DR 400/140B

PILOT'S OPERATING HANDBOOK
and
APPROVED FLIGHT MANUAL

Manufacturer:

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Type certificate nr 45, dated 09.11.1975

Serial number **2675**

Registration **HB-KLM**

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 REVISIONS

Rev. nr	Description	Pages revised	Date of approva
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

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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	=kilometres
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	= .. kT/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	= .. Ab
°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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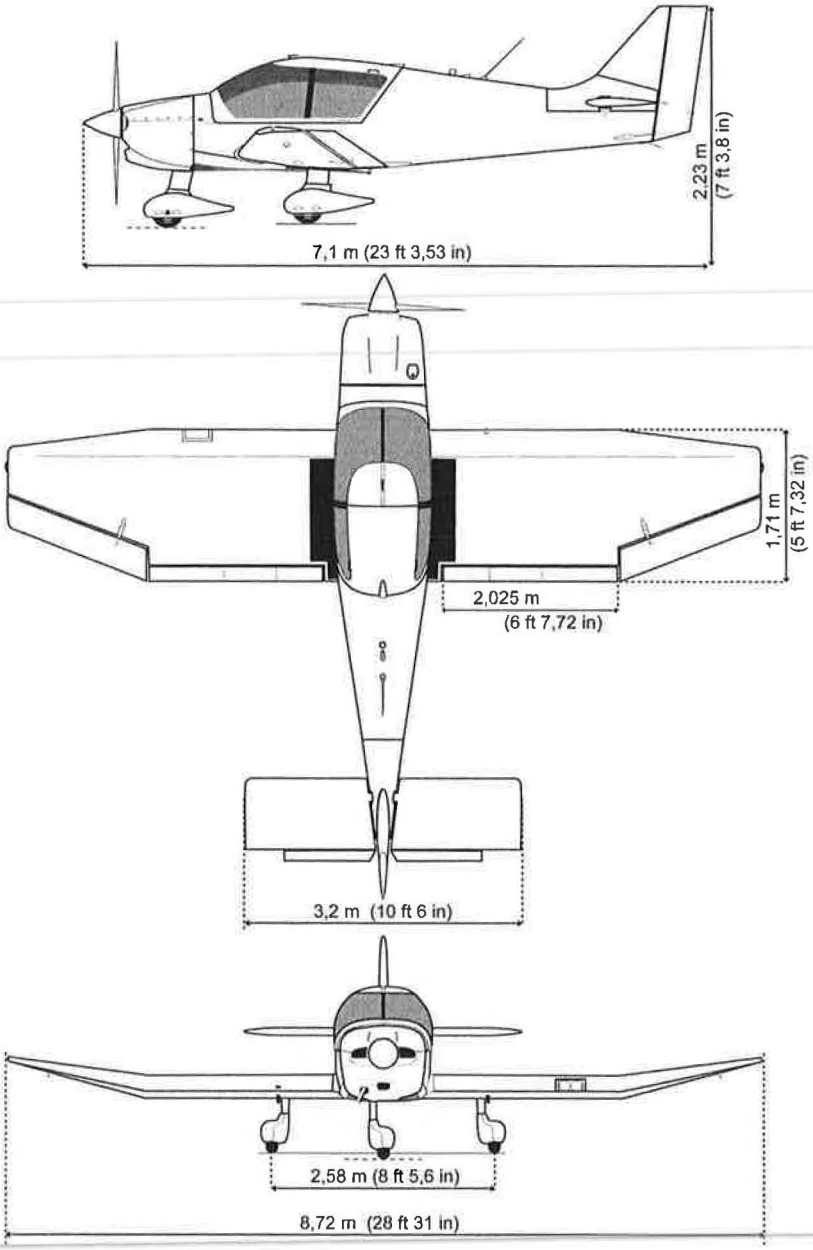

2,23 m
(7 ft 3,8 in)
7,1 m (23 ft 3,53 in)
1,71 m
(5 ft 7,32 in)
2,025 m
(6 ft 7,72 in)
3,2 m (10 ft 6 in)
2,58 m (8 ft 5,6 in)
8,72 m (28 ft 31 in)

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
Dihedral at wing tips ..... 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 ..... (110.76 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

Main landing gear

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

BRAKES

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

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

POWER PLANT

Engine

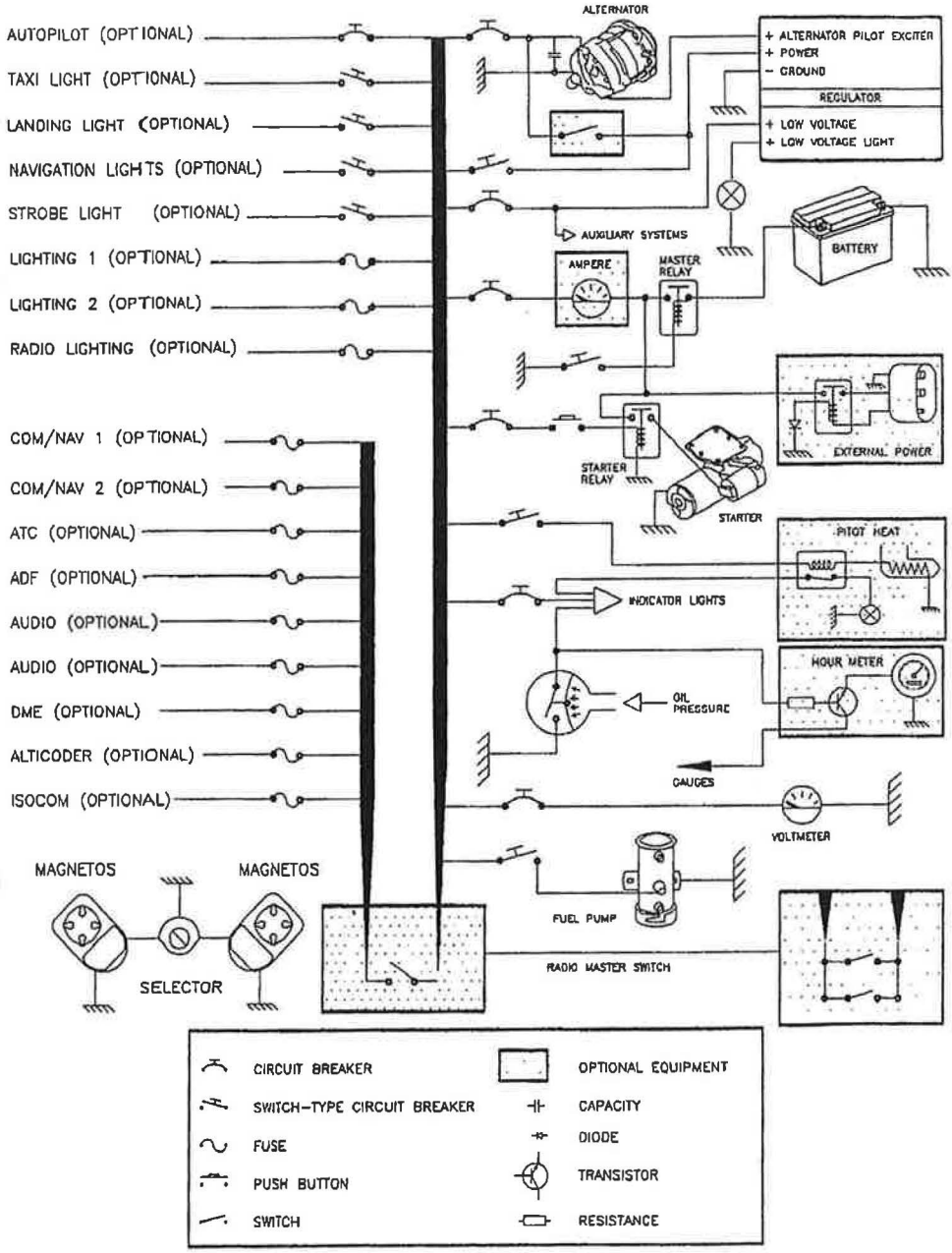
Manufacturer ..... LYCOMING
Type O-320-D2A
Number of cylinders 4
Maximum power ..... (160 HP) at 2700 rpm

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 ..... (6 US quarts) 5.7 l

During the first 50 hours of operation :
Pure mineral oil

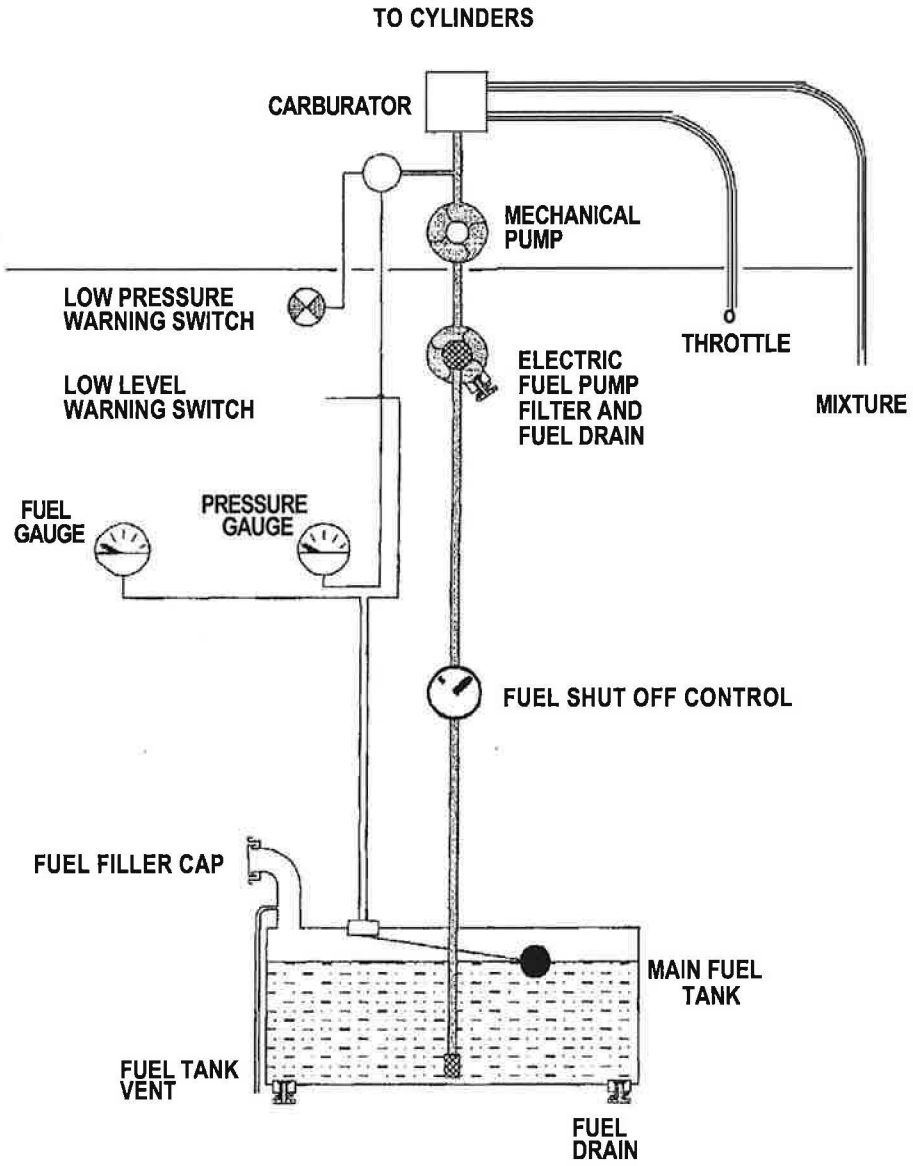
After the first 50 hours of operation:
Dispersant oil

Grades

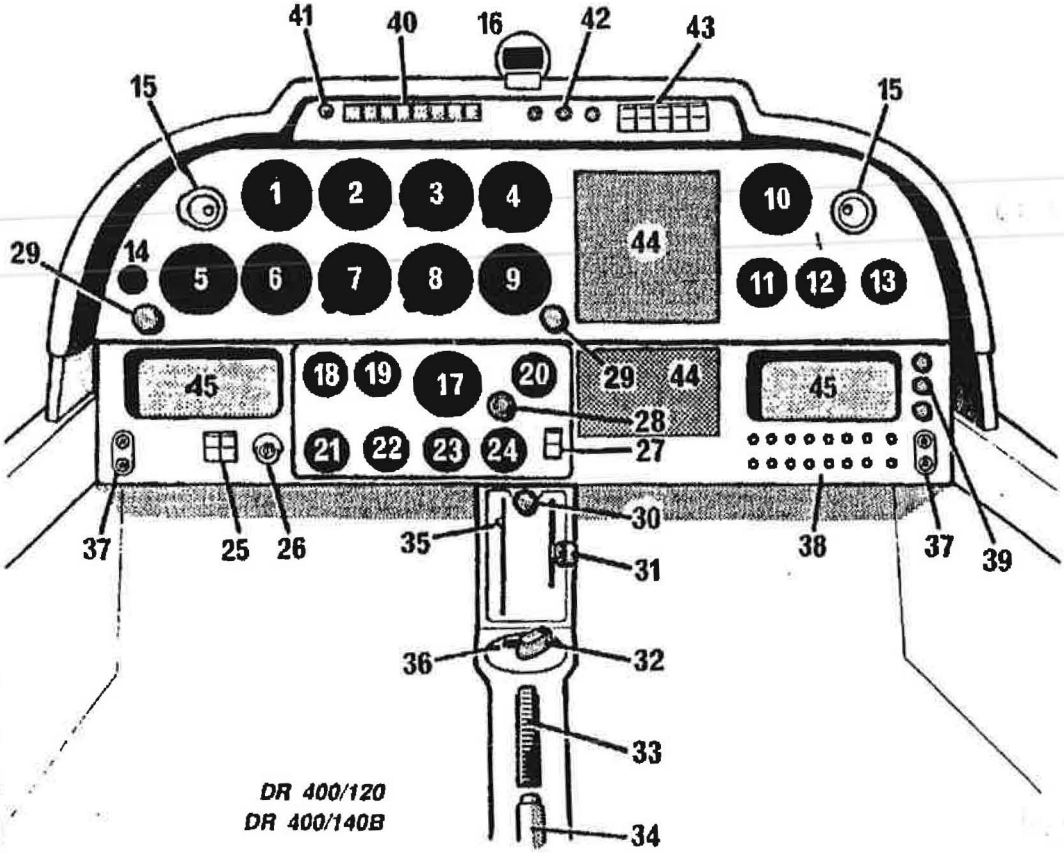
Oil	Dispersant	Pure mineral
All temperatures	SAE 15W50 or 20W50	----------
above + 25°C (80°F)	SAE 60	SAE 60
above + 15°C (60°F)	SAE 40 or SAE 50	SAE 50
from 0°C to +30°C (30°F to 90°F)	SAE 40	SAE 40
from -15°C to +20°C (0°F to	SAE 40, 30 or 20W40	SAE 30
below -10°C (10°F)	SAE 30 or 20W30	SAE 20

