SOCATA

AEROSPATIALE MATRA

TB10

from S/N 948

P/N : T00.DVDPIPYE

PILOT'S INFORMATION MANUAL

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For any information concerning this document, please contact :

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

TELEPHONE : 33 (0)5 62.41.73.00
TELEFAX : 33 (0)5 62.41.76.54
TELEX : 532 835 F

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CAUTION

THE MENTION "US VERSION" OR "UK VERSION" FOLLOWS THE AIRPLANE MODEL ON THE TOP OF A FEW PAGES IN THIS MANUAL.
FOR US OR UK AIRPLANES, THESE SPECIFIC PAGES HAVE TO BE USED INSTEAD OF THE BASIC PAGES WHICH HAVE THE SAME PAGINATION NUMBER.

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SECTION 1

GENERAL

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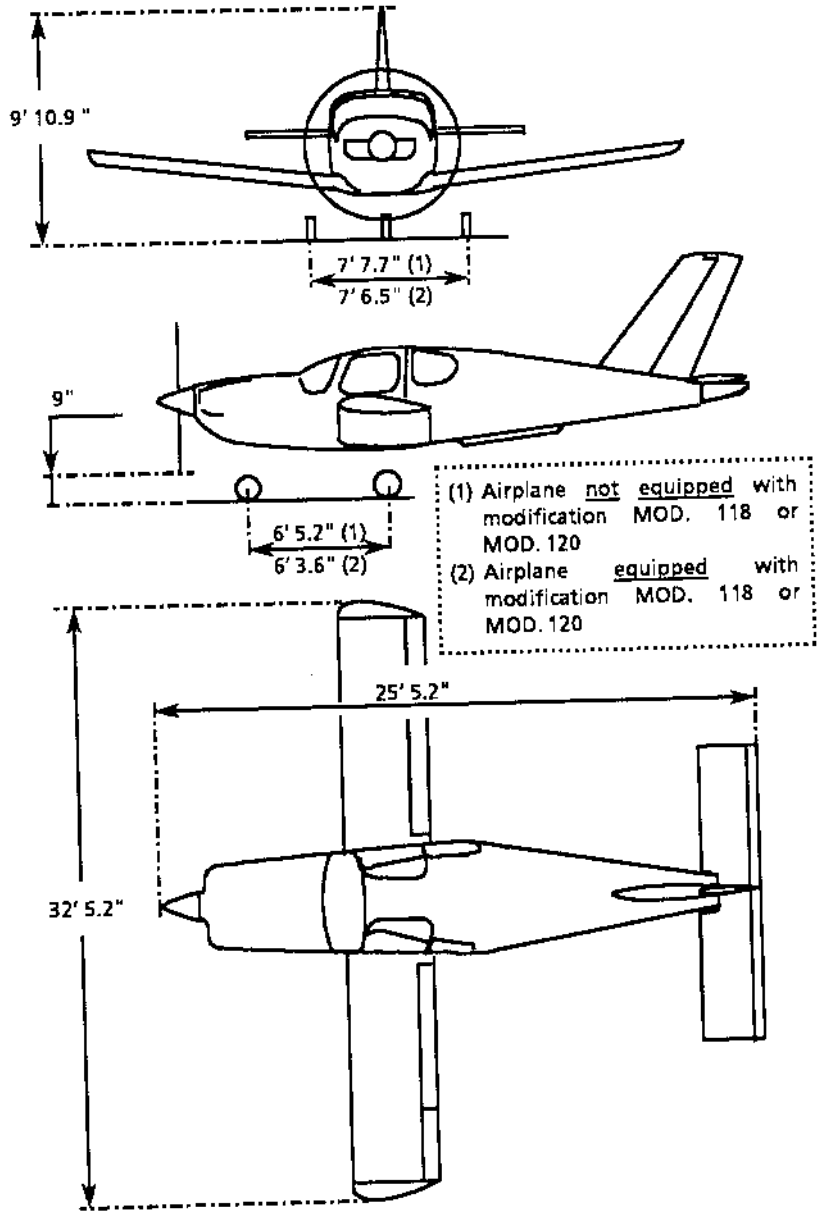


Figure 1.1 - THREE VIEW DRAWING

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 10 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 this Manual.

DESCRIPTIVE DATA

ENGINE

Number of engines : 1
Engine Manufacturer : AVCO LYCOMING
Engine Model Number : O-360-A1AD
Engine Type :
Four-cylinder, horizontally opposed, direct drive, air-cooled
Engine rated at 180 BHP at 2700 RPM.

PROPELLER

Number of propellers : 1
Propeller Manufacturer : HARTZELL
Propeller Model Number : HC-C2YK-1BF/F7666A-2
Number of blades : 2
Propeller Diameter :
Maximum : 74 inches (1.88 m)
Minimum : 72 inches (1.83 m)
Propeller Type :
Constant-speed, hydraulically-actuated, pitch setting at 30 inches station : low 11°5', high 31°
Propeller Governor : HARTZELL F4

FUEL

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

Total capacity : 55.4 U.S Gallons (210 Litres)
Total capacity each tank : 27.7 U.S Gallons (105 Litres)
Total usable : 53.8 U.S Gallons (204 Litres)

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.

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. During oil and filter changes 0.45 additional U.S. qt (0.4 litres) is required for the filter.

MAXIMUM CERTIFICATED WEIGHTS

	Normal category	Utility category
Take-off :	2535 lbs (1150 kg)	2359 lbs (1070 kg)
Landing :	2535 lbs (1150 kg)	2359 lbs (1070 kg)

Weight in Baggage Compartment : 143 lbs (65 kg) ; refer to Section 6 for cargo loading instructions.

STANDARD AIRPLANE WEIGHTS

Airplane <u>not equipped</u> with modification MOD. 118 or MOD. 120 :

	Normal category	Utility category
Standard Empty Weight :	1543 lbs (700 kg)	1543 lbs (700 kg)
Maximum Useful Load :	992 lbs (450 kg)	816 lbs (370 kg)

Airplane <u>equipped</u> with modification MOD. 118 or MOD. 120 :

	Normal category	Utility category
Standard Empty Weight :	1592 lbs (707 kg)	1559 lbs (707 kg)
Maximum Useful Load :	944 lbs (443 kg)	800 lbs (363 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 category

Wing loading : 19.9 lbs/sq.ft (97.1 kg/m^2)
Power loading : 14.1 lbs/BHP (6.4 kg/CV)

Utility category

Wing loading : 18.4 lbs/sq.ft (89.9 kg/m^2)
Power loading : 13.1 lbs/sq.ft (5.9 kg/CV)

SYMBOLS, ABBREVIATIONS AND TERMINOLOGY

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, temperature and compressibility.

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} : ***Maximum 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 :*** Its 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.

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

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 take-off weight and the basic empty weight.

Maximum Take-off Weight :
Is the maximum weight approved for the start of the take-off run.

Maximum Landing Weight :
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
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
ADI	:	Attitude Direction Indicator
ATC	:	ATC transponder
COM	:	Communications Transceivers
DME	:	Distance Measuring Equipment
ELT	:	Emergency Locator Transmitter
HF	:	High Frequency
HSI	:	Horizontal Situation Indicator
IFR	:	Instrument Flight Rules
ILS	:	Instrument Landing System
MKR	:	Marker Radio Beacon
NAV	:	Navigation Indicators and / or Receivers
RMI	:	Radio Magnetic Indicator
UHF	:	Ultra-High Frequency
VFR	:	Visual Flight Rules
VHF	:	Very High Frequency
VOR	:	VHF Omnidirectional Range
VOR / LOC	:	VHF Omnidirectional Range Localizer
VSI	:	Vertical Speed Indicator
XPDR	:	Transponder

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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LIMITATIONS

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LIMITATIONS

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ADDITIONAL LIMITATIONS FOR BRITISH CERTIFICATION

The airplane must be operated in accordance with the following limitations in addition to those contained in the approved Flight Manual and those contained in any relevant supplement.

1 - The type of airplane is eligible for certification in the United Kingdom in the Transport Category (Passenger). This aeroplane may, however be restricted to another category and to a particular use and this may be stated in the Certificate of Airworthiness.

When the airplane is flown for Public Transport the performance contained in this Flight Manual shall be used to establish compliance with the Air Navigation Regulation 10, performance Group E.

The technique for take-off from and landing on short runways on Page 4.20 shall not be used for Public Transport operations.

2 - For the purpose of compliance with the Air Navigation legislation governing flight over water, the true airspeed to be assumed is 110 knots.

3 - Acrobatic maneuvers are not permitted. The maneuvers listed on Page 2.9 are not permitted unless the Utility Category limitations stated in this manual are complied with.

4 - The minimum crew is one pilot. The number of occupants shall not exceed 5 or number of seats fitted. Children under the age of three years carried in the arms of passengers may be left out of account for this purpose.

This airplane may fly at night or in IFR conditions when permitted by the Air Navigation legislation and when the equipment required by that legislation is carried.

STARTER CIRCUIT ENERGISED WARNING LIGHT

If red indicator light does not go off after starting engine, shut down and report defect to maintenance base.

MITCHELL CENTURY 21 AUTOPILOT LIMITATIONS

The autopilot shall not be engaged at a height less than 500 ft above the terrain.

GENERAL

SOCATA Model TB 10 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 this Manual.

This section of the airplane Pilot's Operating Handbook 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 this 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

GENERAL

SOCATA Model TB 10 is certificated in the Normal and Utility Categories.

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

This section of the airplane Pilot's Operating Handbook 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 included in this section have been approved by the Federal Aviation Administration in accordance with 14 CFR Section 21.29.

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

SOCATA Model TB 10 is certificated under FAA Type Certificate N° A51EU.

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	53 - 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	60 - 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-360-A1AD

Engine Operating Limits for Take-off and Continuous Operations :
- Maximum Power : 180 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 : HARTZELL

Propeller Model Number : HC-C2YK-1BF/F7666A-2

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

Propeller Blade Angle at 30 inches station :
- Low : 11°5'
- High : 31°

Propeller Operating Limits :
- Restricted Range for Continuous Operation : 2000 to 2250 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 Red Arc / Caution Range	Y R /	Green Arc / Normal Operating	Red Line or Arc / Maximum Limit
Tachometer	—	2000 to 2250 RPM	R	750 to 2000 RPM and 2250 to 2700 RPM	2700 RPM
Oil Temperature	—	Below 104°F (40°C)	Y	104 to 244°F (40 to 118°C)	244°F (118°C)
Fuel Pressure (1)	Below 0.5 psi	—	/	Above 0.5 psi	—
Fuel Pressure (2)	Below 0.5 psi	—	/	0.5 to 8 psi	Above 8 psi
Oil Pressure (1)	25 psi	25 to 60 psi and 90 to 100 psi	Y	60 to 90 psi	100 psi
Oil Pressure (2)	25 psi	25 to 55 psi and 95 to 115 psi	Y	55 to 95 psi	115 psi
Cylinder head temperature (3)	---	435 to 500°F (224 to 260°C) (4)	Y	200 to 435°F (93 to 224°C) (4)	500°F (260°C)
Carburated air temperature	---	14 to 41°F (-10 to +5°C)	Y	---	---

(1) Alternative No. 1
(2) Alternative No. 2
(3) If installed on airplane
(4) Optional marking (according to instrument model)

Figure 2.3 - POWER PLANT INSTRUMENT MARKINGS

WEIGHT LIMITS

Normal category

Maximum Take-off Weight : 2535 lbs (1150 kg)
Maximum Landing Weight : 2535 lbs (1150 kg)

Utility category

Maximum Take-off Weight : 2359 lbs (1070 kg)
Maximum Landing Weight : 2359 lbs (1070 kg)

Maximum Weight in Baggage Compartment for both categories : 143 lbs (65 kg) ; refer to Section 6 for cargo loading.

CENTER OF GRAVITY LIMITS

Normal category

Forward :
42.6 inches (1.083 m) aft of datum at 2535 lbs (1150 kg)
39.8 inches (1.010 m) aft of datum at 2359 lbs (1070 kg)
37.3 inches (0.949 m) aft of datum at 2138 lbs (970 kg) or less.

Utility category

Forward :
40.7 inches (1.035 m) aft of datum at 2359 lbs (1070 kg)
38.3 inches (0.974 m) aft of datum at 2249 lbs (1020 kg)
37.3 inches (0.949 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 ensure 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	2535 lbs (1150 kg)
Design Maneuvering Speed	122 KIAS (141 MPH IAS)

The TB 10 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	2359 lbs (1070 kg)
Design Maneuvering Speed	122 KIAS (141 MPH IAS)

No aerobatic maneuvers are approved except those listed below :

Maneuver	Recommended Entry Speed
Chandelles	135 KIAS (155 MPH IAS)
Lazy eights	130 KIAS (149 MPH IAS)
Steep turns	108 KIAS (124 MPH IAS)
Stalls (except whip stalls)	Slow Deceleration

Spins Prohibited

FLIGHT LOAD FACTOR LIMITS

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

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

2 Tanks :	27.7 U.S Gallons (105 Litres) each
Total Fuel :	55.4 U.S Gallons (210 Litres)
Usable Fuel :	53.8 U.S Gallons (204 Litres)
Unusable Fuel :	1.6 U.S Gallons (6 Litres)

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 7 U.S Gallons (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.

CREW LIMITATIONS

Minimum crew : 1 pilot
(1 pilot required at L.H. station)

SEATING LIMITS

Front seats :	2
Rear seats :	2 when accommodated with 2 seat belts or 3 when accommodated with 3 seat belts [maximum total weight on rear seats : 454 lbs (206 kg)]

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	2535 lbs (1150 kg)
Design Maneuvering Speed	122 KIAS (141 MPH IAS)

The TB 10 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	2359 lbs (1070 kg)
Design Maneuvering Speed	122 KIAS (141 MPH IAS)

No aerobatic maneuvers are approved except those listed below :

Maneuver	Recommended Entry Speed
Chandelles	135 KIAS (155 MPH IAS)
Lazy eights	130 KIAS (149 MPH IAS)
Steep turns	108 KIAS (124 MPH IAS)
Stalls (except whip stalls)	Slow Deceleration
Spins Prohibited	

FLIGHT LOAD FACTOR LIMITS

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

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.

MAXIMUM OPERATING AMBIENT TEMPERATURE

According to hot weather operation tests, the maximum operating ambient temperature is 104°F (40°C).

FUEL LIMITATIONS

2 Tanks :	27.7 U.S Gallons (105 Litres) each
Total Fuel :	55.4 U.S Gallons (210 Litres)
Usable Fuel :	53.8 U.S Gallons (204 Litres)
Unusable Fuel :	1.6 U.S Gallons (6 Litres)

NOSE GEAR TURNING LIMITATION

Maximum nose gear turn : 22° to the left and 18°30' to the right.

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 : 454 lbs (206 kg)]

USE OF DOORS

Flight with doors open or ajar is prohibited.

VACUUM GAGE MARKINGS (if installed)

MARKING	CORRESPONDING VALUE
Green	Normal operating from 4.4 to 5.2 in.Hg
Red lines	at 4.4 and 5.2 in.Hg

PLACARDS

NOTE :
The placards described in the Section 9 "Supplements" replace or supplement those described in this paragraph.

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

THIS AIRPLANE MUST BE OPERATED AS A NORMAL AND UTILITY CATEGORIES AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS.

INVERTED FLIGHT	PROHIBITED
ACROBATIC MANEUVERS IN NORMAL CATEGORY	PROHIBITED
INTENTIONAL SPINS	PROHIBITED
ICING CONDITIONS	PROHIBITED

NORMAL CATEGORY

MAXIMUM TAKE-OFF AND LANDING WEIGHT		2535 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	FLAPS RETRACTED	+3.8
	FLAPS EXTENDED	+2

UTILITY CATEGORY

MAXIMUM TAKE-OFF AND LANDING WEIGHT		2359 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	FLAPS RETRACTED	+4.4
	FLAPS EXTENDED	+2

	ENTRY SPEED
CHANDELLES	135 KIAS
LAZY EIGHT	130 KIAS
STEEP TURN	108 KIAS
STALLS	

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

65 kg - 143 lbs MAXIMUM

FOR LOADING INSTRUCTIONS SEE " WEIGHT AND BALANCE DATA" IN FLIGHT MANUAL

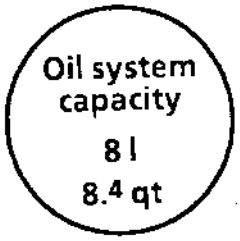
(4) Near fuel tank caps

CARBURANT
FUEL - KRAFTSTOFF

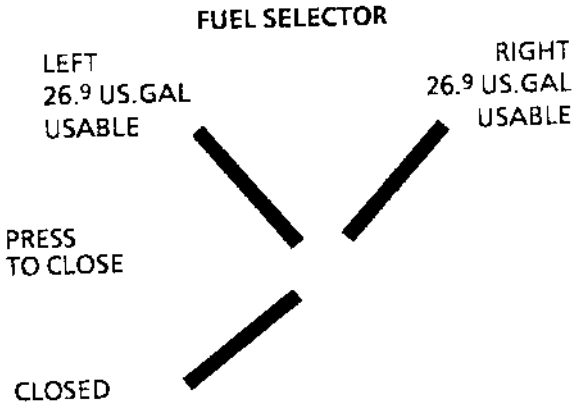
AVGAS 100 LL

26.9 US - 22.4 UK.GAL
102 L

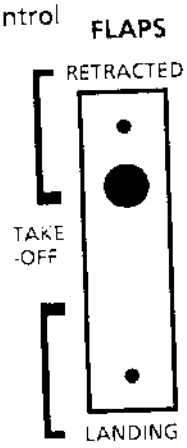
(5) On the back side of access door to oil filler cap



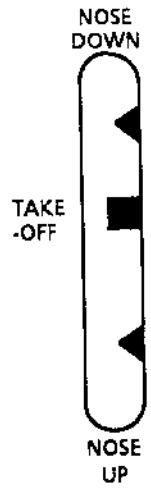
(6) On the fuel selector



(7) Near the wing flap control



(8) Near the stabilator tab position indicator



(9) If three belts are installed at the rear seats :

• MASSE MAXI POUR 3 PASSAGERS AUX PLACES AR. • MAX GEWICHT FÜR 3 PASSAGIERE AUF DEM RÜCKSITZ	206 Kg
• MAX WEIGHT FOR 3 PASSENGERS ON REAR SEATS	454 lbs

INTENTIONALLY LEFT BLANK

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 10 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 this Manual.

AIRSPEEDS FOR SAFE OPERATIONS (IAS)

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

ENGINE FAILURES

ENGINE FAILURE DURING TAKE-OFF RUN

Throttle	REDUCED
Brakes	APPLY
Mixture	IDLE CUT-OFF
Magneto selector	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 the engine does not start :

Mixture	IDLE CUT-OFF
Fuel selector	OFF
Fuel pump	OFF
Land	STRAIGHT AHEAD

Magneto selector	OFF
Main switch	OFF

WARNING

LANDING STRAIGHT AHEAD IS USUALLY ADVISABLE

ENGINE FAILURE IN FLIGHT

Glide speed	86 KIAS
Main switch	ON
Fuel pump	ON

If the engine does not start :

Mixture	IDLE CUT-OFF
Throttle	½ OPEN
Fuel gages	CHECK
Fuel selector	SWITCH TANKS
Magneto selector	BOTH
Starter	ENGAGE (if propeller stopped)
When the engine runs (windmilling)	SLOWLY ENRICH UNTIL RE-START

NOTE :
Engine re-starting can be performed without particular limitations in all airplane flight envelope.

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

NOTE :
Gliding distance - see Figure 3.4.

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 carburetor 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.

