TB

Pilot's Operating Handbook

EADS SOCATA

SOCATA
GROUPE AEROSPATIALE

SUPPORT CLIENT / CUSTOMER SUPPORT

AERODROME TARBES-OSSUN-LOURDES
B.P. 930 -- F65009 TARBES CEDEX
FRANCE

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SERVICE BULLETIN

TB AIRCRAFT

SB 10-099	28
	ATA No.

MANDATORY

DOA D.G.A.C. F.JA.04 Approved
is the subject of AD No. 1999-062 (A)

SUBJECT : FUEL LEVEL

EFFECTIVITY : 14-Volt TB 9, TB 10, TB 20, TB 21 aircraft S/N 1 to 822, 850 to 887, 889 to 947 with engine monitoring cluster at amendment D.

NOTE 1 :
As they have a different conception, 14-volt TB aircraft without engine monitoring cluster at amendment D and 28-volt TB aircraft are not concerned.

NOTE 2 :
This amendment D has never been applied in series but only as spares.

NOTE 3 :
The amendment D is mentioned on the equipment identification plate. (It also has to be mentioned, by the user, in the aircraft log book when the amended equipment has been installed).

REASON : To inform pilots about the fuel quantity which is over-estimated when voltage is lower than 13 volts.

COMPLIANCE : On receipt of this SB.

DESCRIPTION : Write by hand and with ink, the following informations :

In your Pilot's Operating Handbook(s) (14-Volt)

a) In SECTION 3 "EMERGENCY PROCEDURES", at the end of "ALTERNATOR FAILURE" procedure :

> *Fuel gages :*
> *If voltage is lower than 13 VOLTS (below green range), fuel quantity is over-estimated.*

b) In SECTION 4 "NORMAL PROCEDURES", in "PREFLIGHT INSPECTIONS" of "ELECTRICAL SYSTEMS" procedure, at paragraph "a - Cabin", after "Fuel gages Check" :

> *CAUTION*
> *If voltage is lower than 13 VOLTS (below green range), fuel quantity is over-estimated.*

c) In SECTION 4 "NORMAL PROCEDURES", in "AFTER STARTING ENGINE" procedure, before "Fuel selector Set to fullest tank" :

Fuel gages	*Check*

In your "Flughangbuch(es)" (14 Volts)

a) In ABSCHNITT 3 "NOTVERFAHREN", at the end of "AUSFALL DES GLEICHRICHTERGENERATORS" procedure :

Kraftstoffvorratsgeber:
Wenn die Spannung unter 13 Volts (unter dem grünen Bogen) ist, ist die Krafftstoffmenge überbewertet.

b) In ABSCHNITT 4 "NORMALE BETRIEBSVERFAHREN", in "VORFLUGKONTROLLEN" of "ELEKTRISCHE ANGLAGE" procedure, at paragraph "a – Kabine", after "Kraftstoffvorratsanzeiger Prüfen" :

WARNUNG
Wenn die Spannung unter 13 Volts (unter dem grünen Bogen) ist, ist die Krafftstoffmenge überbewertet.

c) In ABSCHNITT 4 "NORMALE BETRIEBSVERFAHREN", in "NACH DEM ANLASSEN DES TRIEBWERKS" procedure, before "Tankwahlschalter Auf vollsten Tank schalten" :

Kraftstoffvorratsgeber	*Geprüft*

Order placard, P/N TB10 7207110000 from your TB spare parts distributor and stick it near the fuel indicator. Until receipt, cut the marking from the enclosed annex and stick it near the fuel indicator.

UPDATING OF THE AIRCRAFT DOCUMENTATION :

Mention, in the aircraft log book, the application of Service Bulletin No. SB 10-099-28 "FUEL LEVEL".

WARNING : SOCATA considers that it is MANDATORY for operators to comply with the instructions of this SB.

Operators who arbitrarily ignore the compliance statement indicated in this SB do so at their own risk.

TB 9

PILOT'S OPERATING HANDBOOK

SOCATA
Groupe AEROSPATIALE
AEROPORT TARBES-OSSUN-LOURDES
B.P.930 - 65009 TARBES CEDEX
FRANCE

TELEGR. : SOCAERO-TARBES
TELEX : 520828 (Administration)
532835 (Product support)
TELECOP. : 62.51.73.55
PHONE : 62.51.73.00
62.93.99.45 (Auto recorder)

PILOT'S OPERATING HANDBOOK

SOCATA Groupe Aérospatiale

MODEL TB 9

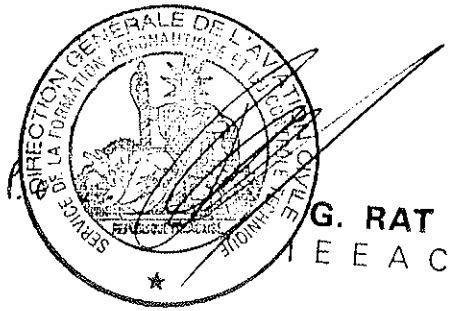
SERIAL N° 299

REGISTRATION N° D-EUGA

Type Certificate Data Sheet N° 165 dated 27th September 1979

Sections 2 - 3 (Pages 2.1 to 2.14, 3.1 to 3.14, 5.3, 5.5) approved by DIRECTION GENERALE DE L'AVIATION CIVILE.

D.G.A.C. Approval



Date : 12 DEC. 1988

"Ce Manuel est une traduction en langue anglaise du Manuel Français correspondant approuvé par la D.G.A.C."

This airplane must be operated in accordance with the limitations contained in Section 2 of this Flight Manual.

THIS DOCUMENT MUST BE KEPT PERMANENTLY ABOARD THE AIRPLANE.

APPLICABILITY OF YOUR MANUAL

The Pilot's Operating Handbook in the airplane at the time of delivery from SOCATA contains information applicable to SOCATA Model TB 9 airplane designated by the serial number and registration number shown on approval page of this handbook.

This information is based on data available at the time of publication.

For any Operating handbook and / or Supplement order, it is necessary to mention their part number.

PILOT'S OPERATING HANDBOOK AND SUPPLEMENTS PART NUMBERS

A Pilot's Operating Handbook consists of a basic part which has its own part number (Sections 0 to 8) and of Supplements, each one bearing a particular part number.

Each Supplement looks like a small Pilot's Operating Handbook.

The part number in the form of "Z00. 18xxxxxxxx" is the number noted on the first page of the "List of effective pages and validities", either of the basic Pilot's Operating Handbook or of each Supplement.

To a part number corresponds an airplane model, a version and an edition of the handbook or of a Supplement.

REVISIONS AND EDITIONS

Changes and / or additions to this handbook and its supplements will be covered by revisions and editions published by SOCATA.

REVISIONS

Revisions allow updating of part of the handbook or the Supplement (s) (mistakes, omissions, airworthiness repercussions, ...).

Revised pages cancel and replace the respective pages in the handbook.
Revisions do not alter part number (Z00. ...).
Revised pages take systematically the more recent edition of the concerned handbook.

NOTE :

Modifications and additions are noted in the margin with a black vertical line facing the modified part ; if the text has not been modified, but if it has been moved to another page, the black line will be drawn opposite paging or revision.

CAUTION :

It is the responsibility of the owner to maintain this handbook in a current status and therefore to incorporate successive revisions.

EDITIONS

Editions enable to validate the whole handbook or Supplement (s) further to modifications and / or important technical improvements on the concerned model (example : new fuel system, increase of landing weight...)

To a new edition corresponds a new airplane validity and a new part number (Z00. ...). Except in exceptional cases, your handbook is not concerned with new editions.

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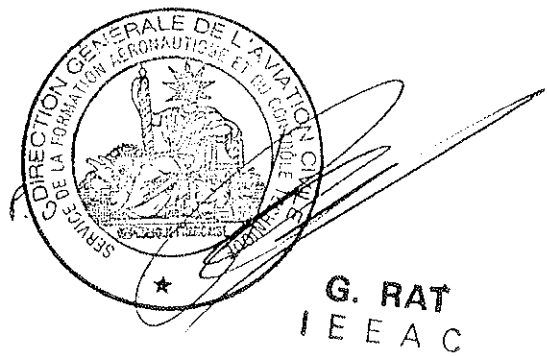
ORIGINAL ... 0 ... January 31, 1988

D.G.A.C. APPROVAL



Approved on 12 DEC. 1988

LIST OF AMENDMENTS

Edition 0 of January 31, 1988

Revision 1 of March 31, 1989

Pages	Description
0.8 thru 0.8B	List of amendments
0.9 and 0.10	List of effective pages and validities
1.1 1.6 thru 1.9	Adding of list of symbols
1.5, 2.8	Suppression of ramp weight and standard airplane weights
1.11, 7.56	Adding of QNH altitude
2.6	Fuel pressure
2.9	Adding of negative flight load factor limits
2.10	Fuel limitations
2.13	Oil placard
4.17	Shut-down / securing airplane
6.8	Table data put in accordance with data in Section 1
6.13	Equipment list
7.41	Main switch

D.G.A.C. approval :

DIRECTION GÉNÉRALE DE L'AVIATION CIVILE
SERVICE DE LA FORMATION AÉRONAUTIQUE ET DU CONTRÔLE TECHNIQUE

P.O. G. RAT
L E E A C

Date : - 5 SEP. 1989

LIST OF AMENDMENTS

Edition 0 of January 31, 1988

Revision 1 of March 31, 1989 (Continued)

Pages	Description
7.44	Alternator control
7.46	Undervoltage warning light
8.10	Oil and oil filter change
9.0.1 and 9.0.2	New presentation of table of contents
0.3, 1.1 1.4 and 1.5 1.10 thru 1.18 2.8, 2.10 3.8, 3.11 4.13 thru 4.16 4.18 and 4.19 5.26, 6.3 7.20 and 7.21 7.30, 7.35 7.37, 7.39, 7.41 7.46 and 7.47 7.56, 8.7	Terminology or text moving

D.G.A.C. approval :

DIRECTION GÉNÉRALE DE L'AVIATION CIVILE
SERVICE DE LA FORMATION AÉRONAUTIQUE ET DU CONTRÔLE TECHNIQUE
G. RAT
S.T.E.A.C

Date : - 5 SEP. 1989

LIST OF EFFECTIVE PAGES AND VALIDITIES

ORIGINAL ... 0 ... January 31, 1988 - From S / N 1 to S / N 730
(P / N Z00. 1800030986)

Page N°	Edition N°	Revision N°
Title	0	-
0.1 and 0.2	0	-
0.3	0	1
0.4 thru 0.7	0	-
0.8 thru 0.8B	0	1
0.9 and 0.10	0	1
1.1	0	1
1.2 and 1.3	0	-
1.4 thru 1.18	0	1
2.1 thru 2.5	0	-
2.6	0	1
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2.11 and 2.12	0	-
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3.1 thru 3.7	0	-
3.8	0	1
3.9 and 3.10	0	-
3.11	0	1
3.12 thru 3.14	0	-
4.1 thru 4.12	0	-
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4.20	0	-
5.1 thru 5.25	0	-
5.26	0	1

6.1 and 6.2	0	-
6.3	0	1
6.4 thru 6.7	0	-
6.8	0	1
6.9 thru 6.12	0	-
6.13	0	1
6.14 thru 6.30	0	-
7.1 thru 7.19	0	-
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7.22 thru 7.29	0	-
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7.39	0	1
7.40	0	-
7.41	0	1
7.42 and 7.43	0	-
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7.48 thru 7.55	0	-
7.56	0	1
7.57 thru 7.64	0	-
8.1 thru 8.6	0	-
8.7	0	1
8.8 and 8.9	0	-
8.10	0	1
8.11 thru 8.18	0	-
9.0.1 and 9.0.2	0	1
9.0.3 and 9.0.4	0	-
Section 9	See Log of Supplements	

SECTION 1

GENERAL

TABLE OF CONTENTS

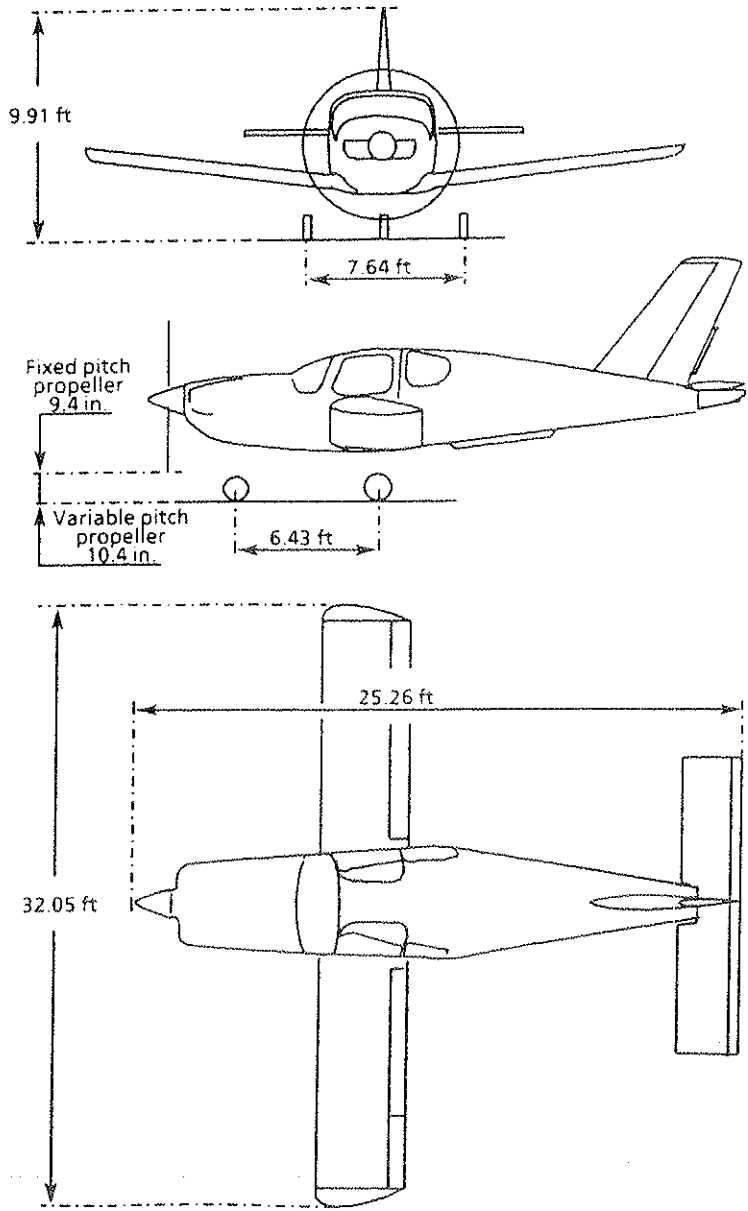


Figure 1.1 - THREE VIEW DRAWING

GENERAL

This handbook contains 9 sections, and includes the material required by FAR Part 23 to be furnished to the pilot for operation of SOCATA Model TB 9 airplane. It also contains supplemental data supplied by SOCATA.

This section provides basic data and information of general interest. It also contains definitions or explanations of abbreviations and terminology commonly used.

The general for optional systems are given in Section "Supplements" of the Flight Manual.

DESCRIPTIVE DATA

ENGINE

Number of engines : 1
Engine Manufacturer : AVCO LYCOMING
Engine Model Number : O-320-D2A
Engine Type :
Four-cylinder, direct drive, air-cooled, horizontally opposed
Horsepower Rating and Engine speed : 160 rated BHP at 2700 RPM.

PROPELLER

Number of propellers : 1
Propeller Manufacturer : SENSENICH
Propeller Model Number : 74.DM6.S8.061
Number of blades : 2
Propeller Diameter :
Maximum : 74 inches (1.88 m)
Minimum : 72 inches (1.83 m)
Propeller Type :
Fixed pitch
(Variable pitch : see "Supplements" Section)

FUEL

Approved Fuel Grades (and Colors) :
100 LL Grade Aviation Fuel (Blue)
100 (Formerly 100/130) Grade Aviation Fuel (Green)

	Standard tanks	Optional tanks
Total capacity :	41.7 U.S Gal (158 l)	55.4 U.S Gal (210 l)
Total capacity each tank :	20.8 U.S Gal (79 l)	27.7 U.S Gal (105 l)
Total usable :	40.2 U.S Gal (152 l)	53.8 U.S Gal (204 l)

NOTE :
Isopropyl alcohol or ethylene glycol monomethyl ether may be added to the fuel supply. Additive concentrations shall not exceed 1 % for isopropyl alcohol or 0.15 % for ethylene glycol monomethyl ether. Refer to Section 8 "Handling, servicing and maintenance" for additional information.

OIL

Oil grades (specifications) and Viscosity :

Outside Air Temperatures	MIL-L-6082 Spec. Mineral Grades 50 first hours	MIL-L-22851 Spec. Dispersant Grades after 50 hours
All temperatures	.....	SAE 15W50 or SAE 20W50
Above 80°F (27°C)	SAE 60	SAE 60
Above 60°F (15°C)	SAE 50	SAE 40 or SAE 50
30°F (-1°C) to 90°F (32°C)	SAE 40	SAE 40
0°F (-18°C) to 70°F (21°C)	SAE 30	SAE 30, SAE 40 or SAE 20W40
0°F (-18°C) to 90°F (32°C)	.....	SAE 20W50 or SAE 15W50
Below 10°F (-12°C)	SAE 20	SAE 30 or SAE 20W30

Oil Capacity :

Sump : 8 Quarts (7.6 Litres)
Total : 8.45 Quarts (8 Litres)
Maximum oil consumption : 0.8 qt/hr.

MAXIMUM CERTIFICATED WEIGHTS

Normal and Utility categories

Take-off :	2337 lbs (1060 kg)
Landing :	2337 lbs (1060 kg)

Weight in Baggage Compartment :

- Maximum 88 lbs (40 kg) at 102.3 in. (2.600 m) (Valid up to S / N 399, (plus S / N 413
- Maximum 143 lbs (65 kg) at 102.3 in. (2.600 m) (Valid from S / N 400, (except S / N 413

Refer to Section 6 for loading instructions.

STANDARD AIRPLANE WEIGHTS

Normal and Utility categories

Standard Empty Weight :	1488 lbs (675 kg)
Maximum Useful Load :	864 lbs (392 kg)

CABIN AND ENTRY DIMENSIONS

Maximum Cabin Width : 4.20 ft (1.28 m)
Maximum Cabin Length : 8.30 ft (2.53 m)
Maximum Cabin Height : 3.67 ft (1.12 m)
Number of Cabin Entries : 2
Maximum Entry Width : 3.45 ft (1.05 m)
Minimum Entry Width : 2.62 ft (0.80 m)
Maximum Entry Height : 2.30 ft (0.70 m)

BAGGAGE SPACE AND ENTRY DIMENSIONS

Maximum Compartment Width : 4.10 ft (1.25 m)
Minimum Compartment Width : 3.45 ft (1.05 m)
Maximum Compartment Length : 2.95 ft (0.90 m)
Minimum Compartment Length : 2.20 ft (0.67 m)
Maximum Compartment Height : 2.03 ft (0.62 m)
Minimum Compartment Height : 1.35 ft (0.41 m)
Entry Width : 2.10 ft (0.64 m)
Entry Height : 1.44 ft (0.44 m)

SPECIFIC LOADINGS

Normal and Utility categories

Wing loading : 18.2 lbs/sq.ft (89.1 kg/m^2)
Power loading : 14.6 lbs/BHP (6.63 kg/CV)

SYMBOLS, ABBREVIATIONS AND TERMINOLOGY

LIST OF SYMBOLS

Lighter

Lighter

Heated pitot tube

Day / Night dimmer

Stall warning device

Emergency locator transmitter

Battery

Battery


Starter

Radio lighting


Instrument panel normal lighting


Instrument panel emergency lighting

Alternator


Anticollision light


Navigation light

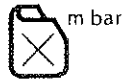

Parking brake


Turn and bank indicator

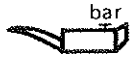

L.H. fuel gage


R.H. fuel gage


Fuel pump



Fuel pressure



Oil pressure

Taxi light

Landing light

Fuel selector

Strobe light

Magnetos switch

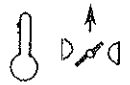
Off

L.H. magneto

R.H. magneto

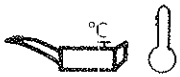
L.H. + R.H. magnetos

Starter



Carburator temperature

Outside air temperature

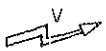


Oil temperature

Indicator lights test

Fan

Electric flaps



Voltmeter

GENERAL AIRSPEED TERMINOLOGY AND SYMBOLS

KCAS : ***Knots Calibrated Airspeed*** is indicated airspeed corrected for position and instrument error and expressed in knots. Knots calibrated airspeed is equal to KTAS in standard atmosphere at sea level.

MPH CAS : ***Miles per hour Calibrated Airspeed***

KIAS : ***Knots Indicated Airspeed*** is the speed shown on the airspeed indicator and expressed in knots.

MPH IAS : ***Miles per hour Indicated Airspeed***

KTAS : ***Knots True Airspeed*** is the airspeed expressed in knots relative to undisturbed air which is KCAS corrected for altitude and temperature.

V_A : ***Maneuvering Speed*** is the maximum speed at which full or abrupt control movements may be used.

V_{FE} : ***Maximum Flap Extended Speed*** is the highest speed permissible with wing flaps in a prescribed extended position.

V_{NE} : ***Never Exceed Speed*** is the speed limit that may not be exceeded at any time.

V_{NO} : ***Maximal Structural Cruising Speed*** is the speed that should not be exceeded except in smooth air, and then only with caution.

V_{SO} : ***Stalling Speed or the minimum steady flight speed*** at which the airplane is controllable in the landing configuration.

V_{S1} : ***Stalling Speed or the minimum steady flight speed*** obtained in a specific configuration.

METEOROLOGICAL TERMINOLOGY

ISA : ***International Standard Atmosphere***

OAT : ***Outside Air Temperature*** is the free air static temperature. It is expressed in either degrees Celsius or degrees Fahrenheit.

Pressure Altitude :
Is the altitude read from an altimeter when the altimeter's barometric scale has been set to 29.92 inches of mercury (1013.2 hPa).

QNH : Setting at the pressure corresponding to the reading of actual airplane altitude.

Standard Temperature :
Is 59°F (15°C) at sea level pressure altitude and decreases by 3.6°F (2°C) for each 1000 ft of altitude.

ENGINE POWER TERMINOLOGY

BHP : ***Brake Horsepower*** is the power developed by the engine.

MP : ***Manifold Pressure*** is a pressure measured in the engine's induction system and is expressed in inches of mercury (in.Hg).

RPM : ***Revolutions Per Minute*** is engine speed.

AIRPLANE PERFORMANCE AND FLIGHT PLANNING TERMINOLOGY

Climb Gradient :
Is the demonstrated ratio of the change in height during a portion of climb, to the horizontal distance traversed in the same time interval.

Demonstrated crosswind velocity :
Is the velocity of the crosswind component for which adequate control of the airplane during take-off and landing was actually demonstrated during certification tests. The value shown is not considered to be limiting.

g : Is acceleration due to gravity.

Usable Fuel : Fuel available for flight planning.

Unusable Fuel :
Fuel remaining after a runout test has been completed in accordance with governmental regulations.

WEIGHT AND BALANCE TERMINOLOGY

Reference Datum :
Is an imaginary vertical plane from which all horizontal distances are measured for balance purpose.

Arm : Is the horizontal distance from the reference datum to the center of gravity (C.G.) of an item.

Moment : Is the product of the weight of an item multiplied by its arm. (Moment divided by the constant 1000 is used in this handbook to simplify balance calculations by reducing the number of digits).

Center of gravity (C.G.) :
Is the point at which an airplane, or equipment, would balance if suspended. Its distance from the reference datum is found by dividing the total moment by the total weight of the airplane.

C.G. Limits :

Center of Gravity Limits are the extreme center of gravity locations within which the airplane must be operated at a given weight.

Standard Empty Weight :

Weight of a standard airplane including unusable fuel, full operating fluids and full oil.

Basic Empty Weight :

Standard empty weight plus optional equipment.

Useful Load :

Is the difference between ramp weight and the basic empty weight.

Maximum Ramp Weight :

Is the maximum weight approved for ground maneuver. (It includes the weight of start, taxi and run up fuel).

Maximum Take-off Weight :

Is the maximum weight approved for the start and the take-off run.

Maximum Computation Weight at Landing :

Is the maximum weight approved for landing touch-down.

GENERAL ABBREVIATIONS

A	:	Ampere
ALT	:	Alternator
A / P	:	Autopilot
C	:	Consumption
CHT	:	Cylinder Head Temperature
EGT	:	Exhaust Gas Temperature
°C	:	Degree Celsius (Centigrade)
°F	:	Degree Fahrenheit
ft	:	Foot (Feet)
ft/min	:	Feet per minute
hPa	:	Hectopascal
hr	:	Hour
HSI	:	Horizontal Situation Indicator
in	:	Inch
in.Hg	:	Inch of mercury
kg	:	Kilogram
kt	:	Knot (1 nautical mile/hr - 1852 m/hr)
l	:	Litre
lb	:	Pound
LDG	:	Landing gear
m	:	Metre
min	:	Minute
mm	:	Millimetre
P / N	:	Part Number
psi	:	Pound per square inch
qt	:	Quart
SM	:	Statute Mile
S / N	:	Serial Number
sq.ft	:	Square foot
Std	:	Standard
U.S Gal	:	U.S Gallon
V	:	Volt

RADIO ABBREVIATIONS

ADF	:	Automatic Direction Finder System
ATC	:	Transponder
COM	:	Communications Transceivers
DME	:	Distance Measuring Equipment
ELT	:	Emergency Locator Transmitter
HF	:	High Frequency
IFR	:	Instrument Flight Rules
ILS	:	Instrument Landing System
MKR	:	Marker Radio Beacon
RMI	:	Radio Magnetic Indicator
NAV	:	Navigation Indicators and / or Receivers
VFR	:	Visual Flight Rules
VHF	:	Very High Frequency
VOR	:	VHF Omnidirectional Range
VOR / LOC	:	VHF Omnidirectional Range Localizer

CONVERSION FACTORS

IMPERIAL AND U.S UNITS TO METRIC UNITS			METRIC UNITS TO IMPERIAL AND U.S UNITS		
MULTIPLY	BY	TO OBTAIN	MULTIPLY	BY	TO OBTAIN
FEET	0.3048	METRE	METRE	3.2808	FEET
INCH	25.4	mm	mm	0.03937	INCH
Imp.Gal	4.546	Litre	Litre	0.220	Imp.Gal
U.S Gal	3.785	Litre	Litre	0.264	U.S Gal
lb	0.45359	kg	kg	2.2046	lb

STANDARD ATMOSPHERE

Pressure altitude (ft)	Pressure (hPa)	°C	°F
0	1013.2	+ 15.0	+ 59.0
2000	942.1	+ 11.0	+ 51.8
4000	875.0	+ 7.0	+ 44.6
6000	811.9	+ 3.1	+ 37.6
8000	752.6	- 0.8	+ 30.5
10000	696.8	- 4.8	+ 23.4
12000	644.3	- 8.7	+ 16.2
14000	595.2	- 12.7	+ 9.2
16000	549.1	- 16.6	+ 2.2
18000	505.9	- 20.6	- 5.0
20000	465.6	- 24.6	- 12.4

CONVERSION TABLE

Note :
The standard pressure of 1013.2 hPa is equal to 29.92 inches of mercury.

950 28.05	951 28.08	952 28.11	953 28.14	954 28.17	955 28.20	956 28.23	957 28.26	958 28.29	959 28.32
960 28.35	961 28.38	962 28.41	963 28.44	964 28.47	965 28.50	966 28.53	967 28.56	968 28.58	969 28.61
970 28.64	971 28.67	972 28.70	973 28.73	974 28.76	975 28.79	976 28.82	977 28.85	978 28.88	979 28.91
980 28.94	981 28.97	982 29.00	983 29.03	984 29.06	985 29.09	986 29.12	987 29.15	988 29.18	989 29.20
990 29.23	991 29.26	992 29.29	993 29.32	994 29.35	995 29.38	996 29.41	997 29.44	998 29.47	999 29.50
1000 29.53	1001 29.56	1002 29.59	1003 29.62	1004 29.65	1005 29.68	1006 29.71	1007 29.74	1008 29.77	1009 29.80
1010 29.83	1011 29.85	1012 29.88	1013 29.91	1014 29.94	1015 29.97	1016 30.00	1017 30.03	1018 30.06	1019 30.09
1020 30.12	1021 30.15	1022 30.18	1023 30.21	1024 30.24	1025 30.27	1026 30.30	1027 30.33	1028 30.36	1029 30.39
1030 30.42	1031 30.45	1032 30.47	1033 30.50	1034 30.53	1035 30.56	1036 30.59	1037 30.62	1038 30.65	1039 30.68
1040 30.71	1041 30.74	1042 30.77	1043 30.80	1044 30.83	1045 30.86	1046 30.89	1047 30.92	1048 30.95	1049 30.98

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SECTION 2

LIMITATIONS

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GENERAL

SOCATA Model TB 9 is certificated in the Normal and Utility Categories.

- Basic general technical conditions :
  FAR 23 Regulations, amendments 1 to 16.

This airplane must be flown in compliance with the limits specified by placards or markings and with those given in this section and throughout the Flight Manual.

This section of the airplane Flight Manual presents the various operating limitations, the significance of such limitations, instrument markings, color coding, and basic placards necessary for the safe operation of the airplane, its power plant and installed equipment.

The limitations for optional systems are given in Section "Supplements" of the Flight Manual.

AIRSPEED LIMITATIONS

Airspeed limitations and their operational significance are shown in Figure 2.1.

	SPEED	KCAS	KIAS	REMARKS
V_{NE}	Never Exceed Speed	165	165	Do not exceed this speed in any operation
V_{NO}	Maximal Structural Cruising Speed	128	128	Do not exceed this speed except in smooth air, and then only with care
V_A	Maneuvering Speed	122	122	Do not make abrupt or full control movements above this speed
V_{FE}	Maximum Flap Extended Speed	95	95	Do not exceed this speed with flaps extended

Figure 2.1 - AIRSPEED LIMITATIONS

AIRSPEED INDICATOR OR TRUE AIRSPEED INDICATOR MARKINGS

Airspeed indicator or true airspeed indicator markings and their color code significance are shown in Figure 2.2.

MARKING	KIAS VALUE OR RANGE	SIGNIFICANCE
White Arc	48 - 95	Full Flap Operating Range Lower limit is maximum weight V_{SO} in landing configuration. Upper limit is maximum speed permissible with flaps extended
Green Arc	58 - 128	Normal Operating Range Lower limit is maximum weight V_{S1} with flaps retracted. Upper limit is maximum structural cruising speed
Yellow Arc	128 - 165	Operations must be conducted with caution and only in smooth air
Red line	165	Maximum speed for all operations

Figure 2.2 - AIRSPEED INDICATOR OR TRUE AIRSPEED INDICATOR MARKINGS

POWER PLANT LIMITATIONS

Number of engines : 1

Engine Manufacturer : AVCO LYCOMING

Engine Model Number : O-320-D2A

Engine Operating Limits for Take-off and Continuous Operations :
- Maximum Power : 160 BHP
- Maximum Engine Speed : 2700 RPM
- Maximum Cylinder Head Temperature : 500°F (260°C)
- Maximum Oil Temperature : 244°F (118°C)

Oil Pressure :
- Minimum : 25 psi (1.7 bar)
- Maximum : 100 psi (6.9 bar)

Fuel Pressure :
- Minimum : 0.5 psi (34 hPa)

Fuel Grades : See Fuel Limitations

Oil Grades (Specification) :
- MIL-L-6082 Aviation Grade Mineral Oil or
- MIL-L-22851 Aviation Grade Dispersant Oil

Number of propellers : 1

Propeller Manufacturer : SENSENICH

Propeller Model Number : 74.DM6.S8.061

Propeller Diameter :
- Minimum : 72 inches (1.83 m)
- Maximum : 74 inches (1.88 m)

(Variable pitch propeller : see Section "Supplements")

Static RPM at maximum permissible throttle setting, sea level :
- Minimum : 2200 RPM
- Maximum : 2400 RPM

POWER PLANT INSTRUMENT MARKINGS

Power plant instrument markings and their color code significance are shown in Figure 2.3.

INSTRUMENT	Red Line or Arc Minimum Limit	Yellow Arc Caution Range	Green Arc Normal Operating	Red Line Maximum Limit
Tachometer	---	---	600 to 2700 RPM	2700 RPM
Oil Temperature	---	Below 104°F (40°C)	104 to 244°F (40 to 118°C)	244°F (118°C)
Fuel Pressure	Below 0.5 psi	---	Above 0.5 psi	---
Oil Pressure	25 psi	25 to 60 psi and 90 to 100 psi	60 to 90 psi	100 psi
Cylinder head temperature *	---	435 to 500°F (224 to 260°C) **	200 to 435°F (93 to 224°C) **	500°F (260°C)
Carburated air temperature	---	14 to 41°F (-10 to +5°C)	---	---

* If installed on airplane
** Optional marking (according to instrument model)

Figure 2.3 - POWER PLANT INSTRUMENT MARKINGS

WEIGHT LIMITS

Normal and Utility categories

Maximum Take-off Weight : 2337 lbs (1060 kg)
Maximum Landing Weight : 2337 lbs (1060 kg)

Maximum Weight in Baggage Compartment for both categories :

- Maximum 88 lbs (40 kg) at 102.3 in. (2.600 m) (Valid up to S / N 399, (plus S / N 413
- Maximum 143 lbs (65 kg) at 102.3 in. (2.600 m) (Valid from S / N 400, (except S / N 413

Refer to Section 6 for loading instructions.

CENTER OF GRAVITY LIMITS

Normal and Utility categories

Forward :
41.3 inches (1.050 m) aft of datum at 2337 lbs (1060 kg)
38.3 inches (0.974 m) aft of datum at 2138 lbs (970 kg) or less.

Aft :
47.4 inches (1.205 m) aft of datum at all weights and for both categories.

Reference datum : Front face of firewall.
Straight line variation between points.
Leveling point : Upper fuselage spar

NOTE :
It is the responsibility of the pilot to insure that the airplane is properly loaded. See Section 6 "Weight and Balance" for proper loading instructions.

MANEUVER LIMITS

This airplane is certificated in both normal and utility categories.

Normal category

The normal category is applicable to airplane intended for non-aerobatic operations.
These include any maneuvers incidental to normal flying, stalls (except whip stalls) and turns in which the angle of bank is no more than 60°.

Maximum Design Weight	2337 lbs (1060 kg)
Design Maneuvering Speed	122 KIAS (141 MPH IAS)

The TB 9 airplane is approved for the following normal category maneuvers : Lazy eights, chandelles, and steep turns in which the angle of bank is not more than 60°.

Utility category

This airplane is not designed for aerobatic flight. However, the utility category is applicable to airplane intended for limited aerobatic operations.

Maximum Design Weight	2337 lbs (1060 kg)
Design Maneuvering Speed	122 KIAS (141 MPH IAS)

No aerobatic maneuvers are approved except those listed below :

Maneuver	Recommended Entry Speed
Chandelles	130 KIAS (149 MPH IAS)
Lazy eights	124 KIAS (143 MPH IAS)
Steep turns	108 KIAS (124 MPH IAS)
Stalls (except whip stalls)	Slow Deceleration

Spins Prohibited

FLIGHT LOAD FACTOR LIMITS

	Normal category n between :	Utility category n between :
Flaps up :	+ 3.8 g and -1.5 g	+ 4.4 g and -1.8 g
Flaps down :	+ 2.0 g and -0 g	+ 2.0 g and -0 g

KINDS OF OPERATION LIMITS

The airplane is equipped for day VFR operations and may be equipped for night VFR and day & night IFR operations. See Supplements Section of this Manual.

Flight into known icing conditions is prohibited.

FUEL LIMITATIONS

	Standard Tanks	Optional Tanks
2 Tanks :	20.8 U.S Gal (79 l) each	27.7 U.S Gal (105 l) each
Total Fuel :	41.7 U.S Gal (158 l)	55.4 U.S Gal (210 l)
Usable Fuel :	40.2 U.S Gal (152 l)	53.8 U.S Gal (204 l)
Unusable Fuel :	1.6 U.S Gal (6 l)	1.6 U.S Gal (6 l)

NOTE :
Usable fuel (up to unusable fuel) can be safely used during all normal airplane maneuvers.
FOR STEEP NOSE DOWN ATTITUDE (rapid descent) select a fuel tank with at least 5 U.S. Gallons - standard tank - or 7 U.S. Gallons - optional tank (a quarter of tank capacity).
FOR PRONOUNCED OR LONG SIDE SLIPPING select the fuel tank (with usable fuel) at the opposite side of the low wing.

SEATING LIMITS

Front seats : 2

Rear seats : 2 when accomodated with 2 seatbelts or
3 when accomodated with 3 seatbelts
[maximum total weight on rear seats :
386 lbs (175 kg)]

OTHER LIMITATIONS

Flight with doors open or ajar is prohibited.

PLACARDS

(1) In full view of the pilot, forward of overhead lights

THIS AIRCRAFT MUST BE FLOWN IN NORMAL OR UTILITY CATEGORY IN ACCORDANCE WITH THE PLACARDS, MARKINGS AND FLIGHT MANUAL.