* Refer to Servicc 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

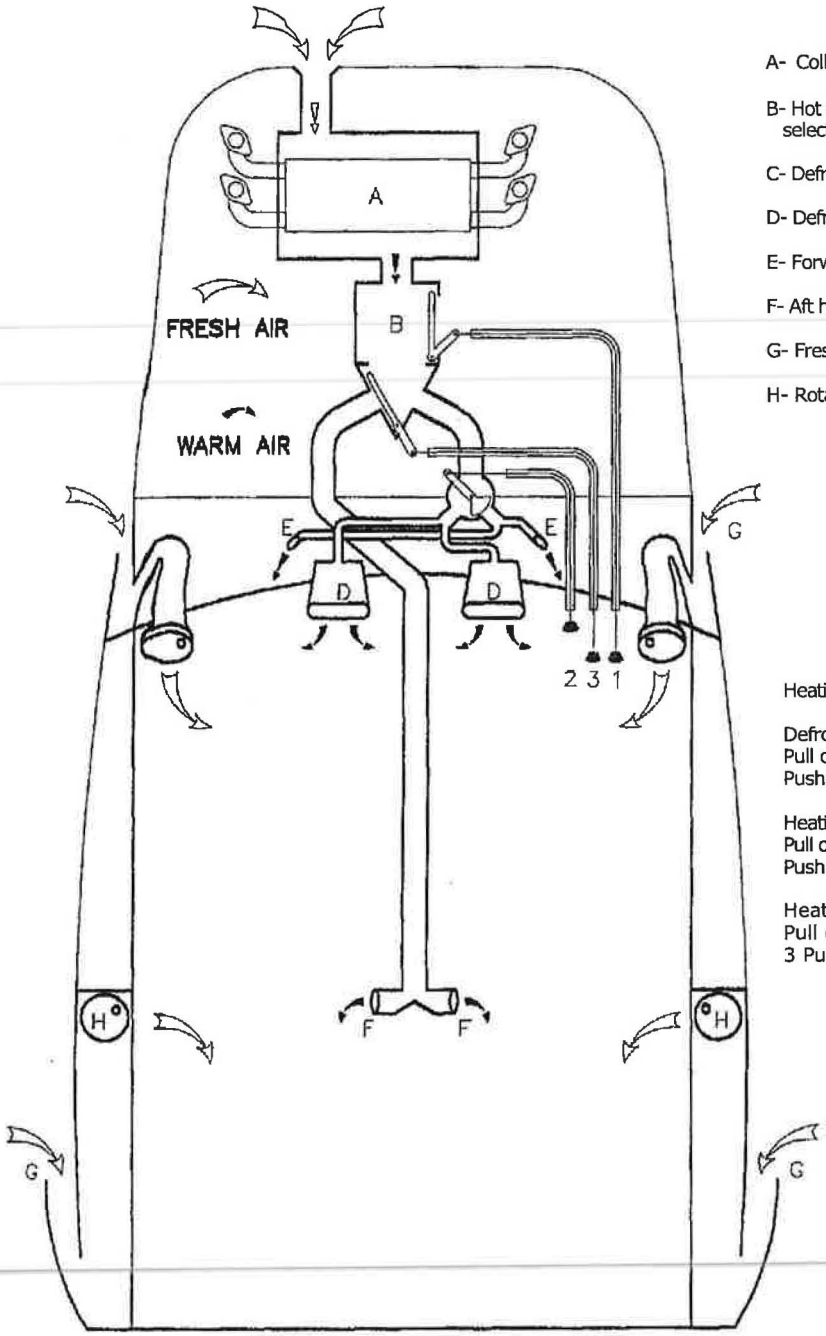


1 .....Airspeed indicator
2 .....Gyro horizon (opt.)
3 .....Altimeter
4 .....Optional equipment
5 .....Optional equipment
6 .....Turn and bank indicator (opt.)
7 .....Directional gyro
8 .....Rate of climb indicator (opt.)
9 .....Optional equipment
10 .....Optional equipment
11 .....Optional equipment
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 .....tarter 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

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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

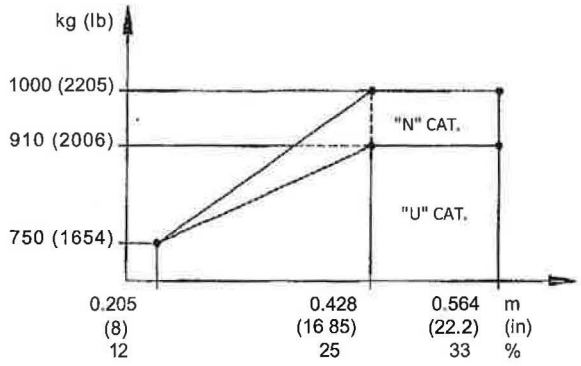
(2205 lb) 1000 kg ("N" category)

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)	2 x 77 (2 x 170)
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 1
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 manoeuvres are authorized:

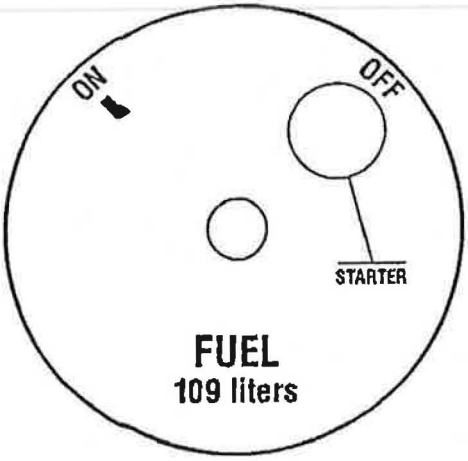
- Steep turns (60°)
- Lazy eights
- Zooms
- Flight at minimum controllable air speed

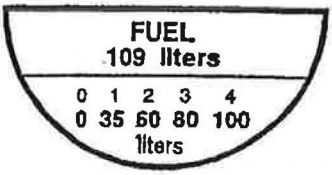
These manoeuvres must be carried out within the conditions below:

- 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

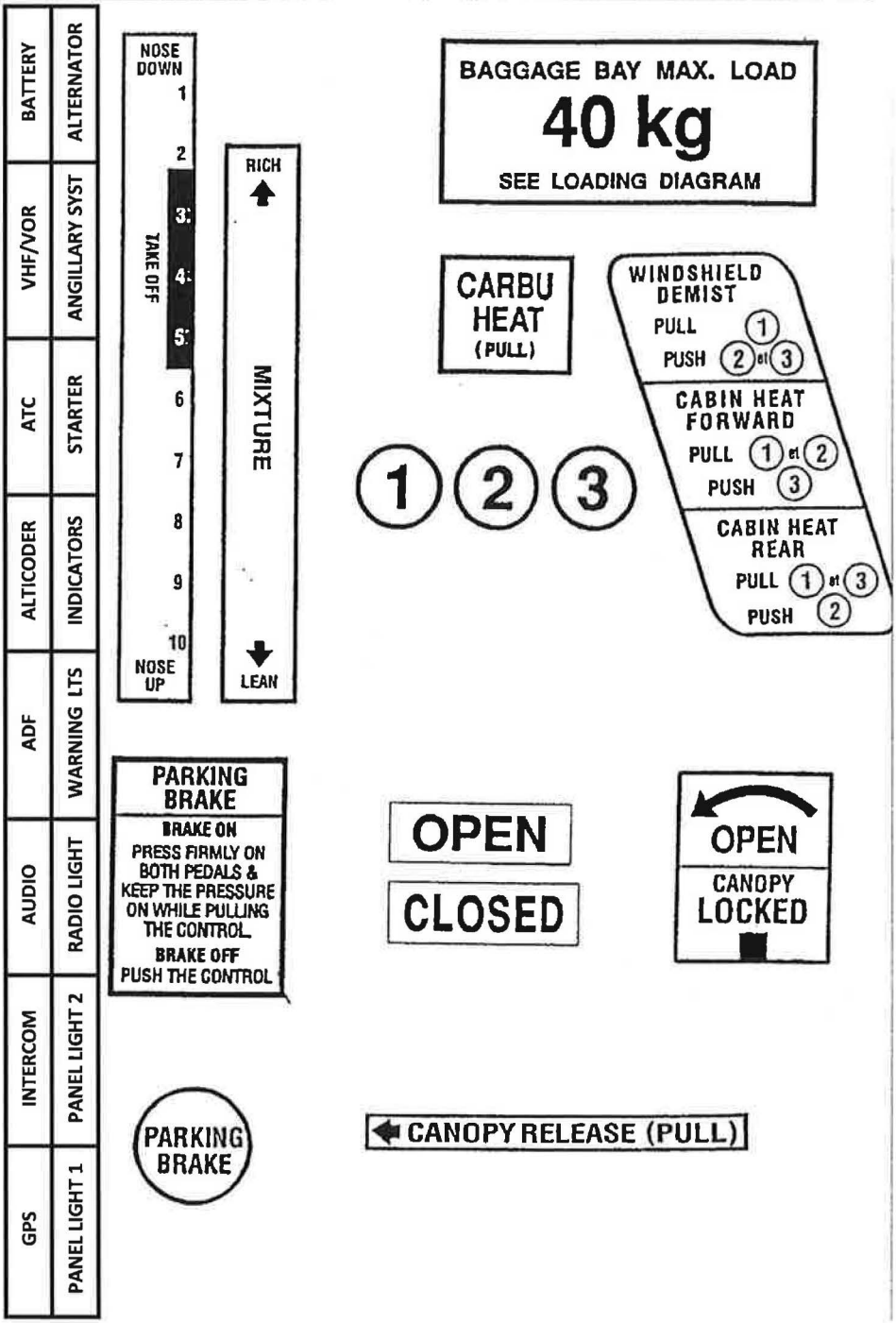


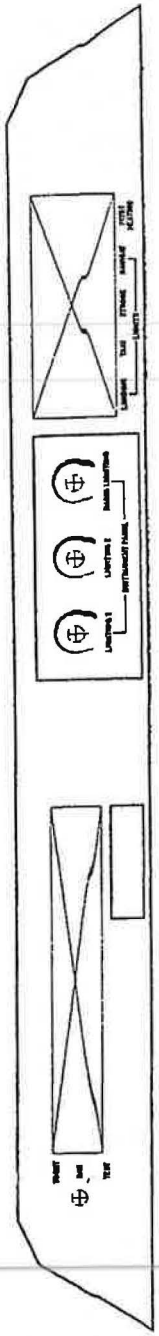


AVGAS 100LL
110 liters
24.2 imp/29 US Gal

NO HOLD

NO STEP


BATTERY
ALTERNATOR
VHF/VOR
ANGILLARY 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 et 3
CABIN HEAT FORWARD
PULL 1 et 2
PUSH 3
CABIN HEAT REAR
PULL 1 et 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 CARREFULLY

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

Never try 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 chosen 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 (2ng 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 rest, 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 tire

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 transient 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
- Ailerons ..... 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.

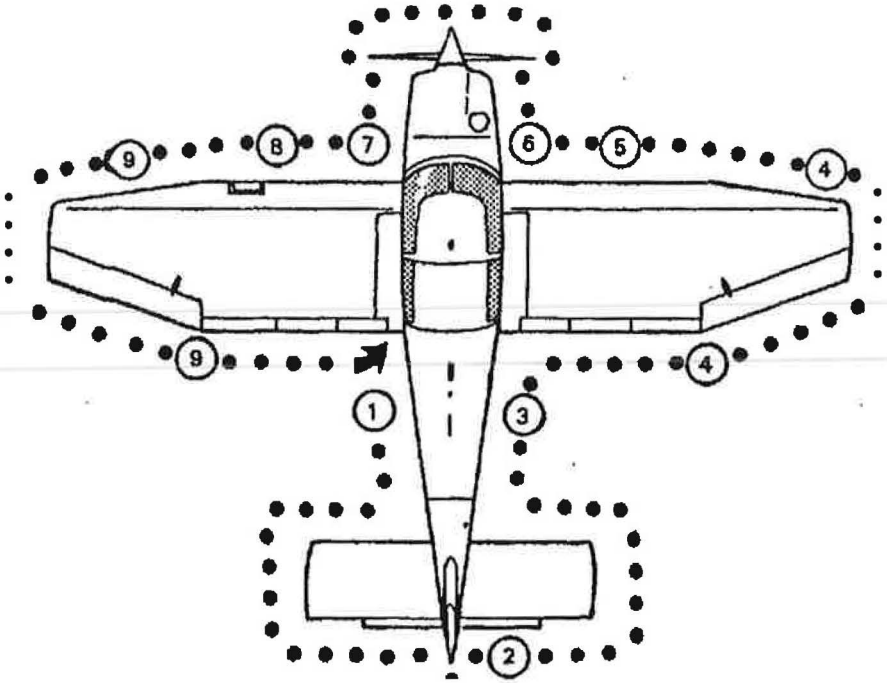
- Best rate of climb speed
  flaps in take-off position (1st notch) ..... (78 kt) 145 km/h
  flaps up ..... (86 kt) 160 km/h

- 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.

1	Fuel filler cap	in place, locked
	Static vent	clean, unobstructed
	Fuselage main tank drain valve (left or right depending on aircraft bank)	actuated
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
5	Stall warning	clean, check displacement
	Right main landing gear	check, oil cap secured, panel closed
		normal shock absorber compression
		tyre inflated
6	Fuel drain valve	actuated
	Oil level	check, oil cap secured, panel closed
	Engine cowl attachment	check
	Propeller	clean, in good condition
	Propeller spinner	no play
	Air inlets	clean, unobstructed
7	Nose gear	check attachment and fairing condition
		normal shock absorber compression
		tyre inflated
		tow-bar removed
	Exhaust pipes	rigid
	Canopy cleanliness	check
8	Left main landing gear	check attachment and fairing condition
		normal shock absorber compression
		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 until 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 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/hr (92 kt) (1st 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) (2nd notch) landing position
Approach speed ..... (62 kt) 115 km/h
Elevator speed ..... set

