 flyover sound exposure level is :

**75.7 dB SEL**

Confidence interval  $\pm 0.3$  dB. This measurement was established taking into account  $V_h = 100$  kt IAS.  
The sound exposure level was determined under ICAO regulation, Annex 16, volume 1, 2<sup>nd</sup> part, chapter 11.

**Section 6    Weight and balance**

|                                               |     |
|-----------------------------------------------|-----|
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| HELICOPTER WEIGHING PROCEDURE .....           | 6-4 |
| WEIGHT AND CG POSITION DETERMINATION .....    | 6-7 |

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### **General**

The helicopter must only be flown within the weight and balance envelope specified in Section 2. Operation outside these loading limits can result in degraded safety.

**Note** : Due to fuel position, the CG location will vary during the flight, especially laterally.  
During flight preparation, the pilot should ensure that the helicopter CG location stays within specified limits until consumption of all fuel.

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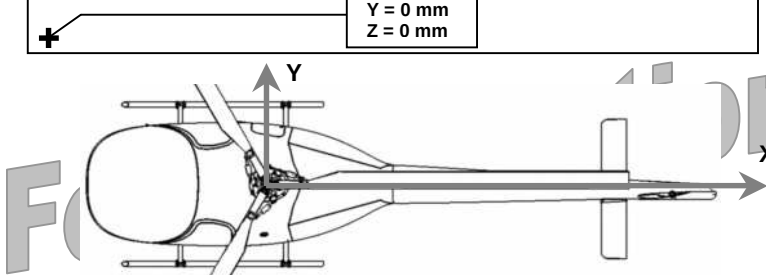
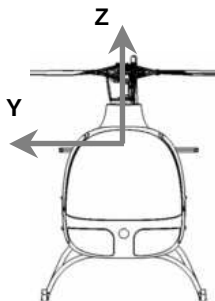
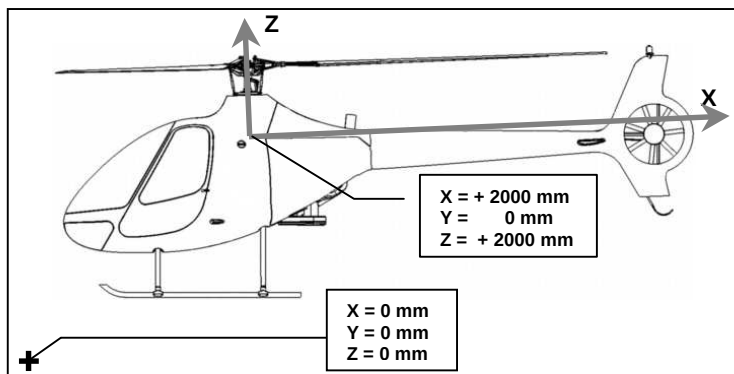
**Center of gravity, Standard definitions**

The Cabri G2 frame axis are defined as follows :

- Z-axis is parallel to the main rotor shaft, positive upward,
- X-axis is normal to Z-axis in the plane defined by Z-axis and tail rotor transmission axis, positive rearward,
- Y-axis is deduced from the two others, so that the XYZ frame is direct. Positive Y are on the helicopter **right side**.

Datum is defined such that main gearbox center coordinates are :

$$\begin{aligned} X &= + 2000 \text{ mm} \\ Y &= 0 \text{ mm} \\ Z &= + 2000 \text{ mm} \end{aligned}$$



- Notes :**
- The helicopter is not leveled when on a horizontal ground.
  - The tail rotor transmission is angled 2° downward when the helicopter is leveled.

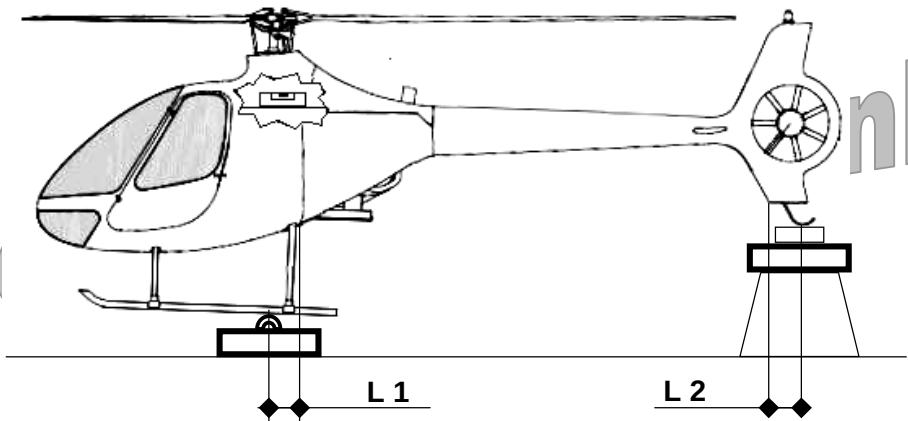
## **Helicopter weighing procedure**

### **1. Aircraft preparation :**

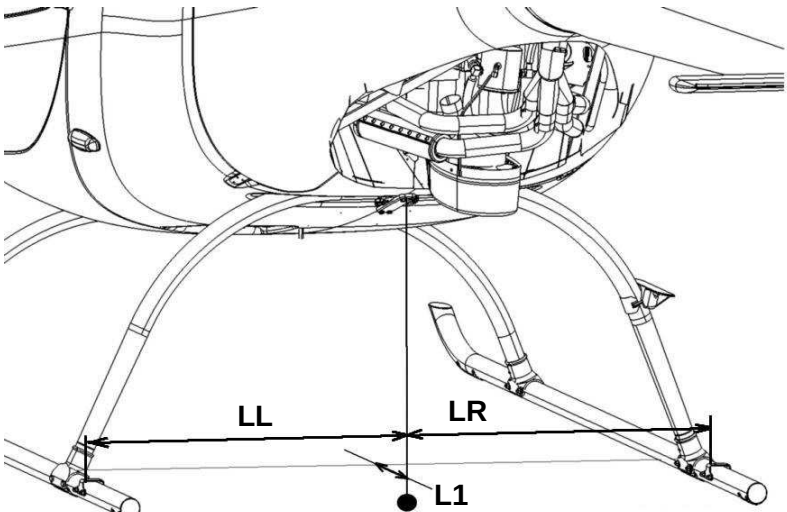
- Drain the fuel tank using the Gascolator drain (boost pump on),
- Fill engine oil and gearboxes to full,
- Make sure all checked items on equipment list are installed in their proper location,
- Make sure copilot controls are installed,
- Make sure aircraft is clean and remove any foreign item in cabin and luggage compartments such as charts, tools or rags,
- Mark helicopter equipment list to show exactly which equipment is installed,
- Close the doors and cowlings,
- Install ground handling wheels.

