INVENTORY SHEET
EC120 B FLIGHT MANUAL

FAA CERTIFICATION

RFM dated on 14/03/2024

The following chapters are subjected to export control regulations.
Classified sections or appendices are provided within this Flight Manual only if relevant to the aircraft (equipment installed/not installed) and if authorized by the proper export licence.
The presence of this Inventory Sheet means the documentation has been checked and meets Export Control requirements.

US extraterritorial jurisdiction (ITAR)
US_EC_NoUScontent

US extraterritorial jurisdiction (Dual Use)
US_EC_NotAssessed

French Jurisdiction (ML)
FR_EC_NotAssessed

p

German Jurisdiction
GE_EC_NotAssessed

UK Jurisdiction
UK_EC_NotAssessed

Spanish Jurisdiction
SP_EC_NotAssessed

Airbus Helicopters
Aéroport international Marseille-Provence 13725 Marignane Cedex – France

AIRBUS HELICOPTERS

Edition du :
Issue Dated : **14/03/2024**

EC 120 B
SITUATION DES REVISIONS DU MANUEL DE VOL
FLIGHT MANUAL REVISIONS STATUS
CERTIFICATION FAA
FAA CERTIFICATION

Ce manuel doit contenir la révision normale (RN) et les révisions rapides (RR) référencées dans l'édition (EDIT) considérée.

This manual must contain the normal revision (RN) and rush revisions (RR) listed under the relevant issue (EDIT).

PARTIE REGLEMENTAIRE
PRESCRIBED SECTION
Volume 1

SECT. / SUP.	EDIT	DATE	
0 => 5.1	RN3	23-35	R
SUP.0	RN1	22-12	
SUP.4	RN0	16-26	
SUP.6	RN0	16-26	
SUP.7	RN0	16-26	
SUP.11	RN0	16-26	
SUP.12	RN0	16-26	
SUP.13	RN0	16-26	
SUP.14	RN0	16-26	
SUP.17	RN1	22-12	
SUP.19	RN0	16-26	
SUP.20	RN0	16-26	
SUP.55.1	RN0	16-26	
SUP.55.2	RN0	16-26	
SUP.55.5	RN0	16-26	
SUP.55.6	RN0	16-26	
SUP.55.7	RN0	16-26	
APP.1.2	RN1	23-10	

PARTIE COMPLEMENTAIRE
COMPLEMENTARY SECTION
Volume 2

SECT.	EDIT	DATE
0, 5.2, 6, 7, 8, 9	RN2	23-35
APP.8.2	RN0	16-26

FLIGHT MANUAL APPENDIX

EC 120 B

FAA TYPE CERTIFICATION No. R 0001 RD

The Rotorcraft Flight Manual (RFM) approved for FAA registered aircraft consists of the EASA approved RFM supplemented by the present Appendix.

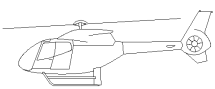
SECTIONS 0, 1, 2, 3, 4, 5, and APP.1.2 of this RFM as well as applicable Supplements constitute the approved RFM. For FAA registered aircraft, compliance with SECTION 2 and this Appendix is mandatory.

INSTRUCTIONS FOR FAA REGISTERED AIRCRAFT

IMPORTANT NOTE

The effectivity of the Appendix at the latest revision is specified on the list of effective pages.

THIS APPENDIX MUST BE INCLUDED IN THE EASA FLIGHT MANUAL FOR FAA REGISTERED AIRCRAFT.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

LIST OF SUPPLEMENTS

Some Supplements covering installations or procedures not used on this helicopter may be withdrawn from this manual. The complete list of Supplements appears on this page.

EASA APPROVED SUPPLEMENTS ACCEPTED BY FAA		
No.	DESCRIPTION	STATUS
0	LIST OF SUPPLEMENTS - INCOMPATIBILITY OF USE - EFFECT ON PERFORMANCE DATA **NOTE** **The EASA approved list of Supplements (SUP.0.P2) is replaced by the following list for FAA registered aircraft**	Accepted
1	RESERVED	
2	RESERVED	
3	RESERVED	
4	INSTRUCTIONS FOR OPERATIONS IN COLD WEATHER	Accepted
5	RESERVED	
6	AUTOROTATION LANDING TRAINING PROCEDURE	Accepted
7	HYDRAULIC FAILURE TRAINING PROCEDURE	Accepted
8 to 10	RESERVED	
11	SKI LANDING GEAR SURFAIR	Accepted
12	TRANSPORT OF EXTERNAL LOADS CARGO SLING with "SIREN" release unit (P/N AS21-8-B)	Accepted *
13	LH SIDE MAIN FLIGHT CONTROLS	Accepted
14	SAND FILTER AEROFLO OR SOFRANCE	Accepted
15 to 16	RESERVED	
17	EMERGENCY FLOATATION GEAR	Accepted
18	RESERVED	
19	AIR CONDITIONING SYSTEM	Accepted
20	IMPROVED HEATING SYSTEM	Accepted
21 to 49	RESERVED	
50 to 55	RESERVED	
55.1	GPS TNL 2101 APPROACH PLUS	Accepted
55.2	GPS GARMIN GNS 430/430 W	Accepted
55.5	GPS TRIMBLE TNL 1000 DC	Accepted
55.6	GPS TNL 2000 APPROACH	Accepted
55.7	GPS TNL 2000 APPROACH PLUS	Accepted

(*) Accepted with modifications stated in the present Appendix

LIST OF APPROVED EFFECTIVE PAGES - FAA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- B .... Specific to FAA registered aircraft.

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

APPENDIX	PAGES	DATE CODE	(1)	(2)
APP.1.2.P1	1 to 1	16-26	B	
APP.1.2.P2	1 to 1	23-10	B	
APP.1.2.P5	1 to 2	23-10	B	
APP.1.2	1 to 2	16-26	B	

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) - FAA

ISSUE 1: NR 0:

NORMAL REVISION 0 - DECEMBER 2012	EASA approval No. EASA D(2013)/FLEG/ffra/C.1.3/0010023036 on June 21, 2013

ISSUE 2:

NORMAL REVISION 0 - date code 16-26	Minor change approved under DOA EASA.21.J.700 on October 06, 2020
Title	New issue
Revised information	All
Deleted information	None
NORMAL REVISION 1 - date code 23-10	Minor change to the RFM approved under DOA privilege on March 13, 2023
Title	Modification of SUP.17 title.
Revised information	APP.1.2.P2, APP.1.2.P5.
Deleted information	None

1 GENERAL

The information issued in the present Appendix is applicable for FAA registered aircraft. It supplements or supersedes the approved information given in the basic EASA Flight Manual and in the EASA Supplements used.

2 LIMITATIONS

The limitations specified in the basic EASA Flight Manual and in the EASA Supplements used remain applicable.

3 EMERGENCY PROCEDURES

The emergency procedures specified in the basic EASA Flight Manual and in the EASA Supplements used remain applicable.

4 NORMAL PROCEDURES

The normal procedures specified in the basic EASA Flight Manual and in the EASA Supplements used remain applicable.

5.1 REGULATORY PERFORMANCE DATA

The regulatory performance data specified in the basic EASA Flight Manual and in the EASA Supplements used remain applicable and are supplemented or modified by the following:

SECTION 5.1
REGULATORY PERFORMANCE DATA

The paragraph hereafter of the basic Flight Manual is modified by the following:

11 NOISE LEVEL

Noise characteristics defined by chapter 11 of the ICAO annex 16 and JAR 36 subpart E are as follows:

Measurement Reference Point	Noise Level SEL (dBA)	ICAO Noise Limits SEL (dBA)
Overflight (at Max. gross weight)	78.7	85.4

NOTE

No determination has been made by the Federal Aviation Administration that the noise levels of this aircraft are or should be acceptable or unacceptable for operation at, into, or out of, any airport.

SUPPLEMENTS

The paragraphs hereafter of the Flight Manual Supplements are modified by the following:

SUPPLEMENT: SUP.12

2 LIMITATIONS

The following limitation is added:

The external load equipment certification does not constitute operational approval. Operational approval for external load operations must be granted by the local Aviation Authority.

AIRBUS HELICOPTERS

FLIGHT MANUAL

EC 120 B

EASA TYPE CERTIFICATE No. EASA.R.508

REGISTRATION No. SERIAL No.

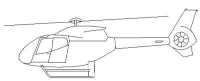
APPROVED BY:
European Aviation Safety Agency

BY:

DATE:
June 15, 2010

THE EFFECTIVITY OF THIS MANUAL AT THE LATEST REVISION IS SPECIFIED ON THE LIST OF EFFECTIVE PAGES. IT IS THE OPERATOR'S RESPONSIBILITY TO MAINTAIN THIS MANUAL IN A CURRENT STATUS IN ACCORDANCE WITH THE LIST OF EFFECTIVE PAGES.

THIS HANDOOK INCLUDES THE MATERIAL TO BE FURNISHED TO THE PILOT AS REQUIRED BY JAR-27 AND ADDITIONAL INFORMATION PROVIDED BY THE MANUFACTURER.
THE EASA FLIGHT MANUAL CONSISTS OF ALL UNCODED AND CODED A PAGES MARKED "APPROVED".
IT HAS BEEN APPROVED IN ACCORDANCE WITH THE JAA CERTIFICATION PROCEDURES OF THE JOINT AVIATION AUTHORITIES.



Airbus Helicopters D i r e c t i o n T e c h n i q u e S u p p o r t
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

APPROVING AUTHORITIES

DIRECCION NACIONAL DE AERONAVEGABILIDAD (DNA)

The DNA approves this RFM and Supplements for EC120B helicopters for aircraft registered in the Republic of Argentina in accordance with the provisions under SECTION 21.29 of DNAR Part 21.

"Later EASA-approved revisions and Supplements to this manual shall be taken as approved by the DNA".

REVISION TO AIRCRAFT PUBLICATION:	EC120 B	
PUBLICATION CONCERNED:	FLIGHT MANUAL	
CUSTOMIZATION AIRCRAFT:		
PMVR REVISION No. : 3	DATE CODE: 23-35	CERTIFICATION CODE: A

- The outline of the revision is given below :
  . Sections or supplements affected (added or modified),
  . Major points of the revision.
- Check that pages in each section are those specified in the list of effective pages.
- Withdraw old and insert new pages affected by this revision.
- Return the acknowledgement card.
- This list of amended pages may be filed (apart from the manual).

THE CONTENT OF THE FLIGHT MANUAL REVISION MUST BE BROUGHT TO THE ATTENTION OF FLIGHT CREWS.

	DELETED PAGES			INSERTED PAGES		
	Section, SUP or APP	**Pages**	**DATE CODE**	**Section, SUP or APP**	**Pages**	**DATE CODE**
SRD FAA	-	-	06/11/2023	-		14/03/2024
Inventory sheet	-	1 to 1	06/11/2023	-	1 to 1	14/03/2024
NORMAL REVISION	0.0.P5 Vol 1	1 to 4	21-21	0.0.P5 Vol 1	1 to 4	23-35
	2.6	1 to 7	16-26	2.6	1 to 7	23-35
	4.3	1 to 5	20-11	4.3	1 to 5	23-35

DESCRIPTION OF THE REVISION	Section	§
Update of list of approved effective pages and integration of log of approved normal revisions (VOL 1).	0.0.P5	all
Door placards deleted (Light Helicopters RFM harmonization).	2.6	3
Hydraulic check procedure updated.	4.3	3

MAIN TABLE OF CONTENTS

COMPOSITION

OF APPROVED CONDITIONAL REVISIONS (RC)

This manual assigned to the helicopter mentioned on the title page contains the following pink pages except those cancelled when the conditions are complied with.

CAUTION

The reader will have to insert the pink pages incorporating the paragraph(s) affected by the Conditional Revision so as the paragraph(s) cover(s) the paragraph(s) of the standard version or of the variant of standard definition.

(1) Paragraph Revision Code:

- **R** ....Revised, to be replaced
- **N** ....New, to be inserted

RC No.	SECTION or SUP.	PARAGRAPH	DATE CODE	Number of pages	(1)	Applicable before condition is met:
a	2.1	1 *RC*	16-26	1		SB 34.001
	2.6	1 *RC*	16-26	1		
	2.6	2 *RC*	16-26	1		
b	4.3	2 *RC*	20-11	1		SB 76.002
c	2.4	1 *RC*	16-26	1		SB 63.019
	2.4	5 *RC*	16-26	1		
d	2.5	1 *RC*	16-26	1		SB 28.007
	2.6	5 *RC*	16-26	1		
e	2.5	1 *RC*	16-26	3		SB 28.009
f	3.1	2 *RC*	16-26	1		SB 31.003
	3.5	2 *RC*	21-21	1	R	
	5.1	1 *RC*	16-26	1		
	5.1	3.2.1 *RC*	16-26	1		
	5.1	3.2.2 *RC*	16-26	1		
	5.1	3.2.3 *RC*	16-26	1		

APPROVED CONDITIONAL REVISIONS (RC)

RC No.	SECTION or SUP.	PARAGRAPH	DATE CODE	Number of pages	(1)	Applicable before condition is met:
g	3.4	1 *RC*	20-11	1		SB 31.004
	3.6	1 *RC*	20-11	1		
	3.6	4 *RC*	16-26	1		
	4.3	1 *RC*	20-11	1		
	4.6	1 *RC*	16-26	1		
h	3.6	4 *RC*	21-21	1	R	Before SB 31.004 and/or before SB 63.019
i	3.6	4 *RC*	21-21	1	R	Post SB 31.004 and before SB 63.019
j	3.6	4 *RC*	21-21	1	R	Post SB 63.019 and before SB 31.004
k	3.6	6 *RC*	16-26	1		SB 21.008

COMPOSITION

OF NON APPROVED CONDITIONAL REVISIONS (RC)

This manual assigned to the helicopter m entioned on the title page contains the following pink pages except those cancelled when the conditions are complied with.

CAUTION

The reader will have to insert the pink pages incorporating the paragraph(s) affected by the Conditional Revision so as the paragraph(s) cover(s) the paragraph(s) of the standard version or of the variant of standard definition.

(1) Paragraph Revision Code:

- **R** ....Revised, to be replaced
- **N** ....New, to be inserted

RC No.	SECTION	PARAGRAPH	DATE CODE	Number of pages	(1)	Applicable before condition is met:

COMPOSITION
OF (APPROVED OR NON APPROVED)
RUSH REVISIONS (RR)

The manual contains the following additional yellow page(s):

CAUTION

The reader will have to insert the yellow pages incorporating the paragraph(s) affected by the Rush Revision opposite the existing paragraph(s) of the standard version or of the variant of standard definition.

(1) Paragraph Revision Code:

- **R** ....Revised, to be replaced.
- **N** ....New, to be inserted.

RR No.	SECTION or SUP. PARAGRAPH	DATE CODE	Number of pages	(1)

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- A .... Specific to EASA.

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION	PAGES	DATE CODE	(1)	(2)
0.0.P1	1 to 2	16-26	A	
0.0.P2	1 to 1	16-26		
0.0.P3	1 to 2	21-21		
0.0.P4	1 to 1	16-26		
0.0.P5	1 to 4	23-35	A	
1.0.P6	1 to 1	16-26		
1.1	1 to 2	16-26		
1.2	1 to 2	16-26		
1.3	1 to 4	16-26		
1.4	1 to 1	16-26		
2.0.P6	1 to 2	20-11		
2.1	1 to 2	16-26		
2.2	1 to 2	16-26		
2.3	1 to 4	21-21		
2.4	1 to 4	16-26		
2.5	1 to 6	20-11		
2.6	1 to 7	23-35		
3.0.P6	1 to 2	21-21		
3.1	1 to 2	16-26		
3.2	1 to 2	16-26		
3.3	1 to 2	21-21		
3.4	1 to 2	20-11		
3.5	1 to 6	21-21		
3.6	1 to 9	20-11		
3.7	1 to 1	16-26		
3.8	1 to 2	20-11		
4.0.P6	1 to 2	16-26		
4.1	1 to 1	16-26		
4.2	1 to 4	21-21		
4.3	1 to 5	23-35		
4.4	1 to 1	20-11		

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

SECTION	PAGES	DATE CODE	(1)	(2)
4.5	1 to 1	16-26		
4.6	1 to 1	16-26		
4.7	1 to 1	16-26		
4.8	1 to 1	16-26		
5.1.P6	1 to 1	16-26		
5.1	1 to 14	16-26		

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) - EASA

ISSUE 1: NR 0 to NR 19:

NORMAL REVISION 19 - SEPTEMBER 2014	Approved under the authority of EASA DOA No. 21J056 on June 11, 2015

ISSUE 2:

NORMAL REVISION 0 date code 16-26		EASA Approval No. 10070977 on September 16, 2019
Title	New issue	
Revised information	All	
Deleted information	None	
NORMAL REVISION 1 date code 20-11		Approved on June 14, 2022 under the authority of EASA DOA No. 21J700
Title	Addition of "Engine Starter/Generator" paragraph in the limitations section. Modification of the engine alarms procedure. Addition of procedure after extinguisher use. Procedure improvement.	
Revised information	0.0.P3 pages 1 to 2; 0.0.P5 pages 1 to 3; 2.0.P6 page 2; 2.5 pages 5 and 6; 3.0.P6 pages 1 to 2; 3.4 page 2; 3.6 page 1; 3.8 page 2; 4.3 pages 3 and 5; 4.4 page 1.	
Deleted information	None	
NORMAL REVISION 2 date code 21-21		Approved on June 14, 2022 under the authority of EASA DOA No. 21J700
Title	Addition of "if necessary" during exterior check MGB cowling, wording improvement, minor corrections.	
Revised information	0.0.P3 pages 1 and 2; 0.0.P5 pages 1 to 3; 2.3 page 4; 3.0.P6 page 1; 3.3 page 2; 3.5 pages 1 and 2; 4.2 pages 2 and 3.	
Deleted information	None	

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) - EASA

NORMAL REVISION 3 date code 23-35	Approved on October 20, 2023 under the authority of EASA DOA No. 21J700
Title	Update of hydraulic check procedure. Deletion of door placards.
Revised information	0.0.P5 pages 1 to 4; 2.6 page 2 and 4.3 page 5.
Deleted information	Doors placards: 2.6 page 2.

LIST OF EFFECTIVE PAGES

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- Indicated .... Specific to indicated civilian airworthiness.

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION	PAGES	DATE CODE	(1)	(2)
0.0.P3	1 to 1	16-26		
0.0.P5	1 to 3	23-35		
0.0	1 to 1	16-26		
5.2.P6	1 to 1	16-26		
5.2	1 to 6	16-26		
6.0.P6	1 to 1	16-26		
6.1	1 to 2	16-26		
6.2	1 to 7	16-26		
6.3	1 to 2	16-26		
6.4	1 to 2	16-26		
6.5	1 to 4	16-26		
7.0.P6	1 to 3	16-26		
7.1	1 to 2	16-26		
7.2	1 to 2	22-12		
7.3	1 to 4	16-26		
7.4	1 to 10	16-26		
7.5	1 to 2	16-26		
7.6	1 to 2	16-26		
7.7	1 to 1	16-26		
7.8	1 to 2	16-26		
7.9	1 to 4	16-26		
7.10	1 to 3	16-26		
7.11	1 to 9	16-26		
7.12	1 to 1	16-26		
7.13	1 to 2	16-26		
8.0.P6	1 to 1	16-26		
8.1	1 to 2	16-26		
8.2	1 to 4	16-26		
8.3	1 to 16	23-35		

LIST OF EFFECTIVE PAGES

SECTION	PAGES	DATE CODE	(1)	(2)
9.0.P6	1 to 2	16-26		
9.1	1 to 4	16-26		
9.2	1 to 3	16-26		
9.4	1 to 4	16-26		
9.6	1 to 3	16-26		
9.12	1 to 2	16-26		
9.14	1 to 1	16-26		
9.18	1 to 1	16-26		
9.20	1 to 4	16-26		

LOG OF NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2)

ISSUE 1: NR 0 to NR 15:

NORMAL REVISION 15 - MARCH 2015	

ISSUE 2:

NORMAL REVISION 0 - date code 16-26	
Title	New issue
Revised information	All
Deleted information	None
NORMAL REVISION 1 - date code 22-12	
Title	Relocation of FLOAT ARM Pushbutton
Revised information	0.0.P5, 7.2, 8.3
Deleted information	None
NORMAL REVISION 2 - date code 23-35	
Title	Test sheet 2C updated (hydraulic test).
Revised information	0.0.P5, 8.3
Deleted information	None

LIST OF MODIFICATIONS OR SERVICE BULLETINS MENTIONED IN THE FLIGHT MANUAL

This list includes all modifications or service bulletins that are or have been referenced in the Flight Manual.

MODIFICATION / SB	DESCRIPTION	Embodiment of MOD / SB	
		Yes	No
SB 34.001	Cabin adaptation for night VFR		
SB 63.019	New NR/Nf indicator		
SB 28.007	Use of JP 4 and JET B		
SB 28.009	Upgraded fuel pump strainer		
SB 31.003	Upgraded VEMD		
SB 31.004	Upgraded LACU		
SB 21.008	P2 TEMP warning light		
SB 76.002	Engine controls		
SB 04.003	Cold weather installation kit		
SB 24.015	Segregation of "Direct Battery" routing regarding to the EMB		

SECTION 1

GENERAL

CONTENTS

SECTION 1.1

PRELIMINARY NOTES

1 GENERAL

To achieve the required degree of safety, this manual must be used in conjunction with the relevant regulations covering aircraft operation, such as aerial navigation laws in the operator's country.

It is essential for the crew to become familiar with the contents of this manual, particularly with the information specific to customized configurations, and to check all revisions and related requirements.

2 DESCRIPTION OF THE MANUAL

This manual contains legally approved information, together with additional manufacturer's information not subject to approval.

- The approved information is contained in PART 1 "FLIGHT MANUAL", in SECTIONS 1, 2, 3, 4, 5.1, in the Supplements and the Appendix.
- The information not subject to approval is contained in PART 2 "COMPLEMENTARY FLIGHT MANUAL", as a complement to PART 1. This information is covered by SECTIONS 5.2, 6, 7, 8, and 9.

  Each PART, each Supplement and each Appendix of the manual makes up a whole and, for this reason, incorporates its own list of effective pages and is revised separately.

The list of effective pages (P5) identifies all the pages which compose the manual.

The total number of P5 pages is shown on the list of effective pages, identified 1/xy where xy is a number between 01 and 99 corresponding to the number of P5 pages.

2.1 BASIC AIRCRAFT

The basic helicopter specifications are covered by SECTIONS 1 through 9.

2.2 SPECIAL SYSTEMS AND PROCEDURES

Information concerning optional equipment systems and operational procedures is covered by Supplements. These are mini Flight Manuals covering any differences from the basic aircraft information, SECTION by SECTION. The Supplements are approved on an individual basis.

2.3 ADAPTATION OF MANUAL TO CERTIFICATION REQUIREMENTS

Specific certification requirements may necessitate modifications to the text or layout of certain pages.

Therefore, a specific Flight Manual (PART 1) is drawn up for each certification.

Each Flight Manual includes its own particular title page; the alphabetical code, corresponding to the relevant certification, appears in the lower left-hand corner of each page of the approved PART 1.

SECTION 1.2

UPDATING

1 GENERAL

This manual is updated periodically through Rush Revisions (RR) or Normal Revisions (RN).

2 REVISIONS

The manufacturer makes every effort to keep this manual updated by revisions to complete the user's information and capabilities. Each revision is accompanied by instructions summarizing the major points affected by the change and advising the person responsible for incorporating the revised pages in the manual (the instruction sheet can be filed separately from the manual).

The user is responsible for ensuring proper updating of the manual complying with the list of pages given at the beginning of PART 1, PART 2 and of each Supplement, since each of the these PARTS or Supplements is revised separately.

The composition must be checked by page number and by the date code. The date code is composed of the last two digits of the year, followed by the number of the week in that year.

2.1 NORMAL REVISIONS (RN) PRINTED ON WHITE PAPER

Normal Revisions fully or partially update the manual. The pages may be new pages or may supersede the existing pages.

They are printed on white paper.

The manual effectivity is specified on the new list of approved effective pages (0.0.P5, SUP.0.P5 and/or APP.X.X.P5).

Normal Revisions are identified in numerical order.

2.2 RUSH REVISIONS (RR) PRINTED ON YELLOW PAPER

Rush Revisions partially update a few major points in the manual.

The new information is given on a page which must face the former text to be modified or completed.

The Rush Revision is printed on yellow paper.

No white page is deleted.

The revised pages are specified on a separate list (0.0.P4 or SUP.0.P4).

Rush Revisions are identified by the number of the next Normal Revision and a letter suffix in normal alphabetical order. Several Rush Revisions may be issued between two Normal Revisions. All Rush Revisions are cancelled when the Normal Revision bearing the same number is issued. If certain Rush Revision provisions remain after the subsequent Normal Revision, they are confirmed by a new Rush Revision with another identification code.

2.3 CONDITIONAL REVISIONS (RC) PRINTED ON PINK PAPER

The revised manual issued on white pages, corresponds to the recommended standard.

For helicopters authorized to fly at an earlier standard, the Conditional Revision (RC) retains the previous standard.

The user is responsible for embodiment of the aircraft modification(s) required for compliance with the recommended standard, after which the pink pages may be deleted under the user's responsibility.

The pink pages are specified on a separate list (0.0.P3 or SUP.0.P3).

NOTE

These pages are unaffected by Normal and Rush Revisions or by customization.

2.4 THE "ERRATUM" PROCEDURE

In the case of minor errors (typing errors, bad printing) likely to affect the understanding of the text, the "ERRATUM" procedures are used to make quick corrections between revisions. In this case, the pages affected by the procedures are re-issued completely and the date code is underlined for identification. These pages are summarized on an accompanying sheet which is not identified.

SECTION 1.3

SYMBOLS AND CONVERSION FACTORS

1 SYMBOLS AND ABBREVIATIONS

DESIGNATION	SYMBOL OR ABBREVIATION
SPEEDS	
Calibrated Airspeed	CAS
Indicated Airspeed	IAS
True Airspeed	TAS
Never Exceed Speed	VNE
Best Rate of Climb Speed	Vy
Rate of Climb/Descent	R/C, R/D
METEOROLOGY	
International Standard Atmosphere	ISA
Outside Air Temperature	OAT
Outside Air Pressure	p
Relative Air Density	σ
Wind Velocity	Vw
ALTITUDE / HEIGHT	
Geometric Altitude	H
Pressure Altitude	Hp
Density Altitude	Hσ
Radio Altimeter Height	HRA
Height	h
POWER / ENGINE PARAMETERS	
Maximum Continuous Power	MCP
Maximum Takeoff Power (5 min.)	MTOP
Power	PWR
Engine Power Check	EPC
Rotor Speed	NR
Engine Generator Speed	Ng
Engine Generator Deviation Indication	ΔNg
Free Turbine Speed	Nf
Torque	Tq
Power Turbine Inlet Temperature	T4
First Limitation Indicator	FLI

DESIGNATION	SYMBOL OR ABBREVIATION
HOVER / TAKEOFF / LANDING	
Hover In Ground Effect	HIGE
Hover Out of Ground Effect	HOGE
WEIGHT AND BALANCE	
Center of Gravity	CG
Empty Weight	EW
Equipped Empty Weight	EEW
Operating Empty Weight	OEW
Useful Load	UL
Payload	P/L
All-Up Weight	AUW
Maximum Take-Off Weight	MTOW
MISCELLANEOUS	
Automatic Direction Finder	ADF
Automatic Flight Control System	AFCS
Ancillary System Unit	ASU
Battery Contactor	BATC
Caution and Warning Panel	CWP
Cockpit Circuit Breaker Panel	CCBP
Direct Current	DC
Emergency Locator Transmitter	ELT
Electrical Master Box	EMB
Engine	ENG
Equivalent	$\cong$
Essential Contactor	ESSC
External Power Line Contactor	EPLC
External Power Unit	EPU
Generator Line Contactor	GLC
Global Positioning System	GPS

DESIGNATION	SYMBOL OR ABBREVIATION
MISCELLANEOUS (cont'd)	
Hall Effect Sensors	HECS
High Load Contactor	HLC
Horizontal Situation Indicator	HSI
Height-Velocity	HV
Intercommunication System	ICS
Light and Ancillary Control Unit	LACU
Main gear box	MGB
Part per million	PPM
Radio Magnetic Indicator	RMI
Shed Bus Contactor	SBC
Starting Contactor	SC
To be defined	TBD
Tail gear box	TGB
Vehicle and Engine Multifunction Display	VEMD

- Symbol used for switches or pushbuttons (example) : [**HORN**]

- Symbol used for CWP caution/warning lights (example) : **HYDR** Light ON **HYDR** Light OFF

- Symbol used for VEMD indications (example) : **P2** indication ON **P2** indication OFF

2 CONVERSION FACTORS

2.1 METRIC UNITS TO OTHER UNITS

Multiply	By	To obtain
Centimeter (cm)	0.3937	Inch (in)
Meter (m)	3.2808	Foot (ft)
Meter per second (m/s)	196.85	Foot per minute (ft/min)
Kilometer (km)	0.5400	Nautical mile (Nm)
Liter (l)	0.2642	US gallon (US gal)
Liter (l)	0.2200	UK gallon (UK gal)
Kilogram (kg)	2.2046	Pound (lb)
Bars (bar)	14.504	Pound per Square Inch (psi)
Kilometer per hour (km/h)	0.5400	Knot (kt)
Hecto pascal (hPa)	0.02953	Inch of Mercury (inHg)

Conversion of degree centigrade (°C) into degree Fahrenheit (°F): °F = (°C x 9/5) + 32

2.2 OTHER UNITS TO METRIC UNITS

Multiply	By	To obtain
Inch (in)	2.5400	Centimeter (cm)
Foot (ft)	0.3048	Meter (m)
Foot per minute (ft/min)	0.00508	Meter per second (m/s)
Nautical mile (Nm)	1.8520	Kilometer (km)
US gallon (US gal)	3.7850	Liter (l)
UK gallon (UK gal)	4.5460	Liter (l)
Pound (lb)	0.4536	Kilogram (kg)
Pound per Square Inch (psi)	0.0689	Bar (bar)
Knot (kt)	1.8520	Kilometer per hour (km/h)
Inch of Mercury (inHg)	33.864	Hecto pascal (hPa)

Conversion of degree Fahrenheit (°F) into degree centigrade (°C): °C = 5/9 x (°F – 32)

SECTION 1.4

TERMINOLOGY

1 GENERAL

Unless otherwise specified in the text, altitudes are pressure-altitudes (Hp), speeds are indicated airspeeds (IAS).

Warnings, Cautions and Notes are used throughout this manual to emphasize important and critical instructions and are used as follows:

WARNING

AN OPERATING PROCEDURE, PRACTICE, ETC., WHICH, IF NOT CORRECTLY FOLLOWED, COULD RESULT IN PERSONAL INJURY OR LOSS OF LIFE.

CAUTION

An operating procedure, practice, etc., which, if not strictly observed, could result in damage to, or destruction of helicopter parts or equipment.

NOTE

An operating procedure, condition, etc., which is essential to highlight.

2 USE OF PROCEDURAL WORDS

The concept of procedural word usage and intended meaning which has been adhered to in preparing this manual is as follows:

- "Shall" or "must" has been used only when application of a procedure is mandatory.
- "Should" has been used only when application of procedure is recommended.
- "May" and "Need not" have been used only when application of a procedure is optional.
- "Will" has been used only to indicate future event or action, never to indicate a mandatory procedure.

SECTION 2

LIMITATIONS

CONTENTS

PAGE

2.5 MISCELLANEOUS LIMITATIONS

2.6 PLACARDS

RC a

The paragraph **1 - TYPE OF OPERATIONS**, is superseded by:

1 TYPE OF OPERATIONS

The helicopter is approved to operate:

- By day in VFR.

NOTE

Additional equipment may be required by operational regulations.

The following are forbidden:

- Night flight.
- Aerobatic maneuvers.
- Flight in freezing rain.
- Flight in icing conditions.
  (Visible moisture and temperatures conducive to producing ice).
- In-flight intentional VEMD complete cut-off (lane 1 + 2).

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 34.001.

SECTION 2.1

GENERAL LIMITATIONS

The helicopter is approved in compliance with JAR part 27 issue 1. The helicopter shall be operated in compliance with the limitations of this section.

1 TYPE OF OPERATIONS

The helicopter is approved to operate:

- By day and night in VFR.

NOTE

Additional equipment may be required by operational regulations.

The following are forbidden:

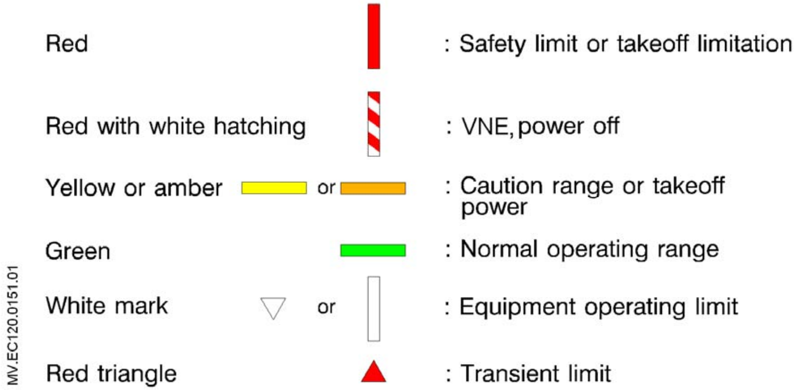
- Aerobatic maneuvers.
- Flight in freezing rain.
- Flight in icing conditions.
  (Visible moisture and temperatures conducive to producing ice).
- In-flight intentional VEMD complete cut-off (lane 1 + 2).

2 OCCUPANTS

- Minimum flight crew .... One pilot in right seat or one pilot in left seat when the removable dual controls are installed on the left
- Maximum number of seats (including flight crew) 5

3 INSTRUMENT MARKINGS

Limitations are marked on instruments with the following color code:



On the VEMD, related numerical values of parameters are underlined:

- In yellow, when the parameter is in caution or takeoff range,
- In red, when at or above a safety limit or maximum takeoff power. Moreover, to attract attention, red underlining flashes.

SECTION 2.2

WEIGHT AND BALANCE LIMITS

1 WEIGHT LIMITS

- Maximum weight ....: 1715 kg (3780 lb).
- Minimum weight ....: 1035 kg (2284 lb).

2 LONGITUDINAL CG

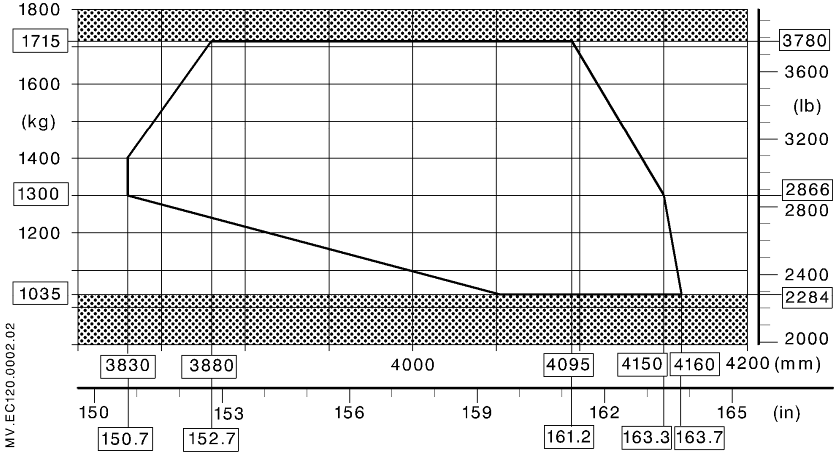


Figure 1: Longitudinal CG Chart

NOTE

The datum is located 4 m forward of the main rotor head center line.

3 LATERAL CG

- Maximum left CG .... : 0.09 m (3.54 in).
- Maximum right CG .... : 0.08 m (3.15 in).

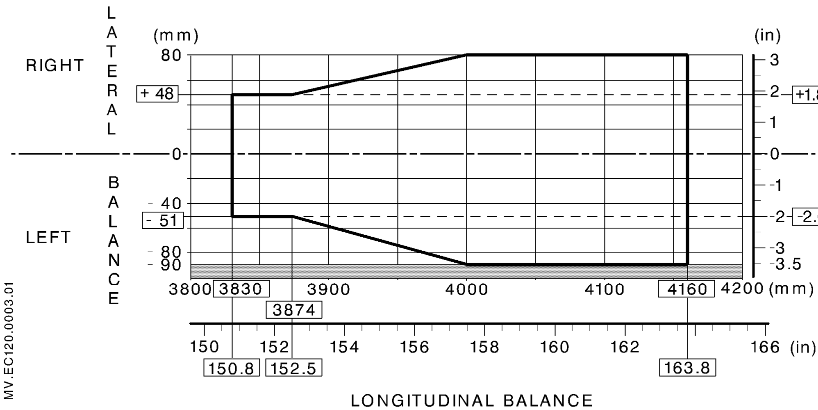


Figure 2: Lateral CG Chart

NOTE

The datum is located in the plane of symmetry of the helicopter.

SECTION 2.3

FLIGHT ENVELOPE LIMITS

1 AIRSPEED LIMITS

All airspeed limitations are Indicated Airspeeds.

1.1 WITH DOORS CLOSED

The opening of the baggage compartment access panel in the cabin has no effect on closed doors airspeed limitations.

1.2 WITH DOORS OPENED OR REMOVED

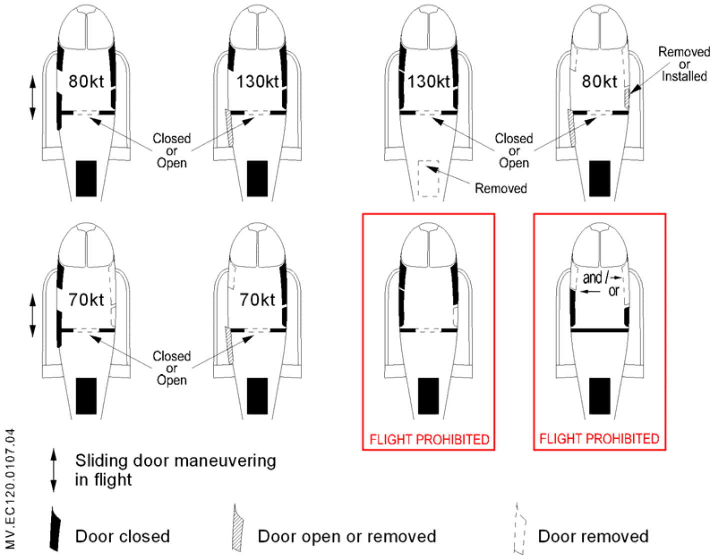
NOTE

Flight with any configuration not shown is prohibited.

In configurations with at least one door opened or removed, loose objects shall not be in the cabin.

- <u>For aircraft up to S/N 1677 except S/N 1674 and for aircraft S/N 8001 to 8034</u>.

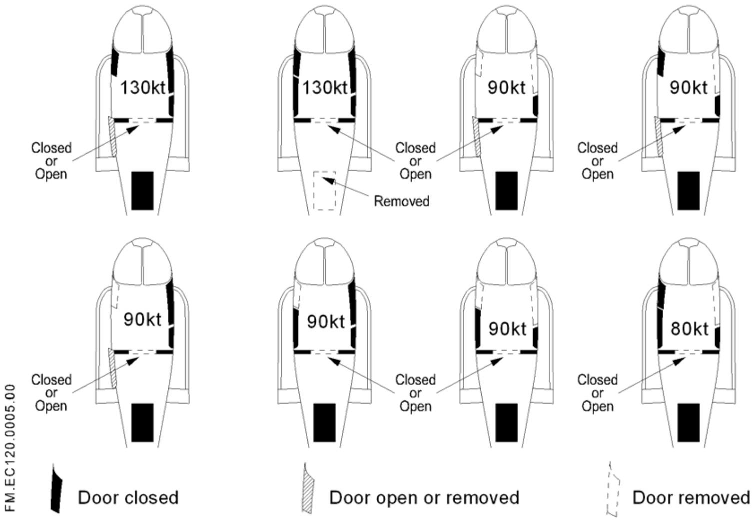
  The VNE is the value as shown below (adapted to the doors configuration) or the VNE « doors closed », whichever is less.



- <u>For aircraft S/N 1674 and from S/N 1678 except for aircraft S/N 8001 to 8034</u>.

  The VNE is the value as shown below (adapted to the doors configuration) or the VNE « doors closed », whichever is less.

  Sliding door opening-closing
  in any authorized configuration .... VNE = 70 kt



2 ALTITUDE LIMITS

Maximum operating altitude in flight .... Hp = 20000 ft (6096 m)

3 TEMPERATURE LIMITS

- Minimum temperature .... - 30°C
- Maximum temperature .... ISA+35°C
  limited to +50°C

For cold weather operations (- 40°C ≤ OAT < - 30°C), refer to SUP.4.

4 LANDING AND ROTOR STOPPING LIMITATIONS ON SLOPE

- Nose up.. 10°
- Nose down .... 6°
- Sideways.. 8°

5 MANEUVERING LIMITATIONS

- Continued operation in servo transparency (where load feedback is felt in the controls) is prohibited.

  Maximum load factor is a combination of TAS, Hσ and gross weight. Avoid such combinations at high values associated with high collective.

  Transparency may be reached during maneuvers, steep turns, hard pull-up or when maneuvering near VNE. Self-correcting, the phenomenon will induce an un-commanded right cyclic load and an associated collective down reaction. However, even if the transparency feedback loads are fully controllable, immediate action is required to relieve the feed back loads: <u>reduce the severity of the maneuver</u>, follow the aircraft's natural reaction, let the collective decrease naturally (avoid low pitch) and smoothly counteract the right cyclic motion.

  Transparency will disappear as soon as excessive loads are relieved.
- In maximum power configuration, decrease collective slightly before initiating a turn, as for this maneuver the power requirement is increased.
- In hover, avoid rotation faster than 6 sec. per full rotation.

RC c

The paragraph **1 - MAIN ROTOR LIMITATIONS**, is modified as follows:

Supersede the figure by the following:

: 150 rpm Rotor brake operation Max. speed
: 340 rpm Min. power-off
: 340 to 390 rpm Caution range
: 390 to 415 rpm Normal operating range
: 415 to 447 rpm Caution range
: 447 rpm Max. power-off

The rest of the paragraph is unchanged

CAUTION

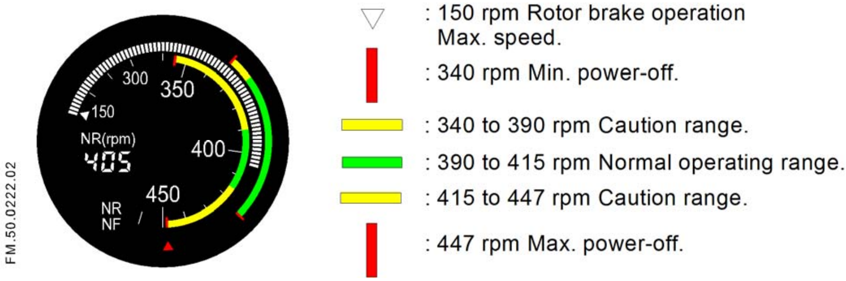
THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 63.019.

SECTION 2.4

VEHICLE LIMITATIONS

1 MAIN ROTOR LIMITATIONS

It is prohibited to use the rotor brake prior to engine shutdown.
Minimum time between two consecutive brake applications: 5 min.



NOTE

Low NR aural warning ≤ 370 rpm
High NR aural warning ≥ 420 rpm

2 TAKEOFF POWER

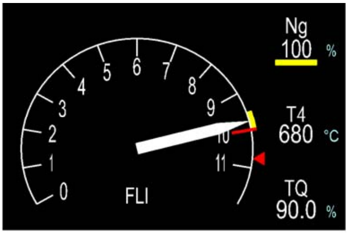
Use of takeoff power is limited to:

- Maximum airspeed Vy (65 kt at Hp = 0 ft - 1 kt per 1000 ft) if Tq is in takeoff rating range.
- 5 min. continuous use if Ng and/or T4 are in takeoff rating range.

Use of the heating system is forbidden if Ng and/or T4 are above the engine maximum continuous rating.

3 FIRST LIMITATION INDICATION

MV.EC120.0006.03



9.6 Max. continuous rating

: 9.6 to 10 Takeoff rating range

: 10 Max. takeoff rating

: 10.8 Max. transient rating

NOTE

The values (Ng = 100 %, T4 = 680 °C, Tq = 90%) are given as examples.

4 MAIN TRANSMISSION LIMITATIONS

TORQUE LIMITATIONS

MV.EC120.0007.04

97 % Max. continuous rating

: 97 % to 103 % Takeoff power

: 103 % Max. takeoff rating

: 110 % Max. transient rating (5 sec.)

5 ENGINE LIMITATIONS

- Nf LIMITATIONS

FM.50.0223.02

: 365 rpm Min.

: 365 to 373 rpm transient range (5 sec.).

: 373 to 422 rpm Normal operating range.

: 422 rpm Max. continuous.

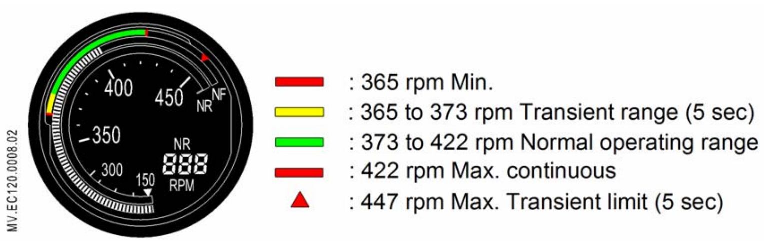
: 447 rpm Max. transient limit (5 sec.).

RC c

The paragraph **5 - ENGINE LIMITATIONS**, is modified as follows:

Nf LIMITATIONS

Supersede the figure by the following:



The rest of the paragraph is unchanged

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 63.019.

- Ng LIMITATIONS

Ng > 63 % : Min. stabilized speed
Δ Ng = -1.5 % Max. continuous rating

: Δ Ng = -1.5 % to 0 % Takeoff power

: Δ Ng = 0 % Max. takeoff rating

: Δ Ng = +2.6 % Max. transient rating (5 sec.)

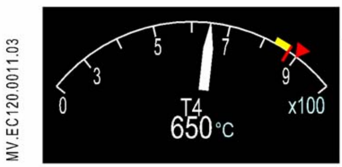
- T4 LIMITATIONS

<u>Starting limitations</u>:

: 800 °C Max. continuous

: 870 °C Transient (10 sec)

<u>Flight limitations</u>:



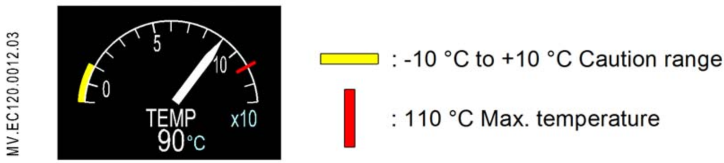
830 °C Max. continuous rating

: 830 °C to 870 °C Takeoff power

: 870 °C Max. takeoff rating

: 900 °C Max. transient rating (5 sec)

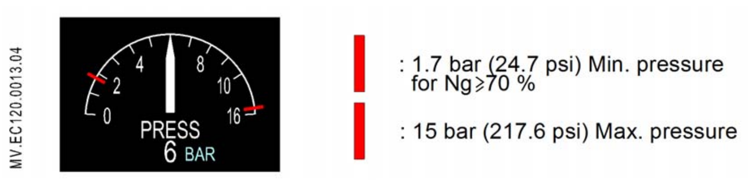
- OIL TEMPERATURE LIMITATIONS



Minimum oil temperature before power application:
- 0°C (Oil 3 cSt),
- 10°C (Oil 5 cSt and 3.9 cSt).

During the oil warm up period, the engine must be run with the collective in its full low pitch position.

- OIL PRESSURE LIMITATIONS



6 ELECTRICAL CIRCUIT LIMITATIONS

- Maximum voltage .... 31.5 V (Rated voltage 26 - 29 V)
- Maximum current .... 150 A Max. continuous 240 A transient (2 min.)

7 BATTERY TEMPERATURE LIMITATION

- Caution temperature .... 60°C
- Maximum temperature .... 75°C

RC e

The paragraph **1 - APPROVED FUEL**, is modified as following:

- NORMAL FUELS

Add the following NOTE:

NOTE 3

The use of an anti-icing additive is compulsory for OAT ≤ + 0°C for all approved fuels which do not contain it.

The rest of the paragraph is unchanged.

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 28 009.

SECTION 2.5

MISCELLANEOUS LIMITATIONS

1 APPROVED FUELS

NOTE 1

Commercial designations of authorized fuels and additives are specified in the TURBOMECA documentation.

- NORMAL FUELS

  (Fuels approved to operate throughout the flight envelope with no restrictions).

Type of fuel	NATO code	Specifications			Anti-ice additive included
		FRANCE	USA	UK	
Kerosene - 50 (AVTUR-FSII) JP8)	F 34	AIR 3405 F 34	MIL-T-83133 (JP8)	D.ENG. RD 2453	Yes
Kerosene - 50 (AVTUR) (JP1)	F 35	AIR 3405 F 35	ASTM-D-1655 JET A1	D.ENG.RD 2494	No
Kerosene	-	-	ASTM-D-1655 JET A	-	No
High flash point (JP5) (AVCAT)	F 43	AIR 3404 F 43	-	D.ENG. RD 2498	No
High flash point (JP5) (AVCAT SII)	F 44	AIR 3404 F 44	MIL-T-5624 (JP5)	D.ENG.RD 2452	Yes
Chinese fuel PRC National Standard N°3 Jet fuel	-	-	-	-	No

NOTE 2

All specifications are effective at latest issue or amendment.

- REPLACEMENT FUELS

USE FOR: -30°C ≤ OAT ≤ +30° AND FOR Hp ≤ 9842 ft (3000 m)						
Type of fuel	**NATO Code**	**Specifications**				**Anti-ice additive included**
		FRANCE	**USA**	**UK**	**RUSSIA**	
Wide cut (AVTAG-FSII) (JP4)	F 40	AIR 3407	MIL-T-5624 (JP4)	D.ENG.RD 2454	-	Yes
Wide cut (JET B) (AVTAG)	-	-	ASTM-D-1655 (JET B)	-	-	No
Russian fuel Kerosene TS 1 (TC1)	-	-	-	-	GOST 10227	No
Russian fuel Kerosene RT (PT)	-	-	-	-	GOST 10227	No

RC d

The paragraph **1 - APPROVED FUEL**, is modified as following:

- REPLACEMENT FUELS

Supersede the table **"USE FOR: -30°C ≤ OAT ≤ + 30° AND FOR Hp ≤ 9842 ft (3000 m)"** by the following:

USE FOR: -30°C ≤ OAT ≤ + 30° AND FOR Hp ≤ 9842 ft (3000 m)						
Type of fuel	**NATO Code**	**Specifications**				**Anti-ice additive included**
		FRANCE	**USA**	**UK**	**RUSSIA**	
Russian fuel Kerosene TS 1 (TC1)	-	-	-	-	GOST 10227	No
Russian fuel Kerosene RT (PT)	-	-	-	-	GOST 10227	No

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 28 007.

RC e

The paragraph **1 - APPROVED FUEL (cont'd)**, is modified as following:

- REPLACEMENT FUELS

Add the following NOTE

NOTE

The use of an anti-icing additive is compulsory for OAT ≤ + 0°C for all approved fuels which do not contain it.

The rest of the paragraph is unchanged.

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 28 009.

RC e

The paragraph **1 - APPROVED FUEL (cont'd)**, is modified as following:

- ANTI-ICE ADDITIVES

Supersede the table "**COMPULSORY USE OF ANTI-ICE ADDITIVE"** by the following text:

Anti-ice additive : If the fuel does not contain a freezing inhibitor and if the OAT is below or equal to 0°C, the use of an anti-icing additive is compulsory.

The rest of the paragraph is unchanged.

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 28 009.

- ANTI-ICE ADDITIVES

<table>
<tr><th colspan="4">COMPULSORY USE OF ANTI-ICE ADDITIVE</th></tr>
<tr><th rowspan="2">Water concentration in fuel</th><th colspan="2">Aircraft without fuel flowmeter system</th><th>Aircraft with fuel flowmeter system (SB 28-006)</th></tr>
<tr><td colspan="2">Operation at
OAT ≤ -15°C | -15°C < OAT < 0°C</td><td>Operation at
OAT ≤ 0°C</td></tr>
<tr><td>> 30PPM</td><td colspan="2">YES</td><td rowspan="2">YES</td></tr>
<tr><td>< 30PPM</td><td>YES</td><td>NO</td></tr>
</table>

<table>
<tr><th>Specifications</th><th>Concentration</th></tr>
<tr><td>AIR 3652</td><td rowspan="5">Between 0.10% and 0.15%</td></tr>
<tr><td>MIL-I 27686</td></tr>
<tr><td>D-ENG-RD 2451</td></tr>
<tr><td>MB-NATO- S 748</td></tr>
<tr><td>MIL-I 85470A</td></tr>
<tr><td>Fluid I :GOST 8313-88</td><td rowspan="2">Between 0.10% and 0.30%</td></tr>
<tr><td>Fluid I :TU 6-1061458-79</td></tr>
</table>

2 APPROVED LUBRICANTS

- ENGINE LUBRICANTS

NORMAL USE					
Oil type	**NATO Code**	**Specification**			**Approved oil grades**
		FRANCE	**USA**	**UK**	
Synthetic 5 cSt at 98.9° C	0.156	-	MIL-L-23699	-	AEROSHELL OIL/500/560 CASTROL/5000/AEROJET 5 ELF TURBOJET II ESSO TURBO OIL/II/2380/2197 MOBIL JET OIL/II/254/291 TOTAL AEROTURBINE 535 TURBONYCOIL 600

OTHER OILS (-30°C ≤ OAT ≤ +30°C)					
Oil type	**NATO code**	**Specification**			**Approved oil grades**
		FRANCE	**USA**	**UK**	
Synthetic 3 to 3.5 cSt at 98.9° C	0.148	AIR 3513	MIL-L-7808	-	ESSO TURBO OIL 2389 MOBIL OIL AVREX 256 TURBONYCOIL 160
	0.150	AIR 3514	-	-	ELF JET SYNTHETIC OIL 15 TOTAL AERO TURBINE 312 TURBONYCOIL 13B
Synthetic 3.9 cSt at 98.9° C	-	-	-	DEF STAN 91-94	AEROSHELL TURBINE OIL 390

NOTE 1
When the oil specification or grade/trademark differs from the approved one, TURBOMECA approval shall be obtained before using this oil.

NOTE 2
In case of oil change with trademark/NATO code/category/grade or specification change, apply instructions as prescribed in the TURBOMECA Maintenance Manual.

NOTE 3
All specifications are effective at latest issue or amendment.

- MAIN AND TAIL GEARBOX LUBRICANTS

NORMAL USE (-25°C ≤ OAT ≤ +50°C)					
Oil type	**NATO Code**	**Specifications**			**Approved lubricants**
		FRANCE	**USA**	**UK**	
Mineral	0.155	AIR 3525	MIL-L-6086	-	ESSO GEAR OIL MEDIUM NYCOLUBE 3525 TOTAL AEROGEAR 823
NOTE : The « SHELL » trademark is prohibited					

COLD WEATHER USE (-30°C ≤ OAT ≤ +0°C)					
Oil type	**NATO Code**	**Specifications**			**Approved lubricants**
		FRANCE	**USA**	**UK**	
Synthetic	0.148	AIR 3513	MIL-L-7808	-	ESSO TURBO OIL 2389 MOBIL OIL AVREX 256 TURBONYCOIL 160
	0.150	AIR 3514	-	-	ELF JET SYNTHETIC OIL 15 TOTAL AERO TURBINE 312 TURBONYCOIL 13B

- SERVO CONTROL LUBRICANT

  Hydraulic fluid: NATO H 537 or MIL-H-83282.

3 CRASH RESISTANT REAR SEATS

The safety belts of unoccupied rear seats must not be fastened and the button on the shoulder belt must not be visible.

4 BAGGAGE COMPARTMENT LOAD LIMITATIONS

Maximum distributed load ....300 kg/m² (62.5 lb/ft²)

5 CABIN COMPARTMENT LOAD LIMITATIONS

Maximum distributed load .... 300 kg/m² (62.5 lb/ft²)

6 ENGINE STARTER/GENERATOR

To prevent starter overheat damage, limit starter time to the following:

1st Start	Cooling time	**Crank**	Cooling time	**2nd Start**	Cooling time	**Crank**	Cooling time
Failed	1 min	30 s	1 min	OK			
Failed	1 min	30 s	1 min	Failed	30 min	30 s	1 min

When performing an engine ventilation, the starter time is the duration that the [**CRANK**] is pressed.

7 MANDATORY MINIMUM EQUIPMENT

A minimum of two adequate radio/audio headsets shall be on-board the helicopter, one worn by the pilot at the controls to monitor the audio warnings delivered through the ICS system, and a spare one.

8 OPTIONAL EQUIPMENT

When optional equipment items are installed, refer to supplements for additional limitations, procedures and performance data.

RC a

The paragraph **1 - VNE PLACARDS**, is superseded by:

1 VNE PLACARDS

VNE ↓ **HP**	**POWER ON**
0	150
1000	147
2000	144
3000	141
4000	138
5000	135
6000	132
7000	129
8000	126
9000	123
10000	120
11000	117
12000	114
13000	111
14000	108
15000	105
16000	102
17000	99
18000	96
19000	93
20000	90
∗**VNE POWER OFF: LESS 30 KTS**	

Location: Inside cabin, instrument panel RH side.

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 34.001.

SECTION 2.6

PLACARDS

All placards shown hereafter are usually presented in bilingual form French/English. However, the State of Registry may approve markings and placards in local language intended for:

- Emergency passenger information and instruction,
- Instruction for operation of passenger doors.

The following illustrations of placards and decals are typical presentations. Slight formal differences from the real placards and decals do not affect information presented therein.

1 VNE PLACARDS

MV.EC120.0094.00

V.N.E. POWER ON	
HP (ft)	Vi (kts)
0	150
2 000	144
4 000	138
6 000	132
8 000	126
10 000	120
12 000	114
14 000	108
16 000	102
18 000	96
20 000	90
* V.N.E. POWER OFF : LESS 30 kts	

MV.EC120.0170.00

V.N.E. POWER ON	
HP (m)	VI (kmh)
0	278
500	269
1 000	260
1 500	250
2 000	241
2 500	232
3 000	223
3 500	214
4 000	205
4 500	196
5 000	187
5 500	178
6 100	167
POWER OFF : − 56 kmh	

Location: Inside cabin, on center post, above standby compass.

