Manufacturer: **C.E.A.P.R.**
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21121 DAROIS
FRANCE
Tél. +33 (0)3 80 35 25 22
Fax +33 (0)3 80 35 25 25
www.ceapr.com

Type certificate nr 45, dated 09.11.1975

Serial number 2630

Registration PH-CCL

Approval

E.A.S.A.
AFM APPROVAL
10033448
Dated 20.01.2011

Sections approved:
2, 3, 4 and Section 5 page 5.02.

This aircraft must be operated within the operating limits specified in this flight manual.

THIS DOCUMENT MUST BE PERMANENTLY KEPT ON BOARD THE AIRCRAFT.

This edition is applicable from s/n 2211 included.

Document nr 1001588 GB

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LIST OF PAGES

LIST OF REVISIONS

Rev. nr	Description	Pages revised	Date of approval
1	Corrections of the fuel weight in the main tank, the weight and balance diagram and insertion of weight and balance calculation.	Cover page ii, iii, 2.05, 6.01 to 6.08	23 march 2005
2	Correction of manufacturer name and details	Cover page, ii and iii	20 january 2011

SECTION 0 GENERAL

TABLE OF CONTENTS

LIST OF ABBREVIATIONS USED

sq ft.....Square foot
ft.....Foot
in.....Inches
Nm.....Nautic mile
km.....Kilometer
m.....Meter
cm.....Centimeter
kt.....Knot
m/s.....Meter per second
tr/mn or rpm ....Revolution per minute
Va.....Maneuvering speed
VC.....Calibrated airspeed
Vfe.....Maximum Flaps Extended speed
Vne.....Never exceed speed
Vno .....Maximum cruising speed
Vso.....Stalling speed landing position
Vs1 .....Stalling speed flaps up configuration
VI.....Indicated air speed
km/h.....Kilometer per hour
HP .....Horse Power
hPa .....Hectopascal
in.Hg.....Inches of mercury
mbar .....Millibar
Zp.....Pressure altitude
l .....Liter
imp gal .....Imperial gallon
us gal.....US gallon
psi.....Pound per square inch
lb.....Pound
kg.....Kilogramme
°C.....Degrees Celcius
°F.....Degrees Farenheit
V.....Volt
A.....Ampere

LIST OF RADIO ABBREVIATIONS

ADF ..... Automatic Direction Finder

ATC..... Air Traffic Control

COM ..... Communication Transceiver

DME..... Distance Measuring Equipment

ELT ..... Emergency Locator Transmitter

IFR ..... Instrument Flight Rules

ILS ..... Instrument Landing System

MKR..... Marker Beacon Receiver

NAV ..... Navigation Indicator and Receiver

AUDIO..... Audio Control Panel

VFR..... Visual Flight Rules

VHF ..... Very High Frequency

VOR ..... Visual Omni-Range (beacon)

CONVERSION FACTORS

Nautic mile	X	1.852	=	kilometers
Feet	X	0.305	=	meters
inches	X	0.0254	=	meters
inches	X	25.4	=	millimeters
Feet/minute	X	0.00508	=	meter/second
gallons (US)	X	3.785	=	liters
gallons (Imp)	X	4.546	=	liters
quarts (US)	X	0.946	=	liters
Knot	X	1.852	=	km/h
psi	X	0.0689	=	bar
in.Hg	X	33.86	=	mbar
lb	X	0.453	=	kg
(°F - 32)	X	5/9	=	°C

Kilometers	X	0.539	=	Nautic mile
meters	X	3.281	=	Feet
meters	X	39.37	=	inches
millimeters	X	0.03937	=	inches
meter/second	X	197	=	Feet/minute
liters	X	0.264	=	gallons (US)
liters	X	0.220	=	gallons (Imp)
liters	X	1.057	=	quarts (US)
km/h	X	0.539	=	Knot
bar	X	14.51	=	psi
mbar	X	0.02953	=	in.Hg
kg	X	2.205	=	lb
°C	X	9/5 + 32 .	=	°F

BAROMETRIC PRESSURE CONVERSION TABLE

Below pressure in MILLIBAR or HECTOPASCAL, the pressure in INCHES of MERCURY is indicated.

→mbar ou hPa

→in. Hg

950	960	970	980	990	1000	1010	1020	1030	1040
28.05	28.35	28.64	28.94	29.23	29.53	29.63	30.12	30.42	30.71
951	961	971	981	991	1001	1011	1021	1031	1041
28.08	28.38	28.67	28.97	29.26	29.56	29.85	30.15	30.45	30.74
952	962	972	982	992	1002	1012	1022	1032	1042
28.11	28.41	28.70	29.00	29.29	29.59	29.88	30.18	30.47	30.77
953	963	973	983	993	1003	1013	1023	1033	1043
28.14	28.44	28.73	29.03	29.32	29.62	29.91	30.21	30.50	30.80
954	964	974	984	994	1004	1014	1024	1034	1044
28.17	28.47	28.76	29.06	29.35	29.65	29.94	30.24	30.53	30.83
955	965	975	985	995	1005	1015	1025	1035	1045
28.20	28.50	28.79	29.09	29.38	29.68	29.97	30.27	30.56	30.86
956	966	976	986	996	1006	1016	1026	1036	1046
28.23	28.53	28.82	29.12	29.41	29.71	30.00	30.30	30.59	30.89
957	967	977	987	997	1007	1017	1027	1037	1047
28.26	28.56	28.85	29.15	29.44	29.74	30.03	30.33	30.62	30.92
958	968	978	988	998	1008	1018	1028	1038	1048
28.29	28.58	28.88	29.18	29.47	29.77	30.06	30.36	30.65	30.95
959	969	979	989	999	1009	1019	1029	1039	1049
28.32	28.61	28.91	29.20	29.50	29.80	30.09	30.39	30.68	30.98

REMINDER:
The Standard Pressure of 1013.2 mbar or hPa equals 29.92 in.Hg

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SECTION 1 DESCRIPTION

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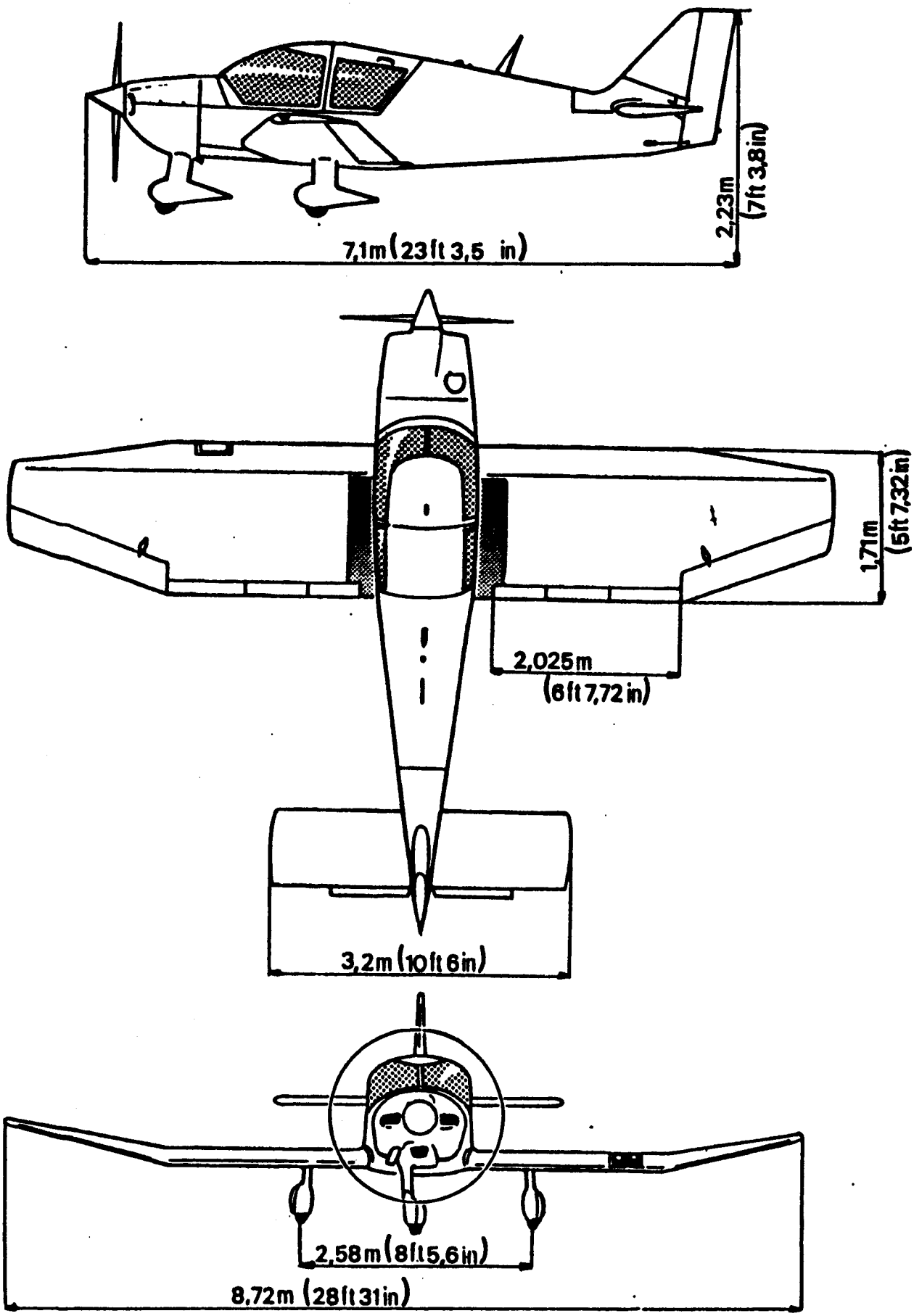

7,1m (23ft 3,5 in)
2,23m (7ft 3,8in)
1,71m (5ft 7,32in)
2,025m (6ft 7,72in)
3,2m (10ft 6in)
2,58m (8ft 5,6in)
8,72m (28ft 31in)

OVERALL DIMENSIONS

Wing span ..... (28 ft 7.3 in) 8.72 m
Overall length ..... (23 ft 3.5 in) 7.10 m
Overall height ..... (7 ft 3.79 in) 2.23 m
Propeller ground clearance ..... (11 in) 0.28 m

INTERNAL CABIN DIMENSIONS

Length ..... (5 ft 3.8 in) 1.62 m
Width ..... (3 ft 7.3 in) 1.10 m
Height ..... (4 ft 0.4 in) 1.23 m
4 seats, accessible from both sides by sliding canopy.

WINGS

Wing area ..... (146.40 sq ft) 13.6 m^2
Airfoil ..... NACA 43013.5 modified
Aspect ratio 5.35
Dièdre en bout d'aile ..... 14°

AILERONS

Surface (each) ..... (6.13 sq ft) 0.57 m^2
Span (each) ..... (5 ft 3.8 in) 1.62 m

The ailerons are statically balanced (at 80%).

WING FLAPS (each)

Surface ..... (3.55 sq ft) 0.33 m^2
Span ..... (6 ft 7.72 in) 2.025 m

HORIZONTAL STABILIZER

Total control surface ..... (31 sq ft) 2.88 m^2
of which antibalance tab ..... (2.8 sq ft) 0.26 m^2
Span ..... (10 ft 6 in) 3.20 m

VERTICAL STABILIZER

Surface overall ..... (17.55 sq ft) 1.63 m^2
Stabilizer ..... (10.76 sq ft) 1 m^2
Rudder ..... (6.78 sq ft) 0.63 m^2

LANDING GEAR

Fixed Tricycle Type

Track ..... (8 ft 5.6 in) 2.58 m
Wheel base ..... (5 ft 5 in) 1.65 m
Tyre size ..... 380 x 150

Oil, shock struts: ..... MIL. H. 5606 - A
NORME AIR 3520

Nose gear

Tyre pressure ..... (26.1 psi) 1.8 bar
Shock strut pressure ..... (72.55 psi) 5 bar

Maing landing gear

Tyre pressure ..... (29 psi) 2 bar
Shock strut pressure ..... (87 psi) 6 bar

BRAKES

The disk brakes are operated by an independant hydraulic circuit on each main gear wheel.

Hydraulic oil ..... MIL.H.5606 - A
Norme AIR 3520

POWER PLANT

Engine

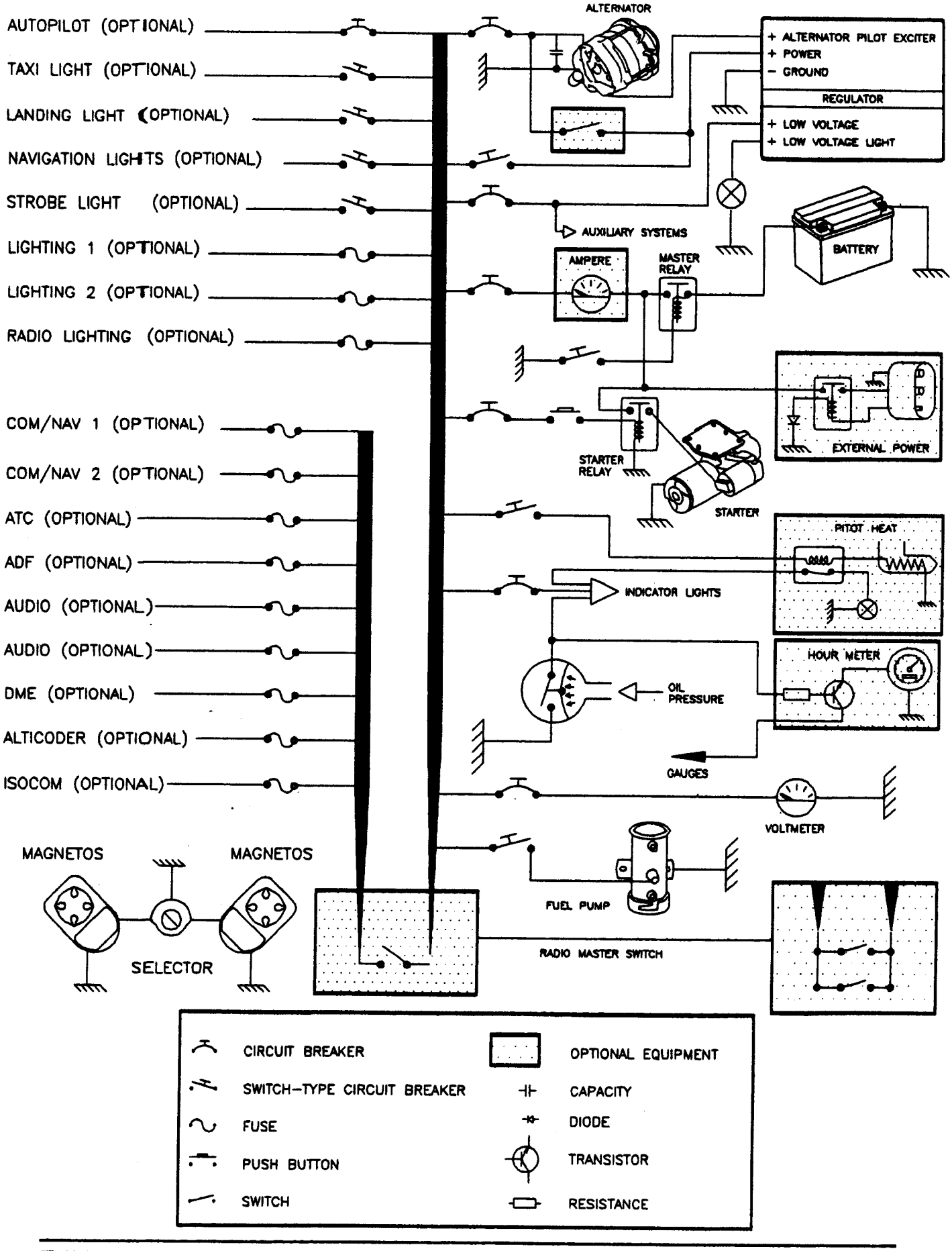
Manufacturer ..... LYCOMING
Type O-320-D2A
Number of cylinders 4
Maximum power ..... (160 HP) at 2700 rpm

PROPELLER

MANUFACTURER	SENSENICH
TYPE	74 DM6 S5-2-64
DIAMETER	1.83 m (72 in)*
PITCH	64 in
MINIMAL STATIC RPM FULL THROTTLE SEA LEVEL	2200

*** Any reduction in diameter during repair is forbidden**

ELECTRICAL SYSTEM



FUEL

Aviation petroleum* ..... AVGAS 100 LL
Fuel grade * ..... (octane) 100 minimum
Total fuel capacity ..... (24.2 imp/29 us gal) 110 l
Total usable fuel ..... (24 imp/28.7 us gal) 109 l
Unusable fuel ..... (0.22 imp/0.26 us gal) 1 l

Total fuel capacity can be increased to 160 l (35.2 imp/ 42.24 us gal) (159 l usable (35 imp/42 us gal)) by installation of optional fuel tank of 50 l (11 imp/13.2 us gal).