LANDING

Short landing

Flaps ..... (2nd 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

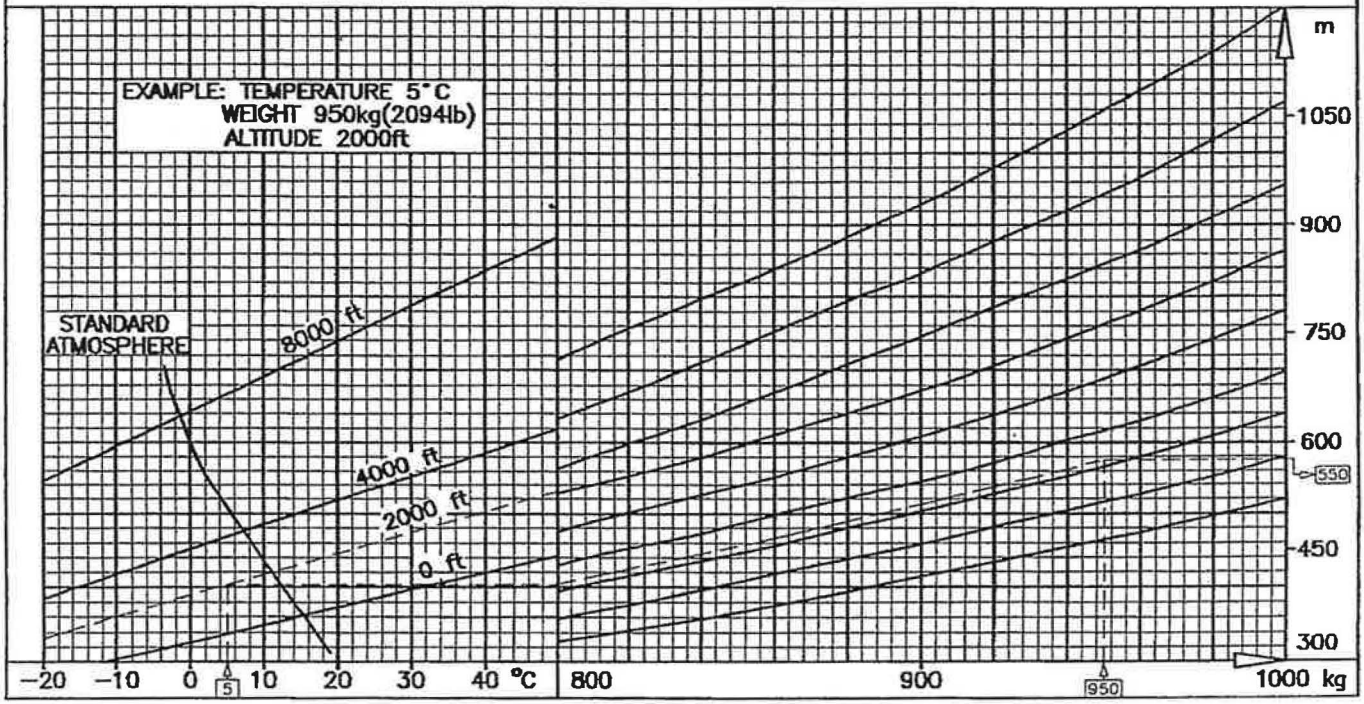
STALL SPEEDS

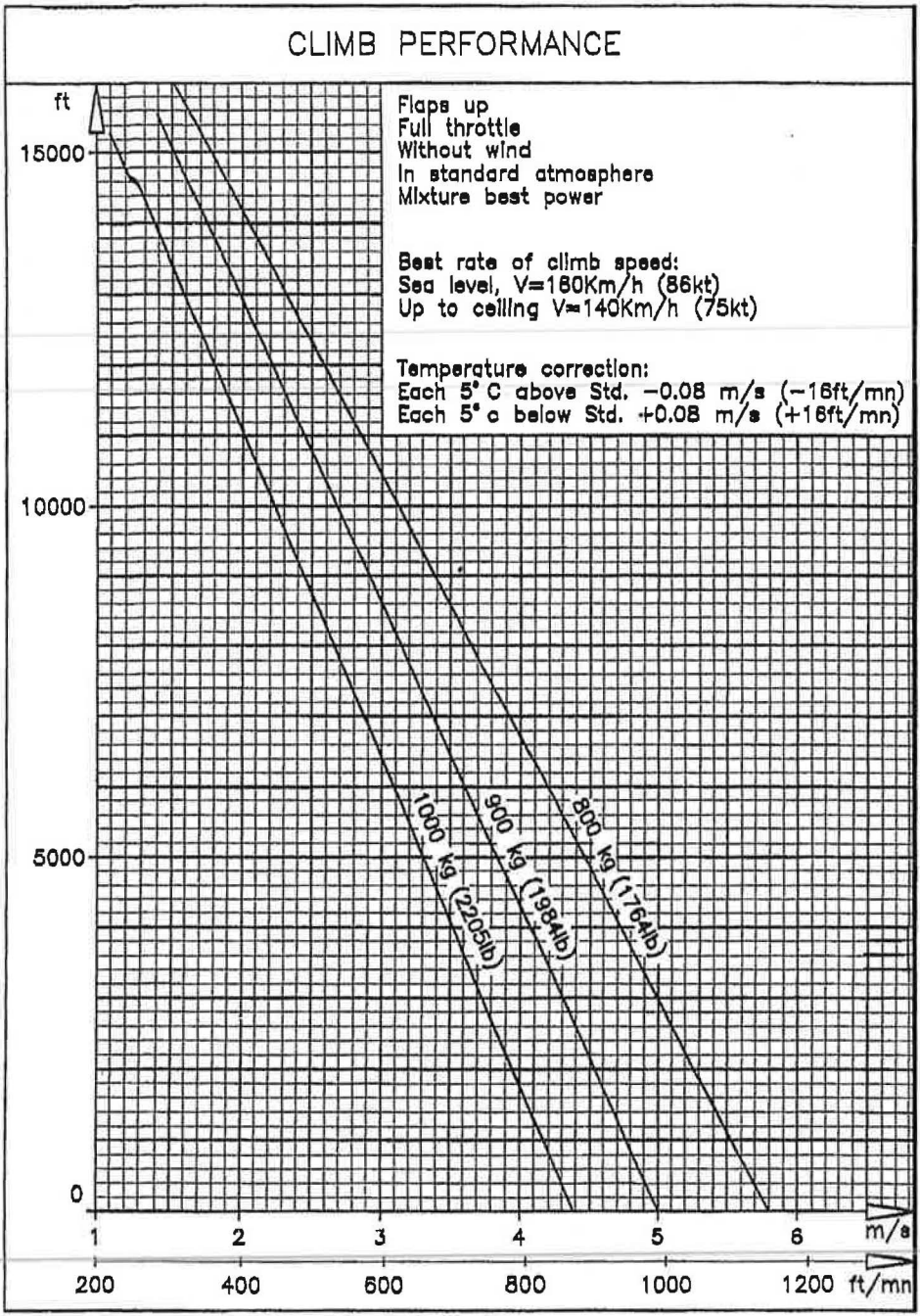
Engine idling, weight: 1000 kg (2205 lb)	km/h (kt)		
Bank angle	0°	30°	60°
Flaps up	99 (54)	106 (58)	140 (76)
Flaps 1st notch, take off position	93 (51)	99 (54)	131 (71)
Flaps 2nd notch, landing position	87 (47)	93 (51)	123 (67)

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
ft
15000
10000
5000
0
Flaps up
Full throttle
Without wind
In standard atmosphere
Mixture best power
Best rate of climb speed:
Sea level, V=160Km/h (86kt)
Up to ceiling V=140Km/h (75kt)
Temperature correction:
Each 5° C above Std. −0.08 m/s (−16ft/mn)
Each 5° C below Std. +0.08 m/s (+16ft/mn)
800 kg (1764lb)
900 kg (1984lb)
1000 kg (2205lb)
1
2
3
4
5
6
m/s
200
400
600
800
1000
1200
ft/mn

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

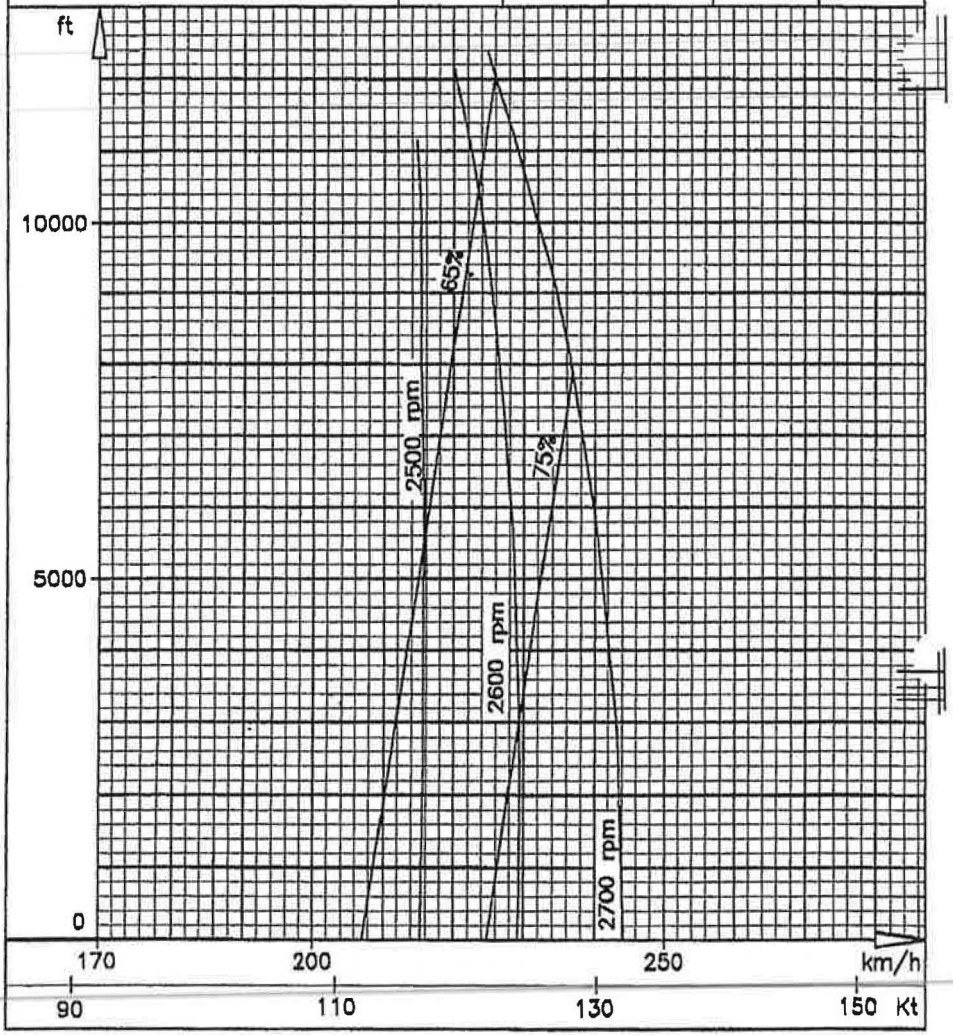
Engine off, the aircraft glides 9.3 times its height (without wind) at 145 km/h (78 kt).

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

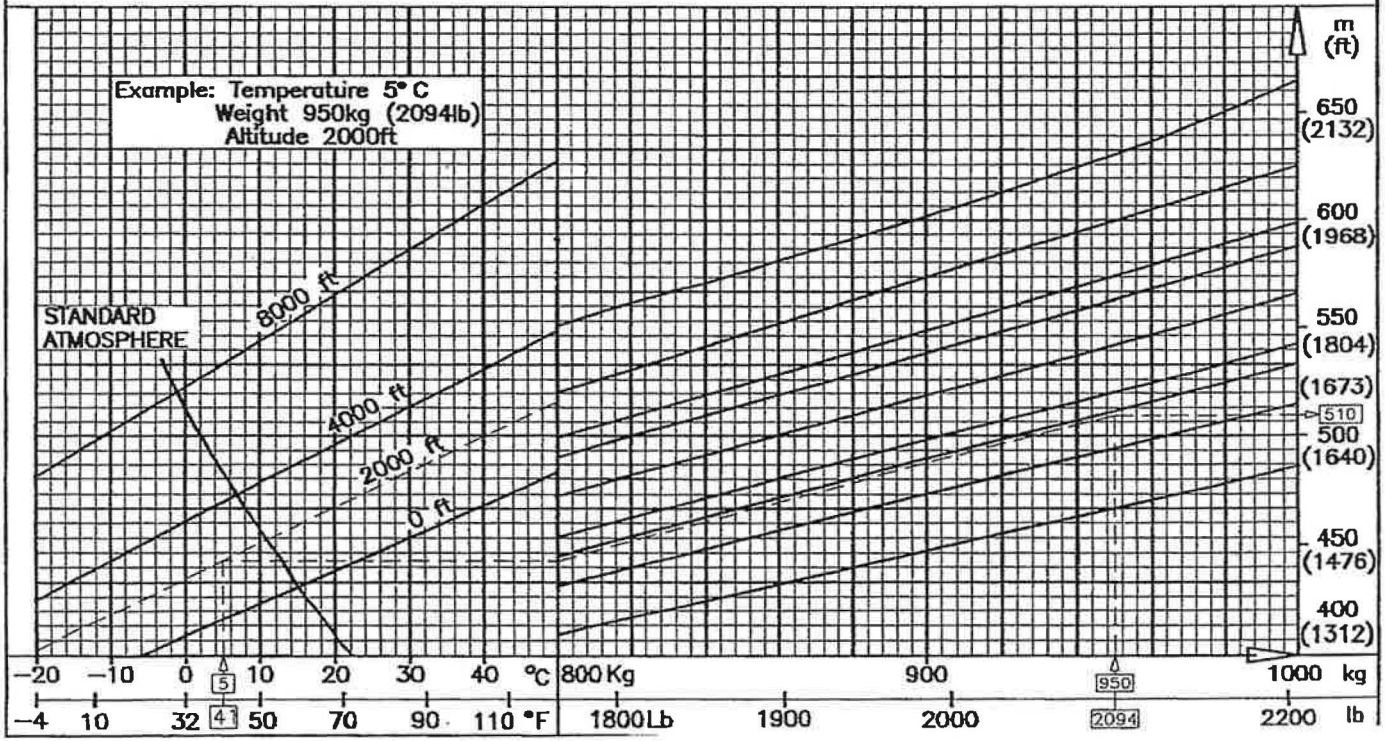


LANDING PERFORMANCE

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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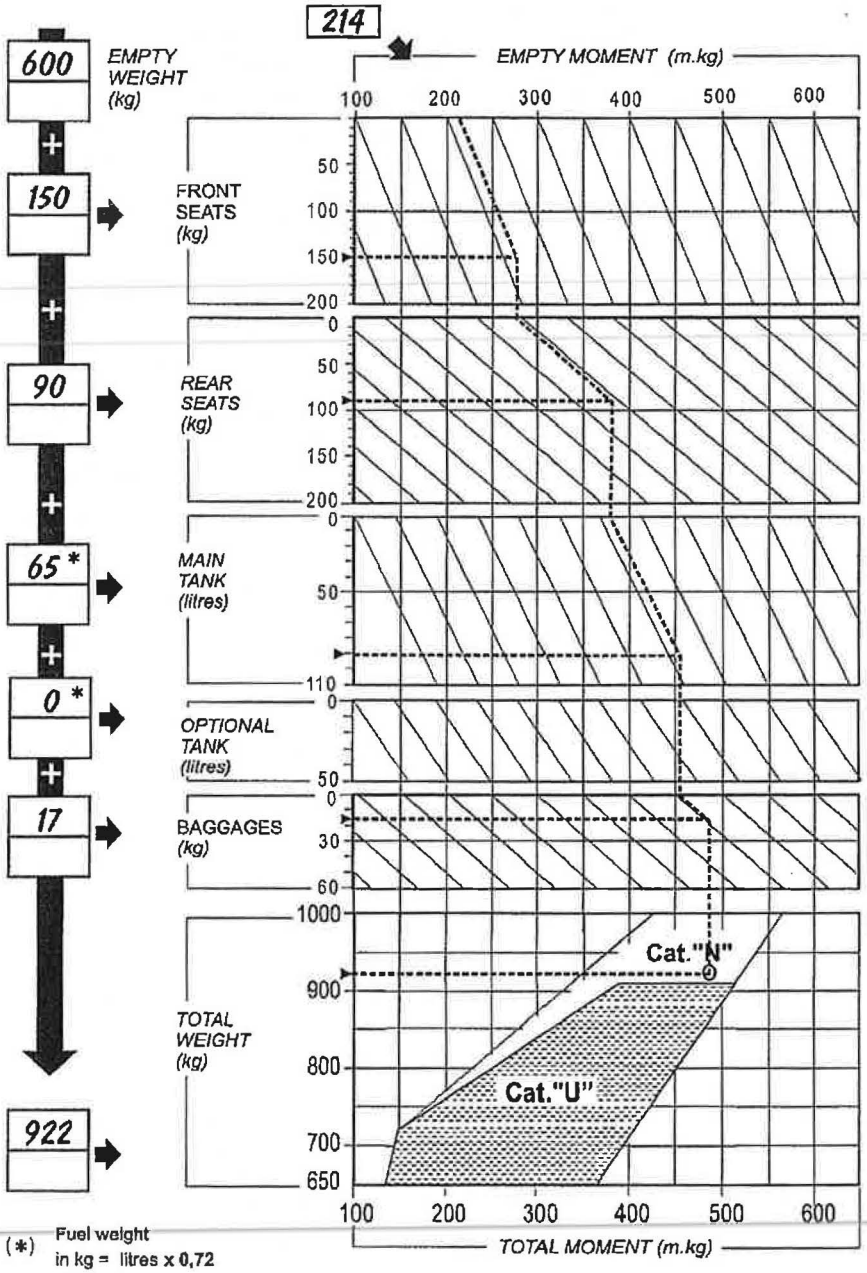
GENERAL

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

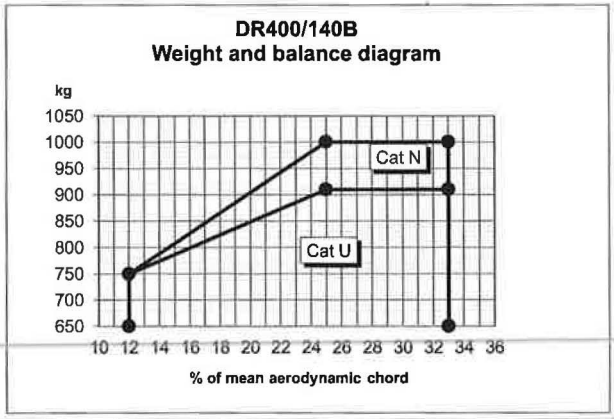
CALCULATION OF WEIGHT AND BALANCE

	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	=	
Baggage (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

$$\frac{\text{.....}}{171} \times 100 = \text{.....}\%$$

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

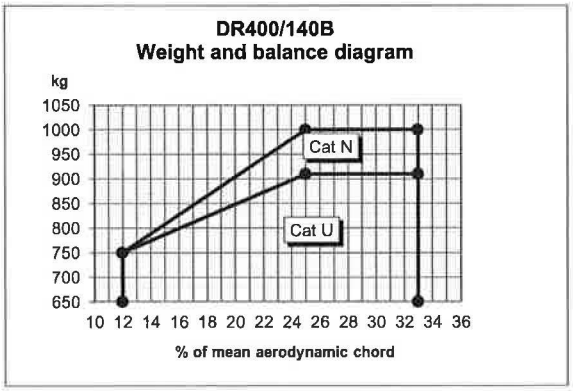
Maximum weight : 1000 kg
Mean Aerodynamic Chord (m.a.c.) : 1,71 m