### **2. Weighing**

- Select a horizontal ground,
- Install three scales at appropriate distances, corresponding to the rear skid pants, and the tail skid. The tail scale should be on a box or a stool, with shims to adjust tail skid height :



- Install a piece of angle or half-round on the two front scales, to bear the skids on a precise point,
- Set the scales zero,
- Lift the helicopter nose by lowering the tail, and install it on the three scales. The front scales position should be forward of skid pants as shown, selected to ensure a 10 to 25 kg (20 to 50 lb) load on the tail skid,
- Remove the wheels,
- Level the helicopter, by adjusting tail skid shim. Use a carpenter level on the main gearbox torque plate as shown, parallel to the longitudinal axis,
- Stretch a thin wire between the two contact points of helicopter skids,
- Attach a plumb line to safety wire securing the two **rear bolts** clamping the main landing bow :



- Measure the horizontal distance **L1** between the wire and the plumb line. L1 is positive when plumb is aft. Measure **LL** and **LR** as shown,
- Measure the horizontal distance **L2** between the tail fin lower leading edge, and the tail skid contact point on the scale,
- Note the three scales readings **Mleft**, **Mright** and **Maft**

**3. Calculation**

Report these data in following table, to determine the helicopter empty weight and moments.

**In millimeters :**

| Weight   | Arm X         | Arm Y         | Mom X    | Mom Y    |
|----------|---------------|---------------|----------|----------|
| Mleft    | 2212 – L1     | - LL          |          |          |
| Mright   | 2212 – L1     | LR            |          |          |
| Maft     | 5913 + L2     | - 90          |          |          |
| Sum = EW | AX =<br>MX/EW | AY =<br>MY/EW | Sum = MX | Sum = MY |



**In inches :**

| Weight   | Arm X         | Arm Y         | Mom X    | Mom Y    |
|----------|---------------|---------------|----------|----------|
| Mleft    | 87 – L1       | - LL          |          |          |
| Mright   | 87 – L1       | LR            |          |          |
| Maft     | 233 + L2      | - 4           |          |          |
| Sum = EW | AX =<br>MX/EW | AY =<br>MY/EW | Sum = MX | Sum = MY |



### **Weight and CG position determination**

Before each flight, the pilot should determine helicopter gross weight and CG position in order to check that helicopter CG limits shown page 2-6 are not exceeded, and to determine performance (Refer to Section 5).

This can be done with the following table :

1. Determine all the weights in the first column,
2. Compute longitudinal and lateral moments,
3. Sum each three columns,
4. Calculate total arms by dividing moments by total weight.

#### **In metric units :**

| Item                       | Weight<br>(kg)           | Arm X<br>(mm)            | Arm Y<br>(mm)            | Mom X                    | Mom Y                    |
|----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Equipped aircraft          | <b>EW <sup>(1)</sup></b> | <b>AX <sup>(1)</sup></b> | <b>AY <sup>(1)</sup></b> | <b>MX <sup>(1)</sup></b> | <b>MY <sup>(1)</sup></b> |
| Right seat                 |                          | 1300                     | 320                      |                          |                          |
| Left seat                  | <sup>(5)</sup>           | 1300                     | -280                     |                          |                          |
| Doors                      | <sup>(4)</sup>           | 1250                     | +/- 600                  |                          |                          |
| Main luggage compartment   |                          | 1854                     | 323                      |                          |                          |
| Front luggage compartment  |                          | 325                      | 0                        |                          |                          |
| Fuel <sup>(2)</sup>        | <sup>(2)</sup>           | <sup>(3)</sup>           | <sup>(3)</sup>           |                          |                          |
| Supplements <sup>(6)</sup> | <sup>(6)</sup>           | <sup>(6)</sup>           | <sup>(6)</sup>           |                          |                          |
| <b>Total</b>               | Sum =<br><b>GW</b>       | <b>MX / GW</b>           | <b>MY / GW</b>           | Sum =<br><b>MX</b>       | Sum =<br><b>MY</b>       |

<sup>(1)</sup> Report aircraft equipped weight data

<sup>(2)</sup> Use 0.72 kg/L for AVGAS density

<sup>(3)</sup> For fuel position, use :

**Fuel Quantity.....X..... Y**

0 to 50 L.....1833 mm -313 mm

50 to 150 L.....1886 mm -338 mm

150 to 170 L.....1903 mm -342 mm

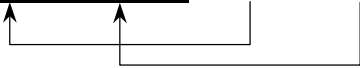
<sup>(4)</sup> Use - 4.2 kg (negative weight) when a door is removed

<sup>(5)</sup> Use - 5.5 kg when left seat is removed

<sup>(6)</sup> Refer to Section 9 for removable supplements

In Imperial units :

| Item                       | Weight<br>(lb)    | Arm X<br>(in)     | Arm Y<br>(in)     | Mom X             | Mom Y             |
|----------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Equipped aircraft          | EW <sup>(1)</sup> | AX <sup>(1)</sup> | AY <sup>(1)</sup> | MX <sup>(1)</sup> | MY <sup>(1)</sup> |
| Right seat                 |                   | 51.2              | 12.6              |                   |                   |
| Left seat                  | <sup>(5)</sup>    | 51.2              | - 11              |                   |                   |
| Doors                      | <sup>(4)</sup>    | 49.2              | +/- 23.6          |                   |                   |
| Main luggage compartment   |                   | 73                | 12.7              |                   |                   |
| Front luggage compartment  |                   | 12.8              | 0                 |                   |                   |
| Fuel <sup>(2)</sup>        | <sup>(2)</sup>    | <sup>(3)</sup>    | <sup>(3)</sup>    |                   |                   |
| Supplements <sup>(6)</sup> | <sup>(6)</sup>    | <sup>(6)</sup>    | <sup>(6)</sup>    |                   |                   |
| Total                      | Sum =<br>GW       | MX / GW           | MY / GW           | Sum =<br>MX       | Sum =<br>MY       |



- <sup>(1)</sup> Report aircraft equipped weight data  
<sup>(2)</sup> Use 6.0 lb/gal for AVGAS density  
<sup>(3)</sup> For fuel position, use :

Fuel Quantity ..... X..... Y

0 to 13 U.S. gal ..... 72.2 in -12.3 in

13 to 40 U.S. gal ..... 74.2 in -13.3 in

40 to 45 U.S. gal ..... 74.9 in -13.5 in

- <sup>(4)</sup> Use - 9.2 lb (negative weight) when a door is removed  
<sup>(5)</sup> Use - 12.1 lb when left seat is removed  
<sup>(6)</sup> Refer to Section 9 for removable supplements

## **Section 7    Systems description**

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## **Airframe**

### **General**

The Cabri G2 airframe is composed of three sections :

- The main fuselage, including cabin, central structure, luggage and fuel compartments. It is all made of composite sandwich.
- The engine section, isolated between a front and an aft firewalls. It is made of the steel truss engine mount, and composite cowlings.
- The aft structure, a composite shell combining the tail boom, the fins, and the tail rotor shroud, with the horizontal stabilizer.