2 OPERATING LIMITATION PLACARD

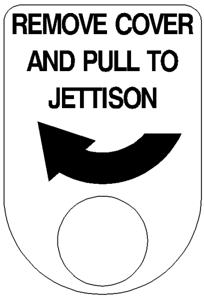
MV.EC120.0067.01

> THE HELICOPTER IS APPROVED TO OPERATE BY DAY AND NIGHT IN VFR.
> THE MARKINGS AND PLACARDS INSTALLED ON THIS HELICOPTER CONTAIN OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS ROTORCRAFT. OTHER OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS ROTORCRAFT ARE CONTAINED IN THE ROTORCRAFT FLIGHT MANUAL. THE "AIRWORTHINESS LIMITATIONS" SECTION OF THE ROTORCRAFT MAINTENANCE MANUAL MUST BE COMPLIED WITH.

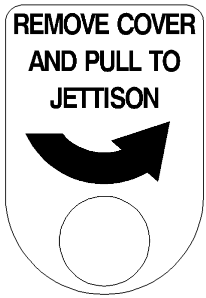
Location: Inside cabin, near the overhead control quadrant.

3 OTHER PLACARDS DISPLAYED IN THE COCKPIT

MV.EC120.0072.00

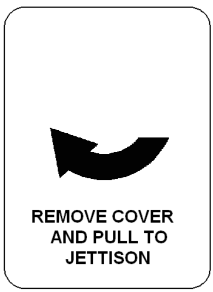


- LH side

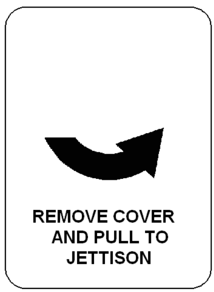


- RH side.

or



- LH side



- RH side.

Location: Inside cabin near door jettisoning handle.

RC a

The paragraph **2 - OPERATING LIMITATION PLACARD**, is superseded by:

2 OPERATING LIMITATION PLACARD

MV.EC120.0067.00

THE HELICOPTER IS APPROVED TO OPERATE BY DAY IN VFR. THE MARKINGS AND PLACARDS INSTALLED ON THIS HELICOPTER CONTAIN OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS ROTORCRAFT. OTHER OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS ROTORCRAFT ARE CONTAINED IN THE ROTORCRAFT FLIGHT MANUAL. THE "AIRWORTHINESS LIMITATIONS" SECTION OF THE ROTORCRAFT MAINTENANCE MANUAL MUST BE COMPLIED WITH.

Location: Inside cabin, near the overhead control quadrant.

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 34.001.

MV.EC120.0060.00

DO NOT STOW ANYTHING
UNDER ALL THE SEATS

Location: - RH forward seat, at bottom RH side,
- LH forward seat, at bottom LH side,
- Bench seat LH side.

MV.EC120.0061.00

A/C SERIAL N°:	
WEIGHT :	
C. OF G. :	
DATE :	

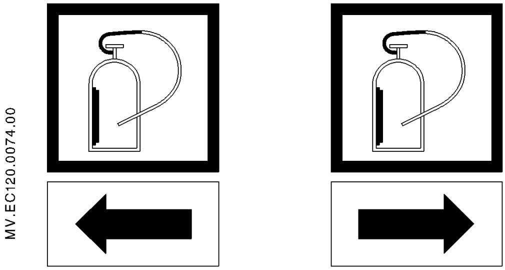
Location: Console RH side.

MV.EC120.0063.00

COMPASS
AIRCRAFT
DATE

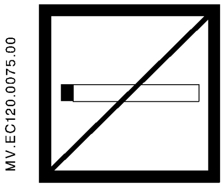
HEADING	
MAGNETIC	CORRECTED
000	
045	
090	
135	
180	
225	
270	
315	

Location: Inside cabin, on center post, near standby compass.



RH side LH side.

Location: Inside cabin, on console lateral side.



Location: Inside cabin, near reading light.

RC d

The paragraph **5 - FUEL AND LUBRICANT PLACARDS**, is modified as following:

5 FUEL AND LUBRICANT PLACARDS

The fuel placard is replaced by the following:

MV.EC120.0065.03

CARBURANT : JP1-JP5-JP8
JET A1-JET A
FUEL : F34-F35-F43-F44
PRC FUEL : N°3 JET FUEL
CAPACITE / CAPACITY :

109,9	U.S. GALLONS
91,6	IMP. GALLONS
416	LITRES / LITERS
324	KG

Location: RH side of filler neck, LH side.

NOTE

The total fuel capacities to be taken into account are those shown in Section 7.1 § 2.4.

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 28.007.

4 FLOOR LOADING PLACARD

MV.EC120.0062.01

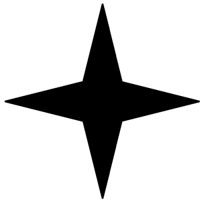
DISTRIBUTED LOADS MAXI
ON FLOOR
62.5 POUNDS/SQ FEET - 300 kg/m²

MAX WEIGHT 970 lb - 441 kg

Location : Console LH side, cargo hold, RH side.

5 FUEL AND LUBRICANT PLACARDS

MV.EC120.0064.00



Location : LH filler neck, LH side.

MV.EC120.0065.02

CARBURANT : JP1-JP4-JP5-JP8
JET A1-JET A-JET B
FUEL : F34-F35-F40-F43-F44
PRC FUEL : N°3 JET FUEL
CAPACITE / CAPACITY :

108,5	U.S. GALLONS
90,4	IMP. GALLONS
410,5	LITRES / LITERS
326,3	KG

Location : RH of filler neck, LH side.

MV.EC120.0066.00

ENGINE OIL CAPACITY :
3L MIN.
4.9L MAX.

NORMAL OIL :
NATO 0.156 / MIL.L.23699

REPLACEMENT OIL :
NATO 0.148 / MIL.L.7808
NATO 0.150 / AIR 3514

MINERAL OIL USE IS
FORBIDDEN FOR
HELICOPTER ENGINE

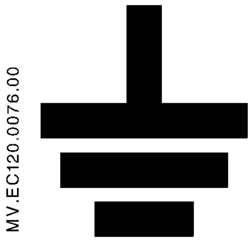
Location : RH of engine oil filler cap.

MV.EC120.0073.01

OIL AIR 3525 0.155	or	OIL AIR 3513 0.148	or	OIL AIR 3514 0.150

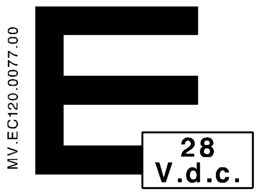
Location : Near TGB and MGB filler neck RH side.

6 ELECTRICAL PLACARDS



Location : LH side of aircraft, above grounding point.

If installed:



Location : RH side, on ground power receptacle cover.

SECTION 3

EMERGENCY PROCEDURES

CONTENTS

SECTION 3.1

EMERGENCY PROCEDURES

1 GENERAL

Emergency procedures describe the actions that the pilot must take relative to the various possible failures that can occur.

Meanwhile, depending on the many variable external environments, such as the type of terrain overflown, the pilot may have to adapt to the situation according to his experience.

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

LAND IMMEDIATELY

Self explanatory.

LAND AS SOON AS POSSIBLE

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

LAND AS SOON AS PRACTICABLE

Emergency conditions are less urgent and in the pilot's judgment, he may proceed to the nearest airfield where he can expect appropriate assistance.

CONTINUE FLIGHT

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

NOTE

Immediate actions that the pilot shall take are written in bold characters.

2 AUDIO WARNINGS

On the LACU, a [**HORN**] pushbutton is used to activate the audio warning.

When [**HORN**] pushbutton is pressed in: **HORN**.

NOTE

The pilot at the controls shall wear an adequate radio/ICS audio headset to monitor the audio warnings through the ICS system.

- **GONG**

  A gong is generated each time a red warning appears on the CWP.

- **CONTINUOUS TONE**

Two continuous tones can be heard:

- A 310 Hz tone when NR is below 370 rpm
- A 285 Hz tone when maximum takeoff rating is exceeded:

  * After 1.5 sec. delay if power remains within transient range

  * Immediately when max. transient rating is or will be exceeded during fast power increase.

1. Collective .... REDUCE to maintain NR in normal operating range or power within limitations

2. Engine parameters .... CHECK

- **INTERMITTENT TONE**

An intermittent tone (310 Hz) is heard when the NR is above 420 rpm.

Collective .... INCREASE to maintain NR in normal operating range

Apply procedure according to the situation.

RC f

The paragraph **2 - AUDIO WARNINGS**, is modified as follows:

The item "CONTINUOUS TONE" is superseded by:

- CONTINUOUS TONE

Two continuous tones can be heard:

- A 310 Hz tone when NR is below 370 rpm.
- A 285 Hz tone when maximum takeoff rating is exceeded:
  - ∗ After 1.5 sec. delay if power remains within transient range.
  - ∗ Immediately when max. transient rating is exceeded.

The rest of the paragraph is unchanged.

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 31.003.

SECTION 3.2

ENGINE FLAME-OUT

1 CRUISE FLIGHT

AUTOROTATION PROCEDURE OVER LAND

1. **Collective.. REDUCE** to maintain NR in normal operating range
2. **IAS... SET TO Vy**
3. Twist grip .... SHUT OFF detent
4. Maneuver the aircraft into the wind on final approach

- <u>At height ≅ 70 ft (21 m)</u>

5. Cyclic .... FLARE

- <u>At 20/25 ft (6/8 m) and at constant attitude</u>

6. Collective .... GRADUALLY INCREASE to reduce the rate of descent and forward speed
7. Cyclic .... FORWARD to adopt a slightly nose-up landing attitude
8. Pedals.. ADJUST to cancel any sideslip tendency
9. Collective .... INCREASE to cushion touch-down

- <u>After touch-down</u>

10. Cyclic, collective, pedals .... ADJUST to control ground run

- <u>Once the aircraft has stopped</u>

11. Collective .... FULL LOW PITCH
12. Rotor brake .... APPLY below 150 rotor rpm

AUTOROTATION PROCEDURE OVER WATER

Before touch-down, apply same procedure as over land, but maneuver to head the aircraft equally between the wind and wave direction on final approach. Ditch with minimum forward speed (IAS < 30 kt (56 km/h)) and vertical speed.
Then:

- After touch-down

10. Collective .... MAINTAIN
11. Forward doors emergency handles .... PULL-UP
12. Doors .... JETTISON or OPEN
13. Rotor brake .... APPLY

Abandon aircraft once the rotor has stopped.

2 HOVER IGE

1. **Collective .... MAINTAIN**
2. **Pedals .... CONTROL YAW**
3. **Collective .... INCREASE** as needed to cushion touch-down

3 HOVER OGE

WARNING

SAFE AUTOROTATIVE LANDING CANNOT BE ENSURED IN CASE OF A FAILURE IN HOGE BELOW THE TOP POINT OF THE HV DIAGRAM (REFER TO SECTION 5.1) OR IN CONFINED AREA.

1. **Collective .... FULL LOW PITCH**

- When NR stops decreasing

2. **Cyclic .... FORWARD**
   to gain airspeed according to available height
3. Autorotation procedure.................................... APPLY

4 IN FLIGHT RELIGHTING

When Ng is less than 10%, according to available height and cause of flame-out, try to relight using starting procedure.

At least 1000 ft (300 m) are necessary to complete relighting procedure after flame-out.

SECTION 3.3

TAIL ROTOR FAILURES

1 COMPLETE LOSS OF TAIL ROTOR THRUST

Symptom: The helicopter will yaw to the left with a rotational speed depending on the amount of power and the forward speed set at the time of the failure.

WARNING

SAFE AUTOROTATIVE LANDING CANNOT BE ENSURED IN CASE OF A FAILURE IN HOGE BELOW THE TOP POINT OF THE HV DIAGRAM (REFER TO SECTION 5.1) OR IN CONFINED AREA.

1.1 HOVER IGE (OR OGE WITHIN HV DIAGRAM)

LAND IMMEDIATELY

1. **Twist Grip** .... **IDLE position**
2. **Collective** .... **INCREASE** to cushion touch-down

1.2 HOVER OGE (CLEAR AREA, OUTSIDE HV DIAGRAM)

Simultaneously,

1. **Collective** .... **REDUCE** depending on available height
2. **Cyclic** .... **FORWARD** to gain speed
3. Airspeed .... MAINTAIN Vy or higher
4. Collective .... ADJUST to obtain minimum sideslip angle

LAND AS SOON AS POSSIBLE

If a go-around was performed, carry out an autorotative landing on an area suitable for the autorotation procedure.

1.3 IN CRUISE FLIGHT

1. Airspeed..MAINTAIN Vy or higher
2. Collective ....ADJUST to obtain minimum sideslip angle.

LAND AS SOON AS POSSIBLE

APPROACH AND LANDING

On a suitable area for autorotative landing:

1. Carry out an autorotative landing according to the autorotation procedure (Refer to SECTION 3.2 § 1).
2. During descent, twist grip...............................IDLE position

RC g

The paragraph **1 - SOURCE NOT IDENTIFIED**, is modified as follows:

1 SOURCE NOT IDENTIFIED

Heating, Demisting...OFF

smoke clears

NO

1. **[BAT.]**............................ OFF
2. **[GENE]**.......................... OFF
3. Ventilate the cabin.

When smoke clears:

4. All Consumers................ OFF
5. **[BAT.]**............................ ON check BAT/GEN voltage.
6. **[GENE]**.......................... ON check BAT/GEN voltage.

smoke clears

NO

LAND AS SOON AS POSSIBLE

YES

If BAT/GEN parameters not correct:

7. **[GENE]**................................OFF
8. Apply case A of GENE off line procedure

LAND AS SOON AS PRACTICABLE

If BAT/GEN parameters correct:

7. **[AVIONIC]** (if installed).........................ON
8. Minimum required consumers..............ON one by one, if smoke returns, switch off that particular system for remainder of flight

CONTINUE FLIGHT

depending on atmospheric conditions

YES

CONTINUE FLIGHT

depending on atmospheric conditions

CAUTION

When battery and generator are off line, the VEMD goes off. Apply the procedure for failure of both screens (SECTION 3.5 § 1 VEMD screen failure).

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 31.004.

SECTION 3.4

SMOKE IN THE CABIN

1 SOURCE NOT IDENTIFIED

Heating, Demisting..OFF

smoke clears

NO

1. [**EMER SW**] (if installed)**........................ OFF**
2. [**BAT/EPU**].. OFF
3. [**GENE**] .... OFF
4. [**AVIONIC**] (if installed)......................... OFF
5. Ventilate the cabin.

When smoke clears:

6. All consumers....................................... OFF
7. [**EMER SW**] (if installed)........................ ON
8. [**BAT/EPU**]...............ON check BAT/GEN Parameters
9. [**GENE**] ....ON, check BAT/GEN Parameters

YES

CONTINUE FLIGHT

depending on atmospheric conditions

smoke clears

NO

LAND AS SOON AS POSSIBLE

YES

If BAT/GEN parameters not correct:

10. [**GENE**]...............................OFF
11. Apply case A of GENE off line procedure

LAND AS SOON AS PRACTICABLE

If BAT/GEN parameters correct:

10. [**AVIONIC**] (if installed).......................ON
11. Minimum required consumers............ON one by one, if smoke returns, switch off that particular system for remainder of flight

CONTINUE FLIGHT

depending on atmospheric conditions

CAUTION

When [EMER SW] (if installed) is actuated or battery and generator are off line, the VEMD goes off. Apply the procedure for failure of both screens (SECTION 3.5 § 1 VEMD screen failure).

2 SOURCE IDENTIFIED

1. **Corresponding system .... OFF**
2. Ventilate the cabin

CONTINUE FLIGHT

depending on system failed.

3 AFTER COCKPIT FIRE EXTINGUISHER USE

1. Avoid as much as possible extinguisher agent inhalation.
2. Ventilate the cabin.

SECTION 3.5

VEMD FAILURES, CAUTION MESSAGES DISPLAYED ON VEMD AND NR/Nf INDICATORS

1 VEMD SCREEN FAILURES

- **Failure of one screen**

  [OFF1] or **[OFF2]** .... OFF

  Read all available information on the other screen.

  Information is available using the [**SCROLL**] pushbutton either on the VEMD or on the collective grip.

- **Failure of both screens**

  To avoid any power overlimit, the maximum authorized power will be the power needed to establish level flight with the following law:

  IAS kt = 100 kt at 0 Hp - (2 kt / 1000 ft).

  IAS km/h = 185 km/h at 0 Hp - (4 km/h per 300 m).

  LAND AS SOON AS PRACTICABLE

  Landing procedure: Carry out a no hover landing.

2 CAUTION MESSAGES ON VEMD

When a parameter is off line, the parameter value is not displayed on the corresponding VEMD screen and the parameter scale symbology is displayed in yellow.
Caution messages are self explanatory and the pilot shall comply with the action requested. If no light is lit on the Caution and Warning Panel, no other action is required from the pilot.

LANE 1 (or 2) FAILED ------> PRESS OFF 1 (or 2)	: Self explanatory
VEH PARAM OUT RANGE	: Abnormal vehicle parameter
ENG PARAM OUT RANGE	: Abnormal engine parameter

These messages appear when a parameter usually displayed on this page reaches a limitation, as the relevant (vehicle or engine) pages are not displayed.

- **[SCROLL]** .... : PRESS to reach the relevant page and check the parameter

CROSSTALK FAILED ------> PRESS OFF 1 (or 2)	: Self explanatory
BRT CNTRL FAILED	: Brightness control failed
FLI FAILED ------> CHECK PARAM	: One power parameter (Ng, T4, Tq) not consistent

- Parameter consistency .... : CHECK
- Relevant procedures in § ABNORMAL ENGINE PARAMETER INDICATION; SECTION 3............... : APPLY

FLI VALID ------> PRESS RESET	: The "FLI" function becomes valid again after failure.
GEN PARAM OUT RANGE	: Abnormal generator parameter
BAT PARAM OUT RANGE	: Abnormal battery parameter

These messages appear when the relevant parameter is not displayed on the vehicle page and when an electrical limitation is reached.

- **[V/A SELECT]**................................. : ACTUATE, check electrical parameters

BAT.T	: Battery temperature probe off line
GPS NOT AVAILABLE	: GPS system not available. (no absolute time reference)

- GPS navigation system .... : CHECK ON

OVERLIMIT DETECTED	: Engine / vehicle overlimit recorded

This message appears as soon as a parameter over limit is recorded in the VEMD. It will be displayed on the FLI or engine page until 40 % Ng during the next engine start.
After the flight, check the recorded over limit data and perform the associated maintenance actions.
For all of these messages, unless otherwise required by accompanying caution/warning lights or procedures:

CONTINUE FLIGHT

RC f

The paragraph **2 - CAUTION MESSAGE ON VEMD**, is modified as follows:
The paragraph is superseded by the following:

LANE 1 (or 2) FAILED ------> PRESS OFF 1 (or 2)	: Self explanatory
VEH PARAM OVER LIMIT	: Abnormal vehicle parameter
ENG PARAM OVER LIMIT	: Abnormal engine parameter

These messages appear when a parameter usually displayed on this page reaches a limitation, as the relevant (vehicle or engine) pages are not displayed.

- **[SCROLL]** ....: PRESS to reach the relevant page and check the parameter

CROSSTALK FAILED ------> PRESS OFF 1 (or 2)	: Self explanatory
BRT CNTRL FAILED	: Brightness control failed
FLI FAILED ------> PRESS OFF 1 (or 2)	: One power parameter (Ng, T4, Tq) not consistent

- Parameter consistency .... : CHECK
- Relevant procedures in § ABNORMAL ENGINE PARAMETER INDICATION; SECTION 3............... : APPLY

FLI VALID ------> PRESS RESET	: The "FLI" function becomes valid again after failure.
GEN PARAM OVER LIMIT	: Abnormal generator parameter
BAT PARAM OVER LIMIT	: Abnormal battery parameter

These messages appear when the relevant parameter is not displayed on the vehicle page and when an electrical limitation is reached.

- **[V/A SEL]**... : ACTUATE, check electrical parameters

BAT.T	: Battery temperature probe off line

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 31.003.

3 ABNORMAL NR/Nf INDICATIONS

- **NR indication failure**

  Collective ....: MAINTAIN Tq > 10 %

  NR reading is given by Nf pointer

LAND AS SOON AS PRACTICABLE

- **Nf indication failure**

  NR indication ....: CHECK in normal operating range with Tq > 0

CONTINUE FLIGHT

NOTE

After failure of the Nf indication, the FLI is replaced by the 3 data symbology (Ng/ΔNg, T4 and Tq) and a failure message is displayed.

4 ABNORMAL ENGINE PARAMETER INDICATIONS

- **Engine Oil Temperature > 110° C**

  IAS ....SET to Vy

  Temperature decreases

  YES → **LAND AS SOON AS PRACTICABLE**

  NO → **LAND AS SOON AS POSSIBLE**

- **Loss of OAT, Ng, Tq or T4 parameters**

  When a parameter is off line, the parameter value is not displayed on the VEMD upper screen and the parameter scale symbology (if applicable) is displayed in yellow.

  The First Limitation Indicator (FLI) is replaced by the 3-data symbology (Ng/ΔNg, T4 and Tq) and a failure message is displayed.

CONTINUE FLIGHT

- **OAT indicator failure**

  OAT appears in the lower right corner of the upper screen when OAT indication fails. The ΔNg scale is then displayed in yellow and ΔNg indication is lost.

  Comply with the maximum Ng values given below:

  - Maximum takeoff power (MTOP) .... Ng = 100 %
  - Maximum continuous power (MCP) .... Ng = 98.5 %

- **Ng indicator failure**

  Comply with the maximum T4 values given below:

  - OAT > -10°C .... T4 limited to 760°C
  - OAT ≤ -10°C .... T4 limited to 750°C

NOTE

In this case, the T4 limitations displayed are the <u>starting limitations</u>.

An engine overlimit may be recorded and the message OVERLIMIT DETECTED displayed on VEMD if the T4 exceeds 750°C. This overlimit can be ignored.

- **Torquemeter failure**

  Comply with the maximum Ng given in the following table:

Ng limitation Max Cont Power (%)

Hp \ OAT (°C)	-40 to -35	-35 to -25	-25 to -15	-15 to -5	-5 to 5	5 to 15	15 to 25	25 to 50
12000 ft (3657 m) to 20000 ft (6096 m)								
10000 ft (3048 m) to 12000 ft (3657 m)	95.5	96.5	97.5					
8000 ft (2438 m) to 10000 ft (3048 m)	94.5	95.5	96.5	97.5				
6000 ft (1829 m) to 8000 ft (2438 m)	92.5	93.5	95.5	96.5	98.5			
4000 ft (1220 m) to 6000 ft (1829 m)	91.5	92.5	93.5	95.5	96.5	98.5		
2000 ft (610 m) to 4000 ft (1220 m)	90.5	91.5	92.5	94.5	95.5	97.5	98.5	
0 ft to 2000 ft (610 m)	89.5	89.5	91.5	93.5	94.5	96.5	97.5	

MV.EC120.0015.01

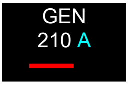
- **T4 indication failure**

  Comply with Ng and Tq limitations.

  Do not start the engine.

5 ABNORMAL ELECTRICAL PARAMETER INDICATIONS

VEMD	CORRECTIVE ACTIONS
GEN 32.0 V	Over voltage on the generator (> 31.5 V): 1. **[GEN]** or **[GENE]** ....OFF 2. CWP..MONITOR for BATT TEMP 3. GENE procedure case A ....Apply **LAND AS SOON AS PRACTICABLE**
GEN 30.0 V	Over voltage on the generator (29.0 V < GEN ≤ 31.5 V): 1. GEN voltage.............................MONITOR **CONTINUE FLIGHT**
GEN 24.0 V	Under voltage on DC bus (≤ 24.0 V): 1. GENE procedure ....Apply 2. GEN voltage............................. CHECK > 24.0 V YES **CONTINUE FLIGHT** NO 3. GENE procedure case A.......................Apply **LAND AS SOON AS PRACTICABLE** **NOTE** **Probable cause of such a failure is a generator defect that does not make GENE come on.**

VEMD	CORRECTIVE ACTIONS
 Red underline is flashing	Generator current over limit: 1. Unnecessary equipment............ OFF **CONTINUE FLIGHT** **NOTE** **After engine starting on battery, a temporary high generator current is normal because the battery is being recharged. During this phase, avoid using high electrical load consumers.**

RC g

The paragraph 1 **- ENGINE ALARMS** , is modified as follows:

1 ENGINE ALARMS

Supersede the table **ENG FIRE** by the following:

WARNING PANEL	CORRECTIVE ACTIONS
ENG FIRE Fire in engine bay	- **At Start-up:** **1. Twist grip .... OFF** **2. Emergency fuel shut-off handle .... CLOSED** 3. **[PUMP]... OFF** 4. **[CRANK]** .... PRESS (10 sec.) 5. Rotor brake .... APPLY (≤ 150 rpm) 6. **[BAT.]** .... OFF 7. Evacuate aircraft and fight fire from outside. - **Hover, Takeoff, Final:** **LAND IMMEDIATELY** Carry out a no hover powered landing. Once on ground, apply same procedure as above. - **In Flight:** **LAND IMMEDIATELY** **1. Collective ....REDUCE** **2. IAS ....SET to Vy** **3. Autorotation procedure ....APPLY** **4. Twist grip ....OFF** **5. Emergency fuel shut-off handle ..CLOSED** **6. [PUMP]..CHECK OFF** - **After landing:** 7. Rotor brake ....APPLY (≤ 150 rpm) 8. **[BAT.]** ....OFF 9. Evacuate aircraft and fight fire from outside

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL MODIFICATION SB No. 31.004 HAS BEEN EMBODIED TO THE AIRCRAFT.

SECTION 3.6

CAUTION AND WARNING PANEL

1 ENGINE ALARMS

WARNING PANEL	CORRECTIVE ACTIONS
ENG FIRE Fire in engine bay	- **At start-up:** **1. Twist grip .... OFF** **2. Emergency fuel shut-off handle.. CLOSED** **3. [FUEL P]...................................... OFF** 4. [**CRANK**] .... PRESS (10 sec.) 5. Rotor brake.................................... APPLY (≤ 150 rpm) 6. [**BAT/EPU**].................................... OFF 7. Evacuate aircraft and fight fire from outside - **Hover, Takeoff, Final:** **LAND IMMEDIATELY** Carry out a no hover powered landing. Once on ground, apply same procedure as above. - **In flight:** **LAND IMMEDIATELY** **1. Collective .... REDUCE** **2. IAS .... SET to Vy** **3. Autorotation procedure .... APPLY** **4. Twist grip .... OFF** **5. Emergency fuel shut-off handle.. CLOSED** **6. [FUEL P]...................................... CHECK OFF** - **After landing:** 7. Rotor brake.................................... APPLY (≤ 150 rpm) 8. [**BAT/EPU**].................................... OFF 9. Evacuate aircraft and fight fire from outside

WARNING PANEL	CORRECTIVE ACTIONS
ENG P Engine oil pressure below limit	**Oil pressure ....CHECK gauge** LOW OR NIL → **LAND IMMEDIATELY** → Autorotation procedure.... APPLY → Shut down engine, time permitting NORMAL → **LAND AS SOON AS PRACTICABLE**
TWT GRIP Twist grip out of FLIGHT position	**Twist grip ....INCREASE to FLIGHT position**
ENG CHIP Metal particles in engine oil circuit	**Collective................................Reduce power** **LAND AS SOON AS POSSIBLE** Low-power approach and landing. Be prepared in case of a loss of engine power. **NOTE** **Takeoff is prohibited until checks specified in TURBOMECA Maintenance Manual have been completed.**

2 TRANSMISSION ALARMS

WARNING PANEL	CORRECTIVE ACTIONS
MGB P Main gear box low oil pressure	**Collective**............................... **REDUCE power** **Tq**.. **Set** < 45% **LAND AS SOON AS POSSIBLE** If a safe landing is not possible, continue flight to the nearest appropriate landing site, reduce power to fly at minimum power speed (Vy). **NOTE** **At low power (Tq < 45%) a maximum of 30 min. of simulated flight time has been demonstrated during bench tests.**
MGB TEMP Main gear box oil overheating	**1. IAS**.................................... **SET TO Vy** **2. CWP** .... **MONITOR** **MGB TEMP** → **LAND AS SOON AS PRACTICABLE** **MGB TEMP** → **LAND AS SOON AS POSSIBLE**
GB CHIP Metal particles in MGB or TGB oil circuit	IAS..Set to Vy **MGB P** and **MGB TEMP** ..... Monitor Be prepared to apply **MGB P** or **MGB TEMP** procedure. Avoid prolonged hovering. **LAND AS SOON AS PRACTICABLE**

3 HYDRAULIC ALARM

WARNING PANEL	CORRECTIVE ACTIONS
HYDR Loss of hydraulic pressure or Hydraulic pressure < 20 bar	**Keep aircraft at a more or less level attitude.** **Avoid abrupt maneuvers.** **CAUTION** **Do not attempt to carry out hover flight or any low speed maneuver.** **The intensity and direction of the control feedback force will change rapidly. This will result in poor aircraft control and possible loss of control.** **NOTE 1** **The accumulators contain sufficient pressure to secure flight and to reach the hydraulic failure safety speed.** **NOTE 2** **Pushing down and locking simultaneously the collective with one hand is a difficult operation. The pilot can decide to first shut down the engine then lock the collective.** - **<u>HIGE, Takeoff, Final</u>:** (if immediate landing is possible) 1. Land normally 2. Collective..LOCK 3. Engine shut down procedure ....Apply - **<u>In flight:</u>** Smoothly 1. IAS ....SET to around Vy (hydraulic failure safety speed) 2. Hydraulic cut-off switch (collective grip).......................................OFF Pilot has to exert forces: - On collective increase or decrease around no force feedback point - On forward and left cyclic **LAND AS SOON AS POSSIBLE** **NOTE** **Speed may be increased as necessary but control loads will increase with speed.** 3. <u>Approach and landing</u>: Over a clear and flat area - Perform a flat approach into wind - Make a no-hover slow running landing at around 10 kt (18.5 km/h) **- Do not hover or taxi without hydraulic pressure** 4. <u>After landing</u>: - Collective..LOCK - Shutdown procedure ....Apply

RC g

The paragraph **4 - ELECTRICAL ALARMS**, is modified as follows:

4 ELECTRICAL ALARMS

Supersede the tables **BATT TEMP** and **BATT** by the following:

WARNING PANEL	CORRECTIVE ACTIONS
BATT TEMP Maximum battery temperature: - Above 60° C, AMBER alarm is displayed on VEMD. - Above 71°C, RED alarm is displayed on VEMD and CWP.	On VEMD: Battery temperature and BAT voltage .... CHECK If overheating suspected: 1. **[BAT.]** .... OFF 2. GEN Voltage .... CHECK NORMAL → Battery temp ..CHECK → DECREASES → **CONTINUE FLIGHT** When Bat temp < 65 °C : **[BAT.]** .... ON (If required) → STEADY → **LAND AS SOON AS PRACTICABLE** ABOVE U max (32V) 1. **[BAT.]** .... ON 2. **[GENE]** .... OFF 3. Unnecessary equipment .... OFF → **LAND AS SOON AS PRACTICABLE**
BATT Battery off line	**[BAT.]** .... CHECK ON NO → **[BAT.]** .... ON → BATT → **CONTINUE FLIGHT** YES → **[ELECT RESET]** ....ACTUATE → BATT (extinguished) → **CONTINUE FLIGHT** → BATT (illuminated) → **LAND AS SOON AS PRACTICABLE** Battery(ies) connections ....CHECK

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No. 31.004.

4 ELECTRICAL ALARMS

WARNING PANEL	CORRECTIVE ACTIONS
BATT TEMP Maximum battery temperature: - Above 60° C, AMBER alarm is displayed on VEMD. - Above 71°C, RED alarm is displayed on VEMD and CWP.	On VEMD: Battery temperature and BAT voltage .... CHECK If overheating suspected: 1. [**BAT/EPU**] .... OFF 2. GEN Voltage .... CHECK NORMAL → Battery temp ......CHECK → DECREASES → **CONTINUE FLIGHT** When Bat temp < 65 °C : [**BAT/EPU**] .... ON (If required) → STEADY → **LAND AS SOON AS PRACTICABLE** ABOVE U max (32V) 1. [**BAT/EPU**]................ ON 2. [**GENE**] .... OFF 3. Unnecessary equipment................. OFF → **LAND AS SOON AS PRACTICABLE**
BATT Battery off line	[**BAT/EPU**] .... CHECK ON NO → [**BAT/EPU**] .....ON → **BATT** (not lit) → **CONTINUE FLIGHT** YES → [**ELEC RST**] ....ACTUATE → **BATT** (not lit) → **CONTINUE FLIGHT** → **BATT** (lit) → **LAND AS SOON AS PRACTICABLE** Battery(ies) connections ..... CHECK

WARNING PANEL	CORRECTIVE ACTIONS
BATT FUSE Battery fuse has blown. Battery is off line	**LAND AS SOON AS PRACTICABLE**
GENE DC Generator off line.	**1. GEN voltage on VEMD .... CHECK** **2. [GENE] .... CHECK ON** YES → [**ELEC RST**] .... ACTUATE NO → [**GENE**]............. ON Case A: GENE → Unnecessary equipment ....OFF → BAT voltage on VEMD ....MONITOR → **LAND AS SOON AS PRACTICABLE** Case B: GENE → **CONTINUE FLIGHT** **WARNING** **IF THE BATTERY FAILS, THE VEMD WILL GO OUT AND NR/NF INDICATION IS LOST.** **APPLY THE PROCEDURE FOR FAILURE OF BOTH SCREENS (SECTION 3.5 §1 VEMD SCREEN FAILURE).** **AVOID AUTOROTATION, PERFORM A SHALLOW APPROACH WITH CAUTIOUS LANDING.** **BEFORE BATTERY FAILURE, NR AUDIO ALARM WILL COME ON (U < 18 V).**

RC h

The paragraph **4 - ELECTRICAL ALARMS**, is modified as follows:

Supersede the tables BATT FUSE and GENE by the following:

WARNING PANEL	CORRECTIVE ACTIONS
BATT FUSE Battery fuse has blown. Battery is off line	**LAND AS SOON AS PRACTICABLE**
GENE DC Generator off line	**1. GEN voltage on VEMD .... CHECK** **2. [GENE]................................. CHECK ON** YES → **[ELECT RESET]**.......... ACTUATE NO → **[GENE]** ....ON Case A : GENE → Unnecessary equipment .... OFF → BAT voltage on VEMD .... MONITOR → **LAND AS SOON AS PRACTICABLE** Case B : GENE → **CONTINUE FLIGHT** **CAUTION** **If the battery fails, the VEMD will go out and only the analogue NR indication will remain. Apply the procedure for failure of both screens (SECTION 3.5 §1 VEMD screen failure). Before battery failure, NR audio alarm will come on (U < 18 V).**

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL MODIFICATION SB No. 31.004 AND/OR MODIFICATION SB No. 63.019 HAVE/HAS BEEN EMBODIED.

RC i

The paragraph **4 - ELECTRICAL ALARMS**, is modified as follows:

Supersede the tables BATT FUSE and GENE by the following:

WARNING PANEL	CORRECTIVE ACTIONS
BATT FUSE Battery fuse has blown. Battery is off line.	**LAND AS SOON AS PRACTICABLE**
GENE DC Generator off line.	**1. GEN voltage on VEMD .... CHECK** **2. [GENE].................................. CHECK ON** YES — NO NO: **[GENE]** .... ON → Case B YES: **[ELEC RST]**................. ACTUATE Case A : GENE — Case B : GENE Case A: Unnecessary equipment .... OFF BAT voltage on VEMD .... MONITOR **LAND AS SOON AS PRACTICABLE** Case B: **CONTINUE FLIGHT** **CAUTION** **If the battery fails, the VEMD will go out and only the analogue NR indication will remain. Apply the procedure for failure of both screens (SECTION 3.5 §1 VEMD screen failure). Before battery failure, NR audio alarm will come on (U < 18 V).**

CAUTION

FOR AIRCRAFT POST MODIFICATION SB No. 31.004, THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL MODIFICATION SB No. 63.019 HAS BEEN EMBODIED.

RC j

The paragraph **4 - ELECTRICAL ALARMS**, is modified as follows:

Supersede the tables BATT FUSE and GENE by the following:

WARNING PANEL	CORRECTIVE ACTIONS
BATT FUSE Battery fuse has blown. Battery is off line	**LAND AS SOON AS PRACTICABLE**
GENE DC Generator off line	**1. GEN voltage on VEMD .... CHECK** **2. [GENE].................................. CHECK ON** YES / NO NO → **[GENE]** ....ON YES → **[ELECT RESET]**.......... ACTUATE Case A : GENE / Case B : GENE Case A → Unnecessary equipment .... OFF BAT voltage on VEMD .... MONITOR **LAND AS SOON AS PRACTICABLE** Case B → **CONTINUE FLIGHT** **WARNING** **IF THE BATTERY FAILS, THE VEMD WILL GO OUT AND NR/NF INDICATION IS LOST.** **APPLY THE PROCEDURE FOR FAILURE OF BOTH SCREENS (SECTION 3.5 §1 VEMD SCREEN FAILURE).** **AVOID AUTOROTATION, PERFORM A SHALLOW APPROACH WITH CAUTIOUS LANDING.** **BEFORE BATTERY FAILURE, NR AUDIO ALARM WILL COME ON (U < 18 V).**

CAUTION

FOR AIRCRAFT POST MODIFICATION SB No. 63.019, THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL MODIFICATION SB No. 31.004 HAS BEEN EMBODIED.

5 FUEL ALARMS

WARNING PANEL	CORRECTIVE ACTIONS
FUEL Fuel quantity < 30 kg (66 lb)	**LAND AS SOON AS POSSIBLE** **NOTE** **15 min of flight time remains at MCP.** **WARNING** **AVOID MAINTAINING SIDESLIP OVER 15° AS THIS COULD LEAD TO AN ENGINE FLAME-OUT.**
FUEL P Low fuel Pressure	**- At engine start up:** [**FUEL P**] or [**PUMP**]........................... ON ↓ **FUEL P** **- In flight:** 1. Collective.................................... REDUCE POWER **2.** [**FUEL P**] or [**PUMP**].................... ON **LAND AS SOON AS POSSIBLE** Low power approach and landing. **WARNING** **BE PREPARED IN CASE OF AN ENGINE FLAME-OUT.**

WARNING PANEL	CORRECTIVE ACTIONS
FUEL FILT Fuel filter clogged	**WARNING** **FUEL FILTER BY-PASS OPENING LEADS TO CONTAMINATION OF THE FUEL LINES AND THE GOVERNOR, WHICH MAY INDUCE NG OSCILLATIONS, LIMITED POWER OR POSSIBLY FLAME-OUT.** Collective .... REDUCE POWER FUEL FILT (extinguished) → Continue flight at reduced power → **LAND AS SOON AS PRACTICABLE** FUEL FILT (illuminated) → **LAND AS SOON AS POSSIBLE** MONITOR Ng If Ng oscillations occur: NR ....CHECK in normal operating range YES → **LAND AS SOON AS POSSIBLE** NO → Refer to SECTION 3.8: GOVERNOR FAILURES

RC k

The paragraph **6 - MISCELLANEOUS ALARMS** , is modified as follows:

6 MISCELLANEOUS ALARMS

The **P2 TEMP** light is deleted.

The rest of the paragraph is unchanged.

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No. 21.008.

6 MISCELLANEOUS ALARMS

WARNING PANEL	CORRECTIVE ACTIONS
PITOT Pitot heating not operative	**[PITOT] ....CHECK ON** YES → Monitor airspeed indicator NO → **[PITOT]** .... ON **CONTINUE FLIGHT**
HORN Aural warning not operative	**[HORN] ....CHECK ON** YES → Aural warning failure NO → **[HORN]** .... ON **CONTINUE FLIGHT**
P2 TEMP Maximum temperature in heating / demisting duct exceeded	Cabin hot air outlet nozzles............. Check that air flows and air outlets not obstructed YES → Heating control............ Reduce until: **P2 TEMP** NO → Heating control.....Close

SECTION 3.7

VARIOUS WARNINGS, FAILURES AND INCIDENTS NOT INDICATED ON THE CWP

1 ROTOR BRAKE INOPERATIVE

WARNING

WAIT UNTIL ROTOR COMES TO A STANDSTILL BEFORE LEAVING THE AIRCRAFT.

Rotor stopping with wind blowing:

1. Aircraft .... Head into the wind
2. Cyclic.. Slightly into the wind

2 FLIGHT CONTROL HARDOVER OR SERVOJAM

A hardover results in uncommanded movements of one or two flight controls (excluding yaw).

A servojam results in a higher than normal force to move the flight controls.

- **HIGE, Takeoff, Final:** (if immediate landing is possible)

LAND IMMEDIATELY

After landing:

1. Hydraulic cut-off switch (collective grip)..................... OFF
2. Engine and rotor shutdown procedure .... APPLY

- **In flight:**

1. IAS .... SET to around Vy
2. Hydraulic cut-off switch (collective grip)..................... OFF, apply HYDR procedure

LAND AS SOON AS POSSIBLE

SECTION 3.8

GOVERNOR FAILURES

Engine governor failure leads either to NR drop, NR increase or NR oscillations.

1 NR DROP OR NR OSCILLATIONS LEADING TO NR/Nf < 365 rpm

1.1 IN CRUISE FLIGHT

Simultaneously to maintain NR in normal operating range:

1. Collective .... REDUCE
2. Twist grip .... CHECK in FLIGHT position

YES → Autorotation procedure............**APPLY**

NO → Twist grip .... FLIGHT position

1.2 HOVER IGE

LAND IMMEDIATELY

1. Collective .... MAINTAIN
2. Yaw .... CONTROL
3. Collective .... INCREASE to cushion touch down

1.3 HOVER OGE

Simultaneously:

1. Collective .... FULL LOW PITCH
2. Twist grip .... CHECK in FLIGHT position

YES → Autorotation procedure............**APPLY**

NO → Twist grip .... FLIGHT position

2 NR INCREASE OR NR OSCILLATIONS LEADING TO NR/Nf > 422 rpm

To maintain NR in normal operating range:

1. Collective .... INCREASE

NR CAN BE KEPT IN NORMAL OPERATING RANGE

YES ↓

LAND AS SOON AS POSSIBLE

APPROACH AND LANDING:
- Suitable area for autorotation landing ....Join
- Twist grip.. SHUTOFF position
- Autorotation procedure..APPLY

NO ↓

LAND IMMEDIATELY

- Twist grip ....SHUTOFF position
- Autorotation procedure ......APPLY

SECTION 4

NORMAL PROCEDURES

CONTENTS

SECTION 4.1

GENERAL

This section contains instructions and procedures for operating the helicopter from the planning stage, through actual flight conditions, to securing the helicopter after landing.

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.

1 OPERATING LIMITATIONS

For minimum and maximum limits, refer to SECTION 2.

Each time an operating limitation is exceeded, an appropriate entry shall be made in the logbook (helicopter, engine, etc.). The entry shall state which limit was exceeded, the duration, the extreme value attained, and any additional information essential in determining the maintenance action required.

2 FLIGHT PLANNING

Each flight should be planned adequately to ensure safe operations and to provide the pilot with the data to be used during flight. Flight planning must comply with helicopter limitations and performance (Refer to SECTIONS 2, 5, 6 and Supplements).

3 TAKEOFF AND LANDING DATA

Refer to SECTION 2 - LIMITATIONS
and
SECTION 5 - REGULATORY & ADDITIONAL PERFORMANCE DATA.

4 WEIGHT AND BALANCE DATA

Ascertain proper weight and balance of the helicopter as follows:

- Consult SECTION 6 - WEIGHT AND BALANCE.
- Ascertain weight of fuel, oil, payload, etc.
- Compute takeoff and anticipated landing gross weights.
- Check helicopter center of gravity (CG) locations.
- Check that the weight and CG limitations in SECTION 2 are not exceeded.

SECTION 4.2

PREFLIGHT CHECK

- Make sure that all flightworthiness-required corrective maintenance operations have been performed.
- These preflight checks can be done without opening any cowlings unless the helicopter had been parked for more than 2 days or in case of any visible leak or doubt.
- Check that the aircraft area is clean and unobstructed.
- Remove all picketing items if applicable.
- Carry out the following checks:

1 EXTERIOR CHECK

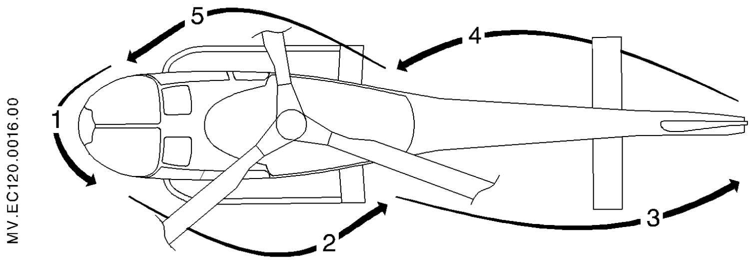


Figure 1: Sequence of checks

Station 1

- Pitot tube .... Cover removed - Condition
- Landing light .... Condition
- Sideslip indicator .... Condition
- Transparent panels .... Condition - Cleanliness
- Windshield wiper (if installed) .... Condition
- External mirror (if installed) .... Condition, set to avoid dazzling (night flight)
- Front Air intake .... Blanking cover removed - Check no obstruction or foreign objects

Station 2

- Front door...Condition, jettison system check
- Sliding door ....Condition, closed or open-locked
- MGB-Engine LH cowling ....Open (if necessary)
- MGB...Oil level
- Hydraulic compact unit..................................Oil level
- Engine ....Oil level
- Transmission deck and engine.......................Condition, cleanliness, no leaks
- MGB-Engine LH cowling ....Closed (if necessary), correctly locked
- Fuel filler plug...Closed, locked
- Landing gear and foot steps...........................Attachment - visual check
- Lower central cowling.....................................Closed, correctly locked
- Fuel tank ....Bled (before the first flight, if OAT ≥ 0°C), no leak at bleed valve
- Main rotor head ....Visual inspection, rotor head, sleeves, spherical thrust bearing, adapters, bonding braids
- Main rotor blades ....Condition, visual inspection from ground, no impact
- Static port...Cover removed, clear
- Exhaust pipe ....Condition – Cover removed
- Maintenance steps ....Closed
- Rear cargo door ....Open, check battery attachment, connections
  Check for no snow in the tail boom.
  Closed, locked
- Tail boom ....Condition, condition of antennas

Station 3

- Stabilizer ....General condition
- Tail rotor blades ....Condition, no impact
- Tail rotor hub fairing ....No rotation (paint marks)
- Keel and tail skid ....Attachment - visual check

Station 4

- Yaw control rod .... Condition
- TGB... Oil level
- Stabilizer .... General condition
- Tail boom .... Condition, condition of antennas

Station 5

- Static port .... Cover removed, clear
- Engine air intake and transmission deck... Cleanliness, no foreign objects
- RH cargo door .... Open
- Electrical master box circuit breakers .... All set
- RH cargo compartment .... Carried objects stowed
- RH cargo door .... Closed and locked
- MGB-Engine RH cowling............................... Open (if necessary)
- Oil cooler .... Condition, cleanliness, no leaks
- MGB-Engine RH cowling............................... Closed (if necessary), correctly locked
- EPU door.. As required
- Landing gear and foot steps........................... Attachment - visual check
- Lower central cowling..................................... Closed
- Door .... Condition, jettison system check

2 INTERIOR CHECK

- Cabin.. Clean
- Seats.. Condition
- Seat belts .... Condition
- Blanking plate of pedal unit .... Installed (if single pilot configuration).
- Fire extinguisher... Secured - checked
- First aid kit (if installed) .... Attachment
- Breakers... All set
- Loads and objects carried .... Stowed and secured
- Front door jettison systems .... Checked plastic guard condition, (snap wire checked for aircraft S/N 1674 and from S/N 1678 except S/N 8001 to 8034)
- Stretcher installation (if installed)... Condition, attachment
- ELT (if installed) .... Check control switch on instrument panel is set to "AUTO" or "ARMED"

3 TURN AROUND CHECK

- Overall aspect .... Condition, cleanliness
- Engine / MGB .... Oil level
- Main and tail rotor blades
  (from ground) .... Condition
- Loads .... Stowed and secured
- All cowlings .... Locked
- Doors .... Closed or sliding door open-locked

NOTE 1

If the aircraft is to be parked some time between flights, temporary picketing is recommended by fitting blanks, covers, and blade socks.
In this case, perform a complete exterior check.

NOTE 2

Perform a complete exterior check if the aircraft was parked in falling snow.

RC g

The paragraph **1 - ENGINE PRESTART CHECK**, is modified as follows:

1 ENGINE PRESTART CHECK

- Seats and control pedals..............................ADJUST and SECURE
- Seat belts ....FASTEN

NOTE 1

Copilot seat belts shall be fastened in all cases.

NOTE 2

The safety belts of unoccupied rear seats must not be fastened and the button on the shoulder belts must not be visible.

NOTE 3

Check that, when flying with doors open there are no loose objects in the cabin, and the belts of unoccupied rear seats are stowed between the backrest foam and the backrest.

1. Heating, demisting, air conditioning (if installed).. OFF
2. Rotor brake .... FORWARD
3. Fuel shut-off lever .... FORWARD LOCKWIRED
4. [**OFF/DAY/NIGHT/NVG**] light selector .... SET to OFF or DAY
5. [**BAT**], [**GENE**] and [**HORN**] .... ON, check BAT voltage
6. [**LIGHT TEST**] .... PERFORM
7. [**FIRE TEST**].. PERFORM, check gong
8. Electrical mirror (if fitted) .... SET to avoid dazzling (night flight)
9. GPS navigation system...................................... ON (if fitted)
10. CWP.. CHECK:
    - With battery power ....:

      GENE **PITOT** **ENG P**

      FUEL P **MGB P**

      TWT GRIP **HYDR**

    - With EPU power ....: Same lights as above + **BATT**

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No. 31.004.

SECTION 4.3

START UP

1 ENGINE PRESTART CHECK

- Seats and control pedals............................ADJUST and SECURE
- Seat belts ....FASTEN

NOTE 1

Copilot seat belts shall be fastened in all cases.

NOTE 2

The safety belts of unoccupied rear seats must not be fastened and the button on the shoulder belts must not be visible.

NOTE 3

Check that, when flying with doors open there are no loose objects in the cabin, and the belts of unoccupied rear seats are stowed between the backrest foam and the backrest.

1. Heating, demisting, air conditioning (if installed)...OFF
2. Rotor brake ....FORWARD
3. Fuel shut-off lever ....FORWARD LOCKWIRED
4. **[EMER SW]** (if fitted).................................ON
5. Light selector..SET to OFF or DAY
6. **[BAT/EPU]**, **[GENE]** and **[HORN]** ....ON, check BAT voltage > 22V
7. **[LIGHT TST]** ....PERFORM
8. **[FIRE TST]**..PERFORM, check gong
9. Electrical mirror (if fitted) ....SET to avoid dazzling (night flight)
10. ICS and GPS navigation system................ON (if fitted)
11. CWP..CHECK:
    - With battery power................................:

      GENE **PITOT** **ENG P**

      FUEL P **MGB P**

      TWT GRIP **HYDR**

    - With EPU power ....: Same lights as above + **BATT**

12. VEMD..Engine page DISPLAYED, check no message
13. Control pedals..Free travel, then NEUTRAL
14. Collective ....LOCK
15. Twist grip...Free travel, check time-delay mechanism then SHUT OFF position
16. Hydraulic cut-off switch (both collective grips) ....ON, guarded
17. Cyclic ....CENTER, friction adjusted

RC b

The paragraph **2 - ENGINE STARTING**, is superseded by the following:

2 ENGINE STARTING

CAUTION

In case of any doubt on the success of the start, abort starting procedure:
- **Keep the starter button pressed,**
- **Set twist grip to OFF position,**
- **Release the starter button, then [FUEL P] OFF, [GENE] OFF.**

In case of residual T4 higher than 200°C or aborted start, if BAT voltage permit, apply CRANKING procedure section 4.3.4.
- **Voltage under 15 VDC when starting:**

If BAT voltage < 15 VDC during start, abort the starting procedure immediately, set the twist grip to OFF position, release the starter button.

1. [**PUMP**]..ON, check **FUEL P**
2. [**A.COL LIGHT**] ....ON
3. Cyclic control..HAND ON

- After 30 sec.:

4. Starter ....PRESS
5.

CAUTION

If remaining T4 is above 150°C wait until 10%Ng before actuating twist grip.

Twist grip...IDLE position

6. Twist grip...CONTROL to maintain T4 within limits

- When Ng = 50% :

7. Starter ....RELEASE
8. Twist grip...Progressively to IDLE position, check: **ENG P** **HYDR**
9. [**HORN**]..OFF, check **HORN**

NOTE 1

In case of failed engine start, return the engine starting selector to OFF. Observe the engine starter limitation given in SECTION 2.5 § 6.

NOTE 2

At Ng > 60 % the VEMD upper screen automatically switches to FLI display.

- If EPU is used:

EPU...DISCONNECT, check **GENE** **BATT**

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No. 76.002.

2 ENGINE STARTING

CAUTION

In case of any doubt on the success of the start, abort starting procedure:

- **Keep the starter button pressed,**
- **Set twist grip to OFF position,**
- **Release the starter button, then [FUEL P] OFF, [GENE] OFF.**

In case of residual T4 higher than 200°C or aborted start, if BAT voltage permit, apply CRANKING procedure section 4.3.4.

- **Voltage under 15 VDC when starting:**

If BAT voltage < 15 VDC during start, abort the starting procedure immediately, set the twist grip to OFF position, release the starter button.

1. **[FUEL P]** ....ON, check **FUEL P**
2. **[A/COL LT]** ....ON
3. Cyclic control...HAND ON

- After 30 sec.:

4. Twist grip..TURN slowly to START position (white index)
5. Starter ....PRESS
6. Twist grip..CONTROL to maintain T4 within limits

- When Ng = 50%:

7. Starter ....RELEASE
8. Twist grip..Progressively to IDLE position, check: **ENG P** **HYDR**
9. **[HORN]** ....OFF, check **HORN**

NOTE 1

In case of failed engine start, return the engine starting selector to OFF. Observe the engine starter limitation given in SECTION 2.5 § 6.

NOTE 2

At Ng > 60 % the VEMD upper screen automatically switches to FLI display.

- If EPU is used:
  EPU...DISCONNECT, check **GENE** **BATT**

3 RUN-UP CHECK

NOTE 1

For aircraft equipped with spot light only: If a flight under night conditions is envisaged adjust the right map light so that it illuminates the pilot's side of the instrument panel and dim it to minimum necessary level before switching the spot light on.

NOTE 2

Do not use the windshield wiper on a dry windshield or in light rain.

1. **[PITOT]** .... ON, check PITOT
2. **[FUEL P]** or **[PUMP]** .... OFF
3. **[V/A SELECT]**:
   - Check electrical system voltage and current
4. Check ENG OIL pressure
5. All necessary systems... ON and TEST
   (Radio, radio navigation, lights, windshield wiper*, instrument panel lighting*, etc.)
6. Hydraulic checks:

CAUTION

If not locked, the collective lever will move up when the accumulators are depleted or when the hydraulic cut-off switch on the collective grip is set to OFF.

- Accumulator checks:
  - **Collective... CHECK correctly locked**
  - **[ACCU TST]** or **[HYDR]** .... ON
  - CWP .... CHECK HYDR
  - Move the cyclic 2 or 3 times on each axis ± 10 % of total travel (± 2.5 cm, 1 inch) and check for accumulator hydraulic assistance on pitch and roll (no control loads).
  - **[ACCU TST]** or **[HYDR]** .... RESET to OFF position
  - CWP .... CHECK HYDR
- Hydraulic cut-off test:
  - Collective .... **CHECK correctly locked**
  - Hydraulic cut-off switch (collective grip)..... OFF
  - CWP .... CHECK HYDR
  - Check that loads are felt immediately and that cyclic can be moved in pitch and roll with normal feedback loads.
  - Hydraulic cut-off switch (collective grip)..... ON, guarded

(*) If installed

- CWP .... CHECK **HYDR**.
  Maintenance action must be performed prior to flight if time extinction is greater than 3 sec.

7. Twist grip.. Progressively to FLIGHT position
   Maintain Tq < 40 %

- When NR = 350 rpm:
  - **[HORN]**.. ON, check:
    - Low NR audio warning sounds for NR < 370 rpm
    - **HORN**
    - **MGB P**

- When twist grip is in flight position:

8. Parameter checks .... No warning light illuminated,
   Electrical system voltage and current,
   Engine oil pressure.

NOTE

In strong wind, perform the hydraulic tests at the nominal power rating, apply a small cyclic input into the wind direction and accelerate the engine to NR ≈ 320 rpm, as fast as compatible with T4 limitations, then follow the normal procedure (refer to SECTION 4.8.1).

4 CRANKING

The cranking procedure shall be performed after a failed or aborted start and can be used for check or maintenance purposes.

Proceed as follows:

CAUTION

Do not crank the engine with the emergency fuel shutoff valve closed as this could damage the engine high pressure fuel pump.

- Check:

1. Twist grip...OFF
2. [**FUEL P**] or [**PUMP**]...................................ON
3. Engine starting selector ....OFF
4. Emergency fuel shut-off lever......................FORWARD
5. Ng ....CHECK ≤ 10 %
6. [**CRANK**] ....PRESS for 30 sec. max.
7. [**FUEL P**] or [**PUMP**]...................................OFF

NOTE

Observe the engine starter limitation given in SECTION 2.5 § 6

SECTION 4.4

TAKEOFF

1 BEFORE TAKEOFF CHECK

1. Doors ....CLOSED or sliding door OPEN LOCKED
2. Cyclic and collective frictions ....AS REQUIRED
3. Landing light...AS REQUIRED
4. Temperatures and pressures ....NORMAL RANGE
5. CWP...All lights OFF
6. Collective ....UNLOCKED

NOTE

Adjust collective and cyclic frictions so that friction loads are felt by the pilot when moving the flight controls.

2 TAKEOFF CHECK AND PROCEDURE

CAUTION

The heating system is forbidden if Ng and/or T4 are above the engine maximum continuous rating.

CAUTION

For safe operation, takeoff path should avoid HV diagram (refer to SECTION 5).

- Gradually increase collective to hover at 5 ft (1.5 m).
- Check NR, engine and mechanical parameters, no warning caution light.
- Increase airspeed with the HIGE power until IAS = 40 kt (74 km/h), then begin to climb so as to clear 20 ft (6 m) at IAS = 65 kt (120 km/h).

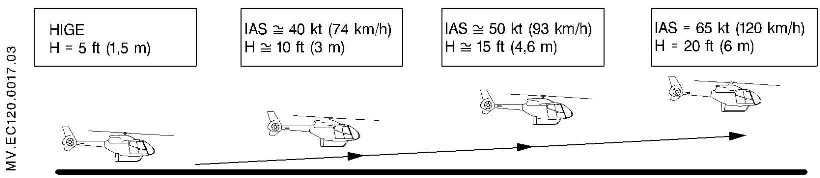


Figure 1: Takeoff procedure

SECTION 4.5

CLIMB - CRUISE - APPROACH - LANDING

1 CLIMB

Above 100 ft (30 m), for maximum climb performance, select up to Maximum Continuous Power and optimum climbing speed (Vy):

IAS kt = 65 kt at 0 Hp - (1 kt / 1000 ft).

