

# ALOUETTE III AND LAMA HELICOPTERS TEST PROGRAMME

This document recapitulates the checks to be carried out in flight or on ground, rotor turning, either after a periodic inspection or after a major work or replacement of main components.

Checks are shown under the form of reproducible sheets which can be directly completed by the crew.

To prevent the possibility of giving values different from those of the flight manual, as this document may be frequently amended, the values to be found in the flight manual are identified by asterisk and are not mentioned on the various sheets.



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DIVISION HELICOPTERES

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**ALOUETTE III - LAMA**  
**TEST PROGRAMME**

AMENDMENT LIST		
Amendment N°	Pages amended	Date
1	Page 2 and Page 3 (revised) - Page 4 (new) Sheet 13 (3 new pages)	9-77 9-77 9-77

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RECOMMENDED PROGRAMME

In the performance of maintenance operations it is recommended, in certain events, to carry out checks with the rotor turning. Such checks must be made by competent personnel, since the observation of results will very often be misleading if the test conditions and configuration are not strictly adhered to.

The programmes are to be devised according to the circumstances. The most frequently used are :

EVENT	TYPE OF CHECK			SHEETS												
	GROUND RUN	CHECK FLIGHT	TEST FLIGHT	1	2	3	4	5	6	7	8	9	10	11	12	13
Pre- T1 T2 inspection	x			x												
Pre-Overhaul	x	x		x	x	x	x			x	x			x		
Post T1 T2	x		x	x	x	x								x		
Post Overhaul	x		x	x	x	x	x	x	x	x	x	x	x	x		x
Contamination of Transmission Component Oil			x	x	x	x								x		
Transmission Component Oil leak	x			x												
Main Rotor Blade change	x		x	x	x	x	x		x	x				x		
Main Gear Box or Main rotor Head/Shaft Unit change	x		x	x	x	x	x		x	x				x		
Tail Rotor Blade change	x			x												
Tail Rotor change	x			x												
Tail Rotor Gear Box or T.R. Gear Box-and Tail Rotor Assembly change	x			x												
Engine change	x		x	x	x	x		x	x					x	x	
Tail Boom change	x			x												
Major Accessory change or Engine Tuning	x			x												
Flying Control rigging or Flying Control Component change	x		x	x	x	x	x		x	x				x		
Change, adjustment or repair of S.A.S.			x	x	x		x							x		x
(For AL. III only).																

# ALOUETTE III - LAMA TEST PROGRAMME

SHEET 0	HELICOPTER: ALOUETTE - LAMA							
	TYPE:							
FLIGHT REPORT								
DATE :			Time of take-off :			WEATHER DATA		
CREW :			Duration :			Q.F.E. :		
FIELD :			Landings :			Q.M.U. :		
			Max. alt. :			Q.A.N. { Direction Strength		
Empty weight :						Partial fuel load :		
Crew :								
Ballast :								
Fuel :								
TOTAL WEIGHT :						C.G. Location :		
MAJOR WORK CARRIED OUT BEFORE THE FLIGHT					REMARKS REPORTED BY THE CREW AFTER THE FLIGHT			
UNITS USED								
Cross out where not applicable								
WEIGHT : kg - lb			FUEL : l. kg. lb.			ALTITUDE : m. ft		
						AIRSPEED : km/h - kt		
SPECIFIC EQUIPMENT :					Signature of writers :			