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

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

$$\frac{0.529}{171} \times 100 = 30.93\%$$

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



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PROCES VERBAL DE PESEE ET DE CENTRAGE

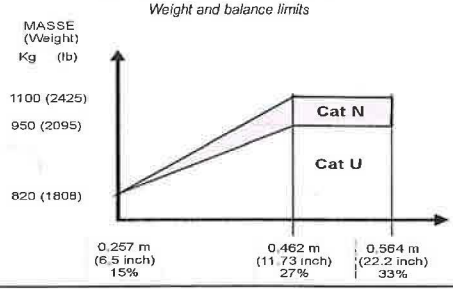
TYPE : **DR 400/140B**

N° DE SERIE / Serial number **2675**

IMMATRICULATION / Registration **HB-KLM**

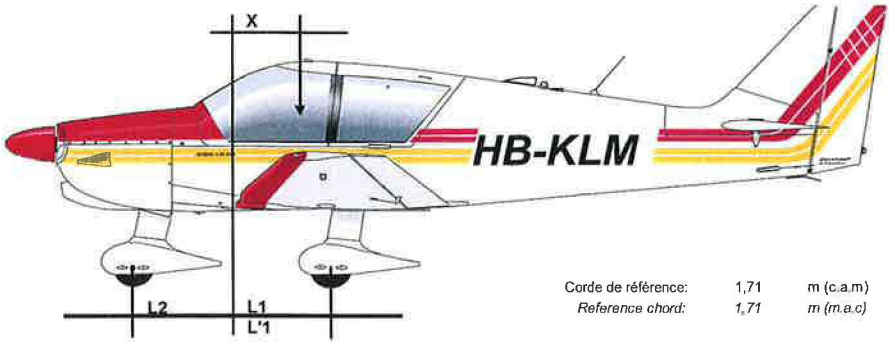
DOMAINE DE MASSE ET CENTRAGE

Weight and balance limits



Référence verticale:Bord d'attaque de la partie rectangulaire de la voilure
Mise a niveau:Longeron de fuselage horizontal
C G datum : leading edge of rectangular wing part
Levelling : horizontal reference top fuselage spar
Conditions de la pesée: Hors Documentation
- pleins d'huiles et liquide refroidissement-Barre de manoeuvre
- équipements figurants au Registre de Contrôle
- essence non utillsable comprise dans la masse à vide

Weighing conditions : - Wiithout documentation
- *full operating oil and cooling fluid -Towbar*
- *equipement listed in the inspection report*
- *unusable fuel inclued in empty weight*



Corde de référence: 1,71 m (c.a.m)
Reference chord: 1,71 m (m.a.c)

MASSE ET CENTRAGE A VIDE

Weight and balance-Empty aircraft

		Masse(kg)	Bras de Levier(m)	Moment(m*kg)
PPALE D *Main R wheel*	L1	**237,8**	0,828	196,898
ROUE PPALE G *Main L wheel*	L'1	**243,2**	0,828	201,370
ROUE AV *Front wheel*	L2	**186,9**	0,819	-153,071
Carburant non utilisable *Unusable fuel*		**0,84**	1,120	0,941
Avion vide *Empty aircraft*		**668,74**	0,368	246,138
CENTRAGE ***Balance***		**21,52%**	c.a.m m.a.c	

A Darois, le : 11 mars 2015 Visa ROBIN AIRCRAFT : R. RADOUAN

ROBIN NEW AIRCRAFT

PROCES VERBAL DU DEBATTEMENT DES GOUVERNES

CONTROL SURFACES TRAVELS

TYPE : DR **400/140B**

N° DE SERIE / Serial number **2675**

IMMATRICULATION / Registration **HB-KLM**

GOUVERNE *SURFACE*	POSITION	VALEUR THEORIQUE *THEORICAL FIGURE*	VERIFICATION *ACTUAL* GAUCHE *LEFT*	DROIT *RIGHT*
AILERONS* *Ailerons*	Angle A - cote X *Angle A - figure X*	14° à 16°	**+15°**	**+14,5°**
	Angle B - cote Y *Angle B - figure Y*	-9° à -11°	**-10°**	**-10°**
	Angle C - cote Z *Angle C - figure Z*	1° à 3°	**+2°**	**+2°**
EQUILIBRAGE AILERONS: THEORIQUE = 100 à 200g *AILERONS BALANCE : THEORICAL = 100 to 200g*			**190 gr**	**167 gr**
VOLETS* *Flaps*	Rentrés *Retracted*	0° +1°	**0°**	**0°**
	1er cran *1st notch*	10° à 20°	**15°**	**15°**
	2ème cran *2nd notch*	55° à 60°	**57°**	**57°**
DIRECTION *Rudder*	En butée *To the extreme position*	25°	**25°**	**25°**

	GOUVERNE - SURFACE		COMPENSATEUR - TRIM	
	THEORIQUE *Theorical*	VERIFICATION	THEORIQUE *Theorical*	VERIFICATION *Actual*
PROFONDEUR *Elevator*	Cabré: -9° à -10° *Up*	**-9,5°**	Cabré: 5° à 7° *Up*	**Conforme gabarit**
			Piqué: 24°30' à 26°30' *Down*	**Conforme gabarit**
	Piqué: 11.5° à 12,5° *Down*	**11,6°**	Cabré: 9°30' à 11°30' *Up*	**Conforme gabarit**
			Piqué: 15°30' à 17°30' *Down*	**Conforme gabarit**
EQUILIBRAGE PROFONDEUR THEORIQUE : ENTRE 0 ET 260 g. Elevator balance theorical : between 0 and 260g				**0 gr**

* Voir manuel d'entretien
See maintenance manual

A Darois, le : 11 mars 2015 Visa ROBIN AIRCRAFT : R.RADOUAN

ROBIN NEW AIRCRAFT

Inventaire des équipements

REPONDANT AU PART 21 § 21A.805

Part 21 §21A.804 equipement list

TYPE : DR 400/140B

N° DE SERIE / Serial number 2675

IMMATRICULATION / Registration HB-KLM

Classe *Class*	Qté *Qty*	DESIGNATION *Description*	REFERENCE	FABRICANT *Manufacturer*	N° SERIE *Serial N°*
S	1	MOTEUR	TAE 125-02-114	CENTURION	02-02-10206
S	1	ALTERNATEUR	05-7150-E000502	CENTURION	01961
S	1	BATI-MOTEUR	51,61,00,910	CEAPR	141844502
S	1	BOITIER ADMISSION	56,61,00,070	CEAPR	1418025
S	1	DEMARREUR	05-8010-E001604	CENTURION	Sans N°
S	1	EMBRAYAGE	05-7211-K018302	CENTURION	30824
S	1	ENGINE LOOM	05-7150-E001703	CENTURION	00094
S	1	FADEC	05-7611-E001903	CENTURION	10237
S	1	FIRMWARE	05-7610-E001002	CENTURION	D4-V1,40
S	1	GEARBOX	05-7212-K041502	CENTURION	02772
S	1	INTERCOOLER	56,81,37,010	CENTURION	Sans N°
S	1	MAPPING	60-7610-E002301	CENTURION	G14D140APEX
S	1	POMPE HAUTE PRESSION	05-7312-K005303	CENTURION	3807
S	1	SILENCIEUX ECHAPPEMENT	56,81,00,140	LANGER LA 49	49000019
S	1	TURBO-COMPRESSEUR	05-7241-K009503	CENTURION	14056
S	1	HELICE	MTV-6A/187-129	MT PROPELLER	141159
S	1	FUSELAGE	21,18,30,001	CEAPR	T085
S	1	CLES VERRIERE	SANS REF.	RONIS	E667
S	1	ATTERRISSEUR AVANT	42,26,00,000	CEAPR	141910402
S	1	BATI ATTERRISSEUR AVANT	42,12,02,000	CEAPR	141805404
S	1	FERRURE INF. D. FIX. BATI MOTEUR	51.26.21.020	CEAPR	1418319
S	1	FERRURE INF. G. FIX. BATI MOTEUR	51.26.21.010	CEAPR	1416318
S	1	FERRURE SUP. D. FIX. BATI MOTEUR	51.11.02.000	CEAPR	1417135
S	1	FERRURE SUP. G. FIX. BATI MOTEUR	51.11.02.000	CEAPR	1417135
S	1	OSSATURE SIEGE DROIT	74,18,04,020	CEAPR	141923802
S	1	OSSATURE SIEGE GAUCHE	74,18,04,010	CEAPR	141923903
S	1	RAIL DROIT SIEGE DROIT	28,12,06,020	CEAPR	141857606
S	1	RAIL DROIT SIEGE GAUCHE	28,12,06,020	CEAPR	141858209
S	1	RAIL GAUCHE SIEGE DROIT	28,12,06,020	CEAPR	141858214
S	1	RAIL GAUCHE SIEGE GAUCHE	28,12,06,010	CEAPR	141857605
S	1	RESERVOIR CARBURANT PPAL	52,81,00,008	CEAPR	141916601

Inventaire des équipements

REPONDANT AU PART 21 § 21A.805

Part 21 §21A.804 equipement list

TYPE : DR **400/140B**

N° DE SERIE / Serial number **2675**

IMMATRICULATION / Registration **HB-KLM**

Classe *Class*	Qté *Qty*	DESIGNATION *Description*	REFERENCE	FABRICANT *Manufacturer*	*N° SERIE Serial N°*
S	1	ROBINET CARBURANT RES. PPAL	52,81,00,010	CEAPR	36897
S	1	TUBE DE CDE ROBINET PPAL	52,81,00,046	CEAPR	Sans N°
S	1	GOUVERNE DE DIRECTION	32,26,00,001	CEAPR	2510
S	1	GOUVERNE DE PROFONDEUR	34,26,20,001	CEAPR	3228
	1	SUPPORT DERIVE	31,12,59,030	CEAPR	Sans N°
S	1	TUBE MASSE EQUIL. PROFONDEUR	34,11,03,000	CEAPR	1418516
S	1	VOILURE	11,26,00,001	CEAPR	C1117
S	1	AILERON DROIT	15,26,00,021	CEAPR	3593
S	1	AILERON GAUCHE	15,26,00,011	CEAPR	3592
S	1	ATTERRISSEUR DROIT	41.26.00.020	CEAPR	141907101
S	1	ATTERRISSEUR GAUCHE	41.26.00.010	CEAPR	141907202
S	1	AXE DROIT FIXATION VOILURE	11,11,07,020	CEAPR	Sans N°
S	1	AXE GAUCHE FIXATION VOILURE	11,11,07,020	CEAPR	Sans N°
S	1	BIELLE COMMANDE VOLET DROIT	16,16,22,010	CEAPR	141802008
S	1	BIELLE COMMANDE VOLET GAUCHE	16,16,22,010	CEAPR	141802011
S	1	LONGERON VOILURE	11,26,00,010	CEAPR	2522
S	1	MASSE EQUILIBRAGE AILERON D.	15,11,03,003	CEAPR	1416351
S	1	MASSE EQUILIBRAGE AILERON G.	15,11,03,003	CEAPR	1416351

A Darois, le : 11 mars 2015

Visa ROBIN AIRCRAFT : R. RADOCHAN

Inventaire des équipements de communication et de navigation

COM. & NAV. EQUIPMENTS LIST

TYPE : DR **400/140B**

N° DE SERIE / Serial number **2675**

IMMATRICULATION / Registration **HB-KLM**

Classe *Class*	Qté *Qty*	DESIGNATION *Description*		REFERENCE	FABRICANT *Manufacturer*	*N° SERIE Serial N°*
O	1	ALTIMETRE	5934-PAM-3A87	5934-PAM-3A87	MID CONTINENT	454191
O	1	ANEMOMETRE	EA 5172-1-ROB	EA 5172-1-ROB	SIGMA TEK	24162
O	1	TUBE PITOT CHAUFFANT	PH502-12CR	PH502-12CR	AERO-INSTRUMENTS	2140001
O	1	COM / VHF 2	GTR225A	GTR225A	GARMIN	2A6010405
O	1	COM./NAV.1	GNC255A	GNC255A	GARMIN	2A8012060
O	1	IND NAV / ILS 1	GI 106A	GI 106A	GARMIN	F13-10813
S	1	BOITIER SAFETYPLANE	V5 - STC n°10031730	V5 - STC n°10031730	ISEI	1425801
O	1	ATC	GTX 328	GTX 328	GARMIN	13K01581
O	1	ALTICODEUR	A 30	A 30	ACK	131413
O	1	AUDIO / IC / MARKERS	GMA 340	GMA 340	GARMIN	96295280
O	1	BALISE DE DETRESSE	406 AF	406 AF	KANNAD	413501

A Darois, le : 11 mars 2015

Visa ROBIN AIRCRAFT : R. RADOUIAN

SECTION 7 **OPTIONAL EQUIPMENT**

TABLE OF CONTENTS

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SUPPLEMENT 1 **OPTIONAL FUEL TANK**

TABLE OF CONTENTS

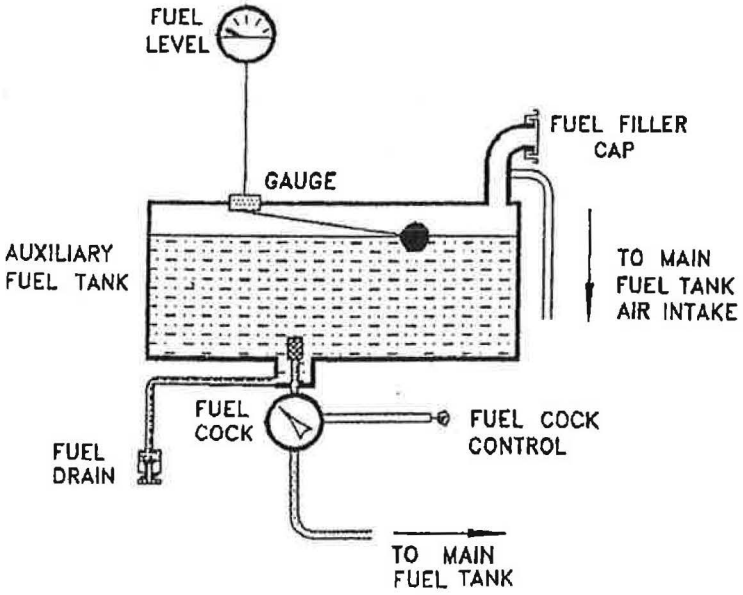
SECTION 1 - DESCRIPTION

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 independent gauge.

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

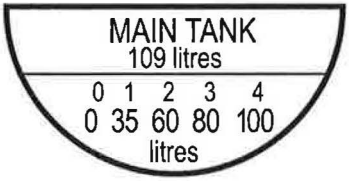
NOTA

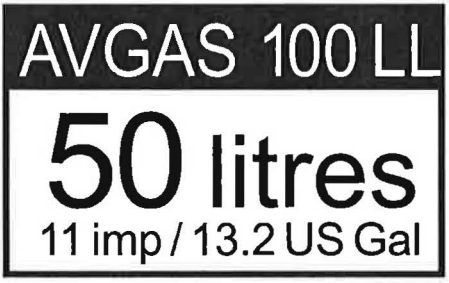
The main fuel tank must be empty enough to receive fuel quantity from the auxiliary fuel tank.