NORMAL AND UTILITY CATEGORY

MAXIMUM WEIGHT	2337 lbs
MANEUVERING SPEED V_A	122 KIAS
NEVER EXCEED SPEED V_{NE}	165 KIAS
FLAP EXTENDED SPEED V_{FE}	95 KIAS

DESIGN LIMIT LOAD FACTOR :

"N" CATEGORY	FLAPS RETRACTED	$-1.5 \leq n \leq +3.8$
	FLAPS EXTENDED	$-0 \leq n \leq +2$
"U" CATEGORY	FLAPS RETRACTED	$-1.8 \leq n \leq +4.4$
	FLAPS EXTENDED	$-0 \leq n \leq +2$

ANY ACROBATIC MANEUVER IS PROHIBITED IN NORMAL CATEGORY

IN UTILITY CATEGORY ONLY THE FOLLOWING ACROBATIC MANEUVERS ARE PERMITTED :

	ENTRY SPEED
CHANDELLES	130 KIAS
LAZY EIGHT	124 KIAS
STEEP TURNS	108 KIAS
STALLS	

VOLUNTARY SPINS ARE PROHIBITED IN BOTH NORMAL AND UTILITY CATEGORIES.

MARKINGS, PLACARDS AND INSTRUCTION PLATES APPLY TO CATEGORIES "N" AND "U".

FLIGHT CONDITIONS : DAY VFR
ICING CONDITIONS NOT ALLOWED

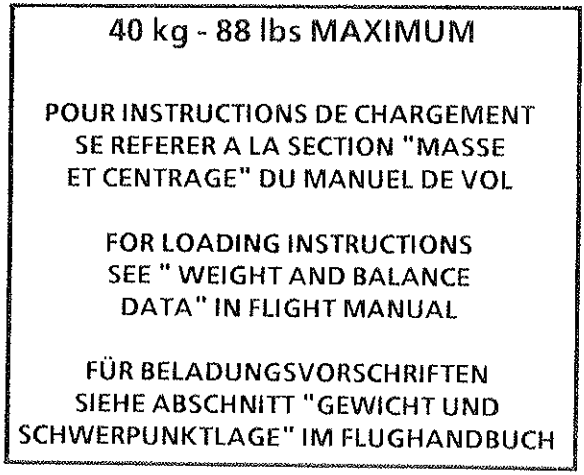
(2) Calibration chart on compass

For	N	30	60	E	120	150
Steer						
For	S	210	240	W	300	330
Steer						

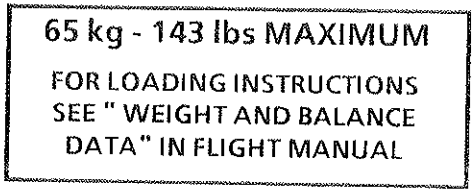
DATE: RADIO ON

(3) On Baggage door

Valid up to S / N 399, plus S / N 413

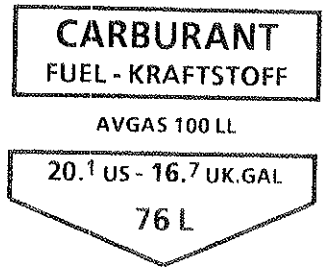


Valid from S / N 400, except S / N 413

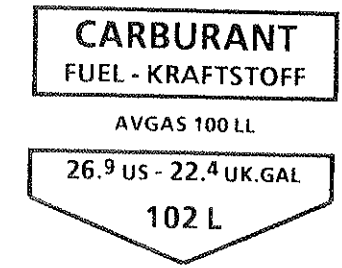


(4) Near fuel tank caps

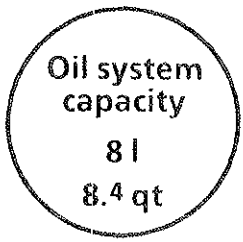
Standard tanks



Optional tanks

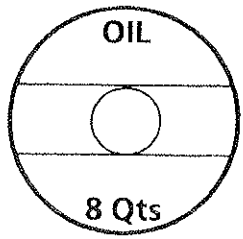


(5) On the back side of access door to oil filler cap

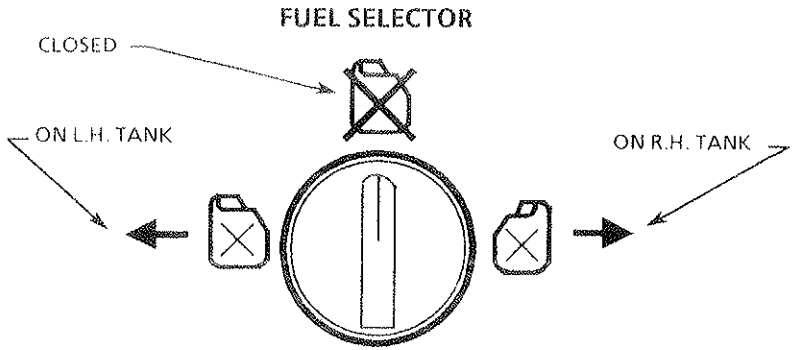


and / or

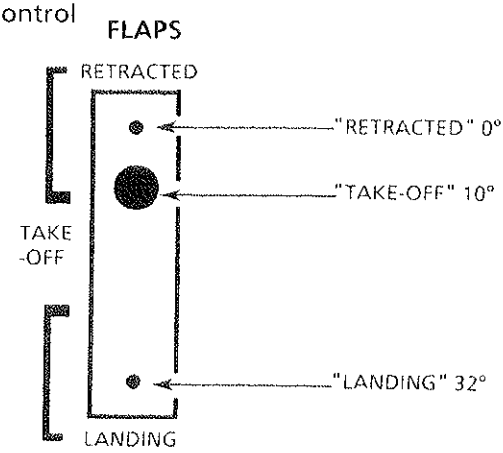
Marking on oil cap



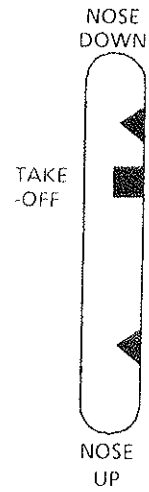
(6) On the fuel selector



(7) Near the wing flap control



(8) Near the pitch trim position indicator



SECTION 3

EMERGENCY PROCEDURES

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GENERAL

This section provides the pilot with procedures that enable him to cope with emergencies that may be encountered in operating the SOCATA Model TB 9 airplane. If proper preflight inspections, operating procedures, and maintenance practices are used, emergencies due to airplane or engine malfunction should be rare. Likewise, careful flight planning and good pilot judgment can minimize enroute weather emergencies. However, should any emergency develop, the guidelines in this section should be considered and applied as necessary to correct the problem.
The emergency procedures for optional systems are given in Section "Supplements" of the Flight Manual.

AIRSPEEDS FOR SAFE OPERATIONS (IAS)

Engine failure after take-off	70 KIAS
Maneuvering speed	122 KIAS
Maximum glide speed	86 KIAS
Precautionary landing with engine power	65 KIAS

ENGINE FAILURES

ENGINE FAILURE DURING TAKE-OFF RUN

Throttle	REDUCED
Brakes	APPLY
Mixture	IDLE CUT-OFF
Magneto switch	OFF
Main switch	OFF
Fuel selector	OFF

ENGINE FAILURE IMMEDIATELY AFTER TAKE-OFF

Airspeed	70 KIAS
Mixture	FULL RICH
Fuel selector	SWITCH TANKS
Fuel pump	ON

If engine does not start :

Mixture	IDLE CUT-OFF
Fuel selector	OFF

Fuel pump	OFF
Land	STRAIGHT AHEAD
Magneto switch	OFF
Main switch	OFF

WARNING

NEVER TRY TO TURN BACK

ENGINE FAILURE IN FLIGHT

Glide speed	86 KIAS
Main switch	ON
Fuel pump	ON
Mixture	IDLE CUT-OFF
Fuel gages	CHECK
Fuel selector	SWITCH TANKS
Magneto switch	BOTH
Starter	ENGAGE (if propeller stopped)
When the engine runs (windmilling)	SLOWLY ENRICH UNTIL RE-START

If the engine does not start, get ready for an emergency landing without engine power.

NOTE :
Gliding distance is approximately 1.62 nautical miles (1.86 statute miles) for each 1000 feet of altitude above terrain.

LOW OIL PRESSURE

Oil warning light	ON
Pressure indicator	IN RED LOW SECTOR
Throttle	REDUCE AS FAR AS POSSIBLE
Oil temperature	CHECKED
If oil temperature in red sector	REDUCE THROTTLE

Prepare for a forced landing and land as soon as possible.

LOW FUEL FLOW

Fuel pump	OPERATING
Fuel gages	CHECKED
Fuel selector	SWITCH TANKS

ENGINE VIBRATION

Engine vibration is generally due to carburator icing (see § "Icing"), defective spark plugs or too rich a mixture.

Mixture RESET

If vibration persist :

RPM SET FOR MINIMUM VIBRATION RANGE

Land as soon as possible.

FORCED LANDINGS

EMERGENCY LANDING WITHOUT ENGINE POWER

Glide speed	86 KIAS
Radio	TRANSMIT MAYDAY on 121.5 MHz or on the appropriate frequency giving location and intentions
Mixture	IDLE CUT-OFF
Fuel selector	OFF
Magneto switch	OFF
Flaps	LANDING
Seats, seat belts, shoulder harnesses	ADJUSTED and SECURE
Main switch	OFF

PRECAUTIONARY LANDING WITH ENGINE POWER

Flaps	LANDING
Approach speed	70 KIAS
Radio	ADVISE ATC OF INTENTIONS
Seats, seat belts, shoulder harnesses	ADJUSTED and SECURE

Field	FLY OVER selected field
Main switch	OFF
Touch-down	FLARE OUT and keep nose high
Magneto switch	OFF
Brakes	AS REQUIRED

DITCHING

Radio	TRANSMIT MAYDAY on 121.5 MHz or on the appropriate frequency giving location and intentions
Flaps	LANDING
Seats, seat belts, shoulder harnesses	ADJUSTED and SECURE
Airspeed	70 KIAS
Flight path	Parallel to swells

Before touch-down :

Main switch	OFF
Mixture	IDLE CUT-OFF
Fuel selector	OFF
Touch-down	FLARE OUT and keep nose high

FIRES

ENGINE FIRE DURING START

Mixture	IDLE CUT-OFF
Starter	GO ON STARTING
Throttle	FULL THROTTLE
Fuel selector	OFF

If fire goes on :

Main switch	OFF
Magneto switch	OFF

Evacuate passengers and extinguish fire using all available means (fire extinguisher if installed)

ENGINE FIRE IN FLIGHT

Visual detection	SMOKE - FLAMES
Fuel selector	OFF
Mixture	IDLE CUT-OFF
Fuel pump	OFF
Throttle	FULL THROTTLE
Cabin air cooling & demisting	FIRE CUT-OFF

After engine has stopped :

Magneto switch	OFF
Alternator switch	OFF
Main switch	OFF
Forced landing	EXECUTE (as described in "Emergency Landing Without Engine Power")

WARNING

NO ATTEMPT SHOULD BE MADE TO RESTART THE ENGINE AFTER A FIRE

ELECTRICAL FIRE IN FLIGHT

*If *FIRE* is in *ENGINE COMPARTMENT* :

Main switch	OFF
Cabin air cooling & demisting	FIRE CUT-OFF

Land as soon as possible.

*If *FIRE* is in *CABIN* :

Main switch	OFF
Alternator switch	OFF
All electrical switches (except magnetos)	OFF
Cabin air cooling & demisting	FIRE CUT-OFF
Fire extinguisher (if installed)	ACTIVATE

*If *FIRE APPEARS TO BE OUT* and electrical power is necessary to continue flight :

Main switch	ON
Circuit-breakers	CHECK for faulty circuit do not reset
Radio / electrical switches	ON, one at a time
Cabin air cooling	OPEN when fire is out

CABIN FIRE

Main switch	OFF
Cabin air cooling & demisting	FIRE CUT-OFF
Fire extinguisher (if installed)	ACTIVATE

WARNING

AFTER DISCHARGING A FIRE EXTINGUISHER WITHIN A CLOSED CABIN, WHEN FIRE IS EXTINGUISHED, TO VENTILATE THE CABIN AND PREVENT SUFFOCATION PARTIALLY OPEN CABIN AIR COOLING.

Land as soon as possible.

WING FIRE

Navigation and landing lights	OFF
Pitot heat switch (if installed)	OFF

Land as soon as possible.

ICING

FLIGHT INTO KNOWN ICING CONDITIONS IS PROHIBITED

Carburator icing leads to a power rating drop, a manifold pressure drop and slight vibration :

Carburator heating	ON

NOTE :
Pulling the carburator heating control may cause the power rating to drop and increase the vibration level.
After having pulled fully the carburator heating control, it is mandatory to adjust the mixture to suppress vibration. The use of carburator heating increases appreciably the hourly fuel consumption.

Cabin temperature	FULL HOT
Pitot heating (if installed)	ON
Demisting	OPEN
Engine	INCREASE POWER and periodically change RPM to minimize ice buildup on propeller
Carburated air thermometer (if installed)	+ 41 to + 68°F (+ 5 to + 20°C)

Turn back or change altitude to obtain outside air conditions that are less likely to cause icing.

After disappearing of icing conditions :

Carburator heating	OFF

If icing continues plan a landing at the nearest airport. With an extremely rapid ice build-up, select a suitable "off airport" landing site.

NOTE :
With an ice accumulation on or near the wing leading edges, a higher stalling speed may be expected. Plan all maneuvers accordingly.

LANDING WITHOUT STABILATOR CONTROL

Fly the airplane using pitch trim and throttle.

- *Long final :*

Airspeed	80 KIAS
Flaps	LANDING
Fuel pump	ON
Mixture	FULL RICH
Variable pitch propeller (if installed)	HIGH RPM
Throttle and pitch trim	ADJUST SO AS TO MAINTAIN A DESCENT RATE LOWER THAN 500 ft/min

- *Final :*

FLARE OUT near the ground with the pitch trim.

CAUTION

REDUCE THROTTLE ONLY AFTER TOUCH-DOWN

AILERON CONTROL FAILURE

Should an aileron control efficiency loss occur (accidental disconnection), fly the airplane using rudder for lateral control.

If flaps are extended, set rapidly sufficient speed (70 KIAS at least) and retract flaps.

Land with retracted flaps.

ELECTRICAL FAILURE

ALTERNATOR FAILURE

Undervoltage warning light	ON
Voltmeter :	
- Green sector	CONTINUE FLYING
- Red / yellow sector	ALT. Switch OFF then ON
Undervoltage warning light	REMAINS ON
ALT. switch	OFF
Nonessential electrical load items	OFF

CAUTION

CHECK BATTERY DISCHARGE IN THIS CASE, ENDURANCE IS REDUCED AS ELECTRICAL POWER IS ONLY SUPPLIED BY BATTERY

Battery approximate duration : 50 min (Night IFR emergency conditions)

ELECTRICAL EQUIPMENT FAILURE

Check the circuit-breakers panel.
If the circuit-breaker is tripped, reset it once only.
If it trips again, do not try to reset the circuit-breaker, the equipment has failed.

AIRSPEED INDICATING SYSTEM FAILURE

In case of erroneous indications in flight :

Pitot heating (if installed)	ON
Alternate static source (if installed)	EMERGENCY (Pulled)

In case of alternate static source utilization, open vents and / or actuate air conditioning flow lever to open position. Then, airspeed indicator and altimeter errors are not significant.

If erroneous indications persist, carry out a precautionary approach maintaining an adequate airspeed margin above stall warning activation speed.

Recommended parameters :

Variable pitch propeller (if installed)	FULL FORWARD
Manifold pressure	AS REQUIRED (Approach : 15 in.Hg)

INVOLUNTARY SPIN

INTENTIONAL SPINS ARE PROHIBITED

However, should inadvertent spin occur, the following recovery procedure is recommended :

Rapid and simultaneous action :

Throttle	REDUCED
Rudder control	HOLD OPPOSITE DIRECTION OF ROTATION
Stabilator control	FULL FORWARD
Ailerons	NEUTRAL

Spin with flaps :

Same procedure, except retract flaps as soon as possible.

When spinning stops, centralize rudders, level the wings and ease out of the ensuing dive.

JAMMED DOORS

In case of jammed doors and in case of emergency : JETTISON REAR WINDOWS, kicking with foot on the upper part.

MAXIMUM GLIDE (See page hereafter)

MAXIMUM GLIDE

- Speed 85 KIAS at maximum weight
- Propeller wind milling
- Flaps up
- Zero wind

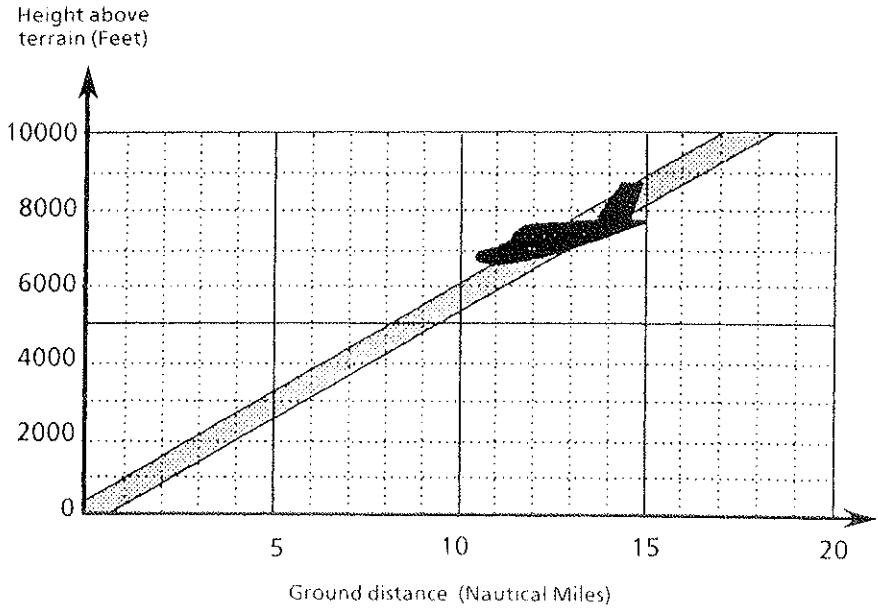

Figure 3.1 - MAXIMUM GLIDE

SECTION 4

NORMAL PROCEDURES

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GENERAL

This section provides procedures for the conduct of normal operation of the SOCATA Model TB 9 airplane.

The normal procedures for optional systems are given in Section "Supplements" of the Flight Manual.

AIRSPEEDS FOR SAFE OPERATIONS (IAS)

Following speeds are those important for safe operation of airplane.

These data are valid for standard airplane used at maximum weight in normal conditions.

- Best rate of climb	
. Flaps retracted	78 KIAS
. Flaps in landing position	62 KIAS
- Best angle of climb	
. Flaps retracted	67 KIAS
. Flaps in landing position	59 KIAS
- Operating speed in turbulent air	122 KIAS
- Maximum speed with flaps in take-off position	95 KIAS
- Maximum speed with flaps in landing position	95 KIAS
- Final approach speed (flaps in landing position)	65 KIAS
- Maximum demonstrated crosswind	25 kt

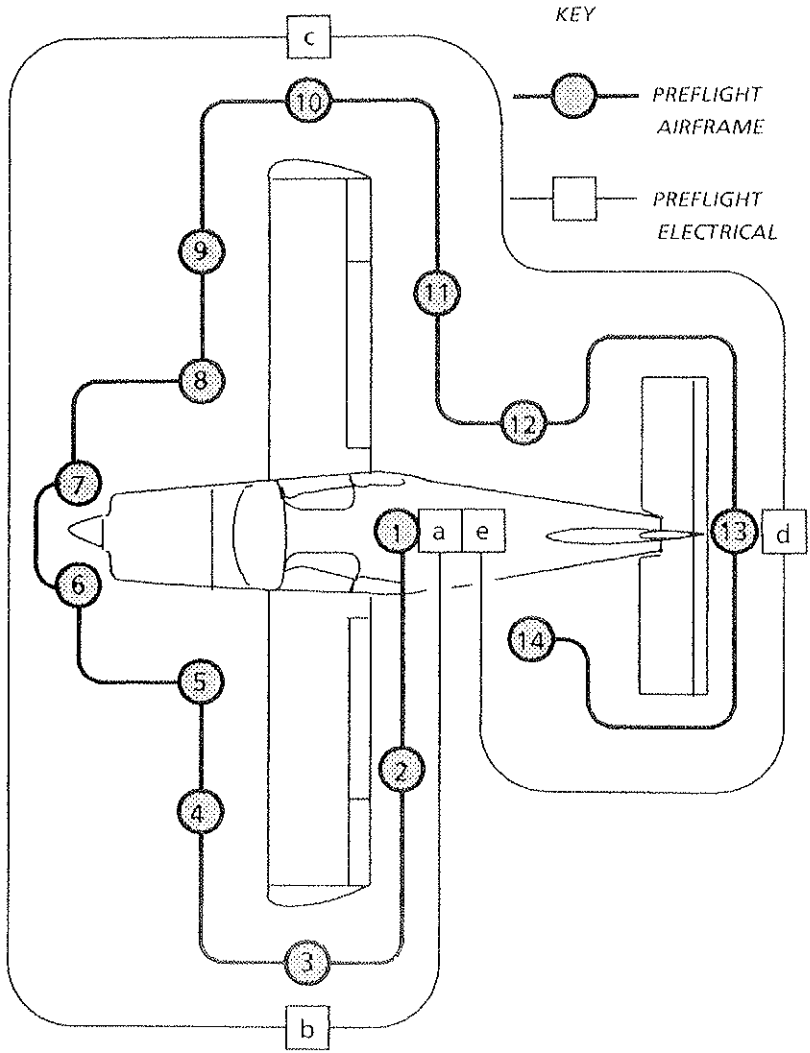

Figure 4.1 - PREFLIGHT INSPECTIONS

PREFLIGHT INSPECTIONS (See Figure 4.1)

AIRFRAME

1 - Cabin

Pilot door	OPEN
Controls lock	REMOVED
Magneto switch	OFF
Mixture	IDLE CUT-OFF
Main switch	ON
Flaps	LANDING
Pitch trim	TAKE-OFF
Fire extinguisher (if installed)	Check pressure
Main switch	OFF

Proceed with the external preflight inspection moving clockwise around.

2 - L.H. wing trailing edge

Flap and aileron	Check controls, hinges, plays, deflections

3 - L.H. wing

Wing tip, lights and landing lights	Undamaged

4 - L.H. wing leading edge

Wing	Free of frost, snow, ice
Pitot	Cover removed, clean, unobstructed
Tie-down	REMOVE
Stall warning device	Clean, check deflection
Fuel tank	Check level
Fuel tank cap	SECURE
Fuel tank draining	Fuel free of water and sediment
Fuel tank drain	Check CLOSED

5 - L.H. main landing gear

Chocks	REMOVE
Tire	Check for condition
Shock absorber	Normal position
Fairing	Check for good condition, cleanliness and normal position

6 - Forward fuselage

Windshield and window panels	Clean
Engine cowling attachment	Check
Oil	Check level and absence of leak
Propeller	Clean, good condition
Propeller cone	Check (no play)
Air intakes	Clean
Oil pump breather	Unobstructed
Exhaust pipe	Check

7 - Nose landing gear

Towing fork	REMOVE
Tire	Check
Shock absorber	Normal position
Fairing	Check for good condition, cleanliness and normal position

8 - R.H. main landing gear

Chocks	REMOVE
Tire	Check for condition
Shock absorber	Normal position
Fairing	Check for good condition, cleanliness and normal position

9 - R.H. wing leading edge

Fuel tank draining	Fuel free of water and sediment
Fuel tank drain	Check CLOSED
Fuel tank	Check level
Fuel tank cap	SECURE
Tie-down	REMOVE
Wing	Free of frost, snow and ice

10 - R.H. wing

Wing tip and lights	Undamaged

11 - R.H. wing trailing edge

Flap and aileron	Check controls, hinges, plays, deflections

12 - R.H. rear fuselage

R.H door lock	Unlocked
Static port	Cover removed, clean
Window panels	Clean

13 - Empennage

Fin	Check
Rudder	Check controls, hinges, deflections, plays, frictions
Stabilator and stabilator tab	Check controls, hinges, deflections, plays, frictions
Tail cone and navigation light	Good condition

14 - L.H. rear fuselage

Static port	Cover removed, clean
Baggage compartment door	SECURE
Windowpanels	Clean

ELECTRICAL SYSTEMS

a - Cabin

Alternator switch	OFF
Fuel pump	OFF
Main switch	ON
Alarm panel	Tested
Fuel gages	Check
Flaps	RETRACT
Instrument lights	ON
Navigation lights	ON
Anti-collision light (if installed)	ON
Strobe lights (if installed)	ON
Pitot heating (if installed)	ON
Landing lights	ON

b - L.H. wing

Navigation light	Illuminated
Strobe light (if installed)	Flashing
Landing lights	Illuminated

WARNING

DO NOT TOUCH PITOT DIRECTLY
IT CAN BE HOT ENOUGH TO BURN SKIN

Heated pitot (if installed)	Check for heat
Stall warning device	Aural warning

NOTE :
Landing lights and Pitot heating "OFF" before carrying on inspection will protect battery from being run down.

c - R.H. wing

Navigation light	Illuminated
Strobe light (if installed)	Flashing

d - Airplane rear part

Navigation light	Illuminated
Strobe light (if installed)	Flashing
Anti-collision light (if installed)	Flashing

e - Cabin

Navigation light	OFF
Strobe lights (if installed)	OFF
Anti-collision light (if installed)	OFF
Pitot heating (if installed)	OFF
Landing lights	OFF
Instrument lights	OFF
Main switch	OFF

BEFORE STARTING ENGINE

Preflight inspection	Carried out
Doors	CLOSED, check hooks in place
Main switch	OFF
Parking brake	Set
Seats, seat belts, shoulder harnesses	ADJUSTED and SECURE
Flight controls	Check for proper operation
Pitch trim	Check deflection
Fuel selector	OPEN (L.H. or R.H.)
Circuit-breakers (side panel)	In
Magneto switch	OFF
"Radio master" (if installed)	OFF

ENGINE STARTING

NORMAL PROCEDURE :

Carburator heating	OFF
Propeller	FULL FORWARD
Mixture	FULL RICH
Main switch	ON
Fuel pump	ON
Injection	Throttle operated a few times
Pump warning light	ON
Fuel pressure	Green Sector
Throttle	1/4 OPEN
Area	Clear
Magneto / start switch	START (30 sec. maxi)

When the engine starts :

Magneto switch	BOTH
Oil pressure	Green Sector

If no oil pressure indication after 30 sec., shut-down engine.

Engine	1000 to 1200 RPM during heating
Fuel pump	OFF

HOT ENGINE :

Same procedure as normal procedure, but without injection.

COLD WEATHER PROCEDURE :

Same procedure as normal procedure, but, after starting, engine speed sustained by successive injections up to 900 / 1000 RPM.

FAILED STARTING :

Failed starting may be due to excess fuel resulting from repeated injection producing black smoke and back fire.

Proceed as follows :

Mixture	IDLE CUT-OFF
Throttle	FULL POWER
Magneto / start switch	START (30 sec. maxi)

Then, resume normal procedure without injection.

AFTER STARTING ENGINE

ELECTRICAL GENERATION CHECK :

Alternator switch OFF

- Generation warning light	ON
- Voltmeter	Yellow sector

Alternator switch ON

- Generation warning light	OFF
- Voltmeter	Green sector

Turn and bank indicator (if installed)	ON
Suction gage (if installed)	Checked
Anti-collision light (if installed)	ON
Alarm panel test	Positive
"Radio master" (if installed)	ON
All radios and navaids	ON
Fuel selector	Set to fullest tank
Flaps	Checked and RETRACTED

TAXIING

Parking brake	Release
Brakes	Checked
Flight instruments	Checked

Avoid exceeding 1200 RPM as long as the oil temperature indicator pointer is within yellow sector.

Steering the airplane with the rudder pedals only is generally sufficient. The combined use of the rudder pedals and the brakes permits tight turns.

Check operation of gyroscopic instruments by means of alternate turns : horizontal attitude, directional and turn and bank indicators.

ENGINE RUN-UP

Parking brake	Set
Engine controls friction	Adjusted
Oil temperature	Green sector
Oil pressure	Green sector
Fuel pressure	Green sector
Mixture	FULL RICH
Carburator heating	OFF
Fuel selector	Set to fullest tank

MAGNETO CHECK :

Throttle	2000 RPM
Magneto switch	L. then BOTH
	R. then BOTH
Maximum RPM drop on each magneto	175 RPM
Maximum difference between magnetos	50 RPM

CARBURATOR HEATING CHECK :

Carburator heating	ON
Manifold pressure	Decrease
Carburator temperature indicator (if installed)	Increase
Carburator heating	OFF

BEFORE TAKE-OFF

Seats, seat belts, shoulder harnesses	Check
Doors	LOCKED
Controls	Free
Pitch trim	TAKE-OFF
Flaps	TAKE-OFF
Magneto switch	BOTH
Propeller	FULL FORWARD
Carburator heating	OFF
Mixture	FULL RICH
Fuel selector	Check set to fullest tank
Fuel pump	ON
Oil temperature	Green sector
Oil pressure	Green sector
Fuel pressure	Green sector
Voltmeter	Green sector
Altimeter	Set
Directional gyro (if installed)	Set
Horizontal attitude gyro (if installed)	Set
Parking brake	RELEASE - Light OFF
Cabin blower (if installed)	OFF
Landing lights	As required
Navigation lights	As required
Pitot heating (if installed)	As required
Transponder (if installed)	As required

TAKE-OFF

Lined up on runway — Check directional gyro
Smoothly apply full power
Airspeeds — See Section 5 "Take-off performance"

STANDARD AIRSPEEDS :

Rotation	59 KIAS
Initial climb	65 KIAS

WHEN SAFELY AIRBORNE :

Brakes	Apply

AT 300 ft :

Climb speed	73 KIAS
Flaps	RETRACT
Landing lights	As required
Navigation lights	As required

AT 1000 ft :

Fuel pump	OFF

CLIMB

Mixture	FULL RICH
Throttle	FULL POWER
Optimum climb speed	78 KIAS

NOTE :
Climb can also be carried out at higher speeds (better visibility towards front, better engine cooling) and lower power ratings (lower noise level)

CAUTION

CLIMB AT BEST ANGLE OF CLIMB SHOULD BE USED ONLY IN EXCEPTIONAL CASES SINCE THE ENGINE IS LESS COOLED

CRUISE

Power	Adjusted
Pitch trim	Adjusted
Mixture	Adjusted

Normal cruise between 60 % and 75 %, see Section 5 "Performance".

Adjust mixture on "FULL RICH" for power higher than 75 %.

RECOMMENDATIONS :

In practice, it is recommended to change tank every half-hour when observing fuel pressure and not to exceed a fuel imbalance of 12.4 U.S. Gal (47 Litres).

During take-off from high elevation airport or during prolonged climbs, roughness or loss of power may result from overrichness.
In such a case, adjust mixture control only enough to obtain smooth operation and not for economy.
Rough operation due to overrich fuel / air mixture is most likely to be encountered at altitudes above 5000 ft.

CAUTION

ALWAYS ENRICH MIXTURE BEFORE INCREASING POWER

Flight into known icing conditions is PROHIBITED

In case of unintentional icing encounter (precipitation or clouds with outside air temperature at or below 32°F (0°C)) set the carburator heating control in ON position.

Leave icing conditions as soon as possible.

Remember to replace the carburator heating control in OFF position after leaving the icing area.

DESCENT

Power setting as required for descent.

Every 1500 ft, apply engine power to prevent excess engine cooling and spark plugs fouling.

If fast descent :

Carburator heating	ON

APPROACH - LANDING

FINAL :

Airspeed	76 KIAS
Flaps	TAKE-OFF
Fuel pump	ON
Mixture	FULL RICH
Carburator heating	ON or OFF as required
Brakes	Checked
Seats, seat belts, shoulder harnesses	ADJUSTED and SECURE
Landing lights	ON as required

SHORT FINAL :

Flaps	LANDING
Airspeed	See Section 5 "Landing Performance"
Standard airspeed	65 KIAS
Landing lights	ON

GO-AROUND

Carburator heating	OFF
Smoothly apply full power	
Airspeed	73 / 78 KIAS

Retract flaps to take-off position then fully Climb at 78 KIAS.

AFTER LANDING

Fuel pump	OFF
Flaps	RETRACTED
Landing lights	OFF
Trim	TAKE-OFF
Radio equipment	As required
Pitot heating (if installed)	OFF
Carburator heating	OFF

SHUT-DOWN / SECURING AIRPLANE

Parking brake	Set
Turn and bank indicator (if installed)	OFF
Anti-collision light (if installed)	OFF
Navigation lights	OFF
"Radio master" (if installed)	OFF
Throttle	REDUCED
Magnetos cut-off test (*)	OFF, then BOTH
Throttle	900 / 1000 RPM
Mixture	IDLE CUT-OFF

AFTER ENGINE STOPS :

Magneto switch	OFF
Alternator switch	OFF
Main switch	OFF
Fuel selector	OFF
Controls lock	Installed
Chocks / Tie-downs	Installed

(*) Depending on the kind of operation, it is not necessary to perform this test more than once a day, but just before securing the airplane.

STALLS

CAUTION

ATTEMPT PRACTICE STALLS ONLY WITH SUFFICIENT ALTITUDE FOR RECOVERY

Power-on stalls require an extremely steep pitch attitude. If the center of gravity is at or near its aft limit, a slight tendency toward wing rocking or a wing drop may occur when the stabilator is deflected near its stop.

Aerodynamic warning (pre-stall buffet) is more pronounced at higher power settings. Stall recovery can be effected immediately by easing the stick forward. Altitude loss is minor in all cases and is minimized by prompt application of power at the onset of the stall.

The stall warning horn will sound from 5 to 10 knots before stall speed.

FLIGHT WITH CROSSWIND

TAKE-OFF :

Apply full power before brake release.

Aileron control moved into wind.

Keep the airplane on centerline using the rudder.

Maintain nose-wheel on ground up to 65 KIAS.

Lift-off cleanly in order to avoid subsequent touch-down.

LANDING :

When landing in a strong crosswind, use the minimum flap setting required for the landing distance available.

Although the crab or combination method of drift correction may be used, the wing low method gives the best control. Maximum bank angle close to the ground is 15°.

After touch-down, keep the nose-wheel on the ground, hold a straight course using rudder pedals.

OPERATION ON SHORT RUNWAYS

TAKE-OFF :

Flaps	TAKE-OFF
Pitch trim	TAKE-OFF

Apply full power before brake release.

Take-off	Airspeed : See Section 5 "Take-off performance"

When safely airborne :

Initial climb	Airspeed : See Section 5 "Take-off performance"
Airspeed	73 KIAS
Flaps	RETRACTED

LANDING :

Make a power approach with a reduced rate of descent.

Flaps	LANDING
Approach with power	Airspeed : See Section 5 "Landing performance"

Just before touch-down, retard throttle to idle.
Nose-wheel on ground.
Firmly apply the brakes.

FLIGHT IN TURBULENT AIR

Maximum airspeed	128 KIAS
Recommended airspeed	108 KIAS
Seats, seat belts, shoulder harnesses	ADJUSTED and SECURE

USE OF DOORS

In windy or gusty conditions, the doors should be firmly held during opening and closing and should be closed and locked immediately after entering or leaving the airplane.

The doors must be closed and locked for all taxiing and flight operations.

SECTION 5

PERFORMANCE

TABLE OF CONTENTS

ACOUSTIC LIMITATION

In compliance with decree dated 15th April 1977, the maximum noise level permissible for SOCATA Model TB 9 airplane corresponding to total maximum certification weight of 2337 lbs is 74.1 d B (A).

The noise level which was determined in conditions stated by above-mentioned decree at maximum continuous power is 72.5 d B (A).

In compliance with decree dated 30th July 1975, SOCATA Model TB 9 airplane has received the noise limitation type certificate Nr N165 dated 29th October 1979.

AIRSPEED CALIBRATION

NORMAL STATIC SOURCE

CAS ≈ IAS

Figure 5.1 - NORMAL STATIC SOURCE

NOTE :

The indicated airspeeds (IAS) suppose instrument error to be null.

ALTERNATE STATIC SOURCE

In case of alternate static source utilization, open vents and / or actuate air conditioning flow lever to open position. Then, instrument error is slight.

ALTITUDE COMPENSATION

ALTERNATE STATIC SOURCE

In case of alternate static source utilization, open vents and / or actuate air conditioning flow lever to open position. Then, instrument error is not significant.

STALLING SPEEDS

CONDITIONS : Weight : 2337 lbs (1060 kg)

Power OFF

CONFIGURATION	BANK					
	0°		30°		45°	
	KIAS	MPH IAS	KIAS	MPH IAS	KIAS	MPH IAS
FLAPS RETRACTED	58	66	62	71	69	79
FLAPS TAKE-OFF	54	63	59	68	65	75
FLAPS LANDING	48	55	52	60	57	66

NOTE :
The indicated airspeeds (IAS) suppose instrument error to be null.