ALOUETTE III - LAMA  
TEST PROGRAMME

SHEET  1	HELICOPTER: ALOUETTE - LAMA						TEST						
	TYPE: <span style="border: 1px solid black; padding: 0 5px;">SE3160</span> <span style="border: 1px solid black; padding: 0 5px;">SA316B</span> <span style="border: 1px solid black; padding: 0 5px;">SA316C</span> <span style="border: 1px solid black; padding: 0 5px;">SA319B</span> <span style="border: 1px solid black; padding: 0 5px;">SA315</span> <span style="border: 1px solid black; padding: 0 5px;"></span> <span style="border: 1px solid black; padding: 0 5px;"></span> <span style="border: 1px solid black; padding: 0 5px;"></span>						<div style="border: 1px solid black; padding: 2px;">Ground</div>						
STARTING - CLUTCH ENGAGEMENT													
<u>TEST REQUIREMENTS:</u>  . Carry out cold starting and clutch engagement according to the procedure given in the flight manual.								BAR. PRESS. or PRESS. ALT.  <hr/>					
								O.A.T.  <hr/>					
								FUEL  <hr/>					
								TESTS OR DATA TO BE MEASURED		RESULTS TO BE OBTAINED		RESULTS OBTAINED	
								- Minimum voltage		$U \geq 24$ volts			
- Operating time of the micro-pump		3160-316B-C 315 t: 5 to 15 sec.	319 Not applicable										
- Max. t4 temperature on starting		*											
- Operating time of the starter		3160-316B-C 315 t ≤ 60 sec.	319 Not applicable										
- Engine R.P.M at the beginning of clutch engagement		*											
- Max. t4 temperature on clutch engagement		Lower than max. t4 temperature on starting											
- Δ t4 on clutch engagement		*											
- Synchronization time													
* Values shown thus * are to be taken in the flight manual													
<u>REMARKS:</u>  Missed start <span style="display: inline-block; border: 1px solid black; padding: 2px 10px;">YES NO</span>													

ALOUETTE III - LAMA  
TEST PROGRAMME

<b>SHEET</b>  2	<b>HELICOPTER: ALOUETTE - LAMA</b>						<b>TEST</b>	
							Flight	
	TYPE:	DE3160	SA316B	SA316C	SA319B	SA315		
HOVER I.G.E.								
<u><b>TEST REQUIREMENTS:</b></u>  . Headwind below 10 knots . Stabilized hover for 5 minutes								BAR. PRESS. or PRESS. ALT. <hr/>
								O.A.T. <hr/>
								FUEL <hr/>
TESTS OR DATA TO BE MEASURED			RESULTS TO BE OBTAINED			RESULTS OBTAINED		
- Collective pitch indicated			Refer to sheet 1 - Tolerance : $\pm 0.02$					
- T4 temperature			See Flight Manual, chap. 2 "POWER check"					
- Engine r.p.m.			Governed r.p.m. *					
- Engine oil pressure (indicator according to version)			*					
- Engine oil temperature			*					
- Main gear box oil pressure and temperature warning lights			Warning lights out					
- Network voltage			28.5 Volts					
* Values shown thus * are to be taken in the flight manual.								
<u><b>REMARKS:</b></u>  								

SHEET 3	HELICOPTER: ALOUETTE-LAMA						TEST	
							Flight	
TYPE:		SE3160	SA316B	SA316C	SA319B	SA315		
HOVER O.G.E.								
<u>TEST REQUIREMENTS:</u>  . Hover O.G.E. - Density altitude : 500 m (1650 ft)							BAR. PRESS. or PRESS. ALT.	
							O.A.T.	
							FUEL	
TESTS OR DATA TO BE MEASURED			RESULTS TO BE OBTAINED			RESULTS OBTAINED		
- Collective pitch indicated								
- T4 temperature			Lower than max. t4 temperature *					
* Values shown thus * are to be taken in the flight manual.								
<u>REMARKS:</u>								