Two composite cabin doors enable passenger / pilot access.

One composite door enables external access to the luggage compartment.

### **Landing gear**

The main landing gear is composed of two tubular bows, and two skids. It is attached to the fuselage by soft elastomeric mounts, giving adequate frequency tuning against ground resonance. There is no damper.

The landing skids are protected against abrasion by a set of carbide wear shoes.

### **Seating**

The cabin features two high-energy absorbing, stroking-seats, improving occupants protection in case of a crash.

The left seat pan can be removed to carry large cabin luggage.

For information only

## **Dynamic systems**

### **Main rotor**

The Cabri G2 main rotor is a three-bladed, fully articulated, soft-in plane rotor.

The rotor hub is forged from aluminum alloy, and attached to the stainless-steel mast, by a large splines and cones attachment, with a thrust nut. The hub is belted with a tough fiberglass winding, which increases its tolerance to damage.

The blades are made of carbon and fiberglass-reinforced composite, with a large internal steel tip weight, and lead balance weight, to increase rotor inertia.

Their fork attachment is directly connected to an elastomeric, spherical thrust bearing which ensures pitch, flap, and lead-lag motions.

They have a two-section, thick stainless steel leading edge cap which protects them against erosion due to sand, dust and precipitations.

Each blade is linked to the rotor hub via an elastomeric lead-lag damper, made of a single cylindrical layer of special rubber.

The blades are restrained in flapping-down, by a reciprocal droop-stop ring, guided in the rotor hub. They are restrained in flapping-up by an upper positive stop.

### **Tail rotor**

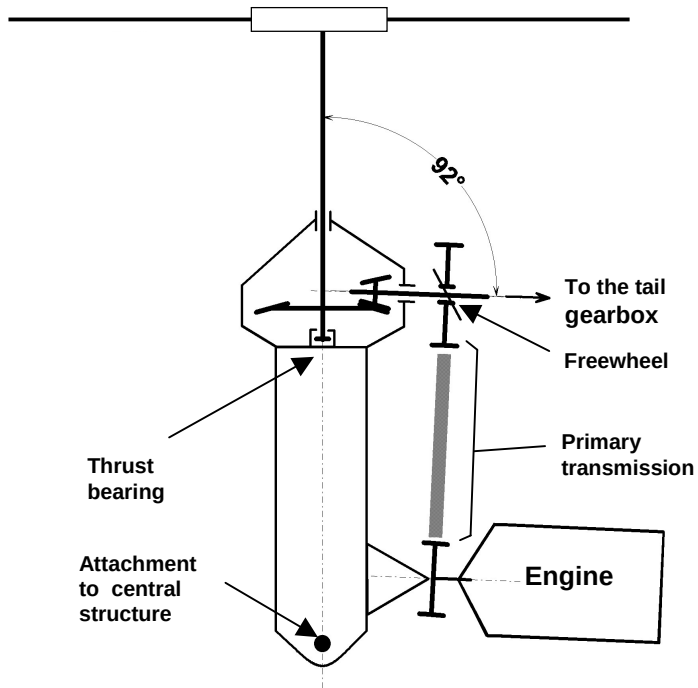
The tail rotor is shrouded in the vertical fin.

It has seven reinforced-plastic-injected blades. Pitch change is permitted by their stainless steel laminated tension-torsion pack.

The tail rotor hub is directly mounted on, and driven by the tail gearbox, and its pitch control mechanism is part of the gearbox.

The tail gearbox is rigidly supported inside the shroud, by a three-tube mount. The front tube houses the tail rotor driving shaft.

### Transmission



The primary transmission is composed of a pulley directly bolted to the engine output flange, a poly-V belt transmitting the power, and an upper pulley connected through a freewheeling unit to the gearbox input.

The power is transmitted :

- forward to main gearbox, and
- aft to the tail rotor transmission.

The main gearbox contains a splash-lubricated spiral bevel-gear set which transmits power to the rotor mast. It is equipped with a filler plug / breather, a sight gage and a self-closing magnetic chip detector.

The main gearbox upper and lower casings act as a tough central structure, rigidly bolted in the middle of the fuselage structure.

The steel tail rotor transmission shaft runs inside the tail cone, on three ball bearings.

A disc rotor brake is installed on the fore portion of tail transmission shaft. The brake jaws are actuated through a cable control, from an overhead control quadrant.

The tail gearbox contains a splash-lubricated spiral bevel-gear set which transmits power to the tail rotor.

It also incorporates the tail rotor pitch control mechanism.

It is equipped with a filler plug / breather, a sight gage and a self-closing magnetic chip detector.

### **Flight controls**

The Cabri G2 has dual flight controls which includes cyclic stick, collective stick and pedals.

Left controls are totally removable, without tools, if needed. They can be stowed in the cabin luggage compartment.

Cyclic and collective controls actuate main rotor blade pitch through push-pull rods, bellcranks and the swashplate.

Yaw control is transmitted from the pedals to the tail rotor by a long flexible push-pull control.

The collective stick grip is divided into one fixed part and one twist grip to enable sensitive throttle control, and to allow governor motion.

The collective stick is equipped with a friction mechanism, which is controlled by the pilot, without releasing his hands from the controls.

The cyclic sticks have no friction mechanism, but a dual-axis electric trim, allowing to completely release the static forces in flight.

This trim system is controlled either by the pilot or the copilot, through a circuit which gives priority to the one who activates it first.

### **Rotor brake**

A rotor brake allows the pilot to stop quickly the rotor after flight. This rotor brake is mounted on the tail rotor transmission. It is actuated by a cable connected to a pull handle located above the pilot (yellow handle).