Figure 5.3 - STALLING SPEEDS

WIND COMPONENTS

EXAMPLE: Wind speed : 20 kt
Angle between wind direction and flight path : 50°
Headwind : 13 kt
Crosswind : 15 kt

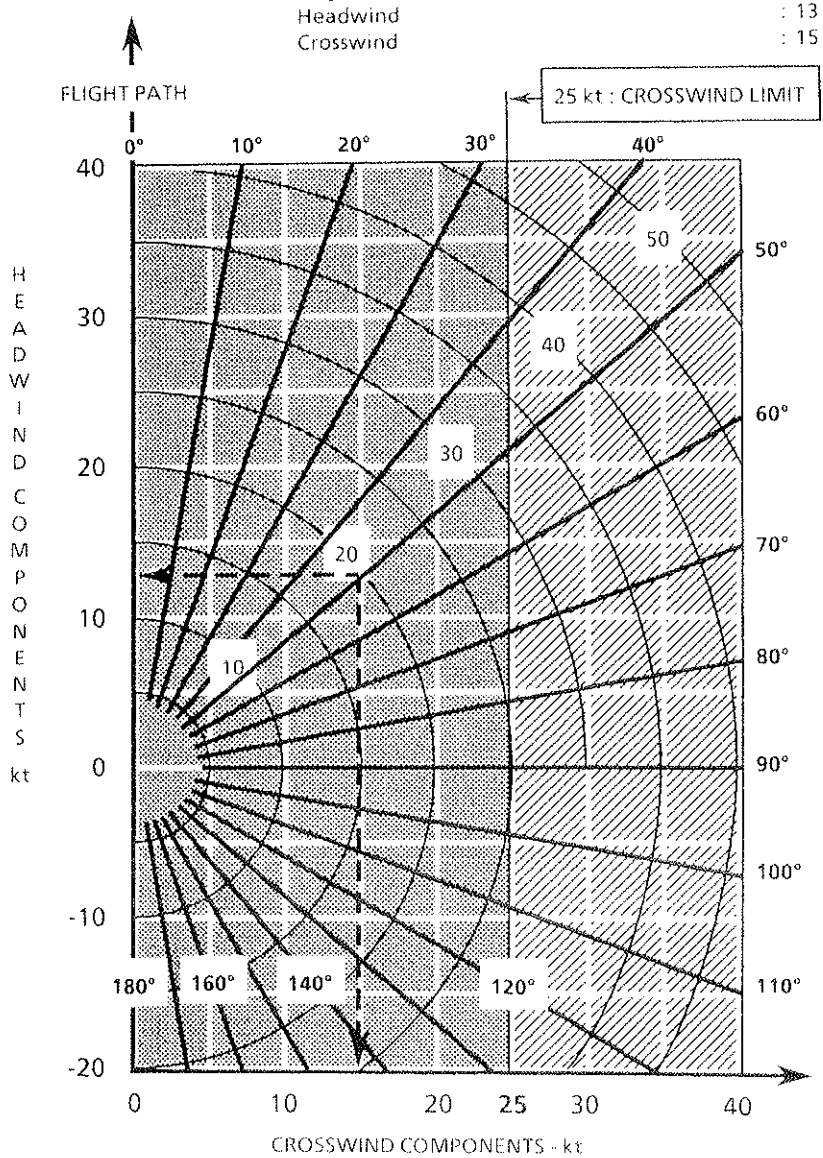

Figure 5.4 - WIND COMPONENTS

NOTICE

Measurements were taken with zero wind condition on dry and hard runway.

The performance are presented as a function of the altitude in feet and the temperature at the considered altitude.

The rolling distances at take-off shall be increased by :

10 % on tarred runway
17 % on hard grass
20 % on short grass
37 % on high grass
39 % on short, wet grass on a firm subsoil
more than 39 % on soft, muddy or snowy field.

For operation on short, wet grass on a firm subsoil, increase take-off (clear 50 ft) distance by 25 % and landing distance by 30 %. The effect on the ground roll is evaluated above.

Wind influence : Headwind :
Reduce distance of 20 % with 5 kt headwind.

Rear wind :
Increase distance of 15 % with 2.5 kt rear wind.

TAKE-OFF PERFORMANCE

Flaps extended

The take-off runs correspond to tests conducted (in TARBES-OSSUN), on tarred runway and compensated for concrete runway.

TAKE-OFF PERFORMANCE

CONDITIONS : IAS : Lift off : 57 KIAS - 65 MPH IAS
Clear 50 ft : 62 KIAS - 71 MPH IAS
Weight : 2337 lbs (1060 kg)

Tempe-rature	Distance	Pressure altitude (ft)				
		0	2000	4000	6000	8000
- 4°F (- 20°C)	Roll (ft)	837	1050	1247	1509	1804
	Clear 50 ft (ft)	1394	1722	2067	2477	3182
+ 32°F (0°C)	Roll (ft)	1050	1197	1460	1739	2116
	Clear 50 ft (ft)	1673	1886	2395	2965	3822
+ 59°F (+ 15°C)	Roll (ft)	1165	1345	1608	1952	2362
	Clear 50 ft (ft)	1854	2182	2674	3363	4429
+ 86°F (+ 30°C)	Roll (ft)	1296	1493	1788	2149	2625
	Clear 50 ft (ft)	2051	2428	2995	3806	5118
+ 104°F (+ 40°C)	Roll (ft)	1378	1657	1919	2313	2789
	Clear 50 ft (ft)	2198	2671	3232	4117	6102

Figure 5.5 - TAKE-OFF PERFORMANCE (2337 lbs)

TAKE-OFF PERFORMANCE

CONDITIONS : IAS : Lift off : 51 KIAS - 59 MPH IAS
Clear 50 ft : 58 KIAS - 66 MPH IAS
Weight : 1764 lbs (800 kg)

Tempe-rature	Distance	Pressure altitude (ft)				
		0	2000	4000	6000	8000
- 4°F (- 20°C)	Roll (ft)	394	492	591	722	853
	Clear 50 ft (ft)	820	1001	1214	1509	1903
+ 32°F (0°C)	Roll (ft)	476	558	689	820	984
	Clear 50 ft (ft)	968	1132	1411	1755	2280
+ 59°F (+ 15°C)	Roll (ft)	558	656	755	886	1083
	Clear 50 ft (ft)	1083	1296	1558	1968	2657
+ 86°F (+ 30°C)	Roll (ft)	607	705	837	984	1181
	Clear 50 ft (ft)	1181	1394	1755	2247	3084
+ 104°F (+ 40°C)	Roll (ft)	656	771	886	1050	1312
	Clear 50 ft (ft)	1280	1526	1886	2428	3839

Figure 5.6 - TAKE-OFF PERFORMANCE (1764 lbs)

CLIMB PERFORMANCE

CONDITIONS : Climb speed : 78 KIAS - 90 MPH IAS
Weight : 2337 lbs (1060 kg)
Flaps retracted

Pressure altitude (ft)	VERTICAL SPEED (ft/min)				
	-4°F (-20°C)	+ 32°F (0°C)	+ 59°F (+ 15°C)	+ 86°F (+ 30°C)	+ 104°F (+ 40°C)
0	768	709	661	610	591
2000	669	610	571	522	492
4000	571	502	463	413	384
6000	463	404	354	315	295
8000	354	305	256	217	187

Figure 5.7 - CLIMB PERFORMANCE (2337 lbs)

CLIMB PERFORMANCE

CONDITIONS : Climb speed : 73 KIAS - 84 MPH IAS
Weight : 1764 lbs (800 kg)
Flaps retracted

Pressure altitude (ft)	VERTICAL SPEED (ft/min)				
	-4°F (-20°C)	+ 32°F (0°C)	+ 59°F (+ 15°C)	+ 86°F (+ 30°C)	+ 104°F (+ 40°C)
0	1132	1053	1004	955	925
2000	1004	935	886	846	817
4000	886	817	768	728	709
6000	758	689	659	610	591
8000	640	581	541	502	482

Figure 5.8 - CLIMBING PERFORMANCE (1764 lbs)

ANTENNAS ACCOUNT ON PERFORMANCE

Installation of radio antennas reduces cruise performance as follows :

AERIAL	CRUISE SPEED		RANGE
	KIAS	MPH IAS	
VHF	- 0.48	- 0.56	- 0.30 %
VOR	- 0.59	- 0.68	- 0.37 %
Glide	- 0.32	- 0.37	- 0.20 %
ADF Loop antenna	- 0.75	- 0.87	- 0.47 %
ELT	- 0.16	- 0.19	- 0.10 %
Strobe lights	- 0.43	- 0.50	- 0.27 %
Flashing lights	- 0.16	- 0.19	- 0.10 %
Example : IFR	- 3.23	- 3.73	- 2 %

Figure 5.9 - ANTENNAS ACCOUNT ON PERFORMANCE

LEVEL FLIGHT PERFORMANCE

Level flight performance are given for a take-off weight of 2337 lbs and for setting "Best Power" obtained with an EGT.

Fuel : 40.2 U.S Gal (152 litres) usable (Standard tank)

Fuel : 53.8 U.S Gal (204 litres) usable (Optional tank)

Endurance without reserves

The endurances and ranges specified correspond to complete use of the fuel at the indicated altitude without allowing for take-off, climb, and so on...

Various parameters such as the mixture setting, engine and propeller condition and the atmospheric conditions (wind, moisture, temperature, and so on...) may noticeably vary the endurance and range.

Performance with minimum consumption

- Decrease speeds by 2 KIAS - 2 MPH IAS
- Decrease fuel consumption by 1.32 U.S Gal/hr
- Add 15 % to distance to be cleared.

Settings

- Minimum consumption with EGT :
  Best economy mixture setting : from full rich, reduce slowly mixture until peak EGT.
- Minimum consumption without EGT :
  Best economy mixture setting : from full rich, reduce slowly until first engine malfunctioning signs (vibration) appear.
- Best power mixture setting :
  From peak EGT, re-enrich until EGT temperature decreases by 75°F (3 divisions).

PRESSURE ALTITUDE : 2000 ft
STANDARD TEMPERATURE : 52°F (11°C)
Total usable capacity : 40.2 U.S Gal

N RPM	% BHP *	TAS		C U.S Gal	DISTANCE TO BE CLEARED (Without reserves)	
		KTAS	MPH		h.min	SM
2550	80	117	134	10.6	3h46'	506
2500	75	113	130	10.1	3h56'	513
2450	71	111	127	9.6	4h09'	528
2400	67	107	124	9.1	4h24'	544
2350	63	104	120	8.5	4h40'	559
2300	59	100	115	7.9	5h03'	581

(*) Rounded values

Figure 5.10 - LEVEL FLIGHT PERFORMANCE (2000 ft)

PRESSURE ALTITUDE : 2000 ft
STANDARD TEMPERATURE : 52°F (11°C)
Total usable capacity: 53.8 U.S Gal (optional tank)

N RPM	% BHP *	TAS		C U.S Gal	DISTANCE TO BE CLEARED (Without reserves)	
		KTAS	MPH		h.min	SM
2550	80	117	134	10.6	5h04'	680
2500	75	113	130	10.1	5h18'	690
2450	71	111	127	9.6	5h36'	711
2400	67	107	124	9.1	5h55'	730
2350	63	104	120	8.5	6h16'	752
2300	59	100	115	7.9	6h48'	783

(*) Rounded values

Figure 5.11 - LEVEL FLIGHT PERFORMANCE (2000 ft / Option)

PRESSURE ALTITUDE : 4000 ft
STANDARD TEMPERATURE : 45°F (7°C)
Total usable capacity : 40.2 U.S Gal

N RPM	% BHP *	TAS		C U.S Gal	DISTANCE TO BE CLEARED (Without reserves)	
		KTAS	MPH		h/min	SM
2600	78	118	135	10.4	3h50'	519
2550	75	115	133	10	4h00'	531
2500	71	113	130	9.6	4h09'	537
2450	68	110	126	9.1	4h24'	553
2400	64	107	123	8.6	4h40'	575
2350	60	102	117	8	4h58'	584

(*) Rounded values

Figure 5.12 - LEVEL FLIGHT PERFORMANCE (4000 ft)

PRESSURE ALTITUDE : 4000 ft
STANDARD TEMPERATURE : 45°F (7°C)
Total usable capacity: 53.8 U.S Gal (optional tank)

N RPM	% BHP *	TAS		C U.S Gal	DISTANCE TO BE CLEARED (Without reserves)	
		KTAS	MPH		h.min	SM
2600	78	118	135	10.4	5h10'	639
2550	75	115	133	10	5h22'	720
2500	71	113	130	9.6	5h36'	724
2450	68	110	126	9.1	5h55'	746
2400	64	107	123	8.6	6h16'	770
2350	60	102	117	8	6h42'	786

(*) Rounded values

Figure 5.13 - LEVEL FLIGHT PERFORMANCE(4000 ft / Option)

PRESSURE ALTITUDE : 6000 ft
STANDARD TEMPERATURE : 37°F (3°C)
Total usable capacity : 40.2 U.S Gal

N RPM	% BHP *	TAS		C U.S Gal	DISTANCE TO BE CLEARED (Without reserves)	
		KTAS	MPH		h.min	SM
2650	78	119	137	10.4	3h50'	528
2600	74	117	135	10	4h00'	537
2550	71	114	131	9.5	4h13'	553
2500	68	111	128	9.1	4h24'	562
2450	64	108	124	8.7	4h36'	569

(*) Rounded values

Figure 5.14 - LEVEL FLIGHT PERFORMANCE (6000 ft)

PRESSURE ALTITUDE : 6000 ft

STANDARD TEMPERATURE : 37°F (3°C)

Total usable capacity: 53.8 U.S Gal (optional tank)

N RPM	% BHP *	TAS		C U.S Gal	DISTANCE TO BE CLEARED (Without reserves)	
		KTAS	MPH		h.min	SM
2650	78	119	137	10.4	5h10'	708
2600	74	117	135	10	5h22'	721
2550	71	114	131	9.5	5h40'	743
2500	68	111	128	9.1	5h55'	758
2450	64	108	124	8.7	6h11'	764

(*) Rounded values

Figure 5.15 - LEVEL FLIGHT PERFORMANCE (6000 ft / Option)

PRESSURE ALTITUDE : 8000 ft
STANDARD TEMPERATURE : 30°F (– 1°C)
Total usable capacity : 40.2 U.S Gal

N RPM	% BHP *	TAS		C U.S Gal	DISTANCE TO BE CLEARED (Without reserves)	
		KTAS	MPH		h.min	SM
2700	77	120	139	10.4	3h50'	531
2650	74	118	135	10	4h00'	541
2600	70	115	132	9.6	4h09'	550
2550	67	110	127	9.1	4h24'	559
2500	64	108	125	8.7	4h36'	572

(*) Rounded values

Figure 5.16 - LEVEL FLIGHT PERFORMANCE (8000 ft)

PRESSURE ALTITUDE : 8000 ft
STANDARD TEMPERATURE : 30°F (– 1°C)
Total usable capacity: 53.8 U.S Gal (optional tank)

N	W	TAS		C	DISTANCE TO BE CLEARED (Without reserves)	
RPM	% *	KTAS	MPH	U.S Gal	h.min	SM
2700	77	120	139	10.4	5h10'	715
2650	74	118	135	10	5h22'	727
2600	70	115	132	9.6	5h35'	739
2550	67	110	127	9.1	5h55'	752
2500	64	108	125	8.7	6h11'	770

(*) Rounded values

Figure 5.17 - LEVEL FLIGHT PERFORMANCE (8000 ft / Option)

PRESSURE ALTITUDE : 10000 ft
STANDARD TEMPERATURE : 23°F (– 5°C)
Total usable capacity : 40.2 U.S Gal

N RPM	% BHP *	TAS		C U.S Gal	DISTANCE TO BE CLEARED (Without reserves)	
		KTAS	MPH		h.min	SM
2650	70	115	132	9.5	4h13'	556
2600	67	112	129	9.1	4h24'	569
2550	64	107	124	8.7	4h36'	569

(*) Rounded values

Figure 5.18 - LEVEL FLIGHT PERFORMANCE (10000 ft)

PRESSURE ALTITUDE : 10000 ft
STANDARD TEMPERATURE : 23°F (– 5°C)
Total usable capacity: 53.8 U.S Gal (optional tank)

N RPM	% BHP *	TAS		C U.S Gal	DISTANCE TO BE CLEARED (Without reserves)	
		KTAS	MPH		h.min	SM
2650	70	115	132	9.5	5h40'	749
2600	67	112	129	9.1	5h55'	764
2550	64	107	124	8.7	6h11'	764

(*) Rounded values

Figure 5.19 - LEVEL FLIGHT PERFORMANCE (10000 ft / Option)

LANDING PERFORMANCE

WEIGHT : 2337 lbs (1060 kg)

CONDITIONS : VI : Touch-down : 57 KIAS - 65 MPH IAS
Clear 50 ft : 65 KIAS - 75 MPH IAS

Tempe-rature	Distance	Pressure altitude (ft)				
		0	2000	4000	6000	8000
- 4°F (- 20°C)	Roll (ft)	541	591	623	689	738
	Clear 50 ft (ft)	1165	1247	1342	1460	1575
+ 32°F (0°C)	Roll (ft)	591	623	689	738	787
	Clear 50 ft (ft)	1263	1345	1460	1572	1690
+ 59°F (+ 15°C)	Roll (ft)	623	673	722	771	837
	Clear 50 ft (ft)	1329	1427	1542	1657	1788
+ 86°F (+ 30°C)	Roll (ft)	656	705	755	820	886
	Clear 50 ft (ft)	1394	1509	1608	1739	1886
+ 104°F (+ 40°C)	Roll (ft)	673	722	787	853	919
	Clear 50 ft (ft)	1444	1542	1673	1804	1952

Figure 5.20 - LANDING PERFORMANCE (2337 lbs)

LANDING PERFORMANCE

WEIGHT : 1764 lbs (800 kg)

CONDITIONS : VI : Touch-down : 54 KIAS - 62 MPH IAS
Clear 50 ft : 57 KIAS - 65 MPH IAS

Tempe-rature	Distance	Pressure altitude (ft)				
		0	2000	4000	6000	8000
- 4°F (- 20°C)	Roll (ft)	328	361	377	410	443
	Clear 50 ft (ft)	837	919	984	1050	1148
+ 32°F (0°C)	Roll (ft)	361	377	410	443	476
	Clear 50 ft (ft)	919	984	1050	1148	1214
+ 59°F (+ 15°C)	Roll (ft)	377	410	443	476	509
	Clear 50 ft (ft)	968	1050	1099	1214	1296
+ 86°F (+ 30°C)	Roll (ft)	394	427	459	492	541
	Clear 50 ft (ft)	1017	1099	1181	1263	1378
+ 104°F (+ 40°C)	Roll (ft)	410	443	476	509	558
	Clear 50 ft (ft)	1066	1132	1230	1312	1427

Figure 5.21 - LANDING PERFORMANCE (1764 lbs)

CLIMB - CONSUMPTION - TIME - DISTANCE COVERED

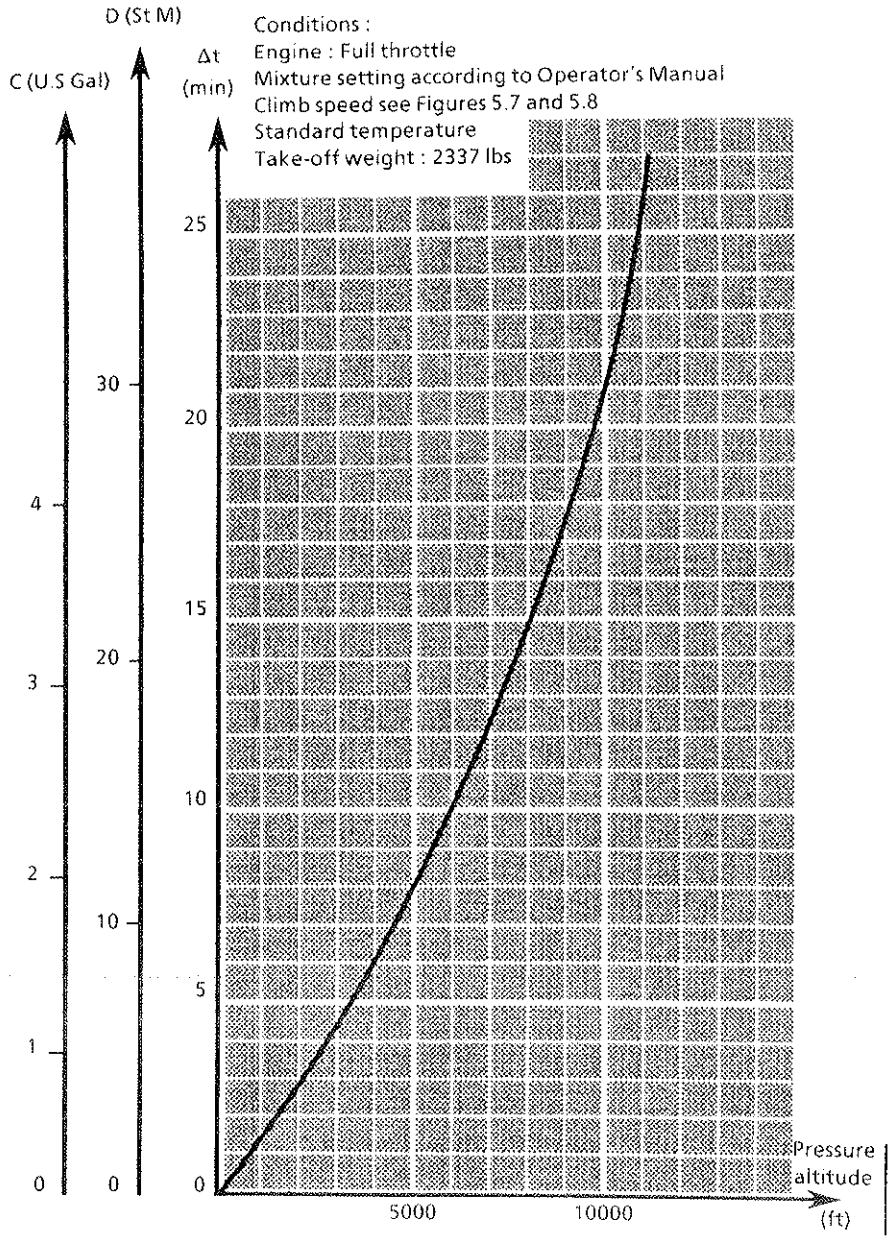

Figure 5.22 - CLIMB - CONSUMPTION - TIME - DISTANCE COVERED

SECTION 6

WEIGHT AND BALANCE

TABLE OF CONTENTS

GENERAL

This section contains the procedure for determining the basic empty weight and moment of SOCATA Model TB 9 airplane. Procedures for calculating the weight and moment for various operations are also provided. A list of equipment available for this airplane is included at the back of this section.

It should be noted that the list of specific optional equipment installed on your airplane as delivered from the factory can be found in the records carried in the airplane.

IT IS THE RESPONSIBILITY OF THE PILOT TO ENSURE THAT THE AIRPLANE IS LOADED PROPERLY.

AIRPLANE WEIGHING PROCEDURES

Refer to Maintenance Manual for the procedures to use.

NOTE :
Weighing carried out in factory takes into account all equipment installed on the airplane. The list of these equipment and the weighing result are noted in the Individual Inspection Record.

BAGGAGE / CARGO LOADING

BAGGAGE

The baggage compartment is located at the back of rear passengers seat. Loading can either be carried out through baggage compartment access door provided with a locking device, located on L.H. side of the airplane, or from the inside of the cabin, on upper part of the rear seat back. In this case, a zip fastener allows folding the sound-proofing cloth.

Tie-down straps are provided for securing baggage on compartment floor.

CARGO

To facilitate the carrying of equipment, large or bulky items, the rear seat may be removed from the airplane.

To remove rear seat : See Figure 6.1 (A, B, C, D)

- Lift up rear seat seating (Item 6) (kept in position with "Velcro" straps)
- If you want to free the back from its support plate, lift it up about 1.5 inch at both ends and pull it forward so that both attaching pins free from apertures.
- To remove the support plate (Item 5) and back (Item 1) :
  . Unfasten attachments of sound-proofing cloth on cross-beam (Item 2)
  . Pushing, unscrew $\frac{1}{4}$ turn both attaching pins of air conditioning duct on rear floor (Item 4)
  . Pull both latches inwards (Item 3)
  . Lift up support plate (Item 5) to disengage it forward.

NOTE :
To reinstall rear seat - see Figure 6.1 (a, b, c, d) reverse removal instructions.

IMPERATIVELY RESPECT WEIGHT AND BALANCE LIMITS

THE PILOT IS RESPONSIBLE FOR CORRECT BAGGAGE AND / OR CARGO LOADING. PRIOR TO ANY FLIGHT HE MUST MAKE SURE THAT WEIGHT, BALANCE AND TIE-DOWN ARE CORRECT.

- **Baggage weight :**
- Maximum 88 lbs (40 kg) at 102.3 in. (2.600 m) (Valid up to S / N 399, (plus S / N 413
- Maximum 143 lbs (65 kg) at 102.3 in. (2.600 m) (Valid from S / N 400, (except S / N 413
- Cargo weight (without baggage) :

  Maximum 441 lbs (200 kg) at 78.7 in. (2.000 m)

CAUTION

WHEN IN CARGO CONFIGURATION, NO PASSENGERS ARE ALLOWED IN THE CARGO AREA.

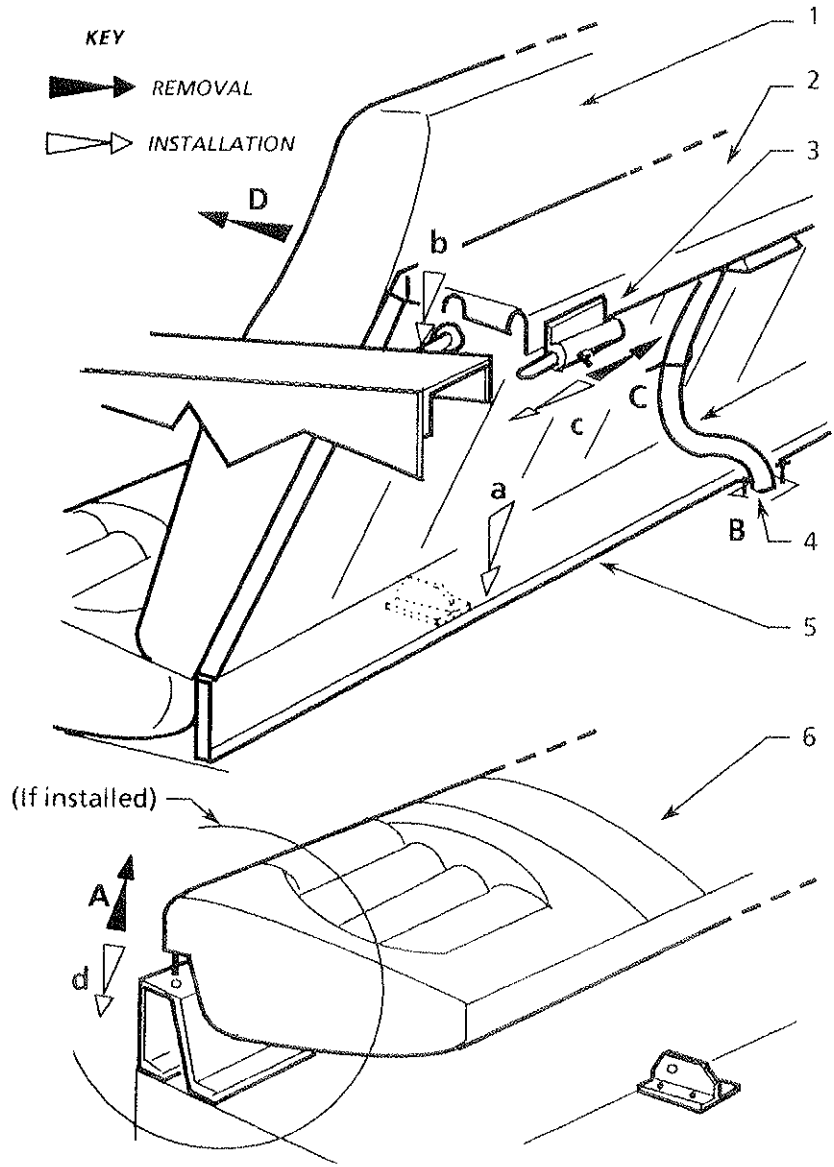

Figure 6.1 - REMOVAL AND INSTALLATION OF REAR SEAT

DETERMINING WEIGHT AND BALANCE

GENERAL

This paragraph is intended to provide the pilot with a simple means of determining weight and balance of his airplane with regard to its empty characteristics and loading. The empty weight to be considered is the one noted on the last weighing form.

The data concerning loading are given on following graphs :

- Loading graph (up to S / N 399, plus S / N 413) : see Figure 6.4
- Loading graph (from S / N 400, except S / N 413) : see Figure 6.4A
- Weight / Moment envelope : see Figure 6.5

To determine airplane loading within a given flight configuration, you only have to add up weights and moments of the various loads recorded and to add them to empty airplane data.

These values carried forward on weight / moment envelope must give a point within the limits drawn with continuous line.

If that is the case, loading is acceptable.

NOTE :
If moment is not directly known (optional equipment for example), determine it multiplying weight (lbs) by arm (in.).

UTILIZATION OF WEIGHT / MOMENT GRAPH

Extract translucent Figure 6.5 from the manual and take a pencil.

- On Figure 6.5, place point A (1) corresponding to your empty airplane
  (Our sample loading : 1499 lbs - 56.40 lb.in / 1000)
- Superpose point A (1) and point A of graph ① Figure 6.4 or 6.4A.
- Draw on weight / moment envelope the straight line pilot + front passenger to get point A (2) corresponding to front seats loading.
  (Our sample loading : 2 persons 340 lbs)

- Superpose point A (2) and point A of graph ①, draw the rear passengers straight line to get point B (1) related to rear seat loading.
  (Our sample loading : 2 persons 284 lbs)
- Superpose point B (1) and point B of graph ②, draw the fuel straight line to get point B (2).
  (Our sample loading : 192 lbs - 31.9 U.S Gal fuel)
- Superpose point B (2) and point B of graph ②, draw the baggage straight line to get point M.
  (Our sample loading : 18 lbs baggage)

Since point M falls within weight / moment envelope, the loading is acceptable.

NOTE (Not valid for TB 9 standard seats) :

The option Nr 800.00 "Moving back of L.H. pilot's seat" is marked on your airplane by a color ring (yellow / green) located on the 2 front supports (tubes) of the seat.

CAUTION

OPTION Nr 800.00 (See NOTE on page 6.6) : 2 in. (50 mm) moving back for pilot's seat

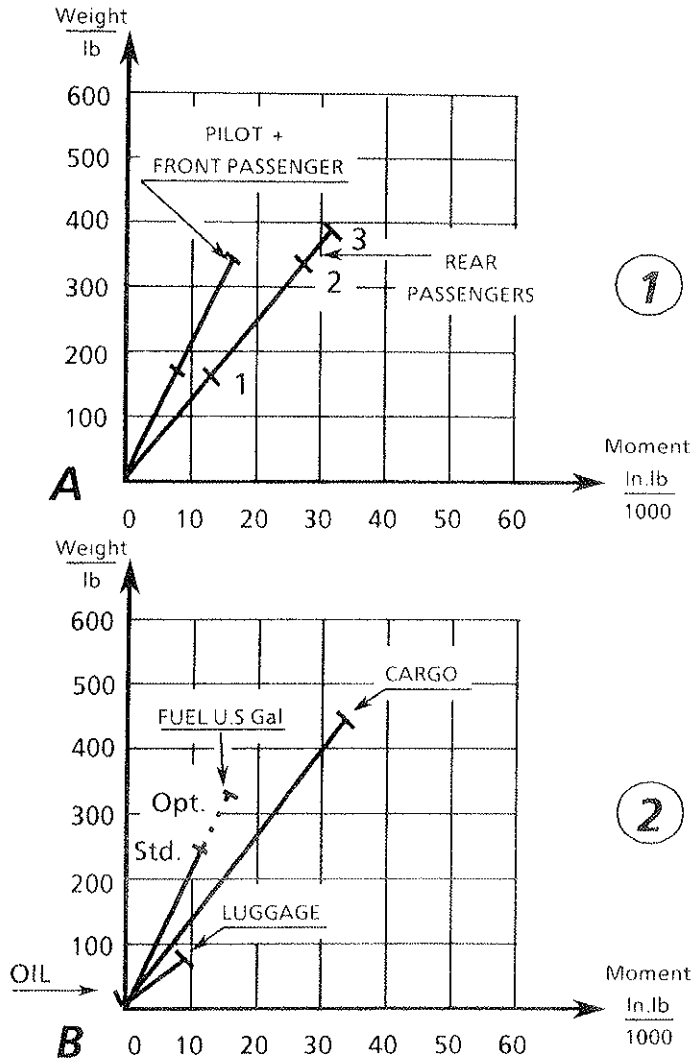

Figure 6.4 - LOADING GRAPHS
(Valid up to S / N 399, plus S / N 413)

CAUTION

OPTION Nr 800.00 (See NOTE on page 6.6) : 2 in. (50 mm) moving back for pilot's seat

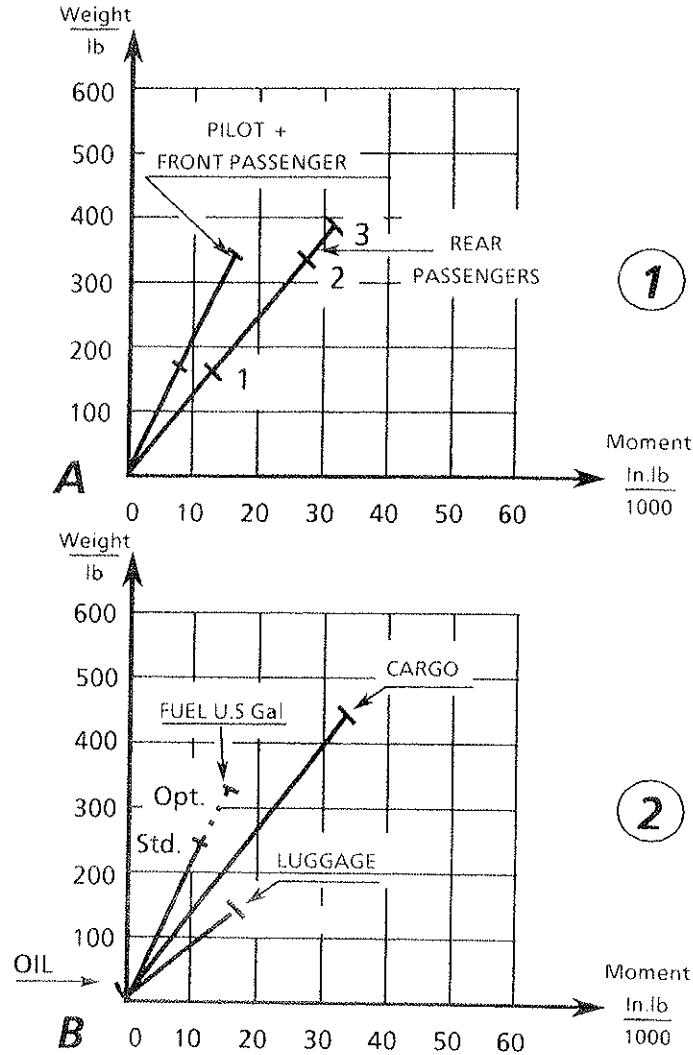

Figure 6.4A - LOADING GRAPHS
(Valid from S / N 400, except S / N 413)

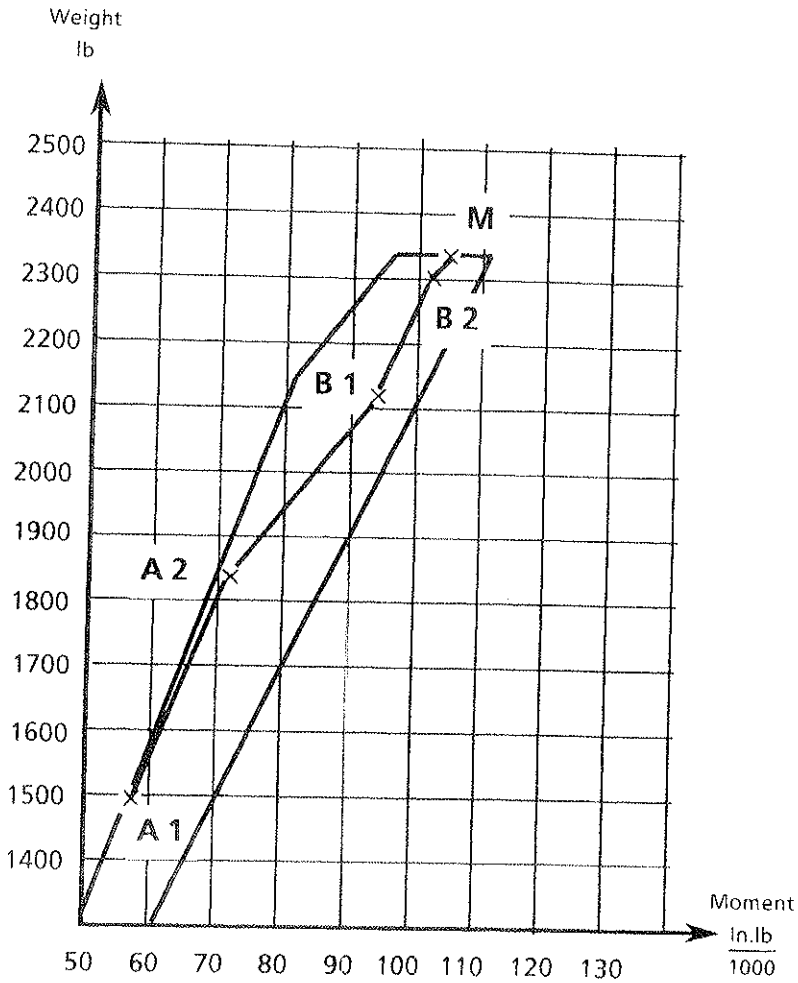

Figure 6.6 - LOADING SAMPLE

EQUIPMENT LIST

The following equipment list contains standard equipment installed on each airplane and available optional equipment.