SHEET  4	HELICOPTER: ALOUETTE - LAMA						TEST	
	TYPE: SE3160 SA316B SA316C SA319B SA315						Flight	
<p><b>TEST REQUIREMENTS:</b></p> <ul style="list-style-type: none"> <li>. Hover with the servo-units in operation, then with the servo-units switched off.</li> <li>. Compensation : from zp 300 m (1000 ft) up to 700 m (2300 ft)</li> <li>. Test of the main rotor at I.A.S. = 150 km/h (90 kt)</li> <li>. Test of the tail rotor in vertical climb (pitch = 0.75) with a turn to the right, then in vertical descent (low pitch) with a turn to the left.</li> </ul>								BAR. PRESS. or PRESS. ALT.  <hr/>
								O.A.T.  <hr/>
								FUEL  <hr/>
TESTS OR DATA TO BE MEASURED		RESULTS TO BE OBTAINED		RESULTS OBTAINED				
Check of servo-unit cut-off by operating the cock in hover.		Acceptable smoothness of controls and symmetrical loads in lateral and longitudinal planes. No severe jerking when the servo-units are cut-off.						
Collective pitch operation from Zp 300 m (1000 ft) up to Zp 700 m (2300 ft) with servo-units off.		Acceptable loads.						
Servo-units in operation; test of the main rotor at I.A.S. = 150 km/h (90 kt)		Correct lateral and longitudinal loads. Correct vibration level.						
Test of the tail rotor in vertical climb at 0.75 collective pitch		Turn to the right possible. Correct loads. Correct vibration level.						
Test of the tail rotor in vertical descent at low pitch.		Turn to the left possible. Correct damping loads. Correct vibration level.						
<p><b>REMARKS:</b></p>     								

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<b>SHEET</b>  5	<b>HELICOPTER: ALOUETTE - LAMA</b>						<b>TEST</b>	
	<b>TYPE:</b>						Flight	
	SE3160	SA316B	SA316C	SA319B	SA315			
ENGINE R.P.M. GOVERNING								
<b><u>TEST REQUIREMENTS:</u></b>  . With full power, move collective pitch from low pitch to take-off pitch in 1 second.								BAR. PRESS. or PRESS. ALT.  <hr/>
								O.A.T.  <hr/>
								FUEL  <hr/>
TESTS OR DATA TO BE MEASURED			RESULTS TO BE OBTAINED			RESULTS OBTAINED		
Record transient R.P.M. variations caused by quick pitch changes.			*					
* Values shown thus * are to be taken in the flight manual.								
<b><u>REMARKS:</u></b>  								

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SHEET  6	HELICOPTER: ALOUETTE - LAMA						TEST	
							Fillant	
	TYPE:	SE3160	SA316B	SA316C	SA319B	SA315		
PERFORMANCES								
<u>TEST REQUIREMENTS:</u>  . Level flight at Zp = 500 m (1650 ft) at 0.8 collective pitch.								BAR. PRESS. or PRESS. ALT.  <hr/>
								O.A.T.  <hr/>
								FUEL  <hr/>
TESTS OR DATA TO BE MEASURED				RESULTS TO BE OBTAINED		RESULTS OBTAINED		
Record I.A.S.				I.A.S. between 175 and 195 km/h (95 and 105 kt)				
Record : . Governed engine R.P.M. . t4 temperature . Engine oil pressure . Engine oil temperature				* * * *				
Switch the booster pump off and record engine r.p.m. variation.				Engine r.p.m. variation $\leq$ 100 r.p.m.				
Tests at VNE				*				
Check all instruments				Readings within the tolerances.				
* Values shown thus * are to be taken in the Flight Manual.								
<u>REMARKS:</u>								

## TEST PROGRAMME

SHEET 7	HELICOPTER: ALOUETTE - LAMA						TEST	
							Flight	
TYPE:		SE3160	SA316B	SA316C	SA319B	SA315		
LOW PITCH STOP - ROTOR R.P.M.								
<u>TEST REQUIREMENTS:</u>  Autorotation, coll. lever against low pitch stop. . I.A.S. = 120 km/h (65 kt) . Read rotor R.P.M. at Zp = 500 m (1650 ft)								BAR. PRESS. or PRESS. ALT.
								O.A.T.
								FUEL
TESTS OR DATA TO BE MEASURED			RESULTS TO BE OBTAINED			RESULTS OBTAINED		
. Record rotor R.P.M. at Zp = 500 m (1650 ft)			. See chart "Rotor R.P.M. in autorotation" in the flight manual. Tolerance : $\pm 5$ r.p.m.					
<u>REMARKS:</u>  								