## **Engine installation**

### **Engine**

The engine is a four-cylinder, direct-drive, carbureted gasoline engine. It is installed in the central compartment, suspended through elastomeric vibration mounts.

It moves slightly to control the main transmission belt tension for clutch engagement / disengagement.

### **Clutch**

The clutch tension actuator is fed by engine oil pressure through a four-way distributor, controlled by the CLUTCH switch.

This system is frozen in case the electrical power is shutdown.

A non-return valve maintains the pressure in case of engine stoppage, or oil pressure loss.

A gas spring maintains the engine disengaged during prolonged stop.

The CLUTCH light lights OFF when the pressure of the oil feeding the distributor is above 3.6 bar. In the clutched position, it means that the belt is tensioned. In the declutched position, it means that the clutch cylinder is on its declutched stop.

### **Air induction**

The engine air intake is located inside the main gearbox compartment, on the right side. It is fed in fresh air, by the front inlet above the cabin.

A wire screen prevents foreign object ingestion.

The air is ducted down the firewall, to an air filter box, behind the carburetor.

This air box includes an electrically-actuated butterfly valve, which controls the carburetor heating, and the air filter.

Both cold and hot air are filtered.

An air intake temperature probe, located inside the air filter, sends the carburetor inlet temperature to the EPM.

### **Ignition system**

The engine has a dual-plug, mixed ignition system comprising :

- One magneto with constant timing,
- One solid-state electronic capacitor-discharge system, with variable timing.

The electronic system is direct-fed by the battery through a dedicated circuit breaker, located on the cabin breaker panel.

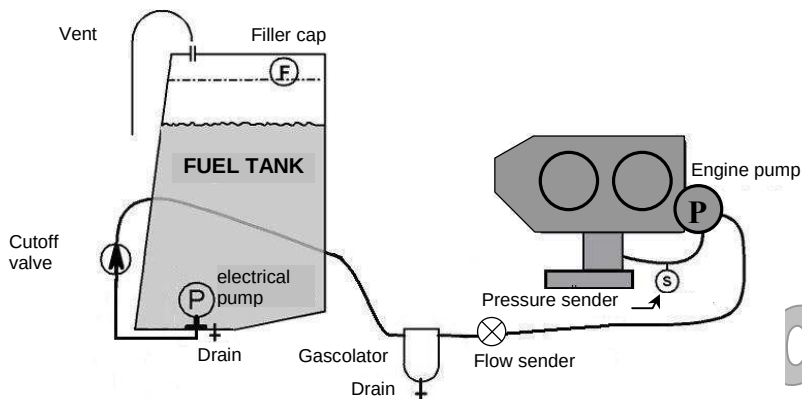
### **Cooling system**

The engine is air-cooled, with an additional oil cooler.  
Cooling air enters the upper cowling plenum around the mast and gearbox. It is forced by a squirrel-cage blower, directly driven by the engine.  
Warm air is exhausted below the engine.

### **Fuel system**

The fuel system comprises :

- a single, crash-resistant fuel tank,
- an submersed electric booster pump,
- the engine-driven pump,
- a shut-down valve,
- a gascolator.



## **Electrical circuit**

The electrical systems are powered by a 12 V, 25 ampere-hour battery located in the left engine compartment, and a 13.7 V, 60 A alternator controlled by a voltage regulator.

A main breaker panel is provided in the cabin, and a secondary breaker panel is located inside the battery shelter.

Various switches are located on the instrument panel. The MASTER switch disconnects all the systems from the battery except :

- NR lights (BARC) backup,
- PLASMA ignition system,
- Doors remote control,
- the 13.7 V Auxiliary power socket,
- Some supplemental equipments (see Section 9).

### **Starting protections**

On ground, before clutching, the system prevents from cranking the engine if :

- It is already running,
- The anti-theft system is activated.

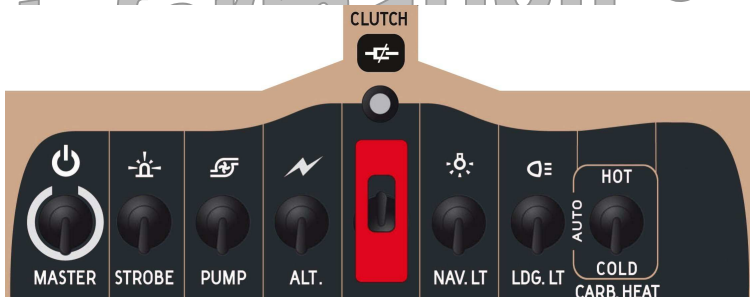
During flight, the anti-theft system is disabled to permit engine restart in any situation.