A separate equipment list of items installed in your specific airplane is provided in your airplane file.

Columns showing weight (in pounds) and arm (in inches) provide the weight and center of gravity location for the equipment.

The equipment list provides the following information :

a) List of Required or Standard items
- A letter "R" or "S" allows classification of the equipment :
  "R" : required items of equipment for certification
  "S" : standard equipment items

b) List of Optional equipment (not restrictive)
- A letter "O" or "A" allows classification of the equipment :
  "O": optional equipment items replacing required or standard items
  "A" : optional equipment items which are in addition to required or standard items
- In the following column, an item number allows identification of the optional equipment
- The column marked "*" will be used to tick off the optional equipment installed on your airplane.

NOTE :
Unless otherwise indicated (-), arms are positive values.
Positive arms are distances aft of the airplane datum ; negative arms are distances forward of the datum.
The symbol ☒ following description means that :
- If this optional equipment is fitted with a "20 W dual cone" loud-speaker, optional equipment n° 539 is to be added to your weight and balance.
- If it is fitted with a "10 W single cone" loud-speaker, do not add anything.

R or S	REQUIRED OR STANDARD EQUIPMENT	WEIGHT lb	ARM in.
	POWER PLANT AND ACCESSORIES		
R	Engine : LYCOMING 0-320-D2A	245.592	- 26.77
R	Propeller : SENSENICH 74-DM6-S8 061	36.817	- 47.64
R	Oil cooler : AP07-AU06-03 or AOC07HG0601	2.006	- 20.47
	HARRISSON 85 26 250	1.742	- 20.47
	or NDM 20002A	1.742	- 20.47
	LANDING GEAR AND ACCESSORIES		
	Wheels, tires and brakes - Main LDG (2) :		
R	- Wheel assy : CLEVELAND 40-97E Type III	5.842	59.84
R	- Brake assy : CLEVELAND 91.50	1.918	59.84
R	- Tire : 15.6.00-6 4 PR	8.818	59.84
R	- Tube : 15.6.00-6	2.425	59.84
	Fairings :		
R	- L.H. : TB10 48012006	11.905	62.20
R	- R.H. : TB10 48012007	11.905	62.20
	Wheel and tire - Nose LDG :		
R	- Wheel assy : CLEVELAND 40-77 B	2.822	- 16.93
R	- Tire: 5.00-5 6 PR	5.798	- 16.93
R	- Tube: 5.00-5	1.455	- 16.93
R	Fairings (Front and Rear) : TB10 48014004 and 005	6.173	- 10.24
	ELECTRICAL EQUIPEMENT		
R	Battery : 12 V - 32 AH SONNENSCHEIN 6MK5	21.826	- 2.76
R	Alternator : PRESTOLITE 60A ALY 8420	12.985	- 37.80

R or S	REQUIRED OR STANDARD EQUIPMENT		WEIGHT lb	ARM in.
	Magneto (without harness) :			
R	- R.H. :	S4LN 21	4.740	- 17.32
R	- L.H. :	S4LN 20	5.247	- 17.32
R	Starter :	PRESTOLITE MZ 4222	12.632	- 39.37
R	Battery relay :	RBM 70 906	0.816	87.40
R	Starter relay :	SAW 4217 or 4204 or SAZ 4201 E	0.816	- 1.18
	or	RBM 70 112 225-5	0.573	- 1.18
S	Lighter :	910.1704	0.287	37.80
R	Alarms panel :	TB10 61042	0.463	22.83
R	Overvoltage relay :	PRESTOLITE 78059 or 17621	0.551	3.15
R	Voltage regulator :	PRESTOLITE 7203	0.683	1.97
	or	TB20 61033000 (LAMAR 800371.5)	1.345	3.94
R	Fuel electric pump :	BENDIX 480 543	1.653	1.18
R	Flaps actuator :	AVIAC 8076.1	5.070	61.81
S	Cabin lighting (Front and Rear) :	TB10 61001	0.639	65.35
S	Landing light :	G.E. 4509	0.441	35.43
S	Taxi light :	G.E. 4519	0.441	35.43
S	Navigation lights :			
	- L.H. :	LABINAL 47007 903 30G	0.220	33.86
	- R.H. :	LABINAL 47007 903 50D	0.220	33.86
	- Rear :	LABINAL 47007 907 70AR	0.198	239.76
	INSTRUMENTS			
R	Tachometer :	TB09 72015 (ACRT11)	0.794	23.62

R or S	REQUIRED OR STANDARD EQUIPMENT	WEIGHT lb	ARM in.
R	Engine and fuel controls : [for fuel tanks of 41.7 U.S Gal (158 litres)]		
	TB09 76061	1.058	24.80
	or TB09 76060	0.551	27.16
	or TB09 76030	0.551	27.16
R	Engine and fuel controls : [for fuel tanks of 55.4 U.S Gal (210 litres)]		
	TB10 76061	1.058	24.80
	or TB10 76060	0.551	27.16
	or TB10 76030	0.551	27.16
R	Airspeed indicator : TB09 72002 (UI 37384		
	or EDO AIRE 5172.1Z		
	or BADIN 38399.040)	0.595	24.80
R	Altimeter : AEROSONIC 10.1720.01545		
	or MAC LEAD 120.121001210		
	or 37500.000 or 5934 PM1		
	or 12003 M	1.036	24.80
R	Vertical speed indicator :		
	UI 7000		
	or EDO AIRE 1403.1Z		
	or BADIN 38210.000	1.014	24.80
R	Compass : TB10 76025		
	(AIRPATH C2400 L 4P)		
	or AIRPATH 2300 L 41	0.595	20.47
R	Turn and bank indicator : AIR PRECISION Type 57	0.110	23.62

R or S	REQUIRED OR STANDARD EQUIPMENT		WEIGHT lb	ARM in.
	CABIN EQUIPEMENT			
R	Seat belts :			
	- Front seat belt :	PACIFIC 0107153	1.631	47.24
	or	SECURAIGLON 10.4022.000.002	2.640	47.24
	or	TRW REPA 10.4022.000.002	2.640	47.24
	or	ANJOU AERO 10.4022.000.002	2.640	47.24
R	- Rear seat belt :	AIGLON Type 343-1 cr 341	0.727	85.03
	or	ANJOU AERO Type 343-1 or 341	0.727	85.03
	Seat belts :			
R	- Front seat belt :	PACIFIC 0107153	1.631	47.24
	or	SECURAIGLON 10.4022.000.002	2.640	47.24
	or	TRW REPA 10.4022.000.002	2.640	47.24
	or	ANJOU AERO 10.4022.000.002	2.640	47.24
R	- Rear seat belt :	AIGLON Type 343-1 or 341	0.727	85.03
	or	ANJOU AERO Type 343-1 or 341	0.727	85.03
	Seats :			
R	- Front seat :	TB09 74011	21.164	51.18
	- Rear seat :			
R	Back	TB10 74016	17.637	88.19
	Seating	TB10 74016		
	Back	TB10 74014	16.821	88.19
	Seating	TB10 74013		
S	Colourless windows		27.558	53.15
	- Windshield	TB21 24001 or TB10 24030	11.023	27.56
	- Doors windows	TB10 25030	8.598	55.12
	- Rear side windows	TB10 22030	7.937	86.61

A or O	ITEM N°	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
		AIRFRAME, ENGINE AND ELECTRICAL EQUIPMENT			
A	508.00	Outside air temperature thermometer		0.331	23.62
A	508.10	Outside air temperature thermometer		0.485	23.62
A	509.00	Carburator thermometer "ISKRA"		0.331	23.62
A	509.10	Carburator thermometer "PEKLY"		0.331	23.62
A	510.00	Fuel decanting filter		0.628	-0.79
A	511.00	Alternate static source - in hull - in cabin		0.705 0.331	76.77 23.62
O	515.00	Heated pitot (L.H. wing) "FENWICK"		1.146	53.15
O	515.10	Heated pitot (L.H. wing) "AERO INSTRUMENT"		1.146	53.15
A	517.00	Fixed emergency beacon "NARCO ELT 10"		3.307	119.29
A	517.10	Fixed emergency beacon "JOLLIET"		3.086	119.29
A	519.00	Ground power receptacle		6.239	106.30
A	519.20	Ground power receptacle		7.121	66.93
	530.00	Navigation lights			
A		- 2 lights (wing tips)		5.864	67.72
A O		- 3 lights : 2 wing tips lights 1 tail light		7.187	92.13
A	533.00	Anti-collision light "LABINAL"		0.882	190.16
A	534.00	Anti-collision light "GRIMES"		3.748	149.61

A or O	ITEM N°	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
A	535.00	Cylinder head thermometer		0.661	23.62
A	536.00	Exhaust gas thermometer		0.661	23.62
A	537.00	Anti-collision light on vertical stabilizer "JPC 1000"		1.984	161.42
A	537.10	Anti-collision lights on vertical stabilizer and under hull "JPC 1000"		3.748	153.54
O	558.00	55.4 U.S Gal fuel tanks (For engine and fuel controls see standard list)		0	/
O	575.00	"Variable pitch" propeller : . HARTZELL HC.C2YL.1BF / F 7663 A-4 propeller + cone + governor + regulation pipe + propeller control + illuminated manifold pressure		59.017	- 40.94
A	580.10	Ferry fuel tank (TB10 52935)		63.933	78.35
A	587.00	Outside air thermometer for the tropics - 25°C to + 40°C "JAEGER"		0.772	23.62
A	587.10	Outside air thermometer for the tropics - 50°C to + 50°C "JAEGER"		1.213	23.62
A	597.00	Rudder / aileron control interconnection		1.675	16.14
A	609.00	EGT - CHT dual indicator - probe on cylinder Nr 3 ("Variable pitch" propeller) - probe on cylinder Nr 2 ("Fixed pitch" propeller) - probes on all cylinders		1.323 1.323 3.307	19.68 19.68 3.94

A or O	ITEM N°	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
O	630.00	Battery 35 AH : REBAT R 35			
		or GILL G 35		2.646	1.97
A	635.00	2nd heated pitot (R.H. wing)			
		"AERO INSTRUMENT"		1.323	55.12
		(Pitot + 2nd true airspeed indicator)		1.984	44.88
A	658.10	Oil drain door		0.220	- 25.59
A	684.00	Illuminated carburator thermometer		0.331	23.62
A	685.00	Illuminated EGT - CHT dual indicator			
		- probe on cylinder Nr 3			
		("Variable pitch" propeller)		1.323	19.69
		- probe on cylinder Nr 2			
		("Fixed pitch" propeller)		1.323	18.90
		- probes on all cylinders		3.307	3.94
A	690.00	Outside air thermometer "AID"		0.948	30.71

A or O	ITEM N°	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
		COCKPIT EQUIPMENT			
A	501	R.H. instrument panel (501.00 or 10)		2.866	23.62
A	502	3rd rear seat belt (502.02 or 03 or 10)		0.882	84.65
A	503	Glare shield curtains (503.00 or 01)		2.646	88.19
A	504	Blower			
		"DALE" (504.30 or 40 or 50 or 60 or 70 or 80)		1.874	125.98
		or "EMECO" (504.10 or 20)		3.086	125.98
O	505	Front seat with tilting back-rest (505.02 or 03)		21.781	51.18
O	506	Rear seat with central arm			
		blue (506.02) or brown (506.03)		22.796	88.19
		- Rear seat seating		9.590	
		- Rear back-rest		14.330	
		- Rear seating support		0.926	
		"cendre" (506.10) or "sable" (506.20)		24.846	88.19
		- Rear seat seating		8.642	
		- Rear back-rest		13.228	
		- Rear seating support		0.926	
O	514.00	Front reel safety belts and strap (Qty 2)		5.291	47.24
A	521.00	Braking control (R.H. post)		3.307	11.81
A	526	Glare shield (526.00 or 10 or 20)		1.102	45.28
A	526.30	Glare shield "Plexiglas"		0.683	41.34
A	528.00	Cabin fire extinguisher		2.822	36.22
A	562	Little window (562.00 or 10 or 20 or 30)		0.750	39.37
O	563	Rear reel safety belt (563.00 or 10 or 20)		2.646	106.30

A or O	ITEM N°	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
O	578	Seats assembly "Executive" leather			
		578.00		86.729	62.99
		578.10 or 20		85.649	62.99
O	579	Seats assembly "Executive" fabric			
		blue (579.10 + 30)			
		or brown (579.20 + 40)		76.037	62.99
		- Front seat		23.237	
		- Rear seat seating		12.875	
		- Rear back-rest		15.763	
		- Rear seating support		0.926	
		"cendre" (579.50 + 70 + 85)			
		or "sable" (579.60 + 80 + 95)		85.649	62.99
		- Head -rest		1.477	
		- Front seat		25.684	
		- Rear seat seating		14.043	
		- Rear back-rest		14.330	
		- Rear seating support		1.653	
O	585	Tinted windows (585.00 or 10 or 20)		27.558	53.15
		- Windshield TB10 24030			
		or TB21 24001		11.023	27.56
		- Doors windows TB10 25030		8.598	55.12
		- Rear side windows TB10 22030		7.937	86.61
A	588.00	Maps reading light		0.176	25.59
A	637.00	Rear seat shoulder harness (Quantity 2)		2.249	94.49
A	640.00	3rd rear reel safety belt		1.918	106.30

A or O	ITEM N°	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
A	641.00	3rd rear seat shoulder harness		1.124	94.49
O	800.00	Moving back system of pilot's L.H. seat		0.331	37.80
O	801.00	Front seat TB10 74012		17.813	51.18
		or TB10 74028		21.164	51.18

A or O	ITEM N°	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
		INSTRUMENT PANEL EQUIPMENT			
A	507.00	R.H. panel lighting		0.220	23.62
A	512.00	Rate of climb indicator "EDO AIRE" or "UNITED INSTRUMENT		0.992	24.61
O	513.00	Turn and bank indicator "EDO AIRE"		1.323	23.62
O	513.10	Turn and bank indicator (capable A / P 1)		1.323	23.62
O	513.20	Turn and bank indicator "BADIN"		1.323	23.62
O	513.40	Turn and bank indicator "UNITED INSTRUMENT"		1.323	23.62
A	516.00	Stop watch		0.441	35.43
A	518.00	Altimeter N° 2 "EDO AIRE"		1.764	25.59
A	518.00	Altimeter N° 2 "BADIN CROUZET"		1.433	25.59
A	518.20	Altimeter N° 2 "UNITED INSTRUMENT"		1.764	25.59
A	527	Electric clock (527.00 or 10)		0.441	27.56
O	529.10	True airspeed indicator (km/h)		0.661	24.80
O	529.40	True airspeed indicator (kt)		0.661	24.80
A	548.00	Electric hour meter		0.331	27.56
A	561.00	Starter warning light		0	/
O	569.00	Flaps preselection		0.772	68.90
A	570.00	Electric hour meter (Airplane using time)		0.661	31.50
A	571.00	Electric hour meter (Engine using time)		0.992	23.62

A or O	ITEM N°	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
A	576	R.H. small instrument panel (576.01 or 02)		2.646	23.62
A	577	R.H. large instrument panel (577.10 or 20 or 30)		4.740	23.62
A	593.00	Ammeter		1.102	29.13
A	606.00	Adjustable radio lighting		0.331	0.79
A	610.00	Emergency lighting		0.220	23.62
A	614.00	Additional adjustable emergency lighting		0.882	25.59
A	631.00	Warning light for gyros supply failure		0.198	0.39
A	638.00	Digital chronometer "ASTROTECH LC2"		0.551	35.43
A	680.00	Chronometer Q18 "THOMMEN"		0.661	35.43
A	681.00	Altimeter N° 2 "UNITED INSTRUMENT"		1.786	24.80
A	682.00	Vertical speed indicator "UNITED INSTRUMENT"		1.014	24.80
A	689.00	Ammeter "AID"		0.529	28.74
O	691.00	Turn and bank indicator "UNITED INSTRUMENT" or "AID"		2.028	22.83

A or O	ITEM N°	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
		RADIO AND NAVIGATION EQUIPMENT			
A	523.00	Boom microphone headset "SOCAPEX"		1.036	55.12
		"DAVID CLARK"		1.190	55.12
A	524	Interphone VHF (524.10 or 20 or 30)		0.441	11.81
A	539.00	VHF capability - loudspeaker 10 W single - loudspeaker 20 W dual		0.860	62.20
A	541.00	VHF 1 COLLINS 251 E ☒		6.239	31.50
A	542.00	VHF 2 COLLINS 251 E + AMR 350		7.209	19.29
A	543.00	VOR LOC COLLINS VIR 351 + IND 350 A		4.850	39.76
A	544.00	VOR ILS COLLINS VIR 351 + IND 351 A + GLS 350 E			
		- used without HSI		9.149	43.31
		- used with HSI		7.848	46.06
A	545.00	ADF 650 A COLLINS		7.496	83.46
A	546.00	Transponder COLLINS TRD 950		2.205	20.47
A	547.00	DME COLLINS 451			
		- without switching box		6.900	41.34
		- with switching box		7.385	41.34
A	547.15	Additional DME COLLINS		0.485	41.34
A	549.10	Rigid antenna VHF 1 D & M		0.661	127.17
A	549.20	Rigid antenna VHF 2 D & M		0.661	57.87
A	550.00	IFR COLLINS		63.382	39.37

A or O	ITEM N°	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
A	551.00	VHF 1 BECKER AR 2009 / 25 ☒		5.071	29.53
A	552.00	VHF 2 BECKER AR 2009 / 25 + AL 3B		5.952	22.44
A	553.00	VOR LOC BECKER NR 2029 + IN 2041		5.732	38.19
A	554.00	VOR ILS BECKER NR 2029 + IN 2040 + GM 2020		9.480	44.88
A	555.00	ADF BECKER 2050		7.496	53.15
A	572.00	ADF BECKER 2079 + VR 2070		8.818	78.74
A	573.00	Transponder BECKER ATC 2000		2.205	20.47
A	583.03	HSI without heading recopy		4.850	23.62
A	583.04	HSI with heading recopy		6.173	23.62
A	584.00	RMI KING KI 229		3.417	23.62
A	594.00	Radio master switch		0.992	29.53
A	596.00	Stormscope 3M-WX-10 A		11.905	96.06
A	598.00	Radio console ventilation		2.028	6.30
O	599.00	Alti-coder NARCO AR 500		1.323	17.72
O	599.10	Alti-coder NARCO AR 850		1.323	17.72
A	600.00	IFR NARCO - with DME - without DME		 51.367 61.729	 35.04 35.83
A	601.00	VHF 1 COM 120 NARCO ☒		5.952	31.50
A	602.00	VOR LOC NAV 121 NARCO		3.748	39.37
A	603.00	VHF 2 COM 120 NARCO and box CP 136		6.614	20.47

A or O	ITEM N°	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
A	604.00	ADF 141 NARCO		7.275	53.15
A	605.00	Transponder AT 150 NARCO		2.866	20.87
A	607.00	VOR ILS NAV 122A NARCO		8.377	45.67
O	608.00	Alti-coder "BADIN CROUZET" 39600.00		1.764	21.65
O	608.10	Alti-coder (not illuminated) "KING" KEA 129		1.764	21.65
A	608.20	Alti-coder "KING" KEA 130		1.764	21.65
A	608.30	Alti-coder "UNITED INSTRUMENT" 20000 ft		1.764	21.65
A	613.00	VOR ILS NAV 122 NARCO		5.732	47.24
A	615	Additional equipment for IFR France (615.00 or 10 or 20)		1.543	24.80
A	616	Additional equipment for night VFR France (616.00 or 10 or 20)		1.543	24.80
A	624	DME 195 NARCO (airplane fitted with VOR LOC) (624.00 + 624.10)		10.362	40.55
A	625.10	DME KING KN 65 A KI 266 1 VOR		10.362	39.76
A	625.15	Additional equipment for installation of 2nd VOR		4.189	40.16
A	627.01	VOR LOC BECKER NR 2030 + NI 2031		5.622	33.07
A	648.00	Transceiver VHF 1 KY 0196-05 with a 28-volt converter		7.496	33.07
A	648.10	Transceiver VHF 2 KY 0196-05 with a 28-volt converter		7.496	33.07
A	651.00	VHF 1 KING KY 019700 ☒		7.055	37.01

A or O	ITEM N°	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
A	652.00	VHF 2 KING KY 019700 + KMA 2402		5.512	23.62
A	652.10	VHF 2 KING KY 197 / VHF - VOR KX		3.748	23.62
A	653.00	VOR LOC KING KN 53.01 + KI 203.00		5.291	51.18
A	654.00	VOR ILS KING KN 53.00 + KI 204.02		7.055	62.99
A	655.00	ADF KING KR 87 + KI 227.00		6.393	59.06
A	656.00	Transponder KING KT 76 A 00		3.307	20.08
A	657.00	DME KING KN 62 A 01 or KN 64		3.968	21.26
	660.00	Course indicator KING KCS 55 A			
A		- without converter		12.456	65.75
A		- with converter		13.779	59.84
A	661.00	VHF / VOR ILS KING KX 155.01 ☒ + KMA 2402 + KI 204.02		13.889	39.37
	662.00	NAV System KNS 81.10 KING			
A		- with KI 206		8.598	43.70
A		- with KI 525 A or with NSD 360 A		7.275	47.24
A	662.10	- indicator KI 206.04		1.301	23.62
A	662.20	- chanellisation warning		/	/
A	663.00	VHF 1 / VOR LOC KING KX 155.08 ☒ + KI 203.00		9.656	33.86
A	663.10	VHF 2 / VOR LOC KING KX 155.08 ☒ + KI 203.00		7.606	21.65
A	664.00	DME KING KN 63.04 + KDI 572		4.189	40.16
A	665.00	2nd ADF KING KR 87 + KI 228 + Audio control box + KMA 24.00		6.393	35.43
A	666.00	VHF / VOR LOC KING KX 165.00 ☒ + KMA 2402 + KI 202.00		12.566	35.43

A or O	ITEM N°	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
A	666.10	VHF / VOR ILS KING KX 165.01 ☒ + KMA 2402		13.889	39.37
	667.00	NAV System KNS 80 :			
A		- without Glide connected with KI 202		7.937	31.50
A		- with Glide connected with KI 206		9.700	43.31
A		- with Glide connected with KI 525 A		12.787	37.80
A		- with Glide connected with NSD 360 A		13.228	37.80
A	676.00	Marker receiver KING KR 21		1.543	21.26

A or O	ITEM N°	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
		AUTOPILOT AND BLIND FLIGHT ASSEMBLY			
A	531.00	A / P "MITCHELL CENTURY I"		5.401	39.76
A	532.00	Blind flight gyroscopic assembly (with vacuum system)			
		"EDO AIRE"		8.929	10.63
		"BADIN CROUZET"		8.377	10.63
A	532.10	Blind flight gyroscopic assembly "EDO AIRE" for A / P II B		8.929	10.63
A	538.00	A / P "MITCHELL CENTURY II B" with connector with neither directional, nor horizon		10.913	32.28
A	581.00	Blind flight gyroscopic assembly (with vacuum system) for A / P 21		9.810	11.42
A	581.10	Blind flight gyroscopic assembly (with vacuum system) for A / P 21 with course indicator, without heading recopy		13.558	15.35
A	581.20	Blind flight gyroscopic assembly (with vacuum system) for A / P 21 with course indicator, with heading recopy		15.102	16.14
A	583.02	Directional		1.235	23.62
A	636.00	2nd air-driven attitude gyro indicator KG 258 KING		3.527	23.62
A	642.00	Radiobeacon KR 10A KING		4.740	112.99
A	643.00	2nd electric attitude indicator RCA 26 AK1 AID		2.976	21.65
A	659.00	A / P "MITCHELL CENTURY 21"		7.716	35.43
A	683.00	Blind flight "AID"		8.929	11.42

SECTION 7

DESCRIPTION

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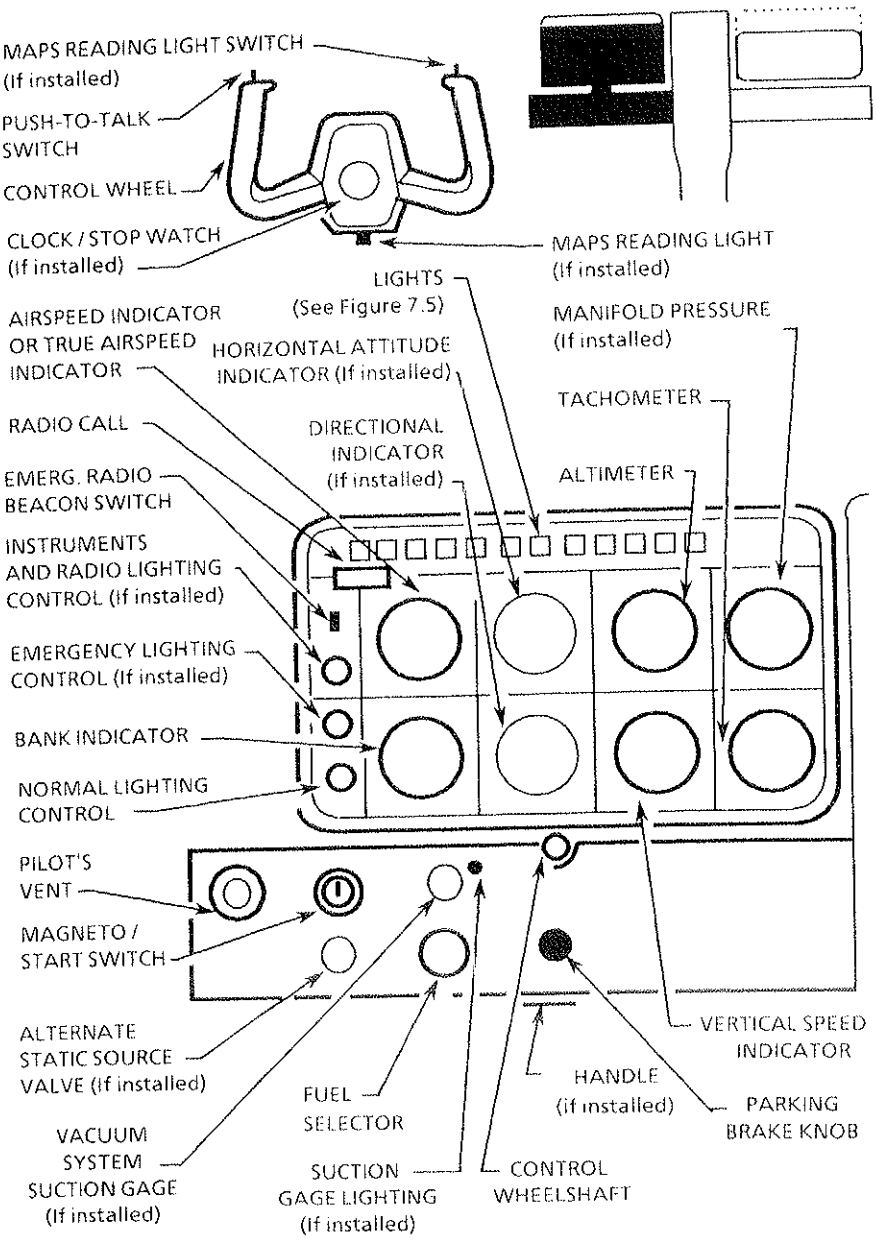


Figure 7.1 - EXAMPLE OF INSTRUMENT PANEL AND L.H. SUBPANEL

A pointer indicator located on the right of the trim control wheel gives the anti-tab position. Forward rotation of the control wheel will trim nose-down, conversely, aft rotation will trim nose-up.

Stabilator tab deflection with stabilator in maximum nose-up attitude must be :

- nose-up 2.5° ± 0.5°
- nose-down 17° ± 1.5°

INSTRUMENT PANEL

L.H. instrument panel (see Figure 7.1) is designed around the basic "T" configuration.
The gyros (if installed) are located in front of the pilot and arranged vertically.
The airspeed indicator or the true airspeed indicator and the altimeter are to the left and right of the gyros, respectively.
The upper edge of the instrument panel contains the alarm panel (see Figure 7.5).
The left side of the panel contains lighting controls, emergency beacon switch (if installed) and registration (enabling airplane radio call).

The L.H. panel strip (see Figure 7.1) contains from left to right : L.H. vent, magneto / start switch, fuel selector, parking brake knob ; alternate static source valve and vacuum system pressure gage (if installed) complete the L.H. panel strip.

The central console (see Figure 7.2) contains in the upper edge, the engine controls panel then radio-navigation equipment vertically mounted to console lower edge.

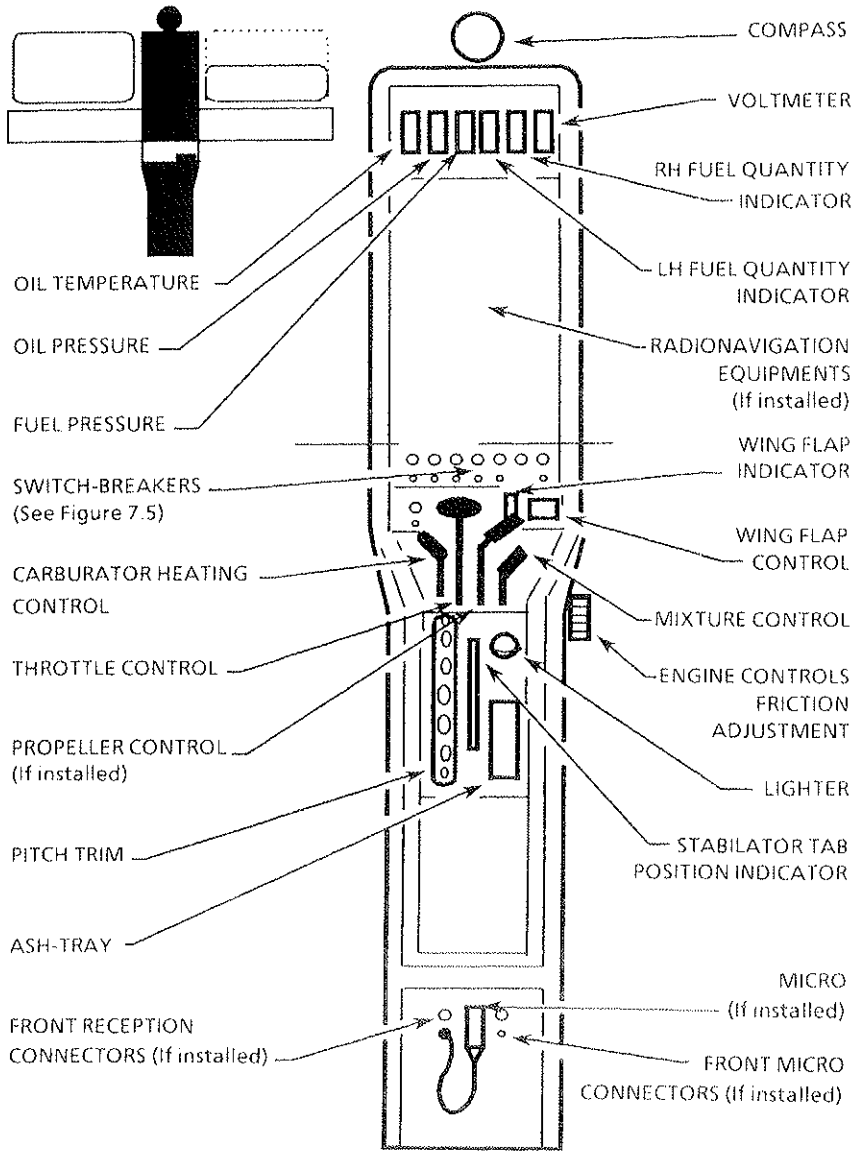


Figure 7.2 - EXAMPLE OF CONSOLE AND PEDESTAL

The central pedestal (see Figure 7.2) contains fore to aft :

- the switch-breakers panel, flaps control and indicator
- the engine controls (from left to right : carburettor heating, throttle, propeller (if installed), mixture)
- the pitch trim and its indicator
- the lighter and the ash-tray
- the micro (if installed)
- the reception and micro jacks (if installed)
- on pedestal R.H. side, engine controls friction device.

The R.H. instrument panel (see Figure 7.3) contains locations for additional equipment (2nd altimeter, VOR / LOC indicator, outside air temperature, cylinder head temperature, exhaust gas temperature...).

The R.H. panel strip (see Figure 7.3) contains a location for radio equipment or any other one, air conditioning control, R.H. vent.

Upper duct central part (see Figure 7.4) contains fore to aft :

- "Flight conditions" placard
- "Instruction" plate
- Front overhead lights
- Radio loud-speaker (if installed)
- Blower switch (if installed)
- Rear overhead light(s)
- Rear vents.

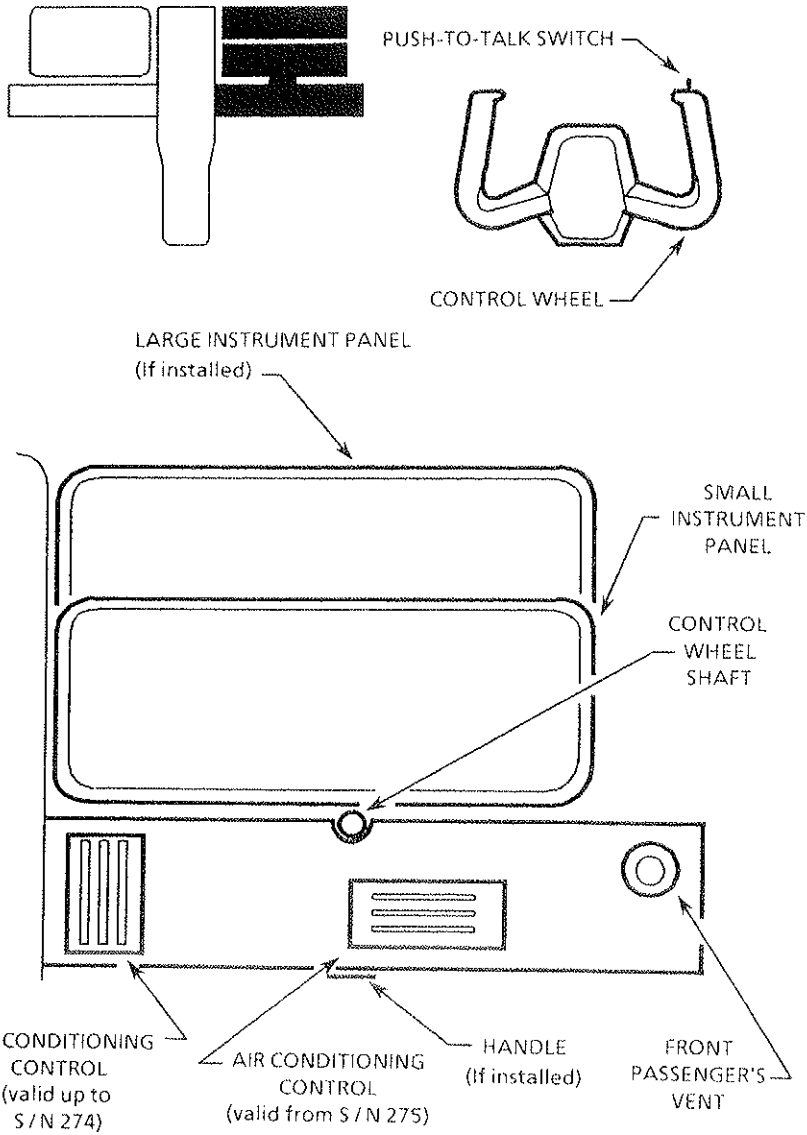


Figure 7.3 - EXAMPLE OF INSTRUMENT PANEL AND R.H. SUBPANEL

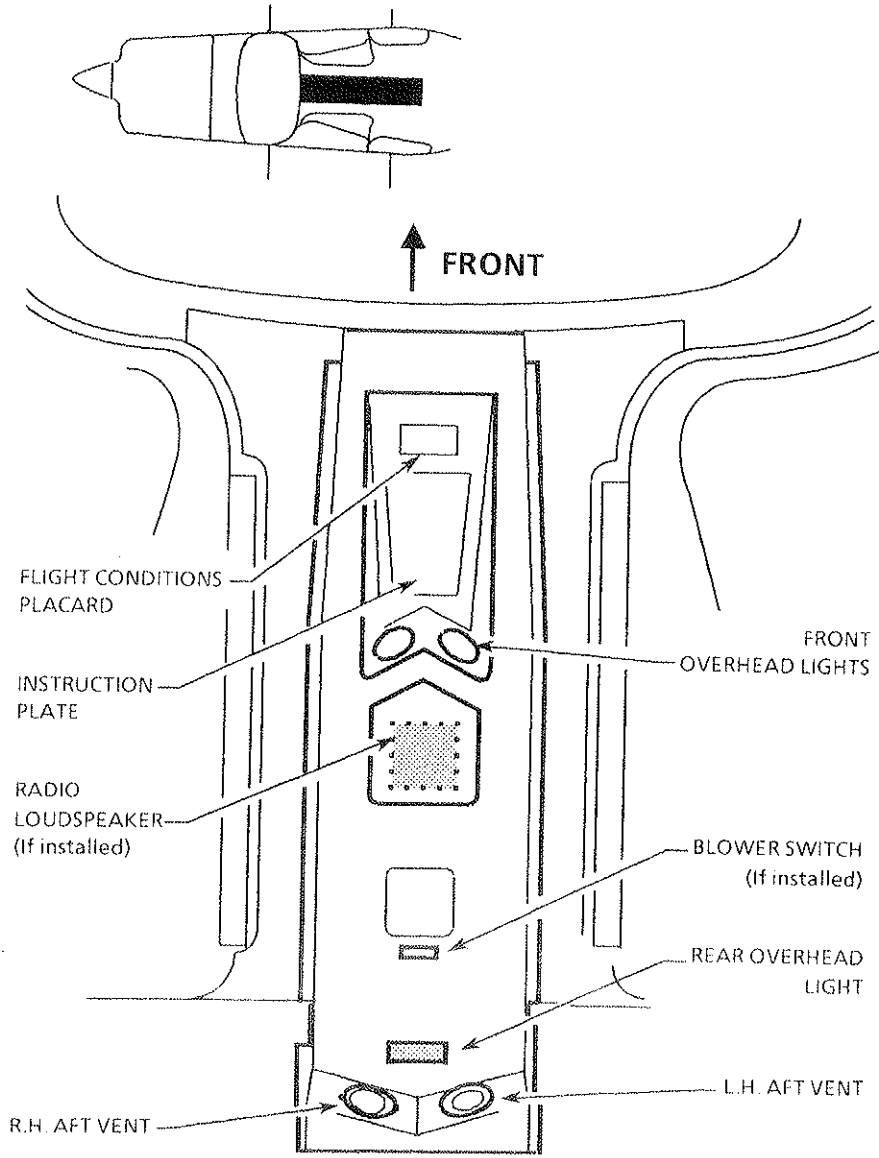


Figure 7.4 - EXAMPLE OF UPPER DUCT CENTRAL PART

ALARMS PANEL

The alarms panel (see Figure 7.5) is located at the top edge of the L.H. instrument panel, directly in front of the pilot. The panel contains ten separate indicator lights which illuminate green, amber or red when a specific condition occurs in the associated airplane system. A green colored light is illuminated to indicate a normal or safe condition in the system. However, an illuminated amber lamp indicates that a cautionary condition exists, but which may not require immediate corrective action. When a hazardous condition exists requiring immediate corrective action, a red light illuminates.