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 DB400/140B 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:

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

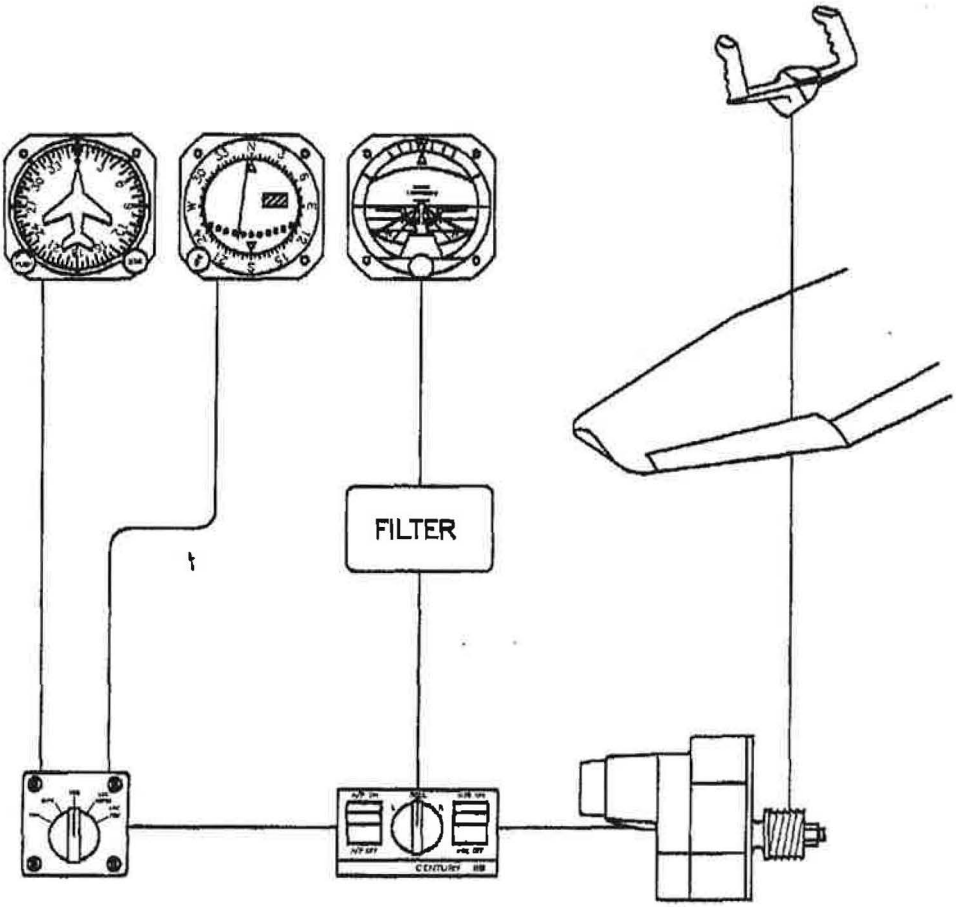
Command console

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 manoeuvre 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 alter 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 autopilot in both VOR and ILS navigation.

Nominal interception angles are 45° and an automatic 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 accommodate the "Localizer" course width (5° instead of 20° for the VOR) and to provide smoother more optimum intercept and track manoeuvers.
Intercept angles of 45° are automatic with tangential intercepts outside the marker and automatic cross-wind 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, vaccum pump or system failure

SECTION 3 - EMERGENCY PROCEDURES

In case of autopilot malfunction:

1- Manoeuvre 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

Pre-flight 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.

SUPPLEMENT 4: SENSENICH 74DM6S5-2-60 PROPELLER

TABLE OF CONTENTS

SECTION 1 - DESCRIPTION

The data 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 (2205lb)				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	Std =	-5 (23)	215	(706)	435	(1428)	125	(411)	245	(804)
		15 (39)	245	(804)	485	(1591)	135	(443)	265	(870)
		35 (95)	270	(886)	535	(1756)	150	(493)	290	(952)
4000	Std =	-13 (7)	290	(952)	580	(1903)	165	(542)	320	(1050)
		7 (45)	330	(1083)	645	(2117)	180	(591)	350	(1149)
		27 (81)	365	(1198)	720	(2363)	200	(657)	385	(1264)
8000	Std =	-5 (23)	390	(1280)	780	(2560)	225	(739)	415	(1362)
		15 (39)	445	(1461)	870	(2855)	245	(804)	465	(1526)
		35 (95)	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	
Zp (ft)	rpm	l/h	imp gal/h	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.

List of the POH DR400/140B (Doc.1001588$_{GB}$) sections replaced by those of the POH DR400/155CDI Edition 2, when the aircraft is fitted with engine TAE 125-02-114.

POH DR400/140B 1001588$_{GB}$		**POH DR400/155CDI**
SECTION 1		SECTION 1
Description		*Description*
Pages 1-06 à 1-12	Replaced by	Pages 1-1 à 1-14
SECTION 2		SECTION 2
Limitations		*Limitations*
Pages 2-01 à 2-06	Replaced by	Pages 2-01 à 2-12
Pages 2-08 à 2-10		
(Page 2-07 to keep)		
SECTION 3		SECTION 3
Emergency procedures	Replaced by	*Emergency procedures*
Page 3-09 to keep		
SECTION 4		SECTION 4
Normal procedures	Replaced by	*Normal procedures*
SECTION 5		SECTION 5
Performance	Replaced by	*Performance*
SECTION 6		SECTION 6
Weight & Balance	Replaced by	*Weight & Balance*
SECTION 7		
Supplements:		
Optional fuel tank	Cancelled	*Cf Section1 page 1-07*
Night VFR	Cancelled	*Cf. POH supplement (1001840)*
Century II B	Not applicable	
Sensenich	Not applicable	
GPS	Not applicable	

REVISION

Amendement	Date	Description
O	26 Janvier 2015	Edition originale

APPLICABILITE ***EFFECTIVITY***

Avion N/S: **2675** ..... Immatriculation : **HB-KLM**.....Date : **12/03/2015**
Airplane S/N: ..... Registration: ..... Date:

Ce registre de suppléments contient tous les suppléments approuvés par la D.G.A.C, nécessaires pour exploiter efficacement et en sécurité les avions ROBIN, quand ils sont équipés de systèmes optionnels ou d'équipements qui ne sont pas fournis avec l'avion standard ou pour des exploitations spéciales non décrites dans le manuel standard. Essentiellement, les suppléments sont des « mini-manuels » qui peuvent contenir des données correspondant à la majorité des sections du manuel de vol.
Les données d'un supplément ajoutent, supplantent ou remplacent des données similaires du manuel de base.

Une croix dans la colonne « OUI » ou « NON » indique si l'avion est équipé.

Les suppléments du manuel de vol approuvés par la D.G.A.C doivent être dans l'avion pendant les vols, quand l'équipement optionnel correspondant est installé ou en cas d'exploitation spéciale.

This register supplements contains all approved supplements by the D.G.A.C, necessary to operate efficiently and in safety ROBIN aircrafts, when they are equipped with optional systems or equipments that are not supplied with the standard aircraft or for special operation not included in the standard manual. Essentially, the supplements are "mini manual" which may contain data corresponding to the majority of the sections of the flight manual.
Supplement data, supersede or replace similar data from basic manual.

A cross in the column 'Yes' or 'No' indicates if the aircraft is equipped with.

Flight manual supplements approved by the D.G.A.C must be in the aircraft during flights, when the corresponding optional equipment is installed or in case of special operations.

LISTE DES SUPPLEMENTS AU MANUEL DE VOL
LIST OF FLIGHT MANUAL SUPPLEMENTS

Avion N/S : **2675** Immatriculation: **HB-KLM** Date:**12/03/2015**
Airplane S/N: *Registration:* *Date*

N° document	TITRE *TITLE*	Applicabilité *Effectivity*	Date	Installé *Fitted*	
				oui *yes*	non *no*
1001114	Garmin GNS 430	DR400/120-140-140B-160-180-180R-200R-500	28 novembre 2002	☐	☐
1001168	Pilote Automatique S-TEC System 20&30 *Automatic Pilot S-TEC Système 20&30*	DR400/120*-140B*-160*-180-200R*-500 (*) A/C N/S 2220 *(*)From S/N 2220*	11 décembre 2002	☐	☐
1001169	Trim de profondeur électrique *Elevator electric trim*	DR400/180-180R-200R-500	11 décembre 2002	☐	☐
1001236	Réservoir carburant 110L standard01	DR400/ 2+2-100-120-125-140-140B-160-180-180R-NGL	4 avril 2003	☐	☐
1001246	Détecteur de Monoxyde de carbone *Carbone monoxide detector*	DR220-DR221-DR200-DR250-DR253-DR300-DR400-ATL-R3000-HR100-R1180T-R1180TD	13 mai 2008	☐	☐
1001287	**GPS GARMIN 100AVD** pour utilisation VFR en vue du sol et/ou de l'eau *for day VFR in view of the ground or the sea*	DR400/120-140-140B-160-180-180R-200R-500	25 septembre 2003	☐	☐
1001305	**GPS GARMIN 150XL** pour utilisation VFR en vue du sol et/ou de l'eau *for day VFR in view of the ground or the sea*	DR400/120-140-140B-160-180-180R-200R-500	30 novembre 2010	☐	☐
1001306	**BENDIX/KING KMD 150** pour utilisation VFR en vue du sol et/ou de l'eau *for day VFR in view of the ground or the sea*	DR400/120-140B-160-180-180R-200R-500	13 décembre 2004	☐	☐
1001339	**GARMIN GNS 430** pour utilisation VFR en vue du sol et/ou de l'eau *for day VFR in view of the ground or the sea*	R2112-R2120-R2160	déc-03	☐	☐
1001777	HELICE SENSENICH 72CKS6-0-54 *PROPELLER SENSENICH 72CKS6-0-54*	DR400/120	13 avril 2006	☐	☐
1001840	VFR de nuit *Night VFR*	DR400/120-140B-160-180-180R-200R-500	4 décembre 2006	☒	☐
1002149	Pilote Automatique S-TEC System 55X *Automatic Pilot S-TEC Système 55X*	DR400/500	23 août 2007	☐	☐
1002299	Procédure de remorquage	DR400/180-180R-180S	11 avril 2008	☐	☐
1002383	Procédure de remorquage DR400/155CI *Glider towing procedures DR400/155CDI*	DR400/140B Equipé du moteur TAE 125-02-114 *Fitted with engine TAE 125-02-114*	26 septembre 2012	☒	☐
1002504	GPS GARMIN 695	DR400 Tous modèles *DR400 All models*	20 mars 2012	☐	☐

N° document	TITRE *TITLE*	Applicabilité *Effectivity*	Date	Installé *Fitted*	
				oui *yes*	non *no*
1002513	**SG025** Jauge réservoir à carburant *Fuel tank level indicator*	Avions Robin équipé de l'indicateur 76.26.12.020 *Robin aircraft fittes with indicator P/N 76.26.12.020*	18 juin 2012	☐	☐
1002530	GPS/SBAS GTN625, 635, 650, 725, 750	Voir le tableau du supplément *See the board of supplement*	20 mars 2013	☐	☐
1002531	G500	Voir le tableau du supplément *See the board of supplement*	20 mars 2013	☐	☐
1002545	GARMIN GTN 750	DR400 Tous modèles *DR400 All models*	19 mars 2013	☐	☐
1002548	Volets de courbure électriques *Electrical Flaps*	Voir le tableau du supplément *See the board of supplement*	21 juin 2013	☒	☐
1002554	S.A.M	DR400 Tous modèles exeptés ATL *DR400 All models unless ATL*	11 octobre 2013	☐	☐
1002557	Trim de profondeur électrique *Elevator electric trim*	Voir le tableau du supplément *See the board of supplement*	18 juin 2014	☐	☐
1002559	IFR	DR400/120-140B-160-180-180R	18 juillet 1978	☐	☐
1002571	Pilote Automatique S-TEC System 55X *Automatic Pilot S-TEC Système 55X*	Voir le tableau du supplément *See the board of supplement*	22 mai 2013	☐	☐
1001639	135 CDI	Voir le tableau du supplément *See the board of supplement*	sept-11	☐	☐
1002382	155CDI	Voir le tableau du supplément *See the board of supplement*	5 avril 2011	☒	☐
1002594	Enrouleur de câble Cable winch (cable winder)	DR400 approuvé remorqueur DR400 towing approval	13 mars 2015	☒	☐

SUPPLEMENT	INSTRUMENT PANEL

HB-KLM

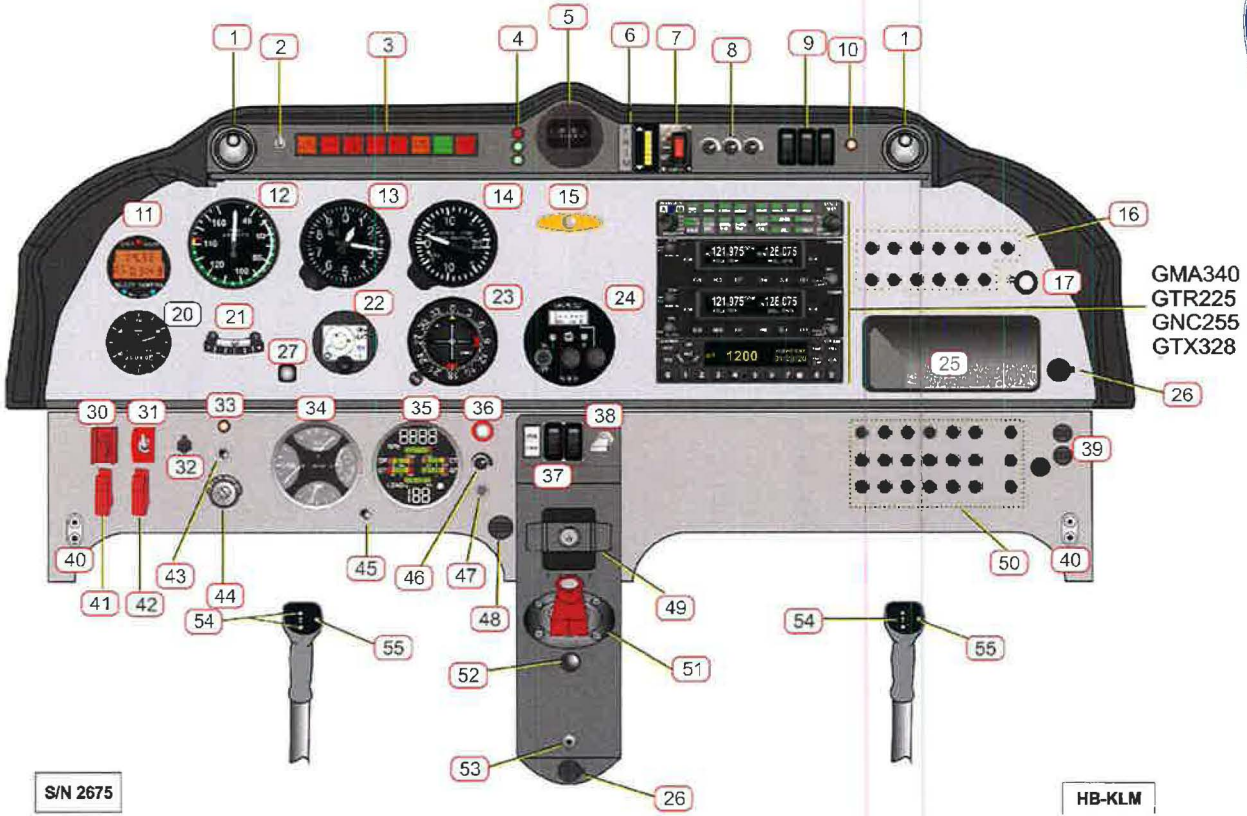
Serial nr: 2675

LIST OF CURRENT PAGES

Pages	Date
1 to 4	March 2015

CHRONOLOGICAL ACCOUNT OF ISSUES

Issue	Subject
1	Original instrument panel.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GMA340
GTR225
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1 Fresh air vent
2 Light test & day/night dimmer switch
3 Warning lights
- CED caution
- Alternator
- Fuel low level
- FADEC A
- FADEC B
- Option
- Pitot heating
- Coolant low level

4 Flaps position indicator lights
5 Magnetic compass
6 Elevator trim position indicator
7 ELT remote control
8 Instrument panel lighting (from LH to RH)
- Light 1: panel lights
- Light 2: Overhead flood lights
- Light 3: radio & instruments lights

9 Safety interbreakers (from LH to RH)
- Navigation light
- Strobe light
- Pitot heating

10 SafetyR control light
11 Stopwatch, Voltmeter, OAT
12 Airspeed indicator (knot)
13 Altimeter sensitive (ft-mb)
14 Vertical speed indicator (ft/min)
15 Towing cable release grip
16 Avionics breakers
17 Cabin main heat knob
20 Horameter
21 Bank indicator (ball type)
22 TCAS
23 VOR/LOC indicator
24 Cable winch control
25 Storage rack
26 Auxiliary 12V socket
27 TCAS switch
30 Battery main switch
31 Engine master switch
32 Avionic master switch
33 Glow plug light
34 Quad indicator
- Fuel gauge main and auxiliary
- Fuel temperature main and auxiliary
- Voltmeter
- OAT

35 Compact Engine Display Indicator (CED)
36 Alternate air induction
37 Safety interbreakers (from LH to RH)
- Electric fuel pump control
- Landing light
- Taxiing light

38 Electric flaps control lever
39 Cabin heat/windshield defrost control
40 Standard headset jacks
41 Alternator relay switch
42 FADEC B forcing switch
43 FADEC test button
44 Starter key
45 Auxiliary tank fuel level
46 CED-125 lighting knob
47 CED warning light RAZ knob
48 Auxiliary tank valve control knob
49 Single power lever
50 Breakers
51 Fuel shut off
52 Parking brake control knob
53 Audio plug in
54 Elevator trim control
55 Push to talk

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AIRCRAFT FLIGHT MANUAL SUPPLEMENT

NIGHT VFR

This supplement includes the information to be provided to the pilot, as required by the certification basis. The information provided supersedes or completes the one of the approved French "Manuel de vol".