IAS km/h = 120 km/h at 0 Hp - (2 km/h per 300 m).

2 CRUISE

Fast cruise is obtained by the first limitation reached corresponding to the beginning of the FLI amber area:

Corresponding mechanical or engine limits (Tq, Ng, T4) are indicated by an underlined numerical value.

Economic cruise: Set Tq to 10% less than MCP Tq.

Reduce indicated airspeed in turbulence.

3 APPROACH

CAUTION

The heating system is forbidden if Ng and/or T4 are above the engine maximum continuous rating.

- Begin approach at Vy.
- At approximately 100 ft (30 m), reduce airspeed down to HIGE at 5 ft (1.5 m).

  - <u>Approach check</u>:

    1. Landing light ....AS REQUIRED
    2. All parameters.....................................CHECK

4 LANDING

- In hover, gradually reduce collective until touch-down, then fully reduce collective.

RC g

The paragraph **1- ENGINE AND ROTOR SHUTDOWN** ,is superseded by:

1 ENGINE AND ROTOR SHUTDOWN

1. Cyclic ....CENTER
2. Collective ....LOCK
3. [**PITOT**], [**HORN**], landing light ....OFF
4. Twist grip...IDLE position

   $66\ \% \leq Ng \leq 70\ \%$, wait 30 sec. for temperature stabilization
5. All unnecessary systems............................OFF
6. **[GENE]** ....OFF

CAUTION

If, after 30 sec. with twist grip in IDLE position, Ng remains higher than 80 %, maintenance action shall be performed before next engine start.

7. Twist grip...OFF position

   Cancel the IDLE stop by briefly pressing on the starter pushbutton.

   The twist grip must be turned to OFF position with no delay.

- At NR $\leq$ 150 rpm:

8. Rotor brake ....APPLY

- When rotor is stopped:

9. GPS navigation system (if installed). ....OFF
10. [**A.COL LIGHT**]..OFF

- **BEFORE LEAVING HELICOPTER**

11. VEMD...CHECK FLIGHT REPORT page data:
    - Operating time (counted from Ng > 60 % until Ng < 50 %)
    - Ng and Nf cycles ....CHECK (indicated in white characters and above 0)
    - Messages: **FAILURE DETECTED** or **OVERLIMIT DETECTED**
12. **[BAT]** ....OFF
13. Map lights...OFF
14. Pitot, static ports, intake, exhaust covers, blade socks as required
15. Battery (or batteries) ....DISCONNECT (if necessary)

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 31.004.

SECTION 4.6

ENGINE AND ROTOR SHUTDOWN

1 ENGINE AND ROTOR SHUTDOWN

1. Cyclic ....CENTER
2. Collective ....LOCK
3. **[PITOT]**, **[HORN]**, landing light ....OFF
4. Twist grip...IDLE position

    66 % ≤ Ng ≤ 70 %, wait 30 sec. for temperature stabilization

5. All unnecessary systems...........................OFF
6. **[AVIONIC]** (if installed) ....OFF
7. **[GENE]** ....OFF

CAUTION

If, after 30 sec. with twist grip in IDLE position, Ng remains higher than 80 %, maintenance action shall be performed before next engine start.

8. Twist grip...OFF position

    Cancel the IDLE stop by briefly pressing on the starter pushbutton.
    The twist grip must be turned to OFF position with no delay.

- At NR ≤ 150 rpm:

9. Rotor brake ....APPLY

- When rotor is stopped:

10. GPS navigation system (if installed). ....OFF
11. **[A/COL LT]** ....OFF

- **BEFORE LEAVING HELICOPTER**

12. VEMD...CHECK FLIGHT REPORT page data:
    - Operating time (counted from Ng > 60 % until Ng < 50 %)
    - Ng and Nf cycles ....CHECK (indicated in white characters and above 0)
    - Messages: **FAILURE DETECTED** or **OVERLIMIT DETECTED**
13. Light selector..OFF
14. **[BAT/EPU]** ....OFF
15. Map lights..OFF
16. Pitot, static ports, intake, exhaust covers, blade socks as required
17. Battery (or batteries) ....DISCONNECT (if necessary)

SECTION 4.7

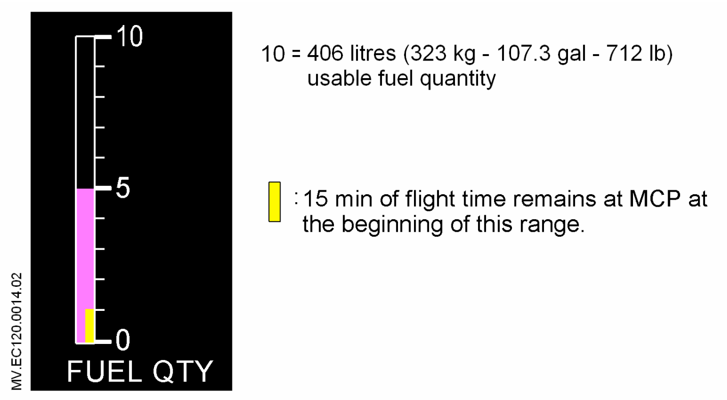
MISCELLANEOUS PROCEDURES AND DATA

1 TANK CAPACITY

- **Maximum capacity**

  410.5 litres (326.3 kg - 108.5 US gal - 719.5 lb).

- **Fuel gauge**



NOTE 1

The unusable fuel quantity is reached when zero is indicated on the fuel gauge.

NOTE 2

Fuel quantity indication in kg and fuel flow indication in kg/h is based on a fuel density of 0.79 kg/l.

SECTION 4.8

EXTREME WEATHER OPERATIONS

1 HIGH WIND OPERATION (WIND ABOVE 30 kt (56 km/h))

- **Parking**
  - Park the helicopter head into the wind. Maintain rotor brake applied with one blade at 12 o'clock. Keep blade socks until start up.
  - For wind above 50 kt (93 km/h) the helicopter must be tied down.
- **Start up**
  - Before engaging the starter switch, push and maintain the cyclic in the wind direction.
  - Apply engine start up procedure and accelerate the engine to reach NR = 320 rpm as quickly as possible within T4 limits and Tq ≤ 40%.
  - Then carry out the normal procedure.
- **Run up check**
  - Perform the hydraulic checks with the twist grip in FLIGHT position and NR at nominal speed.
- **Shutdown**
  - After engine shutdown, push and maintain the cyclic slightly in the wind direction.
  - Apply rotor brake at NR = 150 rpm and maintain cyclic position until the rotor stops with one blade in 12 o'clock position.

NOTE

Start up and shutdo wn have b een demonstrated up to 55 kt (102 km/h) of w ind from all directions.

2 COLD WEATHER OPERATION

Refer to SUP. 4: "INSTRUCTIONS FOR OPERATIONS IN COLD WEATHER"

SECTION 5.1

REGULATORY PERFORMANCE DATA

CONTENTS

RC f

The paragraph **1.0.0 - INTRODUCTION**, is superseded by the following:

1 INTRODUCTION

The following performance curves apply to the basic version of the aircraft.

Refer to Supplement when optional equipment is fitted.

NOTE

Values obtained on VEMD PERFORMANCE and ENGINE POWER CHECK pages can be checked with the ENGINE POWER CHECK, T4 CHECK, HOVER IN GROUND EFFECT, and HOVER OUT OF GROUND EFFECT curves.

For AUW over 1680 kg, the performance has to be checked manually with Figures 6, 7 and 8.

CAUTION

Pilot shall limit the flight envelope and weight displayed on VEMD performance pages to the relevant limitations of SECTION 2.

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 31.003.

SECTION 5.1

REGULATORY PERFORMANCE DATA

1 INTRODUCTION

The following performance curves apply to the basic version of the aircraft.

Refer to Supplements when optional equipment is fitted.

CAUTION

Pilot shall limit the flight envelope an d weight displayed on VEMD performance pages to the relevant limitations of SECTION 2.

2 DEMONSTRATED WIND ENVELOPES

2.1 STARTING AND STOPPING ROTOR WIND ENVELOPE

Starting and stopping the rotor has been demonstrated up to 55 kt (102 km/h) of wind from all directions.

3 ENGINE POWER CHECK

3.1 BEFORE TAKEOFF

In HIGE at 5 ft (1.5 m) and before initiating forward flight, pull the collective slightly to ensure that the Ng can increase by at least 1%, without exceeding the max. transient rating.

3.2 ENGINE POWER CHECK PROCEDURE

The engine power check consists in checking the power margin:

- TRQ margin,
- T4 margin.

Checking can be performed using the VEMD data (refer to paragraph 3.2.1) or manually recorded parameters (refer to paragraph 3.2.2).

3.2.1 VEMD procedure

- The engine power check is performed in level flight at MCP, heating system OFF.
- Prefer an altitude where the engine is operating close to the Ng MCP limit with Hp $\leq$ 12000 ft (3657 m).
- Stabilize level flight at MCP for at least 2 min. before initiating the engine power check.
- Read the results displayed on VEMD at the end of the procedure.
- The engine power check is satisfactory if:
  - The **"TRQ MARGIN"** value is positive ⟶ **"GOOD"** displayed,

  <u>and</u>
  - The **"T4 MARGIN"** value is negative ⟶ **"GOOD"** displayed.

RC f

The paragraph **3.2.1 - VEMD Procedure**, is superseded by the following:

3.2.1 VEMD procedure

- The engine power check is performed in level flight at MCP, heating system OFF.
- Prefer an altitude where the engine is operating close to the Ng MCP limit with Hp ≤ 12000 ft (3657 m).
- Stabilize level flight at MCP for at least 2 min. before initiating the engine power check.
- Read the results displayed on VEMD at the end of the procedure.
- The engine power check is satisfactory if:
  - The **"TRQ MARGIN"** value is positive → **"GOOD"** displayed,

  and
  - The **"T4 MARGIN"** value is negative → **"GOOD"** displayed.

NOTE

To obtain the actual Tq and T4 margins values and/or if the TRQ MARGIN is negative (BAD) and/or T4 MARGIN is positive (BAD), calculate the corrected TRQ and/or T4 margin as per paragraph 3.2.3.

If the corrected TRQ margin is positive and corrected T4 margin is negative, the result is acceptable.

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 31.003.

RC f

The paragraph **3.2.2 - Manual Procedure**, is superseded by the following:

3.2.2 Manual procedure

- The engine power check is performed in level flight at MCP, heating system OFF.
- Prefer an altitude where the engine is operating close to the Ng MCP limit with Hp ≤ 12000 ft (3657 m).
- Stabilize level flight at MCP for at least 2 min. before recording the following parameters: Tq, Ng, NR, Hp, OAT and T4.

NOTE

The altimeter must be set to 1013.2 hPa to display Hp.

Refer to the ENGINE POWER CHECK chart (Fig 1 and 2) and the T4 CHECK chart (Fig 3). Use the chart in the direction shown by the arrows in the example.

The engine power check is satisfactory if:

- The point "P" is located in the "CORRECT" area of the ENGINE POWER CHECK chart ⟶ positive Tq margin,

and

- The point "T" is located in the "CORRECT" area of the T4 CHECK chart ⟶ negative T4 margin.

NOTE

No correction is to be applied to the values obtained by a manual engine power check.

Tq Margin Calculation:

- Mark the point "P" on the chart according to the recorded parameters.
- Mark the point "P' " on the separation line between the "CORRECT" and "INCORRECT" zones according to the recorded Ng and OAT values. Then carry over to the Tq scale according to the recorded NR and Hp values.
- The Tq margin is given by the torque value difference "P" – "P' " measured on the torque scale.

T4 Margin Calculation:

- Mark the point "T" on the chart according to the recorded parameters.
- Mark the point "T' " on the separation line between the "CORRECT" and "INCORRECT" zones according to the recorded Ng and OAT values. Carry over to the T4 scale according to the recorded Hp value.
- The T4 margin is given by the T4 value difference "T' " - "T" measured on the T4 temperature scale on the LH side.

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 31.003.

3.2.2 Manual procedure

- The engine power check is performed in level flight at MCP, heating system OFF.
- choose an altitude where the engine is operating close to the Ng MCP limit with Hp ≤ 12000 ft (3657 m).
- Stabilize level flight at MCP for at least 2 min. before recording the following parameters: Tq, Ng, NR, Hp, OAT and T4.

NOTE

The altimeter must be set to 1013.2 hPa to display Hp.

Refer to the ENGINE POWER CHECK charts (Fig. 1 and Fig. 2). Use the charts in the direction shown by the arrows in the examples.

The engine power check is satisfactory if:

- The point "P" is located in the "CORRECT" area of the ENGINE POWER CHECK chart ⟶ positive Tq margin,

and

- The point "T" is located in the "CORRECT" area of the T4 CHECK chart ⟶ negative T4 margin.

Tq Margin Calculation:

- Mark the point "P" on the chart according to the recorded parameters.
- Mark the point "P' " on the separation line between the "CORRECT" and "INCORRECT" zones according to the recorded Ng and OAT values. Then carry over to the Tq scale according to the recorded NR and Hp values.
- The Tq margin is given by the torque value difference "P" – "P' " measured on the torque scale.

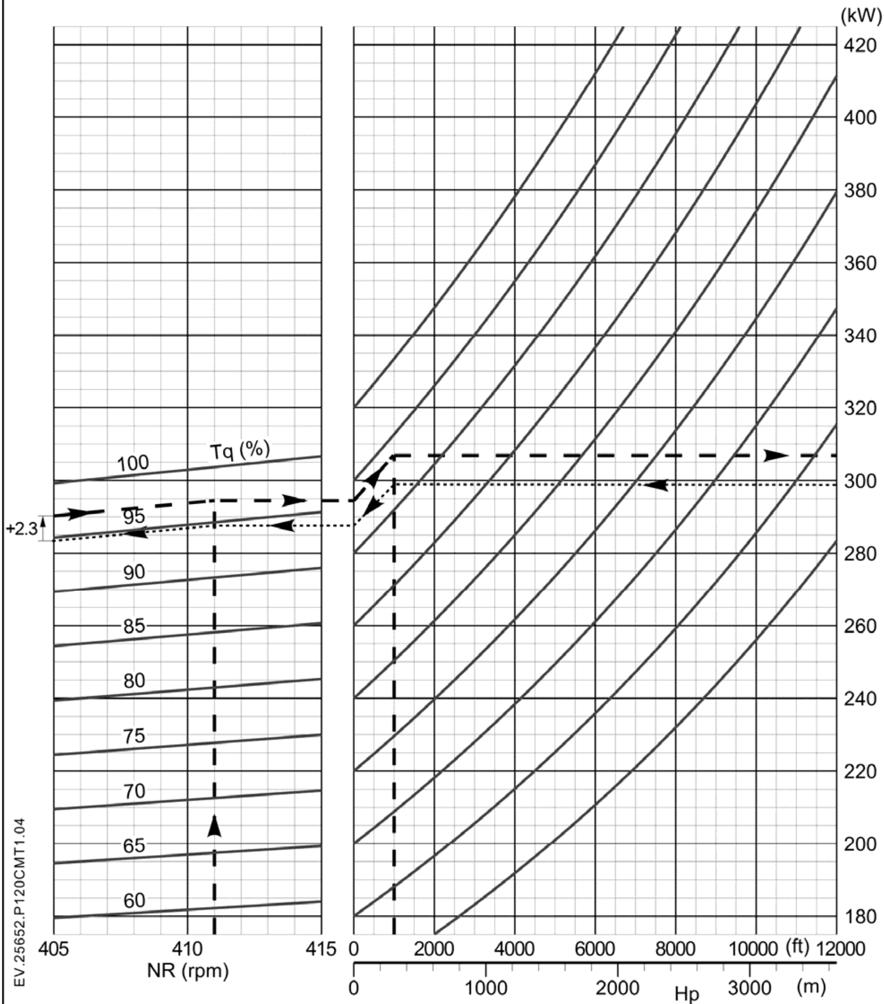
T4 Margin Calculation:

- Mark the point "T" on the chart according to the recorded parameters.
- Mark the point "T' " on the separation line between the "CORRECT" and "INCORRECT" zones according to the recorded Ng and OAT values. Carry over to the T4 scale according to the recorded Hp value.
- The T4 margin is given by the T4 value difference "T' " - "T" measured on the T4 temperature scale on the LH side.

CONDITIONS

- HEATING SYSTEM OFF
- GENERATOR LOAD < 50 A
- Hp ≤ 12000 ft (3657m)

ENGINE POWER CHECK



EXAMPLE: OAT = 20°C Hp = 1000 ft (300 m) NR = 411 rpm

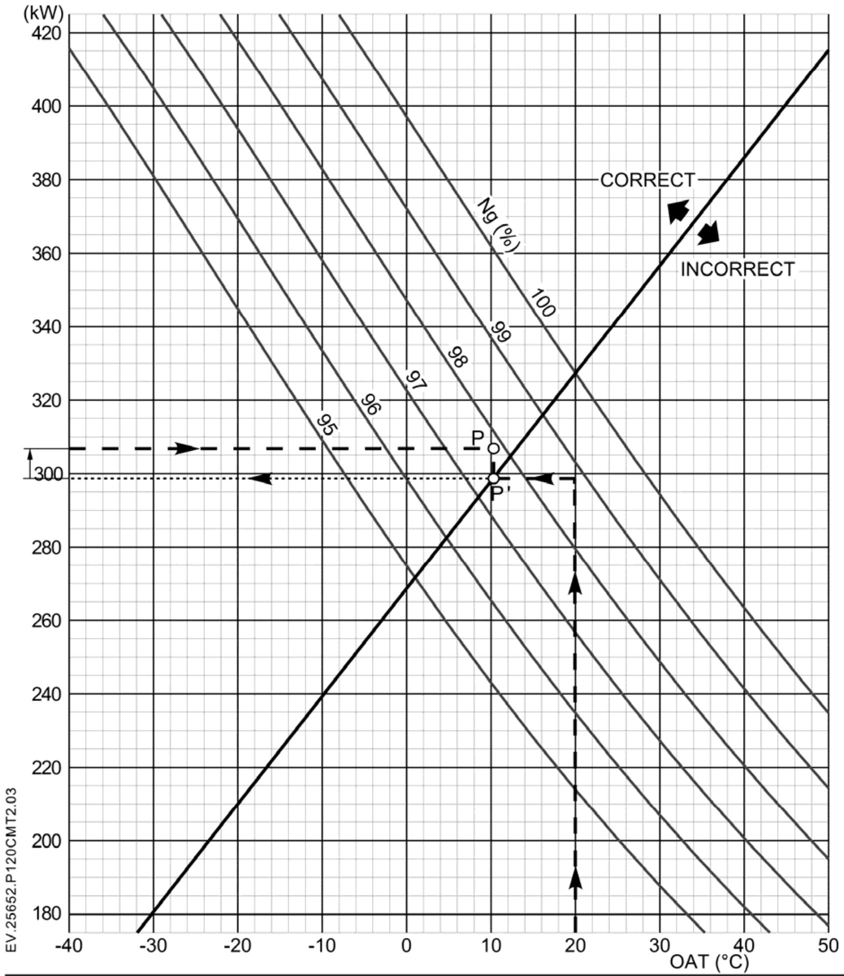
Ng = 98.7% Tq = 97% ⇒ P is in the "CORRECT" zone

⇒ Tq margin = +2.3%

Figure 1

CONDITIONS
- HEATING SYSTEM OFF
- GENERATOR LOAD < 50 A
- Hp ⩽ 12000 ft (3657m)

ENGINE POWER CHECK



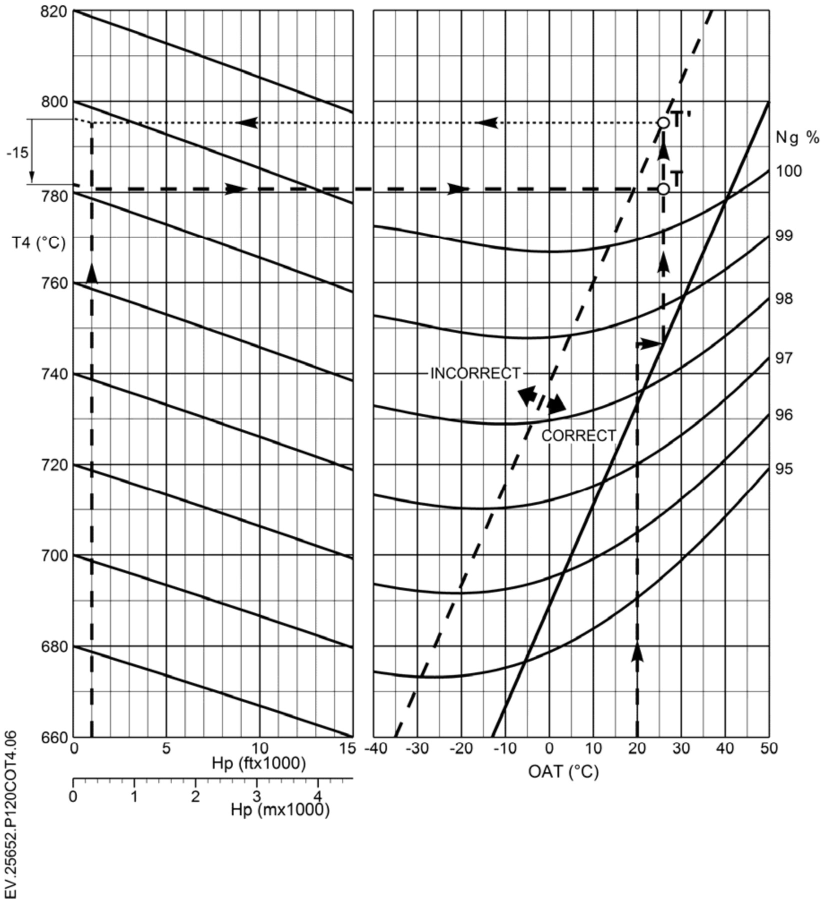
EXAMPLE: OAT = 20°C Hp = 1000 ft (300 m) NR = 411 rpm
Ng = 98.7% Tq = 97% ⇒ P is in the "CORRECT" zone
⇒ Tq margin = +2.3%

Figure 2

CONDITIONS

- HEATING SYSTEM OFF
- GENERATOR LOAD < 50A
- Hp ⩽ 12000 ft (3657m)

T4 CHECK



EXAMPLE : Hp = 1000 ft (300 m) OAT = 20°C ⇒ T is in the "correct" zone
T4 = 782°C Ng = 98.7% T4 margin = -15°C

Figure 3

RC f

The paragraph **3.2.3 - <u>Corrected</u> Tq and T4 margin calculation**, is added as follows:

3.2.3 <u>Corrected</u> Tq and T4 margin calculation

- Apply to the Tq (TRQ MARGIN) given by the VEMD, a correction factor (Hp, Tq) as given in the table below:

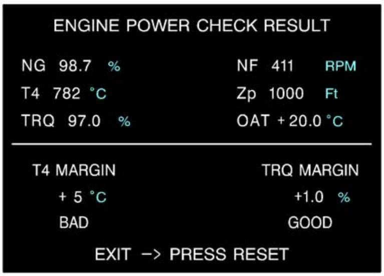
Hp (ft)	0	1000	2000	3000	4000	≥ 5000
Tq (%)	+ 1.7	+ 1.3	+ 1	+ 0.7	+ 0.4	0

  - <u>Corrected</u> Tq margin = Tq margin + correction factor.

- Apply to the T4 (T4 MARGIN) given by the VEMD, a correction of – 20°C:
  - <u>Corrected</u> T4 margin = T4 margin – 20°C.

Example of VEMD results:

MV.EC120.0140.01



- Corrected Tq margin calculation:
  - Enter (Hp, Tq) table, find:

    Hp = 1000 ft gives a correction factor of + 1.3 %
  - <u>Corrected</u> Tq margin = Tq margin + correction factor.
    = + 1 + 1.3
    = <u>+ 2.3%</u>
- Corrected T4 margin calculation:
  - <u>Corrected</u> T4 margin = T4 margin – 20°C.
    = + 5 - 20
    = <u>- 15°C</u>

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 31.003.

4 AIR DATA SYSTEM CALIBRATION

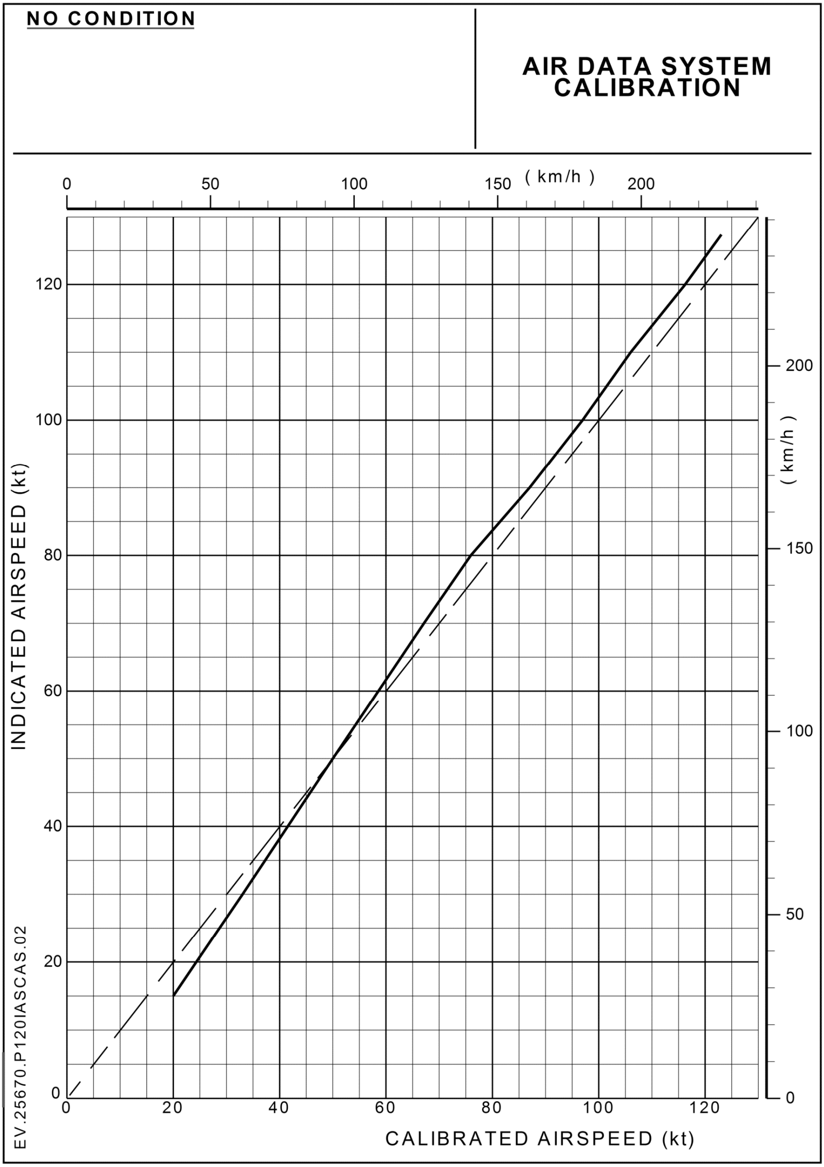


Figure 4

5 HEIGHT - VELOCITY DIAGRAM

The avoidance zone is defined by four points: A, B, C, D (refer to Figure 5)

- Point A: low hover point

  Point A is at 6 ft (1.80 m) skid height at zero airspeed.

- Point B:

  Point B is defined by:

  - A variable height (18 ft ≤ height ≤ 24 ft) depending on the pressure altitude, OAT and on the aircraft weight as determined by line (C).
  - A variable airspeed (50 kt ≤ IAS ≤ 60 kt) depending on the pressure altitude, OAT and on the aircraft weight as determined by line (C).

- Point C:

  Point C is defined by:

  - A constant height of 50 ft (15 m).
  - A variable airspeed (50 kt ≤ IAS ≤ 60 kt) depending on the pressure altitude, OAT and on the aircraft weight as determined by line (C).

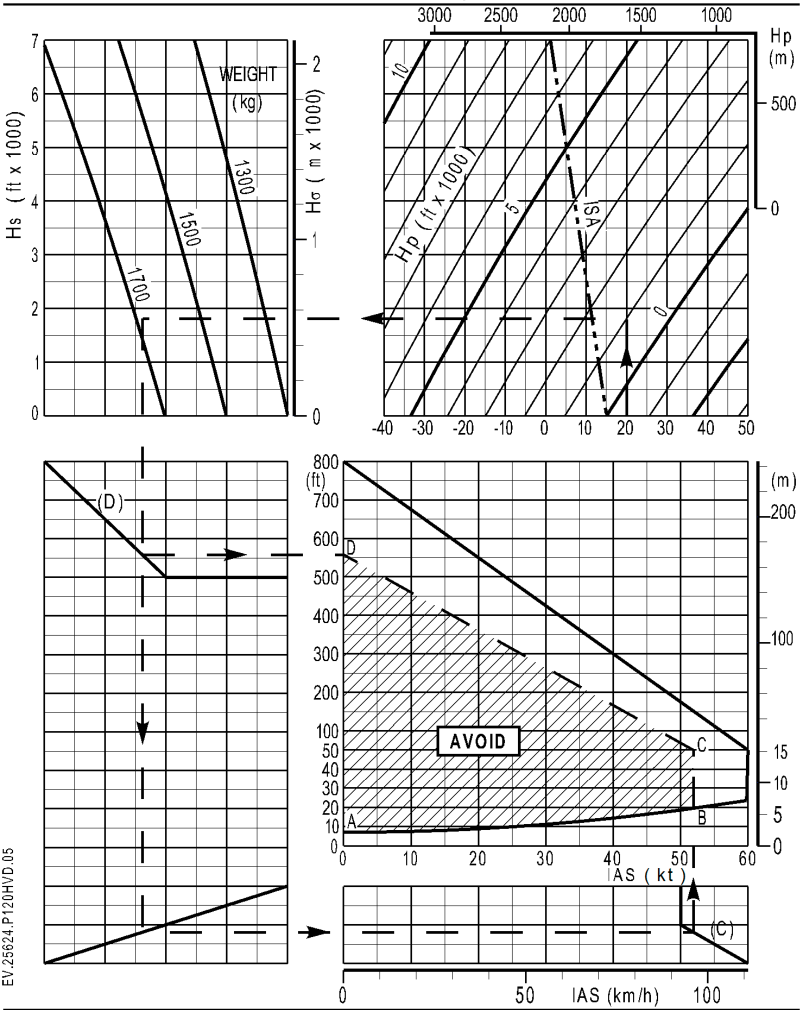
- Point D:

  Point D is defined by:

  - A variable height (500 ft ≤ height ≤ 800 ft) depending on the pressure altitude, OAT and on the aircraft weight as determined by line (D).
  - A constant zero airspeed.

CONDITIONS
- -40 °C ⩽ OAT ⩽ ISA +35 °C

HEIGHT-VELOCITY DIAGRAM



EXAMPLE : OAT = 20°C
WEIGHT = 1680 kg (3704 lb)
Hp = 1000 ft (300 m)

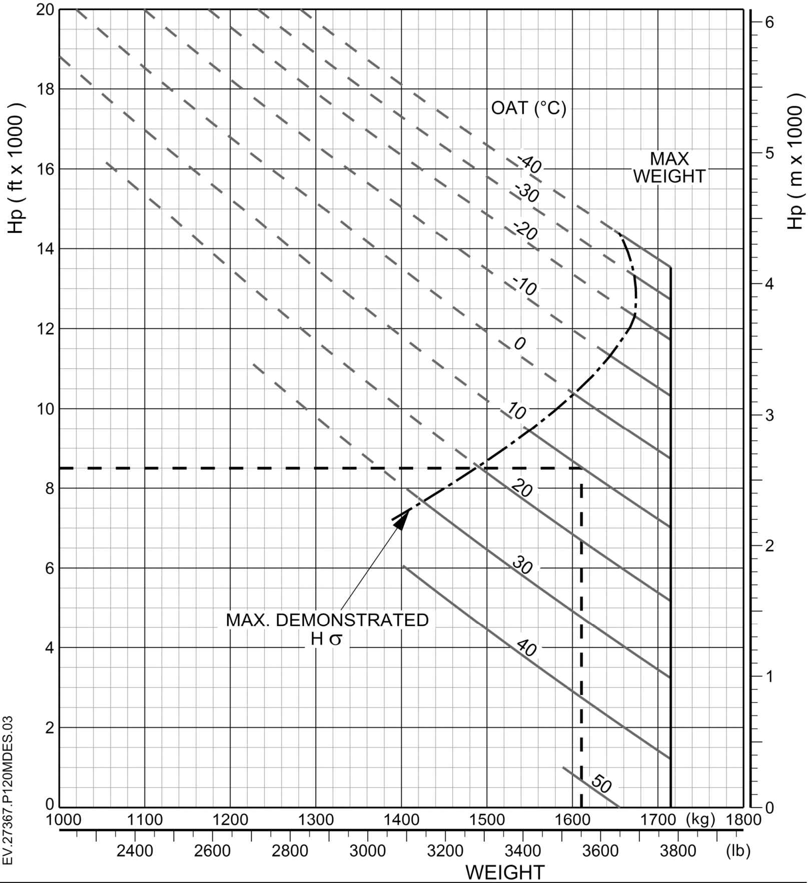
D = 560 ft (171 m) ; IAS = 0
=> C = 52 kt (96 km/h) ; HEIGHT = 50 ft (15 m)
B = 52 kt (96 km/h) ; HEIGHT = 20 ft (6 m)

Figure 5

6 HOVER IN GROUND EFFECT

CONDITIONS
- NO WIND
- HEIGHT 5 ft (1.5 m)
- HEATING SYSTEM OFF
- MAX. TAKEOFF POWER
- -40°C ⩽ OAT ⩽ ISA +35°C

HOVER IN GROUND EFFECT



SAFE WIND HAS BEEN DEMONSTRATED UP TO 35 kt (65 km/h) AND MAX. WEIGHT FOR ALL DIRECTIONS AT SEA LEVEL AND AT 22 kt (41 km/h) FOR A CORRECTED WEIGHT OF 2200 kg (4850 lb). (Refer to Fig.8)

EXAMPLE : OAT = 10°C
Hp = 8500 ft (2590 m) => HIGE WEIGHT 1610 kg (3549 lb).

Figure 6

7 HOVER OUT OF GROUND EFFECT

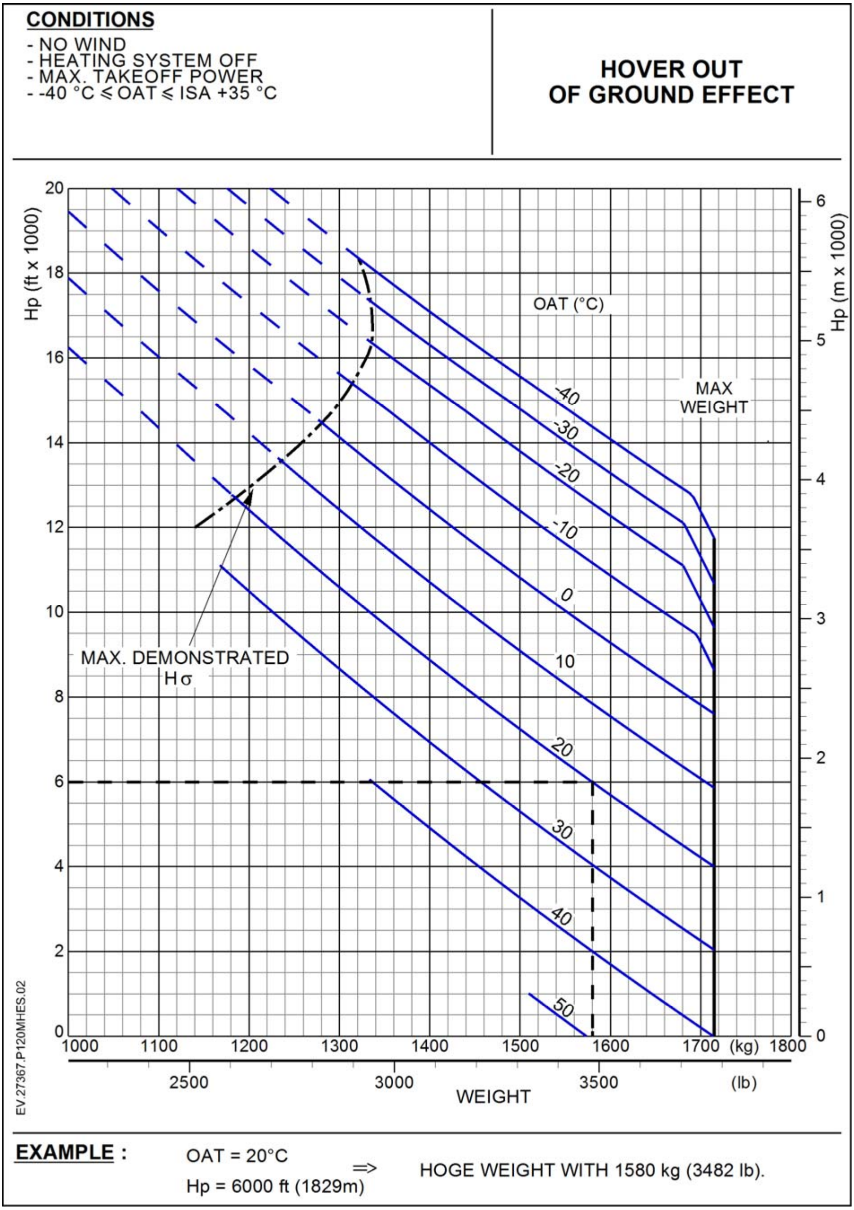
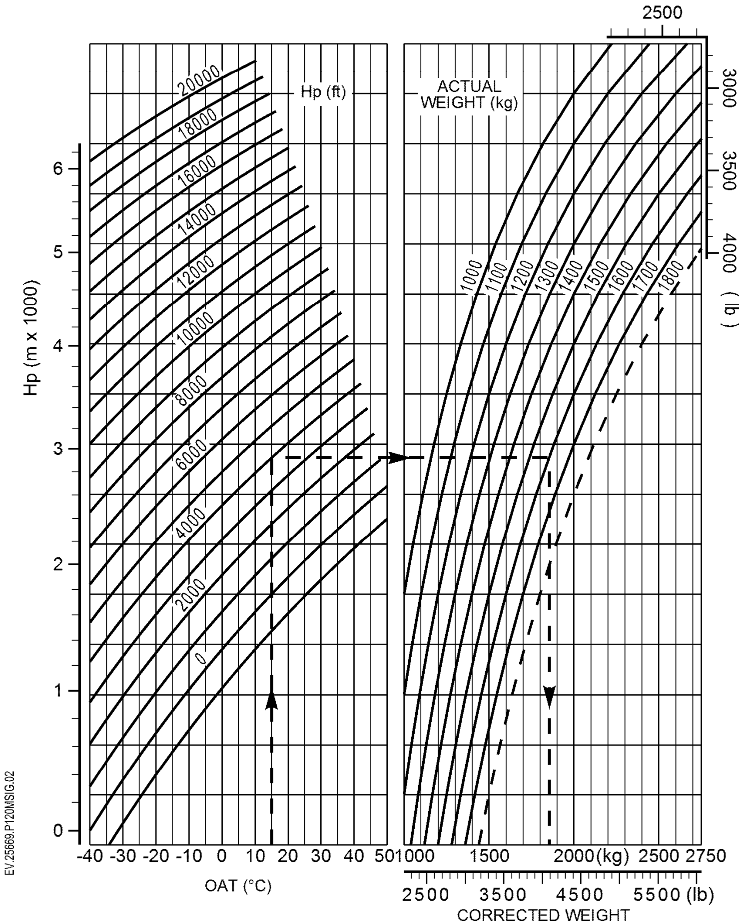


Figure 7

8 CORRECTED WEIGHT

NO CONDITION

DETERMINATION OF CORRECTED WEIGHT



EXAMPLE : OAT = 15°C ACTUAL WEIGHT = 1600 kg (3527 lb)

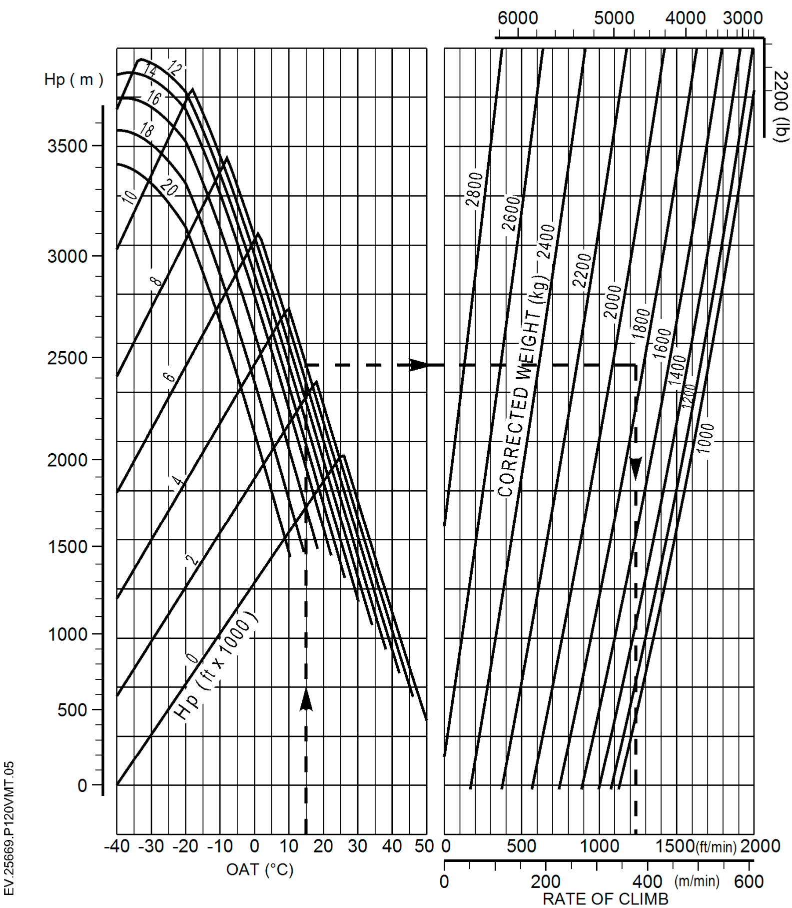
Hp = 4000 ft (1220 m) CORRECTED WEIGHT = 1850 kg (4079 lb)

Figure 8

9 RATE OF CLIMB

CONDITIONS
- MAX. CONTINUOUS POWER
- HEATING SYSTEM OFF
- -40°C⩽OAT⩽ISA + 35°C

RATE OF CLIMB
AT Vy



EXAMPLE : OAT = 15°C ACTUAL WEIGHT = 1600 kg (3527 lb) CORRECTED WEIGHT = 1850 kg (4079 lb)
Hp = 4000 ft (1220 m) RATE OF CLIMB = 1230 ft/min (375 m/min)

Figure 9

10 GLIDE DISTANCE IN AUTOROTATION

The distance flown in autorotation is:

0.7 Nm (1300 m) per 1000 ft (300 m) at Vy and NR $\cong$ 410 rpm.

11 NOISE LEVEL

Noise characteristics defined by chapter 11 of the ICAO annex 16 and JAR 36 subpart E are as follows:

Measurement Reference Point	Noise Level SEL (dBA)	ICAO Noise Limits SEL (dBA)
Overflight (at Max. gross weight)	78.7	85.4

FLIGHT MANUAL

EC 120 B

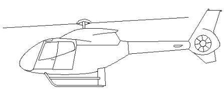
SUPPLEMENT

LIST OF SUPPLEMENTS
INCOMPATIBILITY OF USE
EFFECT ON PERFORMANCE DATA

IMPORTANT NOTE

The information contained herein supplements or supersedes the information given in the basic Flight Manual and/or the Supplements listed in section Supplement 0.

The effectivity of the manual at the latest revision is specified on the list of effective pages.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

NOTE

Pages SUP.0.P3 and SUP.0.P4 concern the whole of the Supplements assigned to the helicopter mentioned on the title pages.

LIST OF SUPPLEMENTS

Some Supplements covering installations or procedures not used on this helicopter may be withdrawn from this manual. The complete list of Supplements appears on pages SUP.0.P2.

LIST OF SUPPLEMENTS (cond't)

No.	TITLE
21 to 49	RESERVED
50 to 55	RESERVED
55.1	GPS TNL 2101 APPROACH PLUS
55.2	GPS GARMIN GNS 430/430 W
55.5	GPS TRIMBLE TNL 1000 DC
55.6	GPS TNL 2000 APPROACH
55.7	GPS TNL 2000 APPROACH PLUS

COMPOSITION

OF CONDITIONAL REVISIONS (RC)

This manual assigned to the helicopter mentioned on the title page contains the following pink pages except those cancelled when the conditions are complied with.

CAUTION

The reader will have to insert the pink pages incorporating the paragraph(s) affected by the Conditional Revision so as the paragraph(s) cover(s) the paragraph(s) of the standard version or of the variant of standard definition.

(1) Paragraph Revision Code:

- **R** ....Revised, to be replaced
- **N** ....New, to be inserted

RC No.	SECTION or SUP.	PARAGRAPH	DATE CODE	Number of pages	(1)	Applicable before condition is met:
a	SUP.12	1 *RC*	16-26	1		SB 31.003
b	SUP.4	2.3 *RC*	16-26	1		SB 28.007
c	SUP.4	2.3 *RC*	16-26	2		SB 28.009
d	SUP.4	2 *RC*	16-26	1		SB 04.003

COMPOSITION

OF RUSH REVISIONS (RR)

The Supplements contain the following additional yellow page(s):

CAUTION

The reader will have to insert the yellow pages incorporating the paragraph(s) affected by the Rush Revision opposite the existing paragraph(s) of the standard version or of the variant of standard definition.

(1) Paragraph Revision Code:

- **R** ....Revised, to be replaced
- **N** ....New, to be inserted

RR No.	SECTION or SUP.	PARAGRAPHS	DATE CODE	Number of pages	(1)

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- $\boxed{A}$ .... Specific to EASA

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION or SUP.	PAGES	DATE CODE	(1)	(2)
SUP.0.P1	1 to 1	16-26		
SUP.0.P2	1 to 2	22-12		
SUP.0.P3	1 to 1	16-26		
SUP.0.P4	1 to 1	16-26		
SUP.0.P5	1 to 2	22-12	$\boxed{A}$	
SUP.0	1 to 2	16-26		

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) EASA

ISSUE 1: NR 0 to NR 13:

<table>
<tr><td>NORMAL REVISION 13 - SEPTEMBER 2014</td><td>Approved under the authority of
EASA DOA No. 21J056
on June 11, 2015</td></tr>
</table>

ISSUE 2:

<table>
<tr><td colspan="2">NORMAL REVISION 0 date code 16-26</td><td>Approved on January 11, 2018
under the authority of EASA DOA
No. 21J700</td></tr>
<tr><td>Title</td><td colspan="2">New issue</td></tr>
<tr><td>Revised information</td><td colspan="2">All</td></tr>
<tr><td>Deleted information</td><td colspan="2">None</td></tr>
<tr><td colspan="2">NORMAL REVISION 1 date code 22-12</td><td>EASA Approval No.10081216
on February 08, 2023</td></tr>
<tr><td>Title</td><td colspan="2">Modification of SUP.17 title</td></tr>
<tr><td>Revised information</td><td colspan="2">SUP.0.P2, SUP.0.P5</td></tr>
<tr><td>Deleted information</td><td colspan="2">None</td></tr>
</table>

INCOMPATIBILITIES OF UTILIZATION BETWEEN OPTIONAL EQUIPMENT ITEMS

The following list is non-exhaustive and covers only those EASA-approved equipment items which are incompatible with one or several other items

NOTE

Incompatibility of installation between equipment items is stated in the Master Servicing Manual (MSM).

Operation of the following installation:		Makes operation with the following optional equipment items impossible:	MANUAL SECTION No.
Item No.			
	None	None	

INFLUENCE OF OPTIONAL EQUIPMENT ITEMS ON PERFORMANCE DATA

When several optional equipment items are used simultaneously, the basic performance data must be reduced by the value corresponding to the influence of each optional item.

1 APPROVED PERFORMANCE DATA

- Takeoff weights:

  When the installation of an optional equipment item modifies the takeoff weights specified in the basic Flight Manual SECTION 5.1, the relevant Supplement either provides the new takeoff weights by new charts or by a penalty relative to the basic flight performance.

- Rates of climb:

  When the rates of climb in the basic Flight Manual SECTION 5.1 are modified, the relevant Supplement either provides a new chart or specifies a reduction with respect to the basic flight performance.

2 ADDITIONAL PERFORMANCE DATA

The influences of the optional equipment items are specified in SECTION 5.2 "Additional performance data ".

FLIGHT MANUAL

EC 120 B

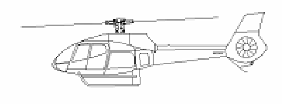
SUPPLEMENT

INSTRUCTIONS FOR OPERATIONS IN COLD WEATHER

IMPORTANT NOTE

The information contained herein supplements or supersedes the information given in the basic Flight Manual and/or the Supplements listed in section Supplement 0.

The effectivity of the manual at the latest revision is specified on the list of effective pages.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- A .... Specific to EASA

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION or SUP.	PAGES	DATE CODE	(1)	(2)
SUP.4.P1	1 to 1	16-26		
SUP.4.P5	1 to 2	16-26	A	
SUP.4	1 to 6	16-26		

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) EASA

ISSUE 1: NR 0 to NR 5:

NORMAL REVISION 5 - FEBRUARY 2009	EASA approval No. R.C.03353 on May 18, 2009

ISSUE 2:

NORMAL REVISION 0 date code 16-26	EASA Approval No. 10070977 on September 16, 2019
Title	New issue
Revised information	All
Deleted information	None

RC d

The paragraph **2 - LIMITATIONS,** is modified as following:

2 LIMITATIONS

Flight is forbidden if the OAT is below - 30°C.

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB NO 04 003.

RC c

The paragraph **2.3 - APPROVED FUEL**, is modified as following:

- NORMAL FUELS

Add the following NOTE:

NOTE 3

The use of an anti-icing additive is compulsory for OAT ≤ + 0°C for all approved fuels which do not contain it.

The rest of the paragraph is unchanged.

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 28 009.

1 GENERAL

This supplement details the procedures to be followed when the aircraft is operated in cold weather (OAT < 0°C) and/or when aircraft is or could be exposed to falling or blowing snow.

2 LIMITATIONS

The limitations specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

2.1 AIRSPEED LIMITS WITH DOORS CLOSED

For OAT ≤ -35°C: Reduce VNE Power ON by 5 kts (9 km/h)

2.2 TEMPERATURE LIMITS

Minimum temperature: -40°C

2.3 APPROVED FUELS

NOTE 1

Commercial designations of authorized fuels and additives are specified in the TURBOMECA documentation.

- NORMAL FUELS

(Fuels approved to operate throughout the flight envelope with no restrictions).

Type of fuel	NATO code	Specifications			Anti-ice additive included
		FRANCE	USA	UK	
Kerosene - 50 (AVTUR-FSII) (JP8)	F 34	AIR 3405 F 34	MIL-T-83133 (JP8)	D.ENG. RD 2453	Yes
Kerosene - 50 (AVTUR) (JP1)	F 35	AIR 3405 F 35	ASTM-D-1655 JET A1	D.ENG.RD 2494	No
Kerosene	-	-	ASTM-D-1655 JET A	-	No

NOTE 2

All specifications are effective at latest issue or amendment.

- REPLACEMENT FUELS

USE FOR: -40°C ≤ OAT ≤ +30° AND FOR Hp ≤ 9842 ft (3000 m)							
Type of fuel	**NATO Code**	**Specifications**				**Anti-ice additive included**
		FRANCE	**USA**	**UK**	**RUSSIA**	
Wide cut (AVTAG-FSII) (JP4)	F 40	AIR 3407	MIL-T-5624 (JP4)	D.ENG.RD 2454	-	Yes
Wide cut (JET B) (AVTAG)	-	-	ASTM-D-1655 (JET B)	-	-	No
Russian fuel Kerosene TS 1 (TC1)	-	-	-	-	GOST 10227	No
Russian fuel Kerosene RT (PT)	-	-	-	-	GOST 10227	No

2.4 APPROVED LUBRICANTS

- ENGINE LUBRICANTS

USE FOR: - 40°C ≤ OAT ≤ +30°C					
Oil type	**NATO Code**	**Specifications**			**Approved oil grades**
		FRANCE	**USA**	**UK**	
Synthetic 3 to 3.5 cSt at 98.9°C	0.148	AIR 3513	MIL-L-7808	-	ESSO TURBO OIL 2389 MOBIL OIL AVREX 256 TURBONYCOIL 160
	0.150	AIR 3514	-	-	TOTAL AERO TURBINE 312 ELF JET SYNTHETIC OIL 15 TURBONYCOIL 13 B

NOTE 1

When the oil specification or grade/trademark differs from the approved one, TURBOMECA approval shall be obtained before using this oil.

NOTE 2

In case of oil change with trademark/NATO code/category/grade or specification change, apply instructions as prescribed in the TURBOMECA Maintenance Manual.

NOTE 3

All specifications are effective at latest issue or amendment.

RC b

The paragraph **2.3 - APPROVED FUEL**, is modified as following:

- REPLACEMENT FUELS

Supersede the table **"USE FOR: -40°C ≤ OAT ≤ +30° AND FOR Hp ≤ 9842 ft (3000 m)"** by the following:

USE FOR: -40°C ≤ OAT ≤ +30° AND FOR Hp ≤ 9842 ft (3000 m)						
Type of fuel	**NATO Code**	**Specifications**				**Anti-ice additive included**
		FRANCE	**USA**	**UK**	**RUSSIA**	
Russian fuel Kerosene TS 1 (TC1)	-	-	-	-	GOST 10227	No
Russian fuel Kerosene RT (PT)	-	-	-	-	GOST 10227	No

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No 28 007.

RC c

The paragraph **2.3 - APPROVED FUEL (cont'd),** is modified as following:

- REPLACEMENT FUELS

Add the following NOTE

NOTE

The use of an anti-icing additive is compulsory for OAT ≤ + 0°C for all approved fuels which do not contain it.

The rest of the paragraph is unchanged.

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB NO 28 009.

- MAIN AND TAIL GEARBOX LUBRICANTS

USE FOR: -40°C ≤ OAT ≤ +0°C					
Oil type	**NATO Code**	**Specifications**			**Approved oil grades**
		FRANCE	**USA**	**UK**	
Synthetic 3 to 3.5 cSt at 98.9°C	0.148	AIR 3513	MIL-L-7808	-	ESSO TURBO OIL 2389 MOBIL OIL AVREX 256 TURBONYCOIL 160
	0.150	AIR 3514	-	-	ELF JET SYNTHETIC OIL 15 TOTAL AERO TURBINE 312 TURBONYCOIL 13 B

3 EMERGENCY PROCEDURES

The emergency procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

3.1 ENGINE FLAME-OUT

NOTE

Following an engine failure at light weight low Hp and low OAT, the stabilized NR may be below the audio warning threshold (370 rpm), the pilot can cut the horn using the [HORN] pushbutton.

3.2 FUEL ALARMS

No action if comes on during engine start as long as the engine oil temperature is below 0°C.

4 NORMAL PROCEDURES

The normal procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

4.1 GENERAL RECOMMENDATIONS

For safe and rational operation of the aircraft in cold weather and snow, carry out the following basic operations:

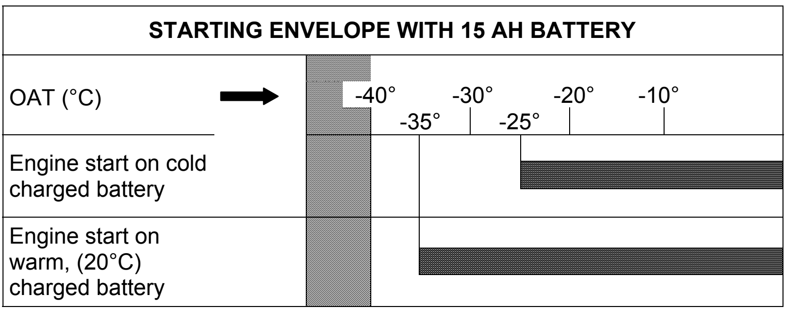
- Remove ice or snow accumulations from the whole of the aircraft, particularly at hinges and on all parts of the dynamic and control systems (main rotor, rotor mast, tail rotor drive and tail rotor, flight controls, engine controls).
- When the aircraft has been subject to very low temperatures, it is recommended:
  - either to perform regular ground runs every two hours for temperatures of around - 20°C or every hour for lower temperatures.
  - or to preheat the engine, transmission assemblies and cabin before engine starting (even if it is possible to start the engine at temperatures down to - 40°C).

4.2 USE OF BATTERY FOR STARTING

During long periods of no flight it is recommended to store the battery in a warm area.

If a ground power unit is not available, startup may be carried out using the aircraft battery.

The starting envelope is related to the temperature and is indicated in the following chart.



4.3 PREFLIGHT CHECK

In addition to the inspections specified in the basic Flight Manual, perform the following operations and inspections:

- Main rotor blades .... : Remove snow and ice
- Main rotor hub and mast .... : Check for absence of ice on the swashplates, the scissors, the servo controls and the rotor head spring antivibration devices
- Engine... :
  - Remove the engine air intake and exhaust nozzle blanking covers only after removal of snow from the aircraft surface
  - Remove snow and ice accumulations around the air intake and on either side of the screen
  - Check for absence of snow and ice accumulations inside the air intake
- Drains and air pressure probes .... : Inspect fuel drain, check for absence of snow and ice on all ventilation and drain pipes as well as on static ports and pitot
- Tail rotor.. :
  - Check for absence of ice on the tail rotor assembly
  - Manually rotate the tail rotor so that the main rotor performs at least a complete turn:
    - Check free rotation
    - Check freewheel operation
- Cabin .... :
  - Remove the cabin cover just before engine starting to prevent windscreen icing
  - Check that the windshield wiper is not stuck on the canopy

NOTE

In falling or blowing snow conditions the engine air intake should be checked at the end of the exterior checks. The further checks before engine starting should then be performed without major delay.

4.4 AFTER LAST FLIGHT OF THE DAY

The normal procedures described in the basic Flight Manual are to be supplemented by the following:

- When the rotor stops turning, position the cyclic close to the neutral position and the collective locked at full low pitch, with pedals in neutral position.
- Do not leave doors open.
- Install the air intake and exhaust nozzle blanking covers.
- When the aircraft is parked in an unsheltered area, it is recommended to apply anti-icing products and to carry out aircraft blanking and mooring.