SWITCH-BREAKERS PANEL

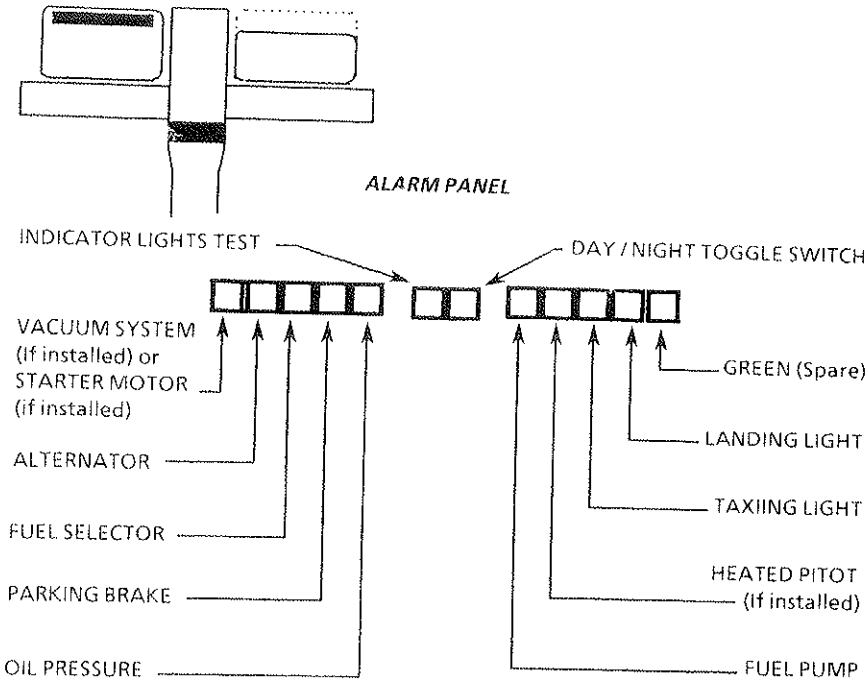
The general electrical equipment switch-breakers are located on the front part of the central pedestal.

The switch-breakers located on this panel are illustrated in Figure 7.5.

CIRCUIT-BREAKERS PANEL

The electrical equipment circuit-breakers are located on a separate panel mounted on the L.H. cabin sidewall adjacent to the pilot.

Circuit-breakers located on this panel are illustrated in Figure 7.6.



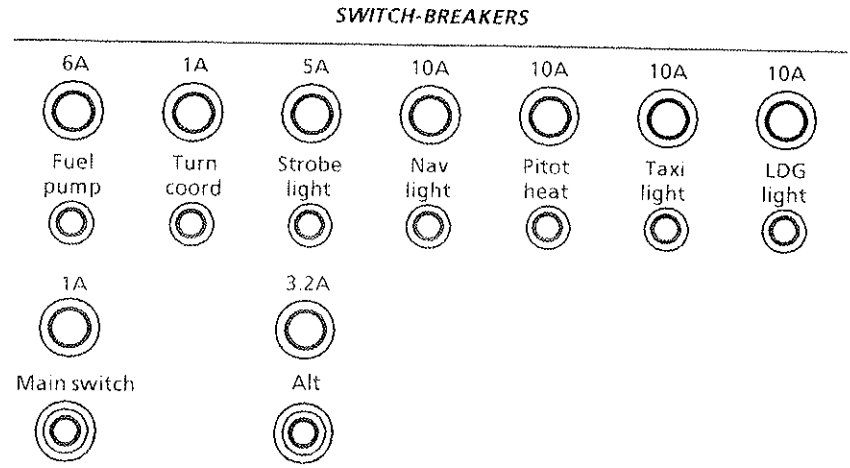


Figure 7.5 - INDICATOR LIGHTS AND SWITCH-BREAKERS

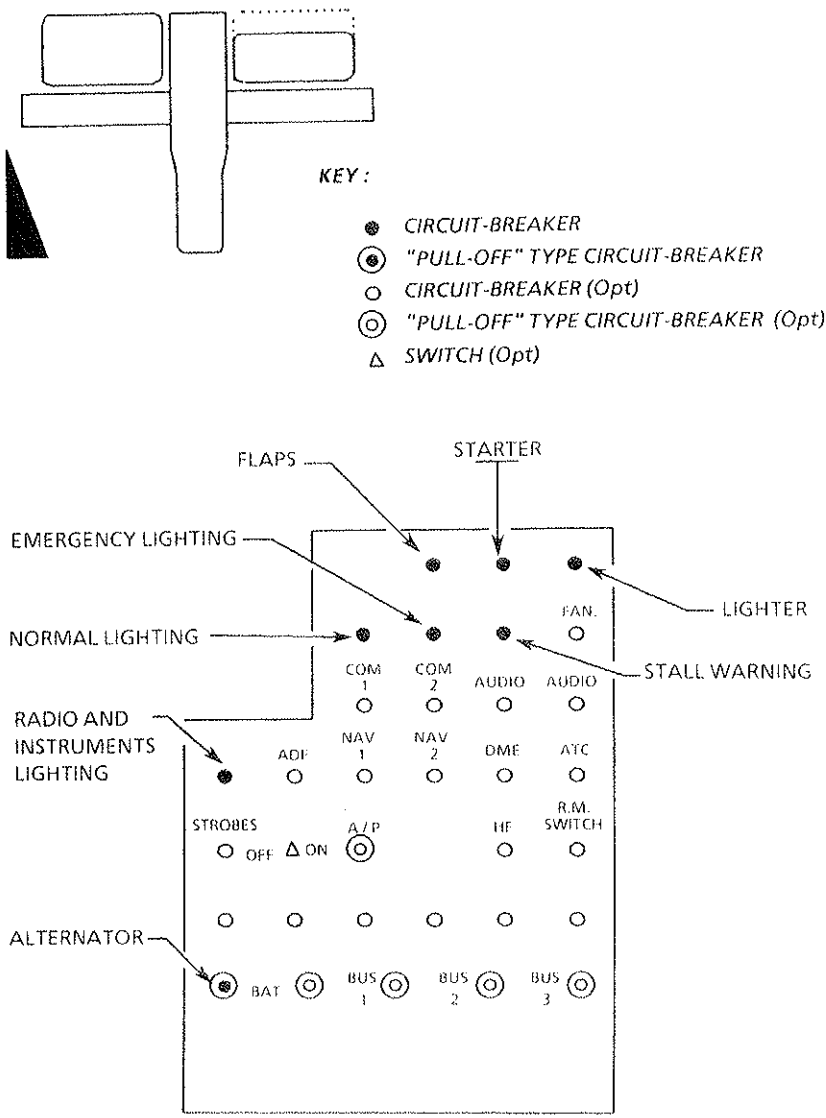


Figure 7.6 - CIRCUIT-BREAKERS ASSEMBLY
(Typical arrangement)

GROUND CONTROL

Effective ground control while taxiing is accomplished through nose-wheel steering by using the rudder pedals connected to nose-wheel through rods.

When a rudder pedal is fully pushed, the nose-wheel rotates through an arc of approximately 22° to the left and 18°30' to the right. By applying either left or right brake, the degree of turn may be increased.

The minimum turning radius of the airplane is obtained by using differential braking and nose gear steering (see Figure 7.7).

Moving the airplane by hand is most easily accomplished by attaching a tow bar (stowed in the baggage compartment) to the nose gear leg.

If the airplane is to be towed by vehicle, never turn the nose gear more than 22° to the left and 18°30' to the right or structural damage to the nose gear could result.

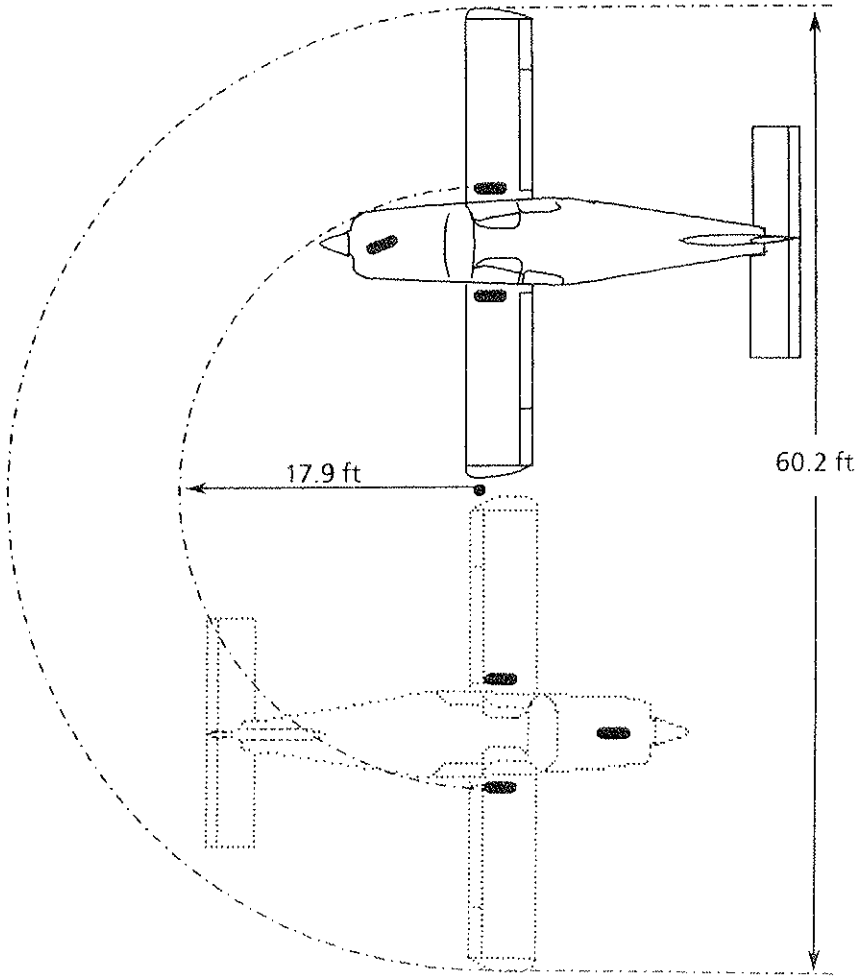


Figure 7.7 - MINIMUM TURNING RADIUS

WING FLAPS

The wing flaps are of the large span, single-slot type. They are retracted or extended by positioning to the desired flap deflection position the flaps control located on the pedestal, on R.H. side of the switch-breakers.

The switch lever tilts up or down with stops at 0° and 32°. If your aircraft is equipped with pre-setting flaps, the switch lever is moved up or down in a slotted panel with mechanical stops at "retracted" (0°) ; "take-off" (10°) and "landing" (32°) positions (see Figure 7.2). An indicator located near the control provides various flaps positions.

The wing flaps system is protected by a 15-amp. circuit-breaker, labeled "FLAPS" located on L.H. circuit-breakers side panel (see Figure 7.6).

LANDING GEAR

The landing gear system is a stationary tricycle type utilizing a conventional steerable nose gear. Nose gear and main gears are provided with telescopic and oil / air shock absorbers incorporated in landing gear leg. Each main gear wheel is equipped with a hydraulically-actuated, single-disc brake on the inboard side of the wheel.

BAGGAGE COMPARTMENT

The baggage compartment extends from the rear seat to the rear bulkhead of the cabin (former n° 6). The access is possible either through a lockable door located on the left side of the airplane, or from the inside of the cabin.

Prior to any flight, check that this door is locked.

To open the access door, proceed as follows :

POUSSER POUR TOURNER

PUSH TO TURN - DRÜCKEN UM ZU DREHEN

Figure 7.8

WARNING

ANY PARCEL OR BAGGAGE MUST BE FIXED WITH STRAPS. IT IS FORBIDDEN TO TRANSPORT PEOPLE IN THE BAGGAGE COMPARTMENT.

ANY MATERIAL THAT MIGHT BE DANGEROUS FOR THE AIRPLANE OR THE OCCUPANTS SHOULD NOT BE PLACED IN THE AIRPLANE.

CARGO CONFIGURATION

The rear seat may be taken off for easy loading in cargo configuration. For further information, refer to Section 6 "Weight and Balance".

SEATS, SEAT BELTS AND SHOULDER HARNESSES

FRONT SEATS

The various possibilities of seats adjustment depend on the version chosen.

- To move the seat forward and aft (*) :
  Use the cross bar located on the front part of the seat, under the seating and grasp handle (if installed) under instrument panel strip.

"Standard" version

- To gain access to rear seats, move the front seat forward to maximum position.

"Optional" version

- To tilt the seat (*) :
  Use the lever located on the outboard side of the seat.
- To change the seat back angle (if installed) :
  Use the knurled knob located at the bottom part on the inboard side of the seat back.
- To adjust the back, at lumbar level (if installed) :
  Use the knob located over the knurled knob on the inboard side of the seat back.
  Press on the knob and moderately lean back to the desired position, release the button, the seat back should fit perfectly with your back.

(*) Lift up cross bar or lever to unlock ; when in desired position, release it and make sure it is locked.

REAR SEAT

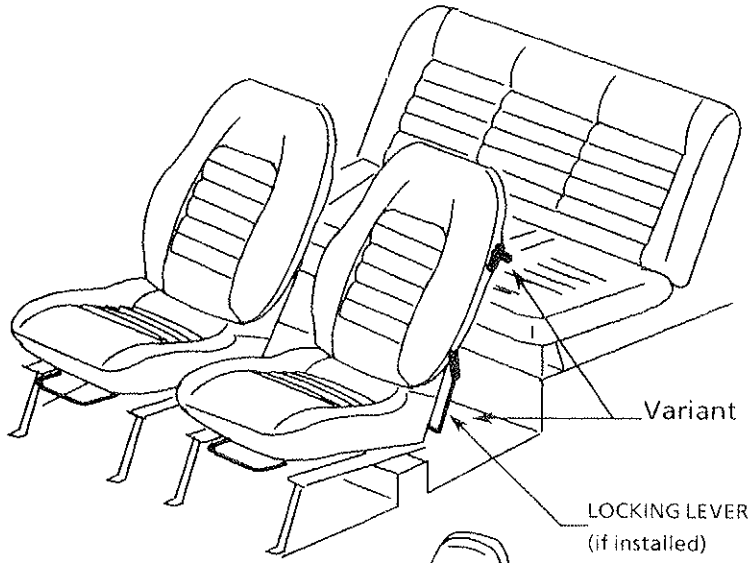
- To remove rear seat, refer to Section 6 "Weight and Balance".
  Rear seat is not adjustable.

HEADRESTS (if installed)

- To adjust and remove the headrest :
  Simply make it slide vertically.
- To fit the headrest into the seat back :

  Turn the centering bush (bearing an arrow) of $\frac{1}{4}$ turn clockwise (in the arrow direction) and maintain it to fit the headrest in the seat back.

«STANDARD» VERSION : Fixed FWD back-rest
«OPTIONAL» VERSION : Adjustable FWD back-rest



«LUXE» AND
«EXECUTIVE» VERSIONS

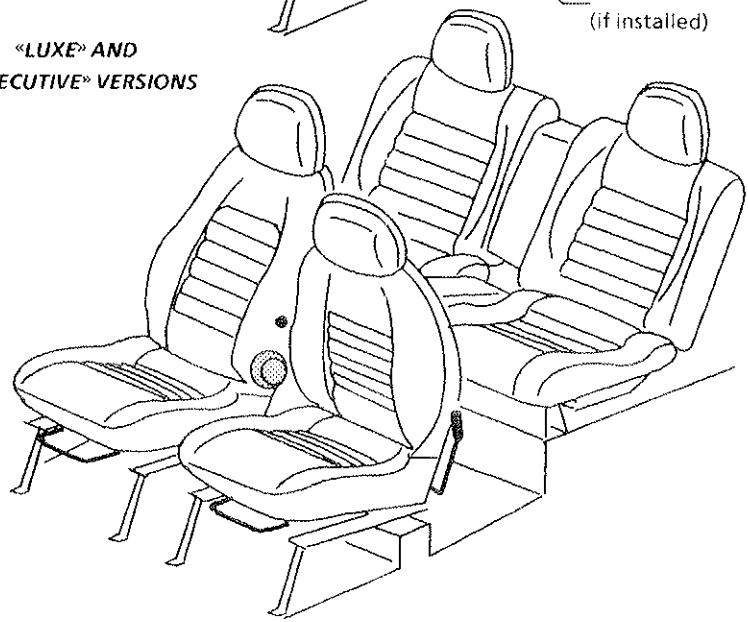


Figure 7.9 - FRONT SEATS AND REAR SEAT

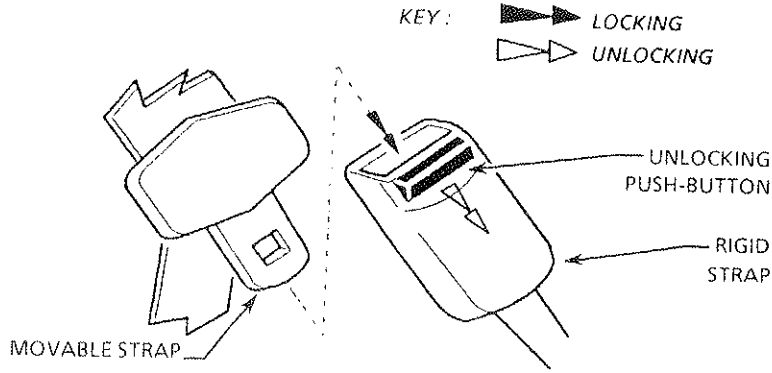


Figure 7.10 - FRONT SEAT BELT (with rigid strap)

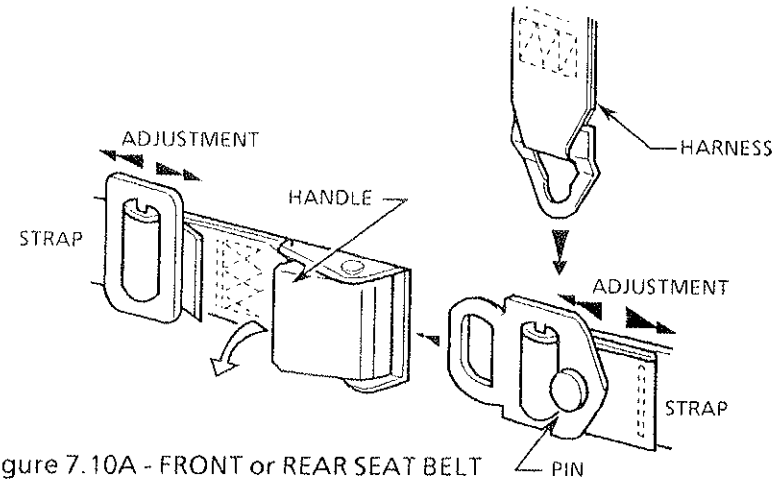


Figure 7.10A - FRONT or REAR SEAT BELT
(with movable straps)

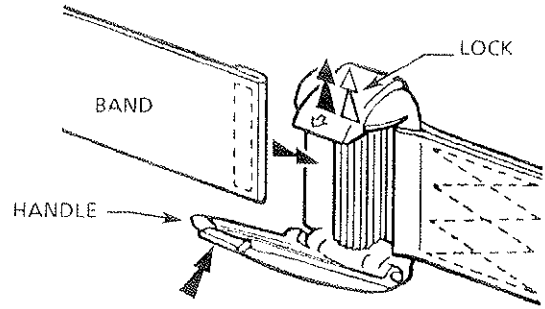


Figure 7.10B - REAR SEAT BELT (with band)

DOORS AND EXITS (see Figure 7.11)

DOORS

- To open them :
  Push handle forward (and maintain it in this position if the mechanism is not fitted with a release spring).
  Lift the door at the location marked with a shaded arrow.
  Follow door up to maximum position.

- To close them :
  Close the door and set handle to "Closed" position.

WARNING

PRIOR TO EACH FLIGHT, CHECK THAT BOTH CABIN ACCESS DOORS ARE NOT KEY-LOCKED

CHECK THAT BOTH LOCKING HOOKS ARE PROPERLY NOTCHED

EXITS

In case of L.H. and R.H. doors locking, and if it is necessary to leave the airplane in a hurry (risks of fire, drowning...) jettisson one or both rear windows, kicking out at the location of the placard.

The placard (see Figure 7.12) is located on both rear windows and is legible from the inside of the airplane.

CONTROLS LOCK

A locking pin located in lateral case on pilot's side is provided to block the control wheel.

To insert the blocking pin into the control wheel tube pull the control wheel backwards to approximately half-way and line up the tube hole with that of the fixed part on the panel. The blocking pin will be inserted vertically from top to bottom.

A safety device preventing the introduction of the magneto / start selector key forbids operation of the engine with blocked control wheel.

Pull the blocking pin upwards to free the control wheel and the magneto / start selector.

ENGINE

The TB 9 airplane is powered by a four-cylinder, horizontally opposed, direct drive LYCOMING O-320-D2A engine rated at 160 BHP at 2700 RPM. It is provided with a starter, a 12 volt / 60 amps alternator, an all-weather shielded ignition harness, two magnetos, a vacuum pump drive, a fuel pump and a manifold air filter.

The engine cowl is a laminate cantilever structure, fixed on the firewall and made of two elements. The upper cowl is fitted with an inspection door provided to check oil level ; it can also be fitted with an access door to the propeller deicing fluid tank. The lower cowl is fitted with incorporated air intakes and may be fitted with an inspection door to easy quick drain. Both cowls are completely removable without requiring removal of the propeller.

The engine mount is made of steel tube, rigidly attached on firewall. Engine attachment is provided by dynafocal mounting brackets to attenuate vibrations.

Engine and accessories cooling is provided by a downwards airflow. Air penetrates through holes located on each side of the propeller cone, is guided around the engine by airproof deflectors, then conducted to two air outlets located on the lower cowl.

Engine inlet air penetrates through an air intake located on the left side of the lower cowl and goes directly through a filter, before being admitted in the air duct under the carburator. The air duct comprises an alternate air intake with mechanical closing, the purpose of which is to supply the carburator with heated air when the airplane is involuntary in icing conditions.

The stainless steel exhaust system comprises a silencer with a heat exchanger in order to provide cabin hot air supply. Exhaust gases are evacuated through the exhaust duct at the basis of engine lower cowl, on R.H. side.

In order to obtain the maximum engine performance and T.B.O, the pilot should apply the procedures recommended by Lycoming Operator's Manual concerning the engine.

ENGINE CONTROLS

- Engine manifold pressure is controlled by the throttle (large black knob) located on the control pedestal. In the forward position, the throttle is open (full power) ; in the aft position, it is closed (engine idling).
- Your airplane may be equipped with a variable pitch propeller, in that case, the propeller governor is controlled by the propeller control (black notched knob) located on the central pedestal. In the forward position, the propeller moves to "low pitch" position (high RPM), in the aft position, it moves to "high pitch" position (low RPM).
- The mixture is controlled by the mixture control (red notched knob) located on R.H. side of the central pedestal. In the forward position, the mixture is open (full rich) ; in the aft position, the mixture is closed (idle cut-off).
- The carburated air temperature is controlled by the carburator heating control (blue round knob) located on the control pedestal on the L.H. side. If control lever is in forward position, the outside temperature air is carried through the air filter to the carburator, if in the aft position, exchanger heated air, mixed with outside temperature air, is directly carried to the carburator.
- Engine controls friction is controlled by a knurled knob located in the alignment of the controls on the R.H. side of the pedestal.

ENGINE INSTRUMENTS

Indicators enable the pilot to assure a permanent check of fuel pressure, oil pressure, oil temperature, tachometer and (if installed) EGT and CHT.

IGNITION - STARTER SYSTEM

Engine ignition is provided by two magnetos on two spark plugs per cylinder.

The R.H. part of the magneto fires the R.H. lower and L.H. upper spark plugs ; the L.H. part of the magneto fires the L.H. lower and R.H. upper spark plugs.

Ignition is controlled by a key-operated rotating switch, located on L.H. side of the L.H. panel strip.

The switch operates clockwise : "OFF" ; "L.H." magneto ; "R.H." magneto ; "L.H. + R.H." magnetos ; "STARTER" by pushing.

CAUTION

RELEASE THE PRESSURE ON THE KEY AFTER ENGINE STARTING

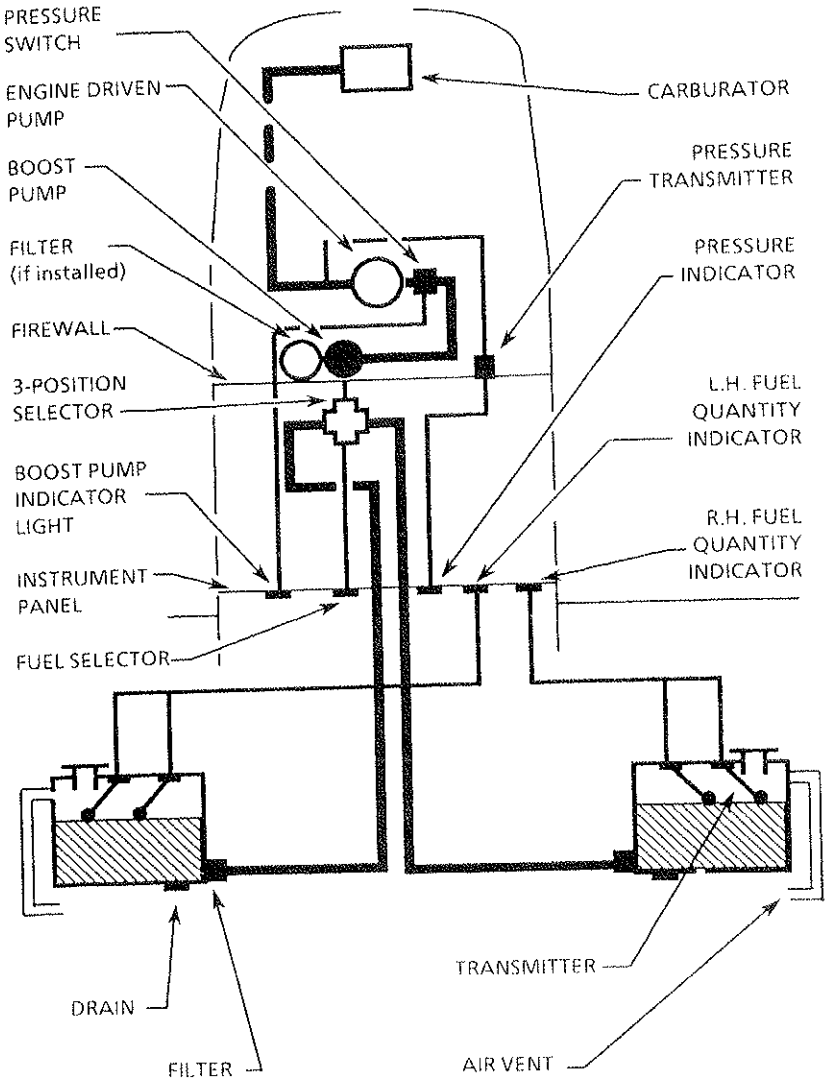


Figure 7.13 - FUEL SYSTEM DIAGRAM

FUEL SYSTEM

The fuel system (see Figures 7.13 and 7.14) consists of two vented integral fuel tanks (one in each wing), a selector valve, a filter (if installed), an auxiliary fuel pump as well as an engine-driven fuel pump and a carburator.

Engine-driven fuel pump suction draws fuel from L.H. or R.H. tank through the three-position selector valve.
The selector valve is controlled through a knob located on the L.H. instrument panel strip.
The selector valve knob has following positions labeled : "LEFT", "CLOSED" , "RIGHT".

Then, the fuel goes through the auxiliary fuel pump (electric) and supplies the engine fuel pump. The engine pump supplies under pressure the carburator.

Fuel quantities :

		Standard Tank	Optional tank
- Total maximum	:	41.7 U.S Gal (158 l)	55.4 U.S Gal (210 l)
- Total usable	:	40.2 U.S Gal (152 l)	53.9 U.S Gal (204 l)
- Unusable	:	1.6 U.S Gal (6 l)	1.6 U.S Gal (6 l)

In cruise flight, a continuation of fuel flow must be assured as the new tank is being selected. When switching from one tank to the other, place the auxiliary fuel pump switch momentarily in the "ON" position until normal fuel flow has been restored.

Each fuel tank is equipped with its own venting system, which is essential to fuel system operation. Blockage of a venting system will result in a decreasing fuel flow from the respective fuel tank and eventual stoppage of the engine. Venting is accomplished by a vent line which terminates at each wing lower surface.

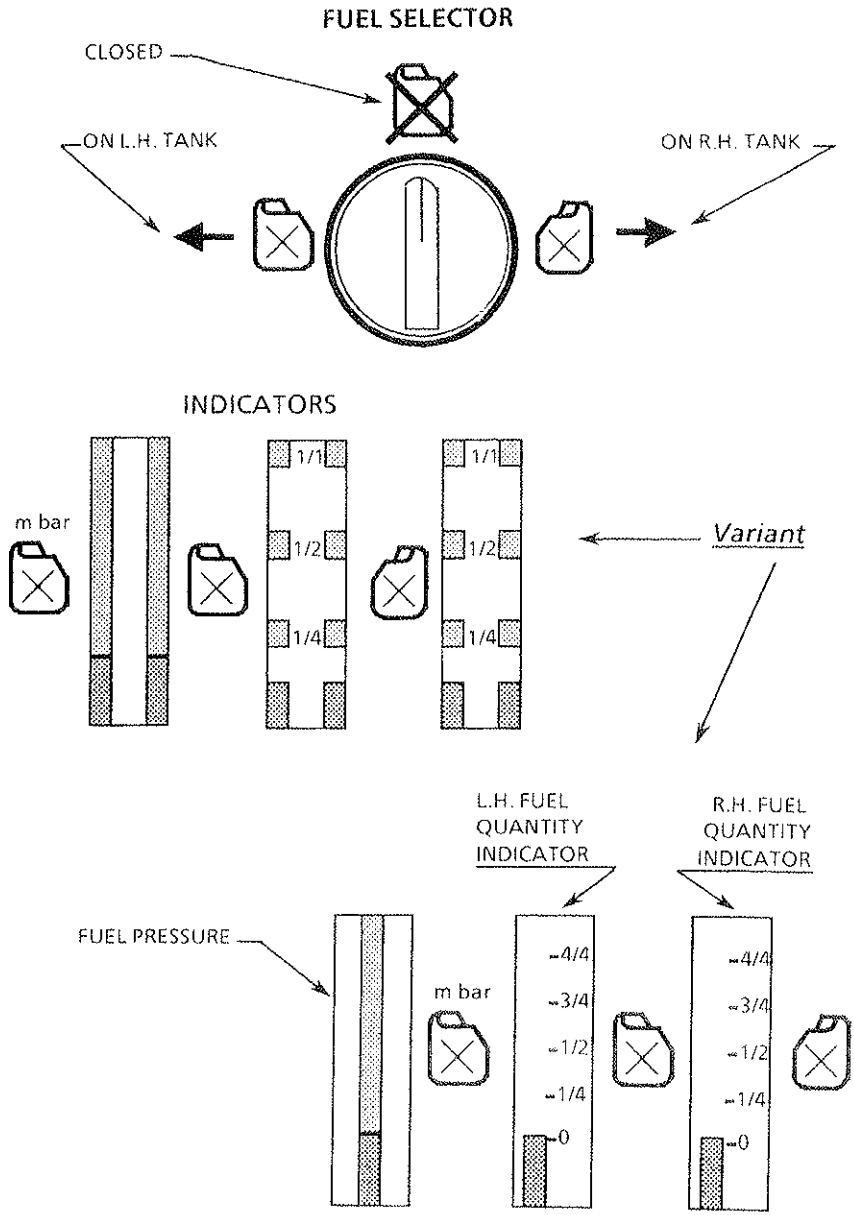


Figure 7.14 - FUEL SYSTEM MARKINGS

Fuel quantity is measured by two or four electrically-operated fuel quantity transmitters (one or two in each wing tank depending on versions) and is shown by two fuel quantity indicators located on the upper portion of the central console.
Indicators are calibrated at 1/4, 1/2, and on some versions at 3/4, 4/4, a red line indicating an empty tank. When and indicator shows an empty tank, approximately one gallon remains in the tank as unusable fuel.
The indicators cannot be relied upon for accurate readings during skids, slips or unusual attitudes. If both indicator pointers should rapidly move to a zero, check voltmeter and oil temperature indicators. If they are not indicating, an electrical malfunction has occurred.

The auxiliary fuel pump is controlled by a switch-breaker located on front part of pedestal.
An indicator light located on the alarms panel show operation of the auxiliary pump.
The fuel system is equipped with drain valves to provide a means for the examination of the fuel in the system for contamination and grade. The system should be drained before the first flight of every day and after each refueling by using the fuel sampler provided to drain fuel from the wing tank sump drain, the fuel strainers drains. The fuel tank sump drains are located just outboard of each main landing gear well. If "SOFRANCE" filter is installed, drain it regularly.

The fuel tanks should be filled after each flight to minimize condensation, respecting the weight and balance limits.
The tanks are provided (from S / N 275) with a gage visible from the filling port.
The fuel tanks uplift (not marked on the gage) is completed when the fuel is flush with the filling port.

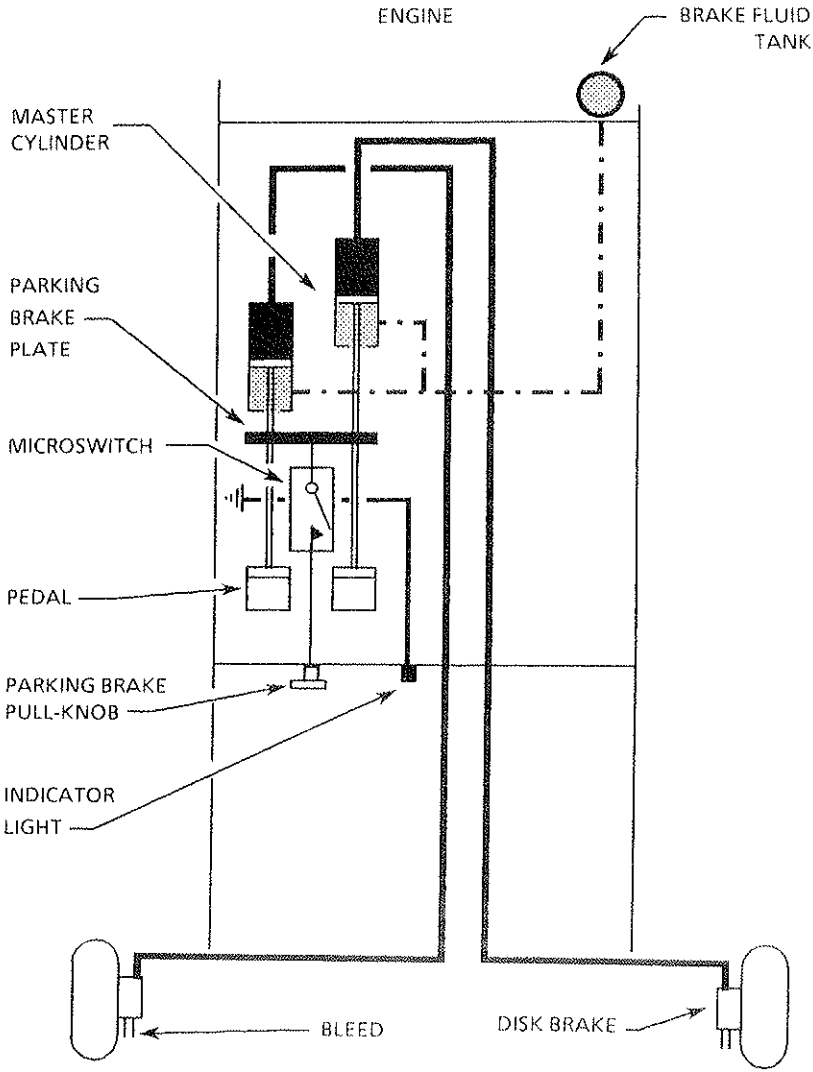


Figure 7.15 - BRAKE SYSTEM
(Valid up to S / N 340)

BRAKE SYSTEM

BRAKING

Braking is provided by hydraulic disk brakes actuated by braking pedals located on the L.H. station rudder pedals.