OIL **

Total engine capacity ..... (8 US quarts) 7.5 l
Usable capacity ..... (6½ US quarts) 5.7 l

During the first 50 hours of operation:
Pure mineral oil

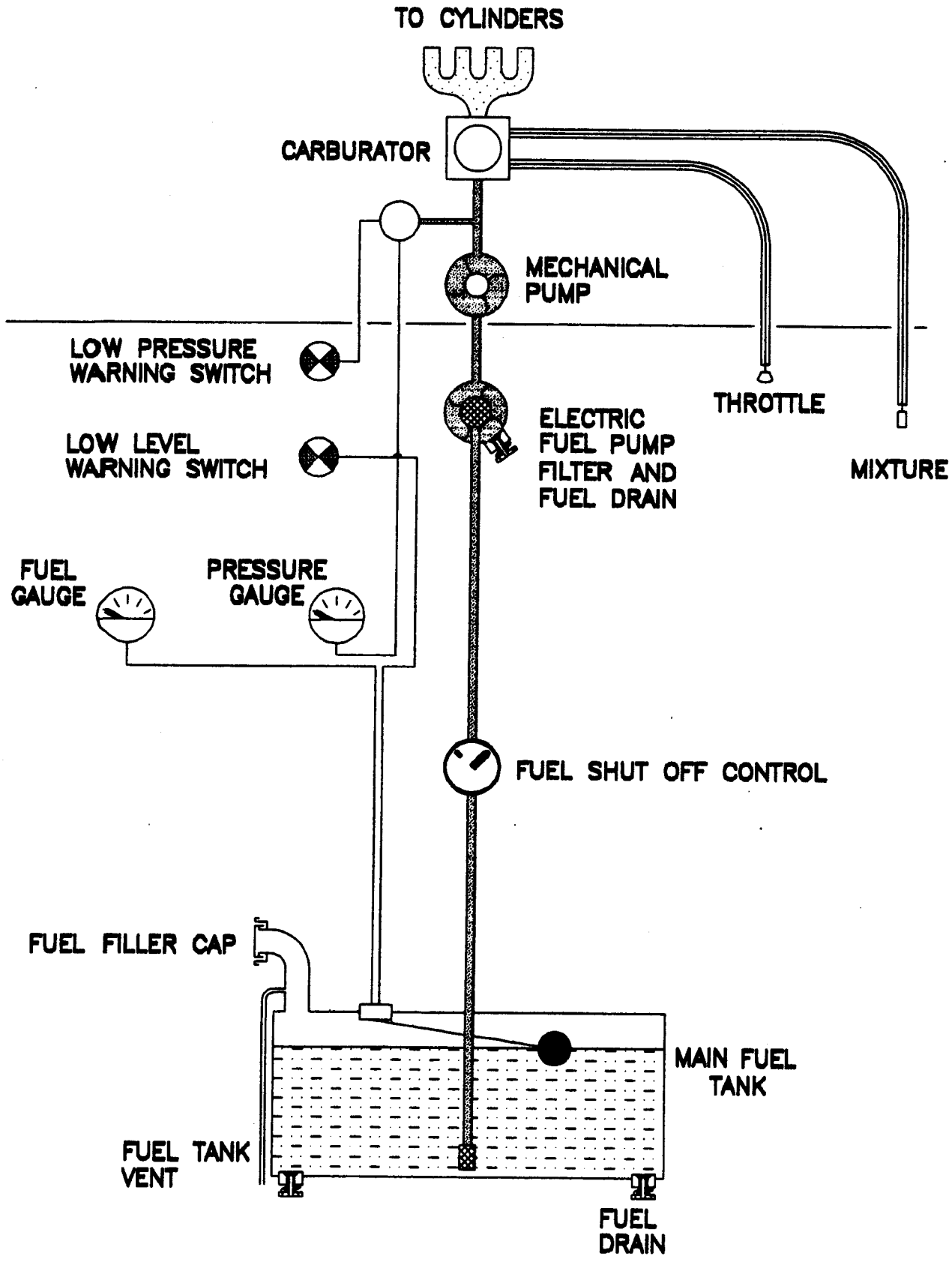
After the first 50 hours of operation:
Dispersant oil

Grades

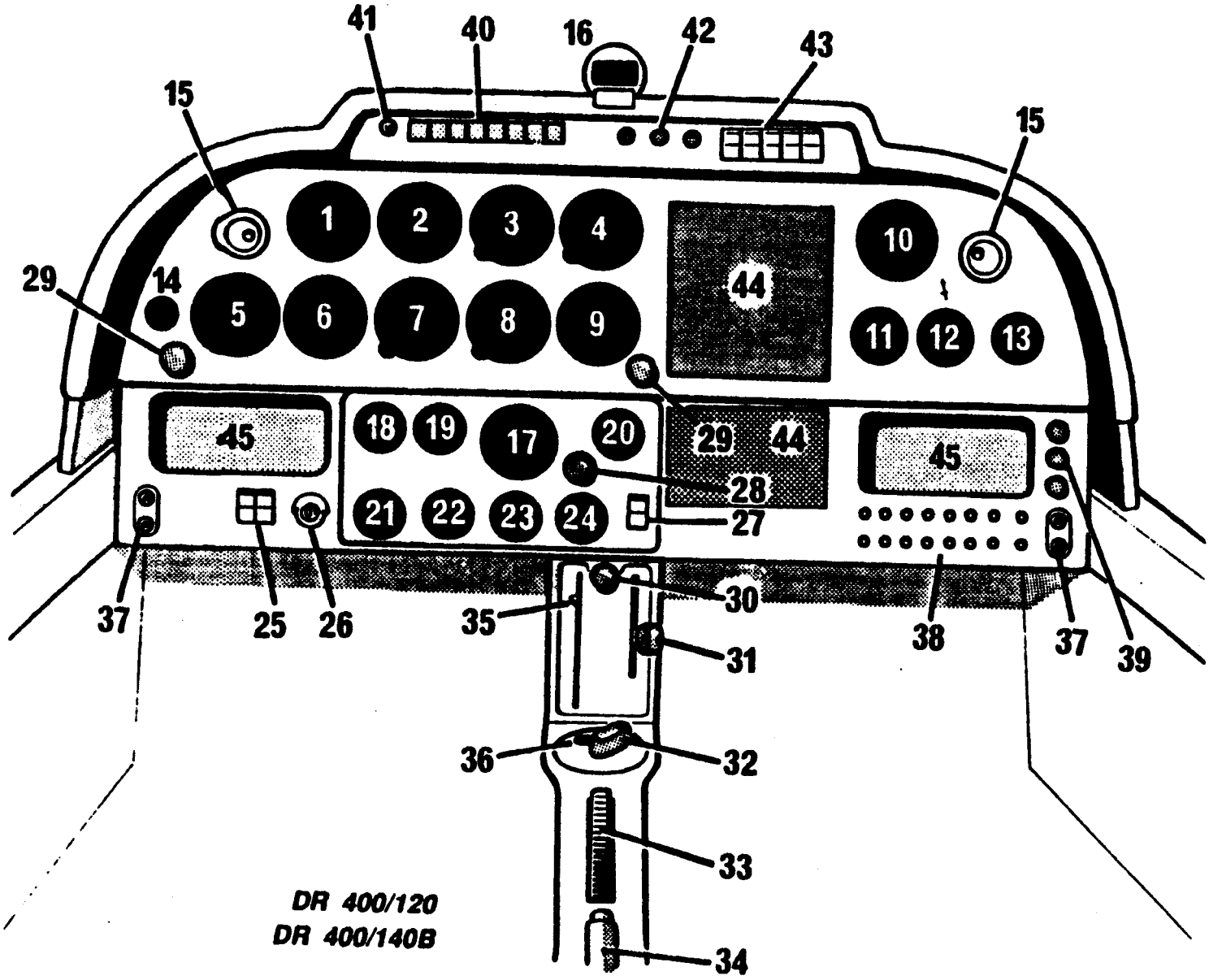
Oil	Dispersant	Pure mineral
All temperatures	SAE 15W50 or 20W50	------
above +25°C (80°F)	SAE 60	SAE 60
above +15°C (60°F)	SAE 40 or SAE 50	SAE 50
from 0°C to +30°C (30°F to 90°F)	SAE 40	SAE 40
from -15°C to +20°C (0°F to 70°F)	SAE 40, 30 or 20W40	SAE 30
below -10°C (10°F)	SAE 30 or 20W30	SAE 20

* Refer to Service Instruction Lycoming nr 1070 (last issue).
** Refer to Service Instruction Lycoming nr 1014 (last issue).

FUEL SYSTEM


TO CYLINDERS
CARBURATOR
MECHANICAL PUMP
LOW PRESSURE WARNING SWITCH
THROTTLE
ELECTRIC FUEL PUMP FILTER AND FUEL DRAIN
LOW LEVEL WARNING SWITCH
MIXTURE
FUEL GAUGE
PRESSURE GAUGE
FUEL SHUT OFF CONTROL
FUEL FILLER CAP
MAIN FUEL TANK
FUEL TANK VENT
FUEL DRAIN

INSTRUMENT PANEL

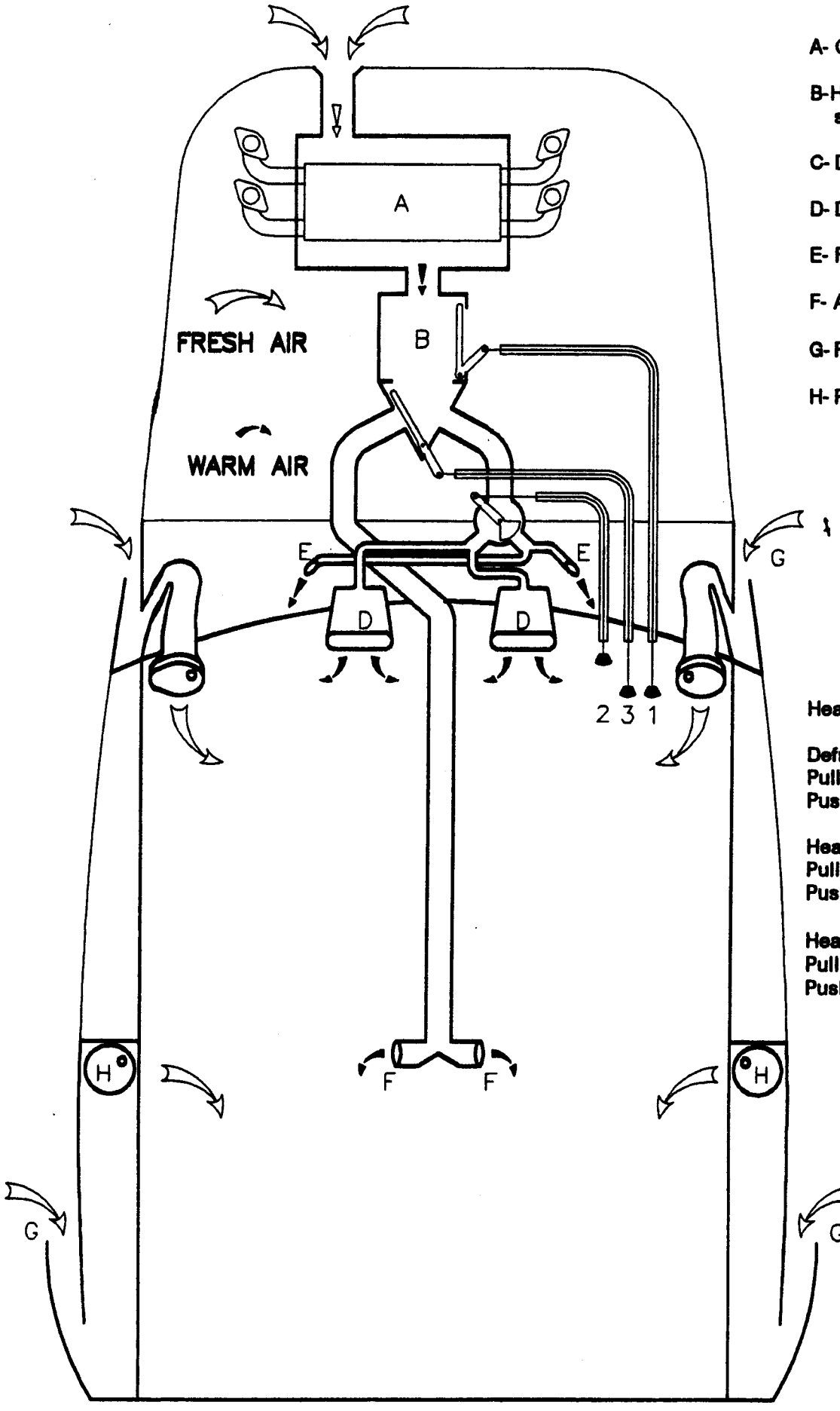


1..... .Airspeed iindicator
2..... .Gyro horizon (opt.)
3..... .Altimeter
4..... .Optional equipment
5..... .Optional equipment
6..... .Turn and bank indicator (opt.)
7..... .Directional gyro
8..... .Rate of climb indicator (opt.)
9..... .Optional equipment
10..... .Optional equipment
11..... .Optional equipment
12..... .Optional equipment
13..... .Optional equipment
14..... Vacuum gauge (opt.)
15..... Cabin vent
16..... Magnetic compass
17..... Tachometer
18..... Oil pressure gauge
19..... Oil temperature gauge
20..... Fuel pressure gauge
21..... Voltmeter
22..... Fuel gauge
23..... Optional equipment
24..... Cylinder head temperature (CHT)
25..... Switch type circuit breaker (battery, alternator)
26..... Magneto switch
27..... Safety switch (electric pump)
28..... Carburator heat control
29..... Throttle
30..... Parking brake locking control
31..... Mixture level friction control
32..... Fuel cock
33..... Elevator trim tab control wheel
34..... Flap control lever
35..... Trim tab position indicator
36..... Starter push button
37..... Mike, Headset-Jack sockets (opt.)
38..... Fuses
39..... Cabin heat control
40..... Annunciator panel (from L to R):
- oil pressure
- fuel pressure
- fuel low level
- alternator load
- flaps extended
- pitot heat (opt.)