PROPELLER GOVERNOR FAILURE

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

Oil pressure	CHECKED
Oil temperature	CHECKED
Throttle	AS REQUIRED
Airspeed	REDUCED

Avoid rapid application of power.

CAUTION : MAXIMUM RPM : 2700

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
Seats, seat belts, shoulder harnesses	ADJUSTED and SECURE

Mixture	IDLE CUT-OFF
Fuel selector	OFF
Magneto selector	OFF
Flaps	AS REQUIRED

When the landing is secured :

Flaps	LANDING
Approach speed	65 / 70 KIAS
Main switch	OFF

PRECAUTIONARY LANDING WITH ENGINE POWER

Flaps	LANDING
Approach speed	65 / 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
Mixture	IDLE CUT-OFF
Fuel selector	OFF
Magneto selector	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 selector	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 selector	OFF
Alternator 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, PARTIALLY OPEN CABIN AIR COOLING TO VENTILATE THE CABIN AND PREVENT SUFFOCATION

Land as soon as possible.

WING FIRE

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

Land as soon as possible.

ICING

FLIGHT INTO KNOWN ICING CONDITIONS IS PROHIBITED

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

Carburetor heating ON

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

Carburetor 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
Propeller	HIGH RPM
Throttle and pitch trim	ADJUST SO AS TO MAINTAIN A RATE OF DESCENT LOWER THAN 500 ft/min

- *Final :*

FLARE OUT near the ground with the pitch trim.

CAUTION

REDUCE THROTTLE ONLY AFTER TOUCH-DOWN

RADIO MASTER SWITCH FAILURE (if installed)

When radio navigation equipment cannot be set under voltage due to RADIO MASTER switch malfunction :

R.M SWITCH circuit-breaker DISENGAGED

Radio navigation equipment is supplied again and flight can go on normally.

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 at 80 KIAS.

ELECTRICAL FAILURE : IMMEDIATE ACTION

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.

ALTERNATOR FAILURE (Simplified procedure)

Undervoltage warning light	ON
Voltmeter :	
- Green sector	CONTINUE FLYING
- Red / yellow sector :	
ALTr. FLD SWITCH	OFF then ON
Undervoltage warning light	REMAINS ON
ALTr. FLD SWITCH	OFF
Nonessential electrical load items	OFF

CAUTION

SEE HEREAFTER THE CHECK-OUT PROCEDURE FOR NIGHT VFR AND IFR (See Figure 3.1)

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 FAILURE : CHECK-OUT PROCEDURE FOR NIGHT VFR AND IFR

ALTERNATOR FAILURE (See Figure 3.1)

BATTERY FAILURE (See Figure 3.2)

TOTAL ELECTRICAL FAILURE (See Figure 3 3)

KEY : CB : Circuit-breaker
PCB : Pull-off type circuit-breaker
SB : Switch-breaker

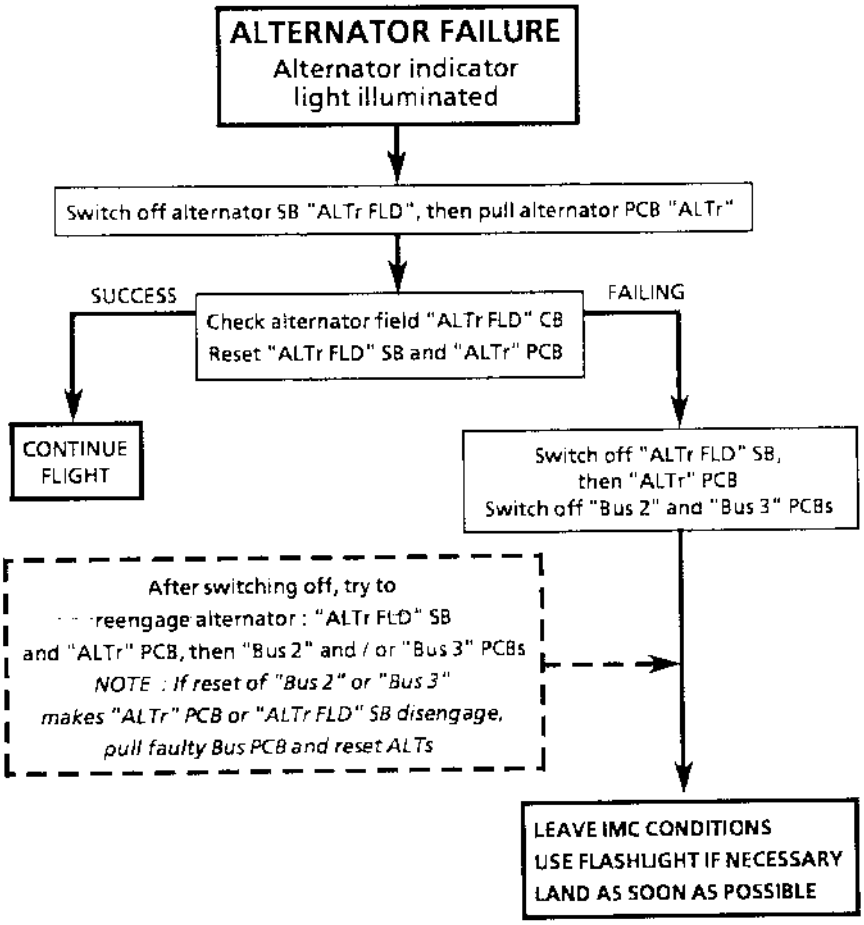


Figure 3 1 - ALTERNATOR FAILURE DIAGRAM

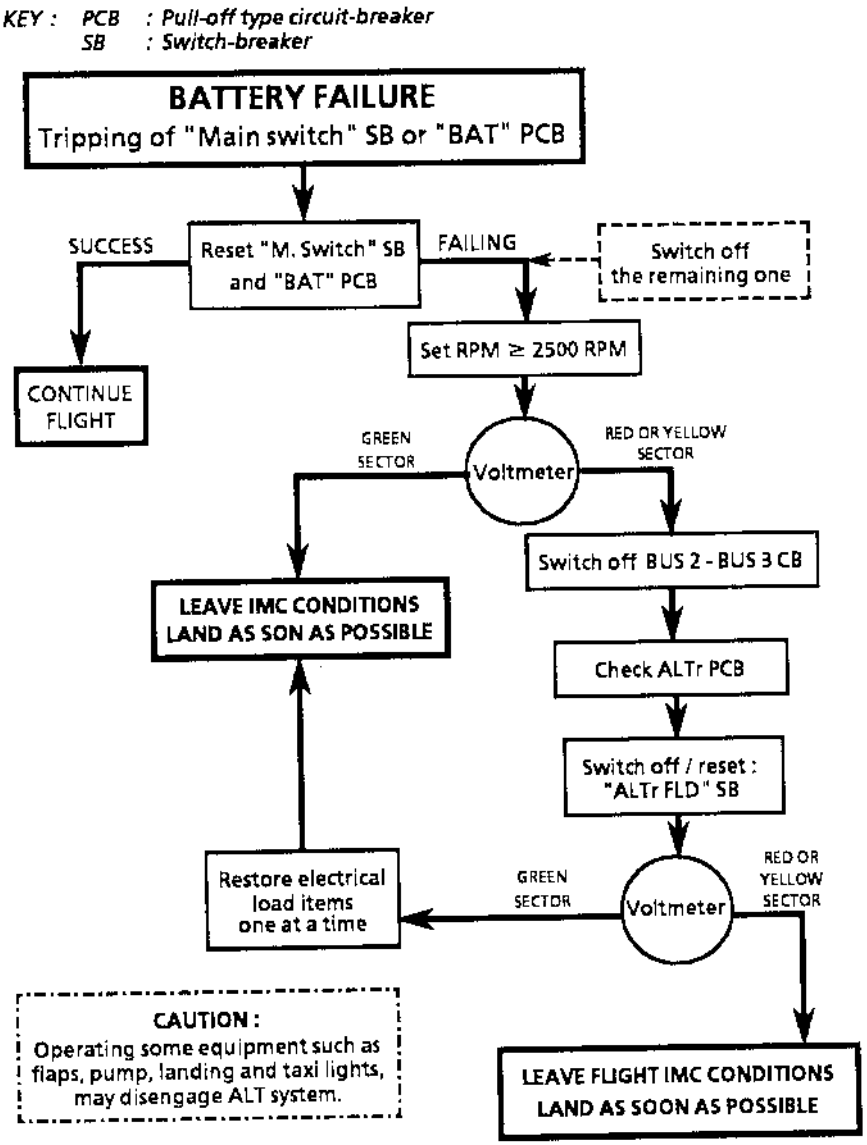


Figure 3.2 - BATTERY FAILURE DIAGRAM

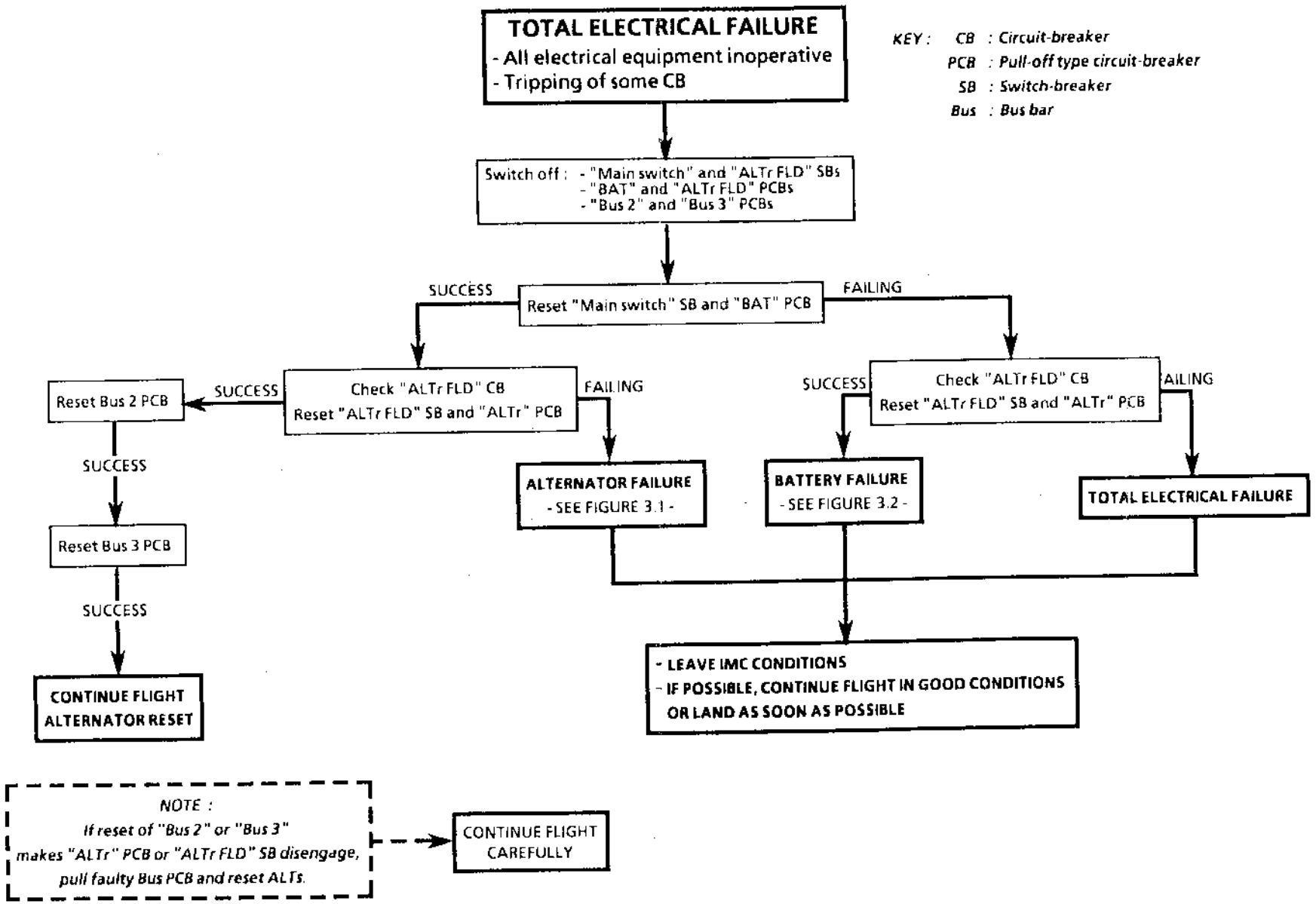


Figure 3.3 - TOTAL ELECTRICAL FAILURE DIAGRAM

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 air outlets and / or actuate cabin air selector 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 :

Propeller	FULL FORWARD
Manifold pressure	AS REQUIRED (Approach : 15 in.Hg)

LANDING WITHOUT FLAPS (Flaps locked, retracted)

Flaps circuit breaker	DEPRESSED
Flaps control	ACTUATED

If the procedure is not successfull, perform the same operations as for a normal landing and maintain a 80 KIAS approach speed.

Plan a landing distance increased by approximately 60 %.

For landing performance, see Section 5 "Performance".

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.

OPTIMUM GLIDE WITHOUT ENGINE RUNNING

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

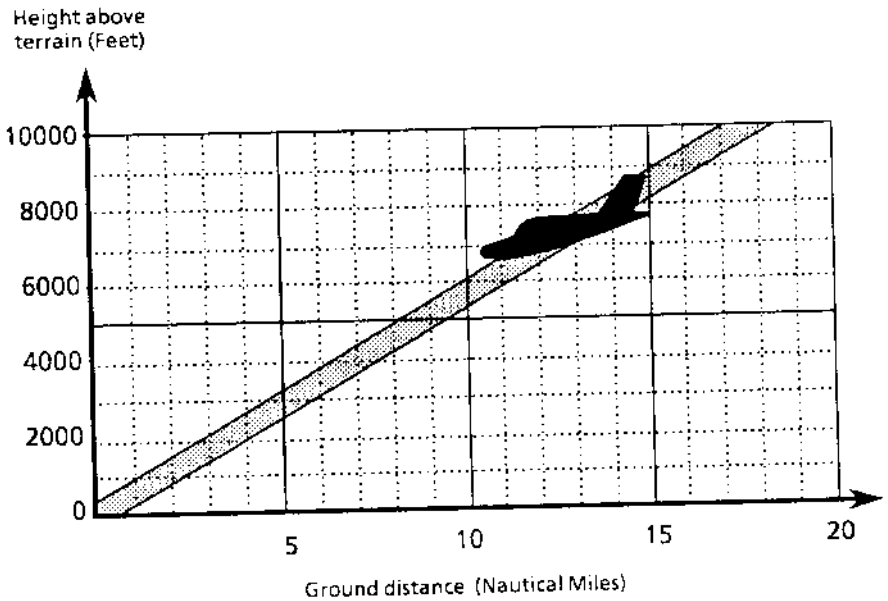


Figure 3.4 - OPTIMUM GLIDE WITHOUT ENGINE RUNNING

SECTION 4

NORMAL PROCEDURES

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GENERAL

This section provides procedures for the conduct of normal operation of the SOCATA Model TB 10 airplane.

The normal procedures for optional systems are given in Section 9 "Supplements" of this 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	70 KIAS
- Best angle of climb	
. Flaps retracted	65 KIAS
. Flaps in landing position	58 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)	72 KIAS
- Maximum demonstrated crosswind	25 kt

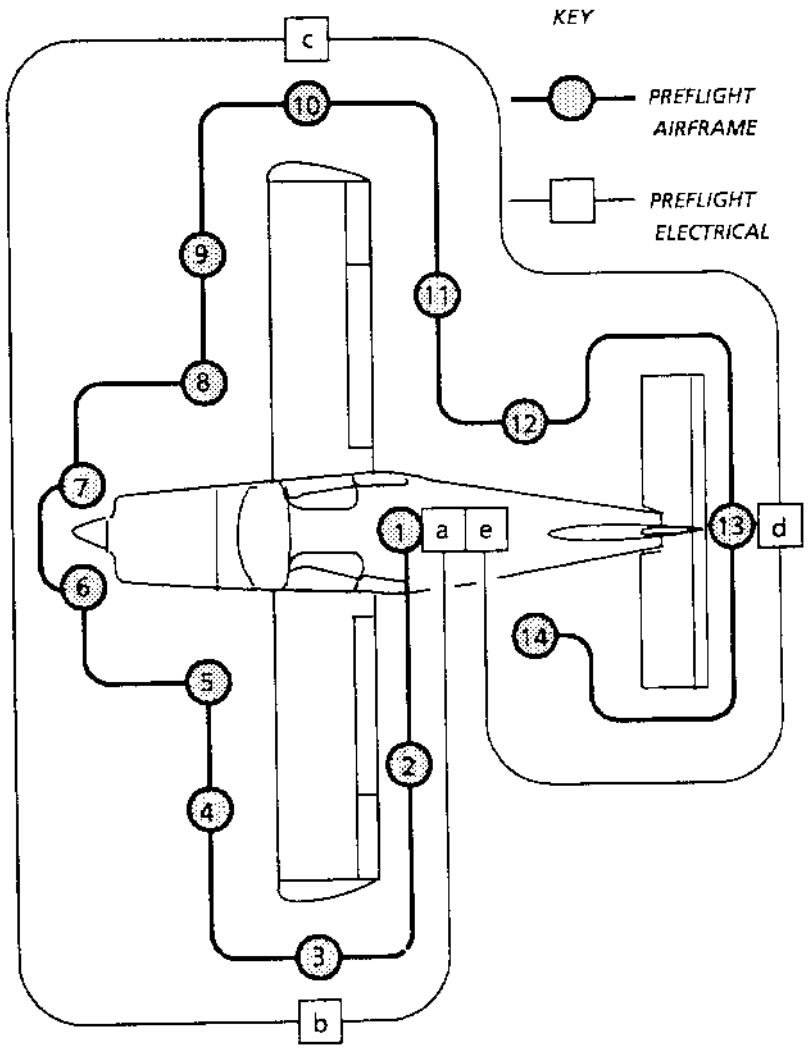


Figure 4.1 - PREFLIGHT INSPECTIONS

PREFLIGHT INSPECTIONS (See Figure 4.1)

AIRFRAME

1 - Cabin

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

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
Fuel filter draining	Fuel free of water and sediment
Fuel filter drain	Check CLOSED

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, 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
Advisory 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
Anticollision 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
Anticollision 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 selector	OFF
"Radio master" (if installed)	OFF
Alternate static source (if installed)	PUSHED

ENGINE STARTING

Anti-collision light (if installed)	ON

NORMAL PROCEDURE :

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

When the engine starts :

Magneto selector	BOTH
Oil pressure	Green Sector

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

Fuel pump	OFF
Engine	1000 to 1200 RPM during heating

HOT ENGINE :

Same procedure as normal procedure, but without injection.

COLD WEATHER PROCEDURE :

Carburetor heating	OFF
Propeller	FULL FORWARD
Mixture	FULL RICH
Main switch	ON
Fuel pump	ON

Pump warning light	ON
Fuel pressure	Green Sector
Injection	Throttle lever operated 10 to 15 times
Throttle	1/4 OPEN
Area	Clear
Magneto / start selector	START (30 sec. maxi)

When the engine starts :

Magneto selector	BOTH
Oil pressure	Green Sector

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

Fuel pump	OFF

Engine

- 1200 RPM until oil temperature pointer moves
- 1500 RPM until oil temperature pointer reaches 50 % of yellow sector
- 2000 RPM until oil temperature pointer reaches the green sector

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 selector	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
Vacuum gage (if installed)	Checked
Advisory 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
Taxi light	As required

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, if necessary, tight turns.

Check operation of gyroscopic instruments (horizontal attitude, heading and turn-and-bank indicators) by means of alternate turns.