This supplement supersedes any existing supplement concerning Night VFR.

Applicability

Aircraft type and model	Manufacturer change
DR400/120 **DR400/140B** **DR400/160** **DR400/180** **DR400/180R** **DR400/200R**	**Dossier d'Evolution Technique DET n°060602R1**
DR400/500	**Dossier d'Evolution Technique DET n°061204**

List of current pages

Pages	Date
1	November 26th, 2010
2	November 26th, 2010
3	November 26th, 2010
4	November 26th, 2010
5	November 26th, 2010

Approval

Amendment	Date	Description	Approval
O	December 04th, 2006	Original issue	EASA.A.C.05014
1	April 16th, 2007	Insertion of DR400/500	EASA.A.C.05887
2	November 26th, 2010	Logo of manufacturer	EASA AFM Approval 10033448 20.01.2011

The sections of the aircraft flight manual are affected as follows.

SECTION 0. DESCRIPTION
Not affected.

SECTION 1. DESCRIPTION
The DR400/120, DR400/140B, DR400/160, DR400/180, DR400/180R, DR400/200R and DR400/500, equipped with a proper instrument panel lighting, can be used for V.F.R. flight in non-icing condition.

For a night VFR flight, the DR400/120, DR400/140B, DR400/160, DR400/180, DR400/180R, DR400/200R and DR400/500 must be equipped with following required equipment:

Flight and navigation
- one air-speed indicator
- one sensitive ajustable altimeter, with a 1 000 feet (304,80 mètres) per turn scale and with a barometric reference pressure indicator in hectopascal
- one compensable magnetic compass
- one vertical speed indicator (variometre)
- one artificial horizon (attitude gyros)
- a second artificial horizon or a gyroscopic rate-of-turn indicator with and integrated slip indicator (turn and bank indicator) separately supplied from the first artificial horizon
- one slip indicator when the airplane is equipped with two artificial horizons
- one directional gyro
- one VOR or one ADF depending on the planned route or one GPS class A, B or C approved
- one torch
- one set of spare fuses
- a navigation light system
- Strobe lights
- a landing light
- a lighting device for instrument panel and for safety equipment
- a watch displaying hours and minutes
- a night V.F.R. placard

Communication
- VHF radio equipment corresponding to the stipulations in equipments required by the the Air Traffic Authorities.

Surveillance
- Surveillance equipement corresponding to the stipulations in equipments required by the the Air Traffic Authorities.

SECTION 2. LIMITATIONS

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

THIS AIRCRAFT MUST BE USED FOR *NORMAL* OR *UTILITY* FLYING, IN ACCORDANCE WITH THE APPROVED FLIGHT MANUAL. ON THIS AIRCRAFT, ALL INDEXES, MARKINGS AND PLACARDS CORRESPOND TO NORMAL UTILISATION. FOR UTILITY OPERATION, REFER TO THE APPROVED FLIGHT MANUAL
SPINS PROHIBITED **MANEUVERING SPEED : 215 km/h - 116 kt** **APPROVED FOR VFR FLIGHT** **BY DAY AND BY NIGHT** **IN NON-ICING CONDITIONS** **NO SMOKING**

SECTION 3. EMERGENCY PROCEDURES

The following emergency procedures complete those of the section 3.

Lighting 1 and/or 3/radio failure

- Lighting 2 ..... on
- Lighting 1 fuse ..... verify
- Lighting 3/radio 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 (not applicable to DR400/135CDI)

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 supplied again. Reset only the switches necessary to ensure flight safety.

SECTION 4. NORMAL PROCEDURES

These procedures complete those of 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
- Landing light ..... 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 gyro 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
Not affected

SECTION 6. WEIGHT AND BALANCE
Not affected

SECTION 7. OPTIONAL EQUIPMENT
Any "VFR flight" supplement is cancelled and replaced by this supplement.

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GLIDER TOWING PROCEDURES
DR400/155 CDI

This supplement is only valid when the TAE 125-02-114 155PS (CENTURION 2.0S) power plant is installed.

Reminder: The flight manuals of DR400/xxx (see applicability) fitted with engine TAE 125-02-114 (155PS) have been modified by DR400/155CDI flight manuals supplement (Doc. Nr. 1002382_{GB}).

This supplement includes the information to be provided to the pilot, as required by the certification basis.
This supplement to the aircraft flight manual must be included in the DR400/155CDI flight manual supplement when the airplane is operated as a tow-plane (tug).

The information provided supersedes or completes the one of the DR400/155CDI supplement to the approved aircraft flight manual. For all operating limitations, procedures and performance specifications not included in this supplement, the DR400/155CDI supplement remains valid.

Applicability

Type of aircraft		Manufacturer change
DR400/140B	Fitted with Thielert engine TAE 125-02-114 155PS (STC 10014219)	Major change no. 080101

Approval

Amendment	Date	Description	Approval
//////	26.09.2012	Original issue	EASA. 10041562
1	06/11/2014	Change of TC holder. Initial issue C.E.A.P.R numbering of C.E.A.P.R document	//////

List of current pages

Pages	Date
1 to 13	November 2014

The sections of the DR400/155CDI supplement to flight manual (document nr. 60-0310-60121) are affected as follows:

Abbreviations and definitions

ISA:	International Standard Atmosphere
KIAS:	Knots Indicated Air Speed
SL:	Sea Level
Vi:	Indicated airspeed
Vr:	Minimum towing speed
Vs1:	Stall speed, flaps 1st notch
Glider:	in this supplement, "glider" stands for the towed plane
Tug:	in this supplement, "tug" stands for the tow-plane
Take-off:	total distance (in meters) from a standing start to achieve to clear 15 m (50 ft) at V = 1.3 Vs1
Ground roll:	During takeoff, the distance an aircraft travels after applying takeoff power until lift off (1.1 Vs1).

GENERAL

No change to DR400/155CDI supplement.

DESCRIPTION

For glider towing, the DR400/140B fitted with TAE 125-02-114 engine (STC 10014219) is modified with:

- A structural reinforcement installed at the manufacturer's;
- A tube mount equipped with an AERAZUR or a TOST hook;
- A release handle at pilot level on the instrument panel;
- An amber warning light indicating towing cable attached;
- An operating placard located next to the release handle;
- A 4 point safety harness fitted to each front seat;
- An outer rear view mirror.

LIMITATIONS

Kinds of operation

Provided that national operational requirements are met and the minimum equipment according to the main part of the AFM is installed and operative, the following kinds of operation are approved:

- Tow flights according to visual flight rules during day time.

Number of gliders on tow

Towing of more than one glider at a time is not permitted.

Glider towing authorized propeller: MTV-6-A/187-129

Towing cable

Breaking strength Maximum: 1000 daN
Minimum: 0.8 times the glider weight

The glider towline shall have a safety link (weak link) installed with a breaking strength of not more than 600 daN.
The length for an aero tow cable (rope) must be from 40 to 60 meters.

Placards

A placard showing following text:
"For towing instructions, see approved flight manual"
must be installed in the aircraft fitted with a towing hook.

A placard providing examples of take-off distance has to be displayed in view of the pilot:
"Take-off distance, tug weight: 840 kg, Z = 1000ft, ISA + 20

Glider weight (kg)	15 m clearance	
	Paved runway (m)	Grass runway (m)
300	590	675
400	690	790
500	780	890
630	907	1035

"

Additional placard: "towing hook, pull to release cable".

Airspeed
The operating limitations specified in the DR400/155CDI flight manuals supplement remain valid with the following deviations:

- The maximum permissible speed for tug operation is VA = 75 KIAS (140 km/h) (position of the flaps of the tug: take-off/1st notch) but not less than 1.2 times the minimum airspeed of the glider.

- Only gliders with a maximum permissible speed for tug operation higher than the minimum towing speed of the tug may be towed.

Mass (weight)
The mass of the glider must not exceed:
815 kg (1797 lb) at a maximum tug take-off mass of 780 kg (1720 lb)
630 kg (1389 lb) at a maximum tug take-off mass of 840 kg (1852 lb)
300 kg (661 lb) at a maximum tug take-off mass of 920 kg (2028 lb)

Load planning
Flight crew
Minimum flight crew: .....1 pilot
Maximum number of occupants:.....2 persons

Other limitations
A towing device certified for aero towing must be used on the glider.
The autopilot must not be activated during aero-towing operation.

3. EMERGENCY PROCEDURES

No change to DR400/155CDI supplement.
Specific procedures concerning glider towing are to be considered (tug pilot towing training certificate or towing permits):

Engine problems
In case of engine problems during the tow-flight, advise the glider pilot to release the tow-rope via signals or radio. If this is not possible or unsuccessful, the tow-rope must be released immediately.
Proceed according to the emergency procedures given in the main part of the DR400/155CDI flight manuals supplement.

Smoke and fire
In case of smoke or fire during the tow-flight, advise the glider pilot to release the tow-rope via signals or radio.
Proceed according to the emergency procedures given in the DR400/155CDI flight manual supplement

Recovery from an unintentional spin
If during the tow-flight the airplane fails to react normally to elevator and aileron operation, immediately release the tow-rope and push the control stick forward.
If this does not prevent spinning, proceed according to the emergency procedures given in the DR400/155CDI flight manual supplement.

Abnormal attitude of the towed glider
If manoeuvrability is no longer ensured due to an abnormal attitude of the towed glider, the tow-rope must be released immediately.
If the glider is apparently outside of a 60° cone behind the tug (i.e. if the angle between the tow-rope and the longitudinal axis of the tug exceeds 30°), the tow-rope must be released immediately.

Warning
The most critical configuration is usually the one in which the glider climbs above the tug during take-off and climb, especially when using a tow-rope connector located at the CG of the glider (if approved).

Failure of the release mechanism on the glider

Landing in tow configuration is possible with the air brakes of the glider fully extended and the rate of descent being controlled via the performance setting of the tug.

Warning
The airspeed must be kept constant during the extension of the flaps of the tug.

4. NORMAL PROCEDURES

Proceed according to the normal operating procedures given in the main DR400/155CDI flight manual supplement.
In addition:

Pre-flight inspection
Inside the cockpit:

- Do a test of the amber light "Tow hook", located under the release handle by pushing the light cover (light must illuminate).

Aircraft walk around inspection:

- Check coupling and release mechanism for excessive dirt and improper function (perform release test).
- Check rear view mirror for damage and insecure attachment.

Coupling of the glider to the tug
Check tow-rope, ring pair and weak link for excessive wear, damage and incorrect configuration.
Do a functional test of the tug hook and of the glider hook.
The amber light "Tow hook", located under the release handle, must illuminate when cable is attached to the tug plane.

Take-off
Tighten tow-rope prior to take-off.
Lift off the tug after the glider has lifted off
Accelerate to minimum towing speed while still in close proximity to the ground

Caution
During the acceleration phase, care must be taken to ensure that the glider lifts off first and that the minimum towing speed is reached while still in close proximity of the ground.

Climb
Towing configuration
Flaps: 1st notch until Vi = 140 km/h (76 KIAS)
Full throttle for all climbs.

Towing speed
Any speed is possible within the minimum aircraft towing speed Vr and the maximum authorized speed Va of the glider on tow.

The best rates of climb are achieved at the minimum permissible tow speeds.
When towing a glider with a high stall speed and/or in rough air, higher towing speeds shall be used.

Descent
Recommended speed: Vi = 250 km/h (135 KIAS)

Landing approach

Prior to landing, the tow-rope should be dropped and the successful release should be verified in the rear view mirror. Dropping of the tow-rope must not endanger persons or objects on the ground.

Landing with the tow-rope attached is only possible when an approach along an obstacle-free path at increased speed is possible.

Dragging the tow-rope on the ground results in a shorter flare phase

ABNORMAL OPERATING PROCEDURES

Landing in tow configuration
Landings in tow configuration are permissible for training and instruction purposes.

Approaching and landing in tow configuration is possible with the air brakes of the glider fully extended and the rate of descent being controlled via the performance setting of the tug.

Warning
The airspeed must be kept constant during the extension of the flaps of the aircraft.

Unintentional separation of the tow-rope
If the connection to the towed glider separates unintentionally or if the glider pilot performs an emergency release, then the pilot of the tug must continue his flight maintaining direction, airspeed and attitude.
The glider must be observed in the rear view mirror, until it is certain that the glider will not be obstructed in its continuation of flight or landing and roll out.

5. PERFORMANCE

Wind components

The maximum demonstrated crosswind component during towing is 5 kts (9 km/h).

5.1 Take-off performance

Take-off distance: total distance (in meters) from a standing start to achieve to clear 15 m (50 ft)

Ground roll: during takeoff, the distance an aircraft travels after applying takeoff power until lift off (1.1 Vs1).

Configuration: Flaps: 1st notch
Full throttle, 155HP at 2300 rpm
ISA Standard
Dry, paved runway, dry and horizontal

- Increase distances by 8% per each 10°C increase with respect to ISA.
- Increase distances by 6% per each 1000 feet altitude increase.
- Increase ground run distances by 14% for good quality grass runway.

Caution
A ground slope of 2% (2 m per 100 m, or 2 ft per 100 ft) results in an increase in the take-off distance by approximately 10%. The effect on the take-off roll can be greater.

The condition of the ground (grass height, soft ground, uneven terrain), a poorly maintained airplane, deviation from the prescribed procedures and unfavourable external factors (rain, cross-wind, wind shear) can all lead to a considerable increase in the take-off distance.

Tug weight : 780 kg
Vlift-off: 49 KIAS (91 km/h)
V50 feet : 58 KIAS (108 km/h)

Zp	0 ft						1000 ft						2000 ft					
Temp.	-5°C		15°C		35°C		-7°C		13°C		33°C		-9°C		11°C		31°C	
Glider weight (kg)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)
630	560	302	677	360	795	418	603	321	718	382	832	443	637	339	758	403	880	468
650	582	308	693	367	804	426	617	327	735	389	852	451	652	345	776	411	901	477
675	596	316	713	376	826	436	635	335	756	399	877	462	671	354	799	421	927	489
700	616	323	734	385	851	447	653	343	778	408	902	473	690	362	822	431	953	500
725	633	331	754	394	875	457	671	351	799	418	927	484	709	371	845	441	980	512
750	650	338	774	403	898	467	689	359	821	427	952	495	728	379	867	451	1006	523
775	667	346	795	412	922	478	707	367	842	436	977	506	748	387	890	461	1032	535
800	684	353	815	421	945	488	726	375	864	446	1002	517	767	396	913	471	1059	547
815	695	358	827	428	959	494	736	379	877	452	1017	524	778	401	926	477	1074	553

Tug weight : 640 kg
Vlift-off: 51 KIAS (94 km/h)
V50 feet : 60 KIAS (111 km/h)

Zp	0 ft						1000 ft						2000 ft					
Temp.	-5°C		15°C		35°C		-7°C		13°C		33°C		-9°C		11°C		31°C	
Glider weight (kg)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)
300	403	223	490	266	557	300	427	237	509	282	590	327	452	250	538	298	624	346
350	436	238	519	284	602	320	462	253	550	301	636	348	488	267	581	318	674	369
400	469	253	558	301	647	350	497	268	592	320	685	371	525	284	625	338	725	392
450	502	268	597	319	693	370	532	284	633	338	734	392	562	300	669	357	776	415
500	535	283	636	337	738	391	567	300	675	357	782	414	596	317	713	377	827	438
550	567	298	675	355	784	411	601	316	716	376	831	436	635	334	757	397	878	461
600	600	313	715	372	829	432	636	332	757	395	879	458	672	350	800	417	928	484
630	620	322	738	383	856	446	657	341	782	406	907	471	694	360	827	429	959	498

Tug weight : 820 kg
Vlift-off: 53 KIAS (98 km/h)
V50 feet : 62 KIAS (115 km/h)

Zp	0 ft						1000 ft						2000 ft					
Temp.	-5°C		15°C		35°C		-7°C		13°C		33°C		-9°C		11°C		31°C	
Glider weight (kg)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)	T/O (m)	Grd roll (m)
300	494	286	598	341	692	396	524	304	623	361	723	416	553	321	659	382	764	443

5.2 Towing performance

Maximum rate of climb at specified configuration.