SHEET 8	HELICOPTER: ALOUETTE - LAMA						TEST	
	TYPE: SE3160 SA316B SA316C SA319B SA315						Ground	
ELECTRICAL POWER SUPPLY								
<u>TEST REQUIREMENTS:</u>  . Start the engine and the rotor							BAR. PRESS. or PRESS. ALT. _____  O.A.T. _____  FUEL _____	
TESTS OR DATA TO BE MEASURED			RESULTS TO BE OBTAINED			RESULTS OBTAINED		
Record engine R.P.M. when the generator cuts in.			$316 \leq 21000 \text{ r.p.m.}$ $319 \leq 23000 \text{ r.p.m.}$ $315 \leq 21000 \text{ r.p.m.}$					
Record the network voltage			28.5 Volts					
Record engine R.P.M. when the generator cuts out on engine shut-off.			The same as when the generator cuts in.					
<u>REMARKS:</u>  								



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<b>SHEET</b>  9	<b>HELICOPTER: ALOUETTE - LAMA</b>						<b>TEST</b>	
	<b>TYPE:</b>						Ground	
	DE3160	SA316B	SA316C	SA319B	SA315			
<b>EQUIPMENT ITEMS</b>								
<b><u>TEST REQUIREMENTS:</u></b>  . Aircraft on ground, rotor turning								BAR. PRESS. or PRESS. ALT.  <hr/>
								O.A.T.  <hr/>
								FUEL  <hr/>
<b>TESTS OR DATA TO BE MEASURED</b>				<b>RESULTS TO BE OBTAINED</b>		<b>RESULTS OBTAINED</b>		
Operational check of : . Gyro-horizon (where fitted) . Directional gyro (where fitted) . Navigation instruments. . Stand-by compass.				. Correct operation . Steady reading				
. Ventilator				Correct operation				
Heating system : Move the lever to "Open" and "Closed".				"Open": efficiency and proper air distribution. "Closed": no leaks.				
Landing light				Correct operation				
Internal and external lighting				Correct operation				
<b><u>REMARKS:</u></b>  								

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<b>SHEET</b>  10	<b>HELICOPTER: ALOUETTE - LAMA</b>						<b>TEST</b>	
							Flight	
	TYPE:	SE3160	SA316B	SA316C	SA319B	SA315		
RADIO INSTALLATION								
<b><u>TEST REQUIREMENTS:</u></b>  . Aircraft in hover								BAR. PRESS. or PRESS. ALT.  <hr/>
								O.A.T.  <hr/>
								FUEL  <hr/>
TESTS OR DATA TO BE MEASURED				RESULTS TO BE OBTAINED		RESULTS OBTAINED		
I.C.S. . All headset jack boxes . Noise and crosstalk				Correct communications Level (to be estimated)				
VHF or UHF receiver/transmitter . Frequency positioning . Communications with a ground station . Squelch - noise				Time $\leq$ 10 s.  Correct Efficiency-Level				
HF receiver/transmitter . Communications with a ground station . Noise				Correct Level (to be estimated)				
A.D.F. . Finding out the nearest station . Accuracy of frequency setting . Bearing - Noise				} Correct } No error of 180°				
Homing H.F. . With another aircraft				Correct homing axis - Correct phasing				
Homing U.H.F. . With beacon on a frequency different from distress frequency				Correct indication				
H.F./SSB receiver/transmitter . Communications with a ground station				Correct				
<b><u>REMARKS:</u></b>  								