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
Carburetor heating	OFF
Fuel selector	Set to fullest tank

PROPELLER CHECK :

Propeller	FULL FORWARD
Throttle	2000 RPM
Propeller	Cycle twice (maxi. 500 RPM drop)
	Return to high RPM (FULL FORWARD)

MAGNETO CHECK :

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

CARBURETOR HEATING CHECK :

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

MAXIMUM POWER CHECK :

Full throttle	2700 RPM

BEFORE TAKE-OFF

Seats, seat belts, shoulder harnesses	Check
Doors	LOCKED
Controls	Free
Pitch trim	TAKE-OFF
Flaps	TAKE-OFF
Magneto selector	BOTH
Propeller	FULL FORWARD
Carburetor 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
Heading indicator (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 heading indicator Check stand-by compass
Smoothly apply full power	
Airspeeds	See Section 5 "Take-off performance"

STANDARD AIRSPEEDS :

Rotation	63 KIAS
Initial climb	70 KIAS

WHEN SAFELY AIRBORNE :

Brakes	Apply

AT 300 ft :

Climb speed	73 KIAS
Flaps	RETRACT

AT 1000 ft :

Fuel pump	OFF
External lights	As required

CLIMB

Mixture	FULL RICH
Throttle	FULL POWER
Propeller	FULL FORWARD (2700 RPM)
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 13.2 U.S Gallons (50 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

Unintentional icing conditions : see Section 3 "Emergency procedures", Paragraph "Icing".

Leave icing conditions as soon as possible.

Remember to replace the carburetor 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 descent with reduced throttle :

Carburetor heating	ON
Seats, seat belts, shoulder harnesses	ADJUSTED and SECURE

APPROACH - LANDING

FINAL :

Airspeed	78 KIAS
Flaps	TAKE-OFF
Fuel pump	ON
Mixture	FULL RICH
Propeller	FULL FORWARD
Carburetor heating	ON or OFF as required
Brakes	Checked
Seats, seat belts, shoulder harnesses	ADJUSTED and SECURE
Landing lights	ON

SHORT FINAL :

Flaps	LANDING
Airspeed	See Section 5 "Landing Performance"
Standard airspeeds :	72 KIAS at 2407 lbs (1092 kg) 73 KIAS at 2535 lbs (1150 kg)

GO-AROUND

Carburetor heating	OFF
Smoothly apply full power	
Airspeed	70 / 73 KIAS
When climb rate is positive :	
Flaps	TAKE-OFF
Airspeed	73 KIAS
Flaps	RETRACTED
Climb	78 KIAS

AFTER LANDING

Fuel pump	OFF
Flaps	RETRACTED
Landing light	OFF
Taxi light	As required
Trim	TAKE-OFF
Radio equipment	As required
Pitot heating (if installed)	OFF
Carburetor heating	OFF

SHUT-DOWN / SECURING AIRPLANE

Parking brake	Set
Turn and bank indicator (if installed)	OFF
Anti-collision light (if installed)	OFF
Taxi light	OFF
Navigation lights	OFF
"Radio master" (if installed)	OFF
Throttle	REDUCED

APPROACH - LANDING

FINAL :

Airspeed	78 KIAS
Flaps	TAKE-OFF
Fuel pump	ON
Mixture	FULL RICH
Propeller	FULL FORWARD
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	72 KIAS at 2407 lbs 73 KIAS at 2535 lbs
Landing lights	ON

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 7 U.S Gallons (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.

GO-AROUND

Carburator heating	OFF
Smoothly apply full power	
Airspeed	70 / 73 KIAS

When climb rate is positive :

Retract flaps to take-off position then fully.
Climb at 73 KIAS.

GO-AROUND

Carburetor heating	OFF
Smoothly apply full power	
Airspeed	70 / 73 KIAS
When climb rate is positive :	
Flaps	TAKE-OFF
Airspeed	73 KIAS
Flaps	RETRACTED
Climb	78 KIAS

AFTER LANDING

Fuel pump	OFF
Flaps	RETRACTED
Landing light	OFF
Taxi light	As required
Trim	TAKE-OFF
Radio equipment	As required
Pitot heating (if installed)	OFF
Carburetor heating	OFF

SHUT-DOWN / SECURING AIRPLANE

Parking brake	Set
Turn and bank indicator (if installed)	OFF
Anti-collision light (if installed)	OFF
Taxi light	OFF
Navigation lights	OFF
"Radio master" (if installed)	OFF
Throttle	REDUCED

WARNING

THE TEST HEREAFTER MUST BE IMPERATIVELY CARRIED OUT WITH ENGINE POWER LOWER THAN 1000 RPM ; THE FAILURE TO OBSERVE THIS RULE MAY LEAD TO DAMAGE THE EXHAUST SYSTEM

Magnetos cut-off test (*)	OFF, then BOTH
Throttle	900 / 1000 RPM
Mixture	IDLE CUT-OFF
AFTER ENGINE STOPS :	
Magneto selector	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 low with power idle, and 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 runway 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 landing flap setting.

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.

WARNING

THE TEST HEREAFTER MUST BE IMPERATIVELY CARRIED OUT WITH ENGINE POWER LOWER THAN 1000 RPM ; THE FAILURE TO OBSERVE THIS RULE MAY LEAD TO DAMAGE THE EXHAUST SYSTEM

Magnetos cut-off test (*)	OFF, then BOTH
Throttle	900 / 1000 RPM
Mixture	IDLE CUT-OFF
AFTER ENGINE STOPS :	
Magneto selector	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

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

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.

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 7 U.S Gallons (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.

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

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.

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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.
Airplane, then 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.

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SECTION 5

PERFORMANCE

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SECTION 5

PERFORMANCE

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ACOUSTIC LIMITATION

In compliance with decree dated 15th April 1977, the maximum noise level permissible for SOCATA Model TB 10 airplane corresponding to total maximum certification weight of 2535 lbs is 75.3 d B (A).

The noise level which was determined in conditions stated by above-mentioned decree at maximum continuous power is 71.5 d B (A).

In compliance with decree dated 30th July 1975, SOCATA Model TB 10 airplane has received the noise limitation type certificate Nr N165 dated 24th August 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 air outlets and / or actuate cabin air selector flow lever to open position. Then, instrument error is slight.

ALTITUDE COMPENSATION

ALTERNATE STATIC SOURCE

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

FLYOVER NOISE LEVEL

Flyover noise level measured in accordance with 14 CFR Part 36 Appendix F : 70.7 dB (A).

NOTE :

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

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 air outlets and / or actuate cabin air selector flow lever to open position. Then, instrument error is slight.

ALTITUDE COMPENSATION

ALTERNATE STATIC SOURCE

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

STALLING SPEEDS

CONDITIONS : Weight : 2535 lbs (1150 kg)

Power OFF

CONFIGURATION	BANK					
	0°		30°		45°	
	KIAS	MPH IAS	KIAS	MPH IAS	KIAS	MPH IAS
FLAPS RETRACTED	60	70	65	75	72	83
FLAPS TAKE-OFF	57	66	62	71	68	78
FLAPS LANDING	53	61	57	66	63	73

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

Figure 5.2 - STALLING SPEEDS

WIND COMPONENTS

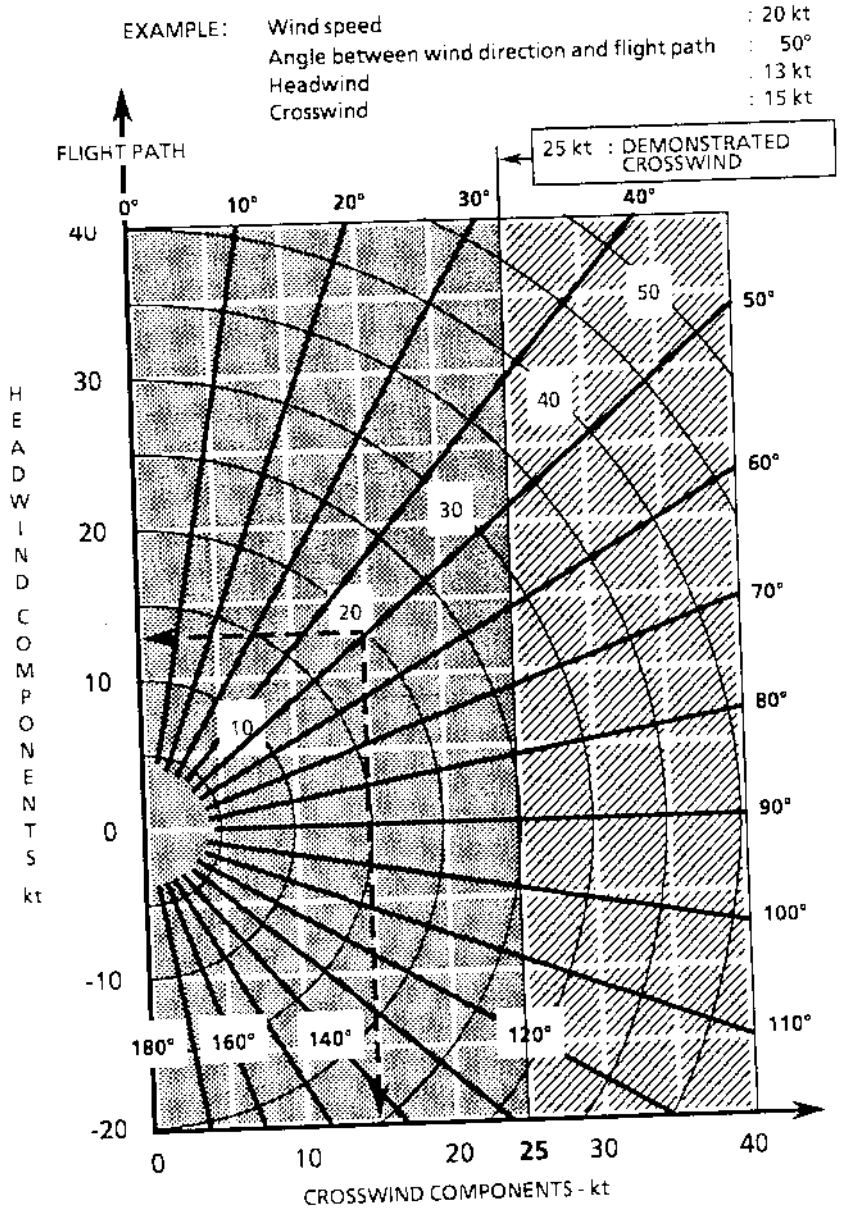


Figure 5.3 - WIND COMPONENTS

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.

Take-off and landing performance figures are based on a dry hard surface runway.

The total take-off and landing distances (taxiing and clear 50 ft) will be corrected as follows :

- Influence of runway condition :

  Increase by : 7 % on hard sod

  10 % on short grass

  25 % on high grass

- Influence of wind :

  . Increase by 30 % for each 10 kt rear wind

  . Reduce by 10 % for each 10 kt headwind.

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 : 59 KIAS - 68 MPH IAS
Clear 50 ft : 65 KIAS - 75 MPH IAS
Weight : 2535 lbs (1150 kg)

NOTE :
See Paragraph "NOTICE" for corrections due to wind and runway condition.

Tempe-rature	Distance	Pressure altitude (ft)				
		0	2000	4000	6000	8000
- 4°F (- 20°C)	Roll (ft)	837	1001	1214	1460	1755
	Clear 50 ft (ft)	1296	1558	1886	2329	2920
+ 32°F (0°C)	Roll (ft)	968	1165	1394	1690	2051
	Clear 50 ft (ft)	1476	1804	2198	2739	3478
+ 59°F (+ 15°C)	Roll (ft)	1066	1280	1542	1870	2297
	Clear 50 ft (ft)	1657	2001	2461	3084	4035
+ 86°F (+ 30°C)	Roll (ft)	1181	1427	1722	2297	2543
	Clear 50 ft (ft)	1837	2231	2756	3478	4626
+ 104°F (+ 40°C)	Roll (ft)	1280	1542	1837	2231	2707
	Clear 50 ft (ft)	1968	2411	2969	3789	5118

Figure 5.4 - TAKE-OFF PERFORMANCE

NOTICE

Performance given in this Section are based on tests and interpolated to standard conditions (ICAO) and extrapolated from parameters : weight, altitude, temperature...

Factors relative to pilot's experience, to relative bad airplane's condition are not taken into account.

It is prudent to add safety factors :

A list of variables affecting performance together with guide line factor is shown hereafter. This table represents the increase in take-off distance to a height of 50 ft or the increase in landing distance from 50 ft.

Variable	Increase in take-off distance to height 50 ft	Increase in landing distance from 50 ft
Dry grass (*) - Short (under 5 in) - Long (between 5 & 10 in)	20 % 25 %	20 % 30 %
Wet grass (*)- Short - Long	25 % 30 %	30 % 40 %
A 2 % slope (*)	uphill 10 %	downhill 10 %
Soft ground or snow (*)	25 % or more	25 % or more
Public transport safety factor	38 %	43 %

(*) Effect on ground run / roll will be greater

NOTE :
For higher humidity conditions, such as those found in the United Kingdom and Northern Europe, the scheduled figures should be amended as follows :

Take-off ground runs and total distance to clear
50 ft obstacle : Increase by 10 %
Rate of climb : Reduce by 10 %

TAKE-OFF PERFORMANCE

CONDITIONS : IAS : Lift off : 63 KIAS - 72.5 MPH IAS
Clear 50 ft : 69 KIAS - 79.5 MPH IAS
Weight : 2535 lbs (1150 kg)

Tempe-rature	Distance	Pressure altitude (ft)				
		0	2000	4000	6000	8000
- 4°F (- 20°C)	Roll (ft)	954	1141	1384	1664	2000
	Clear 50 ft (ft)	1413	1698	2056	2533	3166
+ 32°F (0°C)	Roll (ft)	1103	1328	1589	1927	2338
	Clear 50 ft (ft)	1612	1967	2393	2976	3765
+ 59°F (+ 15°C)	Roll (ft)	1215	1459	1758	2132	2618
	Clear 50 ft (ft)	1806	2180	2677	3346	4357
+ 86°F (+ 30°C)	Roll (ft)	1346	1627	1963	2618	2900
	Clear 50 ft (ft)	2002	2431	2997	3800	4982
+ 104°F (+ 40°C)	Roll (ft)	1459	1758	2094	2543	3086
	Clear 50 ft (ft)	2147	2627	3226	4100	5497

Figure 5.4 - TAKE-OFF PERFORMANCE

CLIMB PERFORMANCE

CONDITIONS : Climb speed : 78 KIAS - 90 MPH IAS
Weight : 2535 lbs (1150 kg)
Airplane equipped with wheel fairings
Flaps retracted

PRESSURE ALTITUDE (ft)	CLIMB SPEED									
	-4°F (-20°C)		+32°F (0°C)		+59°F (+15°C)		+86°F (+30°C)		+104°F (+40°C)	
	m/s	ft/min	m/s	ft/min	m/s	ft/min	m/s	ft/min	m/s	ft/min
0	4.68	921	4.29	844	4.00	787	3.72	732	3.54	697
2000	4.06	799	3.68	724	3.40	669	3.14	618	2.97	585
4000	3.41	671	3.04	598	2.78	547	2.53	498	2.36	465
6000	2.78	547	2.43	478	2.17	427	1.93	380	1.77	348
8000	2.17	427	1.84	362	1.59	313	1.35	266	1.20	236

Figure 5.5 - CLIMB PERFORMANCE

CLIMB PERFORMANCE

CONDITIONS : Climb speed : 78 KIAS - 90 MPH IAS
Weight : 2535 lbs (1150 kg)
Airplane without wheel fairings : option Nr 525
Flaps retracted

PRESSURE ALTITUDE (ft)	CLIMB SPEED									
	-4°F (-20°C)		+32°F (0°C)		+59°F (+15°C)		+86°F (+30°C)		+104°F (+40°C)	
	m/s	ft/min	m/s	ft/min	m/s	ft/min	m/s	ft/min	m/s	ft/min
0	4.02	792	3.68	726	3.44	677	3.19	630	3.04	599
2000	3.49	687	3.16	623	2.92	575	2.70	531	2.55	503
4000	2.93	577	2.61	514	2.39	470	2.17	428	2.02	400
6000	2.39	470	2.08	411	1.86	367	1.65	327	1.52	299
8000	1.86	367	1.58	311	1.36	269	1.16	229	1.03	203

Figure 5.6 - CLIMB PERFORMANCE

CLIMB PERFORMANCE

CONDITIONS : Climb speed : 73 KIAS - 84 MPH IAS
Weight : 2535 lbs (1150 kg)
Airplane equipped with wheel fairings
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	810	740	690	640	610
2000	700	635	585	540	510
4000	590	525	480	435	405
6000	480	420	375	335	305
8000	375	317	274	235	205

Figure 5.5 - CLIMB PERFORMANCE

CLIMB PERFORMANCE

CONDITIONS : Climb speed : 73 KIAS - 84 MPH IAS
Weight : 2535 lbs (1150 kg)
Airplane without wheel fairings : option Nr 525
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	697	636	593	550	525
2000	618	546	503	464	439
4000	507	450	413	374	348
6000	413	361	323	288	262
8000	323	273	236	202	176

Figure 5.6 - CLIMB PERFORMANCE

MAXIMUM PERFORMANCE ALTITUDE

Maximum performance altitude in standard temperature condition (ISA), corresponding to a vertical speed of 100 ft/min, is 13000 ft at take-off maximum weight.

ANTENNAS INFLUENCE 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 %
Anticollision light	- 0.16	- 0.19	- 0.10 %
Strobe lights	- 0.43	- 0.50	- 0.27 %
Example : IFR	- 3.23	- 3.73	- 2 %

Figure 5.7 - ANTENNAS INFLUENCE ON PERFORMANCE

RATINGS TABLE - ENGINE LYCOMING O-360-A1AD

% BHP	PRESSURE ALTITUDE ft	MANIFOLD PRESSURE in.Hg		
		2350 RPM	2450 RPM	2700 RPM
75	0	24.6	***24.1***	23 1
	2000	24.1	***23.6***	22 4
	4000	23.6	***23***	22
	6000		***22.5***	21 5
	8000			21
65	0	***22.2***	21.8	20.7
	2000	***21.7***	21.2	20.3
	4000	***21.2***	20.7	19.8
	6000	***20.7***	20.2	19.4
	8000	***20.2***	19.7	19
55	0	***21***	20.6	/
	2000	***20.5***	20.1	
	4000	***20***	19.6	
	6000	***19.5***	19 1	
	8000	***19***	18.7	

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 5.8 - RATINGS TABLE

LEVEL FLIGHT PERFORMANCE

Level flight performance are given for a take-off weight of 2535 lbs (1150 kg) and for setting "Best Power" obtained with an EGT.

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

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...

Endurance with reserves

The endurances and ranges specified correspond to the use of the fuel allowing for take-off, climb, descent, indicated altitude and with a fuel reserve of 6.07 U.S Gal (23 litres) corresponding to 45 min flight at 50 % of the maximum power.

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 (5 litres/hr)
- Add 15 % to distance to be cleared.

Settings with EGT :

- Best economy mixture : from full rich, weaken slowly mixture until peak EGT.
- Best power mixture : From peak EGT, re-enrich until EGT temperature decreases by 75°F (3 divisions).

Settings without EGT :

- Best economy mixture : from full rich, weaken slowly until first engine malfunctioning signs (vibration) appear and then re-enrich slowly.