The R.H. station may also be equipped with braking pedals.

Differential braking helps to maneuver during taxiing :
- L.H. pedal actuates the L.H. wheel,
- R.H. pedal actuates the R.H. wheel.

MECHANICAL PARKING BRAKE (See Figure 7.15)
(Valid up to S / N 340)

- Braking is ensured by a pull-knob located in the lower section of the instrument panel strip.
- To apply the parking brake, depress the rudder pedals and pull the parking brake control knob.
- To release the parking brake, depress the rudder pedals without actuating the pull-knob.
- A light on the warning panel indicates that the brakes are applied.

NOTE :
Operating the brake knob does not cause the parking brake to operate.

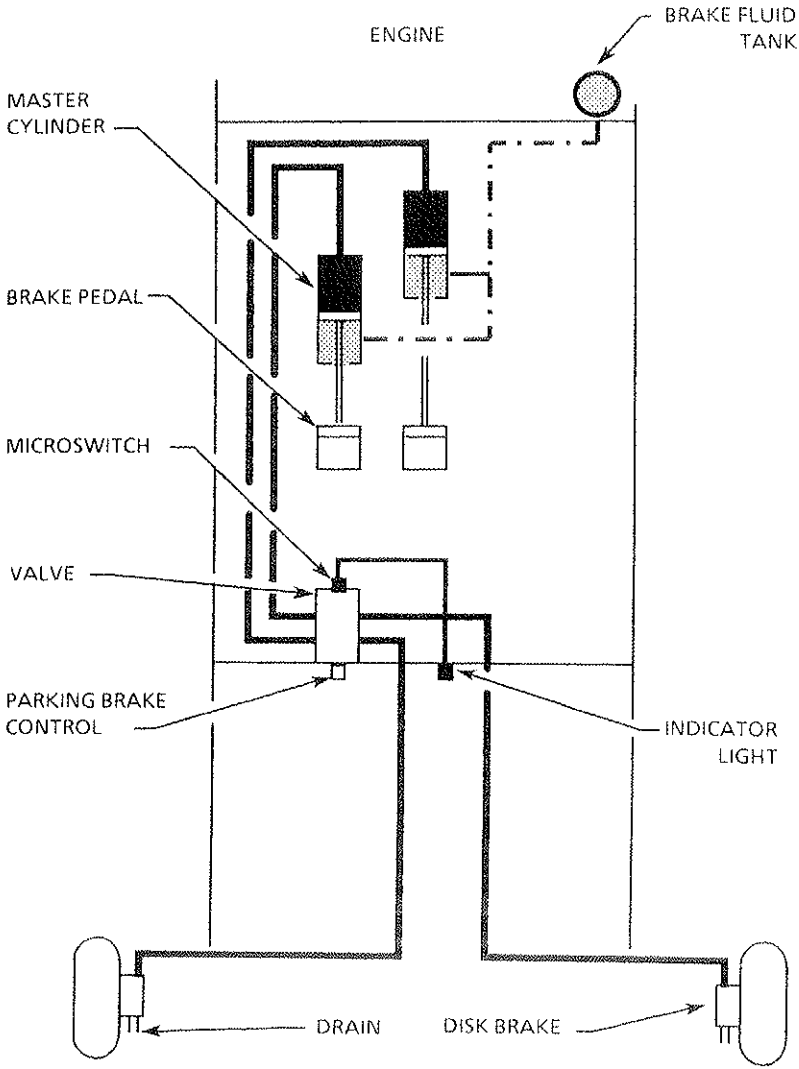


Figure 7.15A - BRAKE SYSTEM
(Valid from S / N 341)

VALVE-TYPE PARKING BRAKE (See Figure 7.15A)
(Valid from S / N 341)

- Parking brake is constituted with a knob located on the lower section of the L.H. strip, actuating a valve.
- To apply the parking brake, depress the pedals and turn the parking brake knob rightward.
- To release the parking brake, depress the pedals and set knob again in its vertical position (turn it leftward).
- An indicator light located on the alarms panel shows the position of the parking brake knob.

NOTE :

Operating the brake knob does not cause the parking brake to operate.

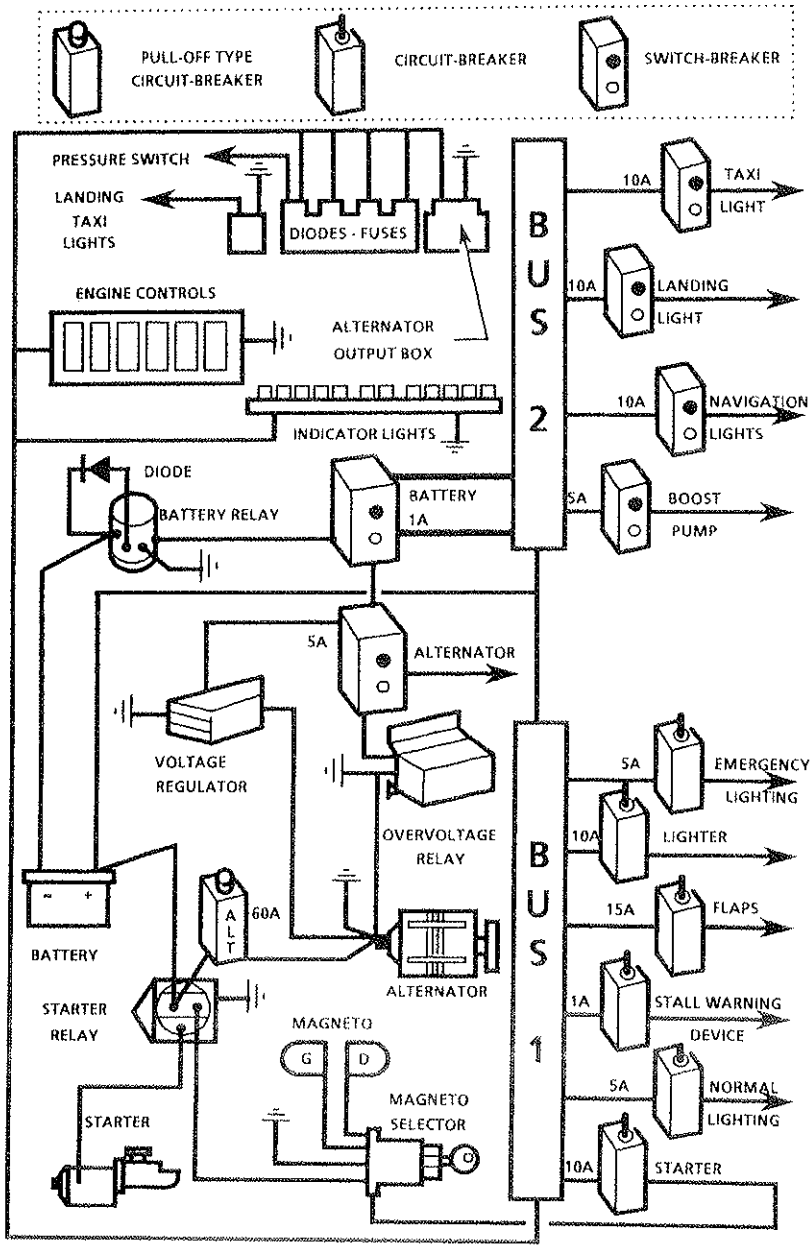


Figure 7.16 - STANDARD ELECTRICAL DIAGRAM
(Valid up to S / N 180, if alternator circuit-breaker on firewall)

STANDARD ELECTRICAL SYSTEM

The airplane is equipped with a 12-volt, direct-current electrical system (see Figures 7.16, 7.16A and 7.16B). A belt-driven 60-amp alternator installed on the engine and a battery located in the engine compartment on firewall R.H. side supply the system.

The alternator (depending on versions) is controlled by :

- a regulator providing voltage regulation and an overvoltage relay detecting overvoltages in the network.
- an alternator control unit providing voltage regulation, plus overvoltage sensing.

A "pull-off" type circuit-breaker calibrated at 60 amps limits the alternator electrical load to the battery and the networks.

ALTERNATOR REGULATOR

A regulator and (integrated or not into this regulator), an overvoltage relay located on the firewall on engine or on cabin side (depending on versions) provides the alternator voltage regulation and overvoltage protection.

In the event of overvoltage, the regulator disconnects the alternator and the indicator light labeled "ALT" illuminates. Only the battery powers the airplane network.

The regulator reset is operated by disconnecting and closing the switch-breaker labeled "ALT".

MAIN SWITCH

Battery connection to the electrical network is made through the switch-breaker labeled "BATTERY".

Before connecting ground power receptacle (if installed) on external power unit, check that main switch is OFF.

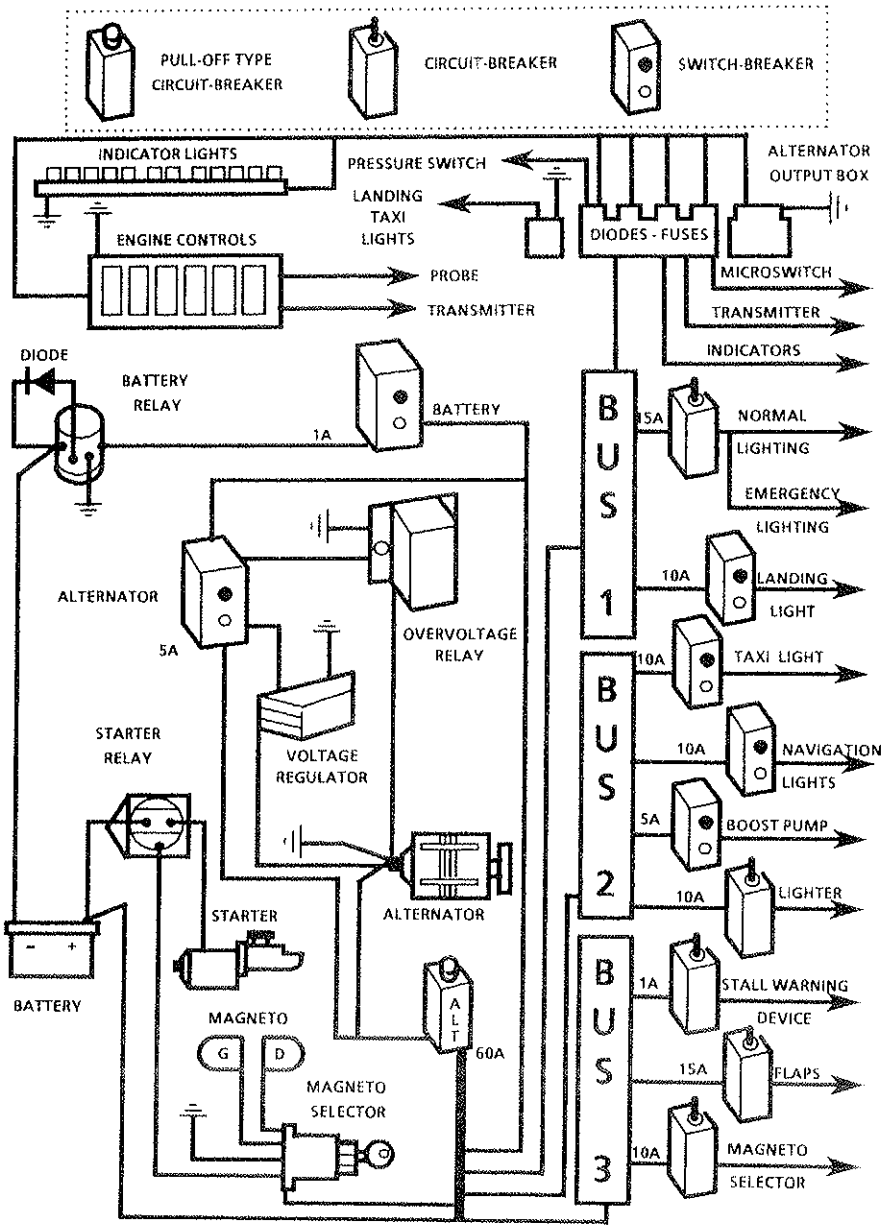


Figure 7.16A - STANDARD ELECTRICAL DIAGRAM
(Valid up to S / N 180, if alternator circuit-breaker in cabin and from S / N 181 to S / N 369)

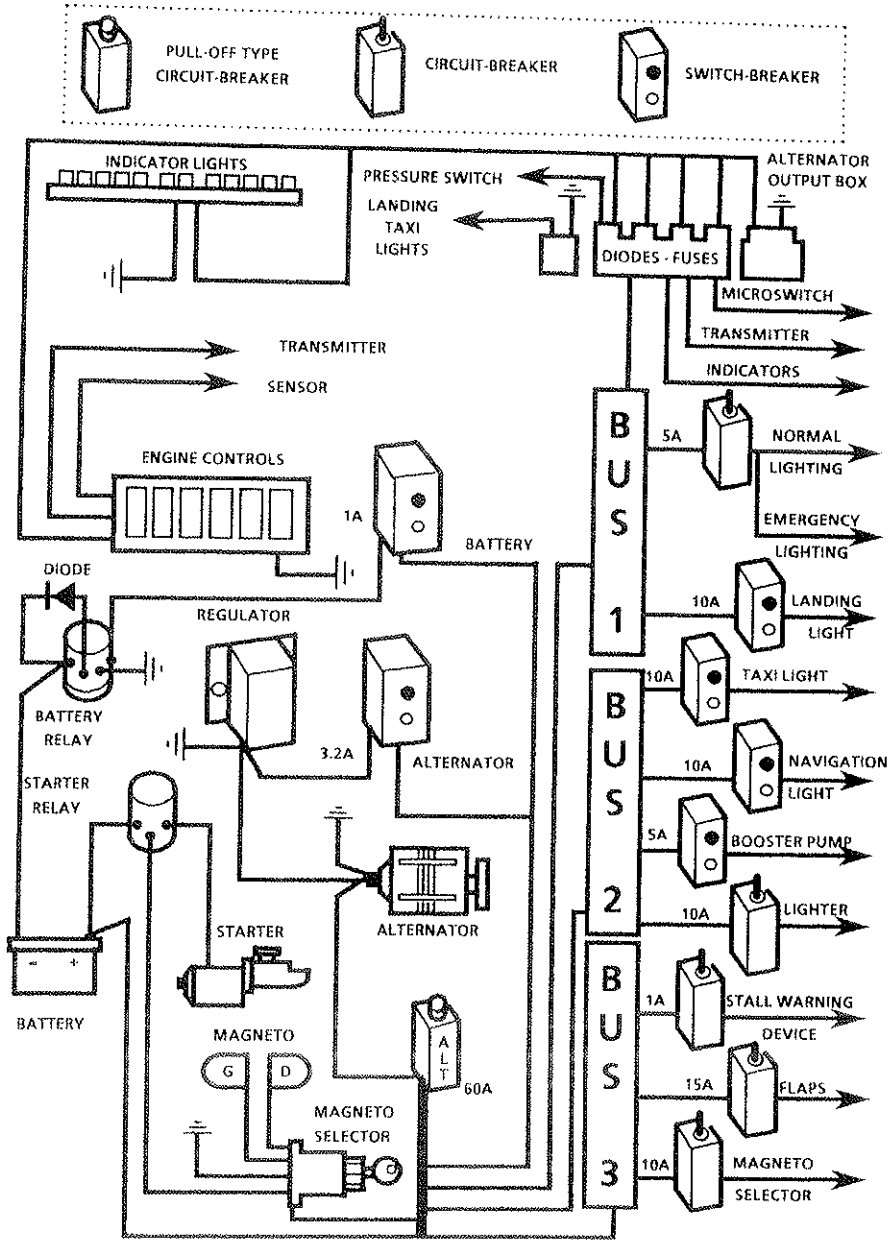


Figure 7.16B - STANDARD ELECTRICAL DIAGRAM
(Valid from S / N 370)

ALTERNATOR CONTROL

Located on the R.H. side of the main switch, the alternator switch-breaker labeled "ALT" controls the operating of the alternator through the regulator.

In the event of an alternator disconnection, should the flight be continued, only the necessary electrical equipment will be used.

Up to S / N 180, except airplanes fitted with alternator circuit-breaker in cabin or with Kit Nr 9074, "BATTERY" disconnecting in flight disconnects simultaneously all electrical power supplies.

From S / N 181 plus airplanes S / N 1 to 180 fitted with alternator circuit-breaker in cabin or with Kit Nr 9074, the "BATTERY" and "ALTERNATOR" disconnecting in flight disconnects simultaneously all electrical power supplies.

AVIONICS POWER SWITCH (if installed)

A switch labeled "RADIO MASTER" is installed on R.H. side of the L.H. strip to control the supply of avionics equipment and enable automatic diconnection of avionics systems when the engine starts, or manual disconnection during abnormal conditions.

When the switch is in OFF position, no electrical power will be applied to the avionics equipment. The avionics power switch "RADIO MASTER" should be placed in the OFF position prior to turning main switch ON or OFF, or applying an external power source and may be utilized in place of the individual avionics equipment switches.

"RADIO MASTER" function does not concern some optional equipment such as electric trim, autopilot, HF transceiver...

VOLTMETER

A voltmeter is incorporated to the engine control intruments module, located on the console, to monitor electric generation system efficiency.

With the alternator operating, the indication must stabilize in the green sector.

With the alternator off, indication may go down to the yellow sector.

If indication is within lower red sector, remove and charge the battery.

If indication is within the upper red sector with the alternator operating, the regulator has to be adjusted.

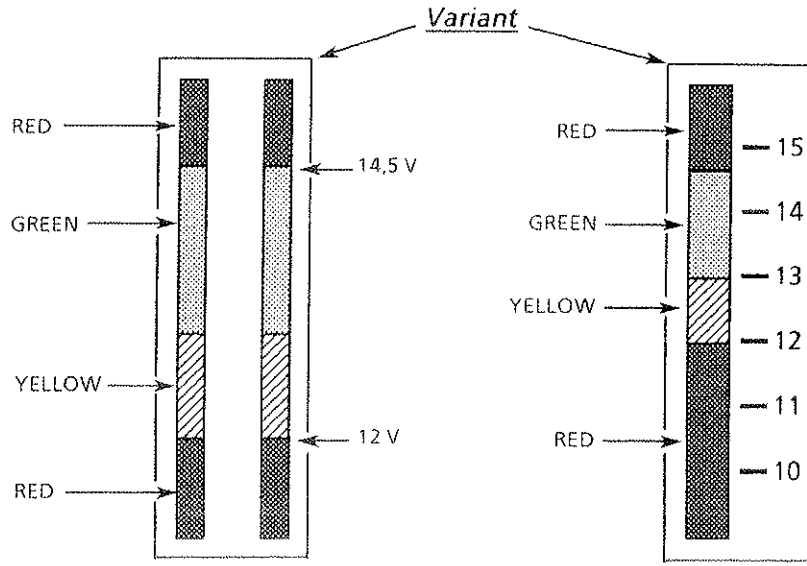


Figure 17 - VOLTMETER MARKINGS

CIRCUIT-BREAKERS AND FUSES

Most of electrical circuits are protected by circuit-breakers installed on the L.H. side panel, adjacent to the pilot. Should an overload occur on a circuit, the circuit-breaker trips and will switch off the circuit. Allow it to cool for three minutes approximately, then the circuit-breaker may be reengaged (pressed down).

Avionics equipment are protected by circuit-breakers grouped in the lower part of the L.H. side circuit-breakers panel.

Fuses located on L.H. firewall door protect the engine control instruments, the regulation units, cabin entrance courtesy light and (if installed) the watch.

UNDERVOLTAGE WARNING LIGHT

Anytime electrical system voltage falls below approximately 12.7 volts, as directly sensed by the distribution systems, an amber (red on U.K. airplanes) indicator light labeled "ALT" illuminates on alarms panel to warn the pilot.

GROUND POWER RECEPTACLE (if installed)

A ground power receptacle permits the use of an external power source for cold weather starting and during maintenance work on the airplane electrical system. Details of the ground power receptacle are presented in Section 9 "Supplements".

IFR AND NIGHT VFR ELECTRICAL SYSTEMS (if installed)

For IFR and night VFR operation, a stricter network protection segregation has been done.

In addition to protection of the alternator supply with a 60-amp pull-off type circuit-breaker labeled "ALT", the following pull-off type circuit-breakers have been installed :

- 70 A labeled "BAT" between battery and network
- 40 A labeled "BUS 1" on bus bar 1 supply
- 40 A labeled "BUS 2" on bus bar 2 supply
- 40 A labeled "BUS 3" on bus bar 3 supply

These five pull-off type circuit-breakers are manually-operated and can isolate the various sources or bus bars.

For further information, refer to Section 9 : "IFR" Supplement 1 and "VFR" Supplement 2 of this Flight Manual.

LIGHTING SYSTEMS

EXTERIOR LIGHTING

Exterior lighting consists of conventional navigation lights located an the wing tips and tail cone stinger, a landing light and a taxi light mounted on the L.H. wing leading edge.

The airplane may be equipped with an anticollision light on vertical stabilizer. In addition to navigation lights the exterior lighting may include a strobe light installed on tail cone stinger and on each wing tip.

All exterior lights are controlled by switch-breakers located on central pedestal. The switch-breakers are on pushing forward and off pushing rearward.

Anticollision light and strobe lights should not be used when flying through clouds or overcast, the flashing light reflected from water droplets or particles in the atmosphere, particularly at night, can produce vertigo and loss of orientation.

INTERIOR LIGHTING

Intrument panel and control panels lighting is provided by integral, flood, post lights and electroluminescent lighting. Three lighting control knobs are grouped together on the L.H. part of the L.H. instrument panel.

These three controls vary the intensity of all instrument panel and L.H. sidewall circuit-breakers panel, except for the rear overhead light. The following paragraphs describe the function of these controls.

Lighting controls :

They allow the operating from down to up of :

- "Normal" control which controls and modulates L.H. and R.H. instrument panels visors lighting.
- "Emergency" control (if installed) which modulates lighting of overhead lights controlled by rotating them.
- "Radio and instruments" control (if installed) which controls and modulates console visor lighting, instruments and equipment on instrument panel and circuit-breakers panel.

NOTE :

- *Both "normal" and "radio and instruments" controls operate and modulate lighting ; from high position "OFF", turn clockwise for "FULL INTENSITY OPERATION" then still clockwise, modulate towards "MINIMUM INTENSITY", turn back to "OFF" position turning counterclockwise.*
- *"Emergency" control modulates lighting ; from high position "FULL INTENSITY" turn clockwise to modulate towards "MINIMUM INTENSITY" ; turn back to high position "FULL INTENSITY" turning counterclockwise.*

A courtesy light is installed in the cabin headliner, in front of the aerators, to facilitate boarding or deplaning the airplane during night operations. The light circuit requires power to be applied to the main electrical system bus bars for operation (Main switch may remain OFF).

This light is controlled by a toggle switch integrated to the light.

A maps reading light may be installed on the bottom of the control's wheel. This light illuminates the lower portion of the cabin in front of the pilot and is used for reading maps and other flight data during night operation. It is controlled by a switch located on the right horn of the pilot's control wheel.

DEMISTING, AIR CONDITIONING, VENTILATION, FIRE CUT-OFF (Valid up to S / N 584)

The temperature and volume of airflow to the cabin is regulated by the cabin air selector sytem and the vents (see Figure 7.18).

DEMISTING (Valid up to S / N 584)

The air intake located on the L.H. side of the propeller cone provides air supply to the exchanger located around the exhaust duct, the heated air supplies a box located aft of the firewall (in front of front passenger's feet). This box may be shut off by a fire cut-off shutter and allows air distribution on both sides of the windshield.

The airflow (hot or cold depending on the position of the other two controls) is regulated from the L.H. knob (up to S / N 274) or from the lower knob (from S / N 275 to S / N 584) on control panel located on R.H. part of the instrument panel strip.

AIR CONDITIONING (Valid up to S / N 584)

Hot air

Comes from the exchanger (located around exhaust duct).

This heated air supplies a cabin air mixer located aft of the firewall (in front of front passenger's feet).

The hot airflow supplying this mixer is regulated by a fire cut-off shutter from the R.H. knob (up to S / N 274) or the upper knob (from S / N 275 to S / N 584) on the control panel located on R.H. portion of the instrument panel strip.

Cold air

Comes from R.H. NACA. This cold air supplies cabin air mixer through the central knob of the control panel.

Hot / cold air mixing in cabin air mixer

Regulation is obtained by moving the above-mentioned controls :

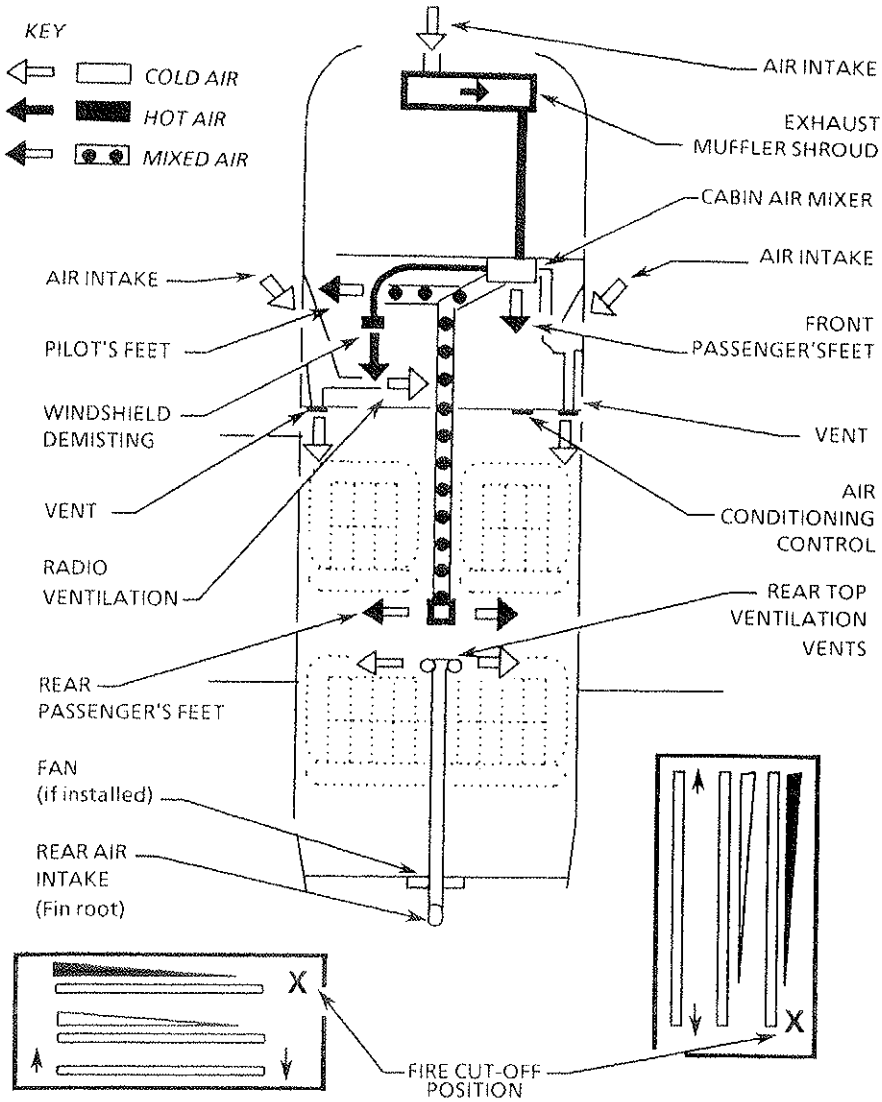
- Up to S / N 274
  - upwards, full flow
  - downwards, no flow
- From S / N 275 to S / N 584
  - to the left, full flow
  - to the right, no flow

Distribution of conditioned air

The cabin air mixer is distributed in the cabin through the L.H. knob (up to S / N 274) or the lower knob (from S / N 275 to S / N 584) on the control panel.

This knob allows :

- Up position (up to S / N 274), L.H. position (from S / N 275 to S / N 584) : Windshield deicing and demisting
- Intermediate position : General air conditioning
- Down position (up to S / N 274) or R.H. position (from S / N 275 to S / N 584) : Front and rear passengers air conditioning.



AIR CONDITIONING CONTROL
(Valid from S / N 275 to S / N 584)

AIR CONDITIONING CONTROL
(Valid up to S / N 274)

Figure 7.18 - DEMISTING, AIR CONDITIONING, VENTILATION, CUT-OFF SYSTEM (Valid up to S / N 584)

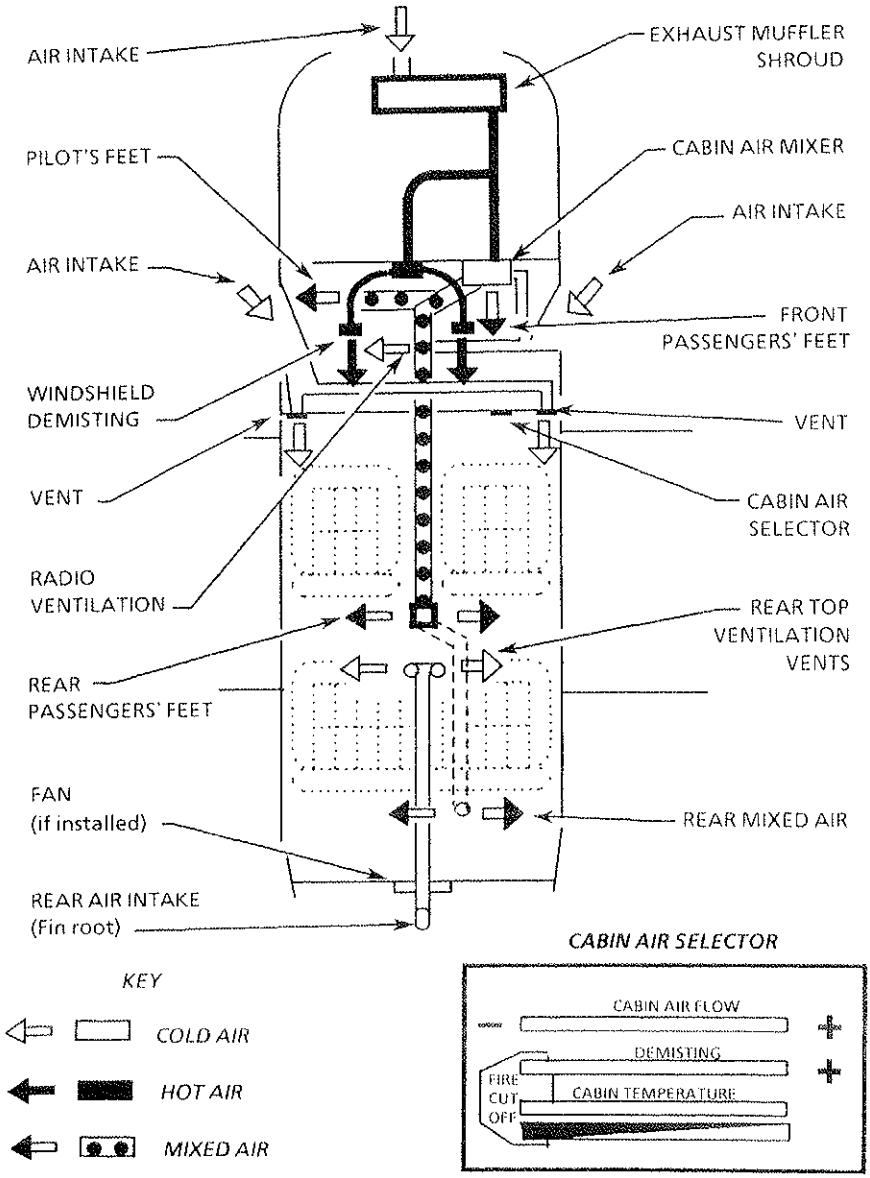


Figure 7.18A - DEMISTING, AIR CONDITIONING, VENTILATION, CUT-OFF SYSTEM (Valid from S / N 585)

VENTILATION (Valid from S / N 585)

Low ventilation

See "Cold air" and "air distribution" of the previous "Air conditioning" paragraph.

High ventilation

- Pilot + front passenger

  Air (at outside temperature) coming from NACA L.H. air intake supplies two steerable vents which airflow may be regulated, located on both parts of the instrument panel strip.

- Rear passengers

  An air intake (at outside temperature), located at the bottom part of the fin, supplies two vents (steerable and with adjustable airflow) installed on the upper duct.

A blower (if installed) attached on aft face of the baggage compartment (former 6) and picking up outside air in aft fuselage permits to accelerate the cold airflow at rear seats. The blower switch is located on the upper duct, in front of vents (see Figure 7.4).

FIRE CUT-OFF (Valid from S / N 585)

CAUTION

TO PROVIDE THE CUT-OFF OPERATION, BOTH "DEMISTING" AND "CABIN TEMPERATURE" CONTROLS MUST BE FULLY POSITIONED TO THE LEFT.

AIRSPEED INDICATING SYSTEM AND INSTRUMENTS

The airspeed indicating system (see Figure 7.19) supplies pitot air pressure to the airspeed indicator or true airspeed indicator and static air pressure to the airspeed indicator or true airspeed indicator the vertical speed indicator and the altimeter.

The system consists of a pitot, which can be heated, located on the lower surface of the L.H. wing, two static ports located on L.H. and R.H. side of aft fuselage, a static system drain located on the wings splicing.

The pitot heating system (if installed) is controlled by a switch-breaker located on the central pedestal.

The alternate static source (if installed) is controlled by a knob located on the L.H. strip, this knob controls a valve which supplies static pressure from inside the cabin.

Refer to Sections 3 "Emergency procedures" and 5 "Performance" of this manual for the pressure variations influence on instruments indication.

When stopped, protect the static ports and pitot with covers.

TRUE AIRSPEED INDICATOR (if installed)

The true airspeed indicator is fitted with a rotable ring which works in conjunction with its dial in a manner similar to a flight computer.

To set the indicator, first rotate the ring until pressure altitude is aligned with outside air temperature.

To obtain pressure altitude, set the barometric scale of the altimeter to 29.92 in.Hg (1013.2 hPa) and read pressure altitude. Pressure altitude should not be confused with QNH altitude.

Having set the ring to correct for altitude and temperature, read the true airspeed shown on the rotable ring by the indicator pointer.