41..... Day/night lighting selector
42..... Instrument panel lighting
43..... Switch type circuit breaker (from L to R):
- taxi lights (opt.)
- landing lights (opt.)
- strobe lights (opt.)
- navigation lights (opt.)
- pitot heat (opt.)

44..... Radio equipment (opt.)
45..... Storage box (or opt. equipment)

HEATING AND VENTILATION



A- Collector/heat exchanger

B-Hot air distribution/Forward selection box

C- Defrost/Heating selection b

D- Defrost jet

E- Forward heating

F- Aft heating

G- Fresh air intake

H- Rotating cabin vent

Heating controls

Defrost forward:
Pull out 1
Push in 2 and 3

Heating forward:
Pull out 1 and 2
Push in 3

Heating aft:
Pull out 1 and 3
Push in 2

SECTION 2 LIMITATIONS

TABLE OF CONTENTS

NOTE

All speeds in this manual are Indicated Air Speeds unless otherwise specified

CERTIFICATION STANDARDS

The DR400/140B aircraft has been certified on the 09.11.75 in the "NORMAL" and "UTILITY" categories conforming to the following technical conditions:

- General conditions of regulation AIR 2052 updated 6 June 1966.
- Complementary conditions for conformity to FAR Part 23 Amendment 7.
- Special condition: the canopy must be jettisonable.

APPROVED OPERATIONS

VFR by day, in non-icing conditions

AIRSPEED LIMITATIONS	km/h	(kt)
Vne (never exceed)	308	(166)
Vno (max. cruise)	260	(140)
Va (max. maneuver)	215	(116)
Vfe (max. flaps extended)	170	(92)

AIRSPEED INDICATOR MARKINGS		km/h	kt
Red line (never exceed)	Vne	308	166
Yellow arc (operate with caution and only in "smooth air")	Vno - Vne	260 - 308	140 - 166
Green arc (normal operating range)	Vs1 - Vno	99 - 260	53 - 140
White arc	Vso - Vfe	87 - 170	47 - 92

LOAD FACTOR LIMITS AT GROSS WEIGHT

(2006 lb) 910 kg ("U" category)

Flaps up ..... n between + 4.4 and - 2.2
Flaps down ..... n = + 2

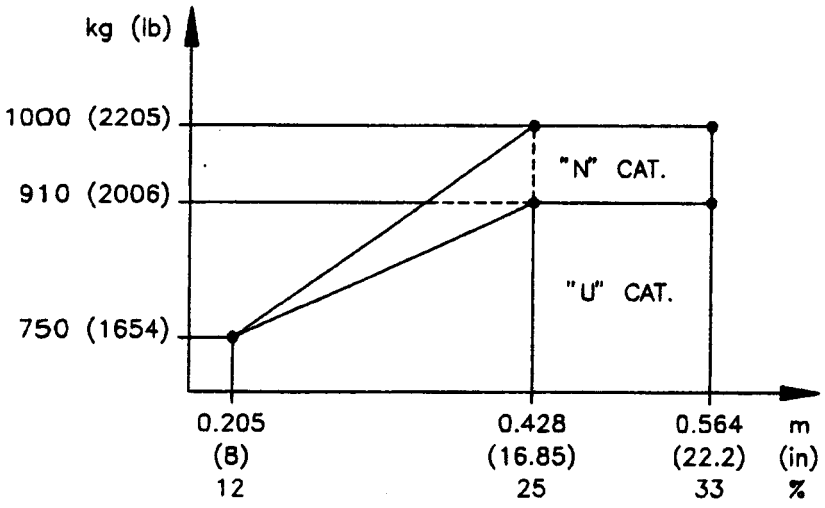
(2205 lb) 1000 kg ("N" category)

Flaps up ..... n between + 3.8 and - 1.9
Flaps down ..... n = + 2

MAXIMUM AUTHORIZED WEIGHTS

	"U" Cat.	"N" Cat.
On take off	(2006 lb) 910 kg	(2205 lb) 1000 kg
On landing	(2006 lb) 910 kg	(2205 lb) 1000 kg

WEIGHT AND BALANCE



Levelling ..... Upper fuselage longeron
Datum ..... wing leading edge, rectangular section
Chord line ..... (67.3 in) 1.71 m

LOAD PLANNING

(also refer to weight and balance chart, section 6)

The weight of engine oil, as well as unusable fuel, must be included in the empty weight of the aircraft.

	Weight kg (lb)	Arm m (in)
Front seats	2 x 77 (2 x 170)	0,36 - 0,46 (14) - (18)
Rear seats (*)	2 x 77 (2 x 170)	1,19 (47)
Fuel Main fuselage tank	78,5 (173)	1,12 (44)
Fuel optional tank (if installed)	36 (79)	1,61 (63,4)
Baggage (**)	40 (88)	1,9 (75)

* The carriage of more than two passengers (with a total weight below or equal to the maximum indicated) is authorized on the rear bench, provided that passenger seat belts are installed for each passenger, and that weight and balance are within the stated limits.

** Within the authorized weight and balance limits.

ENGINE LIMITATIONS

Continuous starter operation ..... 30 sec.
Maximum rpm (red line) ..... 2700 rpm
Maximum cylinder head temperature (red line) ..... (500°F) 260 °C

TACHOMETER MARKINGS

Green arc ..... 2000 to 2700 rpm
Red line ..... 2700 rpm

FUEL

Aviation petroleum * ..... AVGAS 100 LL
Grade * ..... (octane) 100 minimum
Maximum total capacity ..... (24.2 Imp/29 us gal) 110 l
Usable total capacity ..... (24 Imp/28.7 us gal) 109 l
Unusable capacity ..... (0.22 Imp/0.26 us gal) 1 l
Normal pressure ..... (0.5 to 8 psi) 35 to 550 mbar

Total fuel capacity can be increased to 160 l (35.2 Imp/ 42.24 us gal) (159 l usable (35 Imp/42 us gal)) by installation of auxiliary fuel tank of 50 l (11 Imp/13.2 us gal).

OIL

Maximum temperature (red line) ..... (245°F) 118°C
Normal temperature (green arc) ..... (140 to 245°F) 60 to 118°C
Normal pressure (green arc) ..... (55 to 95 psi) 3.8 to 6.5 bar
Minimum idle pressure (red line) ..... (25 psi) 1.70 bar
Maximum pressure (red line) ..... (115 psi) 7.9 bar
Total engine capacity ..... (8 US quarts) 7.5 l
Usable capacity ..... (6 US quarts) 5.7 l
Grades ..... see page 1.08

* Refer to Service Instruction Lycoming n° 1070 (last issue)

LOAD LIMITS

Number of occupants:
Front seats 2
Rear seats 2

Baggage compartment:
Maximum authorized weight .....(88 lb) 40 kg

OPERATIONAL LIMITATIONS IN THE "U" CATEGORY

Within the limits of this category, the following maneuvres are authorized:

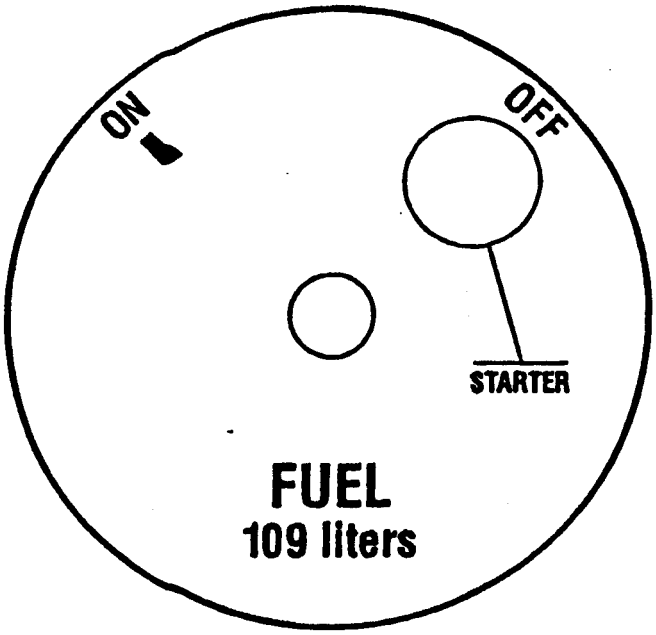
- Steep turns (60°)
- Lazy eights
- Zooms
- Flight at minimum controllable air speed

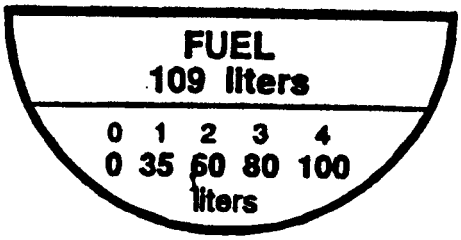
These maneuvres must be carried out within the conditions below:

- The rear seats must be unoccupied
- Entry and exit speeds must be within the normal operating range
- Recommended entry speed: (116 kt) 215 km/h

THIS AIRCRAFT MUST BE USED FOR NORMAL OR UTILITY FLYING ONLY, IN ACCORDANCE WITH THE APPROVED FLIGHT MANUAL. ON THIS AIRCRAFT, ALL INDEXES, MARKINGS & PLACARDS CORRESPOND TO NORMAL UTILISATION.
FOR UTILITY OPERATION, REFER TO THE APPROVED FLIGHT MANUAL.

VA MANEUVERING SPEED: 116 kt - 215 km/h
NO AEROBATIC MANEUVRES ALLOWED
APPROVED FOR VFR BY DAY IN NON-ICING CONDITIONS
SPINS PROHIBITED, NO SMOKING

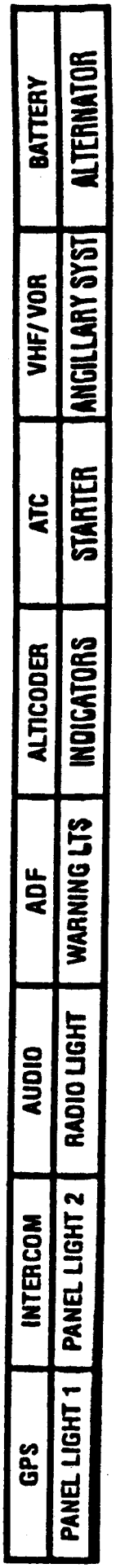


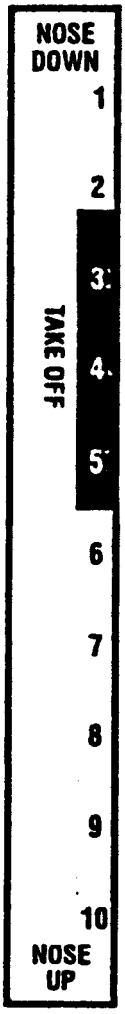


AVGAS 100LL
110 liters
24.2 imp/29 US Gal

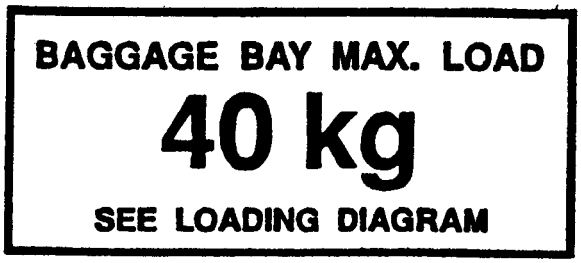
NO HOLD

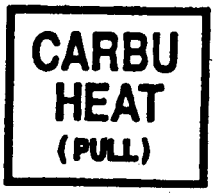
NO STEP

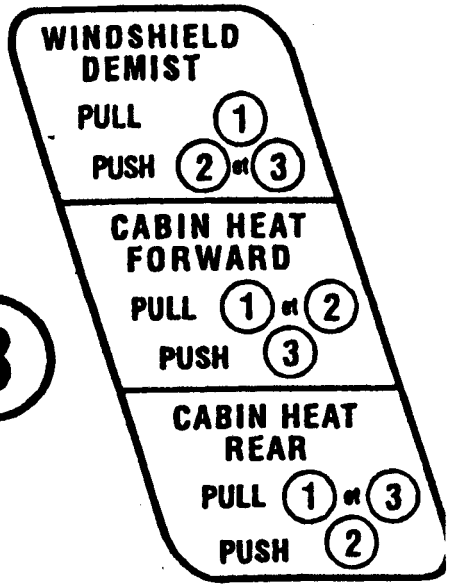

BATTERY
ALTERNATOR
VHF/VOR
ANCILLARY SYST
ATC
STARTER
ALTICODER
INDICATORS
ADF
WARNING LTS
AUDIO
RADIO LIGHT
INTERCOM
PANEL LIGHT 2
GPS
PANEL LIGHT 1


NOSE DOWN
1
2
3
4
5
TAKE OFF
6
7
8
9
10
NOSE UP

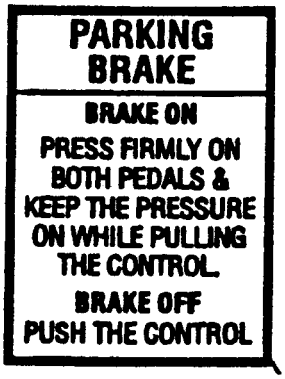

RICH
MIXTURE
LEAN


BAGGAGE BAY MAX. LOAD
40 kg
SEE LOADING DIAGRAM

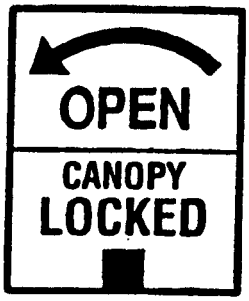

CARBU HEAT
(PULL)


WINDSHIELD DEMIST
PULL 1
PUSH 2 or 3
CABIN HEAT FORWARD
PULL 1 or 2
PUSH 3
CABIN HEAT REAR
PULL 1 or 3
PUSH 2


1
2
3

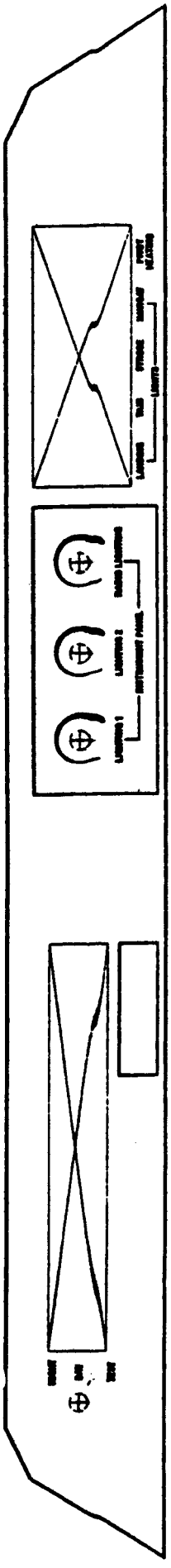

PARKING BRAKE
BRAKE ON
PRESS FIRMLY ON BOTH PEDALS & KEEP THE PRESSURE ON WHILE PULLING THE CONTROL
BRAKE OFF
PUSH THE CONTROL


OPEN
CLOSED


OPEN
CANOPY LOCKED


PARKING BRAKE


CANOPY RELEASE (PULL)



TRAIN PRINCIPAL / MAIN GEAR / HAUPTFAHRWERK	
PNEU / TYRE / REIFEN	2 bar / 29 psi
AMORTISSEUR / SHOCK ABSORB. / STOSSDÄMFER	6 bar / 87 psi

TRAIN AVANT / NOSE GEAR / BUGRAD	
PNEU / TYRE / REIFEN	1.8 bar / 26 psi
AMORTISSEUR / SHOCK ABSORB. / STOSSDÄMFER	5 bar / 73 psi

LIQUIDE DE FREINS HYDRAULIC FLUID BREMSFLÜSSIGKEIT	AIR 3520 MIL. H.5606-A SHELL FLUID 4 BP Hydraulic 1 (Aero)

MIKE
HEADSET

ELECTR
PUMP

BAT | ALT

ANCILLARY SYSTEMS | STARTER | WARNING LAMPS | INDICATORS

SECTION 3 EMERGENCY PROCEDURES

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ENGINE FAILURE DURING TAKE OFF (ROLL)

With sufficient runway remaining:

Throttle to idle, and stop in the runway axis using brakes as required.