## TEST PROGRAMME

SHEET 11	HELICOPTER: ALOUETTE - LAMA						TEST	
							Flight	Ground
TYPE:		SE3160	SA316B	SA316C	SA319B	SA315		
LANDING - STOPPING								
<u>TEST REQUIREMENTS:</u>  . Landing - stopping the rotor and the engine							BAR. PRESS. or PRESS. ALT.	
							O.A.T.	
							FUEL	
TESTS OR DATA TO BE MEASURED			RESULTS TO BE OBTAINED			RESULTS OBTAINED		
Appreciation of undercarriage on landing			Correct					
Taxiing (not applicable to SA 315B) . Freedom of nose wheel . Braking			Correct Efficiency of brakes					
Move the fuel flow control lever back			Engagement of the droop restrainer at : $175 \leq \text{rotor RPM} \leq 195$ RPM					
Stop the rotor with engine running . Apply the rotor brake at a rotor speed $\leq 175$ R.P.M.			Stopping time between 10 and 15 seconds					
Engine at idling speed, stabilized for 1 min 30 sec. Record : . Ng . t4 . Oil temperature . Oil pressure			Idling speed (r.p.m.) 316-315   319 $17500 \pm 1500$   $25500 \pm 400$ * * *					
Stop the engine			The "STOP START" warning light comes on, then goes out.					
* Values shown thus * are to be taken in the Flight Manual								
<u>REMARKS:</u>  								

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<b>SHEET</b>  12	<b>HELICOPTER: ALOUETTE - LAMA</b>						<b>TEST</b>  Flight	
<b>TYPE:</b>		3E3160	3A316B	3A316C	3A319B	3A315		
DETERMINATION OF THE T4 TEMPERATURE CORRECTION SPECIFIC TO THE ENGINE								
<b><u>TEST REQUIREMENTS:</u></b>  . Aircraft in hover - No wind  Operation to be carried out on installation of a new or overhauled engine on the aircraft.								BAR. PRESS. or PRESS. ALT.  <hr/>
								O.A.T.  <hr/>
								FUEL  <hr/>
<b>TESTS OR DATA TO BE MEASURED</b>								
<ul style="list-style-type: none"> <li>- Record the following data :             <ul style="list-style-type: none"> <li>. Collective pitch</li> <li>. t4 read</li> <li>. O.A.T. (read on a temperature indicator placed under shelter)</li> </ul> </li> <li>- Compare the t4 read with the theoretical t4 determined by means of the "power check" chart given in the flight manual.</li> <li>- If the t4 read on the aircraft instrument is lower than the theoretical t4, add sign (+) to the difference between the two figures ; add sign (-) in the opposite case.</li> <li>- Write the correction specific to the engine in the block provided for this purpose on the chart.</li> </ul>								
<b><u>REMARKS:</u></b>  <div style="height: 100px;"></div>								



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<b>SHEET</b> <b>13</b> 1/3	<b>HELICOPTER: ALOUETTE</b>						<b>TEST</b> Ground   Flight	
<b>TYPE:</b> 3160   316 B   316 C   319 B								
STABILITY AUGMENTATION SYSTEM (S.A.S.)								
<b>TEST CONDITIONS</b> . Helicopter on ground, rotor turning . Helicopter in stabilized hover O.G.E.						<b>O.A.T.</b> _____	<b>BAR. PRESS.</b> or <b>PRESS. ALT.</b> _____	
<b>TEST OR DATA TO BE MEASURED</b>			<b>RESULTS TO BE OBTAINED</b>		<b>RESULTS OBTAINED</b>			
<b>1. ON GROUND</b> <u>Preliminary requirements :</u> - Cyclic stick friction clamp released. - A.C. power system switched ON - Flying Control channel switches : - "Off" then "On"  <u>Checks :</u> - Magnetic brakes engaged  - Disengage artificial feel by actuating the pilot's and co-pilot's "Disengage" push-buttons  - Engage the S.A.S.  - Disengage the S.A.S. by actuating the pilot's and co-pilot's control push-buttons			F.C. load feed-back  Momentaneous cessation of load feed-back  S.A.S. remains engaged  S.A.S. is cancelled		          			
<b>2. STABILIZATION IN HOVER O.G.E.</b> <u>Preliminary requirements</u> - Non-turbulent air - All angular rates cancelled <u>Stabilization test</u> - Engage the three channels in perfectly stable hover - Release the "ARTIFICIAL FEEL" push-button and the flying controls for 2 minutes (repeat this stabilization check if necessary).  - Record the "stabilized" parameters.			Maximum deviation . Attitude : 2 degrees per minute . Heading : 4 degrees per minute		          			