5 PERFORMANCE DATA

The performance data specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

FLIGHT MANUAL

EC 120 B

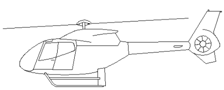
SUPPLEMENT

AUTOROTATION LANDING TRAINING PROCEDURE

IMPORTANT NOTE

The information contained herein supplements or supersedes the information given in the basic Flight Manual and/or the Supplements listed in section Supplement 0.

The effectivity of the manual at the latest revision is specified on the list of effective pages.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- $\boxed{A}$ .... Specific to EASA

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION or SUP.	PAGES	DATE CODE	(1)	(2)
SUP.6.P1	1 to 1	16-26		
SUP.6.P5	1 to 2	16-26	$\boxed{A}$	
SUP.6	1 to 3	16-26		

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) EASA

ISSUE 1: NR 0 to NR 5:

NORMAL REVISION 5 - MARCH 2012	EASA approval No.10041126 REV.1 on August 24, 2012

ISSUE 2:

<table>
<tr><td colspan="2">NORMAL REVISION 0 date code 16-26</td><td>Approved on January 11, 2018
under the authority of EASA DOA
No. 21J700</td></tr>
<tr><td>Title</td><td colspan="2">New issue</td></tr>
<tr><td>Revised information</td><td colspan="2">All</td></tr>
<tr><td>Deleted information</td><td colspan="2">None</td></tr>
</table>

1 GENERAL

This procedure is used for training for autorotation landing with full touchdown or power recovery, with a simulated engine failure or loss of engine power.

In case of engine failure or sudden loss of power, the helicopter will yaw to the right, some red warnings may come on associated with the Gong audio warning, the NR will decay and the low NR audio warning will sound if NR goes below 370 rpm.

The procedure enables engine failure or loss of engine power to be simulated with the same symptoms by setting the twist grip to the IDLE position. Engine is thus set to idle.

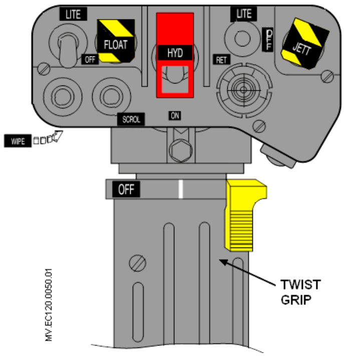


Figure 1: Collective grip

2 LIMITATIONS

The limitations specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

NOTE

Autorotation training shall be conducted within gliding distance of a suitable running landing area.

3 EMERGENCY PROCEDURES

The emergency procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

NOTE

If necessary, it is possible to turn the twist grip back to the FLIGHT position at any time and for any NR value. However, it is recommended to restore engine power when the NR is in normal operating range.

4 NORMAL PROCEDURES

The normal procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

4.1 FAILURE SIMULATION

1. Collective..REDUCE power
2. Twist grip ....IDLE position:
   . TWT GRIP
   . Gong sounds
   . Engine is set to idle, Ng ≅ 67%

- Then:

4.2 FULL TOUCHDOWN AUTOROTATION TRAINING PROCEDURE

1. Autorotation procedure ....APPLY actions 1, 2, 4 to 10 of the procedure described in SECTION 3.2 § 1 of the basic Flight Manual

then:

Once the aircraft has stopped:

2. Collective ....REDUCE to full low pitch
3. Twist grip ....FLIGHT position:
   . TWT GRIP
   . Rotor speed increases to its normal governed value

4.3 POWER RECOVERY AUTOROTATION TRAINING PROCEDURE

1. Collective ....REDUCE, maintain NR in normal operating range
2. IAS ....SET to Vy
3. Maneuver the aircraft into the wind on final approach

<u>At height ≅ 70 ft (21 m)</u>

4. NR...CHECK in normal operating range
5. Twist grip ....Smoothly to FLIGHT position:
   . TWT GRIP
   . Nf accelerates to its governed value
6. Collective ....CONTROL to maintain NR in normal operating range
7. Cyclic ....FLARE

<u>At 20 - 25 ft (6/8 m) and at constant attitude</u>

8. Collective ....GRADUALLY INCREASE to reduce the rate of descent and forward speed
9. Cyclic ....FORWARD slightly to adopt a landing attitude
10. Pedals..ADJUST to cancel any side-slip tendency
11. Collective ....INCREASE as necessary

5 PERFORMANCE DATA

The performance data specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

FLIGHT MANUAL

EC 120 B

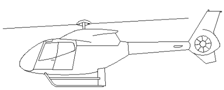
SUPPLEMENT

HYDRAULIC FAILURE TRAINING PROCEDURE

IMPORTANT NOTE

The information contained herein supplements or supersedes the information given in the basic Flight Manual and/or the Supplements listed in section Supplement 0.

The effectivity of the manual at the latest revision is specified on the list of effective pages.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- $\boxed{A}$ .... Specific to EASA

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION or SUP.	PAGES	DATE CODE	(1)	(2)
SUP.7.P1	1 to 1	16-26		
SUP.7.P5	1 to 2	16-26	$\boxed{A}$	
SUP.7	1 to 3	16-26		

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) EASA

ISSUE 1: NR 0 to NR 5:

NORMAL REVISION 5 - SEPTEMBER 2014	Approved under the authority of EASA D.O.A No.21J.056 on June 11th, 2015

ISSUE 2:

NORMAL REVISION 0 date code 16-26	Approved on January 11, 2018 under the authority of EASA DOA No. 21J700
Title	New issue
Revised information	All
Deleted information	None

1 GENERAL

This procedure describes hydraulic failure training for the EC 120 B.

In case of actual loss of hydraulic pressure, **HYDR** on the CWP + "Gong", the hydraulic pressure accumulators contain sufficient pressure to reach the recommended safety speed. Then the pilot must switch OFF the hydraulic cut-off switch on the collective grip (2) and apply the emergency procedure.

Pressing the [**ACCU TST**] or [**HYDR**] (1) guarded pushbutton produces the same effects as an actual failure

- The hydraulic pump pressure is by-passed
- The main rotor accumulators give hydraulic assistance for limited operation of the controls
- **HYDR** + "Gong"

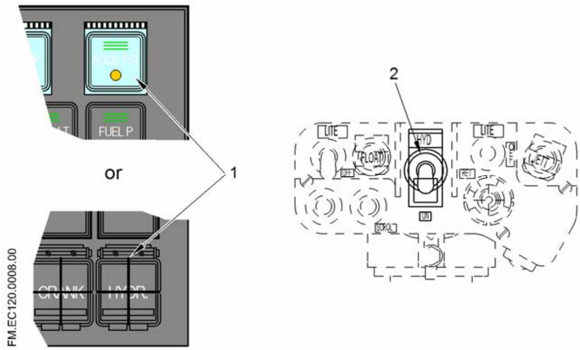


Figure 1: Hydraulic system controls

2 LIMITATIONS

The limitations specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

3 EMERGENCY PROCEDURES

The emergency procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

4 NORMAL TRAINING PROCEDURES

4.1 TRAINING PROCEDURE

CAUTION

Do not hover or taxi without hydraulic assistance.

If the [ACCU TST] or [HYDR] pushbutton is not reset, no hydraulic assistance can be restored.

NOTE

If necessary during the training exercise, hydraulic assistance can be restored by resetting [ACCU TST] or [HYDR] pushbutton (during STEP 1) or by setting the hydraulic cut-off switch on the collective grip to ON (during STEP 2).

- **Before engaging the training procedure:**

  - It is recommended to train with low aircraft weight as higher weight leads to higher control loads.
  - The hydraulic failure training procedure should be performed close to an airfield that is suitable for a running landing.
  - Hydraulic can be switched on at any time but be prepared for a significant decrease of cyclic and collective control loads.
  - Take care that the hydraulic cut-off switch is never in OFF position when the [**ACCU TST**] or [**HYDR**] pushbutton is in ON position.

STEP 1: FAILURE SIMULATION

- **In steady cruise flight conditions:**

  1. Instructor.. [**ACCU TST**] or [**HYDR**]: ON position:
     - CHECK **HYDR** + Gong
  2. Trainee .... **Safety speed** (set airspeed to around Vy)

- **Once safety speed reached:**

  3. Instructor.................................... [**ACCU TST**] or [**HYDR**]: Reset to OFF position:
     - CHECK **HYDR**

STEP 2: HYDRAULIC FAILURE TRAINING PROCEDURE

4. Hydraulic cut-off switch .... OFF :
   - CHECK **HYDR** + Gong
   - Control loads are increased
5. Perform a flat approach into wind
6. Make a no-hover slow running landing at around 10 kt (18.5 km/h)

   Do not hover or taxi without hydraulic pressure.

- **After landing**:

7. Hydraulic cut-off switch .... Reset to ON to restore hydraulic assistance before subsequent takeoff or hovering flight CHECK **HYDR** within 2 to 3 sec.

5 PERFORMANCE DATA

The performance data specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

FLIGHT MANUAL

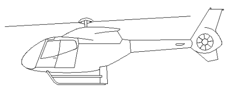
EC 120 B

SUPPLEMENT

SKI LANDING GEAR
SURFAIR

IMPORTANT NOTE
The information contained herein supplements or supersedes the information given in the basic Flight Manual and/or the Supplements listed in section Supplement 0. The effectivity of the manual at the latest revision is specified on the list of effective pages.

THIS SUPPLEMENT MUST BE INCLUDED IN THE FLIGHT MANUAL WHEN THE EQUIPMENT MENTIONED ABOVE IS INSTALLED ON THE AIRCRAFT.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- A .... Specific to EASA

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION or SUP.	PAGES	DATE CODE	(1)	(2)
SUP.11.P1	1 to 1	16-26		
SUP.11.P5	1 to 2	16-26	A	
SUP.11	1 to 2	16-26		

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) EASA

ISSUE 1: NR 0 to NR 1:

NORMAL REVISION 1 - OCTOBER 2004	Approved by DGAC according to the article 10.3 of the CE 1592/2002 regulation on December 03, 2004

ISSUE 2:

NORMAL REVISION 0 date code 16-26	Approved on January 11, 2018 under the authority of EASA DOA No. 21J700
Title	New issue
Revised information	All
Deleted information	None

1 GENERAL

The SURFAIR ski landing gear allows takeoff from and landing on a snow-covered ground or a clear ground.
The skis (1) are attached to the skids by means of eight hooks (2) and a pip pin (3).

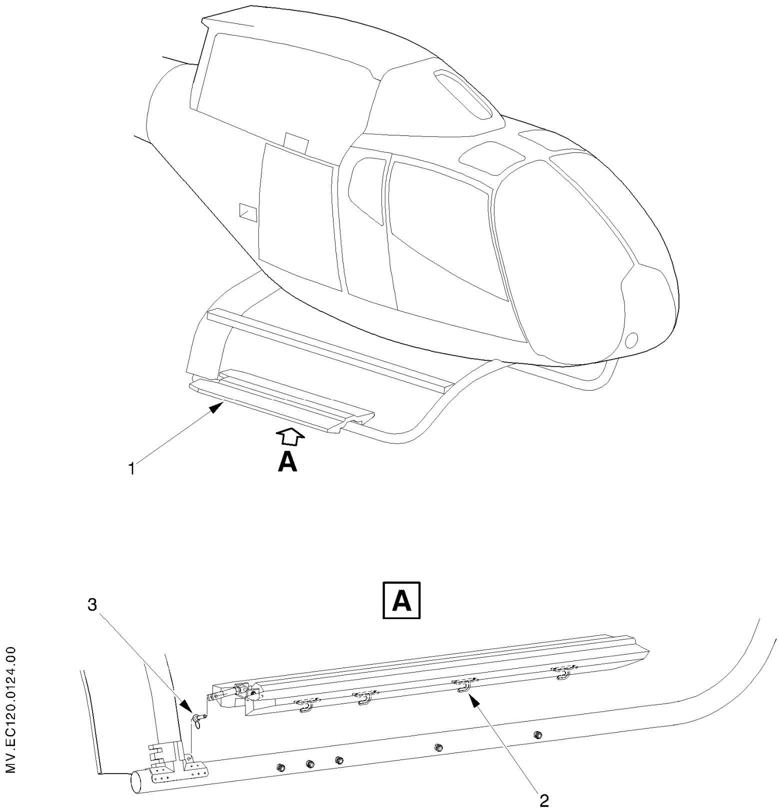


Figure 1: Ski landing gear

2 LIMITATIONS

The limitations specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

3 EMERGENCY PROCEDURES

The emergency procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

4 NORMAL PROCEDURES

The normal procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

- Exterior checks:
  - Ski landing gear .... Visual check.
  - Locking system .... Attachment, secured.

5 PERFORMANCE DATA

When the ski landing gear is installed, the performance data specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following :

- The rate of climb is reduced by 7 %.

AIRBUS HELICOPTERS

FLIGHT MANUAL

EC 120 B

SUPPLEMENT

TRANSPORT OF EXTERNAL LOADS

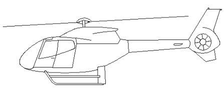
CARGO SLING with "SIREN" release unit (P/N AS21-8-B)

IMPORTANT NOTE

The information contained herein supplements or supersedes the information given in the basic Flight Manual and/or the Supplements listed in section Supplement 0.

The effectivity of the manual at the latest revision is specified on the list of effective pages.

THIS SUPPLEMENT MUST BE INCLUDED IN THE FLIGHT MANUAL WHEN THE EQUIPMENT MENTIONED ABOVE IS INSTALLED ON THE AIRCRAFT.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- $\boxed{A}$ .... Specific to EASA

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION or SUP.	PAGES	DATE CODE	(1)	(2)
SUP.12.P1	1 to 1	16-26		
SUP.12.P5	1 to 2	16-26	$\boxed{A}$	
SUP.12	1 to 10	16-26		

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) EASA

ISSUE 1: NR 0 to NR 8:

NORMAL REVISION 8 - MARCH 2012	EASA approval No. 10041126 REV.1 on August 24, 2012

ISSUE 2:

NORMAL REVISION 0 date code 16-26	Approved on January 11, 2018 under the authority of EASA DOA No. 21J700
Title	New issue
Revised information	All
Deleted information	None

RC a

The paragraph **1 - GENERAL** , is modified as follows:

1 GENERAL

Supersede the NOTE by the following:

NOTE

When fitting the CARGO SLING equipment, the VEMD has to be configured with the CARGO SLING installed.

The "SLING LOAD" line in the VEMD PERFORMANCE page is valid only if the "SLING" pushbutton on the LACU is "ON".

For AUW above 1750 kg, the performance has to be checked manually with the HOGE charts figure 5 or 6.

The rest of the paragraph is unchanged.

CAUTION

THIS PAGE MUST NOT BE REMOVED FROM THE MANUAL UNTIL EMBODIMENT OF MODIFICATION SB No. 31.003.

1 GENERAL

The "CARGO SLING" external load installation is composed of:

- A cargo hook suspended by four cables, equipped with a release unit.
  The release unit hook can be opened electrically and mechanically.
- An underslung load weight indication on the VEMD PERFORMANCE page (Figure 1).

NOTE

When fitting the CARGO SLING equipment, the VEMD has to be configured with the CARGO SLING installed.

The "SLING LOAD" line in the VEMD PERFORMANCE page is valid only if the [SLING] pushbutton on the LACU is "ON".

MV.EC120.0092.01

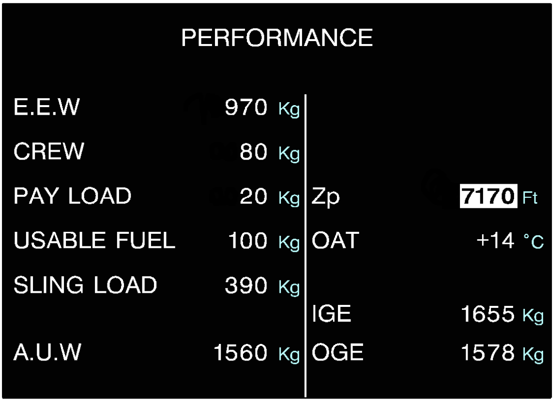


Figure 1: PERFORMANCE page

- A control system is provided for the pilot (Figure 2):
  - A [**SLING**] pushbutton (1) located on the LACU, for powering on the installation,
  - A release control (2) on the cyclic grip (electrical mode),
  - A release handle (3) located under the collective lever (mechanical mode).

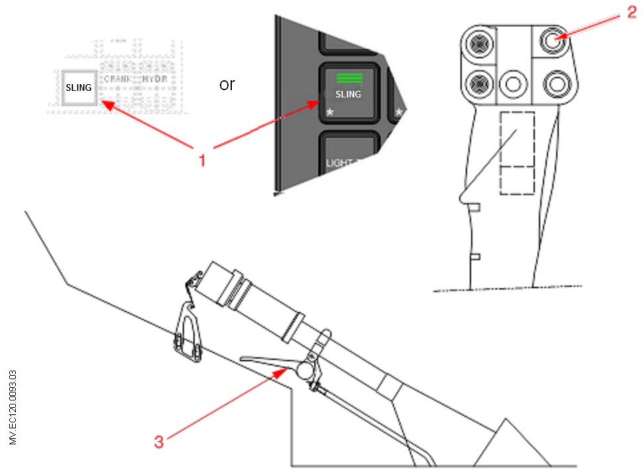


Figure 2: Cargo sling controls

NOTE

A minimum weight of 2,5kg (6lb) is required to open the hook.

2 LIMITATIONS

The limitations specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

2.1 WEIGHT LIMITATION

- Maximum authorized sling load weight .... 700 kg (1543 lb)
- Maximum all up weight with an external load......... 1800 kg (3968 lb)

  or maximum authorized all up weight allowing hovering flight out of ground effect (the lowest of the two values).

CAUTION

The minimum and maximum weight without external load remains limited to the minimum and maximum weight specified in the limitations section of the basic flight manual.

2.2 LONGITUDINAL CG

With an external load, the longitudinal limits are defined according to the weight as per the graph below.

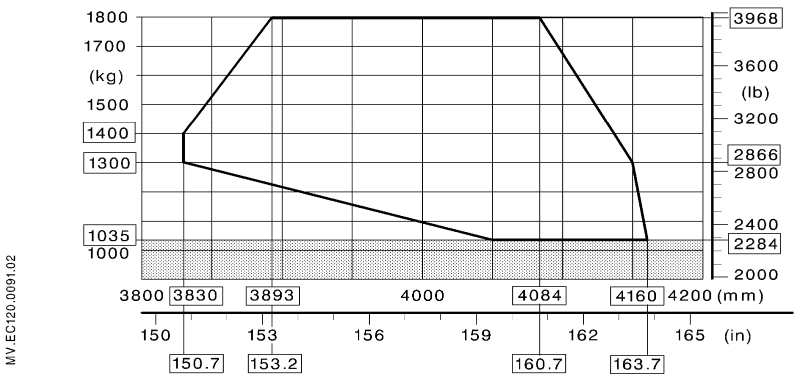


Figure 3: Longitudinal CG chart with external load

2.3 AIRSPEED LIMITATION

- Absolute maximum permissible indicated airspeed with external load .... 110 kt (204 km/h)

NOTE

The pilot is responsible for determining the limit speed according to the load and sling length. Particular care must be exercised when bulky loads are carried on the sling.

2.4 OPERATING LIMITATION

Class of approved aircraft/load combination: B, "Single point suspension external load airborne". This means carriage of external loads, which are jettisonable and lifted free of land or water during rotorcraft operations.

Flying with an unballasted sling cable or empty net is prohibited.

The external loads are limited to non-human loads only.

An instruction placard in the cockpit indicates:

<u>CARRYING OF EXTERNAL LOADS</u> CLASS OF APPROVED AIRCRAFT/LOAD COMBINATION : B. WHEN EXTERNAL LOADS ARE CARRIED, NO PERSON MAY BE CARRIED UNLESS : - HE IS A FLIGHT CREW MEMBER ; - HE IS A FLIGHT CREW MEMBER TRAINEE ; OR - HE PERFORMS AN ESSENTIAL FUNCTION IN CONNECTION WITH THE EXTERNAL-LOAD OPERATION.

OR

<u>EMPORT DE CHARGES EXTERNES</u> CLASSE DE COMBINAISONS GIRAVION-CHARGE APPROUVEE : B AUCUNE PERSONNE NE PEUT ETRE TRANSPORTEE A MOINS DE : - ETRE UN DES MEMBRES DE L'EQUIPAGE - SUIVRE UN COURS DE FORMATION EN TANT QUE MEMBRE D'EQUIPAGE OU - REMPLIR UNE FONCTION ESSENTIELLE AYANT TRAIT A L'UTILISATION DU GIRAVION AVEC CHARGE EXTERIEURE.

Two placards visible to the ground operator and located on the lower fairing near to the hook indicate:

- the maximum sling load,
- the cargo hook rigging.

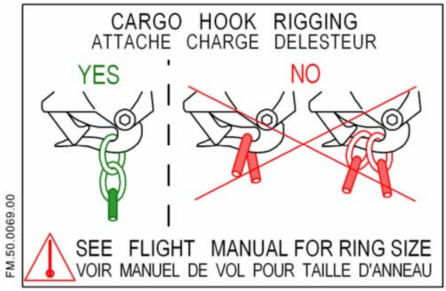


Figure 4: Cargo hook rigging placard

3 EMERGENCY PROCEDURES

The emergency procedures specified the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

3.1 ENGINE FAILURE WITH EXTERNAL LOAD

- IN CRUISE FLIGHT
  1. Autorotation procedure: .... APPLY
  2. External load .... RELEASE as soon as possible
- IN HOVER
  1. Collective .... REDUCE according to the height
  2. External load .... RELEASE as soon as possible
  3. Pedals .... CONTROL yaw
  4. Cyclic .... FORWARD to gain forward speed according to the height
  5. Collective .... INCREASE as needed to cushion touch-down

NOTE

In case of a failure during the hooking phase, the pilot shall move the aircraft away to the right. Ground personnel are to be forewarned that in the event of an engine failure, they have to move away to the left of the helicopter.

3.2 ELECTRICAL LOAD JETTISONING FAILURE

Collective lever mechanical release .... ACTUATE

3.3 SLING LOAD INDICATION FAILURE ON VEMD

Sling load indication in yellow

- [**SLING**] pushbutton .... CHECK ON

SLING LOAD INDICATION

WHITE → **CONTINUE FLIGHT**

YELLOW →
1. **CONTINUE FLIGHT**
   - Once the mission is completed
2. Installation... ....Check

NOTE

With yellow sling load indication on VEMD the electrical release control may be inoperative. In this case use mechanical release and abort the mission.

4 NORMAL PROCEDURES

The normal procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

- Carrying heavy loads is a delicate operation due to the possible effects of a swinging load on the flight behavior of the helicopter. Consequently, pilots are advised to train with gradually increasing sling loads before undertaking heavy or bulky load carrying operations.
- The length of the sling cable must be determined in accordance with the type of mission. To carry a compact load, it is recommended to use the shortest possible cable.
- Operation with no or low load on a sling cable or in a net must be performed in such a way as to ensure that the trailing sling cable or net does not come close to the tail rotor.
- For permissible load attachment ring size refer to SECTION 9 of this Flight Manual.

WARNING

1- THE USE OF A LOAD ATTACHMENT RING WITH INCORRECT DIMENSIONS MAY LEAD TO LOSS OR JAMMING OF THE LOAD.

2- IN WET WEATHER, THE OPERATORS HANDLING THE HOOK AND LOADS SHOULD WEAR THICK RUBBER GLOVES. DISCHARGE STATIC ELECTRICITY BY PLACING AN ELECTRICAL CONDUCTOR CABLE OR TUBE BETWEEN THE GROUND AND THE CARGO RELEASE UNIT (HOOK).

4.1 GROUND CHECK OF THE INSTALLATION

- EXTERIOR CHECK
  - Cargo sling equipment .... Attachment, visual check
  - Electrical hook opening .... CHECK
  - Mechanical hook opening .... CHECK

  (After the last flight of the day)
  - Cargo sling equipment .... Attachment, visual check
  - Hook .... Lightly grease the end of the load hook (if necessary)
- INTERIOR CHECK
  - [**SLING**] .... ON
  - PERFORMANCE page .... SELECT
  - SLING LOAD indication .... Valve displayed is white

NOTE

If the "SLING LOAD" indication is not displayed, check in VEMD configuration mode that sling is set to "Installed".

4.2 TAKEOFF CHECK AND PROCEDURE WITH EXTERNAL LOAD

1. External load .... HOOK and SECURE
2. Collective .... INCREASE very smoothly while maintaining the aircraft vertically above the load
3. Cables tightened .... Dwell briefly before raising the load
4. Lift the load .... Vertically
5. Load indication .... CHECK
6. Take-off path .... ADJUST to adopt an immediate forward climb attitude
7. All parameters .... CHECK

4.3 MANEUVERS

All control movements should be made very gently, with very gradual acceleration and deceleration, and only slightly banked turns.

4.4 APPROACH AND LANDING WITH EXTERNAL LOAD

- Perform approach at minimum rate of descent
- Establish zero translational ground speed sufficiently high to ensure that the load is not dragged along the ground
- Then descend vertically until the load is set on the ground
- Load .... RELEASE
- Load release .... CHECK
- All parameters .... CHECK

NOTE

If the load is not released, actuate the mechanical release handle.

5 PERFORMANCE DATA

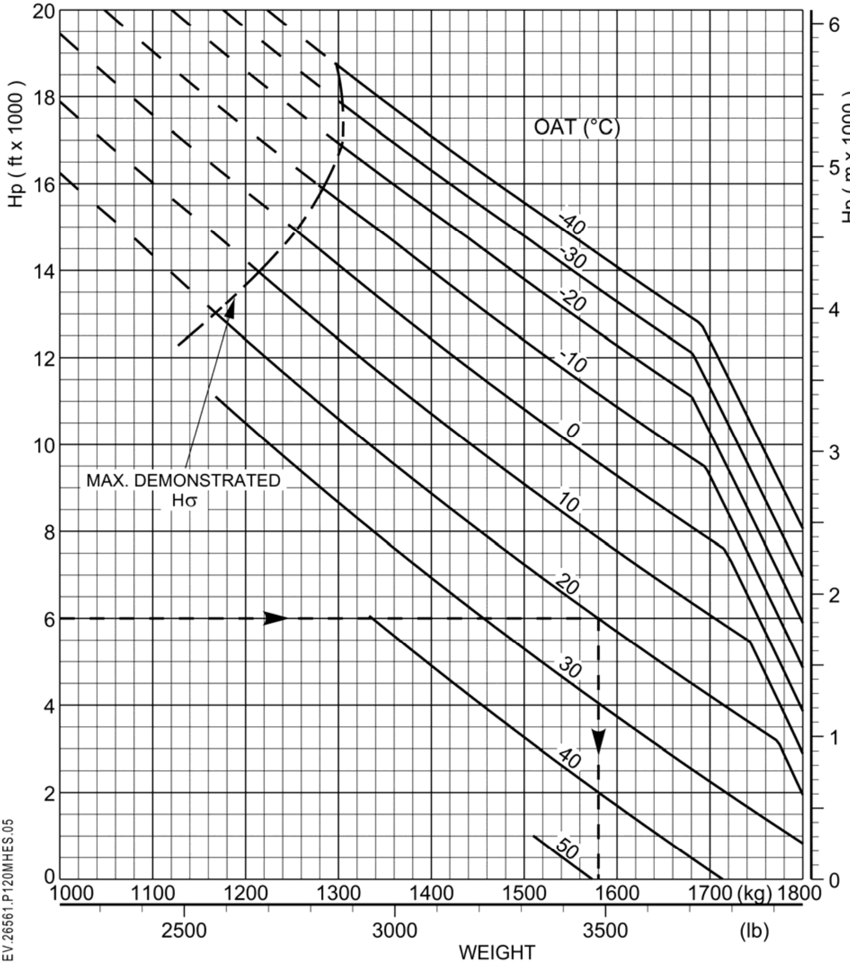
When no external load is carried on the hook, the performance data specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

- Hover out of ground effect performance is shown in Figures 5 and 6 of this Supplement.
- Hover and climb performance may be affected when carrying bulky loads.

CONDITIONS

- NO WIND
- HEATING SYSTEM OFF
- MAX. TAKEOFF POWER
- -40 °C ≤ OAT ≤ ISA +35 °C

HOVER OUT OF GROUND EFFECT WITH EXTERNAL LOAD



EXAMPLE : OAT = 20°C
Hp = 6000 ft (1829 m) => HOGE WEIGHT 1580 kg (3483 lb).

Figure 5: HOGE

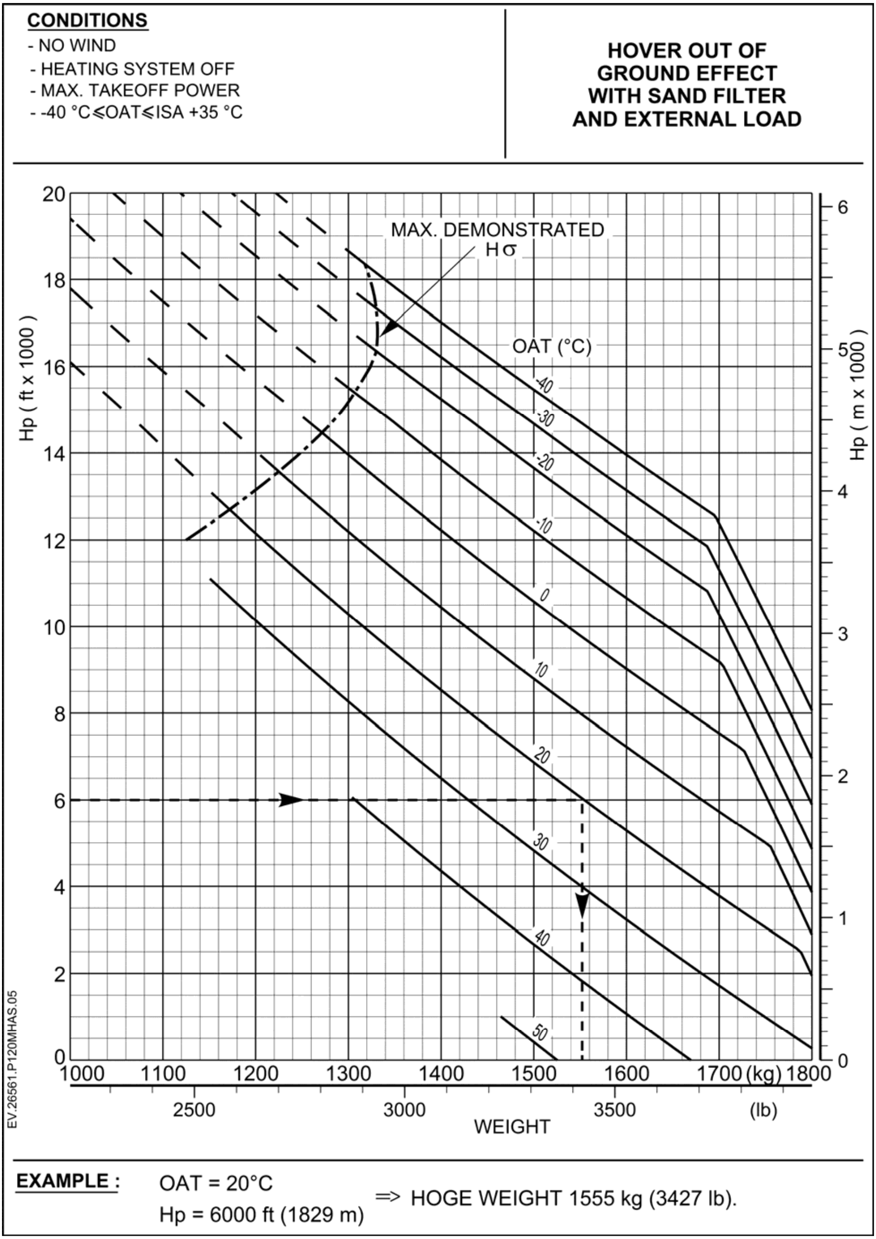


Figure 6: HOGE with sand filter

FLIGHT MANUAL

EC 120 B

SUPPLEMENT

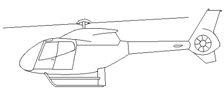
LH SIDE MAIN FLIGHT CONTROLS

IMPORTANT NOTE

The information contained herein supplements or supersedes the information given in the basic Flight Manual and/or the Supplements listed in section Supplement 0.

The effectivity of the manual at the latest revision is specified on the list of effective pages.

THIS SUPPLEMENT MUST BE INCLUDED IN THE FLIGHT MANUAL WHEN THE EQUIPMENT MENTIONED ABOVE IS INSTALLED ON THE AIRCRAFT.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- $\boxed{A}$ .... Specific to EASA

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION or SUP.	PAGES	DATE CODE	(1)	(2)
SUP.13.P1	1 to 1	16-26		
SUP.13.P5	1 to 2	16-26	$\boxed{A}$	
SUP.13	1 to 2	16-26		

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) EASA

ISSUE 1: NR 0 to NR 2:

NORMAL REVISION 2 - APRIL 2005	Approved by DGAC according to the article 10.3 of CE 1592/2002 regulation on April 14, 2005

ISSUE 2:

NORMAL REVISION 0 date code 16-26	Approved on January 11, 2018 under the authority of EASA DOA No. 21J700
Title	New issue
Revised information	All
Deleted information	None

1 GENERAL

This optional equipment consists of moving the main flight controls from the RH station to the LH station. The following equipment is moved:

- Cyclic friction lock.
- Collective locking device when the aircraft is fitted with single controls (1).
- Release handle under the collective lever when the aircraft is equipped for transport of external loads (2).

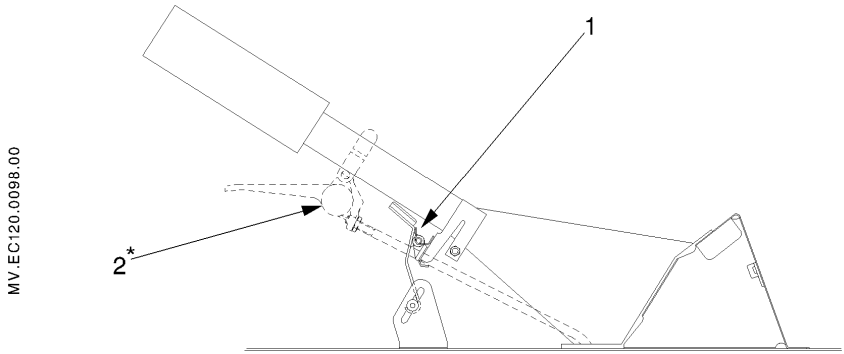


Figure 1: LH side locking device and release handle on the collective lever

* Optional

2 LIMITATIONS

The limitations specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

- Minimum flight crew .... One pilot in left seat

3 EMERGENCY PROCEDURES

The emergency procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

4 NORMAL PROCEDURES

The normal procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

Interior checks (Only when dual controls are not installed)

- RH side pedals protective device .... Installed
- RH cyclic and collective control covers .... Installed
- LH side collective locking device................................ Installed

5 PERFORMANCE DATA

The performance data specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

FLIGHT MANUAL

EC 120 B

SUPPLEMENT

SAND FILTER

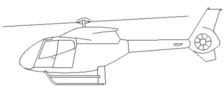
AEROFLO OR SOFRANCE

IMPORTANT NOTE

The information contained herein supplements or supersedes the information given in the basic Flight Manual and/or the Supplements listed in section Supplement 0.

The effectivity of the manual at the latest revision is specified on the list of effective pages.

THIS SUPPLEMENT MUST BE INCLUDED IN THE FLIGHT MANUAL WHEN THE EQUIPMENT MENTIONED ABOVE IS INSTALLED ON THE AIRCRAFT.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- $\boxed{A}$ .... Specific to EASA

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION or SUP.	PAGES	DATE CODE	(1)	(2)
SUP.14.P1	1 to 1	16-26		
SUP.14.P5	1 to 2	16-26	$\boxed{A}$	
SUP.14	1 to 6	16-26		

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) EASA

ISSUE 1: NR 0 to NR 6:

NORMAL REVISION 6 - MARCH 2012	EASA Approval No. 10041126 REV.1 on August 24, 2012

ISSUE 2:

<table>
<tr><td colspan="2">NORMAL REVISION 0 date code 16-26</td><td>Approved on January 11, 2018 under the authority of EASA DOA No. 21J700</td></tr>
<tr><td>Title</td><td colspan="2">New issue</td></tr>
<tr><td>Revised information</td><td colspan="2">All</td></tr>
<tr><td>Deleted information</td><td colspan="2">None</td></tr>
</table>

1 GENERAL

The sand filter installation is intended to protect the engine from sand ingestion, during hovering flight or when flying in sand-laden atmosphere.

It operates permanently when it is fitted on the aircraft.

The installation consists essentially of:

- A structural sand filter support mounted in front of the engine air intake.
- A rectangular filtering panel installed on the structural support.
- A P2 air pressure supply system.

In operation, the ambient air flows through separator tubes which constitute the filter. The sand is evacuated by scavenge tubes ventilated by P2 air.

2 LIMITATIONS

The limitations specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

CAUTION

Flight is forbidden if the filtering panel is not installed on its support.

3 EMERGENCY PROCEDURES

The emergency procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

4 NORMAL PROCEDURES

The normal procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

- Exterior checks:

  MGB cowling (right side) .... OPEN
  Rectangular filtering panel .... Installed, visual check, attachment, not obstructed, clear of snow or ice
  MGB cowling .... CLOSE

- Flight in sand-laden atmosphere:

  Switch off the heating system

5 PERFORMANCE DATA

The performance data specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

NOTE 1

VEMD engine power check and hover performances are automatically modified if the sand filter is installed.

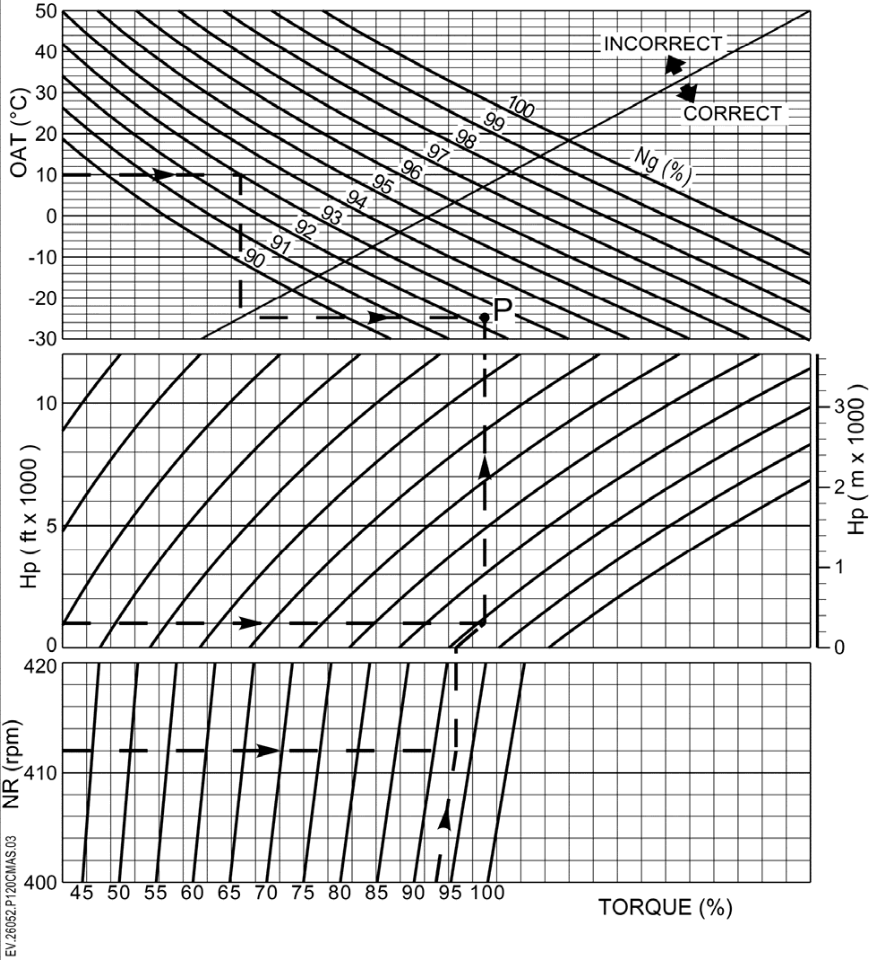
NOTE 2

The T4 check of the Engine Power Check (manual procedure) is not modified; refer to SECTION 5.1 Fig 3.

CONDITIONS

- HEATING SYSTEM OFF
- GENERATOR LOAD < 50A
- Hp ⩽ 12000 ft (3657 m)

ENGINE POWER CHECK WITH SAND FILTER



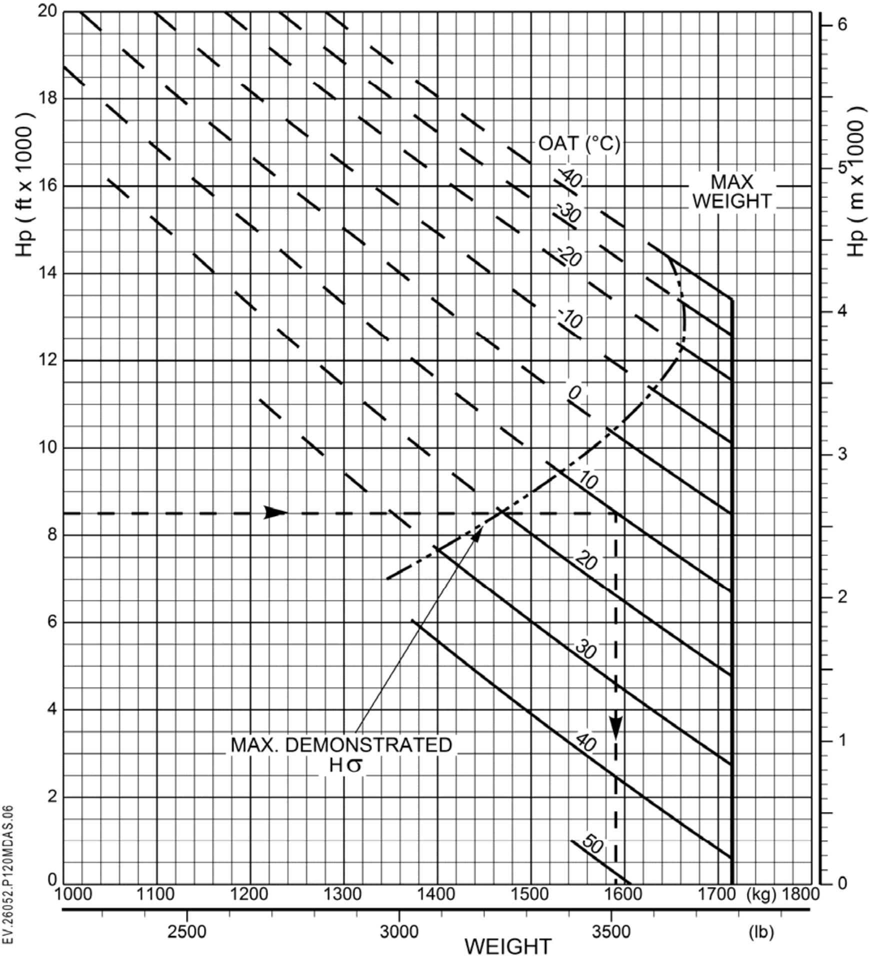
EXAMPLE : OAT = 10°C Hp = 1000 ft (300 m) NR = 412 rpm
Ng = 93% TORQUE = 93% => **P** is in the "correct" zone

Figure 1: Engine power check with sand filter

CONDITIONS

- NO WIND
- HEATING SYSTEM OFF
- MAX. TAKEOFF POWER
- -40 °C ⩽ OAT ⩽ ISA +35 °C
- HEIGHT 5 ft (1.5 m)

HOVER IN GROUND EFFECT WITH SAND FILTER



SAFE WIND HAS BEEN DEMONSTRATED UP TO 35 kt (65 km/h) AND MAX. WEIGHT FROM ALL DIRECTIONS AT SEA LEVEL AND AT 22 kt (41 km/h) FOR A CORRECTED WEIGHT OF 2200 kg (4850 lb). (Refer to section 5.1 Fig.8)

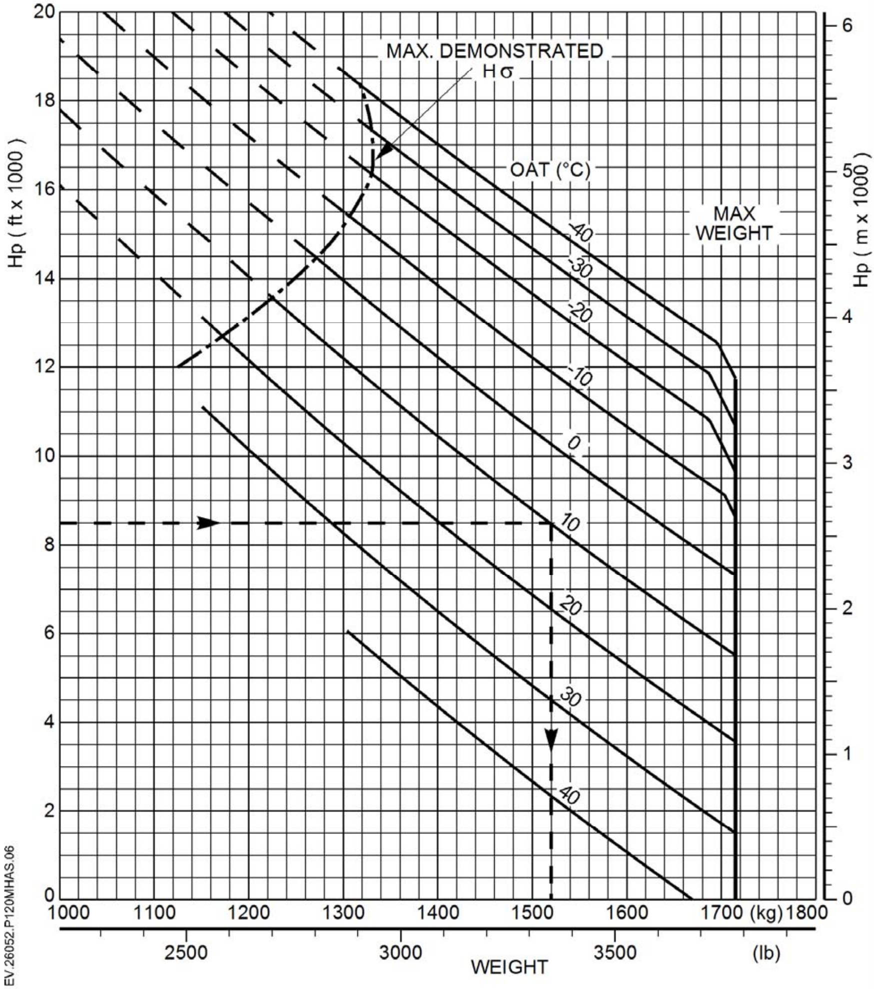
EXAMPLE : OAT = 10°C
Hp = 8500 ft (2591 m) => HIGE WEIGHT WITH 1590 kg (3505 lb).

Figure 2: HIGE with sand filter

CONDITIONS

- NO WIND
- HEATING SYSTEM OFF
- MAX. TAKEOFF POWER
- -40 °C≤OAT≤ISA +35 °C

HOVER OUT OF GROUND EFFECT WITH SAND FILTER



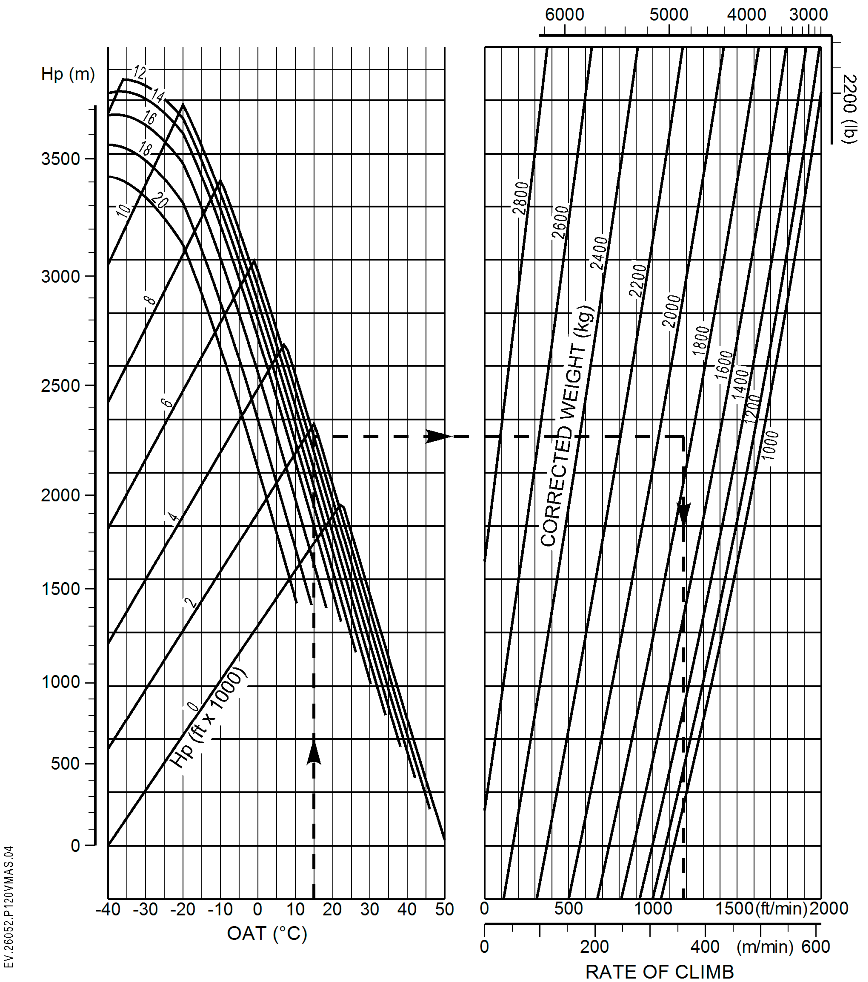
EXAMPLE : OAT = 10°C
Hp = 8500 ft (2591 m) => HOGE WEIGHT 1520 kg (3351 lb).

Figure 3: HOGE with sand filter

CONDITIONS

- MAX. CONTINUOUS POWER
- HEATING SYSTEM OFF
- -40 °C ⩽ OAT ⩽ ISA +35 °C

RATE OF CLIMB AT Vy



EXAMPLE :

OAT = 15°C
Hp = 4000 ft (1220 m)

ACTUAL WEIGHT = 1600 kg (3527 lb)
CORRECTED WEIGHT = 1850 kg (4079 lb)
RATE OF CLIMB = 1180 ft/min

Figure 4: Rate of climb with sand filter

FLIGHT MANUAL

EC 120 B

SUPPLEMENT

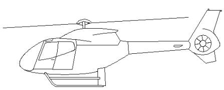
EMERGENCY FLOATATION GEAR

IMPORTANT NOTE

The information contained herein supplements or supersedes the information given in the basic Flight Manual and/or the Supplements listed in section Supplement 0.

The effectivity of the manual at the latest revision is specified on the list of effective pages.

THIS SUPPLEMENT MUST BE INCLUDED IN THE FLIGHT MANUAL WHEN THE EQUIPMENT MENTIONED ABOVE IS INSTALLED ON THE AIRCRAFT.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- A .... Specific to EASA

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION or SUP.	PAGES	DATE CODE	(1)	(2)
SUP.17.P1	1 to 1	22-12		
SUP.17.P5	1 to 2	22-12	A	
SUP.17	1 to 4	22-12		

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) EASA

ISSUE 1: NR 0 to NR 5:

NORMAL REVISION 5 - FEBRUARY 2009	EASA Approval No. R.C.03353 on May 18, 2009

ISSUE 2:

NORMAL REVISION 0 date code 16-26		Approved on January 11, 2018 under the authority of EASA DOA No. 21J700
Title	New issue	
Revised information	All	
Deleted information	None	
NORMAL REVISION 1 date code 22-12		EASA Approval No.10081216 on February 08, 2023
Title	Relocation of FLOAT or FLOAT ARM Pushbutton	
Revised information	SUP.17.P1, SUP.17.P5, SUP.17	
Deleted information	None	

1 GENERAL

The emergency floatation gear is approved for emergency use (not for ditching according to JAR 27) i.e. to aid in keeping rotorcraft sufficiently upright and in adequate trim to permit safe and orderly evacuation in emergency touchdown on water.

The installation allows the aircraft to land also with floatation bags inflated on a runway or a hard prepared surface.

The emergency floatation gear consists of a landing gear assembly fitted with:

- Two floatation units mounted parallel along each skid of the aircraft (1) (1').
- A system for inflating the floats from a cylinder (2) with pressure indicator.
- An electrical control system with a [**FLOAT**] or [**FLOAT ARM**] pushbutton on the LACU (4) or the instrument panel to arm the system.
- A guarded firing pushbutton (3) mounted on the pilot's collective grip.

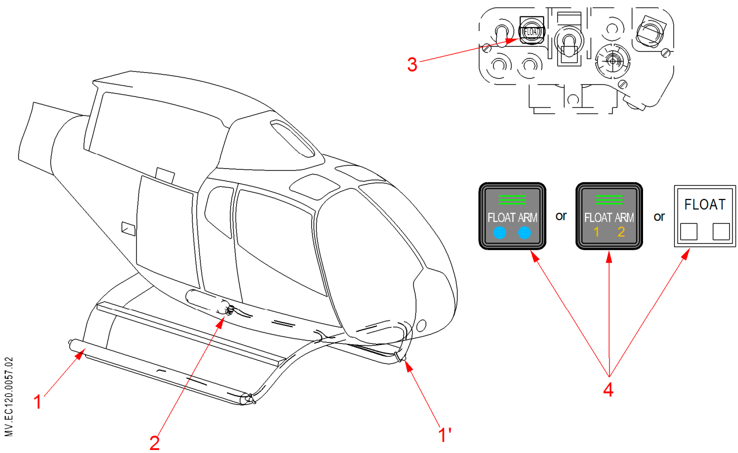


Figure 1: Emergency floatation equipment

2 LIMITATIONS

The limitations specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

- Emergency floatation gear stowed - system armed or floats inflated:
  - maximum indicated airspeed: 120 kt (222 km/h) or VNE power on, whichever is less.
- Maximum altitude for float inflation: 13200 ft (4000 m).
- Maximum permissible loss of altitude after inflation: 6600 ft (2000 m)
- When flying at less than 400 ft (122 m) above water, the floatation gear must always be armed.
- The limit values of pressure in the inflation cylinder, provided by the following table, are applicable if the flight requires the emergency floatation gear to be armed.

  Cylinder reference: 215494-0

OAT	°C	-45	-40	-30	-20	-10	0	10	20	30	40	50	60	70
	°F	-49	-40	-22	-4	14	32	50	68	86	104	122	140	158
MAX. PRESSURE	BAR	170	174	181	188	195	202	209	216	223	230	237	244	251
	PSI	2466	2524	2625	2727	2828	2930	3031	3133	3234	3336	3437	3539	3640
MIN PRESSURE	BAR	154	157	164	171	178	185	192	199	206	213	220	227	234
	PSI	2234	2277	2378	2480	2582	2683	2785	2886	2988	3089	3191	3292	3394

Cylinder reference: 215494-1

OAT	°C	-45	-40	-30	-20	-10	0	10	20	30	40	50	60	70
	°F	-49	-40	-22	-4	14	32	50	68	86	104	122	140	158
MAX. PRESSURE	BAR	163	166	173	180	187	193	200	207	214	220	227	234	241
	PSI	2364	2408	2509	2611	2712	2799	2901	3002	3104	3191	3292	3394	3495
MIN PRESSURE	BAR	147	150	157	164	170	177	184	190	197	204	210	217	224
	PSI	2132	2176	2277	2379	2466	2567	2669	2756	2857	2959	3046	3147	3249

NOTE

The placard located adjacent to the cylinder provides the limit values.

3 EMERGENCY PROCEDURES

The emergency procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

- **INFLATION PROCEDURE**

  In the event of engine failure or other urgent requirement to alight on water, check the rotor speed then apply the following procedure:

  - [**FLOAT**] or [**FLOAT ARM**] .... ON
  - [**FLOAT**] or [**FLOAT ARM**] lights 1 and 2...... CHECK ON (at least one is ON)
  - [**FLOAT FIRE**] on collective grip.................... PRESS (recommended firing IAS: below 80 kt - 148 km/h)

NOTE

A deceleration with a pitch down movement can occur when inflating the floatation gear at a speed greater than 80 kt (148 km/h).

- **AUTORATION PROCEDURE OVER WATER WITH EMERGENCY FLOATATION GEAR**

  1. Collective .... **REDUCE** to maintain NR in normal operating range
  2. IAS .... **Vy**

  - If relighting impossible or after tail rotor failure.

  3. Twist Grip...SHUT OFF position
  4. Maneuver to head the aircraft equally between the wind and wave direction on final approach.

  - <u>At height ≅ 70 ft (21 m)</u>

  5. Cyclic ....Flare

  - <u>At 20-25 ft (6/8 m) at constant attitude</u>

  6. Collective ....GRADUALLY INCREASE to reduce the rate of descent and forward speed
  7. Cyclic ....FORWARD slightly to adopt attitude of 10° nose-up and a forward speed less than 10 kt (19 km/h) on touch-down

8. Pedals .... ADJUST
   to cancel any side-slip tendency
9. Collective .... INCREASE
   to cushion touch down with minimum speed

- <u>After touch-down</u>

10. Collective .... Gradually decrease to fully down
11. Rotor brake .... APPLY
12. Evacuate aircraft once the rotor has stopped.

4 NORMAL PROCEDURES

The normal procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

- Exterior checks:
  - Floatation units.. LOCK in the lowered position
  - Protective cover .... CHECK
  - Pressure in the inflation cylinder .... CHECK
- Interior check:
  - Arming of the emergency floatation gear:
    [**FLOAT**] or [**FLOAT ARM**] .... ON
    [**FLOAT**] or [**FLOAT ARM**] lights 1 and 2......................... CHECK ON
  - Disarming of the emergency floatation gear:
    [**FLOAT**] or [**FLOAT ARM**] .... RESET in OFF position
    [**FLOAT**] or [**FLOAT ARM**] lights 1 and 2......................... CHECK OFF

5 PERFORMANCE DATA

When the floatation gear is stowed, the performance data specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

- The rate of climb must be reduced by 11%.

AIRBUS HELICOPTERS

FLIGHT MANUAL

EC 120 B

SUPPLEMENT

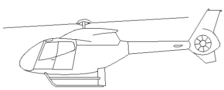
AIR CONDITIONING SYSTEM

IMPORTANT NOTE

The information contained herein supplements or supersedes the information given in the basic Flight Manual and/or the Supplements listed in section Supplement 0.

The effectivity of the manual at the latest revision is specified on the list of effective pages.