PRESSURE ALTITUDE : 2000 ft

ISA : 52°F (11°C)

Airplane with wheel fairings

N (RPM)	2700		2600		2500		2400		2300	
MP (in.Hg)	22.1 20.7 19.2		23.6 22.1 20.7 19.2		23.6 22.1 20.7 19.2		25 23.6 22.1 20.7		25 23.6 22.1 20.7	
% BHP (rounded)	73 67 60		78 72 65 58		76 70 63 57		81 74 68 62		78 72 66 60	
TAS	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH
	119 114 108	137 132 124	122 118 113 106	141 136 130 122	121 117 112 104	140 135 129 119	124 120 115 110	143 138 133 127	122 118 113 108	141 136 130 124
C (U.S Gal/hr)	11.4 10.4 9.4		11.7 10.6 9.6 8.8		11 10 9.1 8.4		11.5 10.5 9.6 8.7		11.1 10.1 9.2 8.4	
Distance to be cleared without reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	4.42 5.12 5.43	646 687 711	4.37 5.05 5.36 6.06	649 690 727 743	4.53 5.22 5.54 6.25	684 724 758 764	4.40 5.07 5.38 6.10	665 708 749 783	4.41 5.20 5.51 6.23	662 727 764 792
Distance to be cleared with reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	4.07 4.32 5.00	562 597 618	4.02 4.26 4.53 5.19	565 600 631 646	4.17 4.42 5.06 5.35	593 631 657 665	4.11 4.29 4.49 5.23	593 615 649 677	4.14 4.39 5.06 5.34	593 531 662 690

Figure 5.9 - LEVEL FLIGHT PERFORMANCE (2000 ft)

PRESSURE ALTITUDE : 2000 ft

ISA : 52°F (11°C)

Airplane without wheel fairings : option Nr 525

N (RPM)	2700		2600		2500		2400		2300	
MP (in.Hg)	22.1 20.7 19.2		23.6 22.1 20.7 19.2		23.6 22.1 20.7 19.2		25 23.6 22.1 20.7		25 23.6 22.1 20.7	
% BHP (rounded)	73 67 60		78 72 65 58		76 70 63 57		81 74 68 62		78 72 66 60	
TAS	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH
	110 106 99	127 122 114	113 108 104 97	130 125 119 112	112 108 103 96	129 124 118 110	114 111 106 101	132 127 122 117	113 109 105 99	130 126 121 114
C (U.S Gal/hr)	11.4 10.4 9.4		11.7 10.6 9.6 8.8		11 10 9.1 8.4		11.5 10.5 9.6 8.7		11.1 10.1 9.2 8.4	
Distance to be cleared without reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	4.42 5.12 5.43	597 634 652	4.37 5.05 5.36 6.06	600 635 666 683	4.53 5.22 5.54 6.25	630 665 696 706	4.40 5.07 5.38 6.10	613 650 687 722	4.41 5.20 5.51 6.23	609 672 708 728
Distance to be cleared with reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	4.07 4.32 5.00	518 549 568	4.02 4.26 4.53 5.19	519 550 577 593	4.17 4.42 5.06 5.35	547 580 602 612	4.11 4.29 4.49 5.23	544 565 588 621	4.14 4.39 5.06 5.34	546 580 608 633

Figure 5.10 - LEVEL FLIGHT PERFORMANCE (2000 ft)

PRESSURE ALTITUDE : 4000 ft

ISA : 45°F (7°C)

Airplane with wheel fairings

N (RPM)	2700		2600		2500		2400		2300	
MP (in.Hg)	22.1 20.7 19.2		23.6 22.1 20.7 19.2		23.6 22.1 20.7 19.2		23.6 22.1 20.7 19.2		23.6 22.1 20.7	
% BHP (rounded)	76 69 62		80 74 67 60		79 72 66 59		77 70 64 58		74 68 62	
TAS	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH
	123 118 112	142 136 129	126 122 117 110	145 140 135 126	125 120 115 107	144 139 132 123	124 119 113 105	142 137 130 121	122 117 111	140 135 128
C (U.S Gal/hr)	11.8 10.7 9.7		12.1 11 9.9 9.1		11.4 10.3 9.7 8.5		10.9 9.9 9 8.3		10.4 9.6 8.7	
Distance to be cleared without reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	4.32 5.02 5.34	640 684 715	4.27 4.55 5.25 5.57	646 690 730 749	4.43 5.13 5.32 6.19	677 721 733 777	4.57 5.27 6.00 6.30	702 746 783 786	5.09 5.40 6.12	724 764 792
Distance to be cleared with reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	3.58 4.28 4.49	550 587 612	3.53 4.17 4.42 5.08	553 590 624 640	4.07 4.32 4.48 5.26	581 618 624 665	4.19 4.44 5.11 5.35	603 637 668 671	4.29 4.54 5.23	618 652 677

Figure 5.11 - LEVEL FLIGHT PERFORMANCE (4000 ft)

PRESSURE ALTITUDE : 4000 ft

ISA : 45°F (7°C)

Airplane without wheel fairings : option Nr 525

N (RPM)	2700		2600		2500		2400		2300	
MP (in.Hg)	22.1 20.7 19.2		23.6 22.1 20.7 19.2		23.6 22.1 20.7 19.2		23.6 22.1 20.7 19.2		23.6 22.1 20.7	
% BHP (rounded)	76 69 62		80 74 67 60		79 72 66 59		77 70 64 58		74 68 62	
TAS	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH
	113 108 103	130 125 118	116 112 108 101	134 129 124 116	115 111 106 99	132 127 122 114	114 110 104 97	131 126 120 112	112 108 103	129 124 118
C (U.S Gal/hr)	11.9 10.7 9.7		12.1 11 9.9 9.1		11.4 10.3 9.7 8.5		10.9 9.9 9 8.3		10.4 9.6 8.7	
Distance to be cleared without reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	4.32 5.02 5.34	589 629 657	4.27 4.55 5.25 5.57	685 634 672 690	4.43 5.13 5.32 6.19	623 663 655 720	4.57 5.27 6.00 6.30	648 687 720 722	5.09 5.40 6.12	664 703 732
Distance to be cleared with reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	3.58 4.28 4.49	508 537 562	3.53 4.17 4.42 5.08	506 540 574 587	4.07 4.32 4.48 5.26	534 568 574 612	4.19 4.44 5.11 5.35	553 587 618 621	4.29 4.54 5.23	571 602 621

Figure 5.12 - LEVEL FLIGHT PERFORMANCE (4000 ft)

PRESSURE ALTITUDE : 6000 ft

ISA : 37°F (3°C)

Airplane with wheel fairings

N (RPM)	2700		2600		2500		2400		2300	
MP (in.Hg)	22.1 20.7 19.2		22.1 20.7 19.2		22.1 20.7 19.2		22.1 20.7 19.2		22.1 20.7 19.2	
% BHP (rounded)	78 71 64		76 69 63		74 68 61		73 66 60		70 64 58	
TAS	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH
	127	146	125	144	125	144	123	142	121	139
	122	140	120	139	119	137	117	135	115	132
	115	132	113	130	111	128	109	126	105	121
C (U.S Gal/hr)	12.2 11.1 9.9		11.3 10.3 9.3		10.7 9.7 8.9		10.2 9.3 8.5		9.9 8.9 8.2	
Distance to be cleared without reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	4.25	643	4.46	687	5.02	721	5.16	746	5.28	761
	4.52	684	5.14	724	5.33	761	5.48	783	6.00	792
	5.25	718	5.48	755	6.06	783	6.21	795	6.32	789
Distance to be cleared with reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	3.53	550	4.10	587	4.23	615	4.35	634	4.44	646
	4.15	581	4.33	618	4.49	646	5.01	665	5.11	671
	4.42	612	5.00	640	5.16	665	5.28	671	5.37	668

Figure 5.13 - LEVEL FLIGHT PERFORMANCE (6000 ft)

PRESSURE ALTITUDE : 6000 ft

ISA : 37°F (3°C)

Airplane without wheel fairings : option Nr 525

N (RPM)	2700		2600		2500		2400		2300	
MP (in.Hg)	22.1 20.7 19.2		22.1 20.7 19.2		22.1 20.7 19.2		22.1 20.7 19.2		22.1 20.7 19.2	
% BHP (rounded)	78 71 64		76 69 63		74 68 61		73 66 60		70 64 58	
TAS	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH
	117 112 106	134 129 122	115 111 104	133 127 120	115 110 103	132 126 118	113 108 100	130 124 116	111 106 97	128 122 111
C (U.S Gal/hr)	12.2 11.1 9.9		11.3 10.3 9.3		10.7 9.7 8.9		10.2 9.3 8.5		9.9 8.9 8.2	
Distance to be cleared without reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	4.25 4.52 5.25	592 628 661	4.46 5.14 5.48	634 665 696	5.02 5.33 6.06	664 699 720	5.16 5.48 6.21	685 719 735	5.28 6.00 6.32	700 732 725
Distance to be cleared with reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	3.53 4.15 4.42	506 534 562	4.10 4.33 5.00	537 565 587	4.23 4.49 5.16	568 593 608	4.35 5.01 5.28	580 612 615	4.44 5.11 5.37	593 615 621

Figure 5.14 - LEVEL FLIGHT PERFORMANCE (6000 ft)

PRESSURE ALTITUDE : 8000 ft

ISA : 30°F (– 1°C)

Airplane with wheel fairings

N (RPM)	2700		2600		2500		2400		2300	
MP (in.Hg)	20.7 19.2 17.7		20.7 19.2 17.7		20.7 19.2		20.7 19.2		20.7 19.2	
% BHP (rounded)	74 66 59		72 65 58		70 63		68 62		66 60	
TAS	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH
	125 119 107	144 137 123	124 117 103	143 134 118	122 115	141 132	121 112	139 129	119 109	137 126
C (U.S Gal/hr)	11.4 10.2 9.3		10.6 9.6 8.7		10 9 1		9.6 8.7		9.2 8.5	
Distance to be cleared without reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	4.42 5.15 5.48	677 718 715	5.05 5.37 6.09	727 752 727	5.22 5.55	758 783	5.37 6.10	780 798	5.49 6.22	798 798
Distance to be cleared with reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	4.09 4.35 5.02	575 606 603	4.27 4.52 5.18	612 634 615	4.41 5.07	637 659	4.52 5.19	656 671	5.02 5.28	668 671

Figure 5.15 - LEVEL FLIGHT PERFORMANCE (8000 ft)

PRESSURE ALTITUDE : 8000 ft

ISA : 30°F (– 1°C)

Airplane without wheel fairings : option Nr 525

N (RPM)	2700		2600		2500		2400		2300	
MP (in.Hg)	20.7 19.2 17.7		20.7 19.2 17.7		20.7 19.2		20.7 19.2		20.7 19.2	
% BHP (rounded)	74 66 59		72 65 58		70 63		68 62		66 60	
TAS	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH
	115 110 99	132 126 114	114 107 94	132 124 109	113 106	130 122	111 104	128 119	110 100	126 116
C (U.S Gal/hr)	11.4 10.2 9.3		10.6 9.6 8.7		10 9.1		9.6 8.7		9.2 8.5	
Distance to be cleared without reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	4.42 5.15 5.48	620 662 661	5.05 5.37 6.09	671 696 670	5.22 5.55	698 722	5.37 6.10	719 734	5.49 6.22	733 739
Distance to be cleared with reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	4.09 4.35 5.02	528 526 553	4.27 4.52 5.18	562 581 565	4.41 5.07	584 603	4.52 5.19	600 615	5.02 5.28	612 615

Figure 5.16 - LEVEL FLIGHT PERFORMANCE (8000 ft)

PRESSURE ALTITUDE : 10000 ft

ISA : 23°F (– 5°C)

Airplane with wheel fairings

N (RPM)	2700		2600		2500		2400		2300	
MP (in.Hg)	19.2 17.7		19.2		19.2		19.2		19.2	
% BHP (rounded)	68 61		67		65		64		62	
TAS	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH
	122 110	141 127	120	139	119	137	116	134	113	130
C (U.S Gal/hr)	10.6 9.5		9.9		9.4		9		8.7	
Distance to be cleared without reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	5.06 5.40	718 718	5.28	758	5.45	786	6.00	802	6.10	802
Distance to be cleared with reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	4.30 4.56	603 603	4.47	634	5.01	656	5.11	668	5.20	668

Figure 5.17 - LEVEL FLIGHT PERFORMANCE (10000 ft)

PRESSURE ALTITUDE : 10000 ft

ISA : 23°F (– 5°C)

Airplane without wheel fairings : option Nr 525

N (RPM)	2700		2600		2500		2400		2300	
MP (in.Hg)	19.2 17.7		19.2		19.2		19.2		19.2	
% BHP (rounded)	68 61		67		65		64		62	
TAS	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH	KTAS	MPH
	113 101	130 117	111	128	109	126	107	123	104	119
C (U.S Gal/hr)	10.6 9.5		9.9		9.4		9		8.7	
Distance to be cleared without reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	5.06 5.40	663 663	5.28	700	5.45	725	6.00	738	6.10	734
Distance to be cleared with reserves	h.min	SM	h.min	SM	h.min	SM	h.min	SM	h.min	SM
	4.30 4.56	553 553	4.47	581	5.01	597	5.11	612	5.20	612

Figure 5.18 - LEVEL FLIGHT PERFORMANCE (10000 ft)

LANDING PERFORMANCE

WEIGHT : 2407 lbs (1092 kg)

CONDITIONS : Clear 50 ft : 72 KIAS - 83 MPH IAS
Flaps in landing position

NOTE :
See Paragraph "NOTICE" for corrections due to wind and runway condition.

Temperature	Distance	Pressure altitude (ft)				
		0	2000	4000	6000	8000
- 4°F (- 20°C)	Roll (ft)	560	610	660	715	765
	Clear 50 ft (ft)	1275	1355	1440	1545	1665
+ 32°F (0°C)	Roll (ft)	610	660	715	765	830
	Clear 50 ft (ft)	1360	1460	1545	1665	1765
+ 59°F (+ 15°C)	Roll (ft)	650	695	745	815	880
	Clear 50 ft (ft)	1425	1525	1630	1730	1835
+ 86°F (+ 30°C)	Roll (ft)	680	730	780	850	917
	Clear 50 ft (ft)	1495	1595	1695	1815	1935
+ 104°F (+ 40°C)	Roll (ft)	695	745	815	880	950
	Clear 50 ft (ft)	1545	1630	1750	1865	1985

Figure 5.19 - LANDING PERFORMANCE [2407 lbs (1092 kg)]
(Flaps in landing position)

LANDING PERFORMANCE

WEIGHT : 2535 lbs (1150 kg)

CONDITIONS : Clear 50 ft : 73 KIAS - 84 MPH IAS
Flaps in landing position

NOTE :
See Paragraph "NOTICE" for corrections due to wind and runway condition.

Temperature	Distance	Pressure altitude (ft)				
		0	2000	4000	6000	8000
- 4°F (- 20°C)	Roll (ft)	591	640	689	738	787
	Clear 50 ft (ft)	1345	1427	1526	1624	1739
+ 32°F (0°C)	Roll (ft)	640	689	738	787	886
	Clear 50 ft (ft)	1427	1542	1624	1739	1870
+ 59°F (+ 15°C)	Roll (ft)	673	722	771	869	935
	Clear 50 ft (ft)	1509	1608	1706	1821	1936
+ 86°F (+ 30°C)	Roll (ft)	705	755	837	902	968
	Clear 50 ft (ft)	1575	1673	1772	1919	2034
+ 104°F (+ 40°C)	Roll (ft)	722	787	869	935	1001
	Clear 50 ft (ft)	1624	1706	1854	1969	2083

Figure 5.20 - LANDING PERFORMANCE [2535 lbs (1150 kg)]
(Flaps in landing position)

LANDING PERFORMANCE

WEIGHT : 2407 lbs (1092 kg)

CONDITIONS : Clear 50 ft : 78 KIAS - 90 MPH IAS
Flaps retracted

NOTE :
See Paragraph "NOTICE" for corrections due to wind and runway condition.

Tempe-rature	Distance	Pressure altitude (ft)				
		0	2000	4000	6000	8000
- 4°F (- 20°C)	Roll (ft)	676	739	800	861	922
	Clear 50 ft (ft)	1537	1640	1742	1866	2010
+ 32°F (0°C)	Roll (ft)	739	800	861	922	1005
	Clear 50 ft (ft)	1640	1764	1866	2010	2132
+ 59°F (+ 15°C)	Roll (ft)	779	841	902	974	1052
	Clear 50 ft (ft)	1722	1845	1969	2091	2215
+ 86°F (+ 30°C)	Roll (ft)	820	881	944	1025	1107
	Clear 50 ft (ft)	1805	1927	2050	2194	2337
+ 104°F (+ 40°C)	Roll (ft)	855	920	984	1066	1149
	Clear 50 ft (ft)	1866	1969	2112	2255	2399

Figure 5.21 - LANDING PERFORMANCE [2407 lbs (1092 kg)]
(Flaps retracted)

LANDING PERFORMANCE

WEIGHT : 2535 lbs (1150 kg)

CONDITIONS : Clear 50 ft : 80 KIAS - 92 MPH IAS
Flaps retracted

NOTE :
See Paragraph "NOTICE" for corrections due to wind and runway condition.