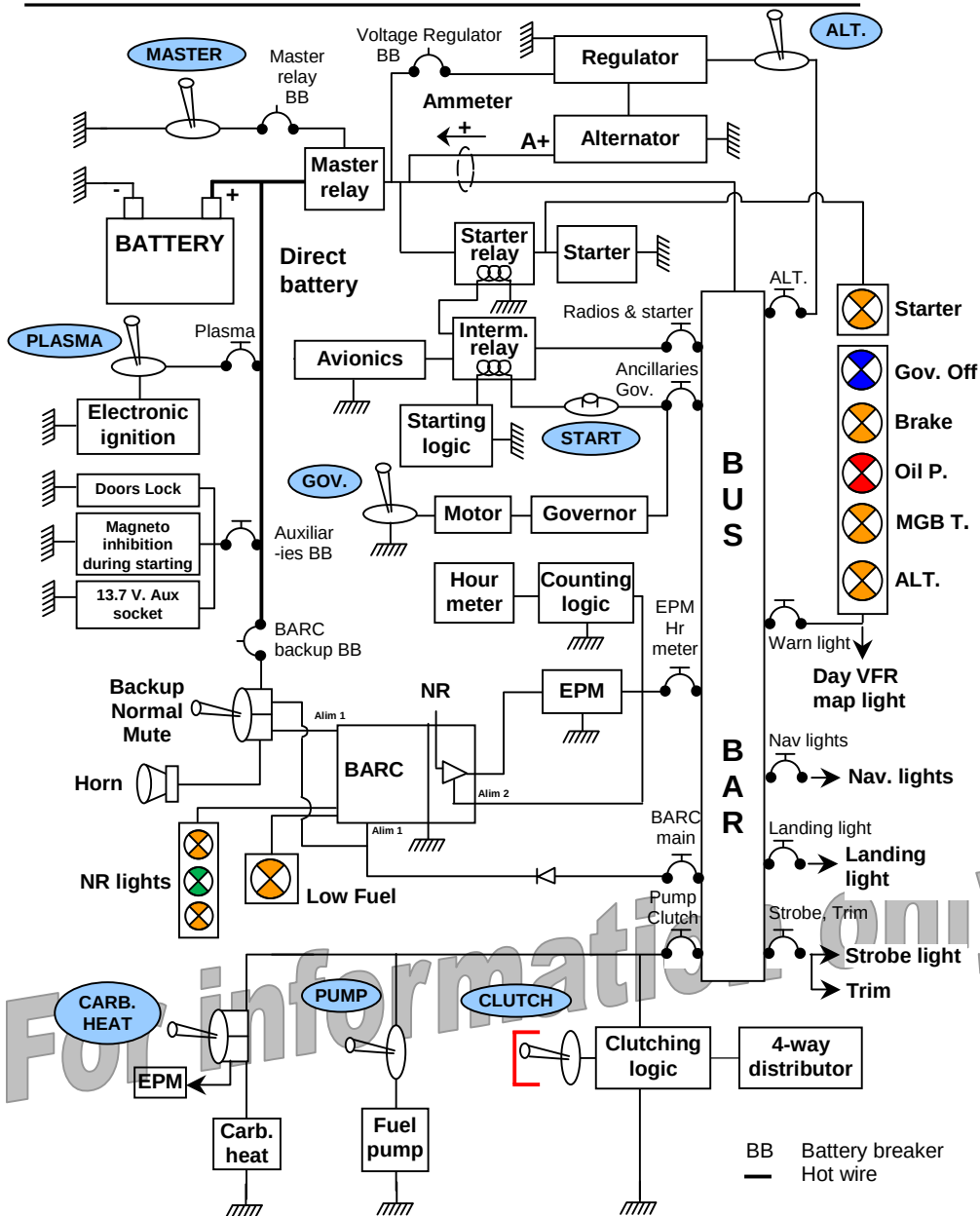
### **Clutching feature**

Clutching is disabled when the rotor brake is applied or seized.

## **Switches**

The instrument panel presents a row of 8 switches, identified by an icon and their function :



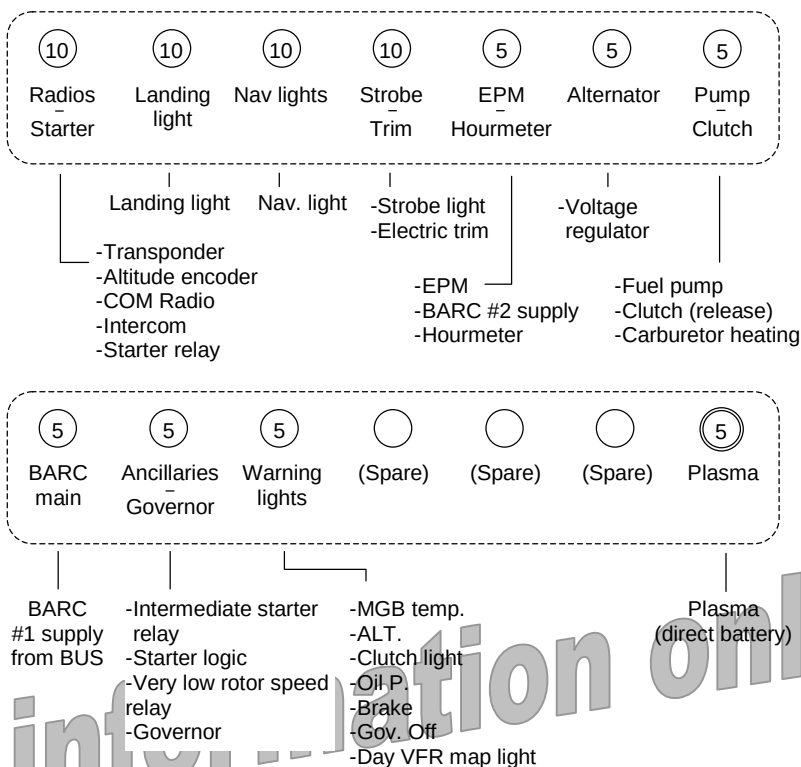


Note : In case of additional equipment, refer to corresponding supplement in Section 9 for wiring description.

## Breaker panel

The breaker panel is located on the cabin bulkhead between the two seats. The breakers are marked to indicate their function. They are of push-pull type.

**Caution** : Some systems are grouped on the same breaker.  
If a circuit breaker pops-off, wait a few seconds before resetting it.  
Do not try twice.



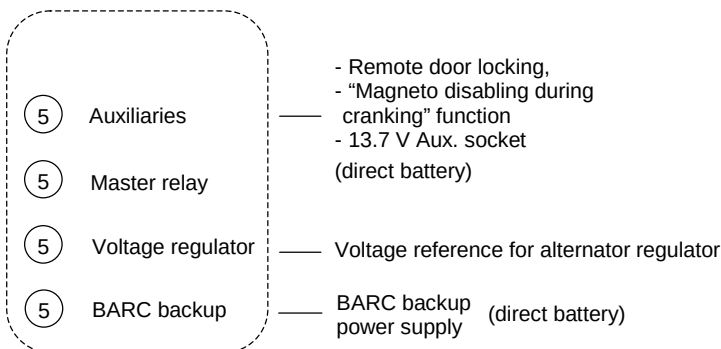
The breakers value is given in amperes on the breakers.

**Note 1** : The Plasma is the only direct battery breaker on the panel.  
Other direct battery breakers are located in the battery shelter (refer to next page).

**Note 2** : In case of additional equipment, refer to corresponding supplement in Section 9 for breaker panel description.

### Battery breakers

Four breakers are located in the battery shelter, two of which are in direct battery :



**Note** : They are "push" breakers except for the Auxiliaries one (refer to page 7-19).

### Instrument panel and console

The standard flight instruments include airspeed indicator, altimeter, vertical speed indicator, magnetic compass and the EPM.

Space is available for one additional conventional instrument.

Refer to Night VFR supplement (Section 9) for wide instrument panel.

The basic avionics stack includes a VHF transceiver, transponder and an intercom.

Space is available for additional equipment.

### Emergency locating transmitter

The ELT is located inside the luggage compartment. It is attached to the main bulkhead by a strap in the lower corner.