Without sufficient runway remaining:

Throttle ..... idle
Brakes ..... apply heavily
Mixture ..... idle cut-off
Fuel valve ..... off
Magneto switch ..... off
Battery switch ..... off

ENGINE FAILURE IMMEDIATELY AFTER TAKE OFF

Glide speed (flaps in take off position) ..... (73 kt) 135 km/h
Mixture ..... idle cut-off
Fuel valve ..... off
Magneto switch ..... off
Battery switch ..... off

NOTE CAREFULLY

Land straight ahead, with only small direction changes to avoid obstructions.

Never try to turn back to the runway, as altitude after take off is seldom sufficient.

ENGINE FAILURE IN FLIGHT

If altitude is evaluated to be sufficient to try an engine restart:

- Establish maximum glide speed, flaps up 145 km/h (78 kt). In these conditions, and without wind, the aircraft covers approximately 9.3 times its altitude.

- Fuel valve ..... open
- Electric pump ..... on
- Mixture ..... fully rich
- Throttle ..... 1/4 travel forward
- Magnetos switch ..... L+R ("Both")

If the propeller still turns, the engine should restart.

If the propeller is stopped, operate the starter.

If the engine still does not start, prepare for a forced landing, following the procedure below.

POWER OFF FORCED LANDING OFF AIRFIELD

Look for a suitable landing area:
Belts and harness ..... tight
Electric pump ..... off
Mixture ..... idle cut-off
Throttle ..... to idle
Magneto switch ..... off
Fuel valve ..... off
Alternator switch ..... off
Battery switch ..... off

Final

Flaps ..... full down
Canopy ..... unlock

PRECAUTIONARY POWER LANDING OFF AIRFIELD

Fly over the choosen field several times at low speed (130 km/h - 70 kt) in order to locate the most suitable landing area, flaps in "take off" position (1st notch) then make a precautionary approach at 120 km/h (65 kt), flaps in "landing" position (2nd notch).

On final, unlock the canopy.

Before touchdown

Magneto switch ..... off
Battery switch ..... off

NOTE: IN CASE OF CANOPY JAMMING

Canopy handle in "open" position.

Free the two canopy release levers located on the arm rests, on both sides of the instrument panel, and place them in vertical position.

FIRE

Engine fire during starting

Keep the engine turning with:
Fuel valve ..... off
Electric pump ..... off
Throttle ..... full power
Mixture ..... idle cut-off

The aim of this procedure is to make the engine "swallow" the accumulated fuel in the inlet pipes (generally following an excess of fuel injection during a difficult engine start).

If the fire continues

Magneto switch ..... off
Battery switch ..... off
Alternator switch ..... off

Abandon the aircraft, and try to extinguish the fire with the aids available: fire extinguishers, covers, clothing, or sand.

Engine fire in flight

Fuel valve ..... off
Throttle ..... full power until engine stops
Mixture ..... idle cut-off
Electric pump ..... off
Alternator switch ..... off
Cabin heat and ventilation ..... off
Establish maximum glide speed ..... (78 kt) 145 km/h

Prepare for a forced landing off airfield, following the procedures in the chapter "Power off forced landing off airfield".

Do not attempt to restart the engine.

Cabin fire

Extinguish the fire by all means possible (optional extinguisher).

To eliminate smoke, apply maximum ventilation.

In case of an electrical fire (fumes indicating insulation burning):

Cabin ventilation ..... reduce
Alternator switch ..... off
Battery switch ..... off
Battery breaker ..... pull out
Alternator breaker ..... pull out

Land quickly if the fire continues.

VIBRATIONS AND ENGINE ROUGHNESS OPERATION

Vibrations and engine roughness operation are generally due to (verify in this order):

- Carburator icing: see paragraph "ICING" on next page

- Mixture set too rich or too lean: adjust the mixture (see section 4)

- Contamination in the fuel system: verify fuel pressure. Switch on the electric pump

- Ignition failure: magneto switch on "L", then on "R", then return to "Both". Select the position providing best engine operation, and fly to the nearest airfield, at reduced power, and adjust mixture control to obtain smooth operation.

LOW OIL PRESSURE

In case of low oil pressure indication, check oil temperature, and if it is too high (red arc):

- Reduce power

- Flight to the nearest airfield, and prepare for an off airfield landing

ICING

Proceed as follows when inadvertently encountering icing:

- Carburator heat on

- Increase power in order to reduce ice built-up to minimum

- Switch on pitot heat (if installed)

- Select maximum cabin heat, and direct the total output to the windscreen (position "defrost") in order to remove the ice quickly

- Turn back, or change altitude, to obtain an outside air temperature less conducive to icing

- Plan to land at the nearest airfield

With an extremely rapid ice build-up, carry out a forced landing.

Remember that a layer of 0.5 cm (0.2 in) on the wing leading edge fairly increases stall speed. If needed, use a higher than normal approach speed: 135 km/h (73 kt).

REMARKS

If continuous carburator heat is deamed necessary, it is imperative to adjust the mixture control to obtain normal engine operation.

Always use carburator heat fully on or fully off, in certain cases, an intermediate position could increase icing.

ELECTRICAL POWER SUPPLY MALFUNCTION

Alternator failure is indicated when the amber "alternator failure" light on the warning panel is lit, and a progressive drop in voltage (shown on the voltmeter).

If "alternator failure" is lit

Switch off the alternator, then back on.
This operation resets the overvoltage relay which may have cut-out due to a translant overvoltage.

If the failure continues

- Switch off the alternator
- Switch off all electrical equipment not essential for continuing the flight
- Land as soon as possible, and have the electrical system inspected

NOTE

An alternator failure does not prevent the engine from operating normally.

INADVERTENT SPIN

Should a spin occur, use the following procedure:

- Throttle ..... idle
- Rudder ..... maximum opposite to direction of rotation
- Elevator ..... neutral
- Allerons ..... neutral
- Once rotation stops, rudder to neutral position and recover within flight limitations.

NOTE

If flaps are down when spin begins, retract them immediately.

LOSS OF ELEVATOR CONTROL

In the event of loss of elevator control (accidental disconnection):

- Stabilize the aircraft in level flight, flaps up, at 130 km/h (70 kt), using the elevator trim and throttle.

- Do not change the elevator trim setting, and control the angle of descent only with throttle. Reduce power only on short final, and near to the ground.

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SECTION 4 NORMAL PROCEDURES

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LOADING

Before each flight, insure that the total weight and the load balance are within the established limits. For this, use the weight and balance chart in Section 6.

NORMAL OPERATING SPEEDS

The speeds reminded hereunder are Indicated Air Speeds recommended for normal operations.

They are based on a standard aircraft, operated at gross weight, in standard atmosphere, at sea level. They can change from one aircraft to another, depending on installed equipment, aircraft and engine condition, atmospheric conditions and pilot proficiency.

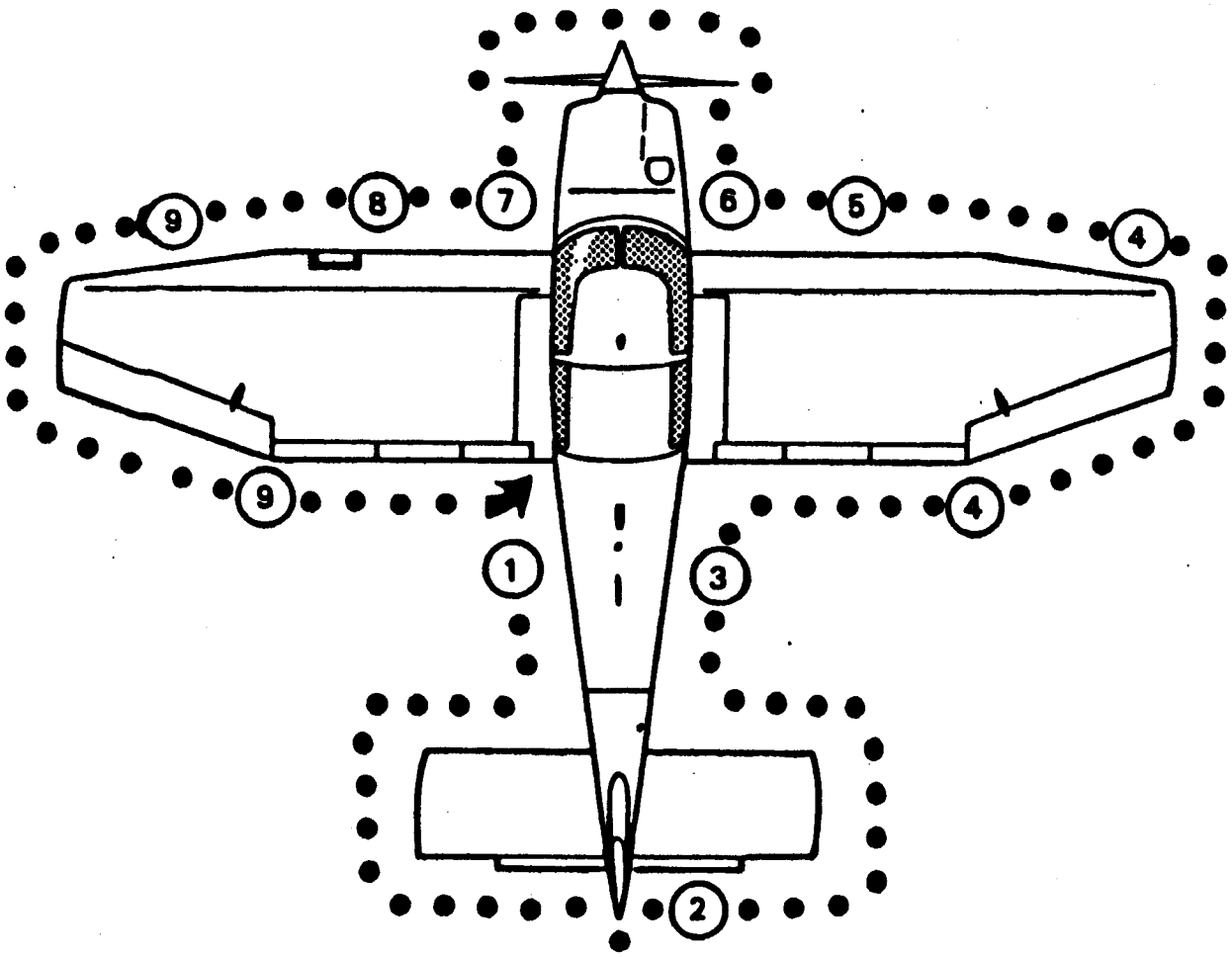
- Best rate of climb speed
  flaps in take off position (1st notch) ..... (78 kt) 145 km/h
  flaps up ..... (86 kt) 160 km/h

- Best angle of climb speed
  flaps in take off position (1st notch) ..... (70 kt) 130 km/h
  flaps up ..... (70 kt) 130 km/h

- Maximum operating speed in turbulence
  flaps up ..... (140 kt) 260 km/h

- Maximum speed
  flaps in landing position (2nd notch) ..... (92 kt) 170 km/h

- Landing speed final approach
  flaps in landing position (2nd notch) ..... (62 kt) 115 km/h



PRE-FLIGHT INSPECTION

To be performed before each flight.
This inspection may be reduced after intermediate on route landings.

Magneto switch ..... "OFF"
Controls .....free
Flaps .....check operation
Battery switch .....on
Fuel quantity .....check
Battery switch .....off
Aircraft documents .....check availability on board
Baggage ..... check stowing

Check flight controls displacements, then make an aircraft walk-around inspection (as shown above) beginning at the fuselage left side.

	Fuel filler cap	in place, locked
1	Static vent	clean, unobstructed
	Fuselage main tank drain valve	actuated
	(Left or right depending on aircraft bank)	
2	Horizontal stabilizer	surface condition, hinges without clearance
	Rudder	check hinges and clearance
3	Static vent	clean, unobstructed
4	Flap and aileron	check condition and hinges
	Wing tip and navigation light (optional)	check condition
	Stall warning	clean, check displacement
5	Right main landing gear	check, oil cap secured, panel closed
		normal shock absorber compression
		tyre inflated
	Fuel drain valve	actuated
	Oil level	check, oil cap secured, panel closed
6	Engine cowl attachment	check
	Propeller	clean, in good condition
	Propeller spinner	no play
	Air inlets	clean, unobstructed
	Nose gear	check atachment and fairing condition
		normal shock absorber compression
7		tyre inflated
		tow-bar removed
	Exhaust pipes	rigid
	Canopy cleanliness	check
	Left main landing gear	check attachment and fairing condition
		normal shock absorber compression
8		tyre inflated
	Pitot	clean, unobstructed
	Lights (optional)	glass clean
9	Wing tip and navigation light (optional)	check condition
	Flap and aileron	check condition and hinges

CABIN INTERIOR CHECK PRIOR START-UP

Canopy ..... closed and locked
Parking brake ..... locked
Front seats ..... adjusted and locked
Belts and harnesses ..... adjusted and fastened
Flight controls ..... free, without play or excessive friction
..... (check rudder on taxi)
Elevator trim ..... verify travel
..... then return to take-off position
Master switch ..... on

STARTING ENGINE

Normal procedure

Carburator heat ..... full out (push in)
Mixture ..... full push in
Strobe light if installed (optional) ..... on
Gauges ..... check
Fuel valve ..... check operation, open
Magneto switch L
Electric pump ..... on
Throttle ..... carry out 2 or 3 injections, then 1/4 travel forward
Propeller area ..... clear
Starter ..... on (max. operation time 30 sec.)
When engine fires magneto switch ..... L+R ("Both")

Hot engine procedure

Same as "Normal procedure", but without injection.