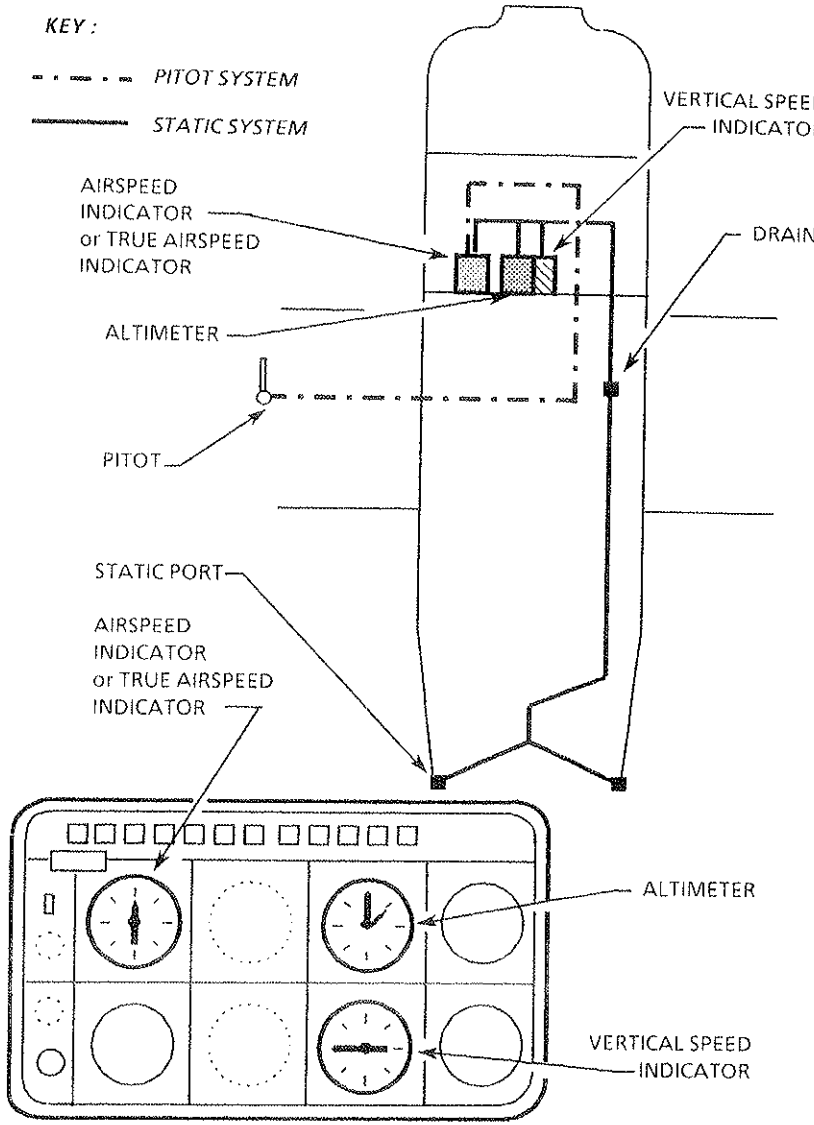


Figure 7.19 - AIRSPEED INDICATING STANDARD SYSTEM

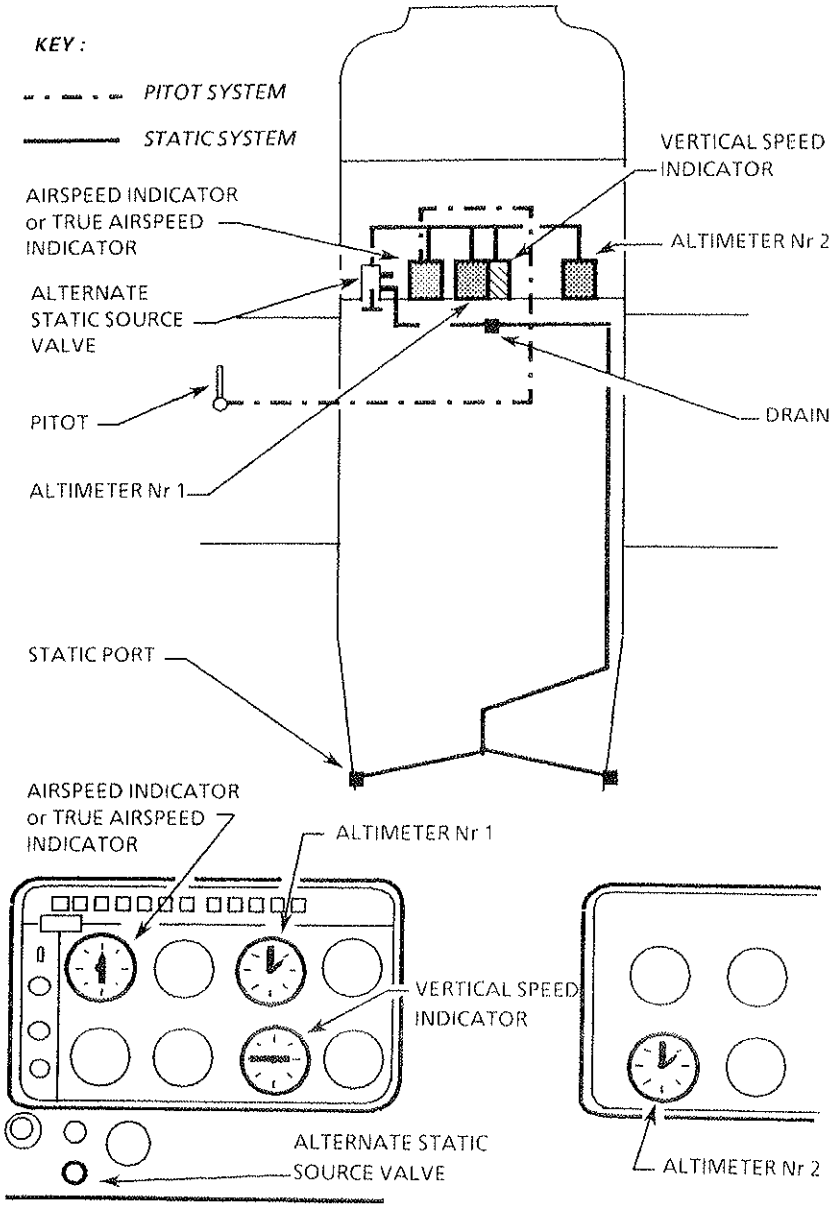


Figure 7.19A - AIRSPEED INDICATING SYSTEM WITH ALTERNATE STATIC SOURCE

For best accuracy, the indicated airspeed should be corrected to corrected airspeed by referring to the Airspeed calibration chart in Section 5 "Performance". Knowing the calibrated airspeed, read true airspeed on the ring opposite the cabibrated airspeed.

VERTICAL SPEED INDICATOR

The vertical speed indicator depicts airplane rate of climb or descent in feet per minute. The pointer is actuated by atmospheric pressure changes resulting from changes of altitude as supplied by the static source.

ALTIMETER

Airplane altitude is depicted by a barometric type altimeter. A knob near the lower left portion of the indicator provides adjustment of the instrument barometric scale to the current altimeter setting.

ALTERNATE STATIC SOURCE (if installed)

A two position selector allows the normal static source system of the airplane to be isolated in case of clogging or icing of static ports.

The "EMERGENCY" position of the alternate static source valve admits cabin static pressure to the static system (see Figure 7.19A).

VACUUM SYSTEM AND INSTRUMENTS

The airplane may be fitted with a vacuum system (see Figure 7.20) providing the suction necessary to operate an attitude indicator and directional indicator.

The sytem consists of an engine-driven vacuum system, a vacuum relief valve and an air filter installed between the firewall and instrument panel, vacuum-operated instruments installed on L.H. instrument panel and a suction gage installed on L.H.panel strip, near the pilot's control wheel.

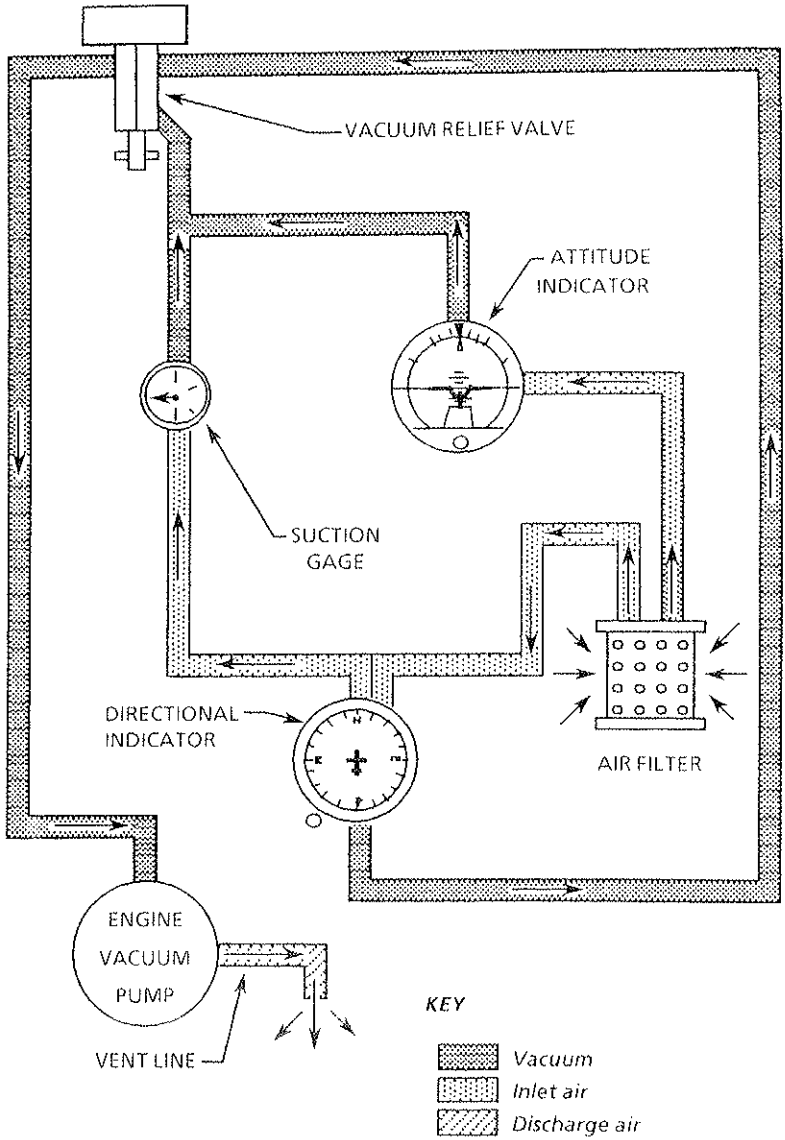


Figure 7.20 - VACUUM SYSTEM

The system may be provided with an alarm, red warning light labeled "GYROS" on the alarms panel ; this warning light indicating an insufficient suction illuminates between 3 and 3.5 in.Hg.

ATTITUDE INDICATOR (if installed)

The attitude indicator gives a visual indication of flight attitude. Bank attitude is presented by an index at the top of the indicator relative to the bank scale which has index marks at 10°, 20°, 30°, 60° and 90° either side of the center mark.

Pitch and roll attitudes are presented by a miniature airplane superimposed over a symbolic horizon area divided into two sections by a white horizon bar. The upper "sky blue" area and the lower "ground" area have arbitrary pitch reference lines useful for pitch attitude control.

A knob at the bottom of the instrument is provided for inflight adjustment of the miniature airplane to the horizon bar for a more accurate flight attitude indication.

DIRECTIONAL INDICATOR (if installed)

The directional indicator displays airplane heading on a compass card in relation to a fixed simulated airplane image and index. The directional indicator will precess slightly over a period of time. Therefore, the compass card should be set in accordance with the magnetic compass just prior to take-off and regularly re-adjusted on extended flights. A knob on the lower left edge of the instrument is used to adjust the compass card to correct for any precession.

SUCTION GAGE (if installed)

The suction gage is calibrated in inches of mercury and indicates the suction available for operation of the attitude and directional indicators. The desired suction range is 4.4 to 5.2 in.Hg.

A suction reading out of this range may indicate a system malfunction or improper adjustment, and in this case, the indicators should not be considered reliable.

AUTOPILOTS

Refer to Section 9 "Supplements".

STALL WARNING SYSTEM

The airplane is equipped with a vane-type stall warning unit in the leading edge of the left wing. The unit is electrically connected to an aural warning. The vane in the wing senses the change in airflow over the wing and operates the warning unit, which produces a tone over the alarms speaker. This warning tone begins between 5 and 10 knots above the stall in all configurations.

The stall warning system should be checked during the preflight inspection by momentarily turning on the battery switch and actuating the vane in the wing. The system is operational if a continuous bell is heard in front of the L.H. instrument panel.

STATIC DISCHARGERS (if installed)

As an aid in IFR flights, wick-type static dischargers are installed to improve radio communications during flight through dust or various forms of precipitation (rain, snow or ice crystals).

Under these conditions, the build-up and discharge of static electricity from the trailing edges of the wings (flaps and ailerons), rudder, stabilator, propeller tips and radio antennas can result in loss of usable radio signals on all communications and navigation radio equipment. Usually, the ADF is first to be affected and VHF communication equipment is the last to be affected.

Installation of static dischargers reduces interference from precipitation static, but it is possible to encounter severe precipitation static conditions which might cause the loss of radio signals, even with static dischargers installed. Whenever possible, avoid known severe precipitation areas to prevent loss of dependable radio signals. If avoidance is impractical, minimize airspeed and anticipate temporary loss of radio signals while in these areas.

RADIO EQUIPMENT

Refer to Section 9 "Supplements".

TURN AND BANK INDICATOR (if installed)

The bank indicator located under the airspeed indicator or the true airspeed indicator may be replaced by a turn and bank indicator ; it is controlled by a switch-breaker located in front of the pedestal and labeled "TURN COORD.".

LITTLE WINDOW (if installed)

In case a lot of mist appears on the windshield, turn both little window attachment knobs upwards and tilt window downwards.

NOTE :
Close the little window and lock it with both knobs prior to opening "butterfly" access door.

GLARE SHIELD (if installed)

To remove glare shield, firmly pull downwards the foamed attachment pin, the latter is equipped (in its upper part) with an adjusting screw which provides friction on arm swivelling. After adjustment, lock the screw using varnish.

To reinstall the glare shield, beat it firmly upwards, at the basis of the foamed attachment pin.

FIRE EXTINGUISHER (if installed)

The fire extinguisher is located under L.H. front seat. It is accessible by moving the seat full backwards. It is attached on the floor by means of a quick-disconnect clamp. A pressure gage allows checking the fire extinguisher condition, follow the recommendations indicated on the extinguisher.

SECTION 8

AIRPLANE HANDLING, SERVICE AND MAINTENANCE

TABLE OF CONTENTS

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(Continued)

GENERAL

This section contains the procedures recommended by SOCATA for the proper ground handling and routine care and servicing of your SOCATA Model TB 9 airplane. Also included in this section are the inspection and maintenance requirements which must be followed if your airplane is to retain its performance and dependability.

It is recommended that a planned schedule of lubrication and preventive maintenance be followed, and that this schedule be tailored to the climatic or flying conditions to which the airplane is subjected.

For this, see Manufacturer's Maintenance Manual.

IDENTIFICATION PLATE (see Figure 8.1)

All correspondence regarding your airplane should include its serial number. This number together with the model number, type certificate number and production certificate number are stamped on the identification plate attached to the left side of the fuselage beneath the horizontal stabilizer.

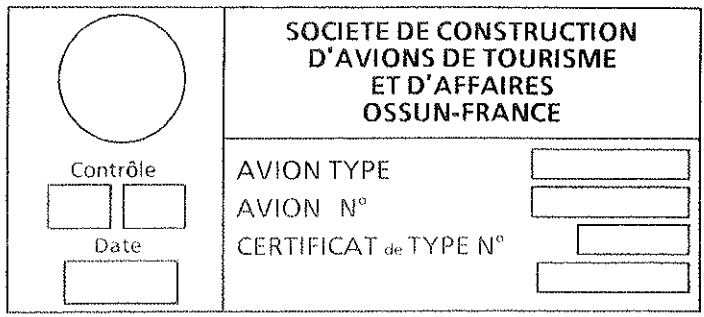

Figure 8.1 - IDENTIFICATION PLATE

PUBLICATIONS

When the airplane is delivered from the factory, it is supplied with a Pilot's Operating Handbook and supplemental data covering optional equipment installed in the airplane.

In addition, the owner may purchase the following :

- Maintenance Manual
- Illustrated Parts Catalog
- Price Catalog
- Removal and Installation Labor Allowances

NOTE :
At the beginning of the Manual, you will find a sheet which enables you to order various Manuals available from SOCATA.

CAUTION

PILOT'S OPERATING HANDBOOK MUST ALWAYS BE IN THE AIRPLANE

INSPECTION PERIODS

Refer to regulations in force in the certification country for information concerning preventive maintenance which is to be carried out by pilots.

A maintenance Manual should be obtained prior to performing any preventive maintenance to ensure that proper procedures are followed. Maintenance must be accomplished by licensed personnel.

ALTERATIONS OR REPAIRS

It is essential that the Airworthiness authorities be contacted prior to any alterations or repairs on the airplane to ensure that airworhiness of the airplane is not violated. Alterations or repairs must be accomplished by licensed personnel.

GROUND HANDLING

TOWING

CAUTION

USING THE PROPELLER FOR GROUND HANDLING COULD RESULT IN SERIOUS DAMAGE, ESPECIALLY IF PRESSURE OR PULL IS EXERTED ON BLADE TIPS

The airplane should be moved on the ground with the aid of nose gear strut fork tow bar which is stowed in the baggage compartment or with a vehicle which will not damage the nose gear steering device or exert excessive loads on the latter.

CAUTION

DO NOT TOW THE AIRPLANE WHEN CONTROLS ARE LOCKED

WHEN TOWING WITH A VEHICLE, DO NOT EXCEED THE NOSE GEAR TURNING ANGLE, OR DAMAGE TO THE GEAR AND STEERING DEVICE WILL RESULT

(see Figure 8.2)

PARKING

When parking the airplane, head into the wind. Do not set the parking brake when brakes are overheated or during cold weather when accumulated moisture may freeze the brakes. Care should be taken when using the parking brake for an extended period of time during which an air temperature rise or drop could cause difficulty in releasing the parking brake or damage the brake system.

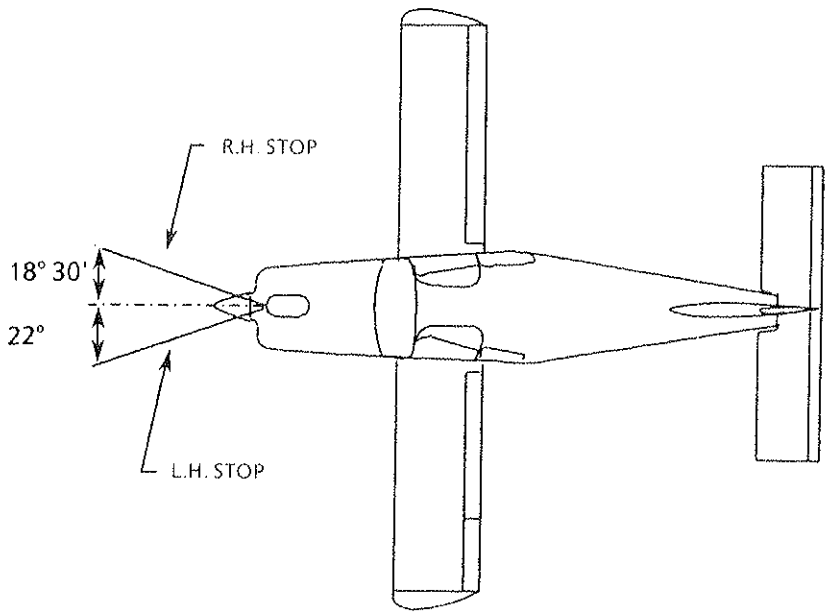

Figure 8.2 - TURNING ANGLE LIMITS

For long term parking, blanking covers (static ports, pitot), cockpit cover, tie-downs, wheel chocks and control wheel lock are recommended. In severe weather and high wind conditions, tie the airplane down as outlined in the following paragraph.

TIE-DOWN

Proper tie-down procedure is the best protection against damage to the parked airplane by gusty or strong winds. To tie-down the airplane securely, proceed as follows :

- Install control wheel lock.
- Chock all wheels.
- Tie sufficiently strong ropes or chains to hold airplane back ; insert a rope in each tie-down hole located on flaps hinge arms and in rear tie-down fitting, located under horizontal stabilizer ; secure each rope to a ramp tie-down.
- Check that doors are closed and locked.

JACKING

When it is necessary to jack the airplane off the ground or when jacking points are used, refer to Maintenance Manual for specific procedures and equipment required.

LEVELING

Level the airplane as described in Maintenance Manual.

FLYABLE STORAGE

Airplanes placed in storage for a maximum of 30 days or those which receive only intermittent use for the first 25 hours are considered in flyable storage.

Every seventh day during these periods, the propeller should be rotated by hand through several revolutions. This action "limbers" the oil and prevents any accumulation of corrosion on engine cylinder walls.

CAUTION

CHECK THAT THE MAGNETO SWITCH IS OFF, THE THROTTLE IS CLOSED, THE MIXTURE CONTROL IS IN THE IDLE CUT-OFF POSITION, AND THE AIRPLANE IS SECURED BEFORE ROTATING THE PROPELLER BY HAND. DO NOT STAND WITHIN THE ARC OF THE PROPELLER BLADES WHILE TURNING THE PROPELLER.

After 30 days in storage, the airplane should be flown for at least 30 minutes, or a ground runup should be made just long enough to produce an oil temperature within the lower green arc range. Avoid prolonged runups.

Engine runup helps to eliminate excessive accumulations of water in the fuel system and other air spaces in the engine. Keep fuel tanks full to minimize condensation in the tanks. Keep the battery fully charged to prevent the electrolyte from freezing in cold weather.

LONG TERM STORAGE WITHOUT FLYING POSSIBILITY

Refer to Maintenance Manual for the procedures to follow.

SERVICING

MAINTENANCE

In addition to the preflight inspection in Section 4, servicing, inspection, and test requirements for your airplane are detailed in the Maintenance Manual.

Maintenance Manual outlines all items which require attention at 50, 100, 400, 500 and 1000 hours intervals plus those items which require servicing, inspection or testing at special intervals, first 25 flight hours, yearly inspection, major inspection.

ENGINE OIL

Grade and Viscosity for temperature range

Outside Air Temperature	MIL-L-6082 Spec. Mineral Grades 50 first hours	MIL-L-22851 Spec. Dispersant Grades after 50 hours
All temperatures	.....	SAE 15W50 or 20W50
Above 80°F (27°C)	SAE 60	SAE 60
Above 60°F (15°C)	SAE 50	SAE 40 or SAE 50
30°F (-1°C) to 90°F (32°C)	SAE 40	SAE 40
0°F (-18°C) to 70°F (21°C)	SAE 30	SAE 30, SAE 40 or SAE 20W40
0°F (-18°C) to 90°F (32°C)	.....	SAE 20W50 or 15W50
Under 10°F (-12°C)	SAE 20	SAE 30 or SAE 20W30

NOTE :

This airplane was delivered from the factory with a corrosion-preventive aircraft engine oil. If oil must be added during the first 50 hours, use only aviation grade straight mineral oil conforming to specification MIL-L-6082.

Capacity of engine sump : 8 U.S. qt (7.6 litres)

Do not operate on less than 4 U.S. qt (3.8 litres). To minimize loss of oil through breather, fill to 6 U.S. qt (5.7 litres) for normal flights of less than 3 hours. For extended flights, fill to 8 U.S. qt (7.6 litres). These quantities refer to oil dipstick level readings.

NOTE :

Total capacity of the system : 8.45 U.S. qt (8 litres)

Oil and oil filter change :

After the first 25 hours of operation, drain engine oil sump and replace filter. Refill sump with straight mineral oil and use this kind of oil until a total of 50 hours has accumulated or oil consumption has stabilized ; then change to dispersant oil and clean strainer. Afterwards drain engine oil sump and clean filter every 25 hours. Change engine oil at least every 4 months even though less than the recommended hours have accumulated. Reduce intervals for prolonged operation in dusty areas, cold climates, or even when short flights and long idle periods result in sludging conditions.

NOTE :

To have a 50-hour drain cycle, instead of 25-hour one on TB 9 equipped with a strainer, the oil system can be fitted with a cartridge type filter - see "SPP.885-1 (Special Service Publication) TEXTRON LYCOMING"

During the first 25-hour oil and filter change, a general inspection of engine compartment is required. Items which are normally checked during a preflight inspection should be given a particular attention. Hoses, metal lines and fittings should be inspected for signs of oil and fuel leaks, and checked for abrasions, chafing, security, proper routing and support and evidence of deterioration.

Inspect the intake and exhaust systems for cracks, evidence of leakage and security of attachment. Engine controls and linkages should be checked for freedom of movement through their full range, security of attachment and evidence of wear. Inspect wirings for security, chafing, burning, defective insulation, loose or broken terminals, heat deterioration and corroded terminals. Check the alternator belt and retighten if necessary. A periodic check of these items during subsequent servicing operations is recommended.

FUEL

Approved fuel grades (and colors)

100 LL Grade Aviation Fuel (Blue)
100 Grade Aviation Fuel (Formerly 100 / 130) (Green).

CAUTION

NEVER FLY THE AIRPLANE WITH CONTAMINATED (WATER, SAND, RUST, DUST...) OR UNAPPROVED FUEL

NOTE :
Isopropyl alcohol or ethylene glycol monomethyl ether may be added to the fuel supply in quantities not to exceed 1 % or 0.15 % by volume, respectively, of the total. Refer to "Fuel Additives" paragraph hereafter for additional information.

Capacity each tank : 20.9 U.S Gal (79 l)

Capacity each tank : 27.7 U.S Gal (105 l)

NOTE :
Service the fuel system after each flight and keep fuel tanks full to minimize condensation in the tanks, respecting weight and balance limits.

WARNING

DO NOT OPERATE ANY AVIONICS OR ELECTRICAL EQUIPMENT ON THE AIRPLANE DURING FUELING. DO NOT ALLOW OPEN FLAME OR SMOKING IN THE VICINITY OF THE AIRPLANE WHILE FUELING.

DURING ALL FUELING OPERATIONS, FIRE FIGHTING EQUIPMENT MUST BE AVAILABLE ; ATTACH GROUNDING WIRE TO ANGLE (IF INSTALLED) ON UPPER SURFACE OF WING NEAR THE CAP ; IN CASE THERE IS NO ANGLE, ATTACH CABLE TO A METALLIC PART OF THE AIRPLANE WHICH IS NOT PAINTED.

Fuel additives

Strict adherence to recommended preflight draining instructions as called for in Section 4 will eliminate any free water accumulations from the tank sumps. While small amounts of water may still remain in solution in the gasoline, it will normally be consumed and go unnoticed in the operation of the engine.

One exception to this can be encountered when operating under the combined effect of use of certain fuels, with high humidity conditions on the ground followed by flight at high altitude and low temperature. Under these unusual conditions, small amounts of water in solution can precipitate from the fuel stream and freeze in sufficient quantities to induce partial icing of the engine fuel system.

While these conditions are quite rare and will not normally pose a problem to owners and operators, they do exist in certain areas of the world and consequently must be dealt with, when encountered.

Therefore, to alleviate the possibility of fuel icing occurring under these unusual conditions, it is permissible to add ispropyl alcohol or ethylene glycol monomethyl ether (EGME) compound to the fuel supply.

The introduction of alcohol or EGME compound into the fuel provides two distinct effects :

- it absorbs the dissolved water from the fuel
- alcohol has a freezing temperature depressant effect.

Alcohol, if used, is to be blended with the fuel in a concentration of 1 % by volume. Concentrations greater than 1 % are not recommended since they can be detrimental to fuel tank materials.

The manner in which the alcohol is added to the fuel is significant because alcohol is most effective when it is completely dissolved in the fuel.

To ensure proper mixing, the following is recommended :

- For best results, the alcohol should be added during the fueling operation by pouring the alcohol directly on the fuel stream issuing from the fueling nozzle.
- An alternate method that may be used is to premix the complete alcohol dosage with some fuel in a separate clean container (approximately 2 to 3 U.S Gal - 7 to 11 litres) and then transferring this mixture to the tank prior to the fueling operation.

Any high quality isopropyl alcohol may be used, such as anti-icing fluid or isopropyl alcohol (Federal Specification TT-I-735a). Figure 8.3 provides alcohol - fuel mixing ratio information.

Ethylene glycol monomethyl ether (EGME) compounds, in compliance with MIL-I-27686, if used, must be carefully mixed with the fuel in concentration not to exceed 0.15 % by volume. Figure 8.3 provides EGME - fuel mixing ratio information.

CAUTION

MIXING OF THE EGME COMPOUND WITH THE FUEL IS EXTREMELY IMPORTANT. A CONCENTRATION IN EXCESS OF THAT RECOMMENDED (0.15 % BY VOLUME MAXIMUM) WILL RESULT IN DETRIMENTAL EFFECTS TO THE FUEL TANKS (DETERIORATION OF PROTECTIVE PRIMER AND SEALANTS) TO FUEL SYSTEM AND ENGINE COMPONENTS (DAMAGE TO SEALS). USE ONLY BLENDING EQUIPMENT RECOMMENDED BY THE MANUFACTURER TO OBTAIN PROPER PROPORTIONING.

DO NOT ALLOW CONCENTRATED EGME COMPOUND TO COME IN CONTACT WITH THE AIRPLANE FINISH AS DAMAGE CAN RESULT.

Prolonged storage of the airplane will result in a water buildup in the fuel which "leeches out" the additive. An indication of this is when an excessive amount of water accumulates in the fuel tank sumps. The concentration can be checked using a differential refractometer. It is imperative that the technical manual for the differential refractometer be followed explicitely when checking the additive concentration.

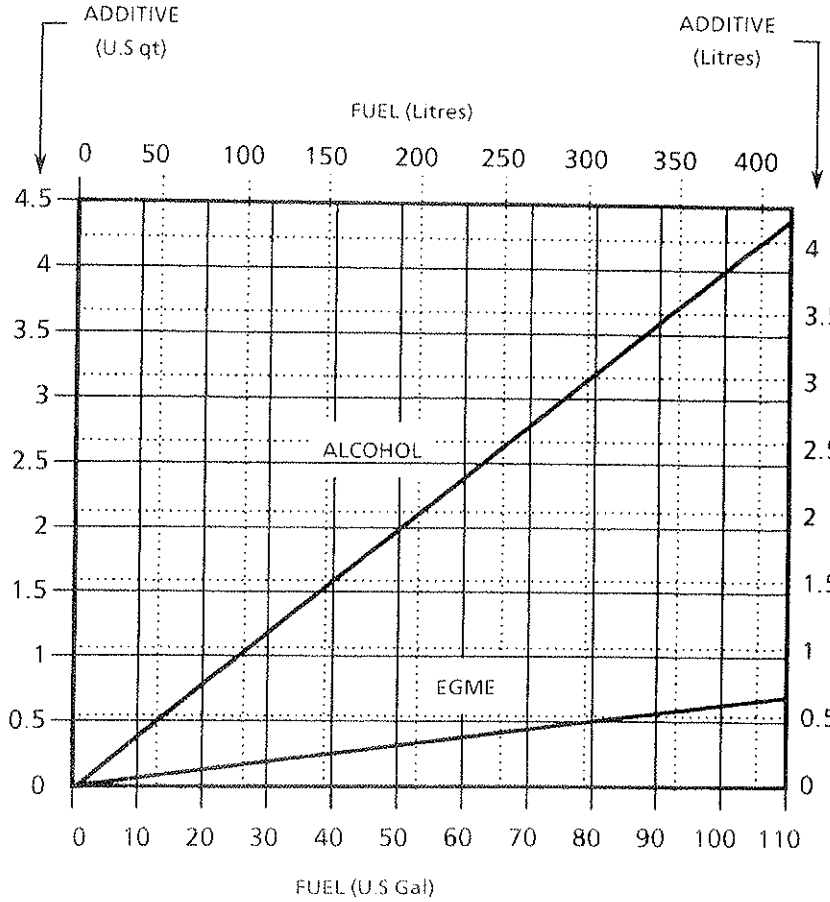

Figure 8.3 - ADDITIVE MIXING RATIO

LANDING GEAR

Nose gear tire :

5.00-5 6 PR - Inflating pressure : 45 psi (3.1 bar)

Main gear tires :

15-6.00-6 4 PR - Inflating pressure : 33.4 psi (2.3 bar)

Nose gear shock absorber :

Filling with hydraulic fluid MIL-H-5606 ; inflate with pressurized dry air or nitrogen to 94.2 psi (± 4) that is 6.5 bar (± 0.3).

Main gears shock absorbers :

Filling with hydraulic fluid MIL-H-5606 ; inflate with pressurized dry air or nitrogen to 130.5 psi (± 4) that is 9 bar (± 0.3).

Brakes :

Service as required with MIL-H-5606 hydraulic fluid.

AIRPLANE CLEANING AND CARE

WINDOWS AND WINDSHIELD

The plastic windshield and windows should be cleaned with an airplane windshield cleaner. Apply the cleaner sparingly with soft cloths and rub with moderate pressure until all dirt, oil scum and bug stains are removed. Allow the cleaner to dry, then wipe it off with soft flannel cloths.

NOTE :
Never use gasoline, benzine alcohol, acetone, fire extinguisher or anti-ice fluid, lacquer thinner or glass cleaner to clean the plastic. These materials will attack the plastic and may cause it to craze.

Follow by carefully washing with a mild detergent and plenty of water. Rinse thoroughly, then dry with a clean moist chamois. Do not rub the plastic with a dry cloth since this builds up an electrostatic charge which attracts dust. Waxing with a good commercial wax will finish the cleaning job. A thin, even coat of wax polished out by hand with clean soft flannel cloths will fill in minor scratches and help prevent further scratching.

Do not use a canvas cover on the windshield unless freezing rain or sleet is anticipated since the cover may scratch the plastic surface.

PAINTED SURFACES

Refer to Maintenance Manual for the procedures to follow.

PROPELLER CARE

Preflight inspection of propeller blades for nicks and wiping them occasionally with an oily cloth to clean off grass and bug stains will assure long blade life. Small nicks on the propeller, particularly near the tips and on the leading edges, should be dressed out as soon as possible since these nicks produce stress concentrations, and if ignored, may result in cracks. Never use an alkaline cleaner on the blades ; remove grease and dirt.

ENGINE CARE

Refer to Maintenance Manual for the procedures to follow.

INTERIOR CARE

To remove dust and loose dirt from the upholstery and carpet, clean the interior regularly with a vacuum cleaner.

For additional information, refer to Maintenance Manual.

FRONT (All validities) **AND REAR** (up to S / N 609 except the S / N 600) **ASH-TRAYS**

To empty front ash-tray, remove it while holding it on its edges (if necessary, lift it up with a screwdriver wrapped up in a cloth).

REAR ASH-TRAYS (From S / N 610 plus the S / N 600)

To empty a rear ash-tray, open it tilting its movable part to its stop, then push moderately on central part to disengage the ash-box.

To install again the ash-box, insert upper part then push on lower part.

SECTION 9

SUPPLEMENTS

NOTE

The Supplements Section must include approved Supplements for all optional equipment installed on the airplane. Additional Supplements for optional equipment not installed on this airplane may be included and can be removed if desired.

TABLE OF CONTENTS

SECTION 9

SUPPLEMENTS

This section consists of a series of supplements, each covering a single system which may be installed in the Model TB airplane. Each supplement contains a brief description, and when applicable, operating limitations, emergency and normal procedures, and performance. The supplements are arranged numerically (See "List of Supplements and Validities") to make it easier to locate a particular supplement. Some installed items of optional equipment, whose function and operational procedures do not require detailed instructions, are discussed in Section 7.

Limitations contained in the following supplements are Airworthiness Authorities approved and adherence to these limitations is mandatory.

NOTE

The Supplements Section must include approved Supplements for all optional equipment installed on the airplane. Additional Supplements for optional equipment not installed on this airplane may be included and can be removed if desired.

LIST OF EFFECTIVE PAGES AND VALIDITIES

ORIGINAL ISSUE OF JANUARY 31, 1993

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P/N Z00. 1820A3T0E0R18

Page No.	Revision No.	Page No.	Revision No.
9.AA	2	9.AS	16
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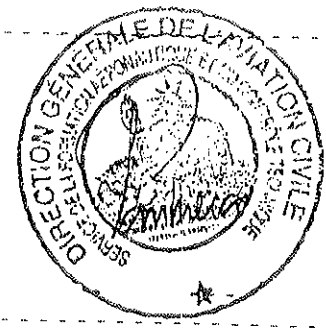
9.AN	11		
9.AO	12		
9.AP	13		
9.AQ	14		
9.AR	15		

D.G.A.C.Approval :

DGAC/SFACT/N.AG
Chargé de Certification
Grégory POMMERA

30 MAI 2002

Date : .....