Tempe-rature	Distance	Pressure altitude (ft)				
		0	2000	4000	6000	8000
- 4°F (- 20°C)	Roll (ft)	711	777	842	906	970
	Clear 50 ft (ft)	1617	1725	1833	1963	2115
+ 32°F (0°C)	Roll (ft)	777	842	906	970	1057
	Clear 50 ft (ft)	1725	1858	1963	2115	2243
+ 59°F (+ 15°C)	Roll (ft)	820	885	949	1020	1121
	Clear 50 ft (ft)	1812	1941	2071	2200	2330
+ 86°F (+ 30°C)	Roll (ft)	863	927	993	1078	1165
	Clear 50 ft (ft)	1899	2027	2157	2308	2459
+ 104°F (+ 40°C)	Roll (ft)	885	949	1035	1121	1209
	Clear 50 ft (ft)	1963	2071	2222	2372	2524

Figure 5.22 - LANDING PERFORMANCE [2535 lbs (1150 kg)]
(Flaps retracted)

CLIMB - CONSUMPTION - TIME - DISTANCE COVERED

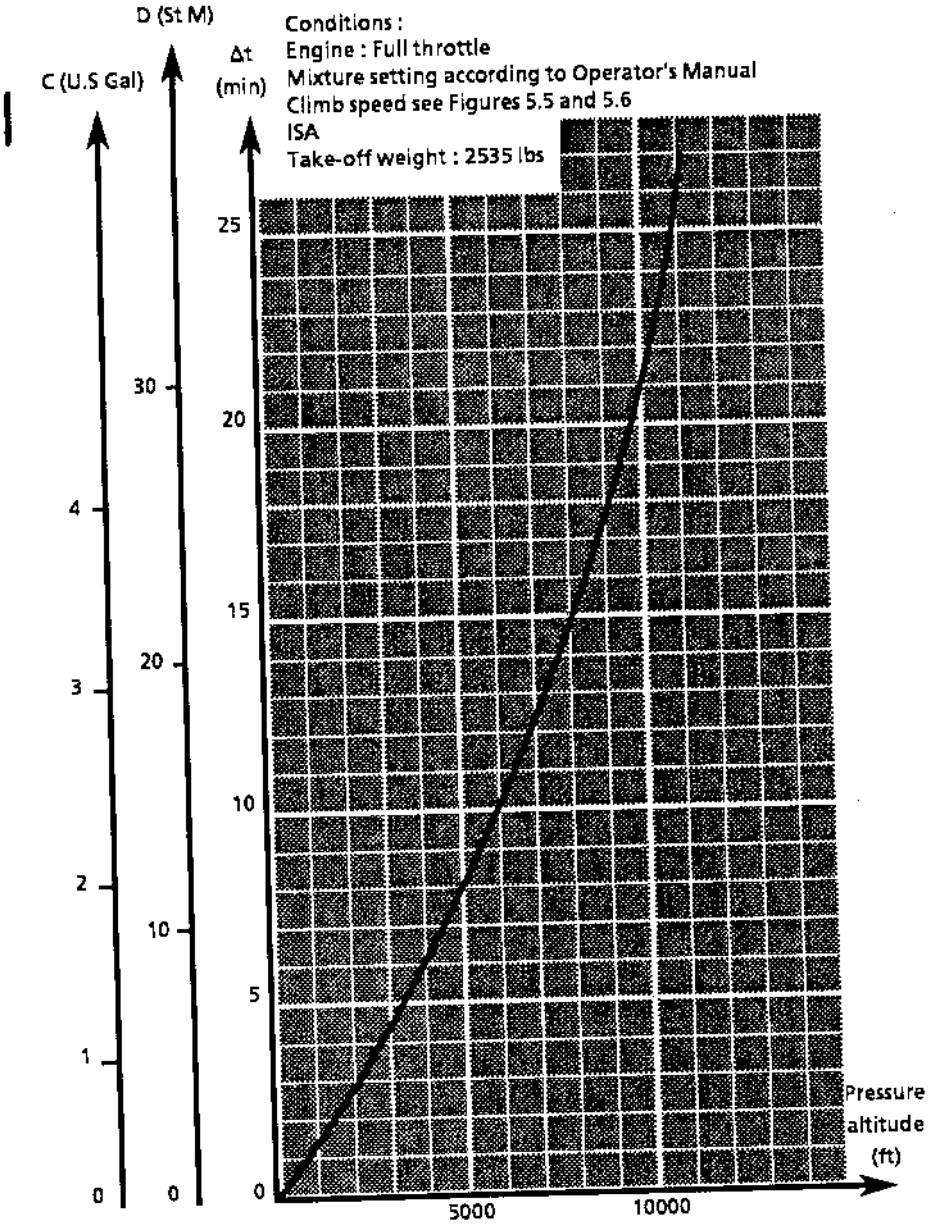


Figure 5.23 - CLIMB - CONSUMPTION - TIME - DISTANCE COVERED

SECTION 6

WEIGHT AND BALANCE

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GENERAL

This section contains the procedure for determining the basic empty weight and moment of SOCATA Model TB 10 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 at the 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 (3 cm) 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 ¼ turn both attaching pins of air regulation 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 143 lbs (65 kg) at 102.36 in. (2.600 m)

- **Cargo weight (without baggage) :**

  Maximum 573 lbs (260 kg) at 74.80 in. (1.900 m)

CAUTION

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

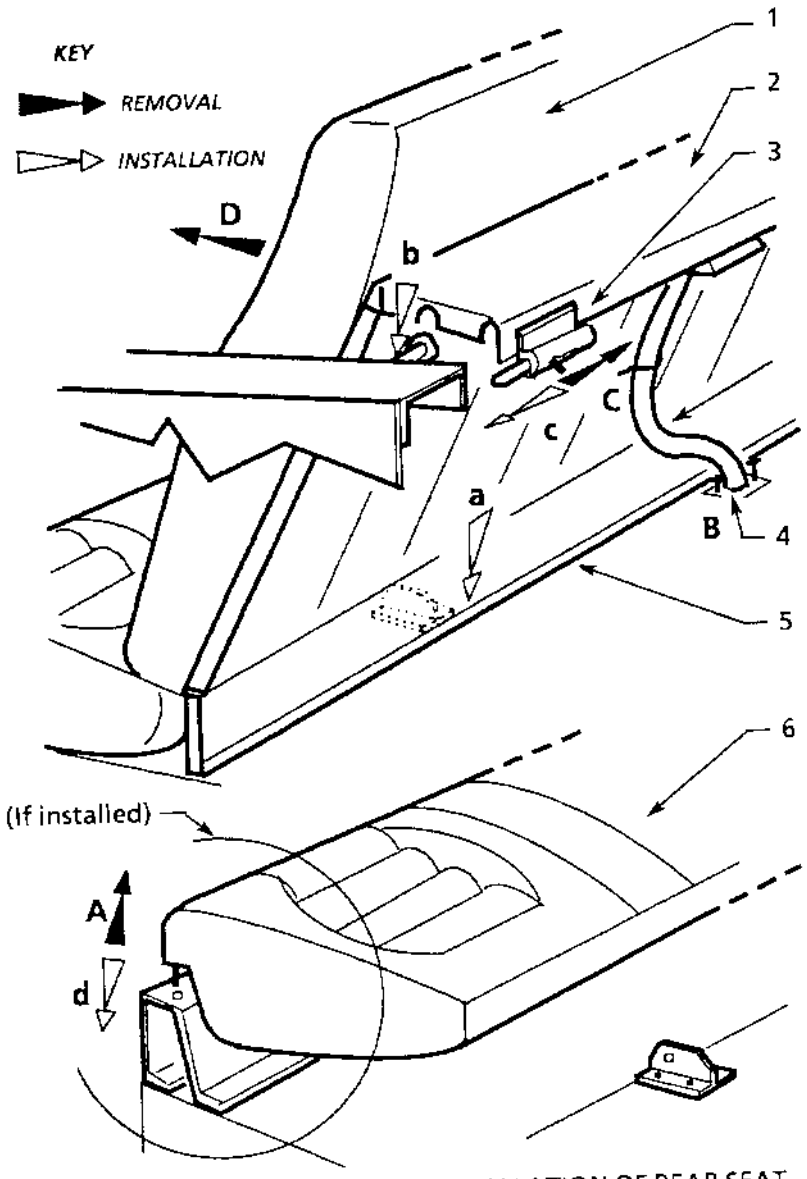


Figure 6.1 - REMOVAL AND INSTALLATION OF REAR SEAT

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 : see Figure 6.4
- 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 : 1554 lbs (705 kg) - 59.17 lb.in / 1000 (662 m.kg)]
- Superpose point A (1) and point A of graph ① Figure 6.4.
- Draw on weight / moment envelope the pilot + front passenger straight line to get point A (2) corresponding to front seats loading.
  [Our sample loading : 2 persons 340 lbs (154 kg)].

- 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 340 lbs (154 kg)]
- Superpose point B (1) and point B of graph ②, draw the fuel straight line to get point B (2).
  [Our sample loading : 249 lbs (113 kg) - 41.45 U.S Gal (157 litres) fuel]
- Superpose point B (2) and point B of graph ②, draw the baggage straight line to get point M.
  [Our sample loading : 33 lbs (15 kg) baggage]

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

NOTE :
Option No. 0800.00M "L.H. or R.H. front seat back-off installation", option No. 0800.10M "L.H. front seat back-off installation" and/or option No. 0800.20M "R.H. front seat back-off installation" are marked on your airplane by a color ring (yellow / green) located on the 2 front supports (tubes) of each seat.
For C.G. location calculation, take 2-inch (50 mm) L.H. front seat or L.H. and R.H. front seats back-off installation into account.

SAMPLE WEIGHT AND BALANCE RECORD

CONTINUOUS HISTORY OF CHANGES IN STRUCTURE OR EQUIPMENT AFFECTING WEIGHT AND BALANCE

AIRPLANE MODEL :				SERIAL NUMBER :						PAGE NUMBER :	
DATE	ITEM No		DESCRIPTION OF EQUIPEMENT OR MODIFICATION	WEIGHT CHANGE						RUNNING BASIC EMPTY WEIGHT	
				ADDED (+)			REMOVED (-)				
	IN	OUT		WEIGHT lb	ARM in.	MOMENT lb.in/1000	WEIGHT lb	ARM in.	MOMENT lb.in/1000	WEIGHT lb	MOMENT lb.in/1000
			As delivered								

Figure 6.2 - SAMPLE WEIGHT AND BALANCE RECORD

	SAMPLE AIRPLANE			YOUR AIRPLANE			Ref. on chart Figure 6.6
	Weight lb	Lever arm in.	Moment lb.in / 1000	Weight lb	Lever arm in.	Moment lb.in / 1000	
Standard empty weight	1543	37.23	57.45				
Optional equipment	11	156.36	1.72				
Basic empty weight	1554		59.17				A(1)
Pilot (without Opt. 0800)	170	45.38	7.71				
Pilot (with Opt. 0800)	/	47.44	/				
Front passenger (without Opt. 0800)	170	45.38	7.71				A(2)
Front passenger (with Opt. 0800)	/	47.44	/				
Rear seat passengers	340	82.48	28.04				
Fuel (41.45 U.S Gal.)	249	42.32	10.54				B(1)
Baggage	33	97.05	3.2				B(2)
TOTAL WEIGHT AND MOMENT	2516		116.37				M

Figure 6.3 - SAMPLE LOADING

CAUTION

OPTION(S) No. 0800.00M (Qty 1 or 2) OR 0800.10M AND 0800.20M (See NOTE on page 6.6) :
2-in. (50 mm) back-off installation for L.H. and/or R.H. front seat(s)

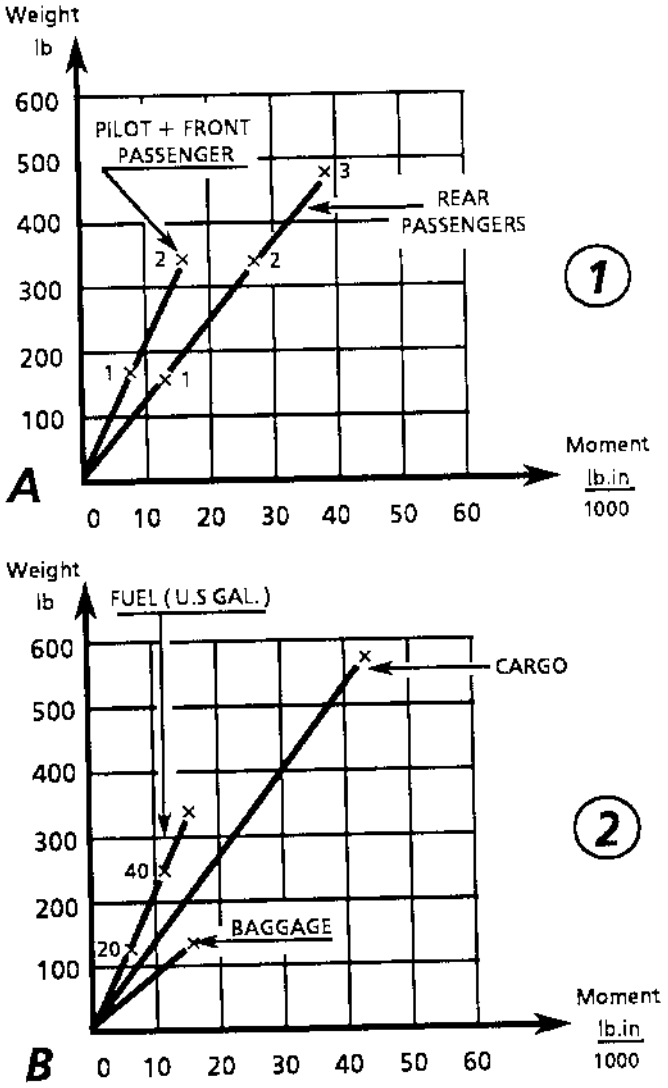


Figure 6.4 - LOADING GRAPHS

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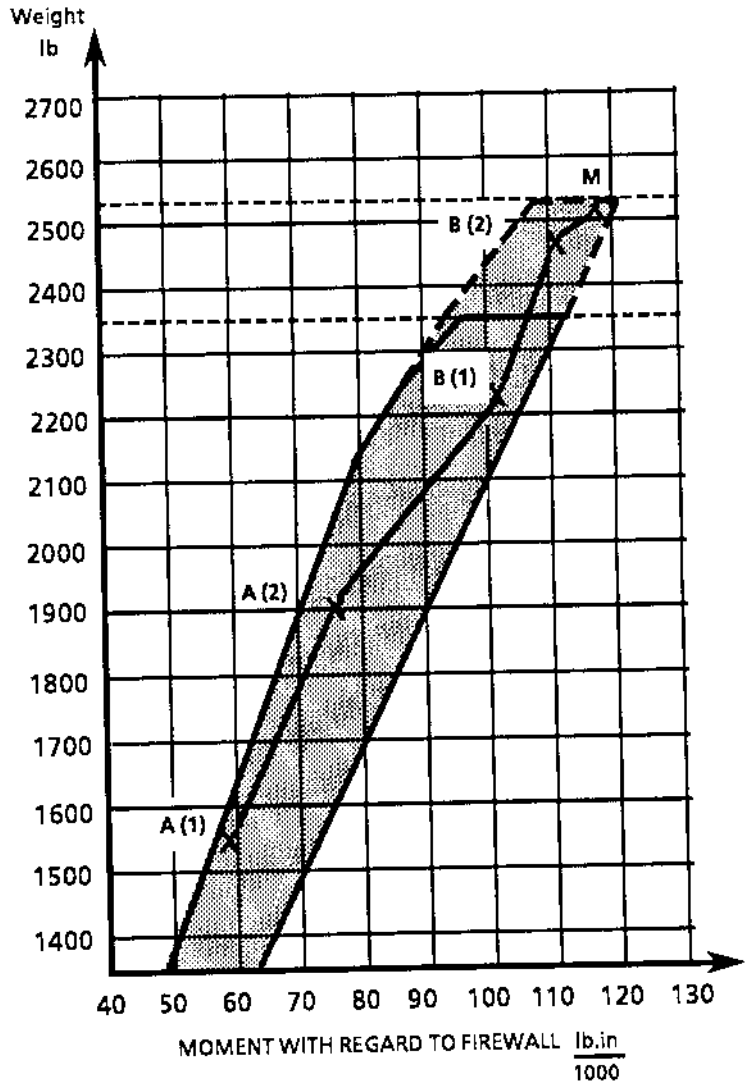


Figure 6.6 - LOADING SAMPLE

EQUIPMENT LIST

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

A separate equipment list of items installed at the factory 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 classifying the equipment :
  "R" : equipment items required for certification
  "S" : standard equipment items

b) List of Optional equipment (not restrictive)
- A letter "O" or "A" allows classifying 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.

R or S	REQUIRED OR STANDARD EQUIPMENT	WEIGHT lb	ARM in.
	POWER PLANT AND ACCESSORIES		
R	Engine : LYCOMING O-360-A1AD	287.700	- 27.95
R	Propeller : HARTZELL HC-C2YK-1BF/F 7666 A-2	54.233	- 47.64
R	Oil cooler : NDM 20002A	1.742	- 20.47
R	Propeller governor : HARTZELL F4	5.731	- 14.96
R	Fuel selector / filter : LE BOZEC 35001 A10-1	1.300	44.49
	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 : 6.00-6 6 PRTT	8.818	59.84
R	- Tube : 6.00-6	1.653	59.84
	Fairings :		
S	- L.H. : TB10 48012006	11.905	62.20
S	- R.H. : TB10 48012007	11.905	62.20
	Wheel and tire - Nose LDG :		
R	- Wheel assy : CLEVELAND 40-77 B or 040-7702	2.822	- 16.93
R	- Tire: 5.00-5 6 PRTT	5.798	- 16.93
R	- Tube: 5.00-5	1.455	- 16.93
S	Fairings (Front and Rear) : TB10 48014004 and 005	6.173	- 10.24
	ELECTRICAL EQUIPMENT		
R	Battery : GILL G242 - 10 AH	26.962	- 2.76
R	Alternator : PRESTOLITE 70A ALU 8421 or LYCOMING 70A LW 14324	12.985	- 37.80

R or S	REQUIRED OR STANDARD EQUIPMENT	WEIGHT lb	ARM in.
R	Dual magneto : D4LN 3000	10.582	- 17.32
R	Starter : PRESTOLITE MHB 4016	12.632	- 39.37
	or LYCOMING LW 15572		
	or LYCOMING 31 B21 064	11.380	- 39.37
R	Battery relay : ESSEX 70 117 221.5	0.772	- 1.18
R	Starter relay : PARIS-RHONE CE 1971 060 F	1.499	- 1.18
S	Lighter : R.V.I (Plug 5000 361 037 (Fixed part 5000 361 635 (Light 5000 462 170	0.154	37.80
R	Advisory panel : TB20 61222 - If the GPS (except "Stand alone version") is installed, see optional equipment J870 or K860 or K899 - If the extended advisory panel is installed, see optional equipment C900	0.397	22.83
R	Voltage regulator : TB20 61215 LAMAR BOO 368.5	0.375	3.94
R	Fuel electric pump : TB10 61218000 FACET 476284	1.653	1.18
R	Flaps actuator : TB10 61235	5.070	61.81
	AVIAC 8375		
	or LPMI 700239	4.365	61.81
	or TB10 61237	5.534	61.81
S	Rear cabin lighting : TB20 64200	0.507	65.35
S	Instrument panel lighting : TB20 64201	0.485	23.62
S	Front cabin lighting (emerg.) : TB20 64200	0.220	44.09
S	Landing light : G.E. 4591	0.353	35.43

R or S	REQUIRED OR STANDARD EQUIPMENT	WEIGHT lb	ARM in.
S	Taxi light : G.E. 4626	0.353	35.43
S	Navigation lights :		
	- L.H. : LABINAL 3131	0.419	34.65
	- R.H. : LABINAL 3133		
	or		
	- L.H. : WHELEN W1250 PR	0.441	34.65
	- R.H. : WHELEN W1250 PG		
	- Rear : LABINAL 3175	0.198	239.76
	or WHELEN A555A-V-28V	0.132	239.76
	INSTRUMENTS		
R	Tachometer : TB10 76226	0.838	25.59
	or CASTLEBERRY 30S101-02		
	or TB10 76206	1.014	25.59
	or LM 82		
R	Manifold pressure : TB10 76224 UI 6111 Code D 73	0.948	25.59
R	Engine & fuel controls : TB10 76201	1.102	24.80
R	True airspeed indicator with integrated lighting TB10 76223 UI 8100 Code B 603		
	or T200 76003 UI 8100 Code B 675	0.728	24.80
R	Altimeter : TB20 76222 UI 5934 PAD 1 or PAD 3 Code A253	0.816	25.59
R	Compass : TB20 76229 AIRPATH C2400 L 4P (28 V)	0.595	20.47

R or S	REQUIRED OR STANDARD EQUIPMENT	WEIGHT lb	ARM in.
R	Slip indicator : AIR PRECISION Type 57	0.110	23.62
	or WINTER 35216		
	CABIN EQUIPMENT		
	Seat belts :		
R	- Front seat belt : TB10 79013		
	SECURAIGLON	2.646	47.24
	or TRW REPA	2.646	47.24
	or ANJOU AERO 10.4022.000.002	2.646	47.24
R	- Rear seat belt : TB10 79014		
	AIGLON 344.22.070.04.300	1.124	94.49
	Seats :		
R	- Front seat : TB10 74030	18.298	51.18
	or TB10 74095	23.622	51.18
	or TB10 74106 X 00/01	24.625	49.21
	or TB10 74106 X 02/03	25.055	49.21
	If the optional equipment is installed, see Paragraph F		
R	- Rear seat :		
	Back + seating TB10 74027	13.448	84.65
	or TB10 74107	14.616	84.65
	If the optional equipment is installed, see Paragraph F		
S	Colourless windows	27.558	53.15
	- Windshield TB21 24001	11.023	27.56
	- Doors windows TB10 25030	8.598	55.12
	- Rear side windows TB10 22030	7.937	86.61
S	Front ash-tray	0.882	43.31
S	Rear ash-tray	0.353	65.35