The ELT switch should be in ARMED position. Then the 3-position switch on the breaker panel can be used for remote control :

- ON (transmission) enables manual activation of the ELT,
- ARMED : stand by mode to enable automatic activation by the shock sensor. Unless there is an emergency, the switch must stay in that position.

For additional features, refer to ELT operation manual.

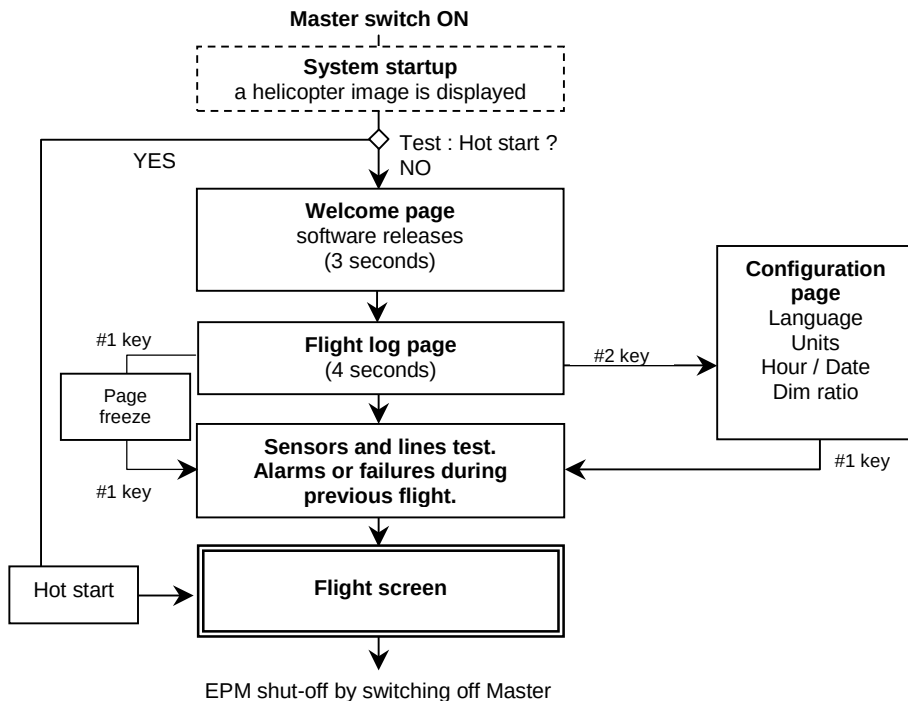
**Electronic Pilot Monitor - EPM**

**Flight screen**



## Starting sequence

The EPM is powered through the MASTER switch. The functioning synoptic after switching on is as follows :



**Note :** Hot start is defined by “Rotor in flying mode” signal (refer to page 7-16).

After an unexpected power cut in this condition, the EPM flight screen recovers within seconds.

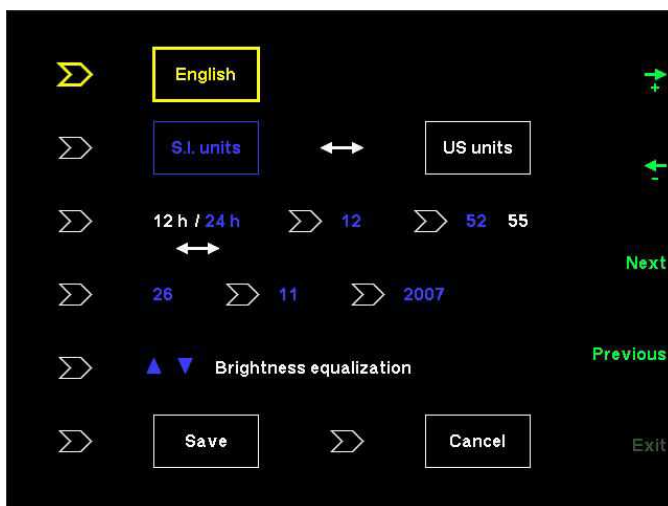
Restart in the welcome page can be done by cutting power off on the ground, with a low rotor speed (out of “flying mode”).

## Flight log page

This page presents, for each of the **last 15 flights** :

- The date and time of the engine start-up,
- The flight time (refer to page 7-14),
- The average fuel consumption (refer to page 7-15).

### Configuration and settings page :



Note : Brightness equalization is used with the instrument panel lighting. It is set during maintenance.

### Sensors and alarms test page :

| Parameter          | Status |                 |
|--------------------|--------|-----------------|
| OAT                | OK     | NR              |
| Pressure           | OK     | NM              |
| T. induction       | OK     | Flowmeter       |
| CHT                | OK     | CPU temperature |
| EGT                | OK     | Alarms :        |
| Carb T.            | OK     | Fire            |
| MAP                | OK     | MGB chips       |
| Throttle           | OK     | TGB chips       |
| Oil T.             | OK     | CO              |
| Oil P.             | OK     | Power supply    |
| Fuel Q.            | OK     |                 |
| Fuel P.            | OK     |                 |
| Fire               | OK     |                 |
| MGB chips          | FAILED |                 |
| TGB chips          | OK     |                 |
| Battery            | OK     |                 |
| CO                 | OK     |                 |
| Power supply       | OK     |                 |
| Memory battery     | OK     |                 |
| Cooling fan        | OK     |                 |
| Carb. heat control | OK     |                 |

The amber caution icons indicate failures that were detected during the last flight.

The amber "FAILED" indicates a line/sensor failure during the self-test.

### **Start indicator**

In START mode, MLI indicates the throttle position to assist the pilot to start the engine.

Mode activation when  $NR \geq 420$  RPM

Mode deactivation when  $NR \leq 300$  RPM

### **Clock - Stopwatch - Flight time counter**



The clock is a continuous display. 12 or 24 - hour format can be selected through configuration page.

The flight time counter is counting the time spent from  $NR \geq 450$  RPM, and until  $NR \leq 400$  RPM.

It discounts the warming, cooling and briefing times in a flight.

Its display is frozen when NR drops below 400 RPM, and is reset zero only on the next flight, when NR increases above 450 RPM.

At EPM shutdown, flight time is recorded in the flight log page (refer to page 7-12).

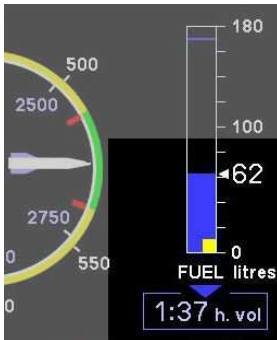
The stopwatch can be activated and started instantly by pressing the #1 key once. It then replaces the flight time display.