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<b>SHEET</b> <b>13</b> 3/3	<b>HELICOPTER: ALOUETTE</b>						<b>TEST</b> <div style="border: 1px solid black; padding: 2px; width: 100px; margin: 0 auto;">Flight</div>		
<b>TYPE:</b> 3160   316 B   316 C   319 B <div style="border: 1px solid black; width: 40px; height: 15px; display: inline-block;"></div> <div style="border: 1px solid black; width: 40px; height: 15px; display: inline-block;"></div> <div style="border: 1px solid black; width: 40px; height: 15px; display: inline-block;"></div>									
STABILITY AUGMENTATION SYSTEM (S.A.S.)									
<b>TEST CONDITIONS</b> . Translational flight . Slow cruise ; normal cruise						<b>Q.A.T.</b> <div style="border: 1px solid black; height: 30px; width: 100%;"></div>		<b>BAR. PRESS. OF PRESS. ALT.</b> <div style="border: 1px solid black; height: 30px; width: 100%;"></div>	
<b>TEST OR DATA TO BE MEASURED</b>			<b>RESULTS TO BE OBTAINED</b>			<b>RESULTS OBTAINED</b>			
5. <u>TRANSLATIONAL FLIGHT</u> (S.A.S. - controlled) From stabilized hover O.G.E. yaw control pedals free during the test :  - Initiate very slow forward flight with a 5° L.H. bank against control load - Repeat the whole test with a R.H. bank			Jolt in yaw axis when yaw integration cuts out at approx. 50 Km/h (27knots) I.A.S						
<b>NOTE :</b> If the normal manoeuvre does not produce a marked result on transition with a L.H bank, re-set the zero load position further to the right and initiate forward flight at a level attitude.									
6. <u>CRUISING FLIGHT</u> <u>Slow cruise</u>  - Level flight, Hp = 500 m (1650 ft) - I.A.S. = 110 km/h (60 knots) perfectly stabilized . Release the "ARTIFICIAL FEEL" push-buttons and the flying controls for 2 minutes			All angular rates cancelled  Maximum deviation : . Attitude 2°/minute . Yaw 2°/ minute						
<u>Normal cruise</u>  - Level flight, Hp = 500 m (1650ft) - I.A.S. corresponding to 0.8 collective pitch and perfectly stable flight . Release the ARTIFICIAL FEEL push-button and flying controls for 2 minutes			All angular rates cancelled  Maximum deviation : . Attitude : 2°/ minute . Yaw : 2°/minute.						

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PLANCHE  
FIGURE

1

HELICOPTERE: ALOUETTE  
HELICOPTER

TYPES

TYPE: 3160 316B

RELATION PAS GENERAL/MASSE EN STATIONNAIRE D.E.S.

NR = 353 tr/mn. Vent nul. Hauteur : 1,50 m (5 ft).

COLLECTIVE PITCH VERSUS WEIGHT IN HOVER I.G.E.

Rotor speed : 353 R.P.M. No wind. 1.5 m (5 ft) above the ground.