THIS SUPPLEMENT MUST BE INCLUDED IN THE FLIGHT MANUAL WHEN THE EQUIPMENT MENTIONED ABOVE IS INSTALLED ON THE AIRCRAFT.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- $\boxed{A}$ .... Specific to EASA

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION or SUP.	PAGES	DATE CODE	(1)	(2)
SUP.19.P1	1 to 1	16-26		
SUP.19.P5	1 to 2	16-26	$\boxed{A}$	
SUP.19	1 to 4	16-26		

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) EASA

ISSUE 1: NR 0 to NR 4:

NORMAL REVISION 4 - MARCH 2007	EASA approval No. R.C.02303 on June 20, 2007

ISSUE 2:

NORMAL REVISION 0 date code 16-26	Approved on January 11, 2018 under the authority of EASA DOA No. 21J700
Title	New issue
Revised information	All
Deleted information	None

1 GENERAL

1.1 DESCRIPTION OF THE SYSTEM

The purpose of the system is to maintain a comfortable temperature in the cabin. It is composed of:

- A compressor which is mechanically driven by a belt from the MGB.
- A condenser located between the MGB fan and the engine oil cooler.
- A cabin fan.
- An evaporator.
- An air supply system only operating for cabin air recirculation.
  The cabin air outlet nozzles are identical to those of the basic aircraft.
- A control unit located on the console comprising:
  - A three-position selector (1).
  - A fan speed adjustment potentiometer (2).

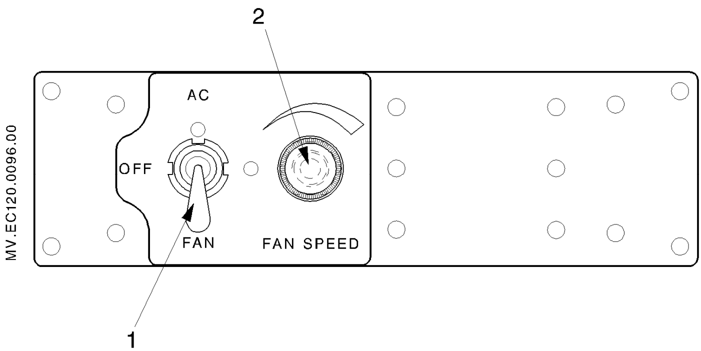


Figure 1: Air conditioning control unit

- An electrical supply and monitoring system. The cabin fan is switched on automatically when the heating system is on.
- A P2 TEMP light on the CWP panel indicates that the maximum allowable temperature is reached in the cabin ventilation duct.

1.2 OPERATING PRINCIPLE

The air conditioning system uses an internal air recirculation system. The air is taken from the interior of the cabin at the rear RH side of the distribution duct. This air flows through the fan and then through the evaporator where it is cooled, finally flowing through the P2 diffuser where it can be mixed with the hot air. This air then flows along the cabin ceiling to reach the cabin distribution duct. The air distribution in the cabin has not changed compared to the basic version.

2 LIMITATIONS

The limitations specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

3 EMERGENCY PROCEDURES

The emergency procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

3.1 VENTILATION SYSTEM FAILURE

If the ventilation system does not operate (no air flow from outlet nozzles), set the system selector to OFF.

3.2 AIR CONDITIONING SYSTEM FAILURE

If the air conditioning system does not operate (cooling inoperative), set the system selector to OFF.

3.3 HEATING/CABIN VENTILATION FAILURE

WARNING PANEL	CORRECTIVE ACTIONS
P2 TEMP Maximum temperature in heating duct exceeded	Cabin air outlets .... CHECK that air flows and air outlets not obstructed YES → Heating control..........Reduce until: P2 TEMP **CONTINUE FLIGHT** NO → Heating control……Close

NOTE

The demisting function is inoperative when the heating control is closed. If the external visibility becomes significantly degraded:

LAND AS SOON AS POSSIBLE

4 NORMAL PROCEDURES

The normal procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

4.1 PRESTART CHECK

- Heating control... OPEN
- Cabin fan .... CHECK automatically activated
- Heating control... CLOSE

4.2 SWITCHING ON AND OFF THE SYSTEM

Set the selector to the:

- FAN position for cabin ventilation
- AC position for cabin air conditioning
- OFF position to switch off the system

Use the FAN SPEED control to adjust the air flow.

4.3 HEATING SYSTEM OPERATION

Open the heating control located on the cabin ceiling.

A P2 indication is displayed on the VEMD FLI screen: **P2**.

The air distribution fan is automatically activated at its maximum flow rate even if the air conditioning selector is set to the OFF position.

When the heating control is closed, the fan is switched off if the air conditioning selector is in the OFF position.

5 PERFORMANCE DATA

The performance data specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

5.1 HOVER FLIGHT

The hover performance is reduced by 20 kg (44 lb) when the air conditioning is active (selector in the AC position). The performance calculated by the VEMD must be reduced by the same value.

5.2 CLIMB

The climb performance given in SECTION 5 of the basic Flight Manual is reduced by 20 ft/min (6 m/min) when the air conditioning is active (selector in the AC position).

5.3 ENGINE POWER CHECK

The operation of the air conditioning system does not affect the engine power check given in the basic Flight Manual.

FLIGHT MANUAL

EC 120 B

SUPPLEMENT

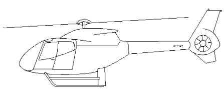
IMPROVED HEATING SYSTEM

IMPORTANT NOTE

The information contained herein supplements or supersedes the information given in the basic Flight Manual and/or the Supplements listed in section Supplement 0.

The effectivity of the manual at the latest revision is specified on the list of effective pages.

THIS SUPPLEMENT MUST BE INCLUDED IN THE FLIGHT MANUAL WHEN THE EQUIPMENT MENTIONED ABOVE IS INSTALLED ON THE AIRCRAFT.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- A .... Specific to EASA

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION or SUP.	PAGES	DATE CODE	(1)	(2)
SUP.20.P1	1 to 1	16-26		
SUP.20.P5	1 to 2	16-26	A	
SUP.20	1 to 4	16-26		

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) EASA

ISSUE 1: NR 0:

NORMAL REVISION 0 - OCTOBER 2005	EASA Approval No. R.C.01067 on October 25, 2005

ISSUE 2:

NORMAL REVISION 0 date code 16-26	Approved on January 11, 2018 under the authority of EASA DOA No. 21J700
Title	New issue
Revised information	All
Deleted information	None

1 GENERAL

The improved heating system is designed for use in very cold temperatures when additional heating is required. Heating is achieved by mixing hot P2 air from the engine with outside air drawn from under the cabin floor.

It is composed of:

- Additional P2 tubes (1).
- A P2 air valve (2).
- A mixing unit/diffuser (3).
- A heating duct under the cabin floor (4).
- Two air outlets on the cabin floor located under the front seats (5).
- A T-handle on the cabin floor which opens or closes a valve in the diffuser to prevent cold air leaking in the cabin when the system is not operating (6).
- A heating control valve on the cabin floor which opens or closes P2 air bleed (7).

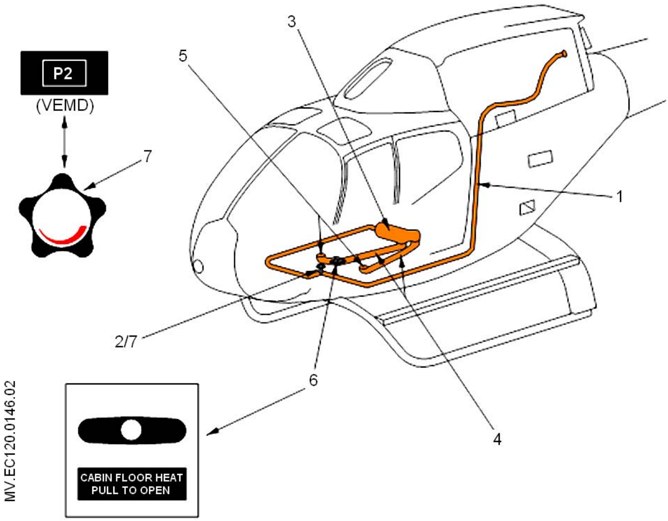


Figure 1: Improved heating system

2 LIMITATIONS

The limitations specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

- The improved heating system shall only be used in conjunction with the existing heating system.
  - Cabin heating shall be used with the improved heating system full-on or full-off. The cabin temperature shall be adjusted by the standard heating system control located on the cabin ceiling.

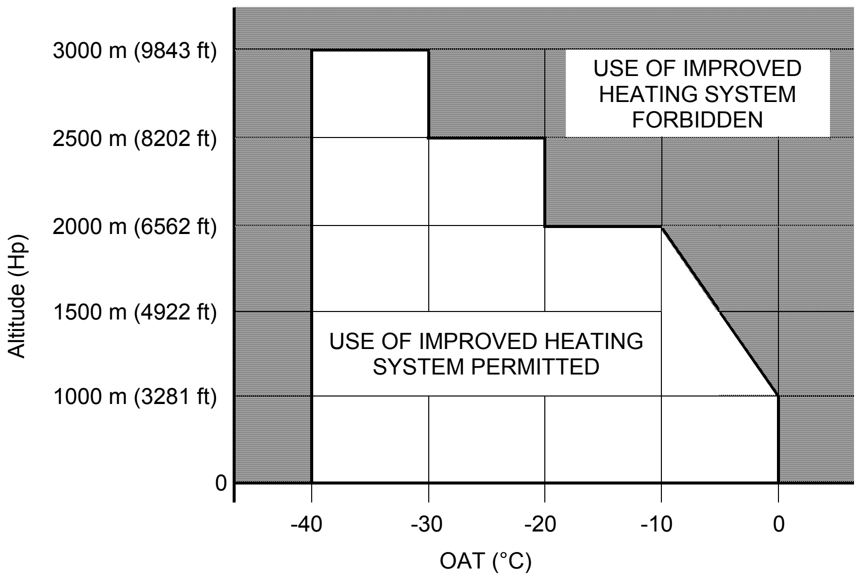


Figure 2: Flight envelope for use of improved heating system.

3 EMERGENCY PROCEDURES

The emergency procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

WARNING PANEL	CORRECTIVE ACTIONS
P2 TEMP Maximum temperature in heating duct exceeded	. T- handle ....CHECK open YES → . Improved heating system NO → . T- handle ....OPEN P2 TEMP → . Improved heating system P2 TEMP → CONTINUE FLIGHT . Improved heating system .... TURN OFF using floor heating control valve P2 TEMP → . Cabin air outlets P2 TEMP → . T- handle .... CLOSE → **CONTINUE FLIGHT** . Cabin air outlets........CHECK that air flows and air outlets not obstructed YES → . Heating control on cabin ceiling...... REDUCE until : P2 TEMP → . T- handle.............CLOSE NO → . Heating control on cabin ceiling....CLOSE ↓ . T- handle.............CLOSE ↓ **CONTINUE FLIGHT** **NOTE** **The demisting function is inoperative when the heating control on cabin ceiling is closed.** **If the external visibility becomes significantly degraded:** **LAND AS SOON AS POSSIBLE**

4 NORMAL PROCEDURES

The normal procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are modified by the following:

4.1 PREFLIGHT CHECK

- Floor heating T-handle .... CHECK fully closed position
- Floor heating control valve .... CHECK fully closed position

4.2 IMPROVED HEATING SYSTEM OPERATION

- Floor heating T-handle .... OPEN
- Floor heating control valve .... OPEN

5 PERFORMANCE DATA

The performance data specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

AIRBUS HELICOPTERS

FLIGHT MANUAL

EC 120 B

SUPPLEMENT

<u>GPS</u>

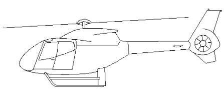
TNL 2101 APPROACH PLUS

<u>IMPORTANT NOTE</u>

The information contained herein supplements or supersedes the information given in the basic Flight Manual and/or the Supplements listed in section Supplement 0.

The effectivity of the manual at the latest revision is specified on the list of effective pages.

THIS SUPPLEMENT MUST BE INCLUDED IN THE FLIGHT MANUAL WHEN THE EQUIPMENT MENTIONED ABOVE IS INSTALLED ON THE AIRCRAFT.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- $\boxed{A}$ .... Specific to EASA

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION or SUP.	PAGES	DATE CODE	(1)	(2)
SUP.55.1.P1	1 to 1	16-26		
SUP.55.1.P5	1 to 2	16-26	$\boxed{A}$	
SUP.55.1	1 to 5	16-26		

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) EASA

ISSUE 1: NR 0 to 2:

NORMAL REVISION 2 - OCTOBER 2004	Approved by DGAC according to the article 10.3 of the CE 1592/2002 regulation on December 03, 2004

ISSUE 2:

<table>
<tr><td colspan="2">NORMAL REVISION 0 date code 16-26</td><td>Approved on January 11, 2018 under the authority of EASA DOA No. 21J700</td></tr>
<tr><td>Title</td><td colspan="2">New issue</td></tr>
<tr><td>Revised information</td><td colspan="2">All</td></tr>
<tr><td>Deleted information</td><td colspan="2">None</td></tr>
</table>

1 GENERAL

The TNL 2101 APPROACH PLUS system complies with the requirements for use:
- In VFR conditions as a day or night primary navigation aid (GPS and HSI or external CDI).
- In VFR conditions in sight of ground or water (GPS autonomous).

For a detailed description of the TNL 2101 APPROACH PLUS, refer to the latest revision of the TNL 2101 APPROACH PLUS Pilot's guide P/N 82879.

1.1 GPS RECEIVER IN "AUTONOMOUS" MODE

The navigation system supplies the DTK for each navigation leg, to the CDU.

1.2 GPS RECEIVER COUPLING

- The navigation system supplies the following information to the navigation indicator (HSI or external CDI):

  - DTK : The DTK is manually displayed using the CRS (course) control.
  - XTK : The track error has an adjustable scale both for the equipment built-in CDI and for the navigation indicator (HSI or external CDI).

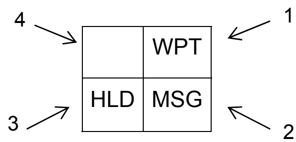
    On the helicopter, the recommended value to use en route is $\pm$ 1 NM.

    It is also recommended to use the same scale for the built-in and external CDI (or HSI).

    When the equipment is powered on, the operator is automatically advised of the XTK selected values.
  - A validity flag for the GPS.

- It sends the following data to an annunciation panel located on the instrument panel:

1. WPT - Waypoint approach.
2. MSG - Repeat of CDU MSG data.
3. HLD - Indicates a pilot action that led to a suspension of the current flight plan.
4. - Not used.



1.3 ABBREVIATIONS USED

DTK	: Desired Track.
XTK	: Cross-Track.
TK	: Track.
CDU	: Control Display Unit.
CDI	: Course Deviation Indicator.
RAIM	: Receiver Autonomous Integrity Monitoring.
HSI	: Horizontal Situation Indicator.

2 LIMITATIONS

The limitations specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

- Use of the GPS system is prohibited in approach mode.
- A placard indicates:

GPS receiver in “autonomous” mode

GPS OPERABLE IN DAY VFR CONDITIONS IN SIGHT OF GROUND OR WATER ONLY	GPS UTILISABLE EN VFR DE JOUR EN VUE DU SOL OU DE L’EAU UNIQUEMENT

GPS receiver and HSI (or CDI) coupling

GPS OPERABLE IN VFR CONDITIONS ONLY	GPS UTILISABLE EN VFR UNIQUEMENT

3 EMERGENCY PROCEDURES

The emergency procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

3.1 GPS FAILURES

- GPS receiver in "autonomous" mode

Symptoms:

• Flashing of MSG pushbutton on the CDU.

Analysis	Action
Loss of GPS data validity.	Use conventional navigation equipment.

NOTE

Pressing the MSG pushbutton on the CDU indicates the status of the GPS.

- GPS receiver coupling

1st case

Symptoms:

• Appearance of a GPS flag on the HSI (or CDI).

• Flashing of MSG pushbutton on the CDU as well as the pilot's MSG warning light.

Analysis	Action
Loss of GPS data validity.	Use conventional navigation equipment.

NOTE

Pressing the MSG pushbutton on the CDU indicates the status of the GPS.

2nd case

Symptoms:

- Illumination of RAIM warning light on the CDU.
- Flashing of MSG pushbutton on the CDU and MSG warning light on the instrument panel with 30 sec. time delay.

Analysis	Action
RAIM failure ("RAIM UNAVAILABLE" message).	Use conventional equipment (Refer to NOTES 1 and 2).
or	
Position error detected by the RAIM ("RAIM ERROR" message).	Use conventional navigation equipment (Refer to NOTE 2).

NOTE 1

"En route", the GPS can still be used, provided that the navigation data are checked with conventional equipment at least every 15 minutes.

NOTE 2

Pressing the MSG pushbutton on the CDU indicates the status of the GPS.

4 NORMAL PROCEDURES

The normal procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

All the navigation means required for each route phase of the intended flight must be available and serviceable.
As the database is not guaranteed, the crew must check, before the flight if possible, the validity and the accuracy of the database information by reference to the official documentation.
Before starting navigation, the crew must read the TNL 2101 APPROACH PLUS self-test messages to check that all necessary validities are present.

The detailed operating procedures are described in the Pilot's Guide referenced in paragraph 1 of this supplement.

NOTE 1

Use of the VHF frequencies listed below may degrade GPS receiver operation after 10 to 15 seconds of transmission time, returning to normal operation a few seconds after transmission ends.

Frequencies = 121.150 / 121.175 / 121.200 / 131.200 / 131.250 / 131.275 and 131.300 MHz.

NOTE 2

Correct operation of the GPS is not guaranteed for cabin temperatures below - 20°C.

5 PERFORMANCE DATA

The performance data specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

FLIGHT MANUAL

EC 120 B

SUPPLEMENT

GPS

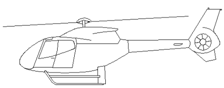
GARMIN GNS 430 / 430W

IMPORTANT NOTE

The information contained herein supplements or supersedes the information given in the basic Flight Manual and/or the Supplements listed in section Supplement 0.

The effectivity of the manual at the latest revision is specified on the list of effective pages.

THIS SUPPLEMENT MUST BE INCLUDED IN THE FLIGHT MANUAL WHEN THE EQUIPMENT MENTIONED ABOVE IS INSTALLED ON THE AIRCRAFT.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- $\boxed{A}$ .... Specific to EASA

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION or SUP.	PAGES	DATE CODE	(1)	(2)
SUP.55.2.P1	1 to 1	16-26		
SUP.55.2.P5	1 to 2	16-26	$\boxed{A}$	
SUP.55.2	1 to 6	16-26		

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) EASA

ISSUE 1: NR 0 to 2:

NORMAL REVISION 2 - SEPTEMBER 2008	EASA approval n° R.C.03112 on October 28, 2008

ISSUE 2:

<table>
<tr><td colspan="2">NORMAL REVISION 0 date code 16-26</td><td>EASA Approval No. 10070977
on September 16, 2019</td></tr>
<tr><td>Title</td><td colspan="2">New issue</td></tr>
<tr><td>Revised information</td><td colspan="2">All</td></tr>
<tr><td>Deleted information</td><td colspan="2">None</td></tr>
</table>

1 GENERAL

The use of this installation is subject to the approval of the operational authorities concerned.

The "GNS 430/430W" includes a VHF COM transceiver, a VOR/ILS receiver and a GPS navigation system.

The GARMIN “GNS 430/430W” GPS system complies with the requirements as a supplement to VFR navigation.

For a detailed description of the GARMIN "GNS 430", refer to the latest revision of the GNS 430 Pilot’s guide P/N 190-00140-00.

For a detailed description of the GARMIN "GNS 430W", refer to the latest revision of the GNS 430W Pilot’s guide P/N 190-00356-00.

Abbreviations

- BRG : Bearing to waypoint.
- CDI : Course Deviation Indicator.
- DTK : Desired Track.
- DIS : Distance to waypoint.
- ETE : Estimated Time En-route.
- GS : Ground Speed.
- HSI : Horizontal Situation Indicator.
- OBS : Omni Bearing Selector.
- RAIM : Receiver Autonomous Integrity Monitoring.
- TRK : Track.
- XTK : Cross Track error, the cross track error has a manual or an automatic adjustable scale on the CDI.

2 LIMITATIONS

The limitations specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

2.1 SOFTWARE VERSIONS

2.1.1 GNS 430 software versions

The GNS 430 must be loaded with the following or later approved software versions:

GNS 430 sub-system	Software version
Main	2.25
GPS	2.11
COMM	5.00
VOR/LOC	3.01
G/S	2.03

The main software version is displayed on the GNS 430 self-test page 5 seconds after power-on. The other system software versions can be checked on the AUX group sub-page 2:

SOFTWARE/DATABASE Ver.

From main software version 5.01, a TAWS (TERRAIN) function has been added to the GNS 430. USING THE TAWS FUNCTION OF THE GPS IS PROHIBITED. Consequently, this function is de-activated by configuration and shall remain so.

2.1.2 GNS 430W software versions

The GNS 430W must be loaded with the following or later approved software versions:

GNS 430W sub-system	Software version
Main	3.10
GPS	3.1
COMM	7.00
VOR/LOC	5.02
G/S	4.00

The main software version is displayed on the GNS 430W self-test page 5 seconds after power-on. The other system software versions can be checked on the AUX group sub-page 2:

SOFTWARE/DATABASE Ver.

USING THE TAWS FUNCTION OF THE GPS IS PROHIBITED. Consequently, this function is de-activated by configuration and shall remain so.

The GPS receiver is capable of tracking SBAS (WAAS, EGNOS) satellites. USING THE SBAS MODE OF THE GPS IS PROHIBITED. Consequently, SBAS (WAAS, EGNOS) operation is de-activated in set-up sub-group page 2 and shall remain so.

2.2 OPERATION

The use of the GPS is restricted to VFR flight only.

All the navigation means required for each route phase of the intended flight must be available and serviceable.

As the database is not guaranteed, the crew must check, before the flight if possible, the validity and the accuracy of the database information by reference to the official documentation.

Before starting navigation, the crew must read the GNS 430/430W self-test messages to check that all necessary validities are present.

2.3 PLACARDS

GPS OPERABLE IN VFR CONDITIONS ONLY	GPS UTILISABLE EN VFR UNIQUEMENT

Location: Besides GNS 430/430W on the instrument panel.

3 EMERGENCY PROCEDURES

The emergency procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

3.1 GPS FAILURES

FAILURES	CORRECTIVE ACTIONS
NAV Flag on HSI (or external CDI) + **MSG**	[**MSG**] key .... Press and check message ↓ **1. GPS navigation data not available or invalid.** **2. RAIM POSITION WARNING.** In both cases, use remaining operational means of navigation (GNS 430/430W VOR or any other available means). **CONTINUE THE FLIGHT**
MSG + **INTEG**	[**MSG**] key .... Press and check message ↓ **RAIM IS NOT AVAILABLE** Revert to other operational means of navigation (GNS 430/430W VOR or any other available means) approved for the route and flight phase. During En-route phase, GPS navigation can still be used provided the position can be checked with other means of navigation at least every 15 min. **CONTINUE THE FLIGHT**

NOTE

Bottom row key [MSG] is used on GNS 430/430W to display the message.

4 NORMAL PROCEDURES

The normal procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

4.1 OPERATING PROCEDURES

The detailed operating procedures are described in the Pilot's Guide referenced in paragraph 1 of this Supplement.

NOTE 1

Use of the VHF frequencies listed below may degrade GPS receiver operation after 10 to 15 seconds of transmission time, returning to normal operation a few seconds after transmission ends.

Frequencies = 121.150 / 121.175 / 121.200 / 131.200 / 131.250 / 131.275 and 131.300 MHz.

NOTE 2

Correct operation of the GPS is not guaranteed for cabin temperatures below - 20°C.

4.2 CONTROLS AND INDICATORS

The GNS 430/430W GPS navigation system provides the following information to the pilot's HSI or external CDI:
- XTK.
- TO / FROM.
- Validity flag.

NOTE 1

XTK full scale deviation is the same for the HSI, or external CDI, and the GNS 430/430W integrated CDI. Default setting is 5 NM (meaning that full deviation is achieved when XTK reaches 5 NM) except within 30 NM range of the departure/destination airfield. Within 30 NM of the destination airfield, the full scale deviation gradually ramps from 5 to 1 NM. Likewise, upon departure, default setting is 1 NM gradually increasing up to 5 NM beyond 30 NM from the departure airfield.

XTK scale is also selectable by the pilot. However, the GNS 430/430W will automatically select the lowest value between the default setting and the value selected by the pilot. Current selected scale is displayed on either side of the GNS 430/430W's CDI. Recommended full-scale value for helicopter "En-route" navigation is 1 NM.

NOTE 2

The HSI or CDI course is not automatically slaved to the desired track (DTK). Consequently, when GPS navigation is selected,(GPS on GNS 430/430W screen) as HSI or external CDI navigation source, the course pointer on the HSI or course selector on the external CDI must be manually set to the DTK indicated by the GNS 430/430W. Particular attention is required during automatic navigation leg changes and subsequent change of DTK. However, if the course selected on pilot's HSI or external CDI differs from the DTK by more than 10°, the MSG annunciator will flash and the message Set course to xxx will be displayed on the GNS 430/430W "MSG" page.

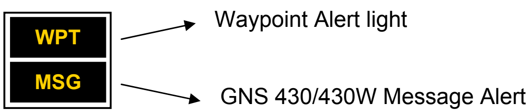
NOTE 3

Pressing the [CDI] key on the GNS 430/430W toggles HSI or external CDI navigation source between GPS and VOR/ILS (GPS or VLOC displayed above [CDI] key).

NOTE 4

Pressing the [OBS] key on the GNS 430/430W toggles between manual mode (OBS mode) and automatic sequencing of waypoints.
Activating OBS mode, indicated by the OBS annunciator above the [OBS] key, holds current active waypoint as the navigation destination and prevents the GNS 430/430W from sequencing to the next waypoint. In OBS mode, the DTK to/from the active waypoint is controlled via the pilot's HSI course pointer or external CDI course selector.

The "GNS 430/430W" GPS navigation system is also associated with a two-label indicator on the pilot's instrument panel (If installed):



5 PERFORMANCE DATA

The performance data specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

AIRBUS HELICOPTERS

FLIGHT MANUAL

EC 120 B

SUPPLEMENT

GPS

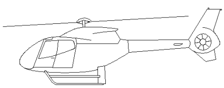
TRIMBLE TNL 1000 DC

IMPORTANT NOTE

The information contained herein supplements or supersedes the information given in the basic Flight Manual and/or the Supplements listed in section Supplement 0.

The effectivity of the manual at the latest revision is specified on the list of effective pages.

THIS SUPPLEMENT MUST BE INCLUDED IN THE FLIGHT MANUAL WHEN THE EQUIPMENT MENTIONED ABOVE IS INSTALLED ON THE AIRCRAFT.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- $\boxed{A}$ .... Specific to EASA

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION or SUP.	PAGES	DATE CODE	(1)	(2)
SUP.55.5.P1	1 to 1	16-26		
SUP.55.5.P5	1 to 2	16-26	$\boxed{A}$	
SUP.55.5	1 to 2	16-26		

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) EASA

ISSUE 1: NR 0 to 1:

NORMAL REVISION 1 - OCTOBER 2004	Approved by DGAC according to the article 10.3 of the CE 1592/2002 regulation on December 03, 2004

ISSUE 2:

NORMAL REVISION 0 date code 16-26	EASA Approval No. 10070977 on September 16, 2019
Title	New issue
Revised information	All
Deleted information	None

1 GENERAL

The use of this installation is subject to the approval of the operational authorities concerned.

The "TRIMBLE 1000 DC" system includes a VHF COM transceiver, a VOR/ILS receiver and a GPS navigation system.

The "TRIMBLE 1000 DC" system complies with the requirements as a supplement to VFR navigation.

For a detailed description of the "TRIMBLE 1000 DC", refer to the latest revision of the Pilot's guide P/N 80455-0612.

Abbreviations

- BRG : Bearing to waypoint.
- CDI : Course Deviation Indicator.
- DTK : Desired Track.
- DIS : Distance to waypoint.
- ETE : Estimated Time En-route.
- GS : Ground Speed.
- HSI : Horizontal Situation Indicator.
- OBS : Omni Bearing Selector.
- RAIM : Receiver Autonomous Integrity Monitoring.
- TRK : Track.
- XTK : Cross Track error, the cross track error has a manual or an automatic adjustable scale on the CDI.

2 LIMITATIONS

The limitations specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

2.1 OPERATION

The use of the GPS is restricted to day VFR flight in sight of the ground or water.

Use of the GPS is prohibited in approach mode.

All the navigation means required for each route phase of the intended flight must be available and serviceable.

As the database is not guaranteed, the crew must check, before the flight if possible, the validity and the accuracy of the database information by reference to the official documentation.
Before starting navigation, the crew must read the TRIMBLE 1000 DC self-test messages to check that all necessary validities are present.

2.2 PLACARDS

A placard located within pilot's sight field indicates:

GPS OPERABLE IN DAY VFR CONDITIONS IN SIGHT OF GROUND OR WATER ONLY	GPS UTILISABLE EN VFR DE JOUR EN VUE DU SOL OU DE L'EAU UNIQUEMENT

3 EMERGENCY PROCEDURES

The emergency procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

NOTE

Press the MSG key on the CDU to display the situation of the GPS and to scroll through next messages if any.

4 NORMAL PROCEDURES

The normal procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

4.1 BEFORE STARTING

The detailed operating procedures are described in the Pilot's Guide referenced in paragraph 1 of this Supplement.

NOTE

During the « en route » phase, the integrity of the position supplied by the GPS is not ensured. Consequently it is the responsibility of the crew to check the accuracy of the position every 15 minutes using either conventional VFR method or other navigation equipment if available.

Transmissions from the helicopter, via transmitters KX165 and KY196 can lead to momentary losses of GPS reception at the following frequencies:

121.150 MHz , 121.175 Mhz, 121.250 Mhz, 131.275 MHz.

Navigation calculation becomes nominal 2 to 3 sec. after the end of transmission.

5 PERFORMANCE DATA

The performance data specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

FLIGHT MANUAL

EC 120 B

SUPPLEMENT

GPS

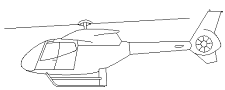
TNL 2000 APPROACH

IMPORTANT NOTE

The information contained herein supplements or supersedes the information given in the basic Flight Manual and/or the Supplements listed in section Supplement 0.

The effectivity of the manual at the latest revision is specified on the list of effective pages.

THIS SUPPLEMENT MUST BE INCLUDED IN THE FLIGHT MANUAL WHEN THE EQUIPMENT MENTIONED ABOVE IS INSTALLED ON THE AIRCRAFT.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- $\boxed{A}$ .... Specific to EASA

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION or SUP.	PAGES	DATE CODE	(1)	(2)
SUP.55.6.P1	1 to 1	16-26		
SUP.55.6.P5	1 to 2	16-26	$\boxed{A}$	
SUP.55.6	1 to 2	16-26		

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) EASA

ISSUE 1: NR 0 to 1:

NORMAL REVISION 1 - OCTOBER 2004	Approved by DGAC according to the article 10.3 of the CE 1592/2002 regulation on December 03, 2004

ISSUE 2:

NORMAL REVISION 0 date code 16-26	EASA Approval No. 10070977 on September 16, 2019
Title	New issue
Revised information	All
Deleted information	None

1 GENERAL

The use of this installation is subject to the approval of the operational authorities concerned.

The "TNL 2000 APPROACH" system includes a VHF COM transceiver, a VOR/ILS receiver and a GPS navigation system.

The "TNL 2000 APPROACH" system complies with the requirements as a supplement to VFR navigation.

For a detailed description of the "TNL 2000 APPROACH", refer to the latest revision of the Pilot's guide P/N 81449.

Abbreviations

- BRG : Bearing to waypoint.
- CDI : Course Deviation Indicator.
- DTK : Desired Track.
- DIS : Distance to waypoint.
- ETE : Estimated Time En-route.
- GS : Ground Speed.
- HSI : Horizontal Situation Indicator.
- OBS : Omni Bearing Selector.
- RAIM : Receiver Autonomous Integrity Monitoring.
- TRK : Track.
- XTK : Cross Track error, the cross track error has a manual or an automatic adjustable scale on the CDI.

2 LIMITATIONS

The limitations specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

2.1 OPERATION

The use of the GPS is restricted to day VFR flight in sight of the ground or water.

Use of the GPS is prohibited in approach mode.

All the navigation means required for each route phase of the intended flight must be available and serviceable.

As the database is not guaranteed, the crew must check, before the flight if possible, the validity and the accuracy of the database information by reference to the official documentation.
Before starting navigation, the crew must read the TNL 2000 APPROACH self-test messages to check that all necessary validities are present.

2.2 PLACARDS

A placard located within pilot's sight field indicates:

GPS OPERABLE IN DAY VFR CONDITIONS IN SIGHT OF GROUND OR WATER ONLY	GPS UTILISABLE EN VFR DE JOUR EN VUE DU SOL OU DE L'EAU UNIQUEMENT

3 EMERGENCY PROCEDURES

The emergency procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

NOTE

Press the MSG key on the CDU to display the situation of the GPS and to scroll through next messages if any.

4 NORMAL PROCEDURES

The normal procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

4.1 BEFORE STARTING

The detailed operating procedures are described in the Pilot's Guide referenced in paragraph 1 of this Supplement.

NOTE

During the « en route » phase, the integrity of the position supplied by the GPS is not ensured. Consequently it is the responsibility of the crew to check the accuracy of the position every 15 minutes using either conventional VFR method or the other navigation equipment if available.

Transmissions from the helicopter, via KY196 can lead to momentary losses of GPS reception at the following frequencies:

121.175 $\pm$ 0.25 MHz and 131.275 $\pm$ 0.25 MHz.

Navigation calculation becomes nominal 2 to 3 sec. after the end of transmission.

5 PERFORMANCE DATA

The performance data specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

FLIGHT MANUAL

EC 120 B

SUPPLEMENT

GPS

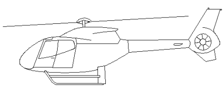
TNL 2000 APPROACH PLUS

IMPORTANT NOTE

The information contained herein supplements or supersedes the information given in the basic Flight Manual and/or the Supplements listed in section Supplement 0.

The effectivity of the manual at the latest revision is specified on the list of effective pages.

THIS SUPPLEMENT MUST BE INCLUDED IN THE FLIGHT MANUAL WHEN THE EQUIPMENT MENTIONED ABOVE IS INSTALLED ON THE AIRCRAFT.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

LIST OF APPROVED EFFECTIVE PAGES - EASA CERTIFICATION

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- $\boxed{A}$ .... Specific to EASA

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

SECTION or SUP.	PAGES	DATE CODE	(1)	(2)
SUP.55.7.P1	1 to 1	16-26		
SUP.55.7.P5	1 to 2	16-26	$\boxed{A}$	
SUP.55.7	1 to 2	16-26		

LOG OF APPROVED NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2) EASA

ISSUE 1: NR 0 to 1:

NORMAL REVISION 1 - OCTOBER 2004	Approved by DGAC according to the article 10.3 of the CE 1592/2002 regulation on December 03, 2004

ISSUE 2:

NORMAL REVISION 0 date code 16-26	EASA Approval No. 10070977 on September 16, 2019
Title	New issue
Revised information	All
Deleted information	None

1 GENERAL

The use of this installation is subject to the approval of the operational authorities concerned.

The "TNL 2000 APPROACH PLUS" system includes a VHF COM transceiver, a VOR/ILS receiver and a GPS navigation system.

The "TNL 2000 APPROACH PLUS" system complies with the requirements as a supplement to VFR navigation.

For a detailed description of the "TNL 2000 APPROACH PLUS", refer to the latest revision of the Pilot's guide P/N 82877.

Abbreviations

- BRG : Bearing to waypoint.
- CDI : Course Deviation Indicator.
- DTK : Desired Track.
- DIS : Distance to waypoint.
- ETE : Estimated Time En-route.
- GS : Ground Speed.
- HSI : Horizontal Situation Indicator.
- OBS : Omni Bearing Selector.
- RAIM : Receiver Autonomous Integrity Monitoring.
- TRK : Track.
- XTK : Cross Track error, the cross track error has a manual or an automatic adjustable scale on the CDI.

2 LIMITATIONS

The limitations specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

2.1 OPERATION

The use of the GPS is restricted to day VFR flight in sight of the ground or water.

Use of the GPS is prohibited in approach mode.

All the navigation means required for each route phase of the intended flight must be available and serviceable.

As the database is not guaranteed, the crew must check, before the flight if possible, the validity and the accuracy of the database information by reference to the official documentation.
Before starting navigation, the crew must read the TNL 2000 APPROACH PLUS self-test messages to check that all necessary validities are present.

2.2 PLACARDS

- A placard located within pilot's sight field indicates:

GPS OPERABLE IN DAY VFR CONDITIONS IN SIGHT OF GROUND OR WATER ONLY	GPS UTILISABLE EN VFR DE JOUR EN VUE DU SOL OU DE L'EAU UNIQUEMENT

- The GPS must not be energized for cabin temperatures less than minus 20°C.

3 EMERGENCY PROCEDURES

The emergency procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

NOTE

Press the MSG key on the CDU to display the situation of the GPS and to scroll through next messages if any.

4 NORMAL PROCEDURES

The normal procedures specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable and are supplemented or modified by the following:

4.1 BEFORE STARTING

The detailed operating procedures are described in the Pilot's Guide referenced in paragraph 1 of this Supplement.

NOTE

During the « en route » phase, the integrity of the position supplied by the GPS is not ensured, consequently it is the responsibility of the crew to check the accuracy of the position every 15 minutes using either conventional VFR method or the other navigation equipment if available.

Transmissions from the helicopter, via KY165 and KY196 can lead to momentary losses of GPS reception at the following frequencies:

121.175 ± 0.025 Mhz, 131.275 ± 0.025 Mhz and 131.200 Mhz.

Navigation calculation becomes nominal few seconds after the end of transmission.

5 PERFORMANCE DATA

The performance data specified in the basic Flight Manual and in the Flight Manual Supplements remain applicable.

SECTION 5.2

ADDITIONAL PERFORMANCE DATA

CONTENTS

SECTION 5.2

ADDITIONAL PERFORMANCE DATA

1 TAS/CAS IN RECOMMENDED CRUISE

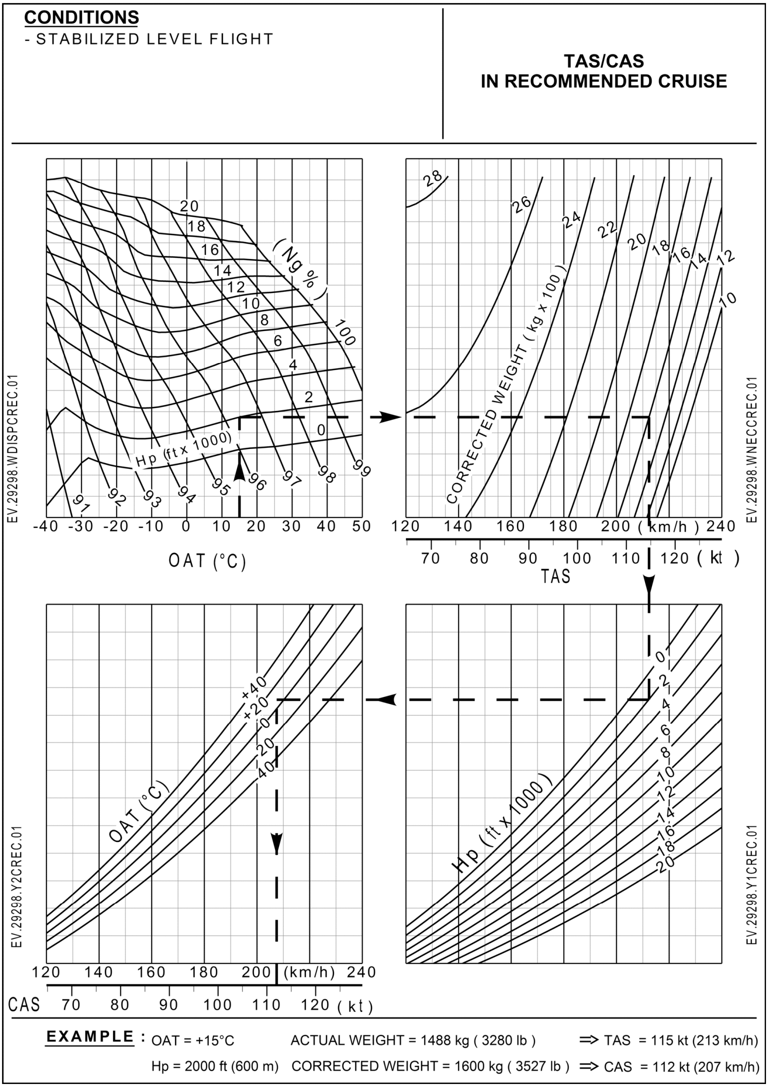


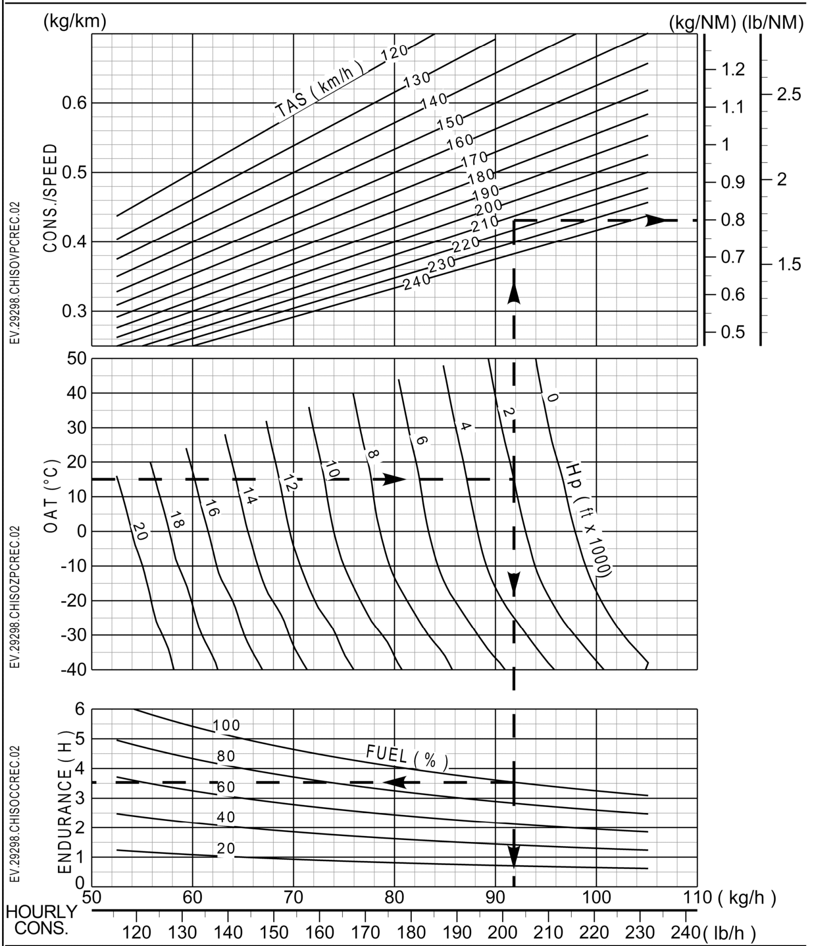
Figure 1

2 FUEL CONSUMPTION AND ENDURANCE IN RECOMMENDED CRUISE

CONDITIONS

- STABILIZED LEVEL FLIGHT
- HEATING SYSTEM OFF
- TAS OBTAINED USING THE TAS/CAS IN RECOMMENDED CRUISE FIGURE

FUEL CONSUMPTION AND ENDURANCE IN RECOMMENDED CRUISE



EXAMPLE : OAT = +15°C TAS = 213 km/h (115 kt) Hp = 2000 ft (600 m) FUEL = 100 %

⇒ CONS./SPEED = 0.8 kg/NM
⇒ ENDURANCE = 3.5 h
⇒ HOURLY CONS. = 91.63 kg/h

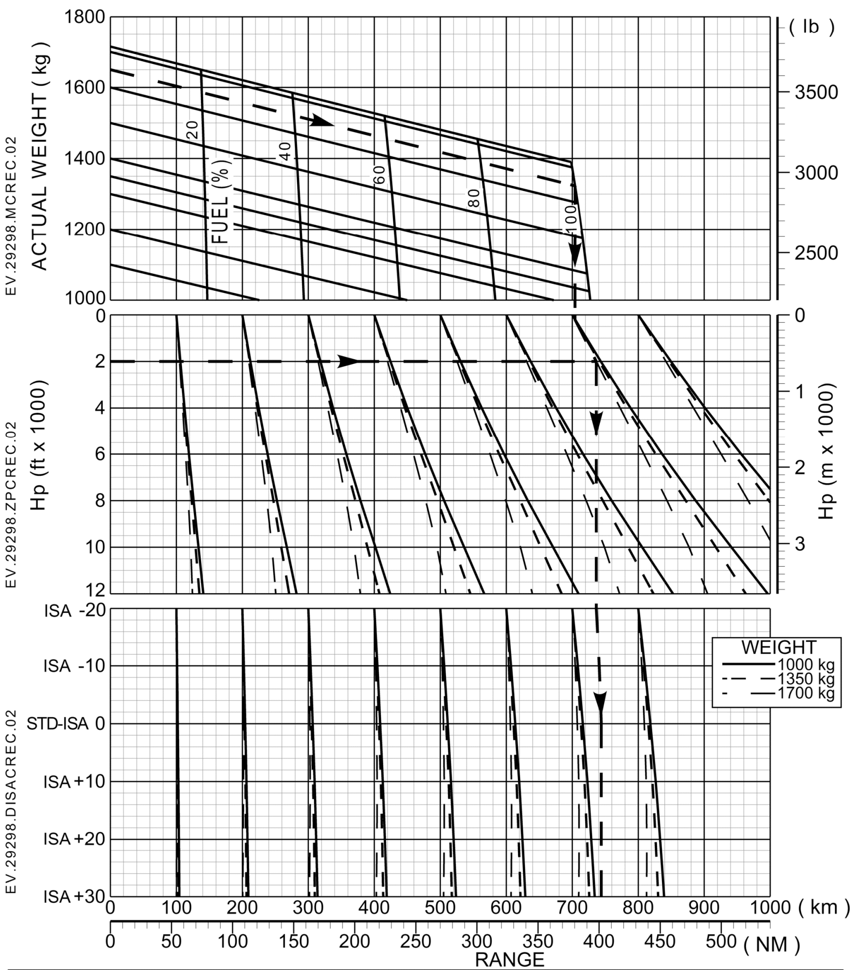
Figure 2

3 RANGE IN RECOMMENDED CRUISE

CONDITIONS

- STABILIZED LEVEL FLIGHT
- HEATING SYSYEM OFF
- NO WIND
- TAS/CAS AS OBTAINED FROM FIGURE 1

RANGE IN RECOMMENDED CRUISE



EXAMPLE : OAT = STD-ISA WEIGHT = 1700 kg (3748 lb)

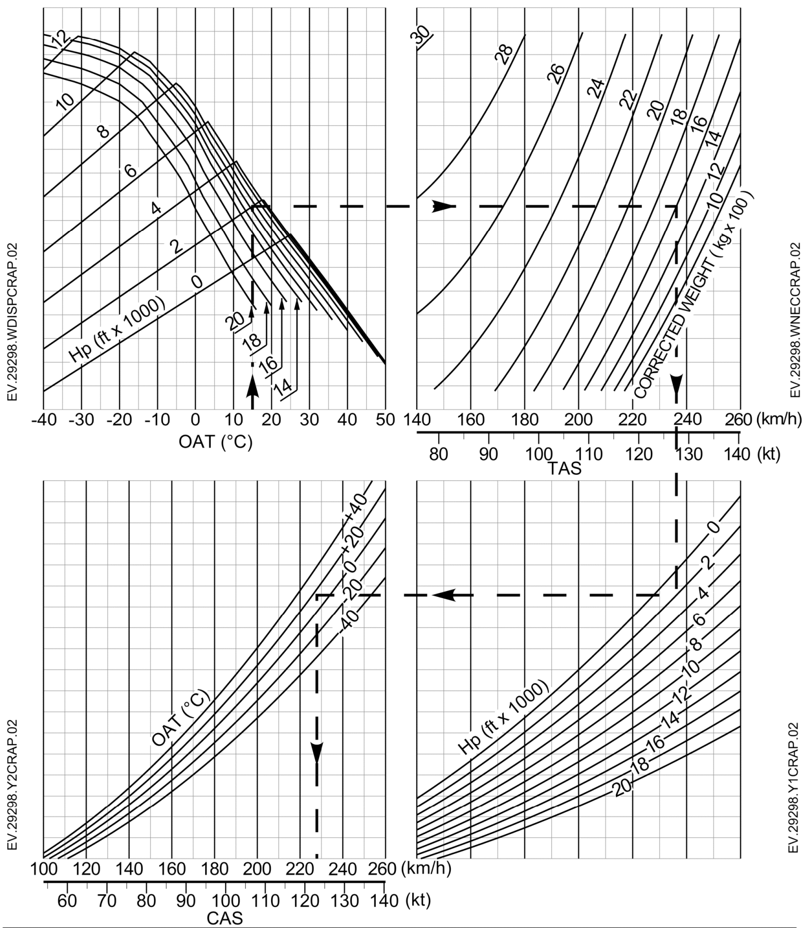
Hp = 2000 ft (600 m) FUEL = 100% ⇒ RANGE = 402 NM

Figure 3

4 TAS/CAS IN FAST CRUISE

CONDITIONS
- STABILIZED LEVEL FLIGHT
- HEATING SYSTEM OFF
- MAXIMUM CONTINUOUS POWER

TAS/CAS IN FAST CRUISE



EXAMPLE : OAT = +15°C ACTUAL WEIGHT = 1488 kg (3280 lb) ⇒ TAS = 127 kt (235 km/h)

Hp = 2000 ft (600 m) CORRECTED WEIGHT = 1600 kg (3527 lb) ⇒ CAS = 124 kt (230 km/h)

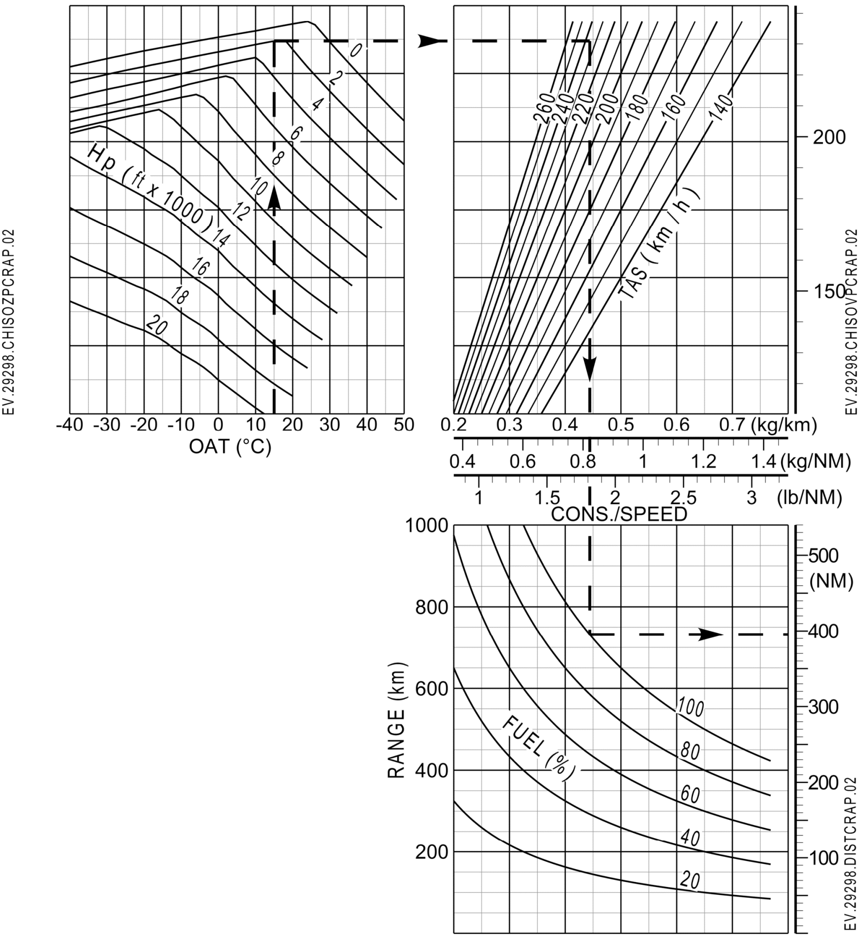
Figure 4

5 FUEL CONSUMPTION AND RANGE IN FAST CRUISE

CONDITIONS

- STABILIZED LEVEL FLIGHT
- HEATING SYSTEM OFF
- NO WIND
- TAS OBTAINED USING THE TAS/CAS IN FAST CRUISE FIGURE

FUEL CONSUMPTION AND RANGE IN FAST CRUISE



EXAMPLE : OAT = +15°C TAS = 236 km/h (127 kt) ⇒ RANGE = 395 NM
Hp = 2000 ft (600 m) FUEL = 100%

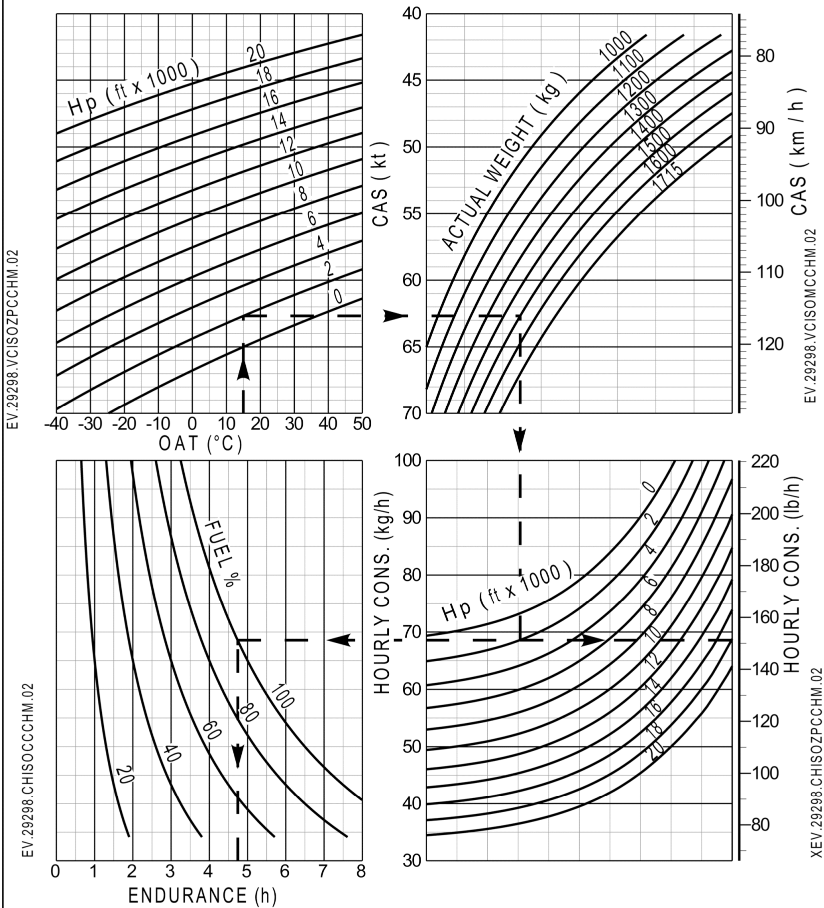
Figure 5

6 ENDURANCE IN CRUISE AT MINIMUM HOURLY FUEL CONSUMPTION

CONDITIONS

- STABILIZED LEVEL FLIGHT TAS = 65 kt (120 km/h)
- HEATING SYSTEM OFF

ENDURANCE IN CRUISE AT MINIMUM HOURLY FUEL CONSUMPTION



EXAMPLE: OAT = +15°c ACTUAL WEIGHT = 1488 kg (3280 lb) HOURLY CONS. = 68.95 kg/h

Hp = 2000 ft (600 m) FUEL = 100% ⇒ ENDURANCE = 4.8 h

Figure 6

SECTION 6

WEIGHT AND BALANCE

CONTENTS

SECTION 6.1

WEIGHT AND BALANCE

1 GENERAL

The purpose of this section is to provide data for use when evaluating a proposed loading configuration or calculating the weight and center of gravity of an aircraft in service.

2 WEIGHT AND BALANCE

2.1 WEIGHT - STANDARD DEFINITIONS

- Empty Weight (EW)

  This corresponds to the sum of the permanent assemblies and equipment:

  - The vehicle and its power plant.
  - Equipment common to all missions.
  - Lubricants and hydraulic fluids.
  - Unusable fuel.

  EW then is constant for a given aircraft.

- Equipped Empty Weight (EEW)

  This is the sum of:

  - Empty Weight (EW).
  - Weight of the specific operational or mission equipment.

  EEW varies according to the proposed mission.

- All-Up Weight (AUW)

  This is the sum of:

  - Equipped Empty Weight (EEW).
  - Crew weight.
  - Payload.
  - Usable fuel.

- Maximum Weight

  Refer to SECTION 2 Limitations.

2.2 CENTER OF GRAVITY CONVENTIONAL TERMS

- The center of gravity is defined by dimensions measured perpendicular to the three basic datum planes. These planes are as follows:
  - A horizontal plane parallel to the cabin floor datum, the Z datum plane, located 2.60 m (102.3 in) above this datum.
  - A vertical plane perpendicular to the cabin floor datum. This Y datum plane is the aircraft plane of symmetry. Dimensions to the left (port) are negative, dimensions to the right (starboard) are positive.
  - A vertical plane perpendicular to the two mentioned above, situated 4.00 m (157.5 in) forward of the center of the main rotor. This is the X datum plane, from which the longitudinal reference stations and CG positions are measured.

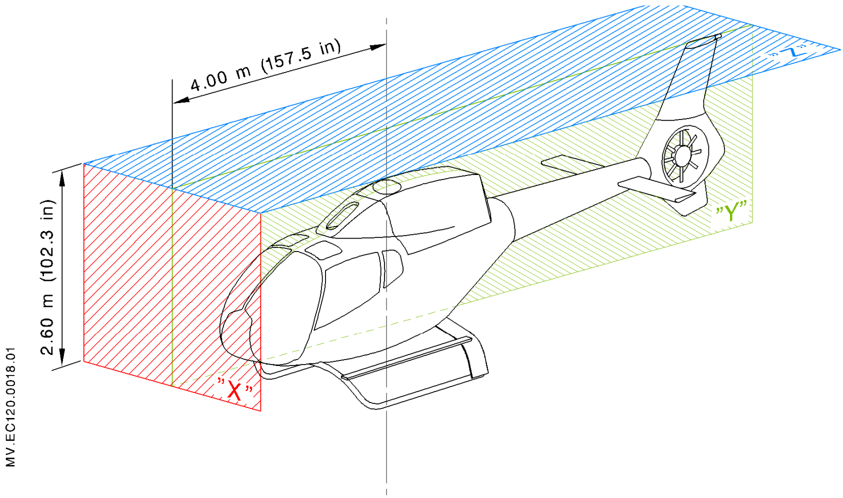


Figure 1: Basic datum planes

NOTE

CG location limits must not be exceeded. Refer to SECTION 2 Limitations.