Cold weather procedure

Same as "Normal procedure", but keeping successive injections up to 900 to 1000 rpm.

Engine "flooded"

Electric pump ..... off
Mixture ..... idle cut off (pull out)
Throttle ..... full throttle (push in)
Starter ..... operate for several seconds

As soon as the engine starts, advance mixture control to "rich", and resume the normal procedure, without injection.

ATTENTION

Avoid operating the starter for more than 30 seconds. Wait at least a minute before operating it again.

As soon as the engine is running, verify the engine oil pressure. If it is zero after 15 to 20 seconds, switch off and investigate the cause.

AFTER THE ENGINE STARTS

Rpm ..... 1200 rpm
Electric pump ..... off
Alternator switch ..... on
Voltmeter ..... green range
Vacuum gauge ..... check
Lights ..... test

COM/NAV, navigation instruments .....on, set
Altimeter .....set
Vacuum gauge if installed (optional) ..... check

TAXIING

Parking brake ..... unlocked
Brakes ..... test
Turn and bank indicator if installed (optional) ..... check
Directional gyro if installed (optional) ..... check setting
Avoid exceeding 1200 rpm as long as oil temperature remains in the yellow range.

ENGINE RUN UP

Parking brake ..... locked
Oil pressure and temperature ..... green range
Fuel pressure ..... green range
Mixture ..... full push in
Carburator heat ..... full out

Magnetos check

Throttle ..... 2000 rpm
Magneto selection:
Max. drop between (L) or (R) and (L+R) ..... 175 rpm
Max. difference between (L) and (R) ..... 50 rpm

Carburator heat check

Carburator heat ..... full on (pull out)
Check rpm drop ..... about 100 rpm
Carburator heat ..... full out (push in)

Mixture check

Lean untill rpm reduction, then return to "full rich".

Engine idle check

Throttle ..... 600 to 650 rpm

BEFORE TAKE OFF

Controls ..... free
Magneto switch ..... L + R ("Both")
Cabin (seats, belts, canopy) ..... check
Fuel shut off control ..... on
Electric pump ..... on
Elevator trim ..... take off position
Instruments ..... check, set
Flaps ..... fully down, then return to take off position (1st notch)
Throttle ..... "holding" 1200 rpm

TAKE OFF

Normal take off

Take off minimum rpm ..... 2200 rpm
Take off speed ..... (54 kt) 100 km/h
Initial climb speed ..... (65 kt) 120 km/h

After obstacle clearance,

Reduce angle of climb to obtain ..... (78 kt) 145 km/h
Electric pump ..... off
Fuel pressure ..... check (green range)
Flaps ..... up

Short take off

Flaps ..... (1str notch) take-off position
Apply full power, brakes applied
then release the brakes ..... mini 2200 tr/mn
Take off speed ..... (54 kt) 100 km/h
Then, if necessary (to clear an obstacle)
best angle of climb speed ..... (70 kt) 130 km/h

Cross wind take off

Flaps ..... (1st notch) take off position
Ailerons ..... into the wind
Take off at a slightly higher airspeed than normal.
Correct drift in the normal way (max. bank angle, close to the ground: 15°)

Demonstrated crosswind (22 kt) 40 km/h

CLIMB

Normal climb (flaps up)

Set climb speed 160 km/h (86 kt); 140 km/h (75 kt) at 10 000 ft.

Above 5000 ft, adjust mixture.

Best angle of climb

A better rate of climb is obtained at 130 km/h (70 kt), flaps in take off position (1st notch), or flaps up.

NOTE

This type of climb should only be used exceptionally, due to poor engine cooling

CRUISE

Refer to Section 5 for rpm settings and cruise performance.

Operation of mixture control

Maintain mixture control in the "full rich" position during take off and in the climb.

In certain conditions (high altitude take off, long climb above 5000 ft), this setting could be too rich, and results in irregular engine operation or loss of power.

In these cases, adjust the mixture to recover regular engine operation, and not for fuel economy.

Mixture adjustment when in stable cruise:

Progressively lean the mixture until a slight reduction in rpm is noted; then lightly enrich to re-establish power and normal engine operation.

NOTE

Take care not to lean the mixture too much, which would cause engine overheating.

ALWAYS ENRICH THE MIXTURE BEFORE AN INCREASE IN POWER.

DESCENT

Rapid descent

Power ..... as required to maintain the desired descent path
Carburator heat ..... as required full on or full out
Each 1500 ft, apply power to avoid excessive engine cooling and to clean the spark plugs.

Approach or down wind

Mixture ..... fully rich (push in)
Electric pump ..... on
Carburator heat ..... as required full on or full out
Cabin (belts and seats) ..... check
Flaps ..... below 170 km/h (92 kt) (1^{st} notch) in take off position
Speed ..... (81 kt) 150 km/h
Elevator trim ..... set
Roll stabilizer or Autopilot (if installed) ..... off

Final

Carburator heat ..... full out (push in)
Flaps ..... below 150 km/h (81 kt) (2^{nd} notch) landing position
Approach speed ..... (62 kt) 115 km/h
Elevator trim ..... set

LANDING

Short landing

Flaps ..... (2^{nd} notch) landing position
Approach speed ..... (with throttle setting) (62 kt) 115 km/h
After touch down, brake heavily keeping nose up with elevator and retracting flaps.

Landing in crosswind or gusty conditions

Flaps ..... (1st notch) take off position
Approach speed ..... (70 kt) 130 km/h + 1/2 gust speed
Drift ..... correct in the normal way
Demonstrated crosswind ..... (22 kt) 40 km/h

Overshoot procedure

Carburator heat off (pushed) ..... check
Throttle ..... full (push in)
Speed ..... (65 kt) 120 km/h
Progressively raise flaps to the take-off position (1st notch), then establish normal climb speed ..... (75 kt) 140 km/h

AFTER LANDING

Electric pump ..... off
Flaps ..... up
Navigation instruments ..... off

ENGINE SHUT-DOWN

Parking brake ..... tight
Flaps ..... down
COM/NAV and electrical equipment ..... off
Magneto cut-off check at idle ..... off, then L + R ("Both")
Rpm ..... 1000 rpm
Mixture ..... idle cut-off (pull out)

After the engine stops

Magneto switch ..... off
Alternator switch ..... off
Battery switch ..... off
When wheel chocks in place ..... release the parking brake

PARKING BRAKE USE

Brake on

Press on both pedals. Keep pressure on, while pulling the parking brake control upwards. Then, release the pressure on the pedals (the parking brake control remains in the pulled position).

Brake off

Push the control down.

SECTION 5 PERFORMANCE

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NOISE LIMITATION

In compliance with the decree of 19.02.1987, the maximum acceptable noise level for the DR400/140B aircraft, at a certified gross weight of (2205 lb) 1000 kg is 83.2 dB(A) (ICAO Annex 16 Chapter 10).

The noise level determined under the conditions of the decree, is 74.9 dB (A) at maximum continuous power.

The DR400/140B aircraft has received noise limitation certificate nr N45.

AIRSPEED INSTALLATION CALIBRATION

VC = (VI + calibration) is substantially equal to VI

The above figures do not take into account the ASI own tolerance

.

NOTE

All speeds in this manual are Indicated Airspeeds unless otherwise specified.

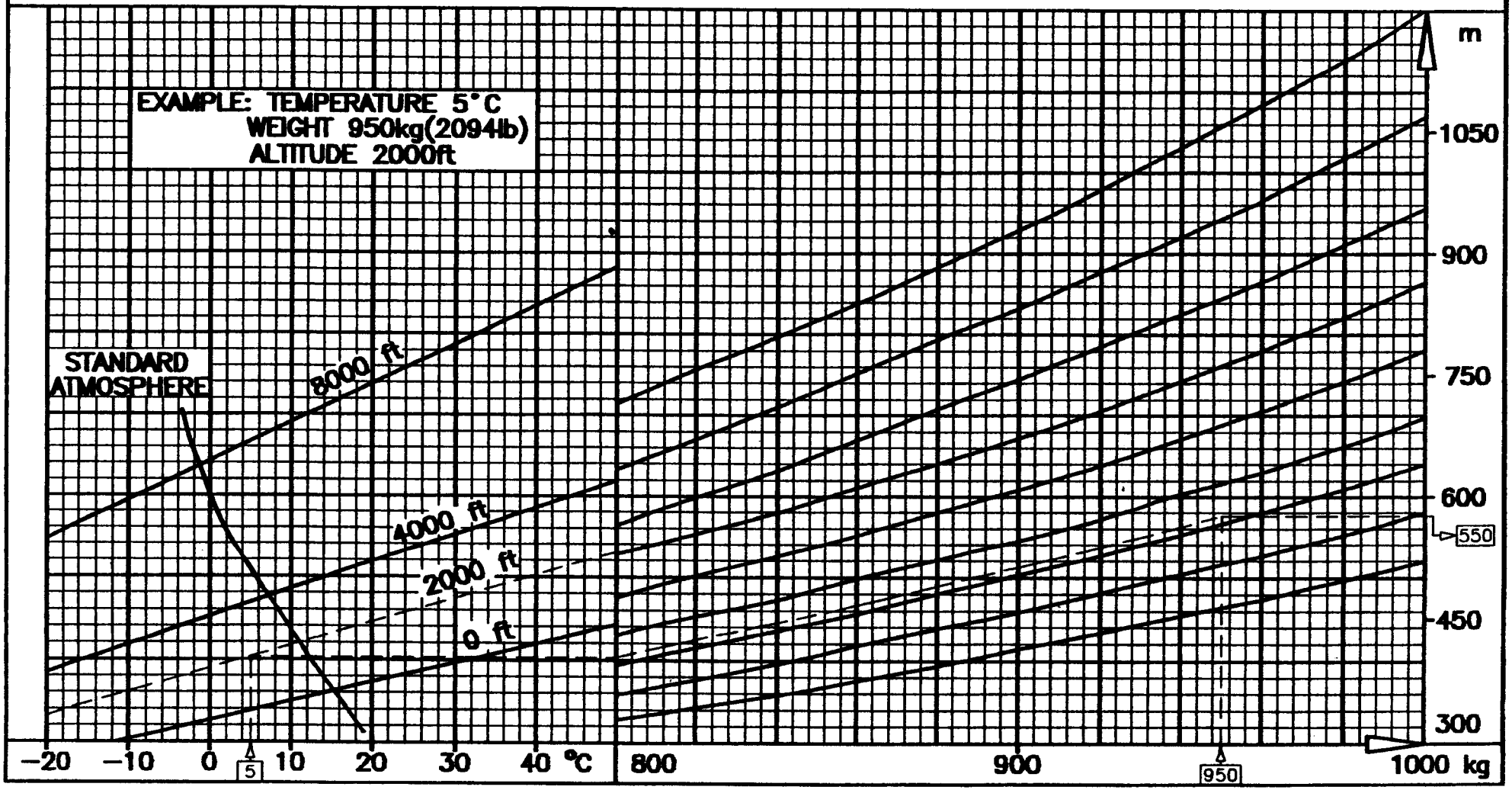
STALL SPEEDS

Engine idling, weight: 1000 kg (2205 lb)	km/h (kt)		
Bank angle	0°	30°	60°
Flaps up	99 (54)	106 (58)	140 (76)
Flaps 1 st notch, take off position	93 (51)	99 (54)	131 (71)
Flaps 2nd notch, landing position	87 (47)	93 (51)	123 (67)

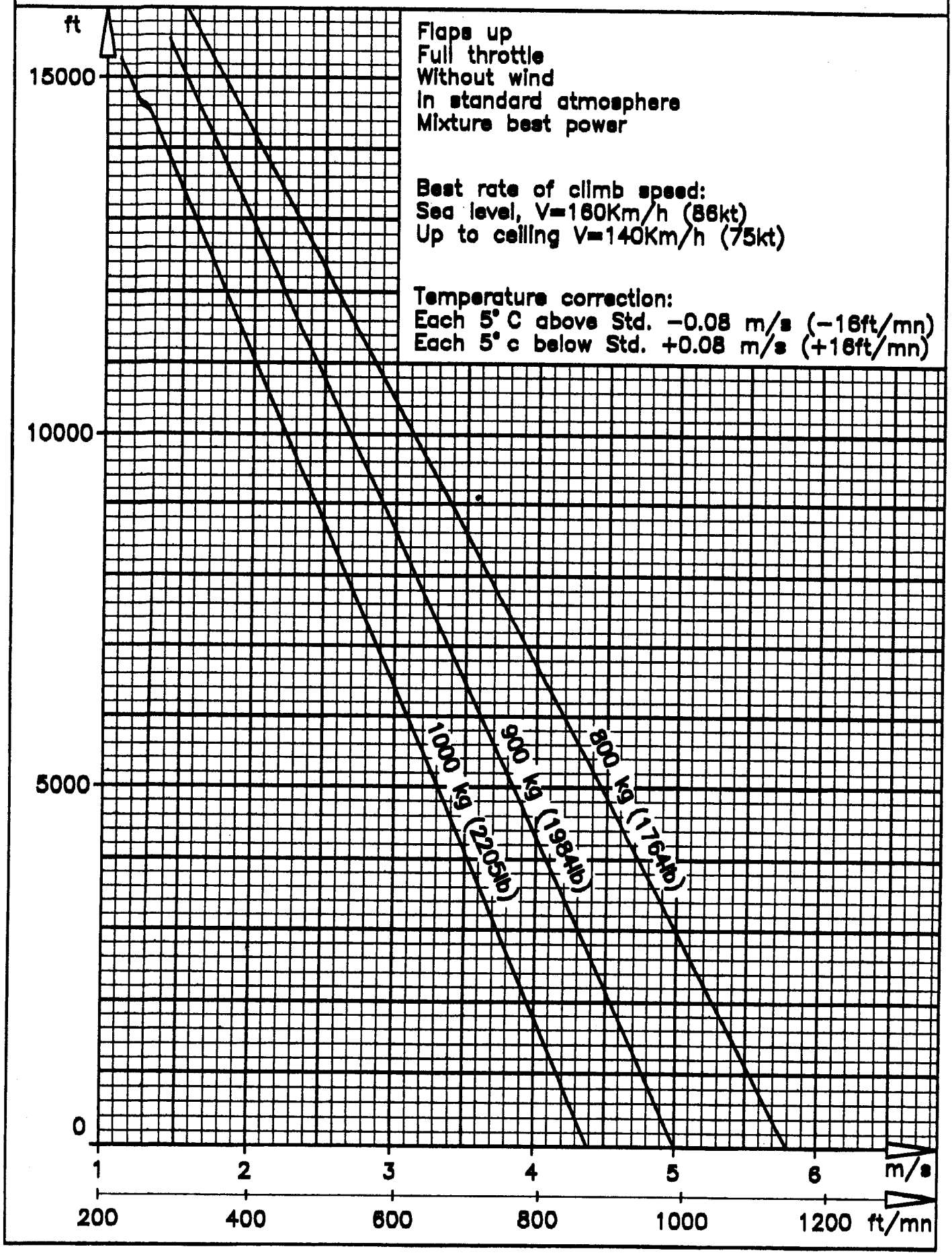
TAKE–OFF PERFORMANCE

WITHOUT WIND
FLAPS IN TAKE–OFF POSITION
ENGINE FULL POWER
DRIED AND PLANE CONCRETE RUNWAY
OVER 15m(50ft) V=120km/h (65kt)
TAKE–OFF,V=100km/h (54kt)

HEAD WIND INFLUENCE: FOR 10kt MULTIPLY BY 0.79
FOR 20kt MULTIPLY BY 0.64
FOR 30kt MULTIPLY BY 0.53
DOWN WIND INFLUENCE: ADD 10% TO DISTANCE PER SECTION OF 2kt
DRIED GRASS RUNWAY: ADD 15%



CLIMB PERFORMANCE



CLIMB PERFORMANCE

1) Flaps, take-off position (1st notch):

At maximum weight of 1000 kg (2205 lb) in standard atmosphere

Best rate of climb speed ..... (78 kt) 145 km/h
Best angle of climb speed ..... (70 kt) 130 km/h

Temperature influence:

Each 10°C above standard, lowers the ceiling by 1000 ft and reduces rate of climb by 0.24 m/s (47 ft/mn).