A or O	ITEM No.	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
		A - ENGINE & ACCESSORIES			
A	A81600M	Vacuum system (pump AIRBORNE P / N 211CC)		4.784	0
A	A88700M	Low noise exhaust		15.432	15.75
A	A90400M	Vacuum pump "SIGMATEK" with filter		4.784	0
A	065810M	Oil drain door		0.220	- 25.59
		B - LDG & ACCESSORIES			
O	052500M	TB10 without LDG fairings		- 29.983	47.24

A or O	ITEM No.	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
		C - ELECTRIC SYSTEMS			
O	C51510M	Heated pitot (not valid for Russian and Ukrainian airplanes)		1.190	53.15
O	C51520M	Heated pitot (Specific for Russian and Ukrainian airplanes)		1.190	53.15
A	C56100M	Starter warning light		0.132	39.37
O	C56900M	Preselecting flaps		0.220	39.37
A	C59800M	Radio console ventilation		1.543	6.30
A	C63200M	Auxiliary dry air pump		12.456	30.31
A	C63500M	2nd heated pitot (R.H. wing)		1.190	47.24
A	C82500M	Ground power receptacle		3.527	47.24
A	C83500M	Ground power receptacle		3.682	49.61
A	C83900M	Converter 28 V - 14 V L.T. 71A KGS		1.653	39.37
A	C84100M	Ground power extension (with Opt. C83500M)		4.740	91.73
O	C86600M	Fuel low level warning		0.728	33.46
A	C86900M	Radio console forced ventilation (blower "KING" KA 33)		1.543	43.31
O	C90000M	Advisory panel (extended)		Δ 0.110	23.62
O	C90010M	Advisory panel (extended) (English-speaking countries)		Δ 0.110	23.62
A	063100M	Warning light for gyros supply failure		0.198	0.39

A or O	ITEM No.	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
		D - INSTRUMENTS			
A	D51600M	Clock "DODANE"		0.441	35.43
A	D53600M	Exhaust gas temperature EGT "ALCOR"		0.882	21.65
A	D57100M	Hourmeter "DATCON"		0.551	23.62
A	D63800M	Digital chronometer (L.H. station) "ASTROTECH"		0.507	35.43
A	D63820M	Digital chronometer (R.H. station) "ASTROTECH"		0.507	35.43
A	D67500M	Altitude and vertical speed preselector KAS 297 B "KING"		1.764	21.65
A	D67510M	Altitude and vertical speed preselector KAS 297 B (on R.H. instrument panel) "KING"		1.764	21.65
A	D67520M	Altitude and vertical speed preselector KAS 297 B (on console) "KING"		1.764	21.65
A	D68000M	Quartz chronometer Q18.945.22.28.1KB "THOMMEN"		0.485	35.43
A	D68100M	2nd altimeter 20000 ft		1.433	19.69
A	D68200M	Vertical speed indicator with integrated lighting P / N 7000 Code C83 "UI"		1.014	23.62
A	D68300M	Attitude gyro and heading gyro indicators "AID"		5.093	21.65

A or O	ITEM No.	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
A	D68310M	Attitude gyro and heading gyro indicators "AID" (Specific for U.K. airplanes)		5.093	21.65
A	D68320M	Attitude gyro indicator "AID"		2.205	21.65
A	D68340M	Air-driven heading indicator "AID"		2.888	21.65
A	D68400M	Carburetor temperature		0.331	23.62
A	D685	EGT / CHT - Probe on all cylinders		3.307	3.94
A	D68900M	Ammeter		0.551	28.74
A	D69100M	Turn-and-bank indicator "UI"		1.675	23.62
A	D69700M	Electrical turn coordinator "CASTLEBERRY"		1.698	23.62
A	D80200M	Electrical attitude gyro indicator 305-2BL (on L.H. instrument panel)		2.690	23.62
A	D80210M	Electrical attitude gyro indicator 305-2BL-S		2.690	23.62
A	D80220M	Electrical attitude gyro indicator 305-2BL-S (Not valid for U.K. airplanes)		2.690	23.62
A	D80230M	Electrical attitude gyro indicator 305-2BL-SK (Specific for U.K. airplanes)		2.690	23.62
A	D80240M	Electrical attitude gyro indicator 305-2BL (on R.H. instrument panel)		2.690	23.62
A	D80260M	Electrical attitude gyro indicator B305-2BL (on R.H. instrument panel)		2.690	23.62
A	D80310M	Installation of 2nd airspeed indicator		1.213	23.62
A	D80400M	Outside air temperature		0.551	23.62
A	D80600M	Three-axis accelerometer		0.992	23.62

A or O	ITEM No.	OPTIONAL EQUIPMENT		*	WEIGHT lb	ARM in.
A	D81100M	Alti-coder K127	"KING"		1.443	17.72
A	D81810M	Slip indicator (R.H. station)			1.675	23.62
A	D82900M	Mechanical chronometer B18 945.22.28.1K	"THOMMEN"		0.485	35.43
A	D83000M	Alti-coder 20000	"TRANSCALL"		1.433	17.72
A	D83100M	Alti-coder 30000 ft	"TRANSCALL"		1.433	17.71
A	D83200M	2nd altimeter 35000 ft			1.433	19.69
A	D83300M	Airplane watch LC2	"ASTROTECH"		0.331	23.62
A	D84400M	Mechanical chronometer Type 11-1	"BREGUET"		0.441	35.43
A	D86300M	Tachometer-Hourmeter P/N LM 03	"LMI"		0.860	23.62
A	D86700M	Electric attitude indicator RCA BK-12	"RC ALLEN"		2.315	21.65
A	D89700M	Vertical speed indicator (R.H. station) P / N 7000 Code C83	"UI"		1.521	23.62
A	067130M	Attitude gyro indicator KG 258 for KAP 100			3.086	20.47
A	067140M	Heading indicator KG 107			2.690	20.47
A	067150M	Blind flight without attitude gyro indicator, nor heading indicator, nor HSI			2.579	10.24
A	067230M	Attitude gyro indicator KG 258 for KAP 150			3.086	20.47
A	067330M	Attitude gyro indicator KI 256 for KFC 150			3.285	20.47

A or O	ITEM No.	OPTIONAL EQUIPMENT		*	WEIGHT lb	ARM in.
		E - LIGHTINGS				
A	E53700M	Strobe light on vertical stabilizer	"JPC"		1.874	145.67
A	E53710M	Strobe lights on vertical stabilizer and under fuselage	"JPC"		3.197	140.55
A	E53720M	Strobe light on vertical stabilizer (red glass)	"JPC"		1.874	145.67
A	E58800M	Map reading light			0.176	25.59
A	E82400M	Anticollision lights (wing tips) A490A TS DF 14-28 - Light A625	"WHELEN"		5.423	107.48
A	E82410M	Anticollision lights (wing tips) A490A TS CF 14-28 - Light A625	"WHELEN"		5.423	107.48
A	E82420M	Anticollision lights (wing tips) A490A TS DF 14-28 - Light A625D	"WHELEN"		5.423	107.48
A	E82430M	Anticollision lights (wing tips) A490A TS CF 14-28 - Light A625D	"WHELEN"		5.423	107.48
O	E82600M	Strobe light, tail A490A TS DF 14-28	"WHELEN"		2.094	145.67
O	E82610M	Strobe light, tail A490A TS CF 14-28	"WHELEN"		2.094	145.67
O	E84800M	Light control box JX 128	"FLASHELEK"		0.551	55.31
A	E87300M	Emergency lighting system			4.079	104.72

A or O	ITEM No.	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
		F - CABIN EQUIPMENT			
O	F63400M	Raised radio console		3.131	23.62
O	F77800M	Leather seats assembly "Grey 95" "PMV" with head-rests (F77815M)			
		- Front seats (Qty 2)		58.598	49.21
		- Rear seat		17.064	84.65
O	F77810M	Leather seats assembly "Chanel 95" "PMV" with head-rests (F77825M)			
		- Front seats (Qty 2)		58.598	49.21
		- Rear seat		17.064	84.65
O	F77900M	Front seats "Blue 90" (Qty 2)		52.117	49.21
A	F77915M	Front head-rests "Blue 90" (Qty 2)		3.417	51.18
A	F822	Forced ventilation "VETUS" (F82200M or F82210M)		2.756	136.61
A	F82300M	Cabin halon extinguisher FH 15N "AREOFEU"		4.409	37.80
A	F82310M	Cabin halon extinguisher H1-10 AIR "MAIP"		4.850	37.80
A	F82320M	Cabin halon extinguisher H1-10 AIR "MAIP" (with special support)		5.313	37.80
A	F86800M	Ventilation scoops		0.220	79.53
O	F87900M	Front seats "Blue 95" (Qty 2) "PMV"		52.976	49.21
O	F87910M	Front seats "Ficelle 95" (Qty 2) "PMV"		52.976	49.21
A	F87915M	Front head-rests "Blue 95" (Qty 2) "PMV"		3.461	55.12
O	F87920M	Rear seat "Blue 95" "PMV"		18.144	84.65
A	F87925M	Front head-rests "Ficelle 95" (Qty 2) "PMV"		3.461	55.12

A or O	ITEM No.	OPTIONAL EQUIPMENT		*	WEIGHT lb	ARM in.
O	F87930M	Rear seat "Ficelle 95"	"PMV"		18.144	84.65
A	F87935M	Rear head-rests "Blue 95" (Qty 2)	"PMV"		3.461	90.55
A	F87945M	Rear head-rests "Ficelle 95" (Qty 2)	"PMV"		3.461	90.55
A	F88300M	Cabin powder extinguisher AFT 15N	"AREOFEU"		4.608	37.80
O	F89900M	Rear seat "Blue 95" with arm-rest "LUXE"			15.939	84.65
O	F89910M	Rear seat "Ficelle 95" with arm-rest "LUXE"			15.939	84.65
A	F90200M	Axe			2.535	37.40
A	F90300M	Life jackets (Qty 4)			8.818	124.80
A	050210M	3rd rear safety belt "Black"			0.882	84.65
A	051100M	Alternate static source (in cabin)			0.331	23.62
A	052100M	Braking control (R.H. post)			3.307	11.81
A	052630M	Sun visor	"PLEXIGLAS"		0.683	41.34
A	052800M	Cabin fire extinguisher			2.822	36.22
A	056200M	L.H. little window			0.750	39.37
A	056210M	R.H. little window			0.750	39.37
A	056220M	L.H. tinted little window			0.750	39.37
A	056230M	R.H. tinted little window			0.750	39.37
O	056320M	Rear reel safety belt			2.646	106.30
O	057730M	R.H. large instrument panel			4.740	23.62

A or O	ITEM No.	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
O	058520M	Tinted windows		27.558	53.15
		- Windshield TB21 24001		11.023	27.56
		- Doors windows TB10 25030		8.598	55.12
		- Rear side windows TB10 22030		7.937	86.61
A	063700M	Rear seat shoulder harness (Qty 2)		2.249	94.49
A	064000M	3rd rear reel safety belt		1.918	106.30
A	064100M	3rd rear seat shoulder harness		1.124	94.49
O	067800M	Leather seats assembly "Grey" "PMV" with head-rest (067815M)			
		- Front seats (Qty 2)		48.060	49.21
		- Rear seat		19.555	84.65
O	067810M	Leather seats assembly "Chanel" "PMV" with head-rest (067825M)			
		- Front seats (Qty 2)		48.060	49.21
		- Rear seat		19.555	84.65
A	067815M	Leather head-rests "Grey" (Qty 2)		3.086	55.12 or 90.55
O	067820M	Leather seats assembly "Grey" "PMV" with head-rest (067815M) (Extended version)			
		- Front seats (Qty 2)		48.060	49.21
		- Rear seat		19.555	84.65
A	067825M	Leather head-rests "Chanel" (Qty 2)		3.086	55.12 or 90.55

A or O	ITEM N°	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
O	067830M	Leather seats assembly "Chanel" "PMV" with head-rest (067825M) (Extended version)			
		- Front seats (Qty 2)		48.060	49.21
		- Rear seat		19.555	84.65
O	067900M	Front seats "Cendre" (Qty 2) "PMV" with head-rests (067915M)		45.194	49.21
O	067910M	Front seats "Sable" (Qty 2) "PMV" with head-rests (067925M)		45.194	49.21
A	067915M	Head-rests "Cendre" (Qty 2) "PMV"		2.161	55.12 or 90.55
O	067920M	Rear seat "Cendre" "PMV" with head-rests (067915M)		17.064	84.65
A	067925M	Head-rests "Sable" (Qty 2) "PMV"		2.161	55.12 or 90.55
O	067930M	Rear seat "Sable" "PMV" with head-rests (067925M)		17.064	84.65
A	067935M	Head-rests "Blue Alcantara" (Qty 2) "PMV"		2.161	55.12 or 90.55
O	067940M	Front seats "Blue Alcantara" (Qty 2) "PMV" with head-rests (067935M)		45.194	49.21
A	067945M	Head-rests "Ficelle Alcantara" (Qty 2) "PMV"		2.161	55.12 or 90.55
O	067950M	Front seats "Ficelle Alcantara" (Qty 2) "PMV" with head-rests (067945M)		45.194	49.21
O	067960M	Rear seat "Blue Alcantara" "PMV" with head-rests (067935M)		17.064	84.65

A or O	ITEM No.	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
O	067970M	Rear seat "Ficelle Alcantara" "PMV" with head-rests (067945M)		17.064	84.65
O	067980M	Front seats "Blue Alcantara" (Qty 2) "PMV" with head-rests (067935M)		50.111	49.21
O	067990M	Front seats "Ficelle Alcantara" (Qty 2) "PMV" with head-rests (067945M)		50.111	49.21
O	079900M	Rear seat "Cendre" "PMV" with central arm-rest		13.338	84.65
O	079910M	Rear seat "Sable" "PMV" with central arm-rest		13.338	84.65
O	079920M	Rear seat "Blue Alcantara" "PMV" with central arm-rest		13.338	84.65
O	079930M	Rear seat "Ficelle Alcantara" "PMV" with central arm-rest		13.338	84.65
O	080000M	L.H. or R.H. front seat back-off installation (before modification No. MOD. 89)		0.331	37.80
O	080010M	L.H. front seat back-off installation (after modification No. MOD. 89)		0.882	37.80
O	080020M	R.H. front seat back-off installation (after modification No. MOD. 89)		0.882	37.80
O	100140M	Tilting front seat "Blue Alcantara"		18.300	49.21
O	100440M	Tilting front seat "Ficelle Alcantara"		18.300	49.21

A or O	ITEM No.	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
		G - AUTOPILOTS - TRIM			
A	G66800M	A / P KAP 100 "KING"		11.442	35.43
A	G66810M	Electrical pitch trim "KING"		6.217	127.17
A	G66900M	A / P KAP 150 "KING"		21.363	76.38
A	G67000M	A / P KFC 150 "KING"		21.561	75.59
A	G81000M	Remote A / P modes annunciator KA 185 03 for KAP 150		0.661	23.62
A	G81010M	Remote A / P modes annunciator KA 185 01 for KFC 150		0.661	23.62
		H - MISCELLANEOUS EQUIPMENT & SYSTEMS			
A	H61520M	Additional equipment for IFR France "Grey"		0.441	25.59
A	H61620M	Additional equipment for night VFR France "Grey"		0.441	25.59
A	H88100M	First aid kit		4.409	90.95
A	058030M	Ferry fuel tank (TB20 52925)		63.933	78.35
A	059700M	Rudder / aileron control interconnection		2.138	16.14

A or O	ITEM No.	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
		J - **MISCELLANEOUS RADIO EQUIPMENT**			
A	J52430M	Interphone		0.441	11.81
A	J53900M	VHF / COM capability		3.395	40.16
A	J68800M	Boom microphone headset "PELTOR"		0.992	55.12
A	J82000M	Stormscope WX 1000 "BFG"		15.432	83.07
A	J82700M	Intercommunication system SPA 400 ICS "SIGTRONICS"		0.750	32.28
A	J82710M	Intercommunication system SPA 400 AV "SIGTRONICS"		0.750	32.28
A	J82800M	Stormscope WX 1000 + "BFG"		15.432	83.07
A	J82810M	Stormscope WX 1000 + (with converter assy) "BFG"		15.432	83.07
A	J87000M	GPS 100 AVD-140 "GARMIN" interfaced with HSI and A/P (VFR use only) (for export only) including advisory panel TB20 61760		4.145	22.44
A	J87010M	GPS 100 AVD-140 "Stand alone" "GARMIN"		3.593	22.44
A	J87020M	GPS 100 AVD-140 "Stand alone" "GARMIN" with audio attenuation including extended advisory panel		3.593	22.44
A	J87030M	GPS 100 AVD-140 "GARMIN" interfaced with HSI and A/P, with audio attenuation (VFR use only) (for export only) including extended advisory panel		4.145	22.44

A or O	ITEM No.	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
A	J87040M	GPS 100 AVD-140 "GARMIN" interfaced with HSI, with audio attenuation (VFR use only) (for export only) including extended advisory panel		4.145	22.44
A	J88400M	ESD protection		/	/
A	J89300M	Headset (noise reducer) HDCII "BOSE" (pilot and front passenger)		4.189	55.12
A	J89310M	Headset (noise reducer) HDCII "BOSE" (pilot)		2.094	55.12
A	J89400M	VHF/COM capability		3.219	45.27
A	051700M	Emergency locator transmitter "NARCO ELT 10"		3.307	119.29
A	051710M	Emergency locator transmitter "JOLLIET" (aft baggage compartment)		3.086	119.29
A	051730M	Emergency locator transmitter "JOLLIET" (forward baggage compartment)		3.086	109.45
A	052300M	Boom microphone headset "D. CLARK"		1.190	55.12
A	054910M	Rigid antenna VHF 1 "D & M"		0.661	127.17
A	054920M	Rigid antenna VHF 2 "D & M"		0.661	57.87

A or O	ITEM No.	OPTIONAL EQUIPMENT		*	WEIGHT lb	ARM in.
		K - KING RADIO				
A	K58400M	RMI KI 22900 (without switching)	"KING"		3.086	21.65
A	K58410M	RMI KI 22900 (with switching)	"KING"		3.307	21.65
O	K60820M	Alti-coder KEA 130 (35000 ft)	"KING"		1.764	21.65
O	K60830M	Alti-coder (20000 ft)	"UI"		1.764	21.65
A	K65400M	Receiver VOR KN 53 NAV 1 VOR / ILS	"KING"		5.026	68.11
A	K65410M	Receiver VOR KN 53 NAV 1 VOR / LOC	"KING"		6.790	55.12
A	K65420M	Receiver VOR KN 53 NAV 2 VOR / ILS	"KING"		5.379	63.78
A	K65430M	Receiver VOR KN 53 NAV 2 VOR / LOC	"KING"		6.967	59.06
A	K65500M	ADF (Indicator KI 227.00, Receiver KR 0087.01 or KR 87, Antenna KA 44 B)	"KING"		8.620	59.06
A	K65510M	ADF (Indicator KI 227.01, Receiver KR 0087.01 or KR 87, Antenna KA 44 B)	"KING"		8.620	59.06
A	K65520M	ADF (Receiver KR 0087.01 or KR 87, Antenna KA 44B)	"KING"		7.848	59.06
A	K65600M	ATC KT 76 A-01 on radio console	"KING"		3.682	20.08