CAUTION

A CG location which is correct on takeoff may vary during the mission, due to fuel weight reduction or loading variation and therefore exceed acceptable limits.

- Longitudinal CG must be monitored more closely.
- Lateral CG need be considered only in very asymmetrical loading configurations.

SECTION 6.2

LONGITUDINAL CG LOCATION

1 DETERMINATION OF LONGITUDINAL CG LOCATION

- Procedure

  The distance from the aircraft center of gravity to the datum plane is obtained using the formula:

$$\frac{\text{Sum of moments}}{\text{Sum of weights}} = \text{CG ready for flight.}$$

- Example: Analysis for a passenger transport mission
  - Before takeoff
    1) Determine the maximum permissible takeoff weight.
    2) Note the equipped empty weight and the moment.
    3) Refer to the tables given below to determine loading conditions; totalize weights and moments.
    4) Calculate the CG location.
    5) Check that CG falls within permissible limits.

    Example:

	kg	m.kg	lb	in.lb
EEW	970	4103.1	2138.45	356126.65
Crew	160	376.0	352.73	32634.74
Passengers	-	-	-	-
Cargo	40	164	88.18	14234.30
Fuel	300	1227.0	661.38	106496.89
TOTAL	1470	5870.1	3240.74	509492.58

$CG = \frac{5870.1}{1470} = 3.993$ m	$CG = \frac{509492.58}{3240.74} = 157.20$ in

Longitudinal CG is within the permissible limits.

2 LOADING DATA

- Crew and passengers

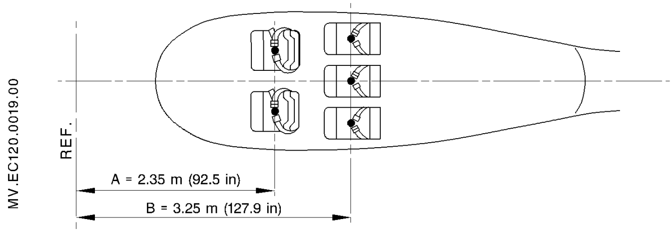


Figure 1: Longitudinal location of seats

METRIC UNITS		
WEIGHT	MOMENT : m.kg	
kg	(A)	(B)
60	141.00	195.00
80	188.00	260.00
100	235.00	325.00
120	282.00	390.00
140	329.00	455.00
160	376.00	520.00
180	423.00	585.00
200	470.00	650.00
220	517.00	715.00
240		780.00
260		845.00
280		910.00
300		975.00
320		1 040.00
330		1 072.50

OTHER UNITS		
WEIGHT	MOMENT : in.lb	
lb	(A)	(B)
100	9 250	12 790
150	13 875	19 185
200	18 500	25 580
250	23 125	31 975
300	27 750	38 370
350	32 375	44 765
400	37 000	51 160
450	41 625	57 555
485	44 863	62 032
500		63 950
550		70 345
600		76 740
650		83 135
700		89 530
730		93 367

- Freight and baggage transport

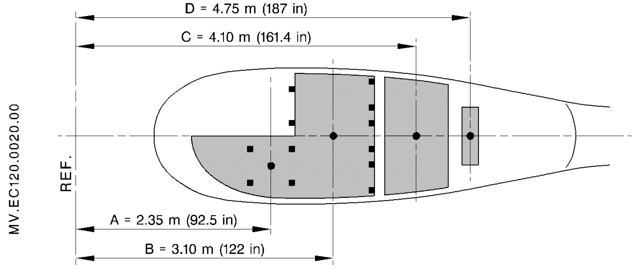


Figure 2: Longitudinal location of loads

	METRIC UNITS			
WEIGHT kg	MOMENT : m.kg (A)	(B)	(C)	(D)
10	23.50	31.00	41.00	47.50
20	47.00	62.00	82.00	95.00
50	117.50	155.00	205.00	237.50
70	164.50	217.00	287.00	
80	188.00	248.00	328.00	
100	235.00	310.00	410.00	
120	282.00	372.00	492.00	
150	352.50	465.00	615.00	
200		620.00	820.00	
250		775.00	1 025.00	
300		930.00	1 230.00	
320		992.00	1 312.00	

	OTHER UNITS			
WEIGHT lb	MOMENT : in.lb (A)	(B)	(C)	(D)
50	4 625	6 100	8 070	9 350
100	9 250	12 200	16 140	18 700
110	10 175	13 420	17 754	20 570
150	13 875	18 300	24 210	
200	18 500	24 400	32 280	
250	23 125	30 500	40 350	
300	27 750	36 600	48 420	
330	30 525	40 260	53 262	
350		42 700	56 490	
400		48 800	64 560	
450		54 900	72 630	
500		61 000	80 700	
550		67 100	88 770	
600		73 200	96 840	
650		79 300	104 910	
700		85 400	112 980	

- Fuel

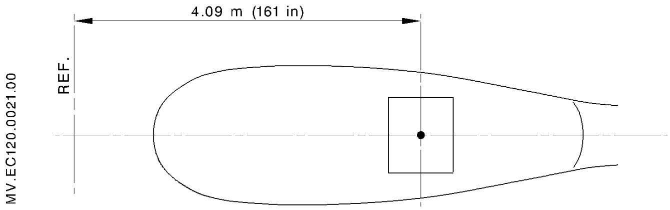


Figure 3: Longitudinal location of fuel

NOTE

Fuel specific gravity: 0.795

METRIC UNITS						
Liter	kg	m. kg		Liter	kg	m.kg
25.16	20	81.80		226.42	180	736.20
50.31	40	163.60		251.57	200	818.00
75.47	60	245.40		276.73	220	899.80
100.63	80	327.20		301.89	240	981.60
125.79	100	409.00		327.04	260	1063.40
150.94	120	490.80		352.20	280	1145.20
176.10	140	572.60		377.36	300	1227.00
201.26	160	654.40		406.00	323	1321.07

OTHER UNITS								
US gal	UK gal	lb	in.lb		US gal	UK gal	lb	in.lb
7.54	6.28	50	8050		67.84	56.54	450	72450
15.08	12.56	100	16100		75.38	62.82	500	80500
22.61	18.85	150	24150		82.92	69.10	550	88550
30.15	25.13	200	32200		90.45	75.39	600	96600
37.69	31.41	250	40250		97.99	81.67	650	104650
45.23	37.69	300	48300		105.53	87.95	700	112700
53.76	44.98	350	56350		107.30	89.40	711.5	114551
60.30	50.26	400	64400					

3 CG CHARTS

The following charts (metric and other units) are used to easily determine the aircraft center of gravity. When the point obtained is close to the limits, it should be confirmed by calculations.

Example (refer to Figure 4): Item on chart

- The weighing operation locates the CG at 4.23 m (166.5 in) for an EEW of	:	970 kg (2138 lb)	:	①
- 2 front seats used	:	160 kg (353 lb)	:	②
- 1 rear seat used	:	80 kg (176 lb)	:	③
- Freight in the rear seat	:	100 kg (220 lb)	:	④
- Freight in the hold with a rear CG	:	90 kg (198 lb)	:	⑤
- Fuel	:	300 kg (661 lb)	:	⑥

The longitudinal CG is within the permissible limits.

These charts are designed so that the variations in fuel weight and freight in the hold (Refer to Figure 2; item C at 4.10 m (161.4 in)) make the CG move along a vertical line:

- The total weight is 1700 kg (3748 lb) with a center of gravity at 3.925 m (154.5 in).
- During the flight, after consuming 200 kg (441 lb) of fuel (Refer to item ⑦) , the center of gravity will be 3.903 m (153.6 in).

The weight and CG limits are given in LIMITATIONS (Refer to SECTION 2) and may be modified by the Supplements corresponding to the optional items installed.

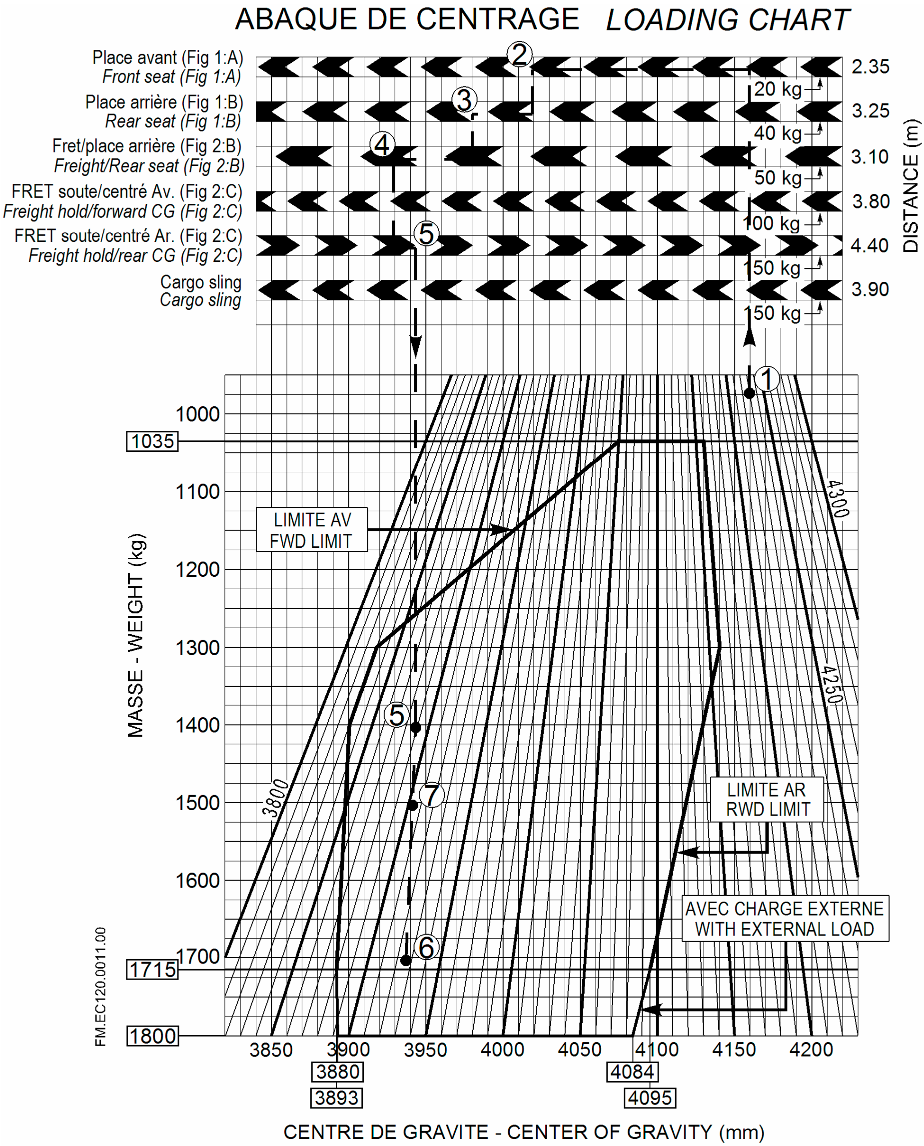


Figure 4: Center of gravity

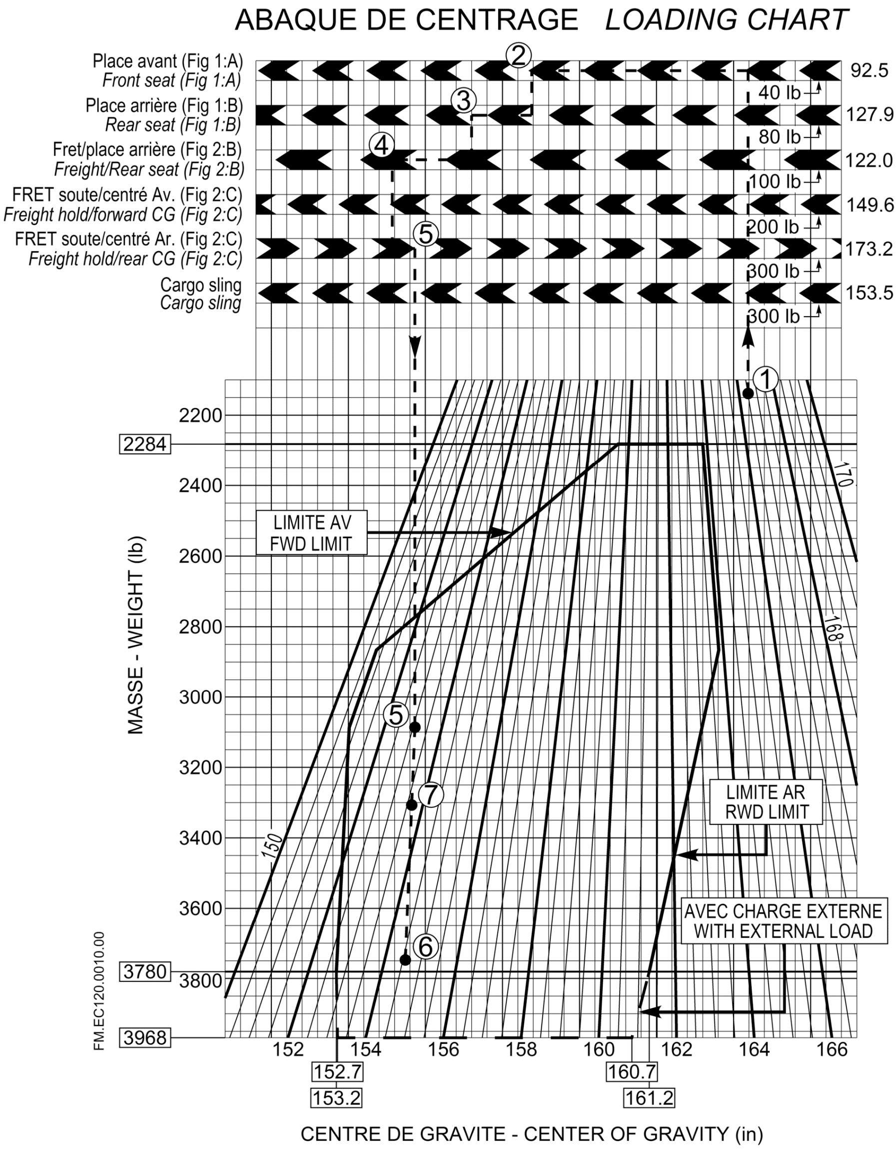


Figure 5: Center of gravity (cont'd)

SECTION 6.3

LATERAL CG LOCATION

The tables below give the lateral CG positions for different weights and their moments with respect to the Y plane (positive dimensions on the right, negative dimensions on the left).

1 DETERMINATION OF LATERAL CG LOCATION

The computation method is the same as that used for determining the longitudinal CG location (SECTION 6.2 paragraph 1).

Add weights and moments to the aircraft empty weight and moment referring to preceding pages.

Lateral CG location values during the mission shall fall within the permissible limits.

Example:

- Before flight

	kg	m.kg	lb	in.lb
EEW	970	9.70	2138.45	842.91
Pilot	80	28.80	176.37	2499.68
Copilot	80	-28.80	-176.37	-2499.68
Right passenger	80	40.00	176.37	3471.78
Right cargo	150	57.00	331.69	4947.27
Fuel	250	0.00	551.15	0.00
TOTAL	1610	106.7	3549	9261.98

$CG = \frac{106.7}{1610} = 0.066$ m	$CG = \frac{9261.98}{3549} = 2.60$ in

This value falls within the permissible limits.

2 LOADING DATA

- Crew and passengers

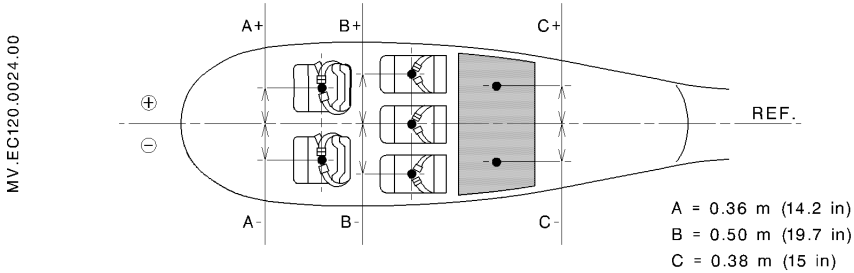


Figure 1: Lateral location of seats and loads

METRIC UNITS						
WEIGHT kg	MOMENT : m.kg A +	A -	B +	B -	C +	C -
50	18.00	- 18.00	25.00	- 25.00	19.00	- 19.00
60	21.60	- 21.60	30.00	- 30.00	22.80	- 22.80
70	25.20	- 25.20	35.00	- 35.00	26.60	- 26.60
80	28.80	- 28.80	40.00	- 40.00	30.40	- 30.40
90	32.40	- 32.40	45.00	- 45.00	34.20	- 34.20
100	36.00	- 36.00	50.00	- 50.00	38.00	- 38.00
110	39.60	- 39.60	55.00	- 55.00	41.80	- 41.80
120	43.20	- 43.20	60.00	- 60.00	45.60	- 45.60
130	46.80	- 46.80	65.00	- 65.00	49.40	- 49.40
140	50.40	- 50.40	70.00	- 70.00	53.20	- 53.20
150	54.00	- 54.00	75.00	- 75.00	57.00	- 57.00

OTHER UNITS						
WEIGHT lb	MOMENT: in.lb A +	A -	B +	B -	C +	C -
50	710	- 710	990	- 990	750	- 750
100	1420	- 1420	1970	- 1970	1500	- 1500
150	2130	- 2130	2960	- 2960	2250	- 2250
200	2840	- 2840	3940	- 3940	3000	- 3000
250	3550	- 3550	4930	- 4930	3750	- 3750
300	4260	- 4260	5910	- 5910	4500	- 4500
330	4690	- 4690	6500	- 6500	4950	- 4950

SECTION 6.4

WEIGHT AND MOMENT OF EQUIPMENT ITEMS

The following list covers the equipment items. It gives the approximate weight and moment of the removable components.

DESCRIPTION	WEIGHT		ARM		MOMENT	
	kg	lb	m	in	m. kg	in.lb
Aircraft ground tool kit						
• Twin handling wheels (355A91.0045.02)	43.4	95.68	-	-	-	-
• Single handling wheels (350A91.0025.01)	23.15	51.04	-	-	-	-
Aircraft tool kit • Static pressure port cover • Pitot tube cover • Mooring ring • Document bag • Storage bag • Main rotor blade socks • Engine tail pipe cover • Air intake cover	5.2	11.49	-	-	-	-
Ballast plate						
• (under battery) / plate	2.50	5.51	6.10	240.04	15.25	1322.59
• (under tail shroud) / plate	2.10	4.63	10.21	401.76	21.44	1859.52
Battery						
• RH side battery	14.70	32.40	4.50	177.08	66.15	5737.02
• Rear cargo battery	14.70	32.40	6.00	236.10	88.20	7649.36
Cabin fire extinguisher	2.01	4.43	2.40	94.44	4.82	418.37
Dual controls	5	11.02	1.99	78.31	9.95	862.98
Doors						
• Pilot door	11.10	24.46	2.50	98.38	27.75	2406.69
• RH flap	3.50	7.71	3.30	129.86	11.55	1001.70
• Copilot door	8.90	19.62	2.30	90.51	20.47	1775.31
• Sliding door	10.40	22.92	3.20	125.92	33.28	2886.29
• Rear cargo door	3.70	8.15	4.20	165.27	15.54	1347.74
ELT						
• KANNAD 406 AFH	2.0	4.41	5.00	196.75	10	867.66
• JOLLIET JE2NG	1.45	3.20	5.00	196.75	7.25	628.77
• SOCATA	1.70	3.75	5.00	196.75	8.50	737.18
Electrical rear view mirror	2.36	5.20	1.28	50.37	3.02	261.99
Emergency floatation gear (removable part)	44.35	102.49	3.89	153.07	172.52	14962.34

DESCRIPTION	WEIGHT		ARM		MOMENT	
	kg	lb	m	in	m. kg	in.lb
First aid kit						
• Standard	1.74	3.84	2.64	103.94	4.59	398.70
• JAR OPS 3	0.7	1.54	2.64	103.94	1.85	160
Furnishing						
• Comfort cabin layout	18.12	39.94	2.88	113.33	52.19	4525.92
• Sound proofing kit	5.20	11.46	3.37	132.61	17.52	1519.81
• RH rear fixed panel	3.50	7.72	3.30	129.92	11.55	1002.23
GPS						
• GPS 2000 Approach	2.17	4.78	1.68	66.11	3.65	316.17
• GPS 2000 Approach Plus	2.00	4.41	1.68	66.11	3.36	291.40
• GPS 2101 Approach Plus	1.30	2.87	1.68	66.11	2.18	189.41
• GPS 1000 DC	1.40	3.09	1.68	66.11	2.35	203.98
Sand filter	5.22	11.50	5.12	201.47	26.73	2317.91
Seats						
• Front seat	12.10	26.67	2.50	98.38	30.25	2623.50
• Rear 3 places seats	30.80	67.88	3.40	133.79	104.72	9082.09
Skis (removable part)	13.24	29.18	3.94	154.84	52.10	4518.45
Sling						
• Removable part	8.43	18.58	3.91	153.86	32.96	2858.65
• Sling accessories	6.30	13.89	4.03	158.58	25.39	2201.92
Stretcher (removable part)	13.30	29.32	3.80	149.57	50.53	4385.29

SECTION 6.5

WEIGHING

1 PRELIMINARY ACTIONS

- The weighing operation must be carried out in a closed shelter to avoid any errors caused by the wind.
- Clean the aircraft carefully before weighing.
- If the weighing operation is used to determine CG location, level the aircraft before weighing.
- In principle, all equipment items included in the aircraft's empty weight must be installed. Draw up a brief inventory of those equipment items and include it in the weighing record.
- All weighing instruments must be checked for correct "zero" setting before use. It is important that the weighing instruments are placed on suitably levelled ground for correct measurement.
- Unless otherwise specified, the fuel cells must be drained.

NOTE

A certain quantity of fuel remaining in the system is defined by the Airworthiness Regulations as the "unusable fuel", i.e. the quantity of fuel below which anomalies in fuel supply begin to appear in certain aircraft attitudes and/or flying maneuvers.
The weight (and moment) of the "unusable fuel" is indicated in the specifications, airworthiness sheets, etc.

2 WEIGHING PROCEDURES

The aircraft is weighed and the CG location is determined as follows:

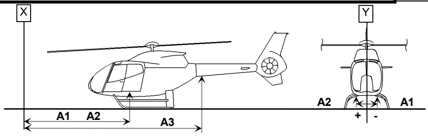
- After the inventory has been made and the checks have been performed, level the aircraft by means of the appropriate markings and using a clinometer, with the landing gear off the ground.
- Check that the fuel cells are drained.
- The distances of the jacking points are defined by the manufacturer when the aircraft is assembled on the jig.
- Record the value of the weight measured at each jacking point.
- Compute the moment by multiplying the weight by the distance of the corresponding jacking point.
- Calculate the sum of the moments.
- Divide the total moment by the total weight to obtain the aircraft CG location.

The empty weight (and CG) must include the weight of unusable fuel.

As a general rule, these values are calculated from the "aircraft dry" weight.

WEIGHING RECORD SHEET

AIRCRAFT /VERSION	
SERIAL No	
CUSTOMER No	
DATE:	



VISA	REMARKS

JACK POINTS	WEIGHT (kg) or (lb)	ARM (m) or (in)		MOMENT (m.kg) or (lb.in)	
		X	Y	MX	MY
LH FORWRAD (A1)		3.048 m 120 in	- 0.376 m - 14.802 in		
RH FORWARD (A2)		3.048 m 120 in	+ 0.376 m + 14.802 in		
TOTAL LH.FWD + RH FWD (A)					
AFT (A3)		6.1475 m 242.02 in	0		
TOTAL WEIGHT				MX=	MY=

LONGITUDINAL CG............................ $X = \dfrac{\text{MX}}{\text{TOTAL WEIGHT}} =$

LATERAL CG .... $Y = \dfrac{\text{MY}}{\text{TOTAL WEIGHT}} =$

WEIGHING CORRECTIONS AND LONGITUDINAL CG CORRECTIONS			
EQUIPMENT ITEMS	WEIGHT (± kg) or (± lb)	ARM (m) or (in)	MOMENT (± m.kg) or (± lb.in)
EMPTY WEIGHT OF EQUIPPED AIRCRAFT			
CORRECTED WEIGHT			
CORRECTED MOMENT			
CORRECTED LONGITUDINAL CG			

EXAMPLE OF INVENTORY AT TIME OF AIRCRAFT WEIGHING (Non exhaustive list)			
FURNISHINGS		**RADIO COMMUNICATION**	
Aircraft tool kit		**RADIO NAVIGATION**	
First aid kit		**AVIONICS**	
Flight manual		VOR1/VHF1/GPS (GARMIN GNS 430)	
Fire extinguisher		VOR2/VHF2	
		U.H.F	
OPTIONAL EQUIPMENT		VHF/FM	
Swivelling landing light		Homing	
Battery		ADF	
2 nd. Battery		IFF Transponder	
Cabin heating system (air blowing)		ICS 2 lanes interphone passenger	
Dual controls		Radio altimeter	
Sand filter		Gyro. horizon	
Stowing installation		Stand-by horizon	
Fuel flowmeter		Gyro compass	
Emergency floatation gear		Emergency locator	
Cargo sling (fixed parts)		Global positioning system (GPS)	
Cargo swing (removable parts)			
Electric rear-view mirror			
Agricultural spraying system			
Gyrostabilized installation for camera			
Sliding door (LH)			
Drip tray			
Cabin trimming (comfort)			
Ground power receptacle			
Carpet			
Full options electrical master box			
Very cold weather starting kit			
Extreme weather starting kit		**MISCELLANEOUS**	
Flight control pilot on the left		Fuel	
Skis			
Cable-cutter wire strike protection system			
Ballast for balancing			
Windshield wipers			
Engine washing installation			
Air conditioning system			
Auxiliary fuel tank			

(0) : Not fitted	(1) : fitted	(FP) : Fix parts

SECTION 7

DESCRIPTION AND SYSTEMS

CONTENTS

PAGE

7.6 LIGHTING SYSTEM

7.7 POWER PLANT

7.8 FUEL SYSTEM

7.9 POWER TRANSMISSION SYSTEM AND ROTORS

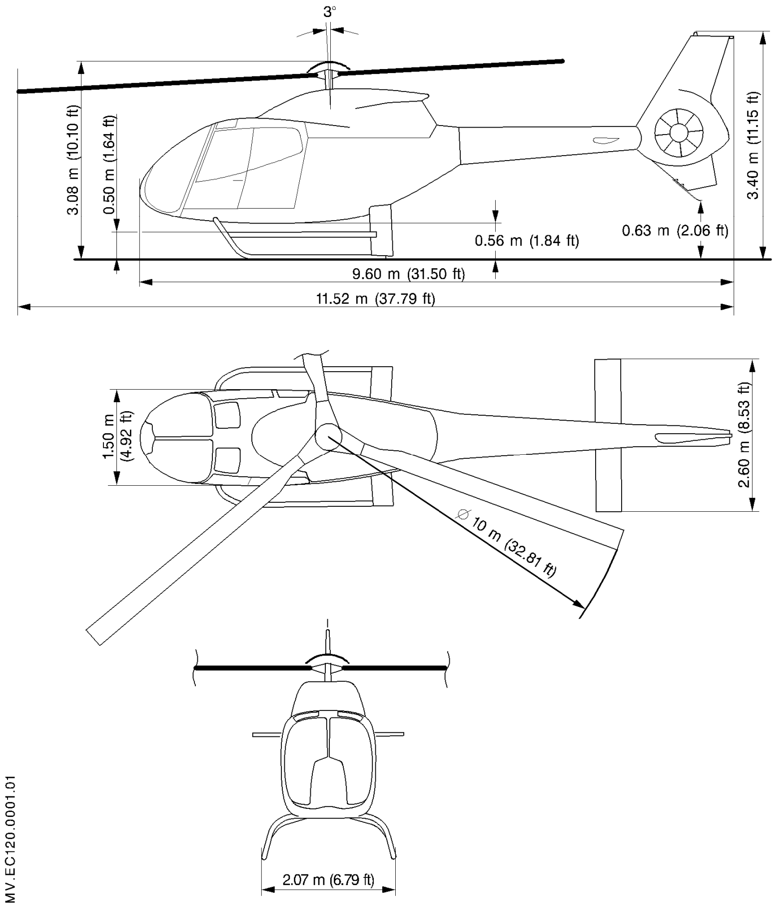
7.10 HYDRAULIC SYSTEM

7.11 ELECTRICAL POWER SYSTEMS

SECTION 7.1

MAIN AIRCRAFT DIMENSIONS

1 AIRCRAFT DIMENSIONS



NOTE

The values which vary according to weight are given at the maximum weight.

Figure 1: Three-view drawing

2 DESCRIPTIVE DATA

2.1 ENGINE

- Number	: 1	- Available power: (uninstalled) (ISA, at sea level):	
- Manufacturer	: TURBOMECA	. Max. takeoff power rating (MTOP): 376 kW (504 SHP)	
- Model	: ARRIUS	. Max. continuous power rating (MCP): 335 kW (449 SHP)	
- Type	: 2F		

2.2 MAIN ROTOR

- Type	: SPHERIFLEX	- Diameter	: 10 m (32.81 ft)
		- Number of blades	: 3
		- Nominal rotor speed	: 412-415 rpm

2.3 TAIL ROTOR

- Type	: FENESTRON	- Diameter	: 0.75 m (2.46 ft)
		- Number of blades	: 8
		- Nominal tail rotor speed in hover	: 4567 rpm

2.4 FUEL

- Total capacity	: 410.5 l (326.3 kg) (108.5 US gal)	- Usable fuel	: 406 l (323 kg) (107.3 US gal)

2.5 OIL

- MGB oil capacity including filter	: 4 l	- Engine oil capacity	: min. 3 l (0.79 US gal)
- TGB oil capacity	: 0.2 l		: max. 4.9 l (1.29 US gal)

SECTION 7.2

COCKPIT

1 INSTRUMENT PANEL AND CONSOLE

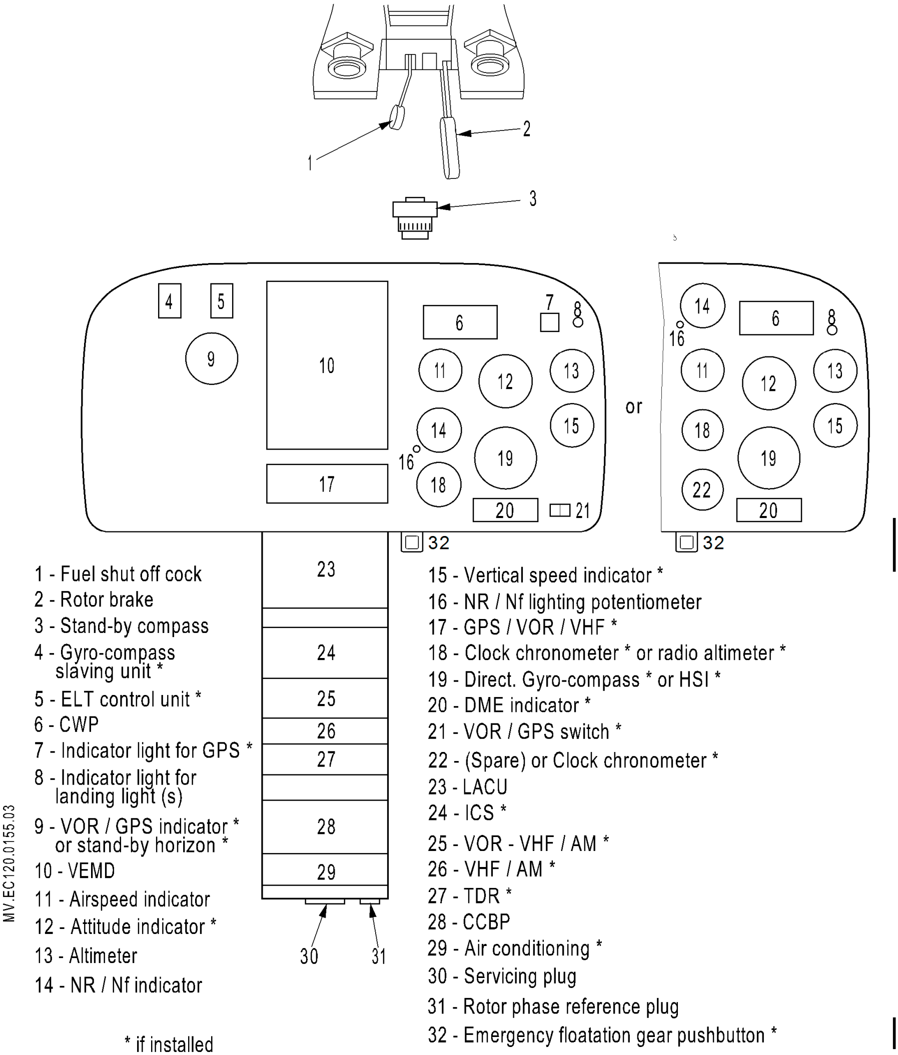
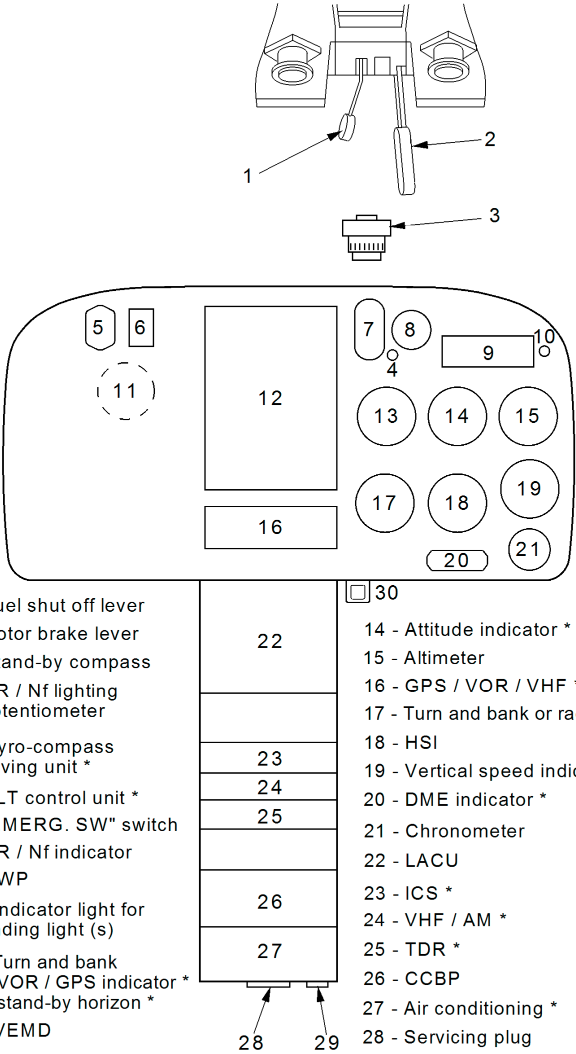


Figure 1: Instrument panel and console

2 INSTRUMENT PANEL AND CONSOLE (VARIANT)



1 - Fuel shut off lever
2 - Rotor brake lever
3 - Stand-by compass
4 - NR / Nf lighting potentiometer
5 - Gyro-compass slaving unit *
6 - ELT control unit *
7 - "EMERG. SW" switch
8 - NR / Nf indicator
9 - CWP
10 - Indicator light for landing light (s)
11 - Turn and bank or VOR / GPS indicator * or stand-by horizon *
12 - VEMD
13 - Airspeed indicator
14 - Attitude indicator *
15 - Altimeter
16 - GPS / VOR / VHF *
17 - Turn and bank or radio altimeter indicator *
18 - HSI
19 - Vertical speed indicator
20 - DME indicator *
21 - Chronometer
22 - LACU
23 - ICS *
24 - VHF / AM *
25 - TDR *
26 - CCBP
27 - Air conditioning *
28 - Servicing plug
29 - Rotor phase reference plug
30 - Emergency floatation gear pushbutton *

* if installed

Figure 2: Instrument panel and console

SECTION 7.3

CENTRAL WARNING AND ANCILLARY SYSTEMS

1 DESCRIPTION

The Caution and Warning Panel (CWP) comprises the following components:

- Red warning lights for alarms which require immediate action,
- Amber caution lights for alarms requiring action which can be delayed.

Audio alarms are generated through the intercommunication system. The audio warning is activated when [**HORN**] on the Lighting and Ancillary Control Unit (LACU) is set to ON position. In this case, **HORN** on the Caution and Warning Panel.

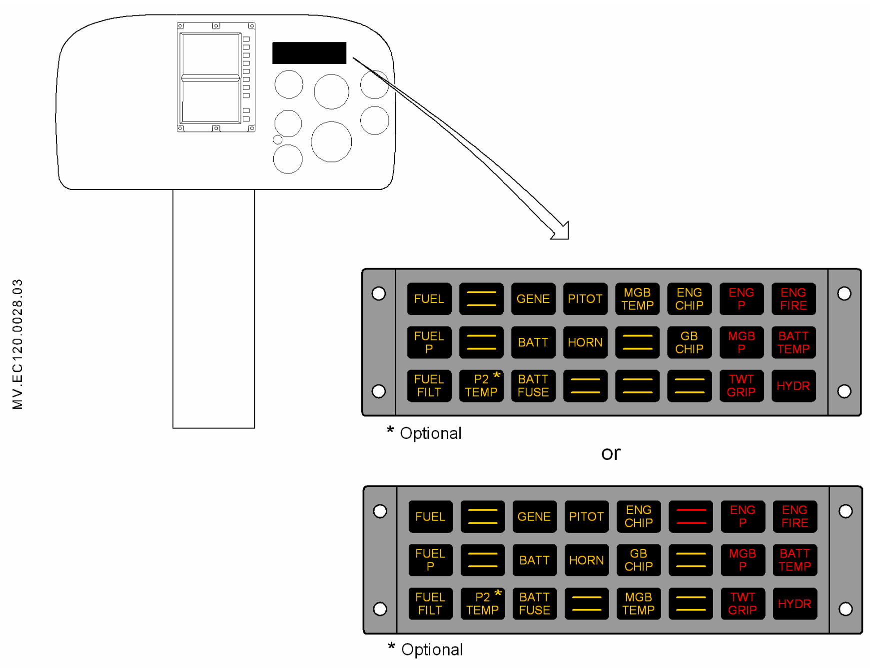


Figure 1: Caution and Warning Panel

2 CHARACTERISTICS

The Caution and Warning Panel is supplied by a dual 28 VDC power supply and protected by circuit breakers.

3 ANCILLARY SYSTEMS

Central computers

- General

The central computers perform the ancillary service functions of the helicopter. They include two subassemblies:

- The ancillary systems unit (ASU) (1),
- The lighting and ancillary control unit (LACU) (2).

The ASU manages all the audio warnings, some visual warnings, and the processing of specific electrical signals.

The LACU includes all the electrical indicating and control components of the main systems and lighting systems.

- Characteristics

The ASU and the LACU are both supplied with a dual 28 VDC power supply and are protected by circuit breakers.

- Description

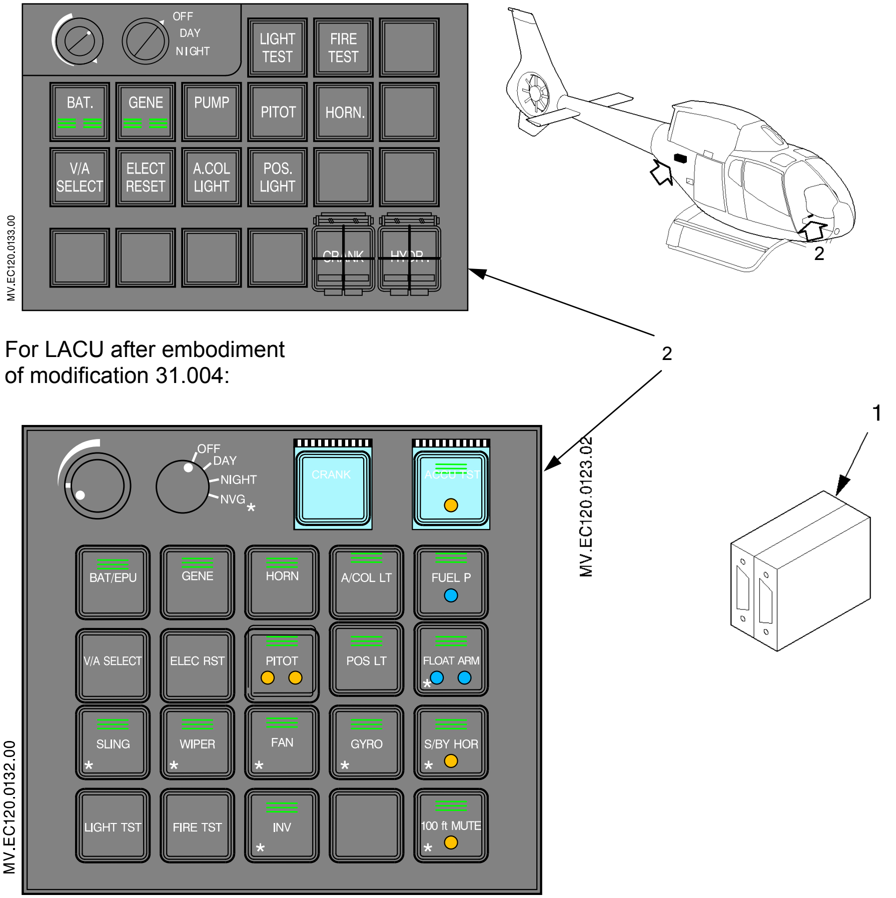
The ASU (1) performs the following functions:

- Management of the ENG FIRE warning light,
- Generation of the high and low NR audio warnings,
- Management of other audio warnings:
  - Due to red alarms: "Gong",
  - Due to MTOP overlimit: continuous low tone.
- Generation of the FLIGHT/GROUND signal for the VEMD,
- Time delay for maintaining the electro-magnetic pointer of the twist grip after releasing the starter button,
- Management of the ENG CHIP warning light.

The front panel of the LACU (2) includes:

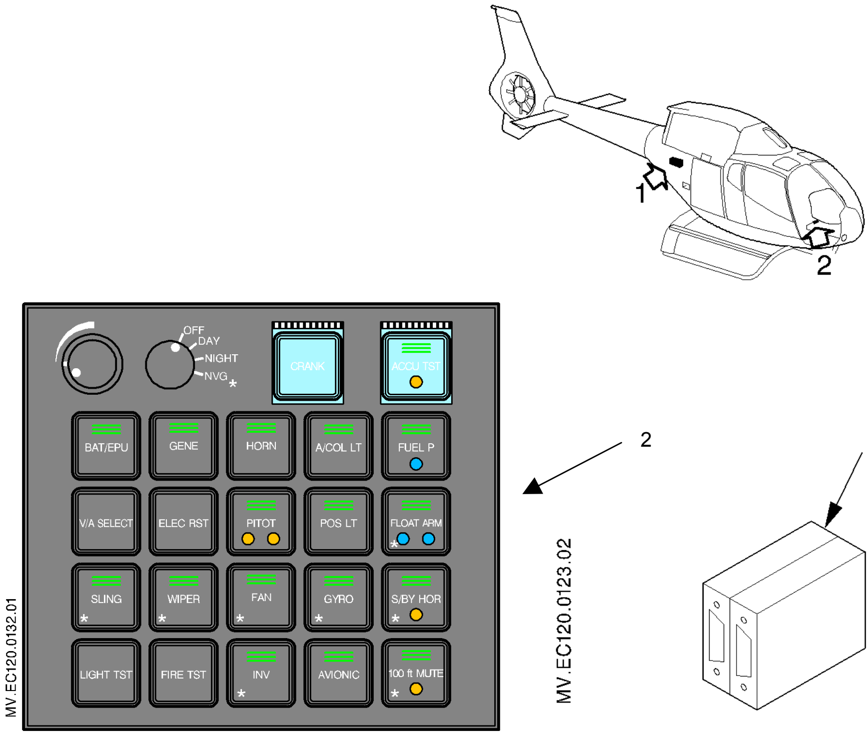
- A lighting selector: OFF/DAY/NIGHT/NVG*. In the DAY position, lighting is at nominal brightness. In the NIGHT position, the VEMD lighting, NR/Nf indicator lighting and warning lights are dimmed,
- Two potentiometers for adjusting the brightness of the instrument panel, console and standby compass lighting, which are active when the selector is in DAY or NIGHT position,
- Control and monitoring pushbuttons.

(*) If installed



(*) If installed

Figure 2: Central computers



(*) If installed

Figure 3: Central computers (radio line 2007)

SECTION 7.4

VEHICLE AND ENGINE MULTIFUNCTION DISPLAY (VEMD)

1 GENERAL

The VEMD is a duplex indicator equipped with two matrix liquid crystal displays. It is located in the center of the instrument panel. The VEMD displays all necessary engine and vehicle parameters. The VEMD comprises 3 modules:

- Two processing modules: LANE 1 and LANE 2,
- One display module which includes two screens and the control pushbuttons.

2 CHARACTERISTICS

The VEMD is supplied with a dual 28 VDC power supply and is protected by circuit breakers.

3 OPERATING MODES

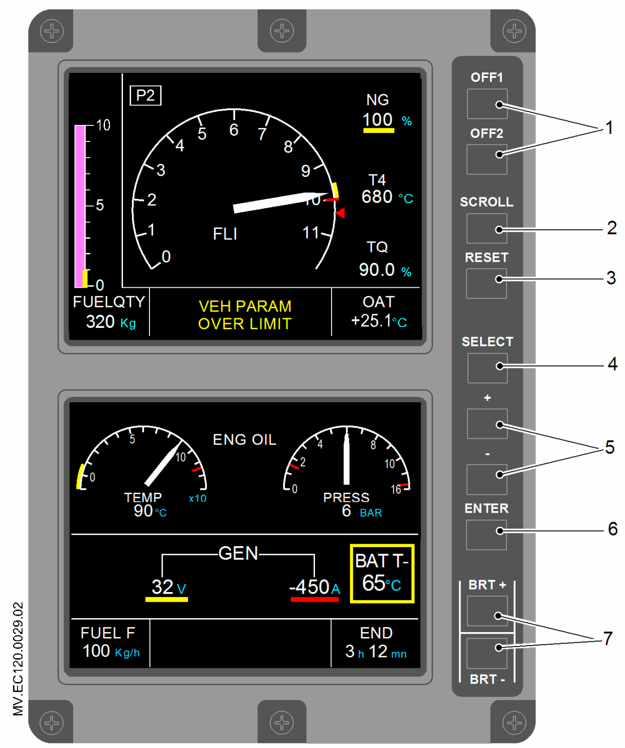
Three operating modes are accessible:

- **"OPERATIONAL" mode**: accessible in ground and flight condition, this mode constitutes the main operating mode of the equipment. It contains the ENGINE, VEHICLE, FLI, FLIGHT REPORT and ENGINE POWER CHECK pages,
- **"CONFIGURATION" mode**: only accessible in ground condition, this mode allows configuration of the VEMD.
  1. [**OFF1**] and [**OFF2**] ....PRESS to switch OFF the VEMD
  2. [**SELECT**] and [**ENTER**]........PRESS and HOLD
  3. [**OFF1**] and [**OFF2**] ....PRESS to switch ON the VEMD
  4. Hold until **RELEASE KEY** message appears on both screens
- **"MAINTENANCE"** mode: only accessible in ground condition. This mode allows the selection of the different maintenance functions: Flight report, Failure report, Overlimits, Engine Power Check, Operating times, EECU data and Data loading**.**

  To access this mode use the same procedure as "CONFIGURATION" mode except item 2, replace by the following.

  2. [**SCROLL**] and [**RESET**] ......PRESS and HOLD,

4 VEMD CONTROLS



1 - [**OFF1 / OFF 2**] pushbuttons:
. Switch ON/OFF processing module 1/2 and the upper or lower screen.

2 - [**SCROLL**] pushbutton:
. Scrolling through the pages.

3 - [**RESET**] pushbutton:
. Return to nominal display configuration.

4 - [**SELECT**] pushbutton:
. Select a data field.

5 - [**+ / -**] pushbuttons:
. Increase/decrease the numerical values of the selected data.

6 - [**ENTER**] pushbutton:
. Validate the selected data.
. Go through a list of available data.

7 - [**BRT +/-**] pushbutton:
. Screen brightness control.

Figure 1: VEMD controls

5 OPERATION

The VEMD is automatically powered up when [**BAT**] or [**BAT/EPU**] is switched ON.

The equipment performs an initialization test which checks correct operation of each of the two lines. During the test, the following message is displayed.

TEST IN PROGRESS

If the test is faulty, the following is displayed:

"LANE 1 FAILED" "PRESS OFF 1"	or	"LANE 2 FAILED" "PRESS OFF 2"

The line concerned can be cut-off by pressing the associated pushbutton (OFF1 or OFF2). This validates the initialization tests and switches the remaining line to operating mode.
If the test is successful, the VEMD automatically goes to "OPERATIONAL" mode.

6 OPERATIONAL MODE

This mode is displayed by default, when no other mode is selected.

The [**SCROLL**] pushbutton is used to scroll the pages as shown on the following diagrams (Figures 2 and 3).

6.1 MANAGEMENT OF PAGES IN NORMAL FLIGHT MODE

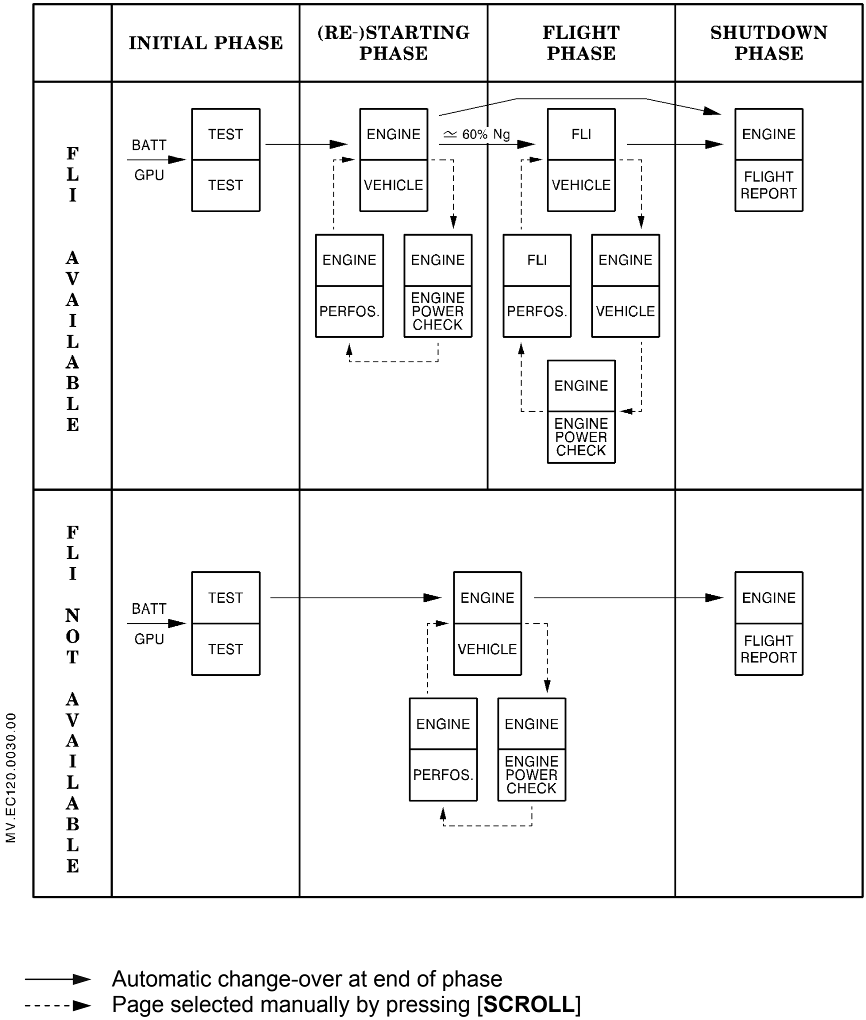
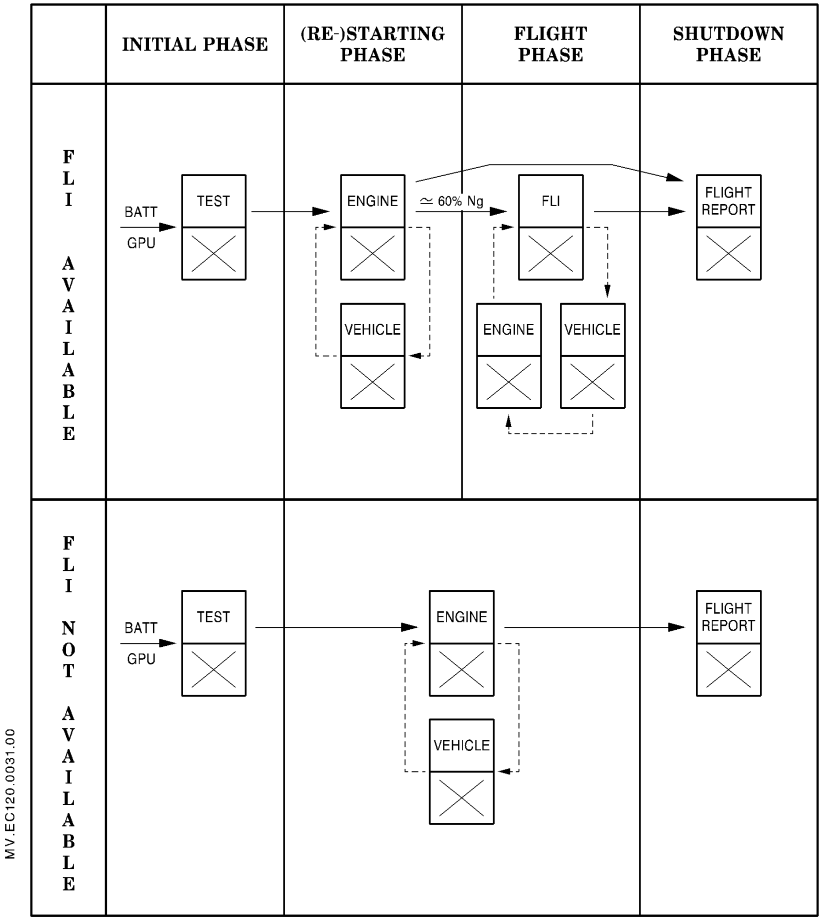


Figure 2: VEMD management in normal FLIGHT mode

6.2 MANAGEMENT OF PAGES IN DEGRADED DISPLAY FLIGHT MODE



⟶ Automatic change-over at end of phase

- - - -► Page selected manually by pressing [**SCROLL**]

Figure 3: VEMD management in degraded display FLIGHT mode

6.3 FIRST LIMITATION INDICATOR (FLI) PAGE

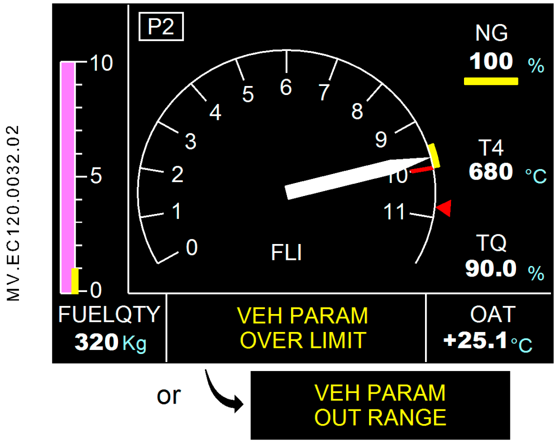


Figure 4: FLI page (Values given as an example)
Fuel gauge with auxiliary tank installed (optional)

NOTE

If one of the parameters on the FLI page becomes invalid, the ENGINE page is displayed automatically; the parameters can then be read on independent indicators.

6.4 ENGINE PAGE

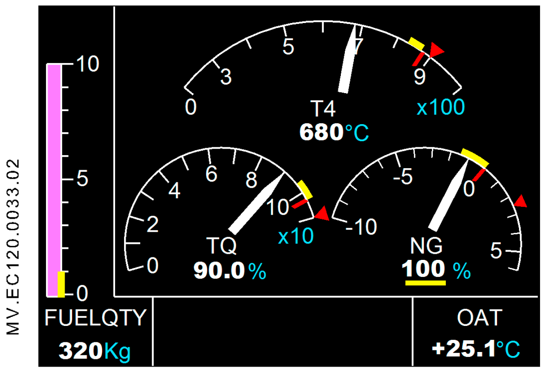


Figure 5: ENGINE page

6.5 VEHICLE PAGE

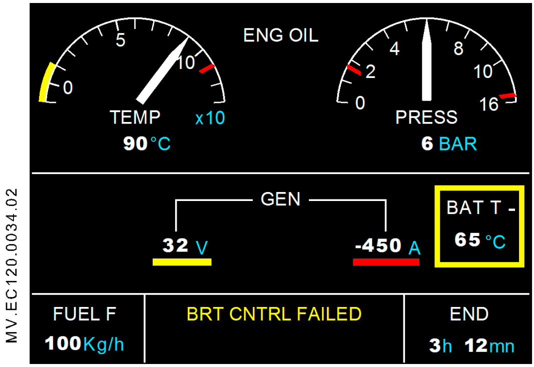


Figure 6: VEHICLE page

The Fuel Flowmeter (optional) provides instantaneous fuel consumption and the VEMD computes the remaining endurance as a function of the remaining fuel quantity.

6.6 ENGINE POWER CHECK (EPC) PAGE

The first page displays the procedure requirements, when applicable, in order to obtain a correct engine power check result. The check is divided into three phases:

- An initial stabilization phase,
- A more restrictive stabilization phase,
- A margin computation phase.

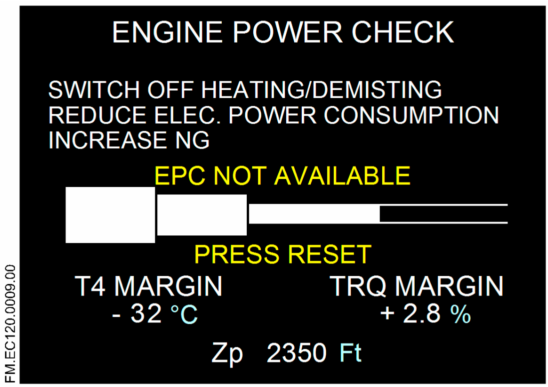
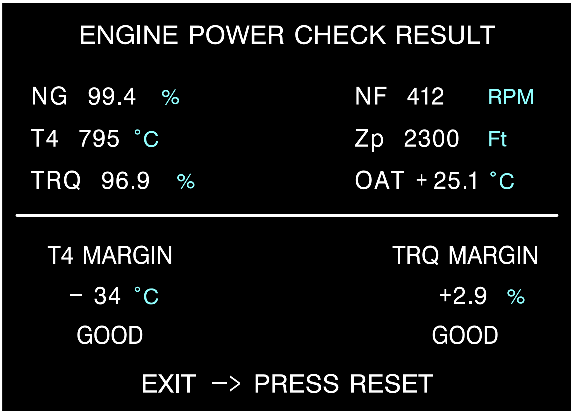


Figure 7: First page of the EPC

The second page displays the result of the EPC according to 6 parameters (Ng, Nf, T4, Hp (Zp), Tq, OAT) and the positive or negative differences in T4 and Tq.