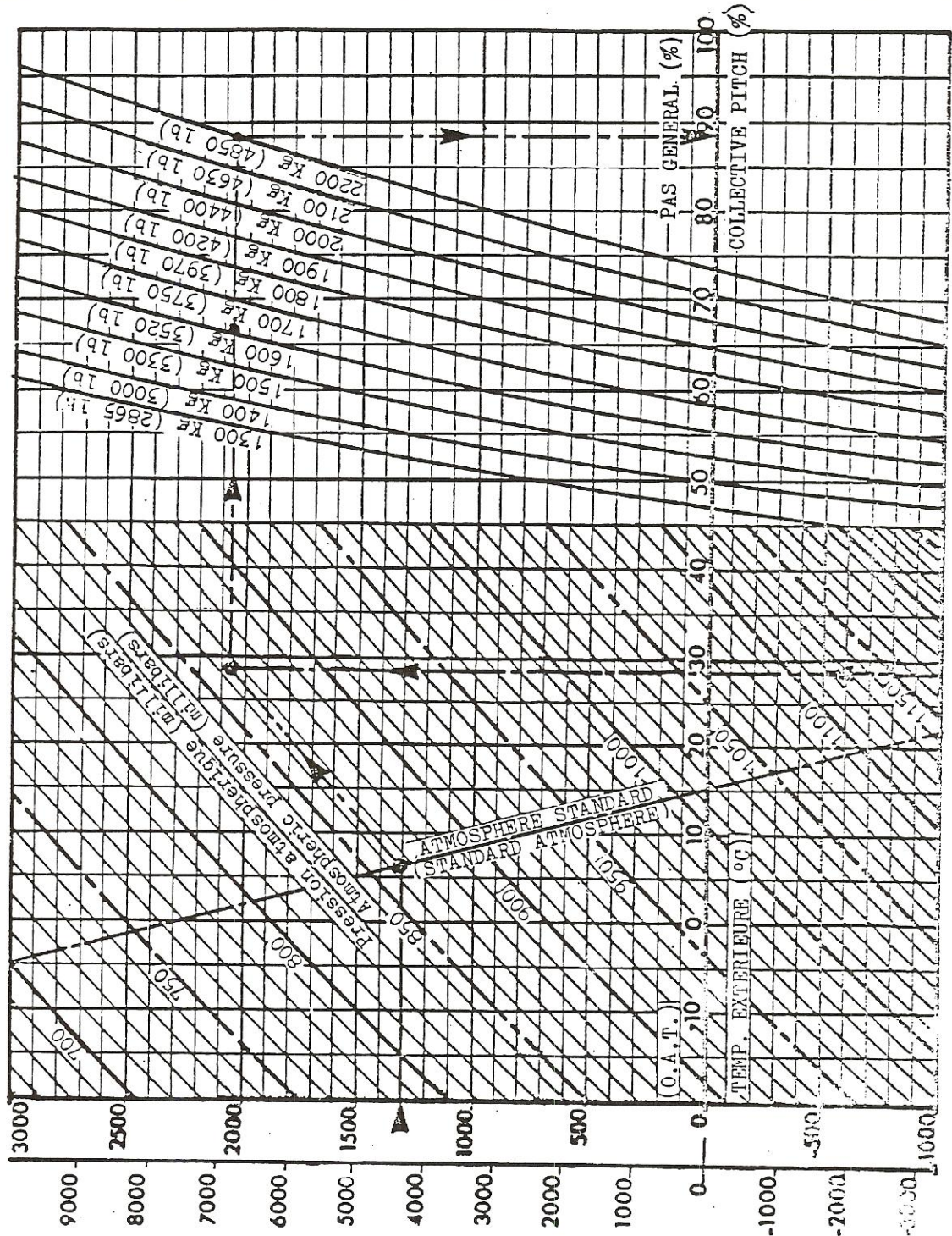




PLANCHE  
FIGURE

1A

HELICOPTERE: ALOUETTE  
HELICOPTER

TYPES

TYPE:

3160

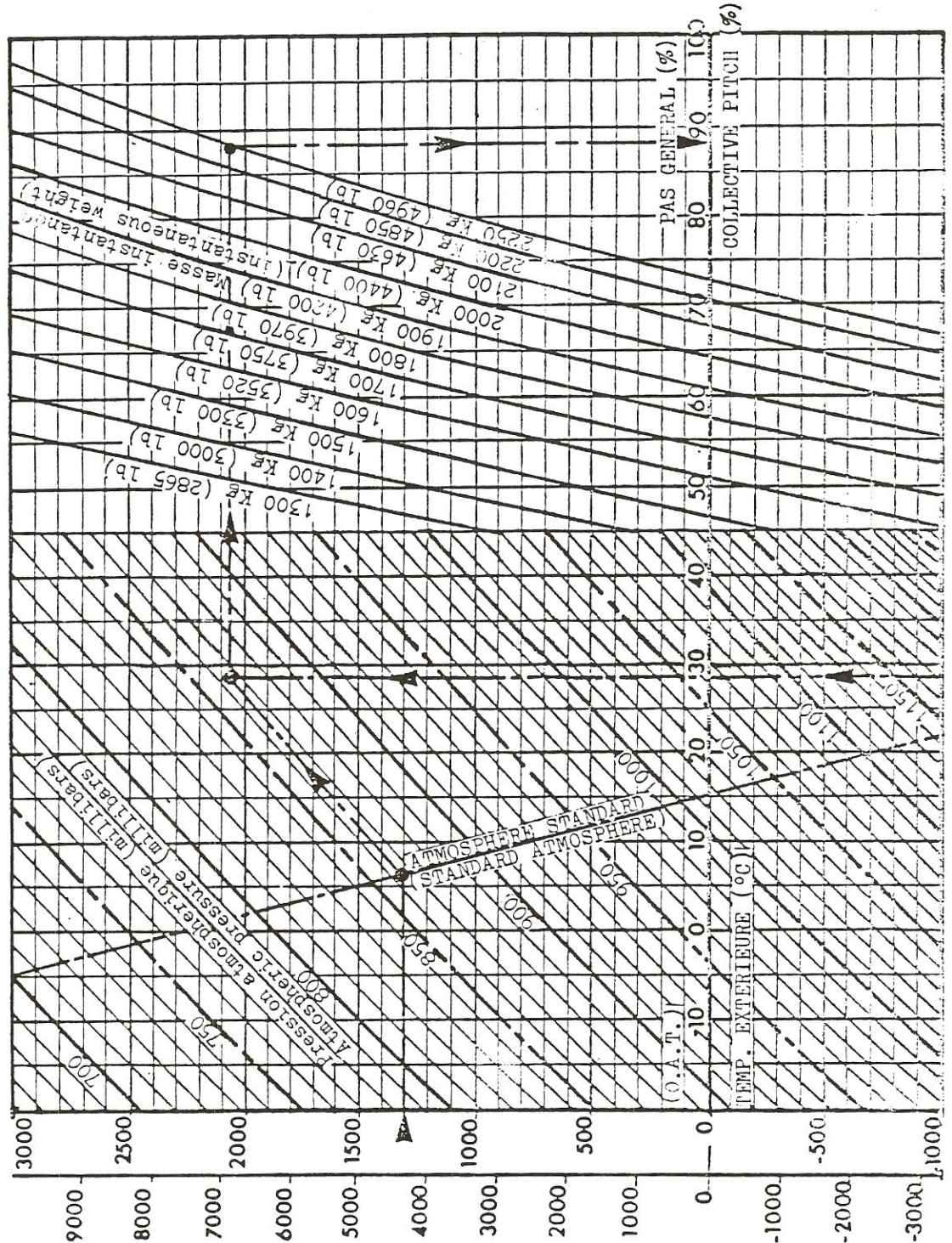
319B

RELATION PAS GENERAL/MASSE EN STATIONNAIRE D.E.S.

NR = 358 tr/mn. Vent nul. Hauteur : 1,5 m (5 ft)

COLLECTIVE PITCH VERSUS WEIGHT IN HOVER I.G.E.

Rotor speed : 358 R.P.M. No wind. 1.5 m (5 ft) above the ground.





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PLANCHE  
FIGURE

1B

HELICOPTERE: LAMA  
HELICOPTER

TYPES  
TYPE:

315B

RELATION PAS GENERAL/MASSE EN STATIONNAIRE D.E.S.

NR 353 tr/mn. Vent nul. Hauteur : 1,5 m (5 ft).

COLLECTIVE PITCH VERSUS WEIGHT IN HOVER I.G.E.

Rotor speed : 353 R.P.M. No wind. 1.5 m (5 ft) above the ground.