The flight time display comes back after 20 s of stopwatch being inactive at zero, or by pressing #2 key twice from stopped state.

## Fuel flow modes

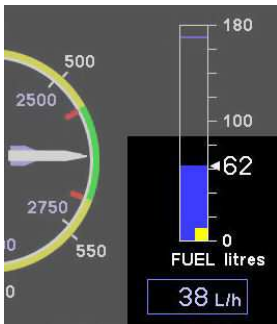
Three different fuel flow display modes can be selected, by pressing the #3 Key cyclically :

- Remaining flight time
- Instantaneous fuel flow
- Average fuel flow



### Remaining flight time

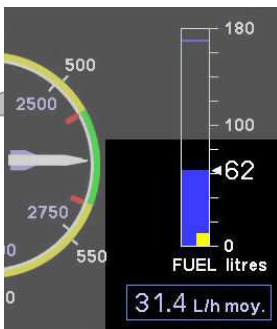
- Standard mode at startup
- Compute approximate flight time to starvation, based on instantaneous fuel flow **averaged about one minute**
- Displays -:- during 2 min after startup



### Instantaneous fuel flow

- Automatically displayed when approximate fuel quantity is **below 10 liters** (2.6 U.S. gal)

**Warning** : Do not rely on fuel quantity indication when caution light is ON or EPM warning is active.



### Average fuel flow

- Calculate average flow since flight start, based on flight time counter
- Displays -:- during 2 min after startup
- Value at the end of flight is stored in log page

## **Carburetor heat**

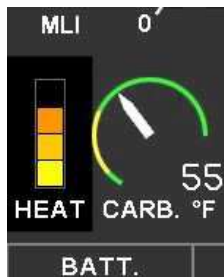
The Cabri is equipped with a two-mode carburetor heat :

- Normal automatic mode (switch on AUTO) : the EPM monitors carburetor temperature and controls the heating valve to keep it outside the yellow zone,
- Manual / test mode (switch on HOT or COLD) : The pilot manually controls the valve, overriding the EPM.

### Indicator

A four-brick indicator informs the pilot of the amount of carburetor heating actually measured at carburetor inlet.

Full carburetor heat is divided in four steps, each represented by one brick.



**Note 1** : During ground run or at low power setting, with a warm engine, T. induction may be biased by carburetor body heat radiation. For this reason, a brick can appear whereas the heating valve is closed.

**Note 2** : - In automatic mode, the EPM gradually opens the valve as needed to maintain Tcarb out of the yellow zone. The amount of heating is given by the indicator.

- In manual mode, the pilot can either completely open (HOT) or completely close (COLD) the valve. When on HOT, all four bricks might not be lighted, depending on environmental conditions.

**Note 3** : Conditions conducive to carburetor icing are :  
High humidity, low temperature,  
Operating near water,  
Moderate to low power setting.

## **BARC**

BARC (Fuel and rotor alarm device). It is designed as an alternate mean in case of EPM failure.

It should be preferred in case of doubt.

When the MASTER is switched ON, the BARC conducts a testing sequence for caution / warning lights on the instrument panel, and the rotor speed horn.

In order to reinitiate the testing sequence, the MASTER should be switched-off during 45 seconds (make also sure that NR switch is on MAIN).

In case of an electrical bus failure, the BARC can be switched to a direct battery backup supply.

### **Main and backup modes**

#### **Continuous**

Power-off maximum NR threshold  
 $NR \geq 594 \text{ RPM}$   
 Intermittent horn

#### **Flashing**

Power-on maximum NR (red limit)  
 $NR > 540 \text{ RPM}$

#### **Flashing**

Power-on minimum NR (red limit)  
 $NR < 515 \text{ RPM}$

#### **Continuous**

Power-off minimum NR threshold  
 $NR \leq 466 \text{ RPM}$   
 Continuous horn

### **Backup mode only**

#### **Green NR arc**

$515 \text{ RPM} \leq NR \leq 540 \text{ RPM}$

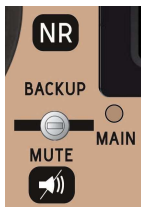
Also comes ON  
 at non-flying NR  
 to prevent from draining  
 the battery low.



### **“Rotor in flying mode” signal**

|                     |                                |
|---------------------|--------------------------------|
| Signal activation   | when $NR \geq 450 \text{ RPM}$ |
| Signal deactivation | when $NR \leq 400 \text{ RPM}$ |

**Switch functions :**



Backup mode : BARC is powered directly by the battery. Central green light is active.

Main mode : Normal operation. Green light is inactive.

Mute : Mutes the continuous NR horn (self reactivation).

**LOW FUEL functions :**

LOW FUEL light lights on when independent sensor is set off (less than 12 L).

Lighting is signaled by a short tone.

Caution light should be preferred to EPM indication in case of doubt.

**Other equipments**

**Pitot - Static system**

The Pitot tube is non-heated. It is located under the helicopter belly.

The static port is located just aft of it.

**Engine governor**

An electric engine governor helps the pilot control the engine speed. When engaged, it acts on the twist grip to control throttle.

Once switched-on, the governor engages above 2000 RPM (NR = 400 RPM), and self-disengages below.

The pilot can disengage it by two ways :

- Using the GOV switch located on the tip of the collective stick. The GOV OFF light then comes on,
- Forcing the twist-grip to NM = 2000 RPM, for an engine failure simulation.

At any time, a friction clutch in the governor motor enables the pilot to overtake it by acting on the twist grip. The pilot can easily disengage the governor while overtaking its action.

### **Doors lock / Anti-theft**

Remote doors lock is provided by a small radio transmitter. It uses a radio security-code to control the cabin doors locks, and enable/disable the engine starter.

**Note :** The starter is enabled when the “Rotor in flying mode” signal is active (see page 7-16), whatever the anti-theft state.

The anti-theft can be disabled (starter enabled) if not needed :

- Peel-off the CODE label on the left side of the central console, below the instrument console. Locate the small 8-switch line,
- Key the 8-bit helicopter individual security code : 1 is up, 0 is down
- To activate the anti-theft back, just scramble the switches.

If the transmitter is not operative, following procedure permits to fly :

- Locate the backup key lock on the right firewall, above the Gascolator,
- Open the luggage door, using the backup key,
- From the luggage door, reach the right cabin door lock,
- From the right seat, open the left door lock,
- Use above procedure to disable the anti-theft.