MV.EC120.0036.01

Figure 8: Second page of the EPC

6.7 PERFORMANCE PAGE

This page is used to calculate aircraft weight and performance in the form of max. hover weights, in and out of ground effect.

The following parameters must be entered:

- The Equipped Empty Weight of the aircraft (EEW),
- The weight of the crew (CREW),
- The weight of the payload (PAYLOAD),
- The weight of the sling load (SLING), if optional is installed.

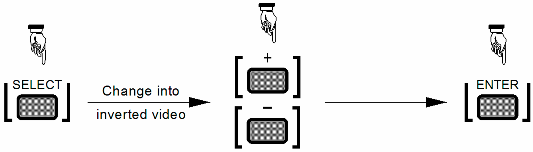
For VEMD after embodiement of modification SB 31.003:

- The Equipped Empty Weight of the aircraft (EEW). At power up, the value displayed is the value from the previous flight, it needs to be updated if the aircraft configuration has been changed.
- The weight of the crew (CREW). At power up, the default value is 80 kg (176 lb).
- The weight of the payload (PAYLOAD). At power up, the PAYLOAD value is automatically set to match the maximum internal takeoff weight.

Fuel and external parameters Hp (Zp) and OAT are taken into account automatically.

For mission planning purposes, Hp (Zp) and OAT can be modified.

When Hp (Zp) is modified, the OAT decreases in accordance with the standard atmosphere law. When the page is changed or another parameter is selected, the VEMD takes into account the actual Hp (Zp) and OAT values. To set or modify the parameters, apply the following procedure.



Use of + / - Keys

	EEW / CREW / PAYLOAD	Zp	OAT
Press > 5 sec.	± 100 kg (200 lb)	± 500 ft (150 m)	± 5°C (10°F)
Press < 5 sec.	± 2 kg (4 lb)	± 100 ft (30 m)	± 1°C (2°F)

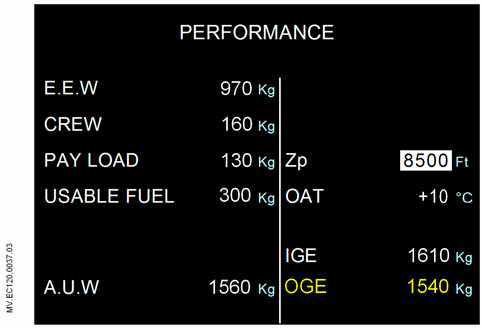


Figure 9: PERFORMANCE page

NOTE

When the IGE and OGE values are less than the aircraft All-Up Weight, they are displayed in yellow.

6.8 FLIGHT REPORT PAGE

The purpose of this page is to provide the crew with a summarized report of the last flight performed. At the end of the flight, the flight report page is automatically displayed on the lower screen.

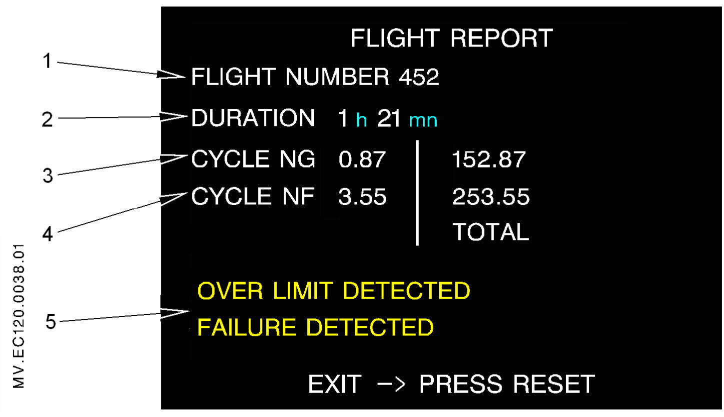


Figure 10: FLIGHT REPORT page

1 - Flight number, which is incremented automatically.
2 - Flight time (from 60% Ng at start up to 50% Ng at shutdown).
3 - Number of Ng cycles during the flight / total number of Ng cycles.
4 - Number of Nf cycles during the flight / total number of Nf cycles.
5 - Message area (in yellow) if a discrepancy or an overlimit is detected during the flight.

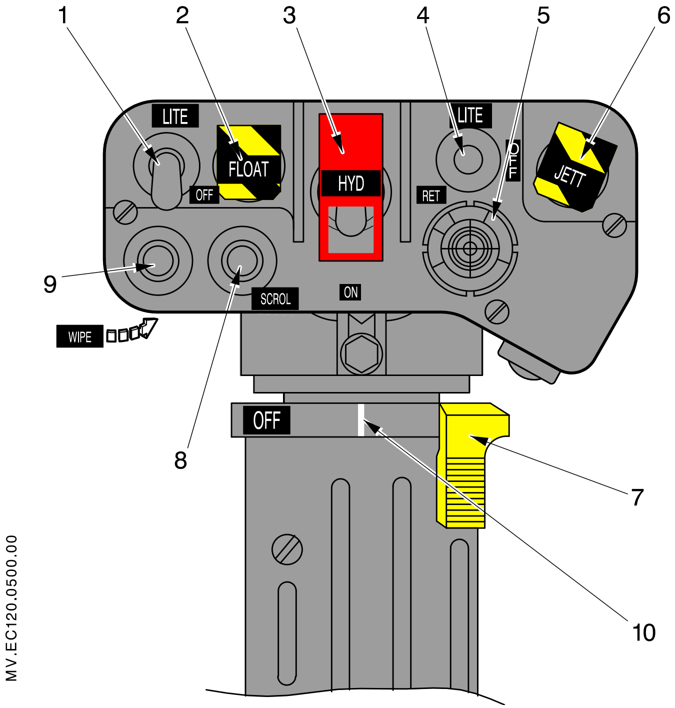
If a message appears, refer to the "MAINTENANCE" mode in the systems description manual.

To exit this page, press the [**RESET**] key.

SECTION 7.5

FLIGHT CONTROLS

1 COLLECTIVE GRIP

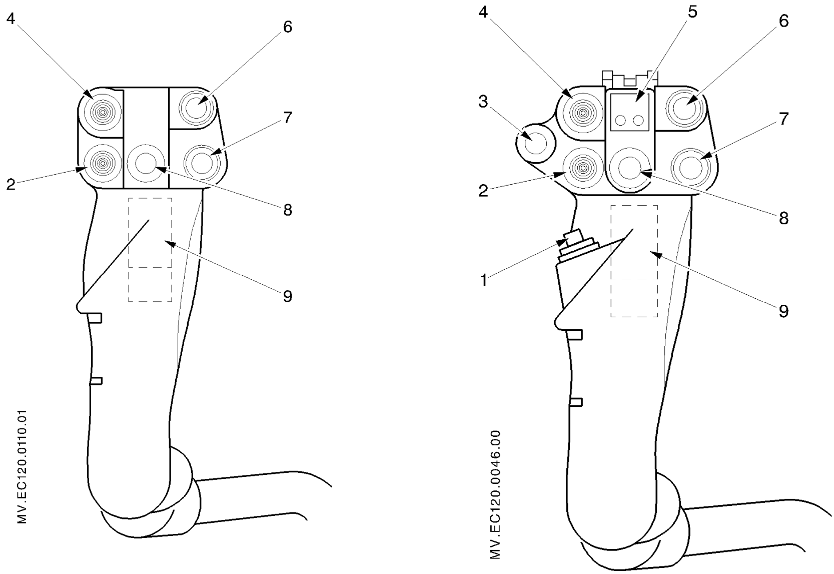


1 - Fixed landing light switch
2 - Emergency floatation switch *
3 - Hydraulic cut-off switch
4 - Retractable landing light switch*
5 - Retractable landing light position control *
6 - Hoist cable cutter *
7 - Engine starting pushbutton
8 - VEMD scroll pushbutton
9 - Windshield wiper pushbutton *
10 - Start position (22° on governor twist grip input)

(*) Optional

Figure 1: Collective grip

2 CYCLIC GRIP



1 - (Spare)
2 - Radio frequency control VHF2
3 - (Spare)
4 - Mirror orientation control (*)
5 - (Spare)
6 - Sling load release (*)
7 - (Spare)
8 - Radio frequency control active/standby VHF1
9 - Radio/ICS push to talk switch

(*) Optional

Figure 2: Cyclic grip

SECTION 7.6

LIGHTING SYSTEM

1 INTERIOR LIGHTING

1.1 GENERAL

Interior lighting is provided by:

- A spot light located on the overhead panel or a lighting plate, for normal instrument panel lighting,
- Two map lights on the overhead panel, which are supplied directly by the battery, for instrument panel and console emergency lighting,
- Integral lighting of console instruments (including standby compass),
- LCD displays on VEMD and NR/Nf indicator,
- CWP integral lighting,
- A dome light for the passengers,
- An internal light for the stand-by compass.

1.2 CONTROLS

Except for the map lights, the interior lighting is controlled on the LACU by:

- The OFF/DAY/NIGHT/NVG* light selector:
  - OFF : The spot light or lighting plate and console instrument lighting are off; the LCD displays and CWP lights are at nominal brightness.
  - DAY : The spot light or lighting plate and console instrument lighting are on; the LCD displays and CWP lights are at nominal brightness.
  - NIGHT : The spot light or lighting plate and console instrument lighting are on; the LCD displays and CWP lights are dimmed.
  - NVG* : The spot light or lighting plate and console instrument lighting are on; the LCD displays and CWP lights are dimmed to be compatible with the use of night vision goggles.
- The general lighting potentiometer.

On the instrument panel by:

- The NR/Nf lighting potentiometer.

(*) Optional

The brightness of the spot light or lighting plate and console instrument lighting can be adjusted using the general lighting potentiometers.

Each map light is switched on by rotating the head of the light. Brightness is adjusted using a potentiometer located near the light.

The passenger dome light is controlled by a switch located in front of the light.

The stand-by compass light is controlled by a switch located on the compass.

The brightness of LCD displays on NR/Nf indicator (1) can be adjusted using the NR/Nf lighting potentiometer (2) when the LACU light selector is on NIGHT position.

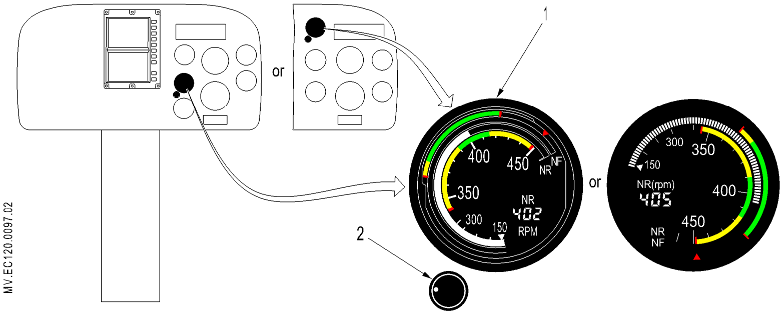


Figure 1: NR/Nf indicator and lighting potentiometer

2 EXTERIOR LIGHTING

The exterior lighting comprises position lights, anticollision light and a fixed landing light. The position lights and anticollision light are switched ON/OFF by [**POS.LIGHT**] or [**POS LT**] and [**A.COL LIGHT**] or [**A/COL LT**] LACU pushbuttons. The landing light is switched ON/OFF by a switch on the collective lever grip.

SECTION 7.7

POWER PLANT

1 GENERAL

The engine is located in a separate fireproof compartment aft of the MGB and above the LH rear cargo compartment. The TURBOMECA ARRIUS 2F engine is a free-wheel turbo shaft type engine with a single stage centrifugal compressor, an annular reverse flow combustion chamber and a single gas generator turbine.

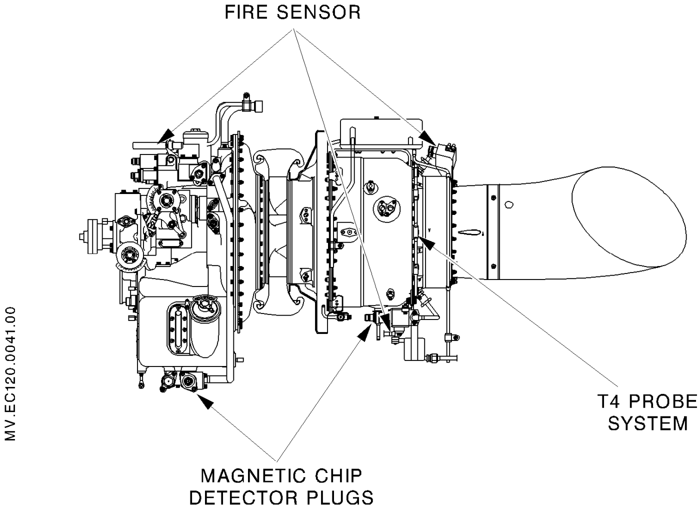


Figure 1: Engine view

2 ENGINE OIL SYSTEM

The engine oil system is divided into two systems:

- An external system installed in both the MGB and engine compartments. It includes two coolers passed through in parallel by the oil and a thermostatic valve which bypasses the coolers if the oil is cold. The hoses installed in the engine compartment are fireproof.
- An internal system integrated into the engine. It includes a tank, pressure and scavenge pumps and a filter.
- An amber ENG CHIP caution light indicates metal particles on the magnetic chip detectors.

SECTION 7.8

FUEL SYSTEM

1 GENERAL

The fuel system comprises two tanks with crash-resistant elastomer bladders, a supply system, refueling equipment and a monitoring system. The connections are designed to be crash-resistant.

2 FUEL TANKS

The upper tank is located above the cargo compartment and feeds the lower tank by gravity. The lower tank is located below the cargo compartment floor. The engine is supplied from this tank.
Both tanks are equipped with a mounting plate and a fuel level transmitter.
The lower tank additionally includes a starting pump, a fuel drain valve and a sedimentation sump with a drain valve. A venting device on the RH side and a filler on the LH side are installed on the upper tank.

3 ENGINE FUEL SUPPLY SYSTEM AND REGULATION

The fuel is aspirated through the filter by the high pressure pump.

The fuel flow is regulated by the metering valve depending on the power required. The principle is to govern a constant Nf independant of the power required from the engine, by controlling Ng.

For starting, the twist grip opens the metering valve, the engine is accelerated by the starter, regulators supply the fuel necessary to reach Ng $\cong$ 50 %. The twist grip can then be moved progressively to the IDLE and FLIGHT positions.

The fuel is then distributed to the injectors.

NOTE

In stabilized flight conditions, NR/Nf oscillations should remain ≤ +/- 3 rpm.

4 CONTROLS AND MONITORING

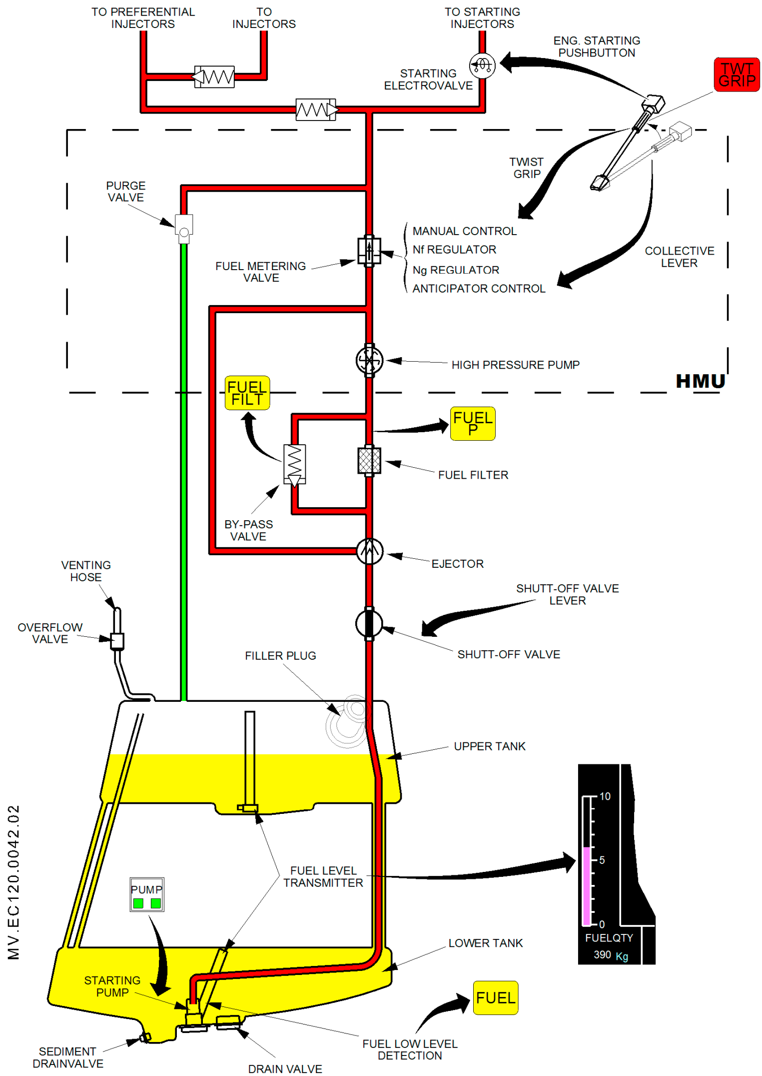


Figure 1: Fuel system

SECTION 7.9

POWER TRANSMISSION SYSTEM AND ROTORS

1 POWER TRANSMISSION

The transmission system consists of:

- Engine / MGB coupling,
- Main gear box (MGB),
- Tail rotor drive shaft,
- Tail gear box (TGB).

- **ENGINE / MGB COUPLING**

  The engine / MGB coupling transmits the engine power to the MGB.

  It consists of:

  - A coupling shaft with a triangular flange at each end,
  - Two flexible couplings at each end of the shaft,
  - A fixed housing bolted to the engine on one side and attached to the input casing on the other side.

- **MGB**
  - It transmits the power from the engine to the main rotor with a speed reduction.
  - It drives the tail rotor drive shaft.
  - It drives and supports the hydraulic compact unit, the MGB lubricating pump, the rotor brake and the oil cooler fan.
  - It supports the servocontrols and suspension bar attachment fittings.

It includes its own lubricating system, monitoring systems and access for maintenance.

The lubricating pump sucks the oil up from the MGB sump through a strainer and delivers it through a filter. The oil returns to the sump by gravity.

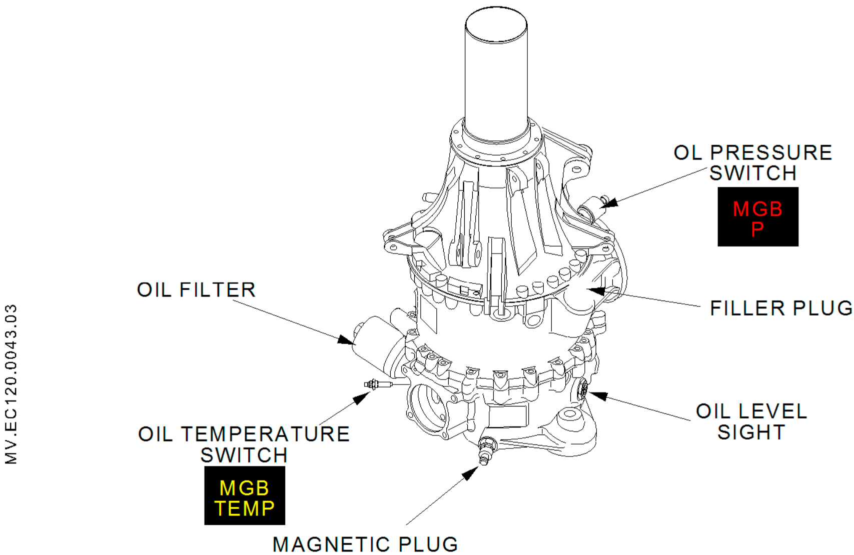


Figure 1: Main gear box

- **TAIL ROTOR DRIVE SHAFT AND TGB**

  The tail rotor drive shaft is composed of two shafts, a front shaft which is shorter, and a rear shaft.

  The TGB is fitted to the rear end of the tail boom and it comprises power and control modules contained in one housing.

  The TGB is splash-lubricated and comprises a visual oil level indicator and a chip detection device.

  The amber caution light **GB CHIP** illuminates on the CWP to indicate metal particles on the magnetic plug.

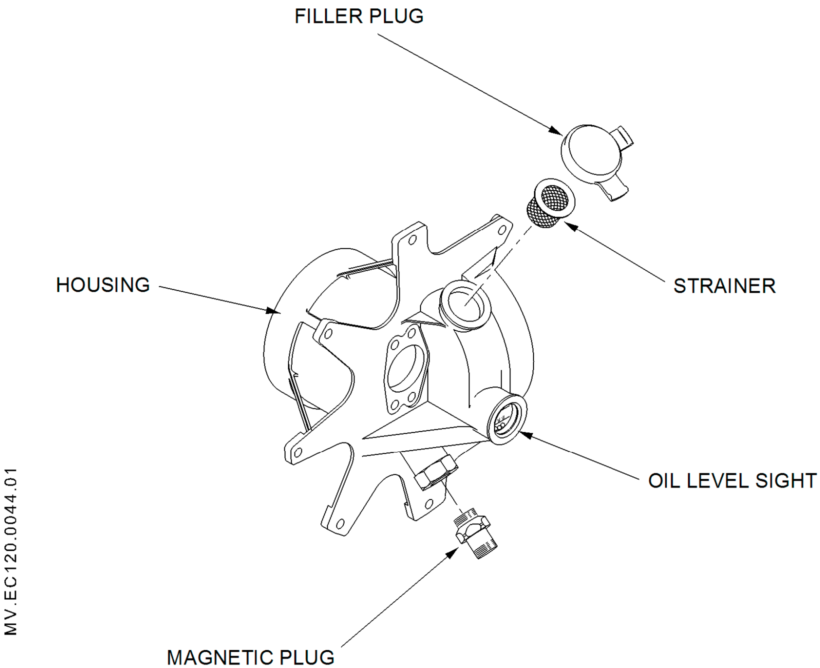


Figure 2: Tail gear box

2 ROTORS

- **MAIN ROTOR**

  The three-blades main rotor is fully articulated. It rotates clockwise when seen from above at a nominal speed of 406 rpm. Flapping, lead-lag and pitch hinges are provided by a spherical elastomeric bearing. An elastomeric lead-lag damper links each blade to the hub.

- **TAIL ROTOR**

  The tail rotor is shrouded (FENESTRON), and is housed in the vertical fin. It comprises eight blades.

  The blades rotate clockwise when seen from the LH side of the aircraft.

SECTION 7.10

HYDRAULIC SYSTEM

1 GENERAL

The hydraulic system reduces the pilot's workload by providing hydraulic assistance to actuate the main rotor controls. It comprises two separate assemblies:

- A hydraulic compact unit, supported and driven by the MGB, which generates the hydraulic power, pressure and flowrate.
- A distribution system which comprises flexible pressure and return hoses, supplying the three servo-controls.

- Normal operation:
  - At start-up, hydraulic pressure is zero: .... HYDR (9).
  - When the pressure in the system is between 20 and 30 bar (290 psi and 435 psi): .... HYDR (9).
  - When [**ACCU TST**] or [**HYDR**] (6) is released, and the hydraulic cut-off switch (on collective grip) (7) is in "ON" position, the electro-valves (4) and (8) are not energized and the servo controls are normally fed by pressurized hydraulic fluid.
  - The hydraulic pump (2) operates when the rotor is spinning.
  - The regulating valve (1) regulates the pressure to between 37 and 40 bar (537 psi and 580 psi): .... HYDR (9).
  - The servo controls are supplied normally.
  - The nitrogen in the accumulators (3) is compressed by the hydraulic fluid. The pressure of the nitrogen P1 equalizes with the pressure of the hydraulic fluid P2 (Detail A). The accumulator (3) is ready to release its energy (expansion of gas) in case of a pressure drop.

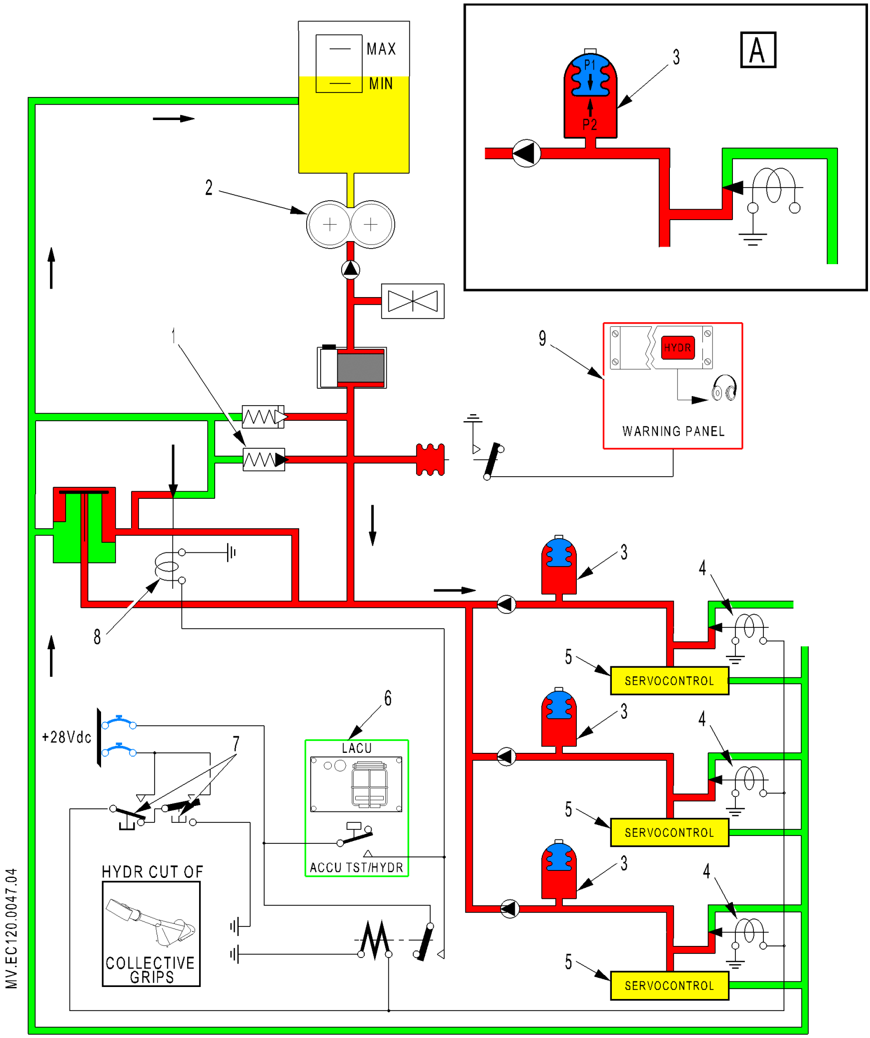


Figure 1: Hydraulic system, normal operation

2 HYDRAULIC COMPACT UNIT

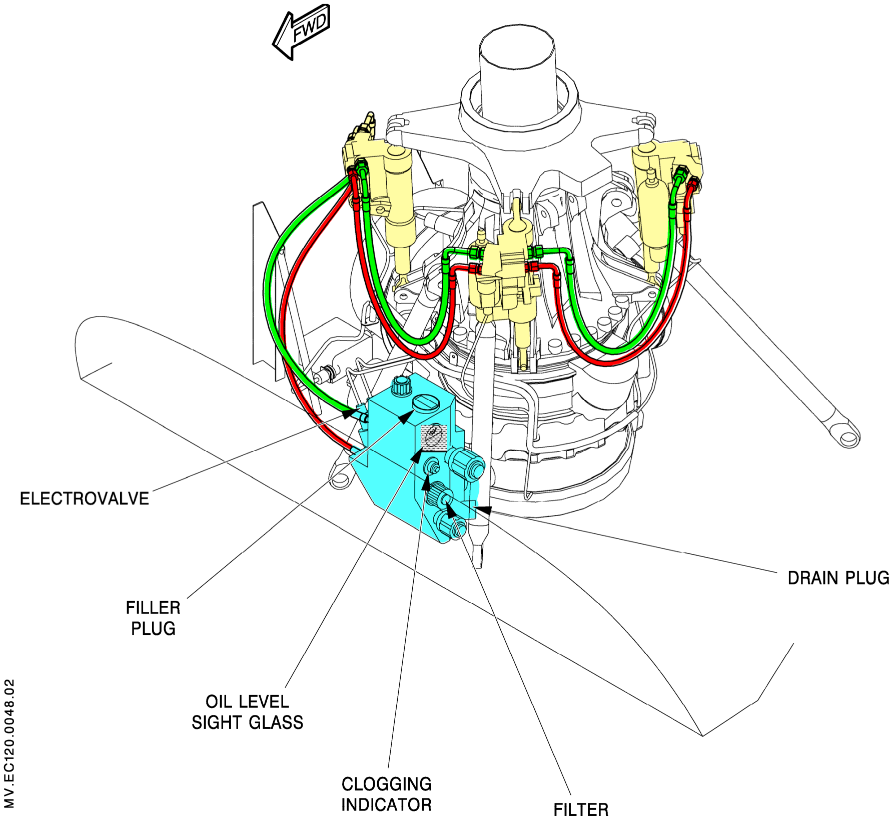


Figure 2: Hydraulic compact unit

SECTION 7.11

ELECTRICAL POWER SYSTEMS

1 GENERAL

The generation and distribution system supplies the electrical network with 28 VDC regulated voltage. The network is supplied by:

- A starter generator located on the engine accessory gear box.
- A battery located in the cargo bay at the tail boom-to-fuselage junction frame and a second optional battery in the right cargo bay.
- An external power unit (EPU) plug on the right side of the fuselage (400A max).

Before embodiment of modification 24.015:

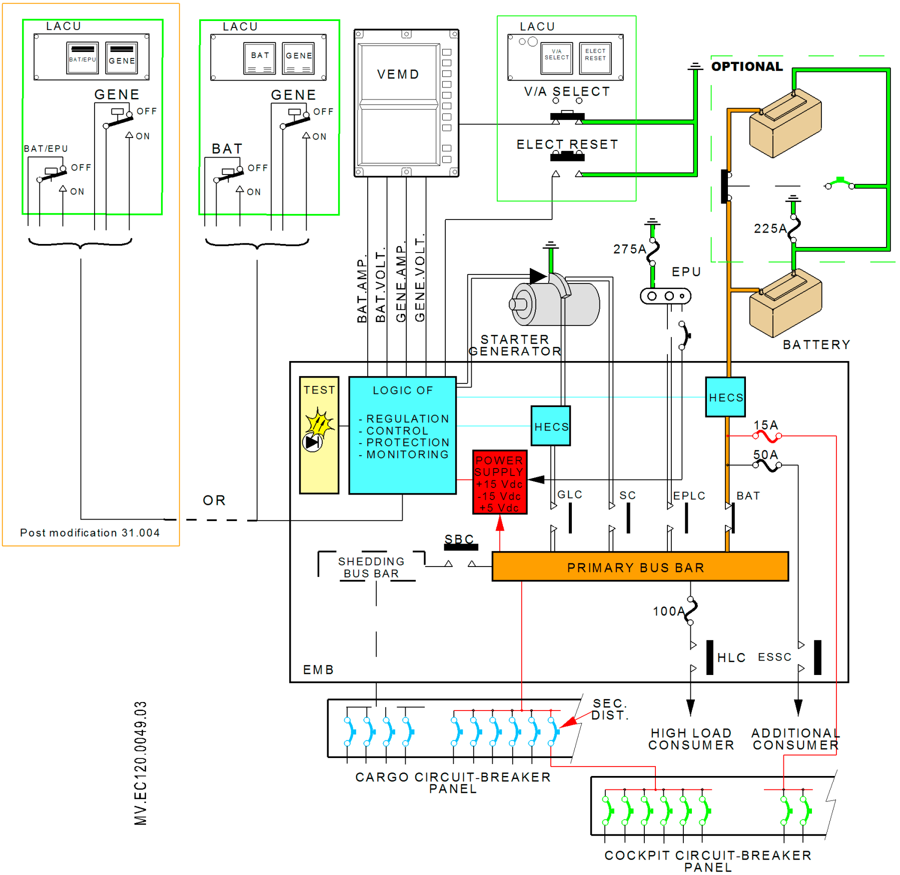


Figure 1: Electrical system

After embodiment of modification 24.015:

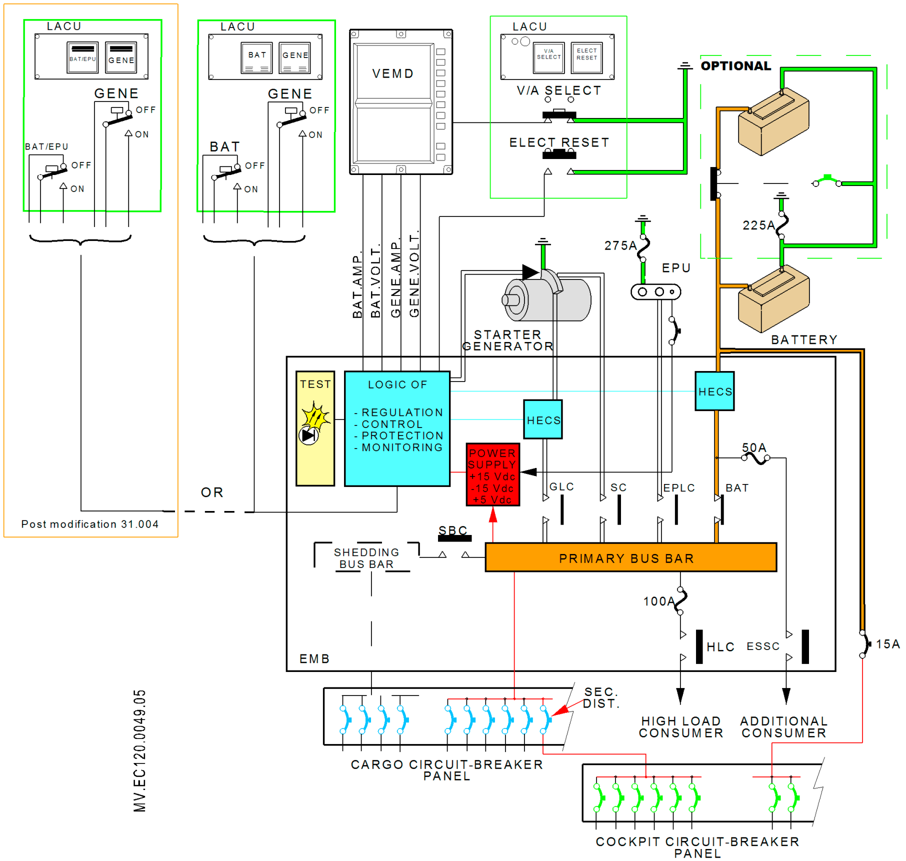


Figure 2: Electrical system

2 DESCRIPTION OF ELECTRICAL SYSTEM

Power sources are connected to the Electrical Master Box (EMB) which ensures the following functions:
- Regulation of the starter generator.
- Electrical network protection against failure of power sources and distribution.
- Connection of power sources to the electrical network.
- Operating logic (network reconfiguration).
- Interface between generation and distribution system and indicating control and monitoring system.
- Self test.

Power distribution is ensured by:
- A Cargo Compartment Circuit Breaker Panel (CCCBP).
- A Cockpit Circuit Breaker Panel (CCBP).

3 ELECTRICAL DISTRIBUTION

The DC distribution system includes:
- An Electrical Master Box (EMB) (2),
- A Cargo Compartment Circuit Breaker Panel (CCCBP) (3),
- A Cockpit Circuit Breaker Panel (CCBP) (1).

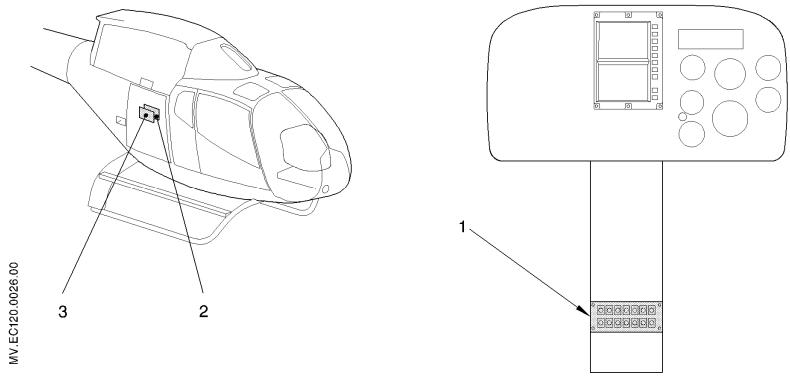
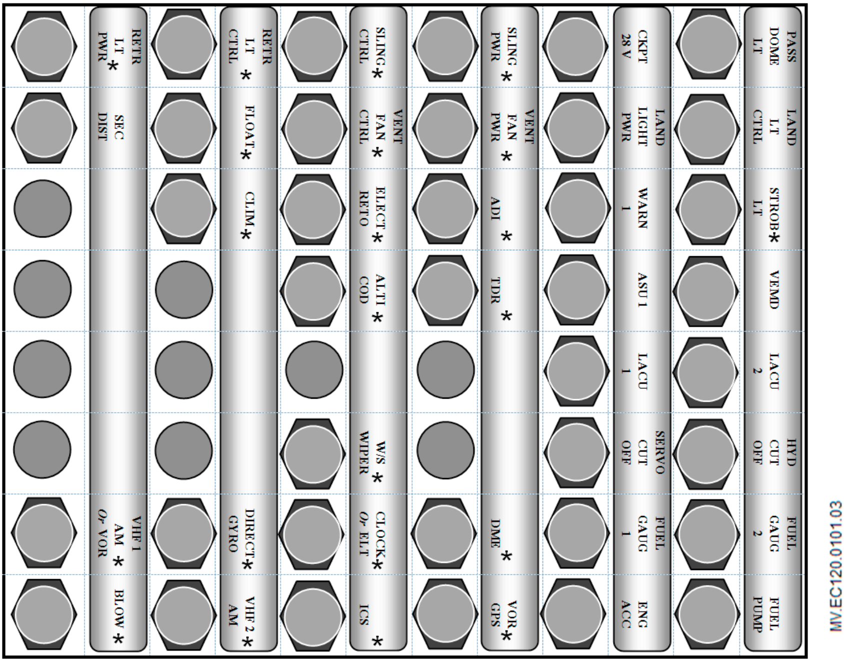


Figure 3: DC distribution - General description

3.1 CARGO COMPARTMENT CIRCUIT BREAKER PANEL

The Cargo Compartment Circuit Breaker Panel is installed in front of the EMB.

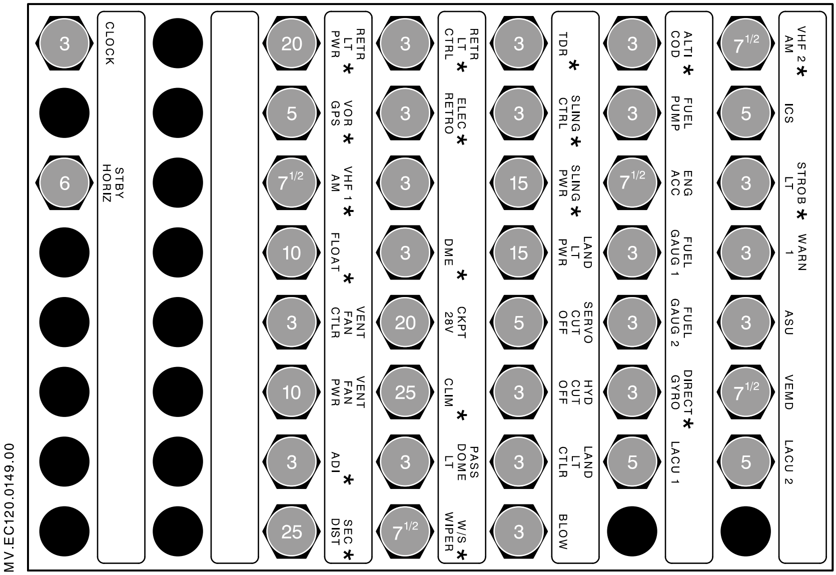


(*) Optional

Figure 4: Cargo Compartment Circuit Breaker Panel

3.2 CARGO COMPARTMENT CIRCUIT BREAKER PANEL (VARIANT)

The Cargo Compartment Circuit Breaker Panel is installed in front of the EMB.

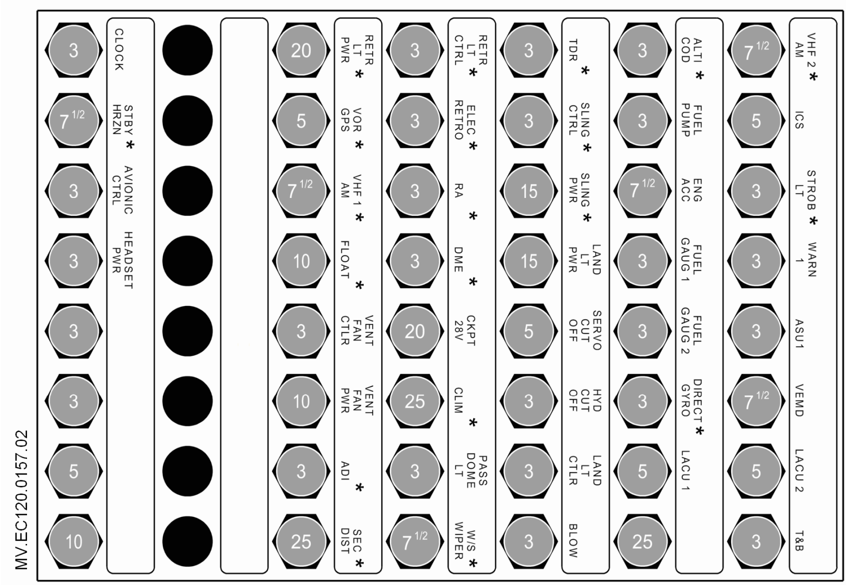


(*) Optional

Figure 5: Cargo Compartment Circuit Breaker Panel (Variant)

3.3 CARGO COMPARTMENT CIRCUIT BREAKER PANEL (RADIO LINE 2007)

The Cargo Compartment Circuit Breaker Panel is installed in front of the EMB.

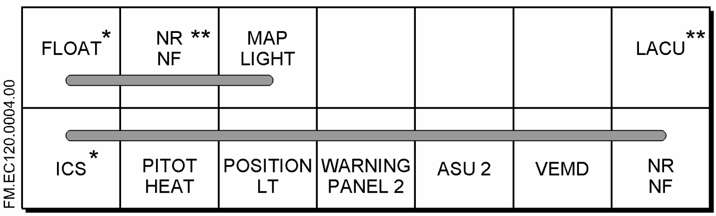


(*) Optional

Figure 6: Cargo Compartment Circuit Breaker Panel (radio line 2007)

3.4 COCKPIT CIRCUIT BREAKER PANEL

The CCBP is installed on the console.



(*) Optional
(**) If fitted

Figure 7: CCBP

4 CONTROLS AND MONITORING

4.1 CONTROLS

The following pushbuttons control the DC power system, they are located on the SCU or on the instrument panel:

- [**EMER SW**] (If installed) (lockwired),
- [**BAT.**] or [**BAT/EPU**],
- [**CRANK**],
- [**GENE**],
- [**ELECT RESET**] or [**ELEC RST**].

4.2 MONITORING

The following warning lights are in the CWP:

- One red warning light: BATT TEMP,
- Two amber lights **GENE** and **BATT**.

The vehicle page on the VEMD displays the following parameters:

- DC bus voltage (U/GEN),
- Generator current (I/GEN),
- Battery bus voltage (U/BAT),
- Battery current (I/BAT),
- Battery temperature.

5 OPERATION

5.1 EXTERNAL POWER CIRCUIT

The EPU is coupled to the primary distribution bus by means of its line contactor when the following conditions are met:

- 28 VDC power is available at EPU plug,
- [**EMER SW**] (if installed) on the instrument panel is in normal (UP) position,
- [**BAT.**] or [**BAT/EPU**], is engaged.

On the CWP: **GENE** and **BATT**.

Battery and generator are isolated from DC system until the EPU is disconnected.

5.2 BATTERY POWER CIRCUIT

The battery is coupled to the primary distribution bus by means of its line contactor when the following conditions are met:

- 28 VDC power is not available at EPU plug,
- [**EMER SW**] (If fitted) on the instrument panel is in normal (UP) position,
- [**BAT.**] or [**BAT/EPU**], is engaged.

Powering the aircraft on ground only via [**BAT.**] or [**BAT/EPU**] allows the crew to monitor radio communications and to plan the navigation while saving battery power.

The [**AVIONIC**] pushbutton (If installed) supplies directly the following equipment:

- VOR2 / VHF2,
- Turn and bank indicator,
- Horizon,
- HSI + gyro compas.

The battery may be isolated from DC system if either:

- Automatically by connecting EPU 28 VDC power,
- Manually by setting in cut-off (down) position the [**EMER SW**] (If installed) or by switching off the [**BAT.**] or [**BAT/EPU**] pushbutton.

In case of an electrical emergency, after actuating the [**EMER SW**] (If installed) in cut-off (down) position, all DC power is switched off except some vital consumers directly connected to the battery:

- NR/Nf instrument (According to version),
- Emergency lighting (Map lights),
- LACU (According to version),
- Emergency floatation gear (If installed).

5.3 GENERATOR CIRCUIT

The 150 A generator is coupled to the primary distribution bus by means of its line contactor if:

- Engine is running,
- 28 VDC power is not connected to EPU plug,
- [**EMER SW**] is in normal (UP) position (If installed),
- [**GENE**] is engaged,
- Generator voltage exceeds battery voltage by at least 0.5 V.

The generator may be isolated from DC system:

- Manually:
  - By disengaging [**GENE**] pushbutton,
  - By setting in cut-off (down) position [**EMER SW**] (If installed), or by switching off [**BAT.**] or [**BAT/EPU**] pushbutton.
- Automatically:
  - By using EPU 28 VDC power,
  - If a reverse current is detected from battery to generator,
  - If the generator voltage exceeds 31.5 V,
  - When [**CRANK**] is activated.

When the generator is isolated from DC circuit **GENE** light illuminates on the CWP.

SECTION 7.12

AIR DATA SYSTEM

1 GENERAL

The pitot tube picks up the total pressure (Pt) which is transmitted to the airspeed indicator. The tube incorporates a heating resistor operated by a [**PITOT**] pushbutton on the LACU which energizes the heating circuit. An amber PITOT caution light on the Caution and Warning Panel indicates that the pitot heating system is not operating, [**PITOT**] OFF or has failed.

The two static pressure ports pick up the static pressure (Ps) which is transmitted to the conventional flight instruments (airspeed indicator, vertical speed indicator, altimeter) and to the VEMD for performance computation.

A bleed valve is used to drain any condensation water which may accumulate within the system.

The air data system comprises the pitot tube (7), two static pressure ports (1), a bleed valve (8), an altimeter (3), a vertical speed indicator (4), an airspeed indicator (2), and a temperature probe (6) connected to the VEMD (5).

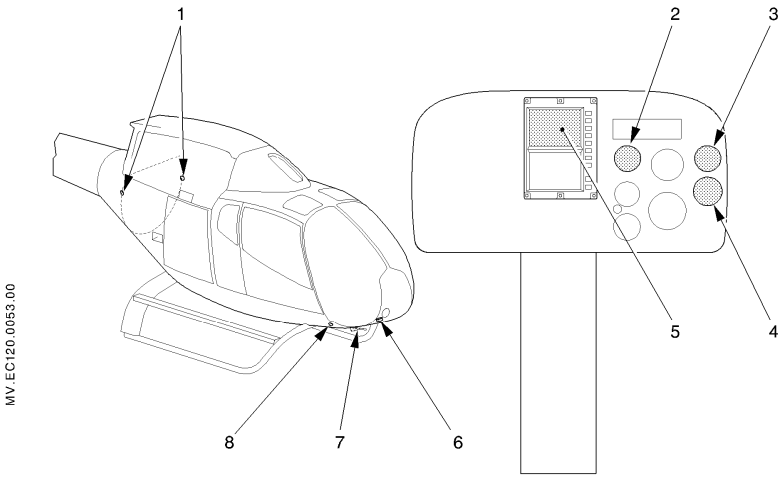


Figure 1: Pitot static system

SECTION 7.13

VENTILATION, HEATING AND DEMISTING

1 AIR GENERATION

Outside air flows from the front air intake to the ventilation scoop. It is mixed in the P2 venturi nozzle with hot P2 bleed air. A P2 valve on the cabin ceiling adjusts the P2 bleed air flow rate. The heating air is then distributed by ducts to the cabin and the windscreen.

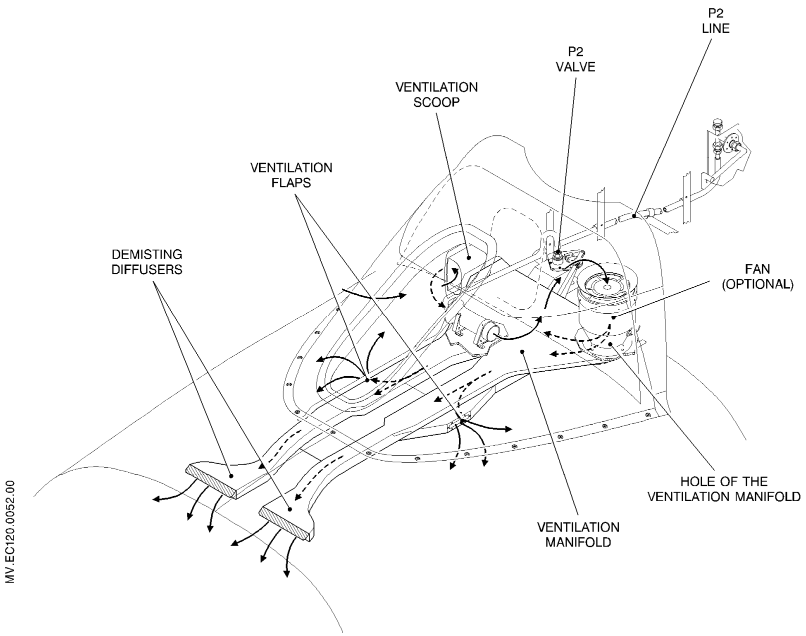


Figure 1: Air generation

If the improved recirculation heating system is installed, heating air flows in a closed circuit. The air is no longer taken from outside, it is taken from the interior of the cabin for improved heating effectiveness (refer to SUP.20).

2 CONTROLS AND MONITORING

- VENTILATION CONTROL
  The ventilation is controlled by adjustable nozzles that can be opened or closed.

- HEATING AND DEMISTING CONTROL
  The heating air temperature is set using the P2 valve control located on the cabin ceiling.
  For best demisting efficiency, the cabin air nozzles shall be closed.

- MONITORING
  A P2 on the VEMD upper screen indicates that the P2 valve is not fully closed.

SECTION 8

SERVICING

CONTENTS

PAGE

SECTION 8.1

HANDLING

1 EQUIPMENT REQUIRED

- **For moving the aircraft by hand:**
  - Single or twin handling (optional) wheels
  - Jacking lever
- **For towing the aircraft with a tractor:**

  The above-mentioned equipment, plus:
  - A towing bar installation

2 HANDLING

2.1 MOVING THE HELICOPTER BY HAND

On prepared ground

- Position the ground handling wheels on the mounting studs according to aircraft balance
- Install ground handling wheels (wheels outside skids)
- Check that wheels are correctly locked (see detail A)
- Lift the aircraft onto the wheels using a jacking lever
- Lock in this position with retaining pins

CAUTION

Do not use the single handling wheels if the weight of the aircraft exceeds 1400 kg (3086 lb).

On unprepared ground

- Use twin handling wheels (optional)
- Proceed as before
- Lift the aircraft with the hydraulic towing and manual positioning device (Figure 1)

2.2 TOWING THE HELICOPTER WITH A TRACTOR

Prepare the aircraft as above and attach the towing bar.

NOTE

The fenestron handle should always be used to guide the aircraft when towed.

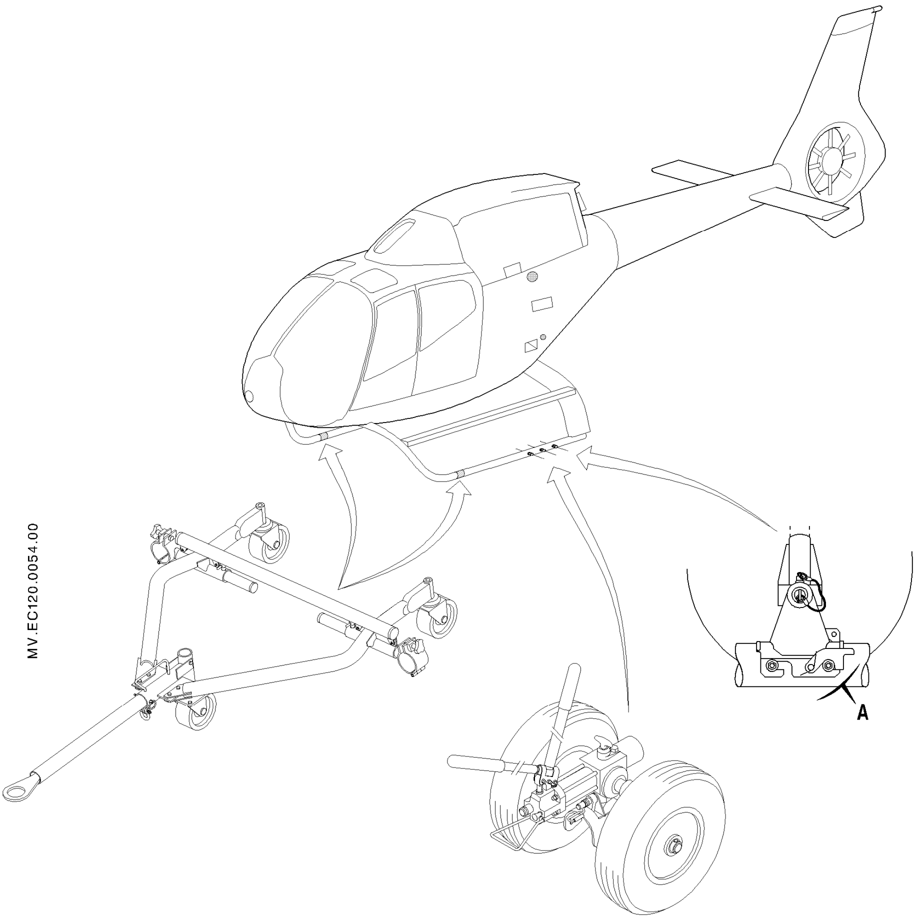


Figure 1: Towing and manual positioning device

SECTION 8.2

SERVICING INSTRUCTIONS

1 FUELS

The authorized fuels are given in SECTION 2 of the basic Flight Manual.

- Capacity:

	Liters	US gal	UK gal		kg	lb
TOTAL FUEL TANK CAPACITY	410.5	108.5	90.4		326.3	719.4
NON-CONSUMABLE FUEL	4.5	1.19	0.99		3.6	7.89
CONSUMABLE FUEL REMAINING WHEN FUEL COMES ON	38	10.04	8.37		30.2	66.6

2 FUEL ADDITIVES

The authorized anti-ice, fungicide and thermal stability fuel additives are given in SECTION 2 5 § 1 "APPROVED FUELS" of the basic Flight Manual.

If there is any doubt as to the concentration of additive in the contents of a fuel tank, the fuel is to be drained from the tank and replaced by fuel containing a known proportion of additive within the defined limits given in SECTION 2 of the Flight Manual unless it is possible to measure the concentration using a differential refractometer.

3 LUBRICANTS

- Engine oil system

  Lubricants and commercial descriptions:

  - Authorized lubricants ....Refer to SECTION 2 of the basic Flight Manual,
  - Commercial descriptions...........Refer to the TURBOMECA publications.

  Capacity:

  Engine oil tank and system capacity ....4.6 liters (1.21 US gal).

- Transmission Components

  Lubricants:

  The authorized lubricants are given in SECTION 2 of the basic Flight Manual.

  Capacity:

  - Main gearbox ....4 liters (1.05 US gal),
  - Tail gearbox ....0.22 liter (0.05 US gal).

4 HYDRAULIC FLUIDS

- Hydraulic Fluids

  The authorized hydraulic fluids are given in SECTION 2 of the basic Flight Manual

  System:

  - Total capacity of the system...................2.2 liters (0.58 US gal).
  - Operating pressure ....37 bar (536 psi).

5 REFUELING

MV.EC120.0055.00

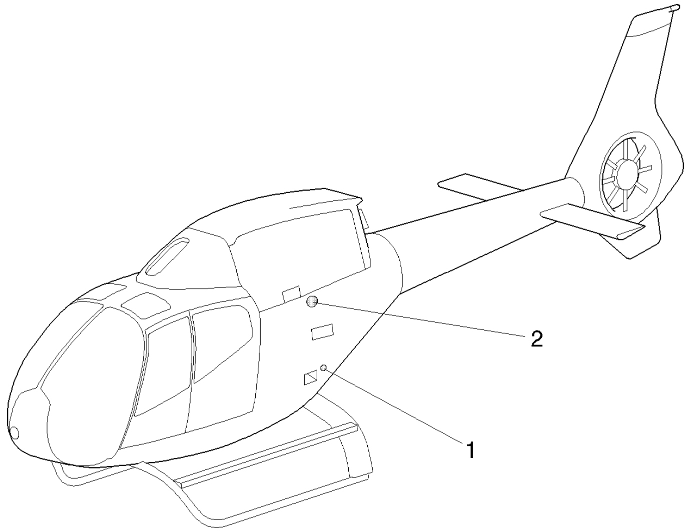


Figure 1: Filler plug and electro-static connector location

5.1 NORMAL REFUELING

- Place the helicopter on a level surface,
- Connect the bowser earth cable to the electrostatic balance connector (1) on the helicopter,
- Check the quantity of fuel remaining in the tanks on VEMD fuel indicator,
- Observe the following safety precautions:
  - Ensure that the aircraft electrical power supply is switched off,
  - Place a fire extinguisher near the work area,
  - Strictly prohibit smoking in the security area,
  - Prohibit the use of any means of lighting not conforming to the safety rules,
  - Ensure, during refueling (or defueling), that the bowser (or the defueling unit) is connected to the aircraft by the electrostatic balance connector (1),
  - Strictly prohibit draining of fuel tanks, whether partial or total, inside a hangar or shop.
- Fill the tanks, monitoring the quantity of fuel delivered on the bowser flowmeter,
- Position and lock the filler plug (2),
- Disconnect the bowser earth connector from the aircraft electrostatic balance connector,
- Check that the difference in the aircraft fuel gauge readings corresponds to the quantity of fuel delivered and determine the corresponding weight.