Glide performance

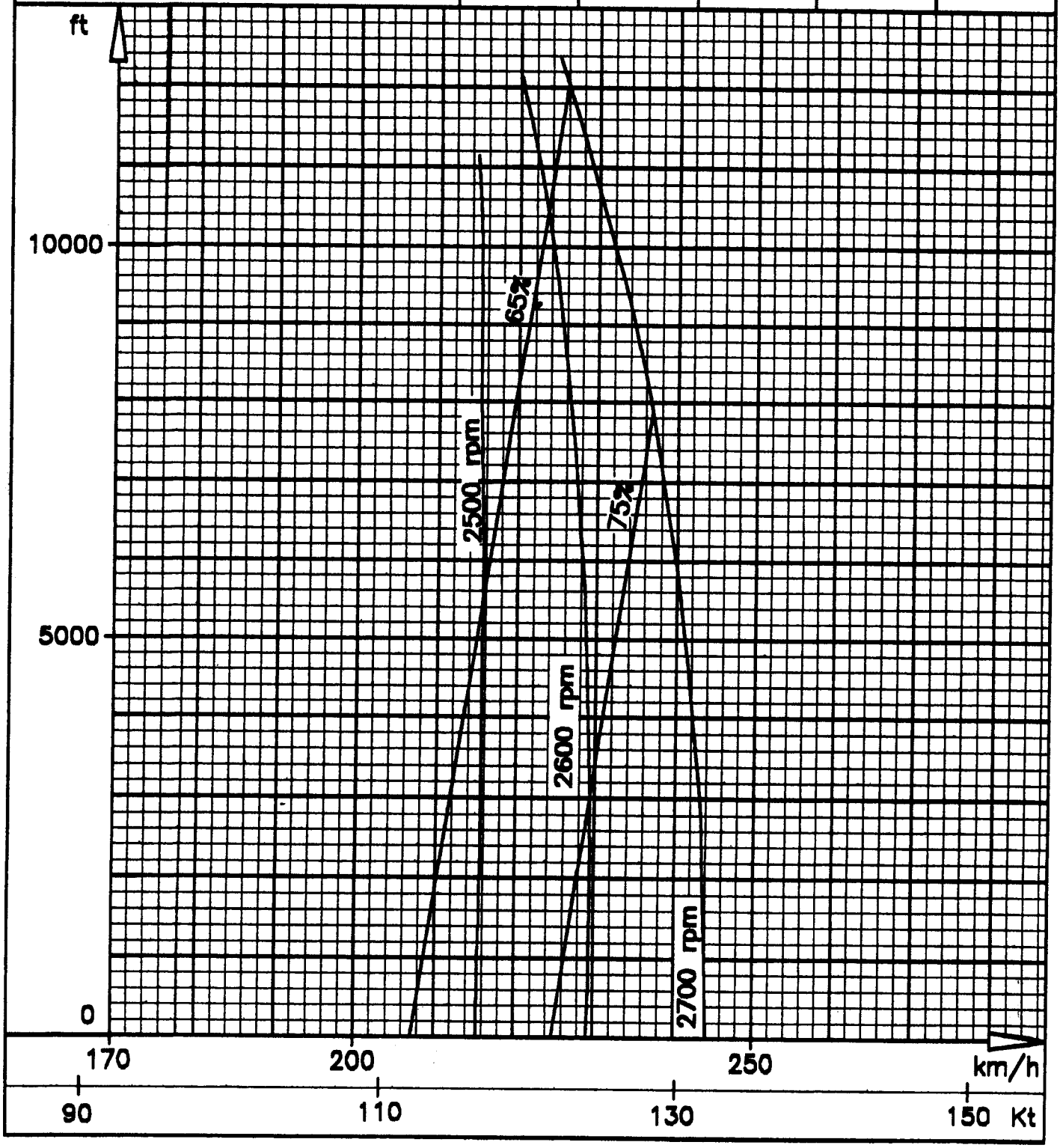
Engine off, the aircraft glides 9,3 times its height (without wind) at 145 km/h (78 kt).

Altitude and temperature do not have perceptible influence.

CRUISE PERFORMANCE

At gross weight 1000kg (2205lb)
In standard atmosphere
Without wind
Optimum mixture setting

Power	Fuel consumption l/h (us gal/h) 75 % l/h	75 % us gal/h	65 % l/h	65 % us gal/h
2700	39.3	10.3	34.7	9.1
2600	38.3	10.1	33.8	8.9
2500			33	8.7

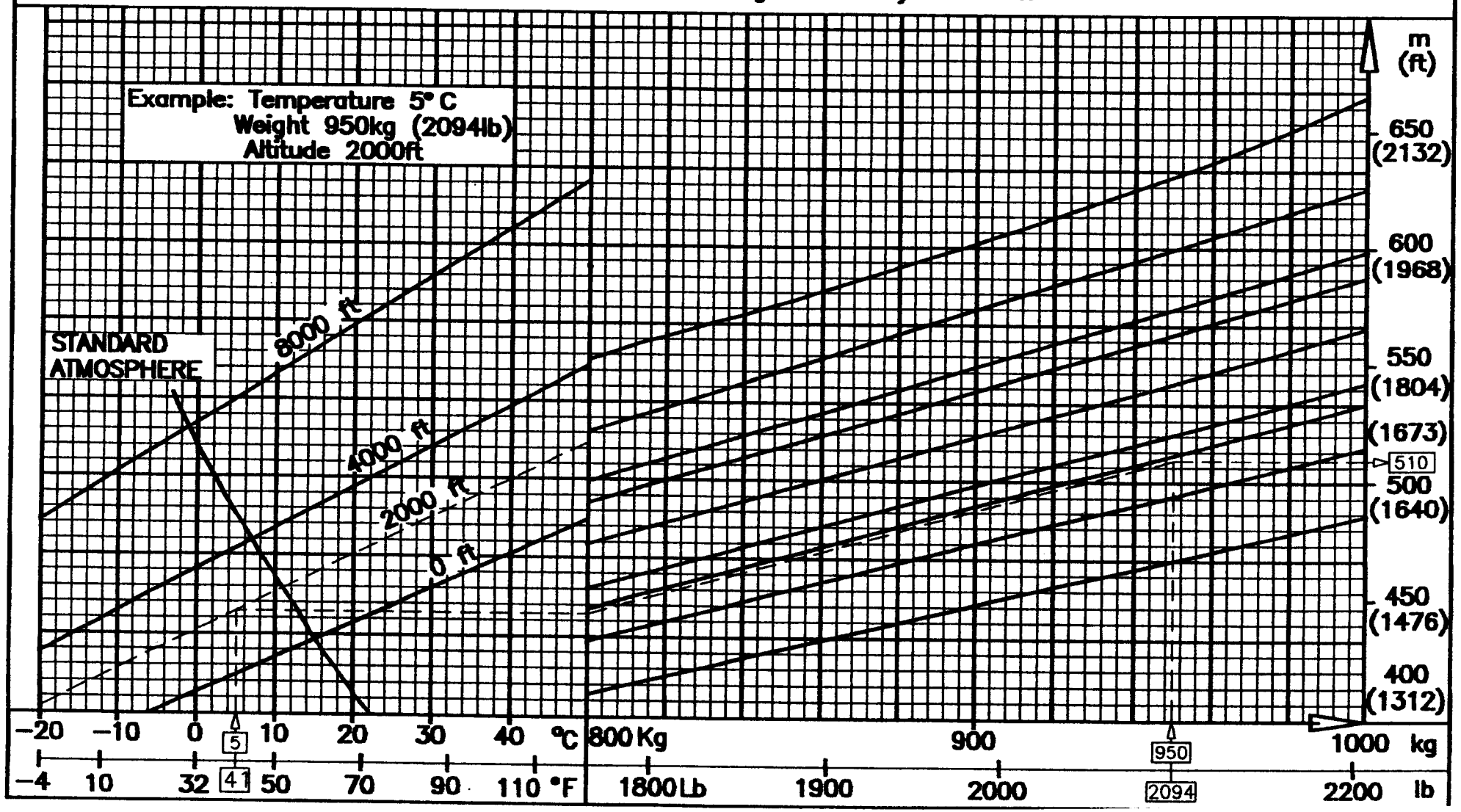


LANDING PERFORMANCE

Without wind
Flaps in landing position
Engine idling
Dried and plane concrete runway
Over 15m (50ft): V=115Km/h(62kt)
Touch down, V=87Km/h(47kt)

Head wind influence: For 10kt multiply by 0.79
For 20kt multiply by 0.64
For 30kt multiply by 0.53

Down wind influence: Add 10% to distance per section of 2kt
Dried grass runway: Add 15%



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SECTION 6 WEIGHT AND BALANCE

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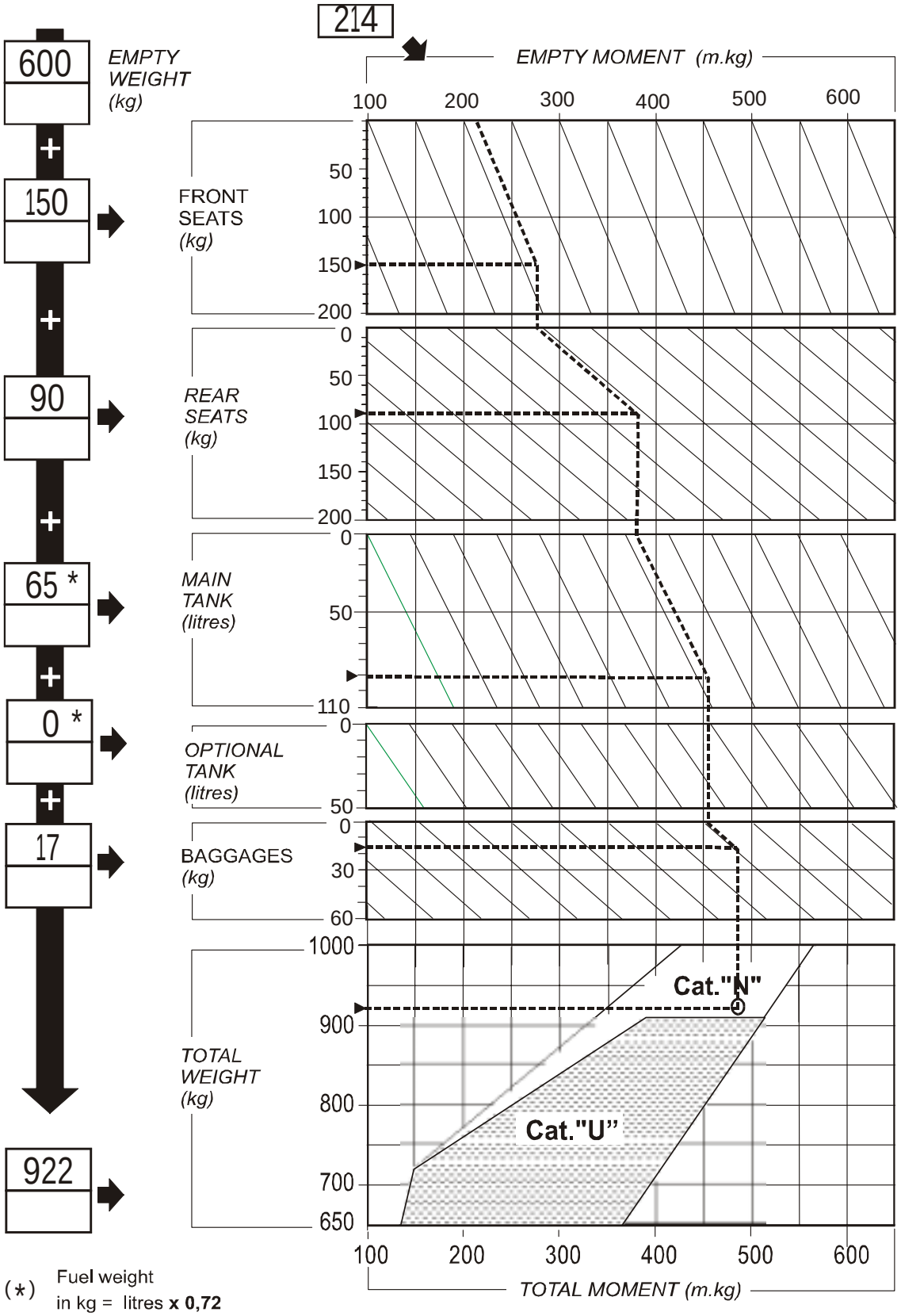
GENERAL

Two methods may be used to determine aircraft weight and balance:

- Graphic: use of weight and balance diagram
- Calculation

WEIGHT AND BALANCE DIAGRAM



(*) Fuel weight in kg = litres **x 0,72**

GRAPHIC METHOD: USE OF WEIGHT AND BALANCE DIAGRAM

1) Calculate the weight of the fully loaded aircraft :
   empty weight (from the Weight & Balance Data Sheet)
   + pilot and passengers weights
   + baggage weight
   + standard fuel
   Make sure that the total weight does not exceed 1000 kg (2205 lb) in cat. N and 910 kg (2006 lb) in cat. U.

2) Place the empty aircraft moment (from the Weight and Balance Data Sheet) on the upper scale of the diagram, and proceed with your own data as in the following example, indicated by dashed line on the diagram.

EXAMPLE of loading problem (dashed line on the diagram)
Licenced empty weight (sample airplane) .. (1548 ft.lb) 214 m.kg
Weight of the empty aircraft ..... (1323 lb) 600 kg
Pilot & front passenger ..... (331 lb) 150 kg
Rear passenger ..... (198 lb) 90 kg
Fuel, main tank 90 l (24 imp/20 US gal) ..... (143 lb) 65 kg
Baggage ..... (37.5 lb)17 kg
TOTAL WEIGHT .....(2033 lb) 922 kg

Loading is acceptable when the resulting point falls within the Center of Gravity moment envelope.

**** CAUTION***

For the calculation of the aircraft center of gravity,do not use the values of empty aircraft weight and moment indicated in the above example !
Use the values indicated in the latest licenced weight and balance data sheet of your aircraft.