A or O	ITEM No.	OPTIONAL EQUIPMENT		*	WEIGHT lb	ARM in.
A	K65620M	ATC KT 76 A-01 on R.H. panel strip	"KING"		3.836	20.08
A	K65700M	DME KN 62 / A	"KING"		3.682	21.26
A	K65710M	DME KN 64	"KING"		3.682	21.26
A	K66000M	HSI assy without heading recopy	"KING"		12.720	67.32
A	K66010M	HSI assy with heading recopy capability	"KING"		12.720	67.32
A	K66020M	HSI assy with heading recopy capability (30/400 Hz) with vertical KA 51B	"KING"		12.720	67.32
A	K66030M	HSI assy with heading recopy capability (30/400 Hz) with horizontal KA 51B	"KING"		12.720	67.32
A	K66040M	HSI assy with heading recopy capability (30/400 Hz) (lighting control at R.H. station)	"KING"		12.720	67.32
A	K66200M	NAV system KNS 81-10	"KING"		7.496	52.76
A	K66220M	NAV system KNS 81-12	"KING"		7.496	52.76
A	K66300M	VHF 1 VOR / LOC KX 155-39 with audio amplifier (with VHF capability)			11.486	35.43
A	K66310M	VHF 1 VOR / ILS KX 155-43 (with VHF capability)			11.596	48.82
A	K66320M	VHF 2 VOR / LOC KX 155-39			7.760	24.80
A	K66330M	VHF 2 VOR / ILS KX 155-43			6.900	24.80
A	K66340M	VHF 1 VOR / LOC KX 155-39 (with VHF capability)			11.486	35.43

A or O	ITEM No.	OPTIONAL EQUIPMENT		*	WEIGHT lb	ARM in.
A	K66350M	VHF 1 VOR / LOC KX 155-39 (without VHF capability)			8.091	30.71
A	K66360M	VHF 1 VOR / ILS KX 155-43 (without VHF capability)			8.201	49.21
A	K66370M	VHF 1 VOR / LOC KX 155-39 with audio amplifier (without VHF capability)			8.091	30.71
A	K66400M	DME KN 63	"KING"		5.489	40.94
A	K66600M	VHF 1 VOR / LOC KX165-25			12.566	39.37
A	K66610M	VHF 1 VOR / ILS KX165-25			14.087	35.43
A	K66620M	VHF 2 VOR / LOC KX165-25			5.335	39.37
A	K66630M	VHF 2 VOR / ILS KX165-25			8.818	48.82
A	K66700M	NAV system KNS 80	"KING"		8.598	54.33
A	K67600M	Marker receiver indicator KR 21	"KING"		1.257	21.65
A	K80500M	VHF 2 KY 196 A 30	"KING"		3.825	22.83
A	K80510M	VHF 2 KY 196 A 30 + KMA 24-02	"KING"		6.768	22.44
A	K80520M	VHF 1 KY 196 A 30 + KMA 24-02 (with VHF capability)	"KING"		7.231	32.28
A	K80530M	VHF 1 KY 196 A 30 + KMA 24-02 (without VHF capability)	"KING"		3.858	19.29
A	K80700M	Audio selection box KMA 24 H 52 with interphone	"KING"		2.205	27.56

A or O	ITEM No.	OPTIONAL EQUIPMENT		*	WEIGHT lb	ARM in.
A	K80900M	Audio selection box KMA 24 H 70 with audio selector threshold	"KING"		2.381	31.50
A	K81200M	VHF 1 VOR / ILS KX 165	"KING"		8.113	49.61
A	K81210M	VHF 2 VOR / ILS KX 165	"KING"		8.818	48.82
A	K81220M	VHF 1 VOR / LOC KX 165	"KING"		7.937	30.71
A	K81230M	VHF 2 VOR / LOC KX 165	"KING"		8.598	31.50
A	K81300M	VOR / ILS KI 206 indicator	"KING"		1.631	21.65
A	K81400M	VOR / ILS KI 204 indicator	"KING"		1.918	21.65
A	K81500M	Audio selection box KMA 24-02	"KING"		2.910	22.44
A	K81510M	Audio selection box KMA 24-02	"KING"		2.910	22.44
A	K81900M	RMI KNI 582	"KING"		3.417	21.65
A	K84700M	Converter VOR / LOC KN 72	"KING"		1.653	43.31
A	K86000M	GPS KLN 90A "Stand alone"	"KING"		8.466	22.44
A	K86010M	GPS KLN 90A interfaced with HSI and A/P, with RMI	"KING"		9.171	21.65
A	K86030M	GPS KLN 90A interfaced with HSI, with RMI	"KING"		9.171	21.65
A	K86040M	GPS KLN 90A interfaced with HSI and A/P, without RMI (For export only)	"KING"		9.171	21.65
A	K87600M	Transponder KT 71	"KING"		4.630	22.44

A or O	ITEM No.	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in.
A	K89900M	GPS KLN 90B "KING" interfaced with HSI and A/P, without RMI (KA91 antenna) (For export only)		9.943	21.26
A	K89910M	GPS KLN 90B "KING" interfaced with HSI and A/P, without RMI (KA92 antenna) (For export only)		9.943	21.26
A	K89920M	GPS KLN 90B "KING" interfaced with HSI and A/P, with RMI (KA92 antenna) (French-speaking countries)		9.943	21.26
A	K89930M	GPS KLN 90B "KING" interfaced with HSI and A/P, with RMI (KA92 antenna) (English-speaking countries)		9.943	21.26
		N - NARCO RADIO			
A	N84600M	Altitude encoder AR 850 "NARCO"		1.323	19.69

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SECTION 7

DESCRIPTION

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GENERAL

This section provides description and operation of the SOCATA Model TB 10 airplane and its systems. Some of the equipment described herein is optional and may not be installed in the airplane. Details of other optional systems and equipment are presented in Section 9 "Supplements" of this Manual.

AIRFRAME

The TB 10 is an all-metal, four / five-place, cantilever low wing, single-engine airplane equipped with fixed tricycle landing gear and is designed to be used in normal and utility categories.

The fuselage consists of an all-metal aluminium alloy structure of semimonocoque design. It includes 10 frames. The main frames are as follows :

- Frame No. 0 on which firewall, engine mount and nose gear mount are fixed.
- Frame No. 1 on which wing front attachments are fixed.
- Frame No. 2 double frame which allows crossing and attachment of the wing spar.
- Frame No. 3 on which wing rear attachments are fixed.
- Frame No. 7 on which vertical stabilizer front attachment is fixed.
- Frame No. 8 on which vertical stabilizer rear attachment is fixed.
- Frame No. 9 on which horizontal stabilator hinge fittings are fixed.

The cabin section, from frame No. 0 to frame No. 6, is reinforced by horizontal spars made of extruded aluminium sections.

The streamlined fairing is ensured by a composite material upper duct which includes the two access "gull-wing" doors.

Access to the baggage compartment (behind the bench seat) is provided through a door located on the L.H. side of the fuselage.

WINGS

The wings contain integral fuel tanks. They are constructed of stamped metal ribs riveted to the wing skin and to monobloc spar.

Wings characteristics :

Profile	RA16–3C3
Aspect ratio	8
Dihedral	4°5
Aerodynamic chord	4.002 ft - 1.220 m
True chord	4.085 ft - 1.245 m
Wing area	128.091 sq.ft - 11.90 m^2
Wing setting	+ 3°

Ailerons :

Unit area	4.897 sq.ft - 0.46 m^2
Mean span	4.081 ft - 1.244 m

Recoil and slotted type wing flaps :

Area	20.021 sq.ft - 1.86 m^2
Mean span	8.366 ft - 2.550 m

EMPENNAGE

The vertical stabilizer consists of a fin and a rudder.
The horizontal stabilizer is of stabilator type with an automatic anti-tab controlled in its stabilator tab function.
Both are of conventional metal structure type (spar, ribs and skin).

Empennage characteristics :

Conventional type vertical stabilizer :

Fin area	9.472 sq.ft - 0.88 m^2
Rudder area	6.781 sq.ft - 0.63 m^2

Stabilator type horizontal stabilizer :

Span	10.499 ft - 3.200 m
Stabilator area, anti-tab included	26.694 sq.ft - 2.48 m^2
Tab area	5.813 sq.ft - 0.54 m^2
Tab automaticity	85 %

FLIGHT CONTROLS

SURFACES

The airplane is equipped with a conventional three-axis surface system, consisting of aileron, stabilator and rudder surfaces.

Each front seat is provided with a control wheel which actuates ailerons and stabilator through rods and bellcranks.The control wheel being actuated fully, ailerons deflection (angles reference : wing chord) must be :

- upwards 15° ± 1.5°
- downwards 15° ± 1.5°

Stabilator deflection (angles reference : fuselage upper spar) must be :

- nose-up − 17° ± 1°
- nose-down + 2° ± 1°

The stabilator consists of an automatic anti-tab, which automaticity is 85 %. This anti-tab can also be controlled through the pitch trim.

Each front seat is provided with a rudder pedal which controls the rudder through rods and bellcranks.

Rudder deflection (angles reference : fin chord) to the left and to the right is 25° ± 2°.

TRIM

A manually-operated pitch trim is provided.

Stabilator trimming is accomplished by actuating on stabilator anti-tab through a control wheel vertically mounted on L.H. side of the control panel.

This control wheel actuates stabilator anti-tab through cables and an irreversibility system.

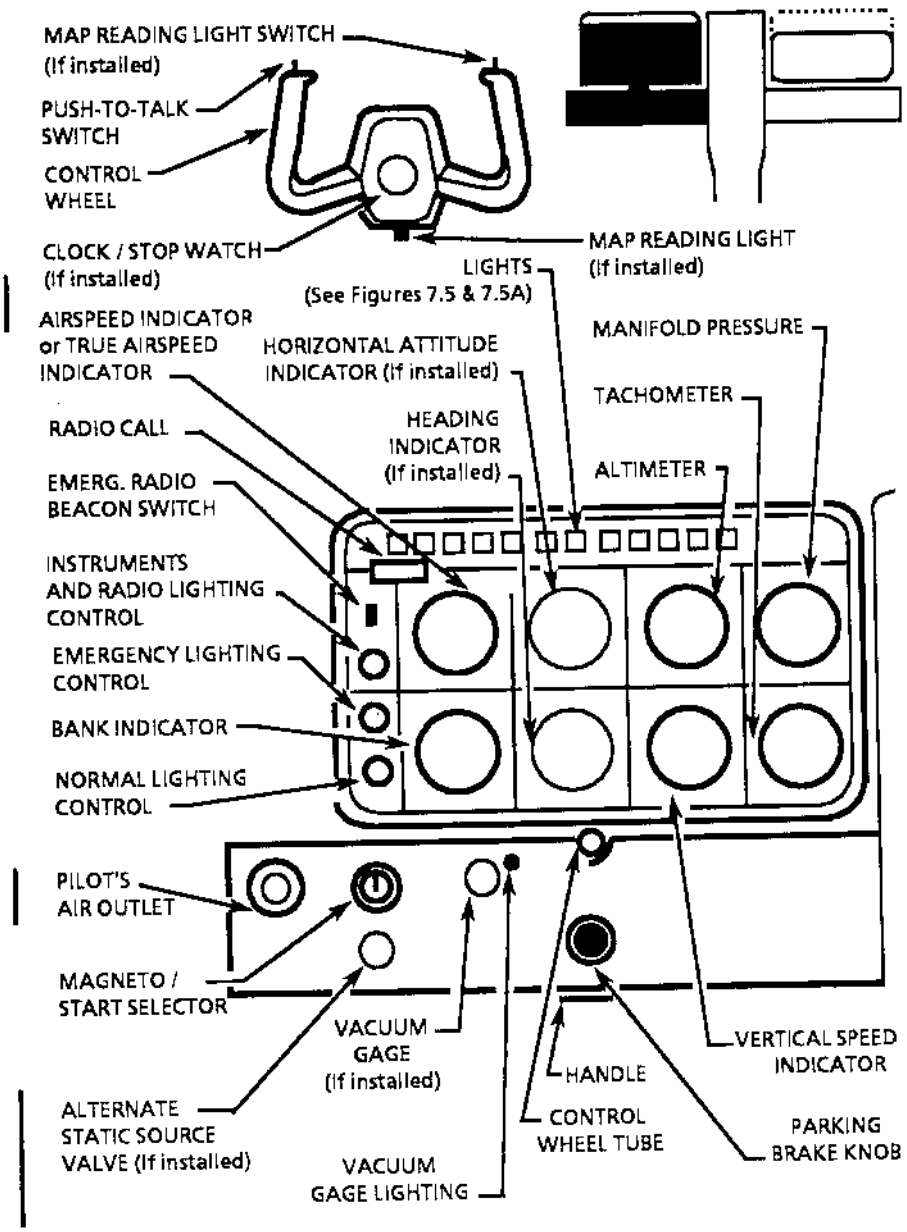


Figure 7.1 - EXAMPLE OF INSTRUMENT PANEL AND L.H. SUBPANEL

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, rearward rotation will trim nose-up.

Stabilator tab deflection (angles reference : stabilator profile chord) 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 advisory panel (see Figures 7.5 and 7.5A).
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. air outlet, magneto / start selector, parking brake knob ; alternate static source valve and vacuum 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.

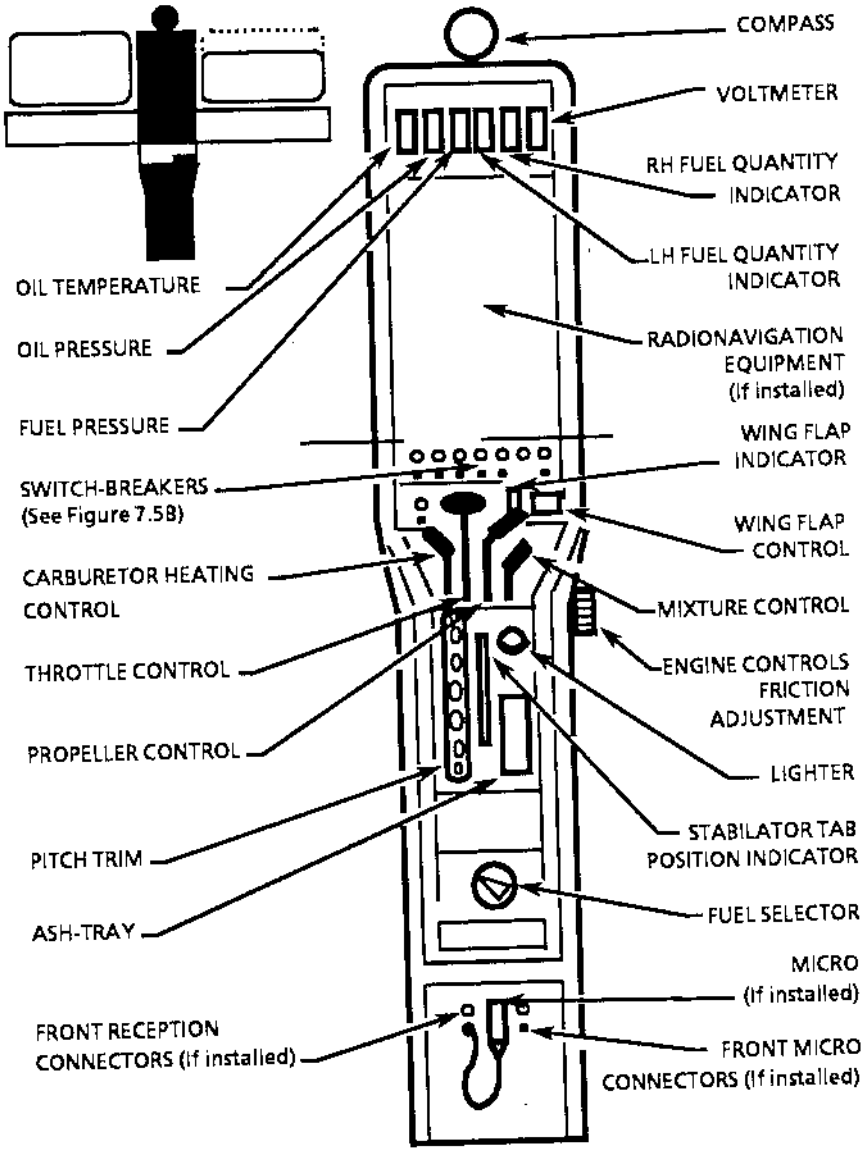


Figure 7.2 - EXAMPLE OF CONSOLE AND PEDESTAL

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

- the switch-breakers panel, flap control and indicator
- the engine controls (from left to right : carburetor heating, throttle, propeller, mixture)
- the pitch trim and its indicator
- the lighter and the ash-tray
- the fuel selector
- 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, cabin air selector, R.H. air outlet.

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)
- Autopilot alarm (if installed)
- Rear overhead light
- Rear air outlets
- Stall warning (buzzer).