5.2 REFUELING WITH ROTOR SPINNING

WARNING

REFUELING WITH ROTORS SPINNING IS PERMITTED ONLY AFTER PRIOR APPROVAL IS GIVEN BY THE AUTHORITY CONCERNED AND IN COMPLIANCE WITH OPERATIONAL REGULATIONS.

Observe the normal refueling safety precautions and strictly comply with the additional instructions defined below:

- Set the aircraft on a firm surface,
- Head aircraft into forward wind sector ± 45° if wind above 15 kt (28 km/h),
- Lock the collective in full low pitch position,
- Pilot must remain at the flight controls during all refueling operations with rotors spinning,
- No radio transmission or operating of electrical switches,
- Limit refueling to 95% in order to prevent any fuel spillage,
- The pilot must always have someone in view who can signal to the mechanic to stop refueling,
- No one shall approach the aircraft rotor disc unless acknowledged by the pilot,
- Make sure that the filler cap is closed and secured, report it to the pilot.

NOTE

For refueling with rotors spinning, it is preferable to set the twist grip to FLIGHT position. IDLE position may also be selected if required by local operational conditions.

Refueling operations with rotors set to IDLE should be conducted with wind velocity ≤ 15 kt (28 km/h) with a gust spread ≤ 5 kt (9 km/h) and should never be conducted on an elevated helipad or other structure where a vertical component of wind may be present.

Refueling with rotors spinning represents a potential hazard to the safety of the helicopter, its occupants and third-parties.

SECTION 8.3

TEST SHEETS

1 GENERAL

The test sheets are intended to sum up the checks to be carried out in flight or on the ground with engine running after replacement of main components, after maintenance action or further to periodic inspections.

The test sheets provided in this section are used to verify the basic helicopter functions. The contents of the flight checks may be reduced or adapted according to the maintenance action performed or to adapt to actual meteorological conditions that may make it impossible to perform the checks as specified.

The test sheets are in the form of reproducible sheets which can be filled in directly by the crew.

CAUTION

Since these checks do not form part of normal helicopter operation, they shall be carried out only by qualified personnel under the operator's responsibility.

2 LIST OF TEST SHEETS

No. 0 FLIGHT REPORT

No. 1 VEMD CONFIGURATION AND MEMORY

No. 2 GROUND RUN

No. 3 HOVER FLIGHT

No. 4 AUTOROTATION 65 kt (120 km/h)

No. 5 MAXIMUM CONTINUOUS POWER LEVEL FLIGHT

No. 6 MAX TAKEOFF POWER CHECK

No. 7 PREFERENCE INJECTOR VALVE TEST (AS SCHEDULED BY THE ENGINE MANUFACTURER)

TEST SHEETS TO BE CONDUCTED ACCORDING TO THE MAINTENANCE ACTION OR COMPONENT REPLACED:

The test items in the following table are a general proposal. Their extent may be adapted by the operator depending on the maintenance action performed.

TEST SHEETS No →	0	1		2				3		4	5	6	7
MAINTENANCE ACTION OR COMPONENTS REPLACED ↓		A	B	A	B	C	D	A	B				
ENGINE OR MODULE	●	●	●	●	/	/	●	/	♦	/	♦	♦	♦
MGB OR MODULE	●	/	/	●	●	●	●	●	/	♦	●	/	/
MAIN ROTOR HUB OR BLADE CHANGE	●	/	/	●	●	/	●	●	/	♦	●	/	/
TAIL ROTOR	●	/	/	●	♦	/	●	/	/	/	/	/	/
HYDRAULIC SYSTEM	●	/	/	●	/	●	●	/	/	/	/	/	/
VEMD	●	●	●	●	/	/	●	/	/	/	/	/	/

(♦) Refer to test sheet.

SHEET No. 0	HELICOPTER EC 120 B	FLIGHT REPORT

AIRCRAFT S/N :

AIRFIELD .... :
DATE .... :
CREW .... :

TAKE-OFF TIME .... :
LANDING TIME .... :
FLIGHT TIME .... :
ENGINE STARTS .... :

PILOT .... :
CREW MEMBER .... :

VEMD

VEMD Flight Number :

VEMD Flight Duration :

Cycles NG Partial Total

Cycles NF Partial Total

Overlimit detected : YES NO
Overlimit origin, value, duration :

WEATHER

Wind direction. :
Wind velocity.. :
OAT .... :
QNH .... :
QFE .... :
Hp.................... :

VEMD

Failures detected : YES NO
Failure codes and time :

WEIGHT

EQUIPPED EMPTY WEIGHT :
CREW .... :
BALLAST .... :
ZERO FUEL WEIGHT .... :
FUEL.. :
ALL-UP WEIGHT (AUW) ..... :
CG .... :

UNITS USED (cross out as applicable)

WEIGHT :		kg	lb
FUEL :		kg	lb
	UK gal	l	US gal
ALTITUDE:		m	ft
AIRSPEED:		kt	km/h
			MPH

MAIN WORK COMPLETED BEFORE FLIGHT

REMARKS MADE BY CREW AFTER FLIGHT

SPECIFIC OPTIONS

CREW SIGNATURE

SHEET No. 1A	HELICOPTER EC 120 B	VEMD CONFIGURATION AND MEMORY	
TEST PHASES AND REQUIREMENTS		**RESULTS TO BE OBTAINED/LIMITATIONS**	**RESULTS OBTAINED**
Before starting: Warning lights test: [**W/LT TST**]........PRESS. Brightness variation using lighting selector Brightness variation using +/- pushbutton on VEMD		Test pattern on both screens and VEMD software reference number Identical variation on both screens Identical variation on both screens	Reference number : ☐ YES ☐ NO ☐ YES ☐ NO ☐
VEMD CONFIGURATION MODE • Select CONFIGURATION MODE OFF1 and OFF2 then hold SELECT and ENTER and simultaneously: OFF1 and OFF2		Confirm options and units used on customer's aircraft. CONFIGURATION MENU pages appears: AUXILIARY FUEL TANK: BATTERY TEMPERATURE PROBE: GPS: FLOWMETER: SLING: UNIT SYSTEM: ALTITUDE UNIT: FUEL UNIT: • Display TRQ CALIBRATION MANUAL page - Refer to engine log book, to enter output voltage (mV) associated with the torque (%) • Display TRQ CALIBRATION AUTO page - Refer to engine log book, to enter torque pressure (kPa) in test bench pressure transmitter: Output voltage (mV) is automatically displayed	GOOD ☐ BAD ☐ I ☐ N/I ☐ I ☐ N/I ☐ I ☐ N/I ☐ I ☐ N/I ☐ I ☐ N/I ☐ SI ☐ IMPERIAL ☐ FEET ☐ METERS ☐ Kg/Lb ☐ L ☐ US G ☐ UK G ☐ mV / % ☐ POINT 1 0 ☐ POINT 2 50 ☐ POINT 3 80 ☐ POINT 4 103 kPa / % ☐ POINT 1 0 ☐ POINT 2 50 ☐ POINT 3 80 ☐ POINT 4 103

SHEET No. 1B	HELICOPTER EC 120 B	VEMD CONFIGURATION AND MEMORY	
TEST PHASES AND REQUIREMENTS		**RESULTS TO BE OBTAINED/LIMITATIONS**	**RESULTS OBTAINED**
VEMD MAINTENANCE MODE • Select MAINTENANCE MODE OFF1 and OFF2 then hold SCROLL and RESET and simulta-neously: OFF1 and OFF2		MAINTENANCE MENU pages appears: "FLIGHT REPORT" page ⇒ SELECT → ENTER Record last "VEMD flight" data : FLIGHT NUMBER DURATION CYCLES NG CYCLES NF OVERLIMIT DETECTED Record origin, value and duration FAILURE DETECTED Record code, type and time	GOOD ☐ BAD ☐ Number: ☐ Duration: ☐ Partial NG: ☐ Total NG: ☐ Partial NF: ☐ Total NF: ☐ YES ☐ NO ☐ ☐ YES ☐ NO ☐ ☐
VEMD CYCLE COUNTING (after removal and installation)		- Removed VEMD (1) cycles - Installed VEMD (2) cycles • Correction value of new VEMD cycles	NG (1) ☐ NF (1) ☐ - - NG (2) ☐ NF (2) ☐ = ☐ = ☐

SHEET No. 2A	HELICOPTER EC 120 B	GROUND RUN	
TEST PHASES AND REQUIREMENTS		**RESULTS TO BE OBTAINED/LIMITATIONS**	**RESULTS OBTAINED**
BEFORE ENGINE STARTING		Record parameters:	Hp: ☐ OAT: ☐
		Battery Voltage ≈ 25 V	U: ☐
ENGINE STARTING Comply with the normal procedures of the Flight Manual SECTION 4		Battery Voltage ≥ 18 V	U min: ☐ T4 max: ☐
		• On warning panel :	
• Ng ≈ 50%		GENE Light off	Correct / Incorrect
• Ng = 60%		FLI page is diplayed on VEMD	Correct / Incorrect
• 150 ≤ NR ≤ 340 rpm		MGB.P Light off	Correct / Incorrect
• Engine in stabilized IDLE		HYDR Light off	Correct / Incorrect
• 45% ≤ Ng ≤ 65 %		ENG. P Light off	Correct / Incorrect
• "HORN" is engaged		Low NR warning sounds for 250 ≤ NR ≤ 370 rpm	Alarm ON: rpm Alarm OFF: rpm
Record parameters when twist grip in FLIGHT position		Nf = NR stabilized between 388 and 395 rpm	Fuel QTY: ☐ Tq: ☐ T4: ☐ Ng: ☐ U Batt: ☐ U Gen: ☐ I Batt: ☐ I Gen: ☐ Eng. oil P: ☐ Eng. oil Temp: ☐ NR: ☐ Nf: ☐ FLI: ☐

SHEET No. 2B	HELICOPTER EC 120 B	GROUND RUN
TEST PHASES AND REQUIREMENTS	**RESULTS TO BE OBTAINED/LIMITATIONS**	**RESULTS OBTAINED**
Aircraft on ground, full low pitch. **<u>MAIN ROTOR TRACK</u>** Record track with stroboscope . TRACK CHECK : The setting must be carried out with the yellow (■) blade as reference.	Full low pitch NR stabilized NR between 388 and 395 rpm • Blade track difference is to be < ½ target.	See main rotor track tables below
<u>MAIN ROTOR BALANCING</u> **NOTE** **Correct blade tracking is to be done prior to rotor balancing.**	• Unbalance < 0.20 IPS Maximum loading per sleeve: Refer to AMM	See main rotor balancing table below
<u>TAIL ROTOR BALANCING</u> To be performed only after maintenance action on tail rotor.	• Unbalance < 0.20 IPS	See tail rotor balancing table below

Main rotor blade track	Pitch rods adjustments: Red	Pitch rods adjustments: Blue

Main rotor blade track	Pitch rods adjustments: Red	Pitch rods adjustments: Blue

Main rotor blade track	Pitch rods adjustments: Red	Pitch rods adjustments: Blue

Unbalance		Sleeve load adjustments		
Amplitude	Phase	Red	Yellow	Blue

Unbalance		Sleeve load adjustments	
Amplitude	Phase	Point Nb	Load

SHEET No. 2C	HELICOPTER EC 120 B	GROUND RUN	
TEST PHASES AND REQUIREMENTS		**RESULTS TO BE OBTAINED/LIMITATIONS**	**RESULTS OBTAINED**
HYDRAULIC CHECKS (on ground) **CAUTION** **If not locked, the collective will move up when the accumulators are depleted or when the hydraulic cut-off switch is set to OFF.** - Twist grip in ground idle position - Collective locked HYDRAULIC ACCUMULATOR TEST			
• [**ACCU TST**] or [**HYDR**]:.......ON		**HYDR** Comes ON + GONG	GOOD ☐ BAD ☐
Move the cyclic stick along the longitudinal and lateral axes (± 10% total travel) until control loads are felt.		The loads must not appear before 3 or 4 maneuvers have been made	GOOD ☐ BAD ☐
• [**ACCU TST**] or [**HYDR**]:.......OFF		**HYDR** Off after 2 to 3 sec.	GOOD ☐ BAD ☐
HYDRAULIC SHUT OFF TEST			
• [**HYD**] on collective grip:.......OFF		**HYDR** Comes ON + GONG Control loads are immediately felt	GOOD ☐ BAD ☐
• [**HYD**] on collective grip:.......ON		**HYDR** Off	GOOD ☐ BAD ☐

SHEET No. 2D	HELICOPTER EC 120 B	GROUND RUN	
TEST PHASES AND REQUIREMENTS		RESULTS TO BE OBTAINED/LIMITATIONS	RESULTS OBTAINED
ENGINE SHUT-DOWN Apply normal procedures Refer to flight manual SECTION 4			
- Twist grip in ground IDLE position		• $66\ \% \leq Ng \leq 70\ \%$.	Ng Idle ☐ %
- Check of the injection protection Engine starting pushbutton..........................PRESS		• No engine flame-out	GOOD ☐ BAD ☐
- Twist grip in anti flame-out stop position		• Stabilization	GOOD ☐ BAD ☐
		• Check the position of the angular index of the regulator $\geq 25°$	GOOD ☐ BAD ☐
		After 60 sec. • VEMD : 3 informations mode (for $Ng \leq 50\ \%$)	GOOD ☐ BAD ☐
- Twist grip in OFF position			
- Rotor braking time		Fully apply rotor brake at 150 rpm ($t \approxeq 25$ sec.)	Duration ☐ sec.
- Flight report page		"FLIGHT REPORT" display when Nf < 80 rpm.	GOOD ☐ BAD ☐
		Record parameters: FLIGHT NUMBER	No: ☐
		DURATION	Duration: ☐
		CYCLE NG	Partial NG: ☐ Total NG: ☐
		CYCLE NF	Partial NF: ☐ Total NF: ☐
		OVERLIMIT DETECTED	YES ☐ NO ☐
		Record origin, value and duration	☐
		FAILURE DETECTED	YES ☐ NO ☐
		Record code, type and time	☐

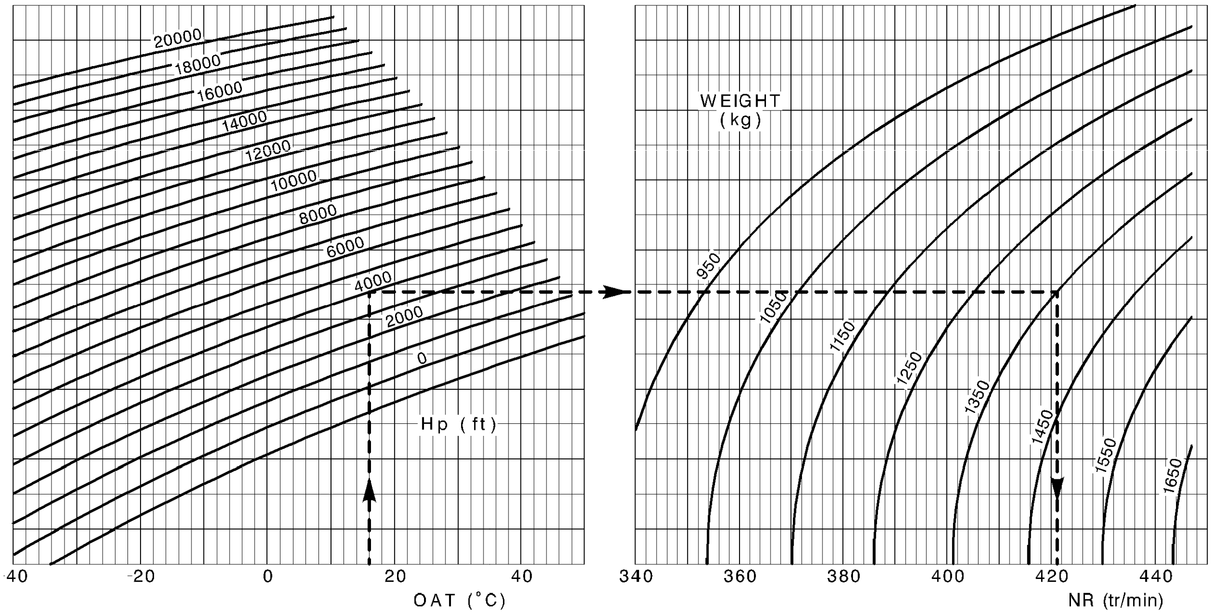
SHEET No. 3A	HELICOPTER EC 120 B	HOVER FLIGHT	
TEST PHASES AND REQUIREMENTS		**RESULTS TO BE OBTAINED/LIMITATIONS**	**RESULTS OBTAINED**
Aircraft on ground			
GROUND RESONANCE CHECK On hard surface: Check with cyclic movements (± 5% of the full tavel) at full low pitch and with Tq = 35%		No diverging oscillations: Convergence between 3 to 4 cycles Full low pitch: Tq = 35%	GOOD ☐ BAD ☐ GOOD ☐ BAD ☐
		NOTE **Some non diverging oscillations are permissible if the phenomenon stops when cyclic is set back to neutral position and collective at full low pitch.**	
TRACK AND BALANCE CHECK			
Check main rotor balance		Record data: • Unbalance to be < 0.2 IPS	Peak amplitude ____ IPS Phase ____
Check main rotor blade track		Record data using a stroboscope: • Blade track difference is to be < ½ target	Track: ____ ____ ____ ____

SHEET No. 3B	HELICOPTER EC 120 B	HOVER FLIGHT
TEST PHASES AND REQUIREMENTS	**RESULTS TO BE OBTAINED/LIMITATIONS**	**RESULTS OBTAINED**
This test must be performed after major engine maintenance or after maintenance on the fuel control system		
HOVER FLIGHT CHECK		
Increase collective to hover At 6 ft (1.8 m) in 2 sec.	• The rotor speed decay must be weak and is followed by a smooth NR increase	GOOD ☐ BAD ☐
	• No low NR audio warning	GOOD ☐ BAD ☐
HOVER CHECK		FLI: ☐
	Record data:	FUEL QTY: ☐ NG: ☐ %
		FF*: ☐ T4: ☐ °C
		END*: ☐ TRQ: ☐ %
		U/GEN: ☐ V I/GEN: ☐ A
		Eng oil T: ☐ °C Eng oil P: ☐ bar
		NR: ☐ rpm

(*) If installed

SHEET No. 4	HELICOPTER EC 120 B	AUTOROTATION 65 kt (120 km/h)
TEST PHASES AND REQUIREMENTS	**RESULTS TO BE OBTAINED/LIMITATIONS**	**RESULTS OBTAINED**
ADJUSTMENT OF THE LOW PITCH STOP	**Max. NR power off: 447 rpm**	
This test must be performed after any maintenance action that may affect the rigging of the main rotor control system If possible, perform with AUW < 1450 kg (3197 lb)	Record parameters:	AUW: ☐ FUEL QTY: ☐ Hp (Zp): ☐ OAT: ☐
Perform a stabilized autorotation with: Vy = 65 kt (120 km/h) and collective on the low pitch stop Check that the engine is desynchronized (NR > Nf). If it is impossible to set the collective on the stop without exceeding the max. rpm, decrease the altitude if possible or decrease the AUW		NR: ☐ rpm Target NR: ☐ rpm
NOTE **If the test is performed with the SURFAIR skis installed, add 4 rpm to the NR obtained before comparing the value with the NR given by the chart**	NR must be in compliance with the value determined by the following chart – 0 /+ 10 rpm	GOOD ☐ BAD ☐
CHECK OF MAX. NR WARNING Adjust the collective to obtain NR > 420 rpm	High NR audio warning sounds for NR > 420 rpm	GOOD ☐ BAD ☐

SHEET No. 4	HELICOPTER EC 120 B	AUTOROTATION 65 kt (120 km/h)
CONDITIONS		ROTOR SPEED IN AUTOROTATION 65 kt (120 km/h)



EXAMPLE:

OAT = + 16°C
Hp = 4000 ft

AUW = 1350 kg

=> ROTOR SPEED = 421 rpm

SHEET No. 5	HELICOPTER EC 120 B	MAXIMUM CONTINUOUS POWER LEVEL FLIGHT
TEST PHASES AND REQUIREMENTS	**RESULTS TO BE OBTAINED/LIMITATIONS**	**RESULTS OBTAINED**
NR IN MCP LEVEL FLIGHT CHECKS		
All air bleeds shut-off	Hp = 0 to 3000 ft (914 m) NR = 410 - 414 rpm Hp > 3000 ft (914 m) NR = 412 - 415 rpm	Hp (Zp): NR:
ROTOR TRACK AND BALANCE CHECK This check is not to be performed if only engine or module concerned.		
Check rotor unbalance	Unbalance < 0.2 IPS	1ΩY: IPS Phase:
Check 1 ΩZ vibration level	Record 1 Ω nose section accelerometer data: - Using nose accelerometer diagram, determine red and blue blade tab settings. • Max. amplitude < 0.2 IPS	1ΩY: IPS Phase: Tabs adjustments: Red: IPS Blue:
Check main rotor blade track	Confirm settings using the stoboscope: • Max. rotor track < 1 target **NOTE** **The best setting is rarely obtained with a perfect track.**	Track:
ENGINE POWER CHECK Check all P2 bleed air consumers off. Set power to obtain MCP. Stabilize at least 2 min. before switching to ENGINE POWER CHECK page. (Use any of the SCROLL pushbutton).	Record data:	IAS: NR: NG: NF: T4: Hp (Zp): TRQ: OAT: T4 MARGIN TRQ MARGIN GOOD BAD GOOD BAD

SHEET No. 6	HELICOPTER EC 120 B	MAXIMUM TAKEOFF POWER CHECK
TEST PHASES AND REQUIREMENTS	**RESULTS TO BE OBTAINED/LIMITATIONS**	**RESULTS OBTAINED**
This test must be performed after major engine maintenance action or after maintenance on the fuel control system.		
MAXIMUM TAKEOFF POWER CHECK	Refer to FLM SECTION 2 "LIMITATIONS"	
Check all P2 bleed air consumers off With IAS < 40 kt (74 km/h) increase collective to obtain TOP limit.	Record data: **CAUTION** **10 < Max. FLI < 10.4 with t < 5 sec.**	Hp (Zp): ☐ OAT: ☐ FLI: ☐ NG: ☐ T4: ☐ TRQ: ☐
NOTE **This check is to be performed at an altitude when TOP is limited by Ng or T4.**		
Max. power audio warning check	Max. power audio warning sounds for FLI > 10 for more than 1.5 sec.	GOOD ☐ BAD ☐

SHEET No. 7	HELICOPTER EC 120 B	PREFERENCE INJECTOR VALVE TEST (AS SCHEDULED BY THE ENGINE MANUFACTURER)
TEST PHASES AND REQUIREMENTS	**RESULTS TO BE OBTAINED/LIMITATIONS**	**RESULTS OBTAINED**
BEFORE ENGINE STARTING And after changing the setting of the idle stop (in accordance with the Aircraft Maintenance Manual task).		
Record the setting of the idle stop on the fuel control unit from the FLIGHT position	Fuel control unit setting = 25°	Setting:
ENGINE STARTING		
Comply with the normal procedures of the Flight Manual SECTION 4.	Engine oil temperatur stabilized	Oil engine T°:
Quickly reduce the twist grip from the FLIGHT position to the IDLE position (perform a total of 3 tests)	The engine must not flame out	1st test: GOOD BAD 2nd test: GOOD BAD 3rd test: GOOD BAD
ENGINE SHUTDOWN Comply with the normal procedures of the Flight Manual SECTION 4.		

NOTE: Do not omit to re-adjust the pitch in accordance with the Aricraft Maintenance Manual task.

SECTION 9

OPERATIONAL INFORMATION

CONTENTS

PAGE

9.7 to 9.11 Not used

9.12 ADDITIONAL LANDING LIGHT, CONTROLLABLE IN ELEVATION AND AZIMUTH

9.13 Not used

9.14 FOLDING STRETCHER INSTALLATION

9.15 to 9.17 Not used

9.18 NOISE REDUCTION

9.19 Not used

9.20 RADIO ALTIMETER (AHV 16)

SECTION 9.1

RECOMMENDATIONS FOR CARGO SLING OPERATIONS

1 PERSONNEL TRAINING

Cargo sling operations may only be conducted by pilots who already have considerable experience with this type of aircraft.

No pilot should perform solo external load flights without first having accomplished such operations with a qualified instructor.

Mechanics on ground duty must be fully informed by the pilot before each new operation, in particular as regards:

- Their position on the ground considering the proposed flight path,
- The direction in which to move away,
- The hook-up operation,
- Hand signals to be used or radio instructions,
- Protective equipment: Helmets, gloves, goggles (if applicable),
- The number of round trips between refueling operations,
- The manner of retrieving slings and nets.

2 MANDATORY PRE-OPERATIONAL CHECKS

- Helicopter condition:

  In addition to the normal pre-flight checks of the helicopter, the release unit must be carefully inspected and the mechanism checked for correct release operation,
- Condition of sling equipment:

  The nets, straps and slings must be examined thoroughly. Any worn or frayed components are to be discarded.
- Preparation of loads:

  Make sure that all participants are well aware of the weight of the loads.
  Ensure that the method of suspension is understood.
- Condition of loading and unloading areas:

  Remove or tie down all that might be displaced by the rotor downwash.
- Total weight of helicopter with load:

  Define maximum acceptable load compatible with terrain configuration and atmospheric conditions. The maximum all up weight of the aircraft is that at which HOGE can be held over the higher of the take-off or landing platforms.

3 AIRBORNE LOADS

Heavy loads, such as bags of cement or drums of kerosene, which are carried in a net, present no particular problem.

Special precautions must be taken in the case of bulky loads, which have a tendency to oscillate and even to "float" during transport on the sling.

Permeability to air can have a stabilizing effect on a bulky load.

Never carry an airfoil alone: There is a great risk of the airfoil flying up into the tail rotor.

If several cables are used to sling the load, they must be long enough to form an angle of less than 45° between cables at the point of suspension under the helicopter; experience shows that oscillation of the load is thus less likely to occur.

On the other hand, if the load is slung on a single sling cable, it is preferable that a fairly short cable be used as there is then less risk of the load swinging, and it is easier to judge the height of the load during approach.

For the retrieval of crashed helicopters, it is generally possible to use a lifting ring on the rotor mast.

Airplanes are carried using straps passing under the fuselage or under the wings. The cables must be attached in such a way that the airplane is in a slight nose-down attitude when the helicopter is in hover.

4 IN-FLIGHT PRECAUTIONS

After hooking on the load, the ground mechanic is to check the position of the sling cables then move away. The pilot must then make sure that the mechanic has moved clear and then be advised by signs that he may lift off the load.

Power must be applied slowly enough to allow the helicopter to center itself above the load.

A vertical take-off must be made, avoiding dragging the load along the ground or striking any obstacle.

If the load starts to swing, slowly reduce speed or make a gentle left turn.

Approach must be made head into the wind with gradual reduction in airspeed, and transition into hover high enough above the ground to eliminate the risk of dragging the load.

Set the load down, then reduce collective sufficiently to slacken the cables before opening the release unit hook; this also allows the pilot to ensure that the load is deposited. If the cables are long enough, move sideways a little before opening the hook, to prevent the ring and tackle from falling onto the freight.

Even after the mechanic has signaled that the load is released, move away as if it were not; this is an advisable precaution against possible misinterpretation of signals.

Never fly away with an empty net or an unballasted sling.

5 CARGO RING SIZE RULE

- Care must be taken when hooking a load on the cargo hook.
- It is the responsibility of the operator to ensure that the cargo hook will operate properly with each ringging.
- A placard located on both sides of the A/C illustrates the following:
  - Cables, straps, ropes, etc. must not be used directly on the cargo hook,
  - Only one primary ring linked to a unique secondary ring shall be attached to the cargo hook.
- Cargo hook ring size shall obey the following rules:

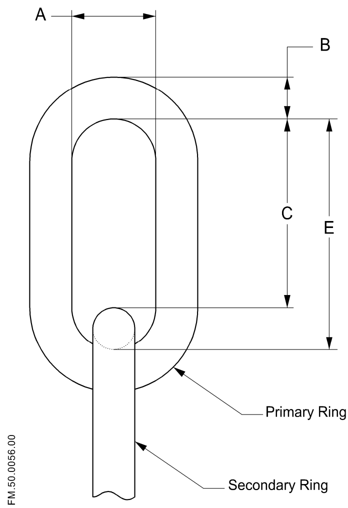


Figure 1: Cargo ring

Cargo Hook manufacturer	Cargo hook reference	**A**	**B**	**C**	**E**
Indraero SIREN	AS 21-8-B	50-100mm	12mm-16mm	> 50mm	< 100mm

SECTION 9.2

EMERGENCY LOCATOR TRANSMITTER (KANNAD 406 AF-H OR 121 AF-H)

1 GENERAL

The KANNAD 406 AF-H or 121 AF-H radio beacon is an emergency transmitter which is used to locate the helicopter in case of an emergency.

The KANNAD 121 AF-H radio beacon transmits simultaneously on the international frequencies of 121.5 MHz, 243 MHz.

The KANNAD 406 AF-H radio beacon transmits simultaneously on the international frequencies of 121.5 MHz, 243 MHz and 406.025 MHz.

The transmitter starts operating automatically in case of impact. It may be switched on manually via the switch located on the lower face of the transmitter or via the remote control switch located on the instrument panel.

2 DESCRIPTION OPERATION

- Components and location:
  - A transmitter (1), with an [**ARM-OFF-ON**] switch, attached to the structure inside the rear cargo hold on the right side,
  - An [**ON-ARMED-RESET TEST**] control switch located on the instrument panel (2),
  - An external antenna between the tail boom and the engine cowl on the right side (3).

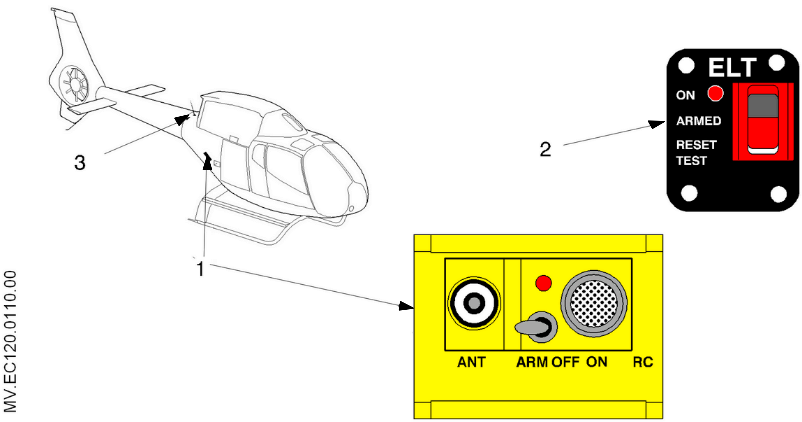


Figure 1: Remote control switch and emergency locator KANNAD 406 AF-H or 121 AF-H

3 OPERATING PROCEDURE

- Preflight check:

  Check the following on the transmitter:

  - The switch is set to "ARM".
    Check the following on the instrument panel:
  - The remote control switch is set to "ARMED".

- Functional test:

NOTE

Test procedure is to be conducted only once per month.

The self test mode is a temporary mode.
This mode is selected either:

- By switching the switch on the ELT from "OFF" to "ARM",
- By selecting "RESET TEST" on the remote control panel (provided that the switch on the ELT is set in the "ARM" position).

The buzzer operates during the self test procedure.

CAUTION

As the ELT transmits on emergency frequencies, the self-test should be carried out only after authorisation by the control tower. If it is not possible to contact a control tower, the self-test must be carried out in the first five minutes of each hour.

NOTE

It is strictly prohibited to test the ELT by transmitting.

- Postflight check:

  After landing, set the VHF receiver to 121.5 MHz to ensure that the ELT has not accidentally been switched on.

NOTE

If the aircraft is to be grounded for a long time, set the switch on the ELT to the "OFF" position.

- Automatic operation:

  The transmitter is activated automatically in the event of an impact providing the switches are set to "ARMED".

  NOTE

  The "RESET TEST" position stops locator transmitting and resets the impact detector.

- Manual operation:

  The unit may be activated manually by setting the control switch to "ON".

- Autonomous operation:

  The transmitter may be used for self-contained operation on the ground as follows:

  - Remove the transmitter from its mounting bracket,
  - Disconnect the coax from the aircraft antenna,
  - Choose an unobstructed area,
  - Extend the built-in tape antenna,
  - Place the unit upright with the antenna upward,
  - Switch on the transmitter by setting the [**ARM-OFF-ON**] switch to "ON".

SECTION 9.4

EMERGENCY LOCATOR TRANSMITTER (ELT 96 - 406)

1 GENERAL

The ELT 96- 406 radio beacon is an emergency transmitter which is used to locate the helicopter in an emergency.

It transmits simultaneously on the international frequencies (121.5 - 243 - 406 MHz).

The transmitter starts operating automatically in case of impact or in case of breakage of the electric cable loom A-B between the remote control switch and the emergency locator.

It may be switched on manually via the switch located on the top face of the transmitter or via the remote control switch located on the instrument panel.

2 DESCRIPTION OPERATION

- Components and location:
  - A transmitter (4) attached to the structure inside the rear RH cargo hold.
  - An external label indicating transmitter location (5).
  - An [**AUTO-MANU**] control switch located on the instrument panel on the left hand side (2).
  - An [**AUTO TEST/RESET**] pushbutton located next to the control switch (1).
  - A amber "XMIT ALERT" indicator light located on the instrument panel on the right hand side (3).
  - A 3 A circuit breaker on CCBP.
  - An external antenna (6).

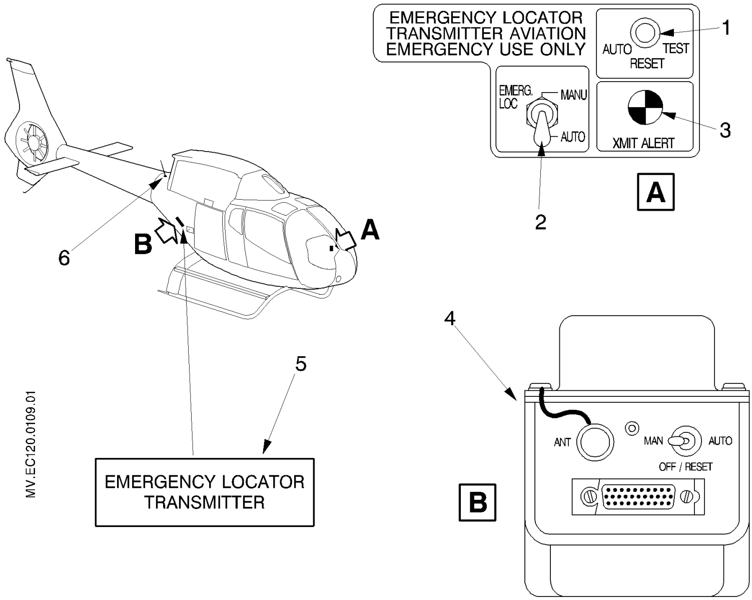


Figure 1: Remote control switch and ELT 96-406

3 TESTING PROCEDURE

NOTE

The manual testing procedure for ELT 96- 406 is prohibited.

Only the following auto-test procedure is authorised:

- Perform the test, by pressing the [**AUTO TEST/RESET**] (1) pushbutton.
- The amber "XMIT ALERT" (3) light comes on for approximately 1.5 sec.

4 OPERATING PROCEDURE

- Preflight check:

  Check the following on the transmitter:

  - The connector is plugged in.
  - The switch is set to "AUTO".

CAUTION

If the switch is set to "AUTO" and the connector is unplugged, the transmitter will operate.

  Check the following on the instrument panel:

  - The remote control switch is set to "AUTO".

NOTE

If the indicator light flashes, it indicates that the batteries are faulty or the transmitter is inoperative.

- Postflight check:

  After landing, check for untimely transmitter operation (the amber "XMIT ALERT" light should be extinguished).

- Automatic operation:

  The transmitter will begin operating automatically in case of impact if the remote control switch is set to the "AUTO" position. The amber "XMIT ALERT" light comes on during transmitter operation.

  Resetting the impact detector:

  - Control switch set to "AUTO".
  - Press the [**AUTO TEST/RESET**] pushbutton.
  - The transmitter should stop operating.

NOTE

If the transmitter continues transmitting, perform the operation again. If, after several attempts, the transmitter remains in operation, set the switch on its top face to "OFF".
In the event of untimely activation, advise the local authorities and provide the aircraft call sign.

- Manual operation:

  The transmitter will begin operating when the remote control switch is set to "MANU". The amber "XMIT ALERT" light comes on during transmitter operation.

- Portable operation:

  This transmitter may be used on the ground, as follows:
  - Set the switch to "OFF".
  - Remove the transmitter from its mounting bracket.
  - Choose an unobstructed area.
  - Hold the transmitter in the vertical position with the antenna upwards.
  - Set the switch to "MAN/RESET" to begin transmission.

SECTION 9.6

EMERGENCY LOCATOR TRANSMITTER (JOLLIET JE-2 NG)

1 GENERAL

The JOLLIET JE-2 NG emergency locator transmits radio beacon signals simultaneously on the international distress frequencies (121.5 MHz and 243.0 MHz) to aid helicopter search and rescue operations.

The unit operates automatically in the event of crash impact exceeding 5 g along the accelerometer axis.
It may be operated manually by means of a [**MANU-RST/OFF-AUTO**] switch (3) on the transmitter front panel, or by means of a [**MANU-AUTO**] (2) remote control switch, on "MANU" position.

2 DESCRIPTION - OPERATION

- Components and location:
  - A transmitter, located on the RH side in the cargo hold: a placard (4) indicates its location and its use in the cockpit (1).
  - An external antenna (6) permits signal transmission when operated on board.
  - A cockpit remote control switch.
  - A flexible antenna (5) on the transmitter can be used in manual operation outside the helicopter.

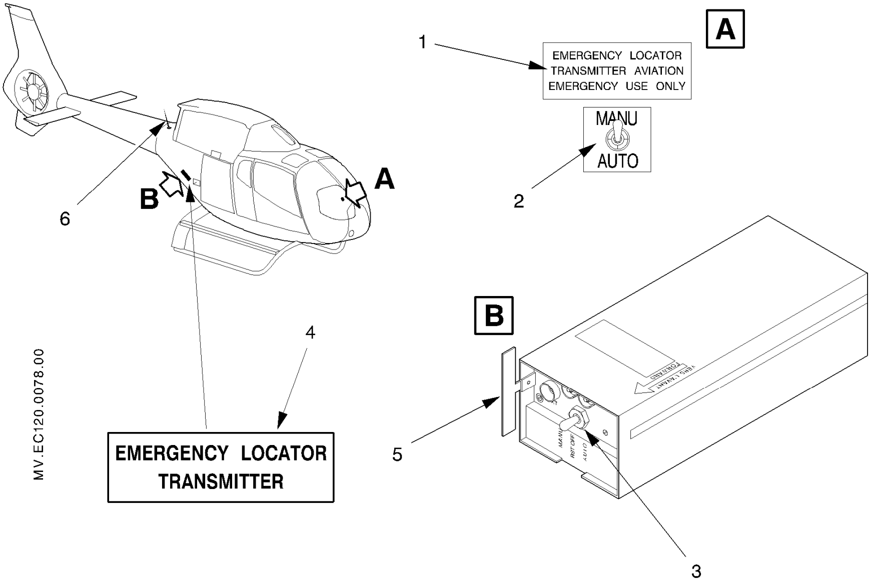


Figure 1: Remote control switch and emergency locator

3 TESTING PROCEDURE

NOTE

Testing is authorized only during the first five minutes of each hour for no more than three consecutive audio signals.

- Select an international distress frequency (121.5 MHz or 243.0 MHz) on the aircraft VHF or UHF system.
- Set the [**AUTO-MANU**] remote control switch to "MANU" for approximately one second.
- The transmitter output signal should be audible in the headphones.
- Set the switch to "AUTO".

4 OPERATING PROCEDURE

- Preflight Checks
  - In cockpit: Check that remote control switch is set to "AUTO".
  - On transmitter: Check that [**MANU-RST/OFF-AUTO**] switch is set to "AUTO".

- Postflight Check

  After landing, set the VHF communications receiver to 121.5 MHz to ensure that the ELT has not accidentally been switched on.

- Automatic Operation

  The transmitter is activated automatically in the event of an impact of at least 5 g (assuming the [**MANU-AUTO**] switch is set to "AUTO").

NOTE

The impact detector (accelerometer) may be reset by means of the switch control on the transmitter front panel on "RST/OFF" position (2 to 3 sec.). The reset stops the transmitter output signals if the unit is operating

- Manual Operation

  The unit may be actuated manually by setting the control switch to "MANU".

- Portable Operation

  The transmitter may be used for self-contained operation on the ground as follows:
  - Remove the transmitter from its mounting bracket.
  - Choose an unobstructed area.
  - Extend the built-in whip antenna.
  - Place the unit upright with the antenna upward.
  - Switch on the transmitter by setting the [**MANU-RST/OFF-AUTO**] switch to "MANU".

- Complete cut-off

  Set the transmitter switch to "RST/OFF".

SECTION 9.12

ADDITIONAL LANDING LIGHT, CONTROLLABLE IN ELEVATION AND AZIMUTH

1 GENERAL

The additional landing light (3), controllable in elevation and azimuth, is an optional equipment intended to improve safety during approach and taxiing maneuvers.

This optional equipment is mounted on the underside of the lower structure, in the center of the fairing in front of the forward cross-tube of the landing gear.

Its power is 450 W.

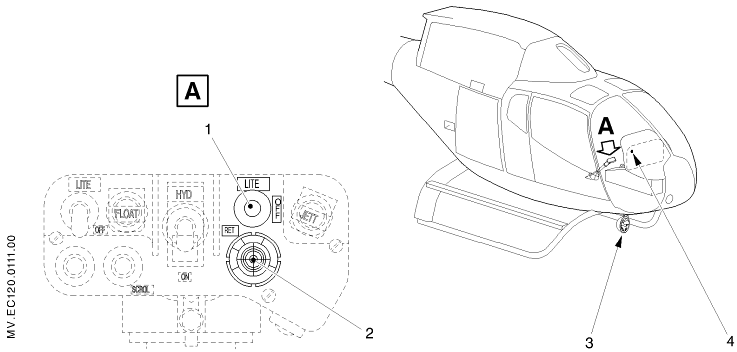


Figure 1: Additional landing light, controllable in elevation and azimuth

2 DESCRIPTION

The installation comprises:

- A retractable and swiveling light (3),
- A three-way switch (1) on each (pilot's and copilot's) collective grip. This switch is used to switch the light and retract it automatically,
- A four-way switch (2) on each (pilot's and copilot's) collective grip. This switch is used to control the light in elevation and azimuth,
- A blue "LAND LT" indicator light (4) on the instrument panel, which shows that the landing light is switched on.

3 OPERATION

The landing light is switched ON or OFF by means of the three-way switch [**ON-OFF-RETRACT**] on the collective grip:

- When the switch is in the "ON" position, the landing light is switched on and the "LAND LT" indicator light is on,
- When the switch is in the "OFF" position, the landing light is switched off and the "LAND LT" indicator is off,
- The spring-loaded "RETRACT" position of the switch is used to switch off and retract the landing light automatically.
- **In this way, the landing light will always be switched off in the retracted position.**

  The extension and orientation of the landing light are controlled by means of the four-way switch.

4 PROTECTION OF THE CIRCUITS

The circuits are protected by means of:

- A 3 A fuse for the control circuits,
- A 20 A fuse for the lighting circuit.

The fuses are located on the side panel of the cargo compartment.

SECTION 9.14

FOLDING STRETCHER INSTALLATION

1 GENERAL

The EC 120 helicopter can be equipped for the transport of one patient.

2 DESCRIPTION

- Fixed parts:
  - An anchoring plate
  - A base plate
- Removable parts:
  - A stretcher which can be disassembled into three parts
  - Two fittings
  - A set of straps
  - A stowage bag

3 OPERATING PROCEDURE

The stretcher is loaded on board preferably through the rear RH door, by two persons.

- Preflight check:
  - The stretcher must be correctly installed
  - The safety harnesses must be fastened
  - All shear pins retaining the stretcher must be fully engaged
- Prelanding check:
  - The safety harnesses must be fastened
  - All shear pins retaining the stretcher must be engaged

SECTION 9.18

NOISE REDUCTION

1 GENERAL

- Choose a flight path as far as possible from sensitive areas; otherwise, fly alongside the noisiest land routes (highways, railways),
- Fly at least at 1000 ft AGL,
- Fly if possible on the downwind side of sensitive areas,
- Maintain as much as possible steady flight, avoiding large pedal movements or over-control,
- Leave sensitive areas by turning to the right.

2 OPERATING IN SENSITIVE AREAS

- Fly-over:
  - Select IAS = 110 kt (204 km/h) for OAT = + 25°C,
  - Increase IAS slightly if OAT is higher, and inversely,
  - If possible, increase height to reduce the noise.

- Take-off and climbing from a helipad in a sensitive area:
  - After the shortest possible acceleration phase, once Vy is reached, set to MCP while maintaining Vy.

- Approach and landing on a helipad in a sensitive area:
  - Select IAS = 60 kt (111 km/h), with a rate of descent close to 1000 ft/min.

- Take-off from and landing on a helipad in a non sensitive area but adjacent to neighboring sensitive areas (seaside areas for example):
  - If possible choose a take-off path opposite to the sensitive area. Accelerate until Vy is reached, then start climbing at this speed with MCP,
  - If possible for landing, choose a path facing the sensitive area. Select Vy with a rate of descent close to 500 ft/min.

- Maneuvers near the ground (around hovering) in a sensitive area:
  - Avoid unnecessary hovering,
  - Avoid quick and repetitive pedal movements,
  - Prefer right spot turns.

SECTION 9.20

RADIO ALTIMETER (AHV 16)

1 GENERAL

The radio altimeter:

- Provides an accurate measurement of the aircraft height relative to the ground, regardless of the atmospheric conditions,
- Informs the crew when the aircraft descends below a decision height or below 100 ft*.

2 DESCRIPTION

2.1 COMPOSITION

The radio altimeter installation consists of:

- A transceiver,
- An indicator located on the instrument panel,
- A warning box,
- A transmission antenna,
- A reception antenna,
- A 3 A circuit-breaker located on the circuit breaker panel.

2.2 POWER SUPPLY

The system is powered by the aircraft 28 VDC power system.

The location of the circuit breaker that protects this system is given in SECTION 7.

(*) If installed

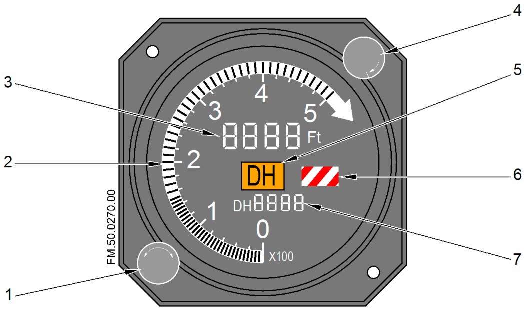
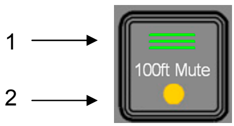


Figure 1: Radio altimeter indicator

Item	Description
1	"DH" selector: Decision Height setting
2	Scale 0 - 500 ft
3	Height digital display (0 to 8000 ft)
4	"ON/OFF/TEST" selector
5	"DH" indicator: The indicator flashes when the Decision Height is reached
6	Flag: The flag appears if: - The system is faulty, - In test mode, - Above 8000 ft.
7	Decision Height display

2.3 CONTROL (ON LACU)



Push-button.. DISENGAGED:

- Indicator light (1) : remains off,
- Indicator light (2) : remains off, ("100 ft" audio alert is audible).

Push-button.. ENGAGED:

- Indicator light (1) : comes on,
- Indicator light (2) : comes on, ("100 ft" audio alert is muted).

3 OPERATION

3.1 GENERAL

The radio altimeter is switched on using the ON/OFF/TEST selector (4) on the indicator.

The DH knob (1) is used to set the decision height.

A specific audio alert (800 Hz modulation chopped at 5 Hz) is produced when the helicopter descends through the decision height.

NOTE

The DH audio alert is (re-)armed after the helicopter climbs at least 20 ft above DH.

When hovering low or when landing with the radio-altimeter antenna(s) above grass or plant cover, the radio-height may become invalid (flag appears). Such invalidities are more likely to occur in the presence of wind.

3.2 "100FT" AUDIO ALERT (IF INSTALLED)

A specific audio alert (800 Hz modulation chopped at 15 Hz) is produced when the helicopter descends through 100 ft.

For operations around 100 ft where the recurrence of the "100 ft" alert may hamper aircrew performance, the "100 ft Mute" function may be used.

- "100 ft Mute" activation
  [**100ft Mute**] ....ENGAGED, CHECK
  the lights come on

- "100 ft Mute" de-activation
  [**100ft Mute**] ....DISENGAGED, CHECK
  the lights are off

NOTE

The "100 ft" audio alert is (re-)armed after the helicopter climbs above 120 ft.

4 TEST PROCEDURE

- Run-up checks:

  Check the radio altimeter installation:

  1. "ON/OFF/TEST" selector (4)........................... ON
  2. "DH" selector (1) .... CHECK, 0 <DH< 100 ft
  3. [**100ft Mute**] .... DISENGAGED, Lights off

  4. "ON/OFF/TEST" selector (4)........................... TEST and CHECK:
     - Display of all front face segments, (Test Height, Flag, DH value).
     - "100 ft" audio alert.
     - "DH" audio alert.

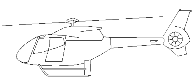
FLIGHT MANUAL APPENDIX

EC 120 B

P CHECK

IMPORTANT NOTE

The effectivity of the Appendix at the latest revision is specified on the list of effective pages.



Airbus Helicopters Direction Technique Support
Aéroport international Marseille-Provence 13725 Marignane Cedex - France

LIST OF EFFECTIVE PAGES

(1) AIRWORTHINESS EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- Indicated .... Specific to indicated civilian airworthiness.

(2) VARIANT OF STANDARD DEFINITION EFFECTIVITY:

- Without indication........... Applicable to all aircraft
- XXX................................ Specific to aircraft equipped with XXX

APPENDIX	PAGES	DATE CODE	(1)	(2)
APP.8.2.P1	1 to 1	16-26		
APP.8.2.P5	1 to 2	16-26		
APP.8.2	1 to 5	16-26		

LOG OF NORMAL REVISIONS

BASIC RFM REVISIONS - EFFECTIVITY (1) (2)

ISSUE 1: NR 0 to 1:

NORMAL REVISION 1 - NOVEMBER 2014	

ISSUE 2:

NORMAL REVISION 0 - date code 16-26	
Title	New issue
Revised information	All
Deleted information	None

1 GENERAL

The P CHECK consists in performing a visual or tactile inspection of the condition of a component, or an assembly, without the use of special techniques or tooling, in order to detect any discrepancies which could be detrimental to its correct operation.

The only reference for this operation is the MMA (Aircraft Maintenance Manual). The information presented hereafter is a duplication of the AMM, and intended for qualified operators.

2 OPERATION OF BASIC INSTALLATIONS

Remove all picketing and blanking equipment if necessary, or install it after inspection if the inspection is performed after the last flight of the day.

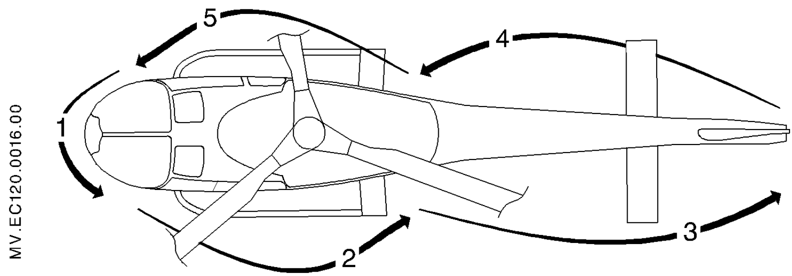


Figure 1: Sequence of checks

<u>SECTION 1:</u>

- Transparent panels ....Condition, cleanliness. Clean if necessary.
- Door pillars, canopy arches........................Condition.
- Pitot pressure port......................................Blanking removed or installed (as applicable).
- Sideslip indicator paddle ....Condition.
- Air intake ....Blanking cover removed or installed (intake not obstructed by snow or foreign body).

CAUTION

Do not drain fuel tanks at a temperature below 0˚C (32˚F).

SECTION 2:

- Front door jettison system..........................Condition, no cracks (especially at the link).
- Cabin access doors...................................Condition, attachment points, locking.
- Static pressure port...................................Blanking removed or installed (as applicable).
- Landing gear ....Condition.
- LH side engine-MGB cowling. ....Opening, condition of locking devices.
- Fuel tank (before the first flight of the day)..Drain, no fuel leaks (at plate).
- MGB..Oil level.
- Hydraulic compact unit..............................Oil level, attachment points, pipes, clogging indicator retracted.
- Servocontrols and hydraulic system...........Attachment points, absence of leak, pipes.
- MGB suspension bars...............................Condition, attachment points.

ENGINE AND ENGINE BAY

- Plenum chamber..Condition, attachment points.
- Engine and accessories............................General condition, absence of leaks, cleanliness, pipes.
- Engine casing ....Condition around bosses.
- Oil filter..Clogging indicator retracted.
- Fuel filter ....Pre-clogging indicator retracted.
- Engine..Oil level: Check the oil level 15 minutes maximum after engine shutdown. The oil consumption must not be more than 0.3 L/hr. Top up the oil to the "Max." level, if necessary. Then record the quantity of oil added to calculate the oil consumption.
- Oil system ....Absence of leaks.
- Engine controls ....Condition, absence of interference points.
- Engine mounts ....Condition, attachment points.
- Coupling Tube Assembly ....Condition, no cracks.
- Cowling upper access panel ....Closed and locked.
- Transmission and engine deck ....Condition, cleanliness, absence of leaks.
- Ports and drains in transmission deck........Unobstructed.
- Exhaust pipe ....Condition, blanking cover removed or installed
- LH engine-MGB cowling ....Closed and locked.
- Fuel tank (before first flight of the day) ....Bled, no fuel leaks (at support base).

CAUTION

Do not drain fuel tanks at a temperature below 0˚C (32˚F).

MAIN ROTOR HUB:

- Main rotor hub ....Attachment points, general condition of all components.
- Hub body (area where the drag damper is attached) ....Condition, no cracks.
- Laminated spherical thrust bearings (elastomeric part).........................Condition, no cracks. If an anomaly is detected refer to (62-21-00, 6-14)
- Bonding braids ....Condition.
- Droop restrainer ring contact surfaces ....Condition, greased.
- Droop restrainer ring ....Split ring in its recess.
- Blade droop restrainers.............................Condition.
- Frequency adapter (elastomeric part) ....Condition, no cracks. If an anomaly is detected refer to (62-21-00, 6-15)
- Frequency adapter ball ends......................Condition, attachment, no abnormal play, no burnishing.
- Pitch control rods ....Condition, absence of end-play.
- Swashplate ....Condition.
- Rotating and stationary scissors ....Condition.
- Swashplate guide......................................Condition.
- Anti-vibration system.................................Condition, rotates freely.
- Dome ....Condition, attachment points.
- MAIN ROTOR BLADES ....Attachment points, general condition, absence of bonding separations on the leading edge, absence of damage or erosion.
- Cargo bay door ....Opened.
- Battery...Condition, attachment points, connection condition.
- Cargo bay ....Check for no snow in the tail boom.
- Cargo bay door ....Closed.

SECTION 3:

- Horizontal stabilizer, fin, rotor tunnel, tail skid ....Condition, attachment points, condition of navigation lights.
- TRH, hub body and fairing ....Condition, absence of impact or crack, no rotation of fairing paint mark, clearance between blade tips and rotor tunnel.
- Tail rotor blades, visible part ....Condition, absence of score, erosion. Check for abnormal gap at the blades.
- Tail boom ....Condition, condition of antennas.

SECTION 4:

- TGB..Oil level.
- Stator ....Condition.
- Tail rotor blades ....Condition.
- Horizontal stabilizer, fin,
  rotor tunnel, tail skid ....Condition, attachment points, condition of navigation lights.
- Tail boom ....Condition, condition of antennas.

SECTION 5:

- Static pressure port ....Blanking removed or installed (as applicable).
- RH cargo bay door ....Opening, attachment points, condition.
- Electrical master box circuit- breakers ....Engaged.
- 2nd battery kit installed ....Condition, attachment points, connections, circuit breakers engaged.
- 2nd battery kit removed...........................Circuit breakers tripped, cables installed on their dummy connector.
- RH cargo bay door ....Closing, locking.
- Ground power plug access panel..............Closed.
- RH engine-MGB cowling..........................Opening, condition of locking systems.
- Fan and oil cooling radiator......................Condition, cleanliness, absence of leaks.
- Engine air intake and
  transmission deck ....Cleanliness, absence of foreign body.
- Servocontrols and hydraulic system...........Attachment points, absence of leaks, pipes.
- RH engine-MGB cowling..........................Closing, correct locking.
- Landing gear ....Condition.
- Lower central cowling.............................Closed.
- MAIN ROTOR BLADES ....Attachment points, general condition, absence of bonding separation on the leading edge, absence of damage or erosion.
- Cabin access door ....Condition, attachment, locking.
- Front doors jettison system ....Condition, no cracks (especially at the link).

CABIN INTERIOR:

- Seats...Condition, attachment points.
- Cabin...General cleanliness.
- Pedal unit blanking plate ....Fitted (in single pilot configuration).

3 OPERATION OF OPTIONAL INSTALLATIONS

The items of equipment concerned are listed below:

1. First aid kit ....Condition, security.
2. Upper and lower cable cutters ....Condition, security.
3. Sand filter...Condition, security, not clogged, filtering panel installed, dust cover removed or installed as applicable.
4. Windshield wipers ....Condition, security, condition of wiper blade.
5. Air conditioning system ....Condition of drive pulleys, condition of the belt, condition of the belt tensioning mechanism, attachment of the compressor.
6. Additional battery (starting in extreme cold weather conditions) ....Condition, security, condition of connections, circuit breakers closed or open as applicable.
7. Reinforced wear shoes, short or long ....Condition, security.
8. Electric Rear-View Mirror ....Condition, security.
9. Loading sling..Condition, security. Slightly grease (grease CM 115) the end of the load hook at the point where the bolt is attached.
10. Swivel light ....Condition, security.
11. Folding stretcher ....Condition, security.
12. Sand protection on main rotor blades ....Make sure that the sand protection is installed and in good condition.

    If wear > 50% or if the protective strip is missing or damaged, replace the element (62-11-00, 8-17).