1 litre AVGAS = 0.72 kg (1.6 lb)
1 US gal AVGAS = 2.7 kg (6 lb)
1 Imp gal AVGAS = 3.27 kg (7.2 lb)
1 lb = 0.453 kg
1 kg = 2.20 lb
1 foot = 0.305 m

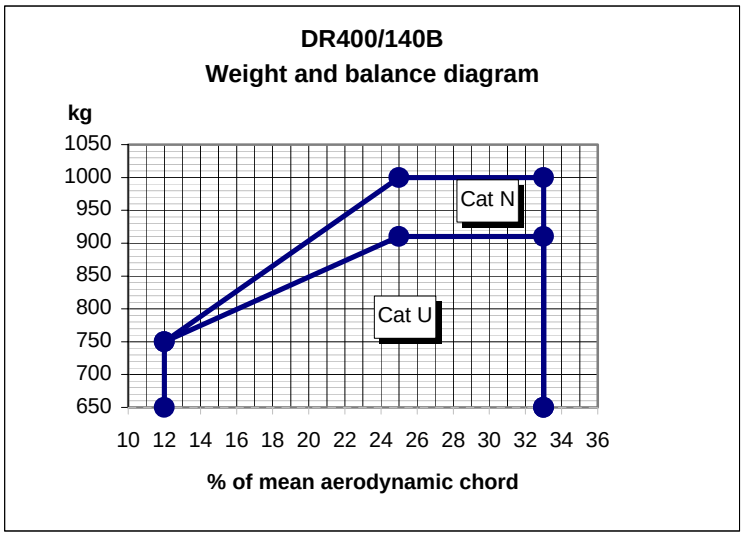
CALCULATION OF WEIGHT AND BALANCE

	weight (kg)		Arm (m)		Moment (m.kg)
Empty weight	(*)	x	(*)	=	(*)
Front seats		x	0.360 to 0,410	=	
Rear seats		x	1,190	=	
Main tank (max. weight 78,5 kg)		x	1,120	=	
Optional tank (max. weight 36 kg)		x	1,610	=	
Baggages (max. weight 40 kg)		x	1,900	=	
Total Pt =	kg		Mt	=	m.kg

(*) Use values indicated on the latest weight and balance data sheet of your plane.
Maximum weight: 1000 kg
Mean Aerodynamic Chord (m.a.c.): 1,71 m
C of G lever arm: Bt = Mt / Pt = …….. m
Balance % of m.a.c.: (Bt / m.a.c.) x 100 = (Bt / 1,71) x 100

$$\frac{\text{……..}}{1{,}71} \times 100 = \text{……. \%}$$

Loading is acceptable when the resulting point falls within the weight and balance envelope.



SAMPLE LOADING PROBLEM

	Weight (kg)		Arm (m)		Moment (m.kg)
Empty weight	600	x	0.357	=	214.02
Front seats	150	x	0.410	=	61.5
Rear seats	90	x	1.190	=	107.1
Main tank (max. weight 78,5 kg)	65	x	1.120	=	72.8
Optional tank (max. weight 36 kg)	0	x	1.610	=	0
Baggages (max. weight 40 kg)	17	x	1.900	=	32.3
Totaux Pt =	922 kg			Mt =	487.72 m.kg

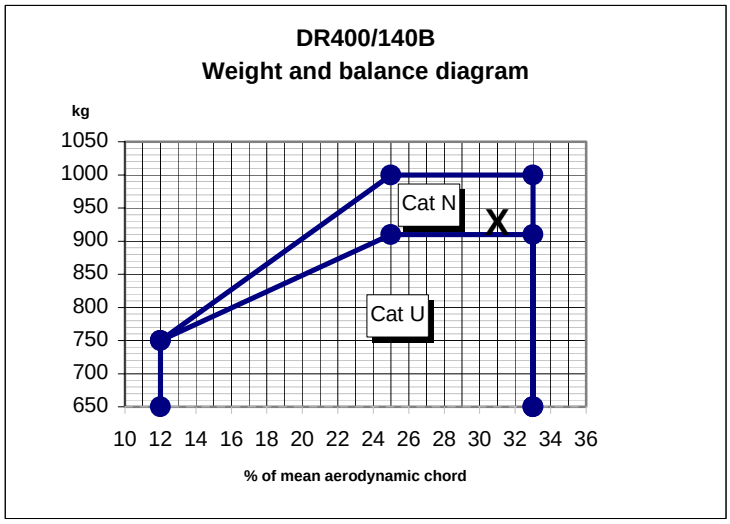
Maximum weight : 1000 kg
Mean Aerodynamic Chord (m.a.c.) : 1,71 m

C of G lever arm : Bt = Mt / Pt = 487.72 / 922 = 0.529 m

Balance % of m.a.c.: (Bt / m.a.c.) x 100 = (Bt / 1,71) x 100

$$\frac{0.529}{1,71} \times 100 = 30.93\ \%$$

Loading is acceptable since the resulting point falls within the weight and balance envelope.



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SECTION 7 SUPPLEMENTS

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SUPPLEMENT 1	OPTIONAL FUEL TANK

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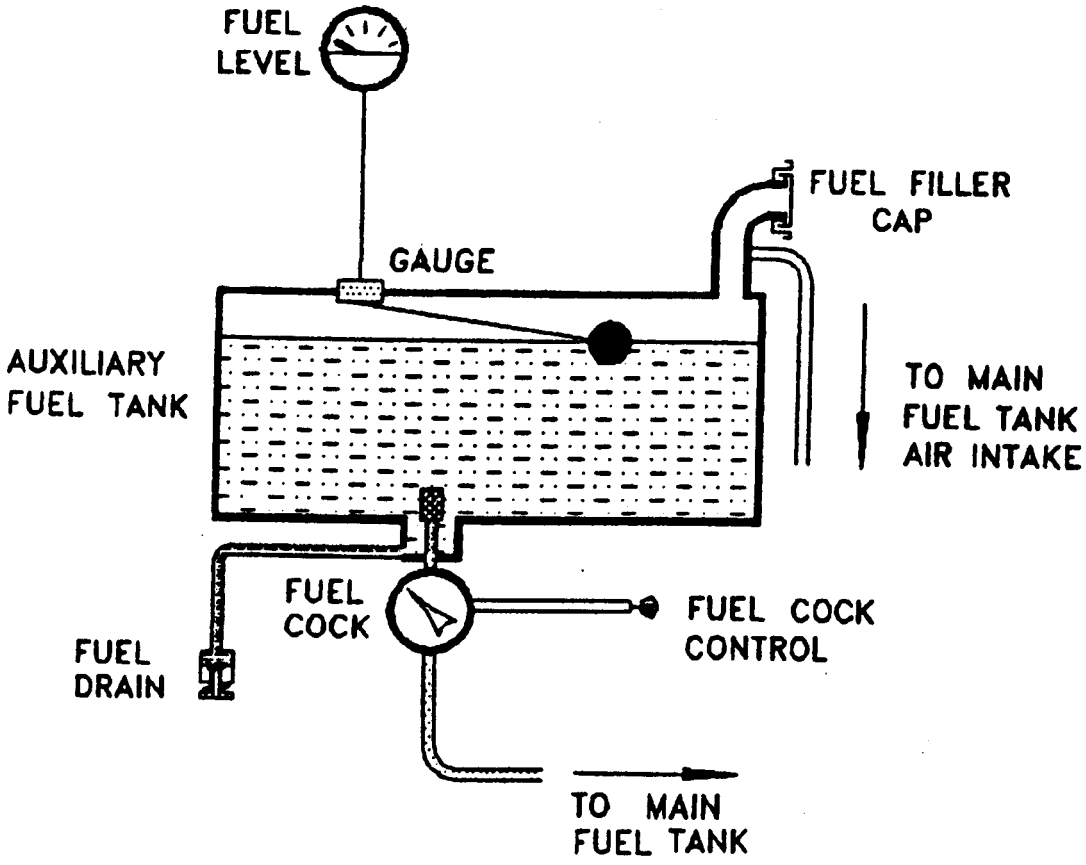
SECTION 1 - DESCRIPTION

The auxiliary fuel tank is located on the bottom of the baggage compartment and is connected to the main fuel tank by a transfer line.
Use first a sufficient quantity from the main fuel tank then refuel by pulling the auxiliary tank transfer valve control.
The quantity of auxiliary tank fuel is given by an independant gauge.

capacity ..... (11 imp/3,2 us gal) 50 l
level arm ..... (63 in) 1,61 m

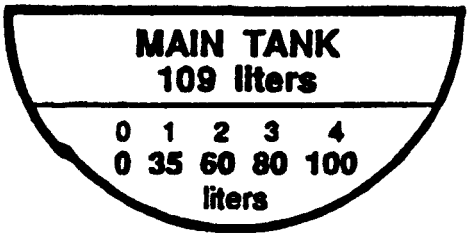
NOTA

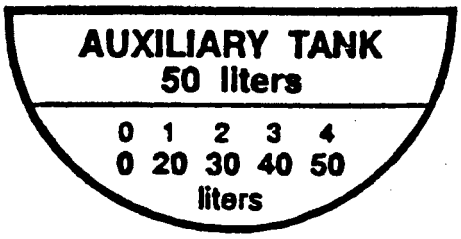
The main fuel tank must be empty enough to receive fuel quantity from the auxiliary fuel tank.

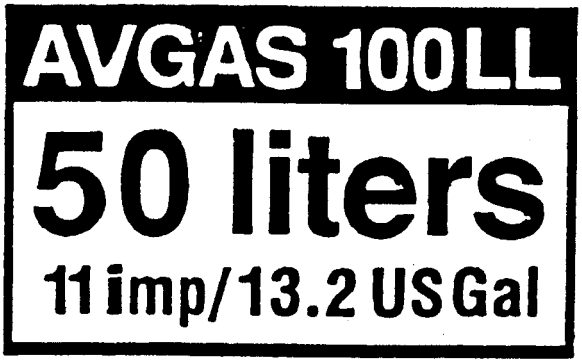


SECTION 2 - LIMITATIONS

The maximum take off weight and the weight and balance limits are not modified by the installation of the auxiliary fuel tank. Therefore, limitations of the Section 2 are not modified. The placard "MAIN TANK" supersedes those of the 2.08 "FUEL". Following placards complete those of the pages 2.08, 2.09 and 2.10.







SECTION 3 - EMERGENCY PROCEDURES

The emergency procedures are not affected by the installation of auxiliary fuel tank.

SECTION 4 - NORMAL PROCEDURES

In addition to normal procedures actuate the auxiliary fuel tank drain valve during the pre-flight check (point 1 page 4.05).

SECTION 5 - PERFORMANCE

The performance are not affected by the installation of the auxiliary fuel tank because the maximum take off weight and the weight and balance limits are not modified.

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SUPPLEMENT 2 NIGHT VFR

TABLE OF CONTENTS

SECTION 1 - DESCRIPTION

The DR400/140B aircraft can be used in VFR system in non-icing condition with application of "modification majeure n° 56". This modification installs an instrument panel lighting.

It is imperative to equip the DR400/140B Night VFR aircraft with following equipment, in addition to day VFR equipment, for a night VFR use:

- Gyro Horizon indicator
- Turn and bank indicator
- Directional gyro indicator
- Variometer
- Strobe lights
- Navigation light
- Taxi light
- Landing light
- Lighting 2
- Spare fuses
- Torch
- VHF 1 (cat. 2)
- VOR (cat. 2) or ADF (cat. 2)
- Night VFR placard

SECTION 2 - LIMITATIONS

Limitations of section 2 are not affected by Night VFR use, except the placard concerning flight conditions which must be replaced by following placard:

THIS AIRCRAFT MUST BE USED FOR *NORMAL* OR *UTILITY* FLYING ONLY, IN ACCORDANCE WHITH THE APPROVED FLIGHT MANUAL.
ON THIS AIRCRAFT, ALL INDEXES, MARKINGS & PLACARDS CORRESPOND TO *NORMAL* UTILISATION.
FOR *UTILITY* OPERATION, REFER TO THE APPROVED FLIGHT MANUAL.

V_a MANEUVERING SPEED: 116 kt - 215km/h
NO AEROBATIC MANEUVRES ALLOWED
APPROVED FOR VFR FLIGHT BY DAY AND BY NIGHT IN NON-ICING CONDITIONS.
SPINS PROHIBITED . NO SMOKING

SECTION 3 - EMERGENCY PROCEDURES

The following emergency procedures complete those of the Section 3.

Lighting 1 failure

- lighting 2 ..... on
- lighting 1 fuse ..... verify

If the failure persists, the lighting 2 and the torch can be used as emergency lighting.

Light failure

- taxi light switch-type circuit breaker ..... verify

Battery failure

If, following a complete battery failure, the alternator deactivates involving loss of power supply, proceed as follows:

- battery, alternator and radio (if installed) circuit breakers ..... off
- battery switch ..... on
- alternator switch ..... on

Notice that circuits are again switched on. Reset only the switches necessary to ensure flight safety.

SECTION 4 - NORMAL PROCEDURES

These procedures complete those of the Section 4.

Preparation

Study of the meteorological report, in order to avoid flight in dangerous conditions (minima, climbing...).
Verify that fuel and oil quantities comply with regulations.

Before flight

Verify operation of:

- strobe lights ..... verify
- navigation lights ..... verify
- landing light ..... verify
- taxi light ..... verify
- lighting 2 ..... verify
- lighting 1 ..... verify
- day/night selector switch ..... verify
- emergency torch on board ..... verify

Lighting

- switch on lighting 2
- adjust with lighting 1 if necessary

Taxiing

- strobe lights ..... on
- navigation lights ..... on
- gyro instruments ..... verify operation
- artificial horizon ..... pitch index setting
- directional gyro ..... correct rotation
- turn and bank indicator ..... correct movement

Before take-off

- vacuum indication ..... check
- VHF ..... test
- VOR or ADF ..... test
- heating .....defrost as necessary
- landing light ..... on

Aligning

- directional setting

Take off

- Maintain positive climb on rate of climb indicator.
- Switch off taxi and landing lights at the end of the runway.

Climb and cruise

Above 8000 feet, there is a risk of disturbance in the pilot's night vision.

Landing

- landing light ..... on
- taxi light ..... on

After engine shut down

- light ..... off

SECTION 5 - PERFORMANCE

Performance of the Section 5 are not affected.

SUPPLEMENT 3	CENTURY II B AUTOPILOT

TABLE OF CONTENTS

SECTION 1 - DESCRIPTION

The CENTURY II B is an all electric, single axis (roll) autopilot system. It provides course intercept, tracking and coupler for VOR/ILS optional equipment.