LIST OF AMENDMENTS

Edition 0 of January 31, 1993

Pages	Description
9.A.1 thru 9.A.8	Complete reissue of Section 9 table of contents

LIST OF AMENDMENTS

Edition 0 of January 31, 1993

Revision 7 of June 30, 1997

Pages	Description
9.AB	List of effective pages
9.AJ	List of amendments
9.A.3	Modification of supplement 22 (addition of "BFG" WX-900 stormscope)
9.A.4	Modification of supplement 35 validity and addition of supplements 36 and 37
9.A.5	Addition of supplement 38
9.A.1 and 9.A.2	Text moving
9.A.6	Presentation

LIST OF AMENDMENTS

Edition 0 of January 31, 1993

Revision 8 of August 31, 1997

Pages	Description
9.AB	List of effective pages
9.AK	List of amendments
9.A.5	Addition of Supplement 39
9AL	Presentation

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Edition 0 of January 31, 1993

Revision 9 of September 30, 1997

Pages	Description
9.AB	List of effective pages
9.AL	List of amendments
9.A.5	Addition of Supplement 40

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Edition 0 of January 31, 1993

Revision 10 of September 30, 2000

Pages	Description
9.AB	List of effective pages
9.AM	List of amendments
9.A.5	Addition of Supplements 41 thru 44
9.AN	Presentation

LIST OF AMENDMENTS

Edition 0 of January 31, 1993

Revision 11 of October 30, 2000

Pages	Description
9.AB	List of effective pages
9.AN	List of amendments
9.A.5	Addition of Supplement 45

LIST OF AMENDMENTS

Edition 0 of January 31, 1993

Revision 12 of January 31, 2001

Pages	Description
9.AB	List of effective pages
9.AO	List of amendments
9.A.3	Modification of supplement 22 (addition of "BFG" WX-500 stormscope)
9.A.5	Addition of Supplements 46 to 48
9.A.6	Addition of Supplement 49
9.AP	Presentation

LIST OF AMENDMENTS

Edition 0 of January 31, 1993

Revision 13 of April 30, 2001

Pages	Description
9.AB	List of effective pages
9.AP	List of amendments
9.A.5	Assignment of Supplement 41 to "TKS" system
9.A.6	Approval page for the list of Supplements
9.A.6	Text moving

LIST OF AMENDMENTS

Edition 0 of January 31, 1993

Revision 14 of May 30, 2001

Pages	Description
9.AB	List of effective pages
9.AQ	List of amendments
9.A.6	Addition of Supplement 50
9.AR	Presentation

LIST OF AMENDMENTS

Edition 0 of January 31, 1993

Revision 15 of June 15, 2001

Pages	Description
9.AB	List of effective pages
9.AR	List of amendments
9.A.6	Addition of Supplement 52

LIST OF AMENDMENTS

Edition 0 of January 31, 1993

Revision 16 of June 30, 2001

Pages	Description
9.AB	List of effective pages
9.AS	List of amendments
9.A.6	Addition of Supplement 51
9.AT	Presentation

LIST OF AMENDMENTS

Edition 0 of January 31, 1993

Revision 17 of November 30, 2001

Pages	Description
9.AB	List of effective pages
9.AT	List of amendments
9.A.3	Addition of TB 21 airplanes effectivity for the Supplement 24
9.A.6	Approval page for the new list of Supplements
9.A.3 to 9.A.6	Text moving

LIST OF AMENDMENTS

Edition 0 of January 31, 1993

Revision 18 of January 15, 2002

Pages	Description
9.AB	List of effective pages
9.AU	List of amendments
9.A.5	Modification of validity for the Supplement 43
9.A.6	Addition of Supplement 53
9.AV	Presentation

LIST OF SUPPLEMENTS AND VALIDITIES

Supp. No.		Edition No. - Date
A -	General	
	TB 9 / 10 / 200 / 20 / 21 - From S / N 1	0 - 31.01.93
1 -	Day and night IFR equipment	
	TB 9 / 10 - From S / N 1 to 947	1 - 31.01.88
	TB 9 / 10 / 200 - From S / N 948	2 - 30.09.89
1A -	Day and night IFR equipment	
	TB 20 - From S / N 1 to 947, except S / N 823 to 849 + 888	1 - 31.01.88
	TB 20 - From S / N 948, and S / N 823 to 849 + 888	2 - 30.06.88
1B -	Day and night IFR equipment	
	TB 21 - From S / N 1 to 947	1 - 31.01.88
	TB 21 - From S / N 948	2 - 31.05.89
2 -	Night VFR equipment	
	TB 9 - From S / N 1 to 878, except S / N 765	1 - 31.01.88
	TB 10 - From S / N 1 to 947	1 - 31.01.88
2A -	Night VFR equipment	
	TB 20 - From S / N 1 to 947, except S / N 823 to 849 + 888	1 - 31.01.88
	TB 20 - From S / N 948, and S / N 823 to 849 + 888	2 - 30.06.88
2B -	Night VFR equipment	
	TB 21 - From S / N 1 to 947	1 - 31.01.88
	TB 21 - From S / N 948	2 - 31.05.89
2C -	Night VFR equipment	
	TB 9 - From S / N 879 to 947, plus S / N 765	0 - 30.09.88
	TB 9 - From S / N 948	1 - 30.09.89
2D -	Night VFR equipment	
	TB 10 / 200 - From S / N 948	0 - 30.09.89

3 -	Electric pitch trim TB 20 / 21 - From S / N 1	1 -	31.01.88
4 -	Fuel flow totalizer FT 101 "HOSKINS" TB 20 / 21 From S / N 1 to 947, except S / N 823 to 849 + 888	1 -	31.01.88
5 -	Propeller de-icing "T.K.S." TB 20 / 21 - From S / N 1	1 -	31.01.88
6 -	"HARTZELL" constant speed propeller TB 9 - From S / N 1 to 878, except S / N 765	1 -	31.01.88
7 -	"KING" autopilot type KAP 100 TB 10 / 200 / 20 / 21 - From S / N 275	1 -	31.01.88
8 -	"KING" autopilot type KFC 150 and KAP 150 TB 10 / 200 / 20 / 21 - From S / N 275	1 -	31.01.88
9 -	Stormscope "3M" WX-10 A TB 9 / 10 / 20 / 21 From S / N 1 to 947, except S / N 823 to 849 + 888	1 -	31.01.88
10 -	Oxygen equipment "PURITAN-BENNETT" (Front seats pressure-demand type masks) TB 20 / 21 - From S / N 1	1 -	31.01.88
10A -	Oxygen equipment "PURITAN-BENNETT" (Front seats constant-flow type masks) TB 20 / 21 - From S / N 1	1 -	30.04.97
11 -	"MITCHELL" autopilot type CENTURY 21 TB 9 / 10 / 20 - From S / N 1	1 -	31.01.88
12 -	"MITCHELL" autopilot type CENTURY 3 i TB 20 - From S / N 1	1 -	31.01.88
13 -	Ground power receptacle TB 9 / 10 / 20 / 21 From S / N 1 to 947, except S / N 823 to 849 + 888	1 -	31.01.88
	TB 9 / 10 / 200 / 20 / 21 From S / N 948 and S / N 823 to 849 + 888	2 -	30.06.88

14 - Auxiliary dry air pump
TB 10 / 200 / 20 / 21 - From S / N 1 ..... 1 - 31.01.88

15 - "TKS" ice protection systems
TB 20 / 21 - From S / N 1 ..... 0 - 29.02.88

16 - "MITCHELL" autopilot type CENTURY I
TB 9 / 10 - From S / N 1 ..... 1 - 31.01.88

17 - "MITCHELL" autopilot type CENTURY II B
TB 9 / 10 - From S / N 1 ..... 1 - 31.01.88

18 - Oxygen equipment "EROS"
TB 20 / 21 - From S / N 1 ..... 1 - 31.01.88

19 - Intentionally left blank

20 - Fuel flow totalizer FC / FT 10 "ARNAV"
TB 20 / 21 - From S / N 731 ..... 0 - 31.01.91

21 - Fuel flow totalizer FT 101 A "HOSKINS"
TB 20 / 21
From S / N 948 and S / N 823 to 849+888 ..... 0 - 31.01.91

22 - "BFG" WX-1000 / 1000+ or WX-900 or WX-500 stormscope
TB 9 / 10 / 200 / 20 / 21
From S / N 948 and S / N 823 to 849+888 ..... 0 - 31.01.91

23 - Air conditioning system
TB 20 / 21
From S / N 948 and S / N 823 to 849+888 ..... 0 - 31.01.91

24 - "KEITH" air conditioning system
TB 20
From S / N 948 and S / N 823 to 849+888
TB 21
From S / N 2081 ..... 0 - 30.09.94

25 - "GARMIN" 100 AVD GPS navigation system interfaced with HSI KI 206
TB 20 (Valid for aircraft under FAA regulations)
From S / N 948 and S / N 823 to 849+888 ..... 0 - 30.09.94

26 - "BENDIX / KING" KLN90A GPS navigation system interfaced with HSI KI 525A
TB 9 / 10 / 200 / 20 / 21 - From S / N 1 ..... 0 - 15.01.95

27 - Low noise exhaust
TB 9 - From S / N 1 ..... 0 - 31.10.95

28 - Low noise exhaust
TB 10 - From S / N 1 ..... 0 - 31.10.95

29 - Low noise exhaust
TB 20 - From S / N 1 ..... 0 - 31.10.95

30 - "BENDIX / KING" vertical speed and altitude selector type KAS 297B
TB 10 / 200 / 20 / 21
From S / N 948 and S / N 823 to 849+888 ..... 0 - 31.12.95

31 - "BENDIX / KING" EHI 40
TB 20 / 21
From S / N 948 and S / N 823 to 849+888 ..... 0 - 30.04.96

32 - "BENDIX / KING" KLN90A GPS navigation system interfaced with EHI 40 EHSI
TB 20 / 21
From S / N 948 and S / N 823 to 849+888 ..... 0 - 30.04.96

33 - "BENDIX / KING" KLN90B GPS navigation system interfaced with the HSI KI 525A
TB 10 / 200 / 20 / 21
From S / N 948 and S / N 823 to 849+888 ..... 0 - 30.04.96

34 - EDM 700
TB 20
From S / N 948 and S / N 823 to 849+888 ..... 0 - 15.11.96

35 - "SHADIN" digital fuel management system
TB 20 / 21
From S / N 948 and S / N 823 to 849+888 ..... 0 - 15.11.96

36 - Intentionally left free

37 - "BENDIX / KING" KLN89B GPS navigation system - "Stand Alone"
TB 9 / 10 / 200 / 20 / 21
From S / N 948 and S / N 823 to 849+888 ..... 0 - 30.06.97

38 - "BENDIX / KING" KLN90B GPS navigation system interfaced with EHI 40 EHSI
TB 20 / 21
From S / N 948 and S / N 823 to 849+888 ..... 0 - 30.06.97

39 - "GARMIN" 150 GPS navigation system -"Stand Alone"
TB 9 / 10 / 200 / 20 / 21
From S / N 948 and S / N 823 to 849+888 ..... 0 - 31.08.97

40 - "BENDIX / KING" KLN89B GPS navigation system interfaced with the HSI KI 525A
TB 9 / 10 / 200 / 20 / 21
From S / N 948 and S / N 823 to 849+888 ..... 0 - 30.09.97

41 - "TKS" system
TB 20 / TB 21
From S / N 948 and S / N 823 to 849+888 ..... 0 - 15.11.98

42 - Intentionally left free

43 - "GARMIN" GNS 430 GPS navigation system interfaced with GI 106A CDI
TB 9 / 10 / 200 / 20 / 21
From S / N 2000, plus S / N 1633 + 1900 ..... 0 - 31.08.00

44 - "KEITH" air conditioning system
TB 200
From S / N 2013 ..... 0 - 31.08.00

45 - Three-blade propeller
TB 20 / TB 21
From S / N 1 ..... 0 - 28.10.00

46 - Intentionally left free

47 - "HONEYWELL" KFC 225 automatic flight control system
TB 20 / TB 21
From S / N 948 and S / N 823 to 849+888 ..... 0 - 31.01.01

48 - "HONEYWELL" KLN 94 GPS (B-RNAV) navigation system interfaced with electromechanical instruments
TB 9 / 10 / 200 / 20 / 21
From S / N 2000, plus S / N 1633 and 1900 ..... 0 - 31.01.01

49 - "HONEYWELL" KMD 550 Multi-function display
TB 9 / 10 / 200 / 20 / 21
From S / N 948 and S / N 823 to 849+888 ..... 0 - 31.01.01

50 - "SHADIN" MICROFLO-L™ digital fuel management system
TB 200 / 20 / 21
From S / N 948 and S / N 823 to 849+888 ..... 0 - 15.05.01

51 - "GARMIN" GNS 430 GPS (B-RNAV) navigation system interfaced with electromechanical instruments
(GPS # 1 : B-RNAV / GPS # 2 : IFR)
TB 9 / 10 / 200 / 20 / 21
From S / N 2000, plus S / N 1633 + 1900 ..... 0 - 15.05.01

52 - "HONEYWELL" KLN 94 GPS navigation system -"Stand Alone"
TB 9 / 10 / 200 / 20 / 21
From S / N 2000, plus S / N 1633 and 1900 ..... 0 - 30.05.01

53 - "GARMIN" GNS 530 GPS (B-RNAV) navigation system interfaced with electromechanical instruments
(GPS # 1 : B-RNAV)
TB 9 / 10 / 200 / 20 / 21
From S / N 2000, plus S / N 1633 + 1900 ..... 0 - 15.01.02

D.G.A.C.Approval :
DGAC/SFACT/N.AG
Chargé de Certification
Grégory POMMERA
30 MAI 2002
Date : .....

DIRECTION GÉNÉRALE DE L'AVIATION CIVILE

FLIGHT MANUAL

SECTION 9

SUPPLEMENT 6

"HARTZELL" CONSTANT SPEED PROPELLER

This supplement includes only the general, limitations, emergency procedures, normal procedures and performance in addition to those of SOCATA airplane in its standard version.

Sections 2 - 3 - 4 - 5 - 9

Pages 9.6.2 to 9.6.6 - 9.6.23 - 9.6.24 approved by DIRECTION GENERALE DE L'AVIATION CIVILE (D.G.A.C.).

Approval :

P. o

Date : 22 AOUT 1988

"Ce supplément est une traduction en langue anglaise du Supplément Français correspondant approuvé par la D.G.A.C."

THIS DOCUMENT MUST BE EMBODIED IN SECTION 9 OF THE FLIGHT MANUAL

FLIGHT MANUAL

SECTION 9

SUPPLEMENT 6

"HARTZELL" CONSTANT SPEED PROPELLER

LOG OF PAGES AND VALIDITIES

TB 9 Airplanes

S / N 1 to 878 except S / N 765

EDITION ... 1 ... January 31, 1988

(P / N Z00. 182063T088)

Page N°	Edition N°	Revision N°
9.6A	1	–
9.6B	1	1
9.6C and 9.6D	1	–
9.6E and 9.6F	1	1
9.6.1 thru 9.6.24	1	–

D.G.A.C. Approved

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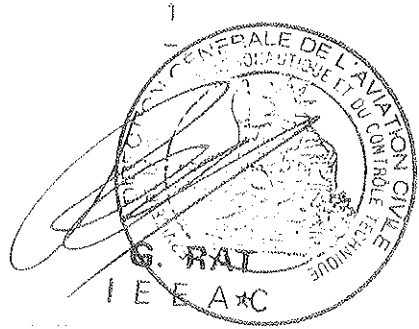

Date : 18 JAN. 1989

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"HARTZELL" CONSTANT SPEED PROPELLER

LIST OF AMENDMENTS

Edition 1 of January 31, 1988

Pages	Description
9.6A 9.6.1 to 9.6.24	New presentation
9.6B to 9.6D	Adding of necessary pages for the supplement approval

D.G.A.C. approval:

Date : 22 AOUT 1988

G. RAT
I E E A C

FLIGHT MANUAL

SECTION 9

SUPPLEMENT 6

"HARTZELL" CONSTANT SPEED PROPELLER

LIST OF AMENDMENTS

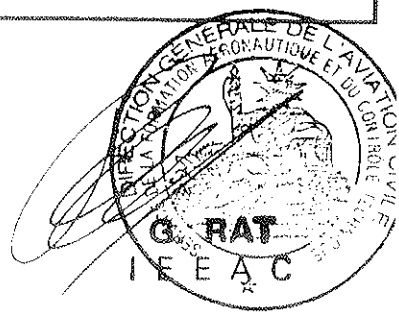
Edition 1 of January 31, 1988

Revision 1 of December 1988

Pages	Description
9.6B	List of effective pages and validities
9.6E and 9.6F	Adding of necessary pages for the revision approval

D.G.A.C. approval:

P.O



Date : 18 JAN. 1989

SECTION 1
GENERAL

This supplement is valid for TB 9 airplane equipped with "HARTZELL" constant speed propeller :

HC.C2YL-1BF / F 7663 A-4

IN THIS ADDITIVE
THE DIRECTIVES AND CHARACTERISTICS
APPROPRIATE TO THIS VERSION
ARE ONLY INDICATED

SECTION 2
LIMITATIONS

These limitations complete or supersede those of standard airplane described in Section 2 "Limitations" of the basic Flight Manual.

HARTZELL propeller HC.C2YL-1BF / F 7663 A-4 : constant speed

- Hub	HARTZELL	HC.C2YL-1BF
- Blade	HARTZELL	F 7663 A-4
- Governor	HARTZELL	F4-27
Maximum speed		2700 RPM
Maximum diameter		72 in (1.83 m)
Minimum diameter		70 in (1.78 m)
Pitch setting at 0,75	Low	11°
	High	26°06'

SECTION 3
EMERGENCY PROCEDURES

These procedures complete those of standard airplane described in Section 3 "Emergency procedures" of the basic Flight Manual.

PROPELLER GOVERNOR FAILURE

In case of oil pressure drop in the governor system or control breakdown, the propeller moves to low pitch.

Control the engine in order not to exceed 2700 RPM ; full throttle is possible at low speeds only.

Check oil pressure and temperature.

SECTION 4
NORMAL PROCEDURES

These procedures complete those of standard airplane described in Section 4 "Normal procedures" of the basic Flight Manual.

STARTING THE ENGINE

Same procedure as under Section 4 "Normal procedures" of the basic Flight Manual.

However, we point out :

Propeller FULL LOW PITCH

MANEUVERING POINT

RUN-UP

PROPELLER CHECK

Propeller	FULL LOW PITCH
Throttle	2000 RPM
Propeller	Actuated twice
Do not drop engine rating below 1500 RPM	
Engine rating check	2700 RPM

MAGNETOS CHECK

Propeller	FULL LOW PITCH
Throttle	2000 RPM
Magneto switch	L. then both
	R. then both
Maximum RPM drop on each magneto	175 RPM
Maximum difference between magnetos	50 RPM

BEFORE TAKE-OFF

Same procedure as under Section 4 "Normal procedures" of the basic Flight Manual.

However, we point out :

Propeller	FULL LOW PITCH

CLIMB

NORMAL CLIMB

Climb speed	76 KIAS - 87 MPH IAS up to 5000 ft

Same procedure as under Section 4 "Normal procedures" of the basic Flight Manual.

MAXIMUM GRADIENT CLIMB

Best climb gradient 59 KIAS - 68 MPH IAS
flaps retracted or in take-off position

NOTE :
This type of climb should be used only in exceptional cases since the engine is less cooled.

DESCENT

APPROACH

Same procedure as under Section 4 "Normal procedures" of the basic Flight Manual.

However, we point out :

Propeller FULL LOW PITCH

SPECIAL MANEUVERS AND OPERATIONS

OPERATION ON SHORT RUNWAYS

Take-off

Same procedure as under Section 4 "Normal procedures" of the basic Flight Manual.

However, we point out :

As soon as the airplane lifts off 76 KIAS - 87 MPH IAS

SECTION 5
PERFORMANCE

These performance complete or supersede those of standard airplane described in Section 5 "Performance" of the basic Flight Manual.

ACOUSTIC LIMITATION

In compliance with decree dated 15th April 1977, the maximum noise level permissible for SOCATA TB 9 airplane corresponding to total maximum certification weight of 2337 lbs (1060 kg) is of 74.1 d B (A).

The noise level which was determined in conditions stated by above-mentioned decree at maximum continuous power is of 70.8 d B (A).

In compliance with decree dated 30th July 1975, SOCATA TB 9 airplane has received the noise limitation type Certificate n° N165.

LANDING PERFORMANCE

See "Landing performance" given in Section 5 of the basic Flight Manual.

TAKE-OFF PERFORMANCE

CONDITIONS : IAS : Take-off : 59 KIAS - 68 MPH IAS
Clear 50 ft : 62 KIAS - 71 MPH IAS
Weight : 2337 lbs (1060 kg)
Flaps : 10°

Tempe-rature	Distance	Pressure altitude (ft)					
		0	2000	4000	6000	8000	10000
- 4°F (- 20°C)	Roll (ft)	725	856	1020	1234	1499	1837
	Clear 50 ft (ft)	1089	1289	1545	1890	2342	3008
+ 32°F (0°C)	Roll (ft)	850	990	1184	1434	1745	2136
	Clear 50 ft (ft)	1266	1489	2047	2192	2785	3652
+ 59°F (+ 15°C)	Roll (ft)	879	1106	1318	1598	1936	2375
	Clear 50 ft (ft)	1398	1660	2011	2493	3153	4239
+ 86°F (+ 30°C)	Roll (ft)	1040	1224	1463	1771	2162	2638
	Clear 50 ft (ft)	1542	1844	2247	2799	3622	5043
+ 104°F (+ 40°C)	Roll (ft)	1112	1319	1565	1900	2313	2825
	Clear 50 ft (ft)	1654	1988	2415	3038	3973	5725

Figure 9.6.1 - TAKE-OFF PERFORMANCE

CLIMB PERFORMANCE

CONDITIONS : Climb speed : 76 KIAS - 87 MPH IAS
Weight : 2337 lbs (1060 kg)
Flaps retracted

Pressure altitude (ft)	VERTICAL SPEED (ft/min)				
	-4°F (-20°C)	+ 32°F (0°C)	+ 59°F (+ 15°C)	+ 86°F (+ 30°C)	+ 104°F (+ 40°C)
0	883	811	757	706	673
2000	773	700	649	600	566
4000	663	594	545	496	464
6000	551	486	438	391	362
8000	444	381	334	291	263
10000	336	275	230	188	161

Figure 9.6.2 - CLIMB PERFORMANCE

RATINGS TABLE - ENGINE LYCOMING 0-320-D2A

% BHP	PRESSURE ALTITUDE ft	MANIFOLD PRESSURE in.Hg		
		2350 RPM	2500 RPM	2700 RPM
75	0	24.7	***23.7***	22.6
	2000	24.1	***23.1***	22
	4000	23.5	***22.5***	21.5
	6000		***21.9***	21
	8000			20.4
70	0	23.6	***22.6***	21.6
	2000	22.9	***22***	21
	4000	22.4	***21.4***	20.4
	6000	21.8	***20.9***	20
	8000		***20.4***	19.5
65	0	***22.4***	21.4	20.5
	2000	***21.9***	20.9	20
	4000	***21.4***	20.4	19.6
	6000	***20.8***	19.9	19.1
	8000	***20.3***	19.4	18.6

Recommended values : ***Italic numbers***

Add 0.5 in.Hg to manifold pressure per fraction of 18°F (10°C) above standard temperature.

Decrease manifold pressure by 0.5 in.Hg per fraction of 18°F (10°C) under standard temperature.

Figure 9.6.3 - RATINGS TABLE

PRESSURE ALTITUDE : 2000 ft

STANDARD TEMPERATURE : 52°F (11°C)

Total usable capacity : 40.2 U.S Gal

N RPM	MP in.Hg	% BHP *	TAS KTAS	TAS MPH	C U.S Gal	DISTANCE TO BE CLEARED (Without reserves) h.min	DISTANCE TO BE CLEARED (Without reserves) SM
2700	22.1	75	114	131	10.4	3 h 51'	500
	20.7	68	108	125	9.6	4 h 09'	520
	19.2	61	102	117	8.7	4 h 36'	540
2600	23.6	80	117	134	10.8	3 h 42'	500
	22.1	73	112	129	9.9	4 h 03'	520
	20.7	66	107	123	9.1	4 h 24'	540
	19.2	59	100	115	8.3	4 h 49'	550
2500	23.6	77	115	132	10.4	3 h 51'	510
	22.1	71	111	127	9.5	4 h 13'	540
	20.7	64	105	121	8.7	4 h 36'	555
	19.2	57	98	112	8.0	4 h 58'	560
2400	25	81	117	135	10.9	3 h 39'	480
	23.6	75	113	130	10.0	4 h 00'	520
	22.1	68	108	125	9.1	4 h 24'	550
	20.7	61	102	117	8.4	4 h 45'	560
2300	25	78	115	133	10.5	3 h 48'	510
	23.6	71	111	128	9.5	4 h 13'	540
	22.1	65	105	121	8.7	4 h 36'	555
	20.7	58	98	113	8.0	4 h 58'	560

(*) Rounded values

Figure 9.6.4 - LEVEL FLIGHT PERFORMANCE (2000 ft)

PRESSURE ALTITUDE : 2000 ft

STANDARD TEMPERATURE : 52°F (11°C)

Total usable capacity : 53.8 U.S Gal (optional tank)

N	MP	% BHP	TAS		C	DISTANCE TO BE CLEARED (Without reserves)	
RPM	in.Hg	*	KTAS	MPH	U.S Gal	h.min	SM
2700	22.1	75	114	131	10.4	5 h 09'	670
	20.7	68	108	125	9.6	5 h 35'	700
	19.2	61	102	117	8.7	6 h 18'	740
2600	23.6	80	117	134	10.8	4 h 58'	660
	22.1	73	112	129	9.9	5 h 44'	710
	20.7	66	107	123	9.1	5 h 54'	730
	19.2	59	100	115	8.3	6 h 28'	740
2500	23.6	77	115	132	10.4	5 h 09'	680
	22.1	71	111	127	9.5	5 h 40'	720
	20.7	64	105	121	8.7	6 h 10'	740
	19.2	57	98	112	8.0	6 h 41'	750
2400	25	81	117	135	10.9	4 h 55'	660
	23.6	75	113	130	10.0	5 h 22'	700
	22.1	68	108	125	9.1	5 h 54'	740
	20.7	61	102	117	8.4	6 h 22'	750
2300	25	78	115	133	10.5	5 h 06'	680
	23.6	71	111	128	9.5	5 h 40'	730
	22.1	65	105	121	8.7	6 h 10'	750
	20.7	58	98	113	8.0	6 h 41'	760

(*) Rounded values

Figure 9.6.5 - LEVEL FLIGHT PERFORMANCE (2000 ft / Option)

PRESSURE ALTITUDE : 4000 ft
STANDARD TEMPERATURE : 45°F (7°C)
Total usable capacity : 40.2 U.S Gal

N	MP	% BHP	TAS		C	DISTANCE TO BE CLEARED (Without reserves)	
RPM	in.Hg	*	KTAS	MPH	U.S Gal	h.min	SM
2700	22.1	78	117	135	10.8	3 h 42'	500
	20.7	71	112	129	9.7	4 h 06'	530
	19.2	64	106	122	8.8	4 h 32'	550
2600	22.1	76	115	133	10.1	3 h 57'	530
	20.7	69	110	127	9.2	4 h 20'	550
	19.2	63	104	120	8.5	4 h 40'	560
2500	23.6	80	118	136	10.6	3 h 45'	510
	22.1	73	114	131	9.7	4 h 06'	540
	20.7	66	108	124	8.9	4 h 28'	550
	19.2	59	100	115	8.1	4 h 54'	560
2400	23.6	77	117	134	10.1	3 h 57'	530
	22.1	71	112	129	9.5	4 h 13'	540
	20.7	64	105	121	8.5	4 h 40'	570
2300	23.6	74	114	132	10.0	4 h 00'	530
	22.1	67	109	126	9.1	4 h 24'	550
	20.7	61	101	117	8.3	4 h 49'	560

(*) Rounded values

Figure 9.6.6 - LEVEL FLIGHT PERFORMANCE (4000 ft)

PRESSURE ALTITUDE : 4000 ft

STANDARD TEMPERATURE : 45°F (7°C)

Total usable capacity : 53.8 U.S Gal (optional tank)

N	MP	% BHP	TAS		C	DISTANCE TO BE CLEARED (Without reserves)	
RPM	in.Hg	*	KTAS	MPH	U.S Gal	h.min	SM
2700	22.1	78	117	135	10.8	4 h 58'	670
	20.7	71	112	129	9.7	5 h 30'	710
	19.2	64	106	122	8.8	6 h 05'	740
2600	22.1	76	115	133	10.1	5 h 18'	700
	20.7	69	110	127	9.2	5 h 49'	740
	19.2	63	104	120	8.5	6 h 16'	750
2500	23.6	80	118	136	10.6	5 h 02'	680
	22.1	73	114	131	9.7	5 h 30'	720
	20.7	66	108	124	8.9	6 h 00'	740
	19.2	59	100	115	8.1	6 h 34'	760
2400	23.6	77	117	134	10.1	5 h 18'	710
	22.1	71	112	129	9.5	5 h 40'	730
	20.7	64	105	121	8.5	6 h 16'	760
2300	23.6	74	114	132	10.0	5 h 22'	710
	22.1	67	109	126	9.1	5 h 54'	740
	20.7	61	101	117	8.3	6 h 28'	760

(*) Rounded values

Figure 9.6.7 - LEVEL FLIGHT PERFORMANCE(4000 ft / Option)

PRESSURE ALTITUDE : 6000 ft
STANDARD TEMPERATURE : 37°F (3°C)
Total usable capacity : 40.2 U.S Gal

N	MP	% BHP	TAS		C	DISTANCE TO BE CLEARED (Without reserves)	
RPM	in.Hg	*	KTAS	MPH	U.S Gal	h.min	SM
2700	22.1	81	121	139	11.2	3 h 54'	500
	20.7	74	116	134	10.1	3 h 57'	530
	19.2	66	110	126	9.1	4 h 24'	550
2600	22.1	78	119	137	10.5	3 h 48'	520
	20.7	71	114	131	9.6	4 h 09'	540
	19.2	64	107	123	8.7	4 h 36'	570
2500	22.1	75	117	135	10.1	3 h 95'	530
	20.7	69	112	129	9.2	4 h 34'	560
	19.2	62	104	119	8.4	4 h 75'	570
2400	22.1	72	115	132	9.6	4 h 16'	550
	20.7	66	108	125	8.9	4 h 47'	560
2300	22.1	70	113	130	9.2	4 h 34'	570
	20.7	63	106	122	8.5	4 h 68'	580

(*) Rounded values

Figure 9.6.8 - LEVEL FLIGHT PERFORMANCE (6000 ft)

PRESSURE ALTITUDE : 6000 ft
STANDARD TEMPERATURE : 37°F (3°C)
Total usable capacity : 53.8 U.S Gal (optional tank)

N	MP	% BHP	TAS		C	DISTANCE TO BE CLEARED (Without reserves)	
RPM	in.Hg	*	KTAS	MPH	U.S Gal	h.min	SM
2700	22.1	81	121	139	11.2	4 h 48'	670
	20.7	74	116	134	10.1	5 h 18'	710
	19.2	66	110	126	9.1	5 h 54'	740
2600	22.1	78	119	137	10.5	5 h 06'	700
	20.7	71	114	131	9.6	5 h 35'	730
	19.2	64	107	123	8.7	6 h 10'	760
2500	22.1	75	117	135	10.1	5 h 18'	720
	20.7	69	112	129	9.2	5 h 14'	750
	19.2	62	104	119	8.4	6 h 22'	760
2400	22.1	72	115	132	9.6	5 h 35'	740
	20.7	66	108	125	8.9	6 h 00'	750
2300	22.1	70	113	130	9.2	5 h 49'	750
	20.7	63	106	122	8.5	6 h 16'	760

(*) Rounded values

Figure 9.6.9 - LEVEL FLIGHT PERFORMANCE (6000 ft / Option)

PRESSURE ALTITUDE : 8000 ft
STANDARD TEMPERATURE : 30°F (- 1°C)
Total usable capacity : 40.2 U.S Gal

N	MP	% BHP	TAS		C	DISTANCE TO BE CLEARED (Without reserves)	
RPM	in.Hg	*	KTAS	MPH	U.S Gal	h.min	SM
2700	20.7 19.2	76 69	119 113	137 130	10.6 9.5	3 h 45' 4 h 13'	510 550
2600	20.7 19.2	73 66	118 110	135 127	9.9 8.9	4 h 03' 4 h 28'	540 570
2500	20.7 19.2	71 64	115 107	133 124	9.5 8.7	4 h 13' 4 h 36'	560 570
2400	20.7 19.2	69 62	113 102	130 117	9.2 8.5	4 h 20' 4 h 40'	560 500
2300	19.2	66	110	127	8.8	4 h 32'	580

(*) Rounded values

Figure 9.6.10 - LEVEL FLIGHT PERFORMANCE (8000 ft)

PRESSURE ALTITUDE : 8000 ft

STANDARD TEMPERATURE : 30°F (- 1°C)

Total usable capacity : 53.8 U.S Gal (optional tank)

N	MP	% BHP	TAS		C	DISTANCE TO BE CLEARED (Without reserves)	
RPM	in.Hg	*	KTAS	MPH	U.S Gal	h.min	SM
2700	20.7 19.2	76 69	119 113	137 130	10.6 9.5	5 h 02' 5 h 40'	690 740
2600	20.7 19.2	73 66	118 110	135 127	9.9 8.9	5 h 26' 6 h 00'	730 760
2500	20.7 19.2	71 64	115 107	133 124	9.5 8.7	5 h 40' 6 h 10'	750 770
2400	20.7 19.2	69 62	113 102	130 117	9.2 8.5	5 h 49' 6 h 16'	760 730
2300	19.2	66	110	127	8.8	6 h 05'	780

(*) Rounded values

Figure 9.6.11 - LEVEL FLIGHT PERFORMANCE (8000 ft / Option)

PRESSURE ALTITUDE : 10000 ft
STANDARD TEMPERATURE : 23°F (- 5°C)
Total usable capacity : 40.2 U.S Gal

N RPM	MP in.Hg	% BHP *	TAS KTAS	TAS MPH	C U.S Gal	DISTANCE TO BE CLEARED (Without reserves) h/min	DISTANCE TO BE CLEARED (Without reserves) SM
2700	19.2 17.2	71 63	117 104	135 120	9.9 8.9	4 h 03' 4 h 28'	550 540
2600	19.2	68	114	131	9.3	4 h 16'	560
2500	19.2	66	111	128	8.9	4 h 28'	570
2400	19.2	64	106	122	8.7	4 h 36'	560

(*) Rounded values

Figure 9.6.12 - LEVEL FLIGHT PERFORMANCE (10000 ft)

PRESSURE ALTITUDE : 10000 ft
STANDARD TEMPERATURE : 23°F (- 5°C)
Total usable capacity : 53.8 U.S Gal (optional tank)

N	MP	% BHP	TAS		C	DISTANCE TO BE CLEARED (Without reserves)	
RPM	in.Hg	*	KTAS	MPH	U.S Gal	h.min	SM
2700	19.2 17.2	71 63	117 104	135 120	9.9 8.9	5 h 26' 6 h 00'	730 720
2600	19.2	68	114	131	9.3	5 h 45'	760
2500	19.2	66	111	128	8.9	6 h 00'	770
2400	19.2	64	106	122	8.7	6 h 10'	750

(*) Rounded values

Figure 9.6.13 - LEVEL FLIGHT PERFORMANCE (10000 ft / Option)

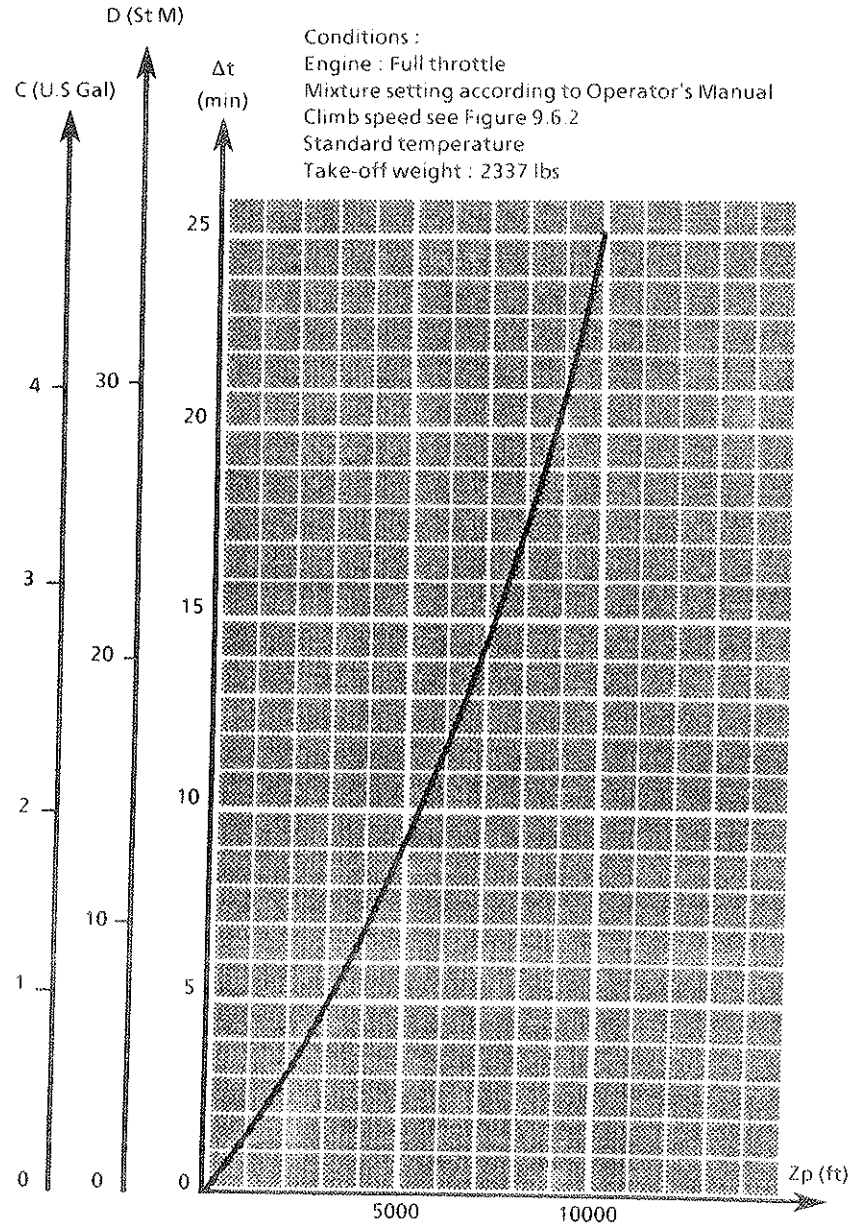


Figure 9.6.14 - CLIMB - CONSUMPTION - TIME - DISTANCE COVERED

SECTION 6
WEIGHT AND BALANCE

These weight and balance complete those of standard airplan€ described in Section 6 "Weight and balance" of the basic Fligh Manual.

A or O	ITEM N°	OPTIONAL EQUIPMENT	Weight lb	ARM in.
		AIRFRAME, ENGINE AND ELECTRICAL EQUIPMENT		
O	575.00	Fitting of HARTZELL constant speed propeller	Δ 20	- 31.50

NIGHT VFR EQUIPMENT

DESCRIPTION

See Supplement 2

NORMAL PROCEDURES

ILS APPROACH

	Flaps	IAS		MP in.Hg	Propeller RPM	Verti. Sp. indicator ft/min
		KIAS	≈ MPH			
Holding	0°	86 / 92	99 / 106	20.7	2600	0
ILS Approach	0°	86 / 92	99 / 106	14.8	2600	-450
Final	25°30'	70 / 76	81 / 87	*	Full low pitch	-450

(*) as required

Figure 9.6.16 - PRE-SETTING, ILS APPROACH