**Note :** The remote door locking circuit has a very small standby current drain. However, when storing the helicopter for more than a month, pull the AUXILIARIES battery breaker, inside the battery shelter.

### **Lights**

The helicopter is equipped with :

- a strobe light atop vertical fin,
- navigation lights on fuselage sides,
- a landing light in the nose.

Refer to Section 9 Night VFR for optional cabin lights.

## **Cabin and amenities**

### **Luggage compartments**

A 200 liter luggage compartment is provided in the right side of the fuselage.

It can accept two standard trolley cabin suitcases.

It is accessible from the outside, through a hinged door, and from the cabin through a small access hole, limited to soft objects.

Another luggage compartment is provided in the cabin, to stow the removable passenger controls, and some small cabin luggage : camera, drink, etc.

It is accessible from a small door in front of the passenger pedals. It features a cigarette-lighter socket for auxiliary power output.

Soft luggage like clothes can be stowed under the stroking seats.

### **Ventilation and heating**

Each door has an adjustable fresh air vent.

For a better ventilation at lower airspeeds, and particularly in a hover, doors must be partially opened during flight using the cord strap.

A cabin heater / defogger is provided. It takes its air from the engine cooling blower.

The control knob is located between the two seats, on the central console.

In case of fire, shutting the heater off prevents fire from crossing the firewall through heating system.

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## **Section 8     Handling and servicing**

|                                      |     |
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| JUMP-STARTING THE ENGINE .....       | 8-2 |
| DOORS REMOVAL AND INSTALLATION ..... | 8-2 |

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## **General**

This section outlines procedures recommended for handling and maintaining the Cabri G2. Every Cabri G2 owner should stay in contact with Hélicoptères Guimbal or approved source to obtain the latest service and maintenance information.

## **Fuel**

Refer to page 2-5 for approved fuel.

Refueling while the engine or the rotor are turning is forbidden.

Fuel tank may be topped-off. A slight increase in maximum tank capacity is possible by refueling with the left ground handling wheel installed alone.

Fuel gage will still function in this case, with the same accuracy.

## **Engine oil**

Refer to page 2-5 for approved oil types and quantities.

Check oil level with the dipstick.

## **Gearboxes oil**

Refer to page 2-5 for approved oil.

For both main and tail gearboxes :

Check oil level while helicopter is sitting on a horizontal surface, without ground handling wheels.

Add oil when level is below half level.

## **Ground handling**

Use only approved ground handling wheels on dedicated attachment points.

Use the vertical tail gearbox support tube as a handle to raise the helicopter nose and maneuver.

**Caution** : Do not use the shroud structure as a handle. The tail rotor blades may be damaged and could cause fingers injury.

Additional people can push the helicopter on the engine cowlings or main gear bow.

### **Parking and tie-down**

Parking the helicopter on a soft surface may cause it to tilt back due to aft center of gravity when empty. In case of doubt, for long time parking, place a hard piece of wood beneath the skid aft tips before removing the wheels.

Tie-down should only be done by straps attaching the landing gear.

Avoid leaving the helicopter exposed to direct sunlight without shielding the canopy with external cover or internal survival blanket.

Tie the blades with appropriate straps in case of strong wind or high gusts. Keep the straps loose to avoid stressing the blades.

### **Jump-starting the engine**

Jump-starting the engine is an acceptable practice in case of a low battery. Only use 12V lead acid battery for jump starting. Proceed in following order:

1. Connect the red cable to helicopter battery plus,
2. Connect it to the external battery plus,
3. Connect the black cable to helicopter battery ground,
4. Connect it to the external battery ground,
5. Start the engine (with left cowling open),
6. Remove in opposite order.

**Caution** : a dead battery is not airworthy and should not be jump started.

### **Doors removal and installation**

#### **Door removal :**

1. Open the door,
2. Remove the small circular locking clip from gas spring attachment on the fuselage side. Snap the rod end off,
3. Remove the two hinges lock pins, and save the washers,
4. Slide the door off.

#### **Door installation :**

1. Install the door, and check the plastic bushings are in place,
2. Install one washer and one lock pin on each hinge.

**Note** : The lower hinge has its plastic bushing inverted, to take the upward thrust from the gas spring. The washer is then important.

3. Snap the gas spring rod end on its sphere, and install the small locking pin in the rod end.

**Caution** : Never install the gas spring without the hinge pins : the gas spring exerts an upward force that would eject the door.  
The gas spring should be installed in the right direction : rod facing inside/forward, body on the door side

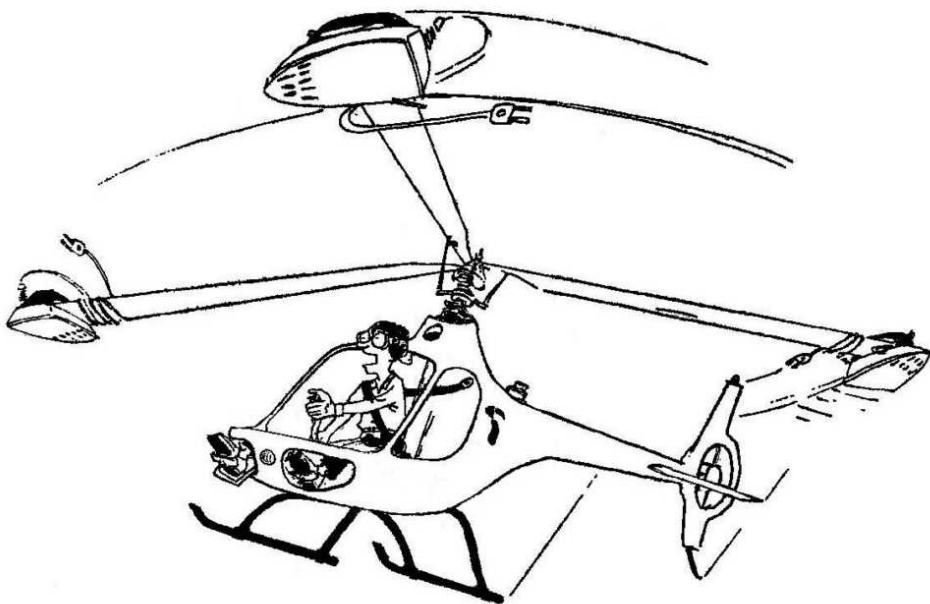
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## Hélicoptères Guimbal CABRI G2

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Comfort in Autorotation Belongs to Rotor Inertia

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