CENTURY II B COMPONENTS DESCRIPTION

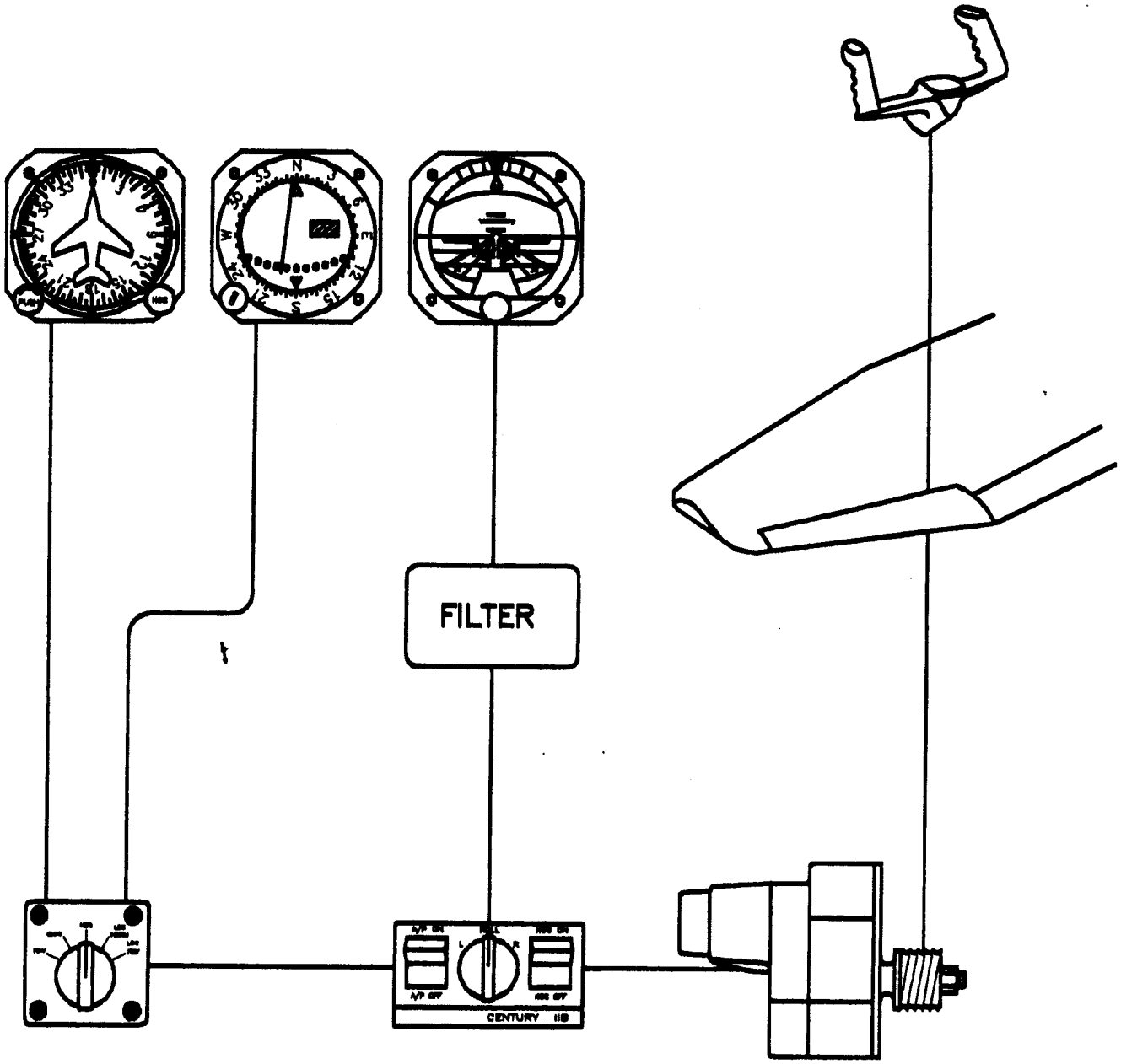
Command console

A/P ON - A/P OFF — Autopilot ON-OFF rocker switch.
When only this switch is engaged (A/P ON), the autopilot is responsive to the roll command knob (ROLL) on the center of the console.

ROLL — Roll maneuvre knob up to approximately 30° of bank right or left.
The centered position represents approximate wings level flight. When the heading mode is engaged (HDG ON), action on the roll knob (ROLL) is ineffective.

HDG ON - HDG OFF — Heading mode ON-OFF rocker switch.
It provides turning the aircraft to a preselect heading on the Course Selector Directional Gyro or conducting course intercepts or tracking.
When heading mode switch is engaged (HDG ON), roll knob input is replaced by the Course Selector Directional Gyro and the optional Coupler Mode Selector inputs.
The Course Selector Directional Gyro and the optional Coupler Mode Selector should be set prior to engagement of the heading mode (HDG ON).
(See Section on Coupler Mode Selector operations when optional Coupler Mode Selector is installed)

CENTURY II B AUTOPILOT INSTALLATION DIAGRAM



Course Selector Directional Gyro

Any heading may be selected, either before or after heading mode (HDG ON-HDG OFF) engagement on the command console and turns up to 160° may be programmed directly, either right or left.
If course selector indicator is rotated beyond 180° from the Directional Gyro card heading, the autopilot will turn in the shortest direction to reach the selected heading.
In normal operation the maximum bank in heading mode (HDG) is 20°.

Coupler Mode Selector

Direct the autpilot in both VOR and ILS navigation.

Nominal interception angles are 45° and an automatiç 15° crosswind correction capability is provided.

"HDG" Mode — It is the basic function of the CENTURY II B autopilot as described in Command console section.

"OMNI" Mode — When in the "OMNI" Mode position the system is coupled to the VOR Indicator.
To select a desired course for interceptor tracking, always set both the VOR Course Selector and the Directional Gyro Course indicator to the desired course. All heading will then be controlled by the VOR signal. A full deflection on the VOR Indicator will produce a 45° interception angle.
With less than full deflection, the system will automatically direct a smooth, tangential intercept to arrive over the radial with crosswind correction established. The same dynamic intercept is accomplished whether 3 km (2 miles) or maximum reception distance from station.
Below approximately 3 km (2 miles), autopilot bank limitations will allow a slight overshoot of the selected radial.

"NAV" Mode

This mode serves the same functions as "OMNI" Mode and is initiated in the same manner.
The "NAV" Mode, however, incorporates an extended time delay which reduces reaction to short term VOR needle deflections.
The "NAV" Mode is recommended for enroute navigation or any time autopilot response to short term VOR needle deflections becomes excessive.
The "NAV" Mode should not be used for close in VOR approach work, as close in work requires the proportioned dynamic response provided by the "OMNI" Mod

"LOC NORM" Mode

In the "LOC NORM" Mode, the system adjusts its sensitivity to accomodate the "Localizer" course width (5° instead of 20° for the VOR) and to provide smoother more optimum intercept and track maneuvers.
Intercept angles of 45° are automatic with tangential intercepts outside the marker and automatic crosswind correction.
As with the "OMNI" Mode, the Course Selector Directional Gyro must be set to correspond the desired magnetic course.

"LOC REV" Mode

The features of "LOC REV" Mode are identical to the "LOC NORM" Mode except that the aircraft will fly away from the Localizer Indicator Needle instead of toward it.
When using the "LOC REV" Mode the Course Selector Indicator must be set to the reciprocal of the front course heading.

SECTION 2 - LIMITATIONS

Section 2 limitations are not affected by the CENTURY II B autopilot installation .

Following autopilot specific limitations are to be added:

Minimum use height ..... 500 ft
Maximal use speed .....(140 kt) 260 km/h

IMPORTANT

Do not use the autopilot in case of Directional Gyro, vacuum pump or system failure.

SECTION 3 - EMERGENCY PROCEDURES

In case of autopilot malfunction:

1- Manoeuvrer the stick as required in order to override the autopilot

NOTE

The autopilot may be overriden by the pilot without damage to the system.

2- Cut off the main autopilot switch (AP/OFF)

3- Pull the autopilot breaker and do not try to switch it on again

In case of vacuum system failure:

1- Cut off the main autopilot switch (AP/OFF)

SECTION 4 - NORMAL PROCEDURES

Preflight autopilot check with engines running and gyros erected:

1 - Vacuum ..... green arc

2 - Autopilot switch ..... "A/P OFF"

3 - Heading mode switch ..... "HDG OFF"

4 - Coupler Mode Selector ..... "HDG"

5 - "ROLL" knob ..... centered

6 - Course Selector Directional Gyro ..... centered

7 - Autopilot switch ..... "A/P ON"

8 - Turn the "ROLL" knob ..... "L" then "R"
(note that the control stick responds in the proper direction)

9 - Heading mode switch ..... "HDG ON"

10 - Rotate the heading knob ..... "R" then "L"
(note the autopilot response. Without aerodynamic response, servo action is unlimited)

11 - Override the autopilot at the control stick ..... "R" then "L"
(Force required should be approximately 7 kg (15 lbs))

12 - Before take off autopilot switch ..... "A/P OFF"

In flight autopilot engagement procedure

Aircraft flight attitude ..... wings level

"ROLL" knob ..... centered

Heading mode switch ..... "HDG OFF"

Autopilot switch ..... "A/P ON"

Coupler Mode Selector ..... "HDG"

Heading knob ..... centered

Heading mode switch ..... "HDG ON"

Select desired lateral guidance mode

For more details concerning the use of available modes, refer to the CENTURY II B pilot's operating manual.

Final approach procedure

In final approach and at latest 500 ft height:

Autopilot switch ..... "A/P OFF"

SECTION 5 - PERFORMANCE

Section 5 performance are not affected by CENTURY II B autopilot installation.

SUPP LEMENT 4: SENSENICH 74DM6S5-2-60 PROPELLER

TABLE OF CONTENTS

SECTION 1 - DESCRIPTION

The datas of the Section 1 are not modified except those hereunder:

Engine

Maximum power ..... (155 cv) 2500 rpm
Maximum continuous power ..... (155 cv) 2500 rpm

Propeller

MANUFACTURER	SENSENICH
TYPE	74 DM6 S5-2-60
DIAMETER	1.83 m (72 in)
PITCH	60 in
MINIMUM STATIC RPM FULL THROTTLE SEA LEVEL	2300 rpm

SECTION 2 - LIMITATIONS

The limitations of the Section 2 are not modified except those hereunder:

Engine limitations

Maximum rpm 2500
Maximum continuous rpm 2500

Tachometer markings

Green arc ..... 2000 to 2500 rpm
Red line ..... 2500 rpm

SECTION 3 - EMERGENCY PROCEDURES

The procedures of the Section 3 are not modified.

SECTION 4 - NORMAL PROCEDURES

The emergency procedures of the Section 4 are not modified except those hereunder:

Normal take off

Take off minimal rpm 2300

Short take off

Apply full power (brakes applied)
then release the brakes ..... mini 2300 rpm

SECTION 5 - PERFORMANCE

Noise limitation

In compliance with the decree of 19.02.1987, the maximum acceptable noise level for the DR400/140B aircraft, at a certified gross weight of (2205 lb) 1000 kg, is 73.3 dB (A).

The noise level determined under the conditions of the decree, is 64.7 dB(A) at maximum continuous power.

The DR400/140B aircraft has received noise limitation certificate nr N45.

Take off performance

At gross weight 1000 kg (2205 lb),
Without wind, flaps in "take off position" (1st notch), engine full power

Take off speed ..... (54 kt) 100 km/h
Over 15 m (50 ft) barrier speed ..... (65 kt) 120 km/h

PRESSURE ALTITUDE (ft)	TEMPERATURE °C (°F)	WEIGHT 1000 kg (2205 lb)				WEIGHT 800 kg (1764 lb)			
		Take off distance		Run to clear 15m(50ft) barrier		Take off distance		Run to clear 15m(50ft) barrier	
		m	(ft)	m	(ft)	m	(ft)	m	(ft)
0	- 5 (23)	215	(706)	435	(1428)	125	(411)	245	(804)
	Std = 15 (59)	245	(804)	485	(1591)	135	(443)	265	(870)
	35 (95)	270	(886)	535	(1756)	150	(493)	290	(952)
4000	- 13 (7)	290	(952)	580	(1903)	165	(542)	320	(1050)
	Std = 7 (45)	330	(1083)	645	(2117)	180	(591)	350	(1149)
	27 (81)	365	(1198)	720	(2363)	200	(657)	385	(1264)
8000	- 21 (-6)	390	(1280)	780	(2560)	225	(739)	415	(1362)
	Std = - 1 (30)	445	(1461)	870	(2855)	245	(804)	465	(1526)
	19 (66)	500	(1641)	975	(3199)	275	(903)	515	(1690)

Head wind influence:	For 10 kt multiply by 0,79 For 20 kt multiply by 0,64 For 30 kt multiply by 0,53
Down wind influence:	Add 10% to distance per section of 2 kt
Dried grass runway:	Add 15%

Climb performance

1) Flaps take off position:

At maximum weight of 1000 kg (2205 lb) in standard atmosphere

Maximum rate of climb after take off ..... (847 ft/mn) 4.3 m/s
reduction of 0.3 m/s (59 ft/mn) per 1000 ft
Best rate of climb speed ..... (78 kt) 145 km/h
Best angle of climb speed ..... (70 kt) 130 km/h

2) Flaps up:

In standard atmosphere,
Full throttle, mixture best power,

- At maximum weight of 1000 kg (2205 lb):

Maximum rate of climb after take off ..... (867 ft/mn) 4.4 m/s
reduction of 0.25 m/s (49 ft/mn) per 1000 ft
Service ceiling .....14000 ft
Best rate of climb speed after take off .....(81 kt) 150 km/h)
up to ceiling (73 kt) 135 km/h
Best angle of climb speed ..... (70 kt) 130 km/h

- At weight of 800 kg (1764 lb):

Maximum rate of climb after take off ..... (1162 ft/mn) 5.9 m/s
reduction of 0.28 m/s (55 ft/mn) per 1000 ft

Temperature influence:

Each 10°C above standard, lowers the ceiling by 1000 ft and reduces rate of climb by 0.28 m/s (55 ft/mn).

Cruise performance

At gross weight 1000 kg (2205 lb), in standard atmosphere.
Optimum mixture setting, usable fuel (22 imp/26.4 us gal) 100 l.
Without reserve fuel, without wind.

Consumption and climbing time compensated with descent.

ALTITUDE	POWER	FUEL CONSUMPTION			TRUE AIR SPEED		ENDURANCE	RANGE	
			gal/h						
Zp (ft)	rpm	l/h	imp	us	km/h	kt	h.mm	km	Nm
2000	2150	25	5.5	6.6	175	94	4.00	700	375
	2400	25	5.5	6.6	206	111	4.00	825	445
	2500	28	6.2	7.4	216	116	3.35	770	415
5500	2400	25	5.5	6.6	206	111	4.00	825	445
	2500	28	6.2	7.4	216	116	3.35	770	415
8500	2400	25	5.5	6.6	206	111	4.00	825	445
	2500	28	6.2	7.4	216	116	3.35	770	415

SUPPLEMENT 5 GPS

TABLE OF CONTENTS

SECTION 1 - DESCRIPTION

The description of the GPS and the operational procedures are detailed in the GPS pilot's guide furnished with the instrument.

SECTION 2 - LIMITATIONS

The following placard complete those of the pages 2.08, 2.09 and 2.10:

NOTE

GPS LIMITED TO VFR USE ONLY

SECTION 3 - EMERGENCY PROCEDURES

The emergency procedures of the section 3 are not modified.

SECTION 4 - NORMAL PROCEDURES

The normal procedures of the section 4 are not modified.

SECTION 5 - PERFORMANCE

The performance of the section 5 are not modified.

SECTION 6 - WEIGHT AND BALANCE

The weight and balance of the section 6 are not modified.