Altitude pression				0 ft	3000 ft	6000 ft
Glider wingspan (m)	Mass of glider (kg)	Mass DR400CDI (kg)	Vr (4) km/h (KIAS)	Rate of climb ft/min (m/s)		
Longer than 24	815 maximum	780 (1)	110 (59)	500 (2.55)	410 (2.05)	345 (1.75)
24 or more	750 maximum	780 (1)	110 (59)	510 (2.60)	415 (2.10)	350 (1.80)
17 or more	630 maximum	840 (2)	115 (62)	500 (2.54)	405 (2.05)	340 (1.75)
15 or more	630 maximum	840	115 (62)	480 (2.45)	390 (2.00)	320 (1.60)
15 or more	450 maximum	840	115 (62)	560 (2.80)	460 (2.35)	380 (1.95)
10 or more	300 maximum	840	115 (62)	650 (3.30)	530 (2.70)	450 (2.30)
15 or more	300 maximum	920 (3)	125 (67)	530 (2.70)	430 (2.20)	360 (1.85)

Notes:

1): 780 kg = 1 standard pilot (86 kg / 190 lbs) + 50 litres JETA1 assuming a plane of which empty weight is 660 kg.

2): 840 kg = 1 standard pilot (86 kg / 190 lbs) + 110 litres JETA1 assuming a plane of which empty weight is 660 kg.

3): 920 kg = tow pilot training = 1 standard pilot and 1 standard pax (2x86 kg) + 110 litres JET A1 assuming a plane of which empty weight is 660 kg.

4): Vr: recommended towing speed.

6. WEIGHT AND BALANCE

No change to DR 400/155CDI supplement.
The limitations of the centre of gravity specified in the DR 400/155CDI supplement remain valid.

Note: Even though rear view mirror, tow-rope, connection ring pair and weak links are necessary for aero-towing, they are not considered for the determination of the CG.

ELECTRICAL FLAPS
VOLETS DE COURBURE ELECTRIQUES

This Aircraft Flight Manual Supplement (AFMS) includes the material required to be furnished to the pilot and additional information provided by the manufacturer.

The information contained herein supplements or supersedes any existing supplement concerning the electrical flaps.

Ce supplément au manuel de vol contient les informations que les conditions de certifications exigent de fournir au pilote. Ces informations remplacent ou complètent celles du manuel de vol approuvé.

Ce supplément annule et remplace tout additif au manuel de vol concernant les volets de courbure électriques.

Applicability ***Applicabilité***

Aircraft type and model *Type et modèle d'avion*		Manufacturer change *Modification constructeur*
TC EASA.A.367 (DR 300 DR 400)	DR 340, DR 315, DR 360, DR 380 DR 300/108, DR 300/180R, DR 300/140 DR 300/125 **DR 400/125, DR 400/140, DR 400/160, DR 400/180, DR 400/180R, DR 400/2+2** ~~DR 300/120~~ **DR 400/120, DR 400/125i, DR 400/140B DR 400/120A, DR 400/160D, DR 400/120D, DR 400/180S, DR 400/100,** ~~**DR 400RP**~~**,** ~~**DR 400 NGL**~~**, DR 400/200R,** ~~**DR 400/500**~~**,** **DR 400/140B with STC EASA 10014219**	*Dossier d'Evolution Technique* DET n°120901

Approval ***Approbation***

Amendment *Amendement*	Date	Description	Approval *Approbation*
//////	21 June 2013	Original issue *Edition originale*	E.A.S.A. Major change approval 10045400

List of effective pages ***Liste des pages en vigueur***

Pages	Date
1 to *(à)* 3	June 2013

INTRODUCTION

DR 400 airplanes can be equipped with wing flaps electrical actuator.

Les DR 400 peuvent être équipés de commande de volets électrique.

MODIFICATION

The sections of the aircraft flight manual are affected as follows.

Les sections du manuel de vol sont affectées de la façon suivante.

0. GENERAL

No change.

GENERALITES

Section non affectée.

1. DESCRIPTION

The wing flaps are controlled by a multifunction unit which operates the electrical actuator and provides annunciation. The control plate has 3 positions: flaps retracted, 1st notch and 2nd notch.
The lower warning light (amber) blinks during operation and is off when flaps reach selected position.
The upper green warning light indicates 1st notch position. The lower green warning light indicates 2nd notch position. When flaps are in retracted position, all warning lights are off.

The system is protected by a 4 Amps dedicated circuit breaker.

DESCRIPTION

Les volets de courbure sont commandés par un boîtier multifonction qui actionne le vérin électrique de commande et assure la signalisation.
La palette de commande a trois positions (rentré, décollage et atterrissage). Le témoin lumineux inférieur (couleur ambre) clignote en cours de manœuvre et s'éteint lorsque les volets sont arrivés en position. Le témoin vert supérieur signale la position décollage. Le témoin vert inférieur signale la position atterrissage. Lorsque les volets sont en position rentrée, tous les témoins sont éteints.

Le système est protégé par un disjoncteur spécifique de 4A.

2. LIMITATIONS

No change.

LIMITATIONS

Section non affectée

3. EMERGENCY PROCEDURES

APPROACH, RETRACTED FLAPS
Approach speed... VI = 135 km/h (73 KIAS)
Short final..... VI = 125 km/h (67 KIAS)

PROCEDURES D'URGENCES

APPROCHE VOLETS RENTRES.
Vitesse d'approche ..... 135 km/h (73 KIAS)
Courte finale ..... 125 km/h (67 KIAS)

4. NORMAL PROCEDURES

In case of landing flaps retracted, landing distance will be increased by 30%.

PROCEDURES NORMALES

En cas d'atterrissage volets rentrés, la longueur d'atterrissage sera augmentée de 30%.

5. PERFORMANCE

No change.

PERFORMANCES

Section non affectée.

6. WEIGHT AND BALANCE

No change.

MASSE ET CENTRAGE

Section non affectée.

ENROULEUR DE CÂBLE
CABLE WINCH (CABLE WINDER)

Ce supplément au manuel de vol contient les informations que les conditions de certifications exigent de fournir au pilote. Ces informations remplacent ou complètent celles du manuel de vol approuvé
Ce supplément annule et remplace tout additif au manuel de vol concernant :
L'enrouleur de câble.

This Aircraft Manual Supplement (AFMS) includes the material required to be furnished to the pilot and additional information provided by the manufacturer.
The information either supplements or overrides those in the approved flight manual.
The information contained herein supplements or supersedes any existing concerning cable winch (cable winder).

Applicabilité ***Applicability***

Type et modèle d'avion *Aircraft type and model*	Modification constructeur *Manufacturer change*
DR 400 approuvé remorqueur DR 400 towing approval	Modification 119

Approbation ***Approval***

Amendement *Amendment*	Date	Description	Approbation *Approval*
//////	**04/06/1996**	Edition originale *Original issue*	GSAC

Liste des pages effectives ***List of effective pages***

Pages	Date
1 à *(to)* 13	21 Novembre 2013

SECTION 1 – DESCRIPTION

SECTION 1 - DESCRIPTION

Le treuil électrique permet un enroulement automatique du câble en vol par l'action sur un interrupteur électrique uniquement.
L'opération peut être effectuée à vitesse élevée avec un temps d'enroulement court.
En cas de panne du treuil électrique, on peut facilement mettre en service le crochet classique.

The electrical winch can automatically wind in the cable in flight by simply pressing an electrical switch.

The operation can be carried out at high speed with a short reel-in time.

If the electrical winch fails, the conventional hook can easily be brought into service.

Description des composants du système

Description of system components

Console de commande

Control console

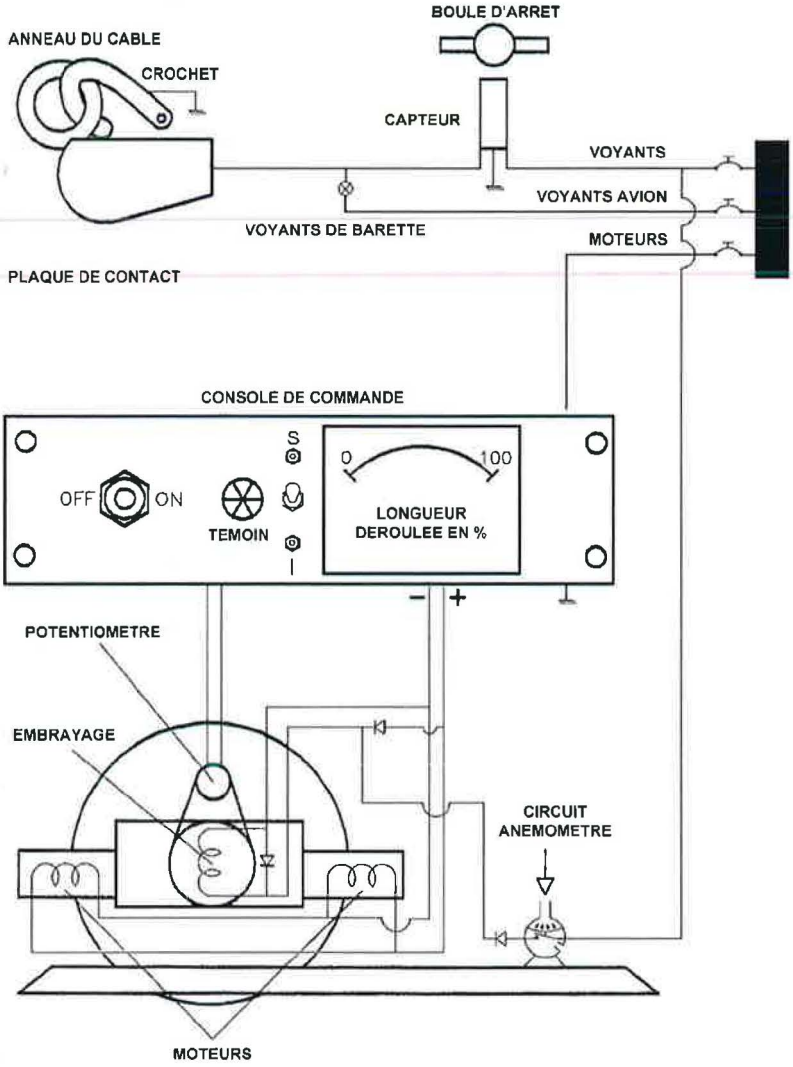
Marche Arrêt *ON/OFF*	Commutateur à poussoir trois positions. Une impulsion vers "MARCHE" déclenche l'opération d'enroulement automatique. En cas de problème, une impulsion vers "ARRET" permet de stopper l'opération d'enroulement automatique. *Three position toggle switch. One press for "ON" to start automatic winding. If problems arise, one position for "OFF" to stop the automatic winding operation.*
Témoin *Indicator lamp*	Témoin orange de mise sous tension du moteur. *Orange control light to show the motor is energized.*
Indicateur à aiguille *Needle indicator*	Indicateur de longueur de câble sorti en %, ou de courant consommé par les moteurs. *Indicates the length of cable paid out as a percentage, or the current consumed by the motors.*
Interrupteur poussoir et trimmer I et S	Quand l'interrupteur poussoir est vers S (position naturelle), on peut lire sur l'indicateur à aiguille la valeur en % de la longueur de câble sorti. A l'aide du trimmer S, on peut régler la lecture 100% en fonction de la longueur de câble utilisée quand il est complètement sorti. Avant de régler l'indication 100%, il faut régler l'indication 0% avec le câble rentré en agissant mécaniquement sur le potentiomètre transmetteur de longueur déroulé, situé à côté des moteurs. Quand l'interrupteur poussoir est actionné vers I, on peut lire sur l'indicateur à aiguille la valeur du courant consommé par les moteurs. Le seuil de coupure des moteurs en cas de surcharge peut être règle par le trimmer I.

Toggle switch and I and S trimmer

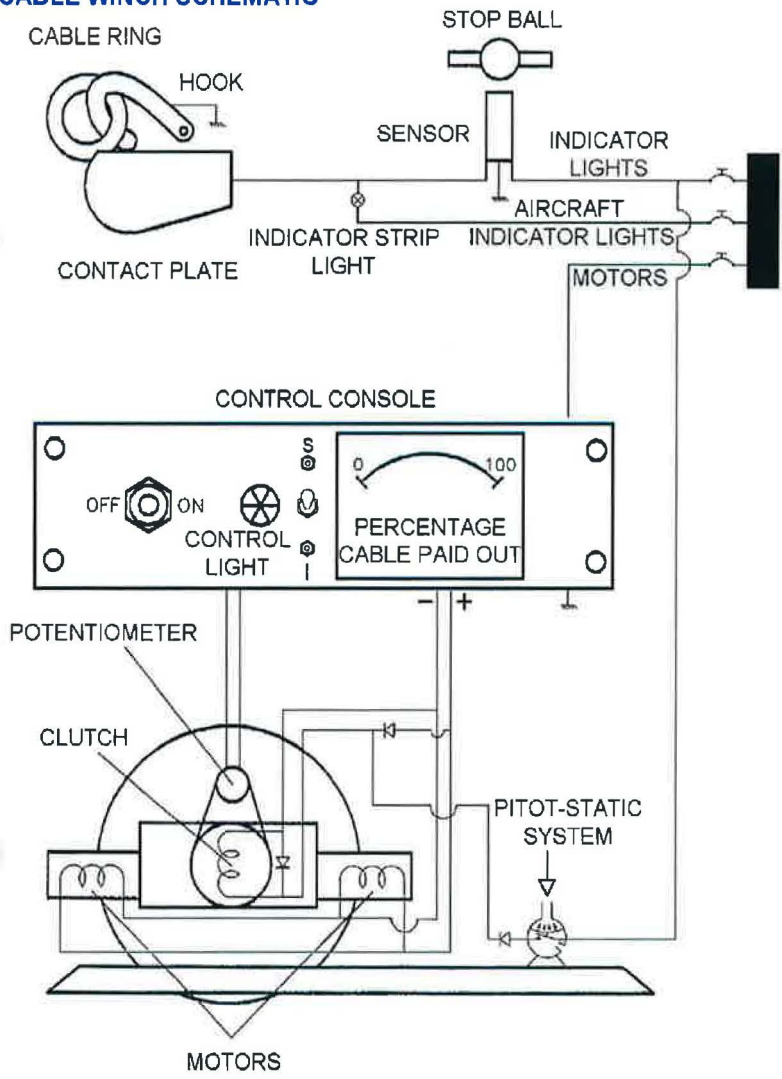
When the toggle switch is at S (usual position), the indicator needle shows the percentage of cable length paid out. The trimmer S is used to set the 100 per cent reading whatever the length of cable used when the cable is fully paid out. Before setting the 100 per cent reading, the 0 per cent reading must be set with the cable fully wound in by mechanically adjusting the payout potentiometer next to the motors.

When the toggle switch is moved to I, the needle indicates the current drawn by the motors. The motor cut-out limit in the event of overload can be set by the trimmer I.

SCHEMA DE L'ENROULEUR DE CÂBLE



CABLE WINCH SCHEMATIC



Enrouleur de câble

Cable Winder

L'enrouleur comporte un tambour qui reçoit le câble, deux moteurs pour l'enroulement, un embrayage électromagnétique, un frein à friction réglable, une capsule anémométrique et un potentiomètre.
Les moteurs sont mis sous tension en vol ou au sol en même temps que l'embrayage pour l'enroulement du câble par une action vers "MARCHE" sur l'interrupteur poussoir situé sur la console de commande.
L'embrayage est mis sous tension automatiquement en vol par la capsule anémométrique branchée sur le circuit avion lorsque celle-ci détecte une vitesse supérieure à un seuil, afin d'éviter un déroulement du câble intempestif en vol.
Le potentiomètre relié mécaniquement au tambour informe la console de commande du % de câble sorti.
Le frein à friction sert à éviter l'emballement du tambour lorsqu'on déroule la corde au sol.

The winder includes a drum around which the cable is wound, two winding motors, an electromagnetic clutch, an adjustable friction brake, a pitot-static air capsule and a potentiometer.
The motors are energized in flight or on the ground at the same time as the clutch so that the cable can be wound in by moving the toggle switch on the control console to the "ON" position.
The clutch is energized automatically in flight by the pitot-static capsule connected to the aircraft system when it detects a speed above a set limit. This prevents cable being paid out inadvertently during flight.
The potentiometer mechanically connected to the drum provides an indication to the control console of the percentage of cable paid out.
The friction brake prevents the drum from spinning as the cable is paid out on the ground.

Bâti tubulaire

Tubular Mount

Le bâti tubulaire comporte une guillotine, un crochet classique, un détecteur de proximité câble sorti pour l'enrouleur et un détecteur câble accroché pour le crochet classique.
La guillotine est actionnée par la poignée située au tableau de bord. Elle sert à sectionner le câble en cas d'urgence.
Le crochet classique peut être mis en service facilement en cas de panne de l'enrouleur. Le largage est commandé par la même poignée que la guillotine. Le détecteur de câble complètement sorti pour l'enrouleur et câble accroché pour le crochet classique agissent sur le même voyant situé sur le tableau de bord.

The tubular mount includes a cable-cutter, a standard hook, a cable extended proximity detector for the winder and a cable attached detector for the standard hook.
The cable-cutter is activated by the control handle on the aircraft instrument panel. It is used for cutting through the cable in an emergency.
The standard hook can be brought into service easily if the winder fails. Jettison is controlled by the same handle as the cable-cutter. The cable fully paid out detector for the winder and the cable attached detector for the standard hook activate the same indicator light on the instrument panel.

Poignée
Control Handle

La poignée située sur le tableau de bord sert à guillotiner le câble de l'enrouleur et, lorsque le crochet classique est utilisé, à larguer le câble. Le passage de la fonction guillotine à la fonction largage se fait en démontant le câble de commande du levier de la guillotine et en le remontant sur le levier du crochet classique. Les deux leviers sont sur le bâti-tubulaire, accessibles de l'extérieur. Une étiquette démontable doit être posée à côté de la poignée en fonction de l'usage.

The control handle on the instrument panel is used for cutting the winder cable and, when the standard hook is used, for jettisoning the cable. The changeover from the cable-cutter function to the jettison function is made by removing the control cable from the cable-cutter lever and attaching it to the standard hook lever. Both levers are on the tubular mount, and accessible from outside. A removable placard must be placed next to the control handle in accordance with its specific use.

Mise en service du crochet classique

Démonter le cône

Démonter le câble de la poignée du levier de guillotine (au niveau du bâti tubulaire) et le remonter sur le levier du crochet classique

A proximité de la poignée au tableau de bord, mettre l'étiquette "Largage câble" à la place de l'étiquette « Guillotine câble ».

Faire un essai de fonctionnement

Bringing the standard hook into service

Remove the cone.

Remove the cable from the cable-cutter lever handle (on the tubular mount) and attach it to the standard hook lever.

Place the placard "Towing Hook / Pull to release Cable" nearthe handle on the instrument panel instead of the "Rope Shears" placard.

Test that it is working.

SECTION 2 – LIMITATIONS

SECTION 2 - LIMITATIONS

Les limitations de la section 2 ne sont pas affectées par l'installation de l'enrouleur électrique.

The limitations of Section 2 are not affected by installation of the electrical winder.

SECTION 3 - PROCEDURES D'URGENCE

SECTION 3 - EMERGENCY PROCEDURES

Les procédures d'urgence de remorquage ne sont pas affectées lors de l'utilisation du crochet classique Aérazur. Les procédures qui suivent sont valables pour l'enrouleur uniquement.

The towing operation emergency procedures are not affected when using the Aérazur standard hook. The following procedures are valid for operation with the cable winder only.

INCIDENTS EN REMORQUAGE

TOWING INCIDENTS

Largage de secours

Emergency Jettison

Lorsque le remorquage doit être interrompu par le remorqueur à cause d'une position en vol inhabituelle dûe au décalage par rapport au planeur, non fonctionnement du crochet planeur ou d'autres causes, prendre les mesures suivantes:

Guillotine.....tirer la poignée jusqu'à la butée
Enrouleur.....ne pas actionner
Indication aiguille.....100%
Miroir de voilure.....vérifier que le câble est coupé
Atterrissage.....de façon normale

ATTENTION
Si le planeur se retrouve en position haute, le remorqueur peut se trouver en situation incontrôlable très rapidement.

When the towing operation must be interrupted by the towing aircraft because of an unusual flight position relative to the glider, failure of the glider hook or other causes, proceed as follows:

Cable-cutter.....pull the handle fully
Winder.....do not activate
Needle indication.....100 per cent
Wing-mounted mirror.....check that the cable has been cut
Landing.....as normal

ATTENTION
If the glider is in a high position, the towing aircraft may find itself very rapidly in an uncontrollable situation.

Rupture du câble
Cable Failure

Il faut enrouler la longueur du câble restante:
Interrupteur poussoir ..... vers marche
Miroir de voilure..... surveiller la longueur restante
Interrupteur poussoir ..... arrêt quand il reste 5 m
Atterrissage ..... avec réserve d'altitude correspondante

The remaining length of cable must be wound in:
Push button ..... to on
Wing-mounted mirror..... check the remaining length
Push button ..... off when 5 m remains
Landing ..... with corresponding extra clearance

INCIDENTS LORS DE L'ENROULEMENT

INCIDENTS DURING CABLE WINDING

Formation de boucles
Loop Formation

Si des boucles se forment et empêchent le câble de s'enrouler normalement, le moteur doit s'arrêter à la suite de l'effort supplémentaire qu'il rencontre.

Interrupteur poussoir ..... vers arrêt
Témoin orange des moteurs..... éteint
Indication aiguille..... noter le % restant
Miroir de voilure..... vérifier la situation
Atterrissage ..... avec réserve d'altitude correspondante

ATTENTION

Lorsqu'une longueur de câble ne peut être enroulée, il faut éviter d'accrocher un obstacle lors de l'approche finale. Cela peut endommager le remorqueur ou provoquer sa chute.

If loops form and prevent the cable from winding in normally, the motor should stop because of the increased effort encountered.
Push button ..... to off
Orange motor control lamp..... off
Needle reading..... note percentage still paid out
Wing-mounted mirror..... check situation
Landing ..... with corresponding extra clearance

ATTENTION

When the cable cannot be fully wound in, care must be taken not to catch any obstacles during final approach. This could damage the towing aircraft or even bring it down.

Le moteur s'arrête
Motor Stoppage

L'arrêt du moteur peut être dû à une vitesse excessive du remorqueur provoquant un effort d'enroulement anormal.

Vitesse..... réduire
Disjoncteur moteurs..... vérifié
Interrupteur poussoir ..... vers marche

The motor may stop because of excessive speed of the towing aircraft requiring an unusually large winding force.
Speed..... reduced
Motor circuit breakers..... checked
Push button ..... to on

Le moteur ne s'arrête pas
Motor fails to stop

Interrupteur poussoir ..... vers arrêt
Témoin orange des moteurs ..... éteint

Si le témoin orange des moteurs est toujours allumé:
Disjoncteur moteurs ..... tirer

Push button ..... to off
Orange motor control light ..... off
..... If the orange motor control light is still on:
Motor circuit breaker..... pull

Incident sur la sonde anémométrique
Incident with pitot-static sensor

Si la sonde anémométrique provoque une fuite dans le circuit avion, l'indicateur de vitesse de l'avion peut être faussé.
Choisir un terrain de dégagement dont la piste est assez longue.
Ne pas tenir compte des indications de vitesse.
Approche au jugé.

REMARQUE
Le fonctionnement de l'avertisseur de décrochage n'est pas affecté.

If the pitot-static sensor causes a leak in the aircraft system, the aircraft's airspeed indicator may give incorrect readings.
Choose a landing ground with a long enough runway.
Disregard the speed indications.
Estimate speed.

REMARK
Stall warning operation is not affected.

SECTION 4 - PROCEDURES NORMALES

SECTION 4 - NORMAL PROCEDURES

Inspection pré-vol

Pre-Flight Inspection

Les inspections suivantes spécifiques à l'enrouleur de câble doivent être effectuées en plus des inspections normales de la section 4.

1 - Contrôle visuel de la guillotine
Contrôle de la liberté de mouvement de la lame en évitant de blesser le câble
2 - Contrôle visuel du câble en le tirant; vérifier l'absence de point dur en même temps
3 - Contrôler l'état des nœuds de fixation des anneaux
4 - Interrupteur batterie sur marche, l'aiguille doit indiquer 100% et le voyant crochet de remorquage situé sur la barrette du tableau de bord doit être allumé
5 - Rentrer le câble. Le témoin orange sur la console de commande doit s'allumer; le voyant orange sur la barrette du tableau de bord doit s'éteindre. Vérifier la régularité de déroulement de l'opération.
6 - Vérifier l'arrêt du moteur (témoin orange sur la console de commande éteint). L'aiguille doit indiquer 0%

The following inspections specifically of the cable winder must be made in addition to the NORMAL inspections in Section 4.
1 - Visually check the cable-cutter. Check the blade moves freely, but taking care not to nick the cable.
2 - Visually check the cable by pulling it: check there is no stiffness at the same time.
3 - Check the condition of the ring attachment knots.
4 - When the battery switch is on, the needle should read 100 per cent and the tow-hook indicator on the instrument panel strip should be on.
5 - Wind in the cable. The orange control light on the control console should come on; the orange indicator light on the instrument panel strip should go off. Check the winding operation is smooth.
6 - Check that the motor stops (orange control light on the control console goes off). The needle should indicate 0 per cent.

Utilisation remorquage
Towing Operations

Placer le remorqueur devant le planeur.
Tirer le câble et l'accrocher au planeur.
Quand le planeur est prêt, rouler lentement pour dérouler le câble.
Quand le voyant crochet de remorquage situé sur la barrette de voyant du tableau de bord s'allume, vérifier que l'aiguille indique 100%.
Décoller de la même façon qu'avec un crochet classique.

ATTENTION

Ne pas accélérer avant l'illumination du voyant crochet de remorquage situé sur la barrette de voyant du tableau de bord.
Ce voyant indique que le câble est entièrement sorti.
Si l'avion accélère avant la sortie complète, le câble continu à se dérouler sans tirer le planeur. Au moment où il est entièrement sorti, il se tend brusquement, le planeur risque d'être catapulté par l'élasticité du câble. Cette situation peut aboutir à une rupture du câble, un endommagement du planeur ou du remorqueur.

ATTENTION

Si le câble est tendu lorsque le planeur se largue, des boucles peuvent se former. Eviter de tendre le câble au moment du largage planeur.

Place the towing aircraft in front of the glider.
Pull the cable and hook up the glider.
When the glider is ready, taxi slowly to pay out the cable.
When the tow-hook indicator light on the instrument panel strip comes on,
Check that the needle indicates 100 per cent.
Take off in the same way as with a standard hook.

ATTENTION

Do not accelerate before the tow-hook indicator light on the instrument panel strip comes on. This indicator light shows that the cable is fully paid out.
If the aircraft accelerates before the cable is fully paid out, the cable will continue to unwind without pulling the glider.
At the instant it is fully paid out, the cable will tighten suddenly and the glider may be catapulted by the elasticity of the cable.
This may cause the cable to break and could damage the glider and towing aircraft.

ATTENTION

If the cable is taut when the glider releases, loops may form.
Take care that the cable is not taut at the moment the glider is released.

Après le largage
After Release

Actionner l'interrupteur poussoir vers marche.
Vérifier que le témoin orange sur la console de commande est allumé et que le voyant orange sur la barrette du tableau de bord est éteint.
Surveiller l'opération d'enroulage pendant la descente.

Move the toggle switch to on. Check that the orange control lamp on the control panel is on and that the orange indicator light on the instrument panel strip is off. Monitor the cable winding operation during the descent.

Avant atterrissage
Before Landing

Vérifier que l'aiguille indique 0%.
Vérifier à l'aide du miroir situé sur la voilure que le câble est rentré.

Check that the needle reads 0 per cent.
Check with the wing-mounted mirror that the cable is wound in.

SECTION 5 – PERFORMANCES
SECTION 5 - PERFORMANCE

Les performances de la section 5 ne sont pas affectées par l'installation d'un enrouleur de câble.
Performance in Section 5 is not affected by installation of the cable winder.

SECTION 6 - MASSES ET CENTRAGE
SECTION 6 - WEIGHT AND BALANCE

Avec un câble de 50 m, la masse totale du système est de 15,7 kg environ, le bras de levier est de 2,57 m.

La masse et le moment sont inclus dans la masse et le moment à vide de l'avion si l'enrouleur est monté d'origine en usine

With a 50 m cable, the total weight of the system is about 15.7 kg, and the moment arm is 2.57 m.
The weight and moment are included in the aircraft empty weight and moment if the cable winder is factory fitted.

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ROBIN AIRCRAFT

Handcrafted in France since 1957

Operating instruction of flight recorder installed for Robin Aircraft warranty

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Operating instruction of flight recorder installed for Robin Aircraft warranty

1. PRODUCT DESCRIPTION

1.1 Operation

The flight recorder, associated with the warranty cell Robin Aircraft, is a black box that allows to record flight parameters.
The operation is automatic and does not require intervention.

1.2 Location

The flight recorder and its GPS antenna are installed in the fuselage and are accessible by the inspection hatch under fuselage.

Note: installation on the dashboard in the cabin is also possible as an option

1.3 Control

The system has a led/lamp control operation on the headband, and a breaker on the dashboard or on the control panel.
These items are identified by labels: "Safety R."
The control lamp (led) is fed through the panel lamp breaker.
The flight recorder is powered by the dedicated breaker.

1.4 Approval

The flight recorder is approved by ISEI (EASA Approval 10031730 and 1004653).
The installation is approved by CEAPR.

2. VERIFICATIONS

Operating check:

1- At power (general aircraft) the led on the control panel light.
2- After engine start-up, the light will turn off indicating that the recorder is operational

3. FAILURES / TROUBLESHOOTING

The light / led on the headband does not light after general power aircraft:

1- Check that the panel lamp breaker is switched on, and that the other lights work (lights on the alarm panel).
2- Check that the led is powered (2-pin plug behind banner)
   Pin 1 = 12V
   Pin 2 = Ground
3- If the led is powered but remains off, change the led.
4- If the led is not powered, contact your workshop for trouble shooting or change the power supply unit.

The light / led on the headband does not turn off after start-up of the engine.

1- Check that the breaker dedicated to the recorder is switched on
2- Refer to the manual ISEI MM-PN47XX-A-02 (or later) for more information.

4. MAINTENANCE / OPERATION

In addition to specific ISEI maintenance operations (refer to ISEI MM-PN47XX-A-02, or later), the flight recorder must be removed and returned to **Robin Aircraft** each 2000 h/6 years, for download and verification of the recorded data which are necessary for the maintenance of the Robin Aircraft warranty.

5. CONTACT

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