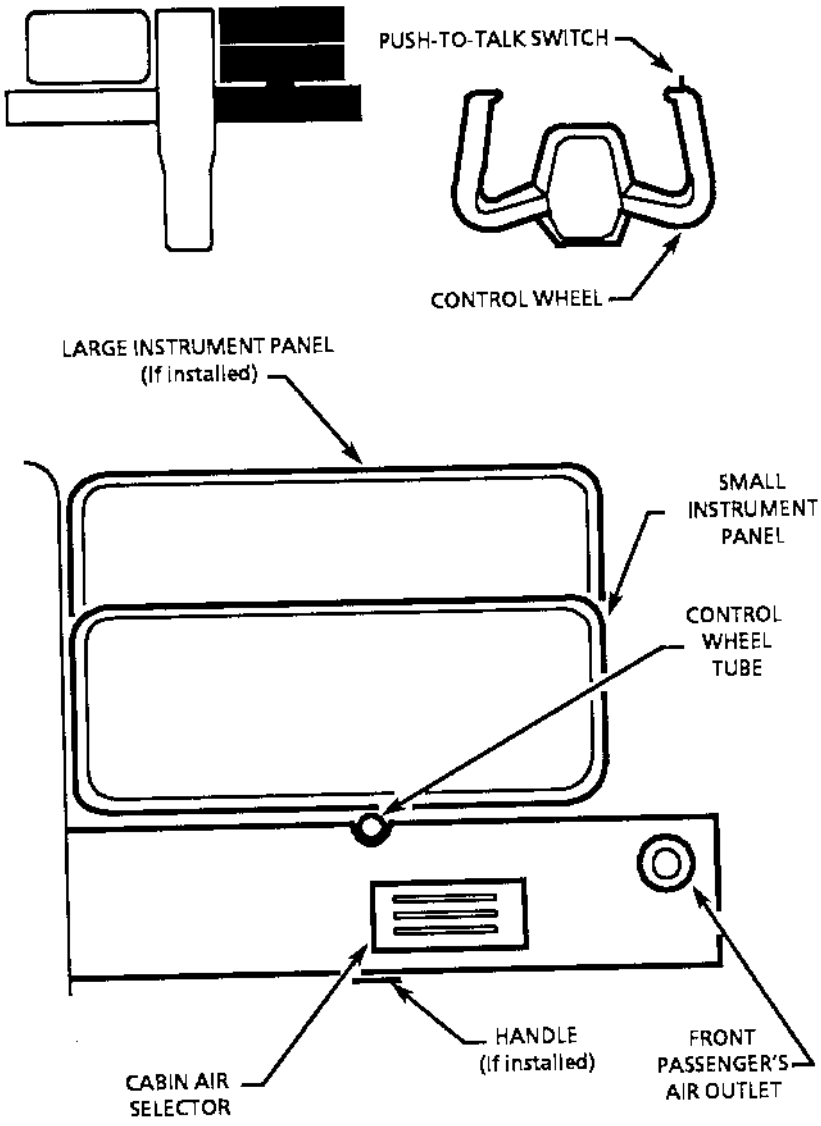


Figure 7.3 - EXAMPLE OF INSTRUMENT PANEL AND R.H. SUBPANEL

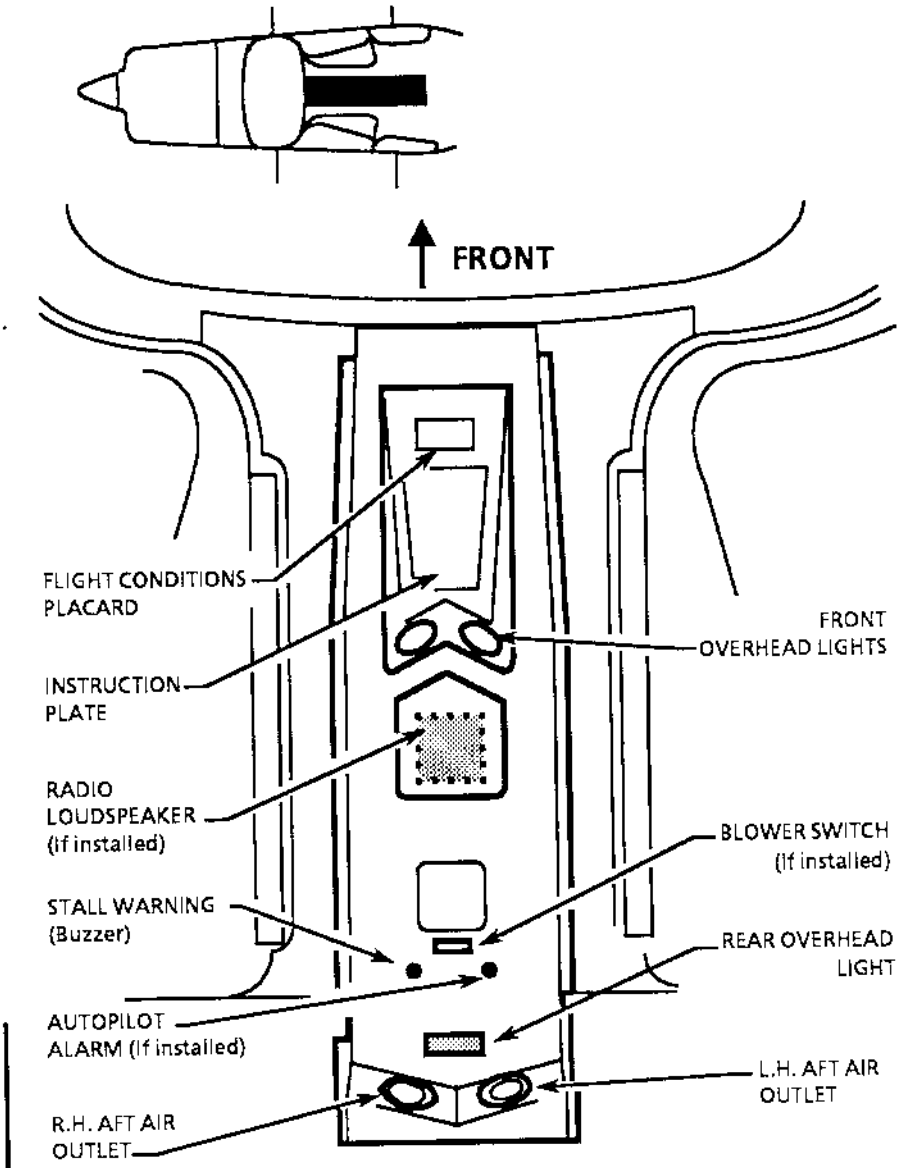


Figure 7.4 - EXAMPLE OF UPPER DUCT CENTRAL PART

ADVISORY PANEL

The advisory panel (see Figures 7.5 and 7.5A) 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.

A day / night switch is installed in the centre of the advisory panel to control the intensity of the green indicator lights and of the GPS annunciators (if GPS installed).

Additional annunciators, associated to the GPS (if installed) are installed in the centre of the advisory panel.

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 7.5B.

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.

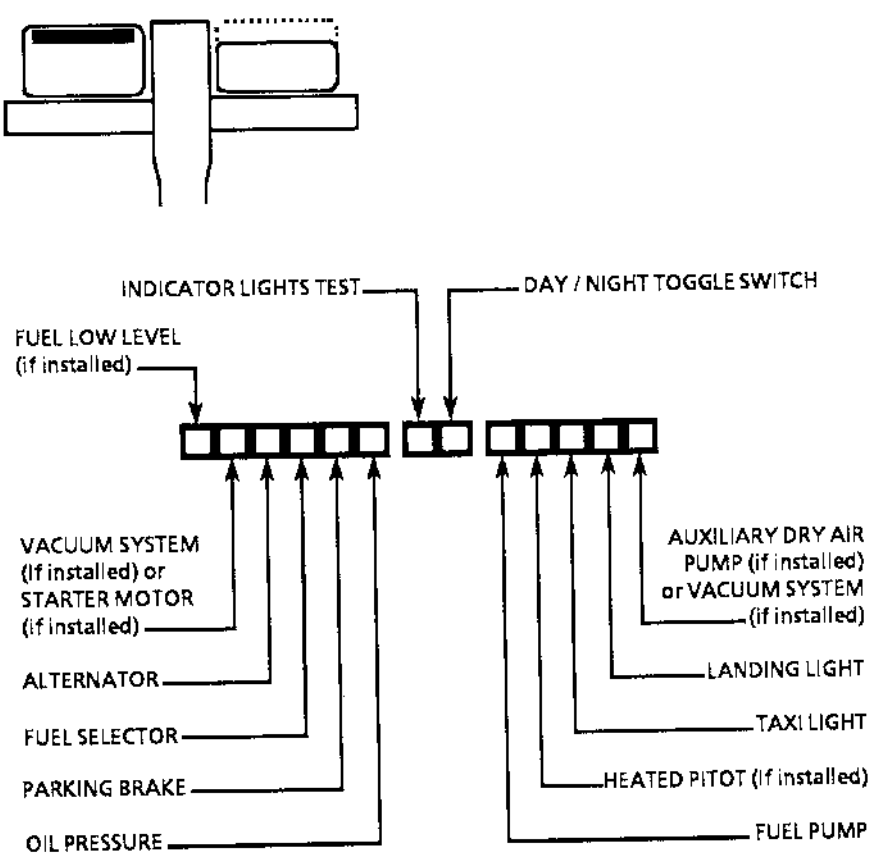
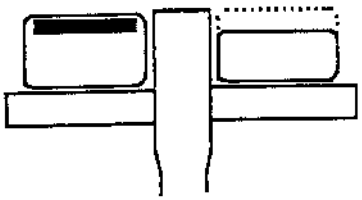


Figure 7.5 - ADVISORY PANEL (BASIC)



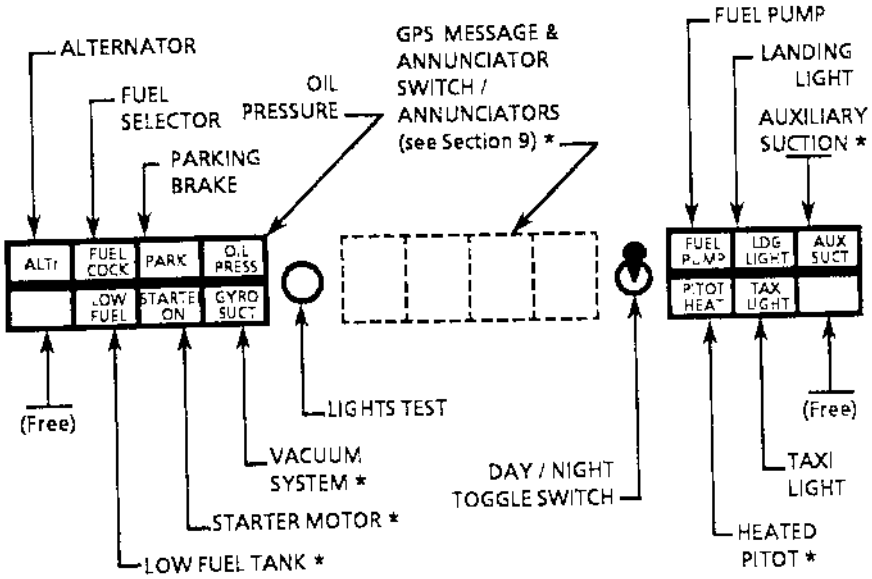


Figure 7.5A - ADVISORY PANEL (EXTENDED)

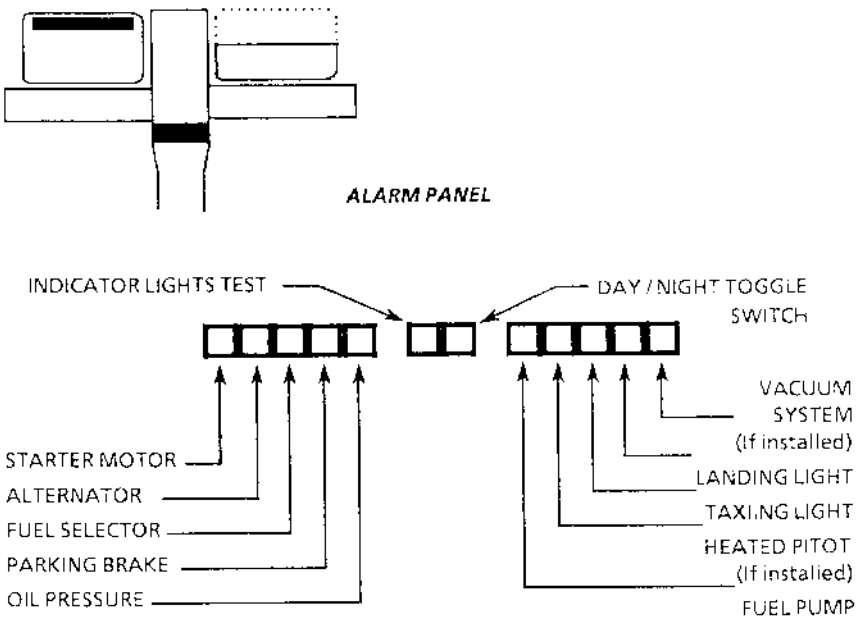
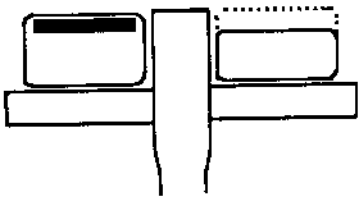
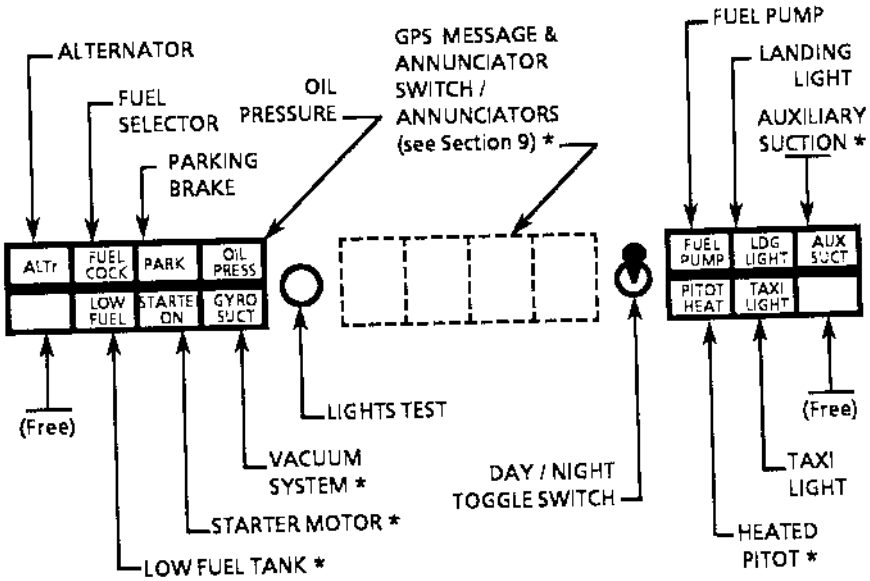


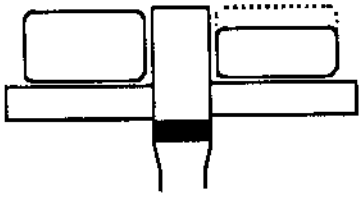
Figure 7.5 - INDICATOR LIGHTS AND SWITCH-BREAKERS





(*) If installed

Figure 7.5A - ADVISORY PANEL (EXTENDED)



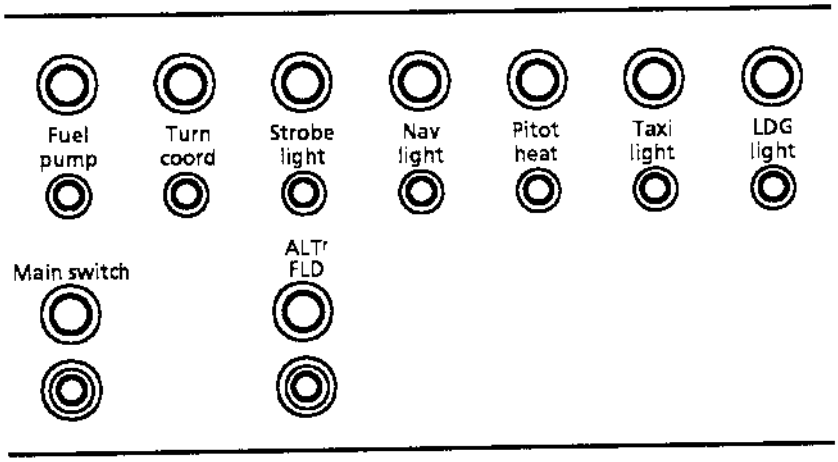
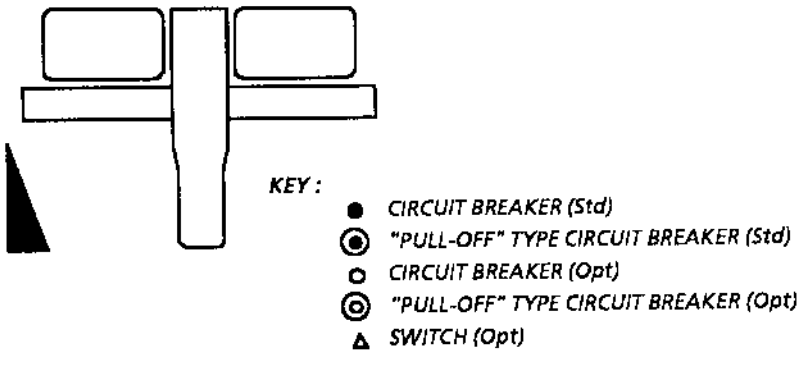


Figure 7.5B - SWITCH-BREAKERS (SB)



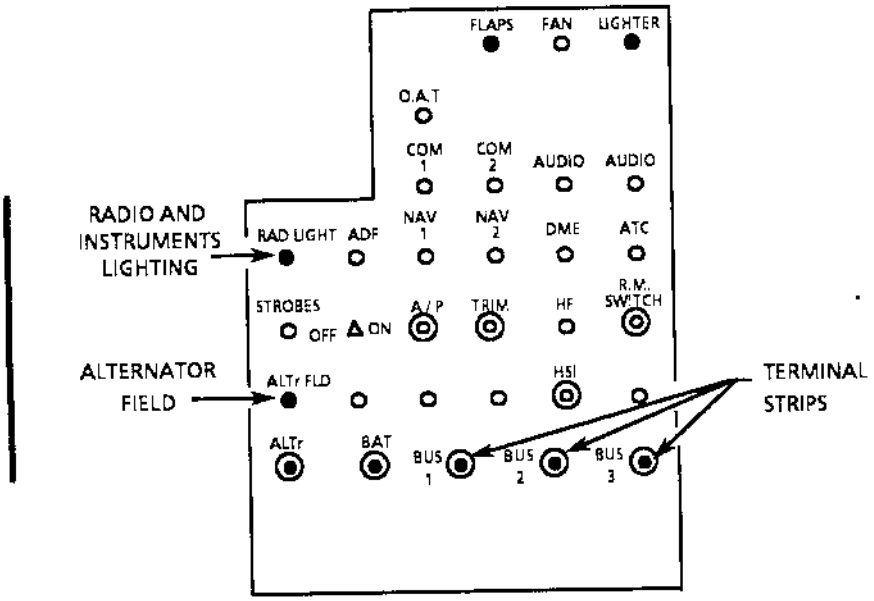


Figure 7.6 - CIRCUIT BREAKERS ASSEMBLY
(Typical arrangement)

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.

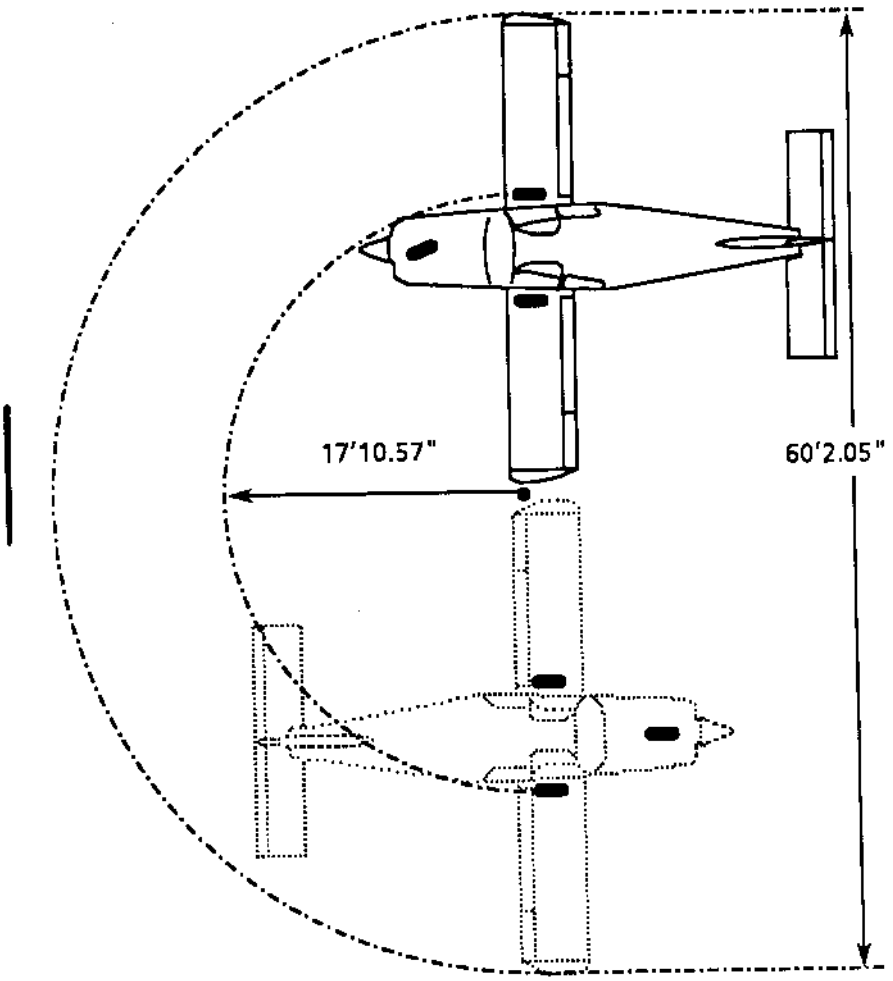


Figure 7.7 - MINIMUM TURNING RADIUS

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 25°30'. 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" (25°30') positions (see Figure 7.2). An indicator located near the control provides various flaps positions.

The wing flaps system is protected by a 8-amp circuit breaker, labeled "FLAPS" located on L.H. circuit breakers side panel (see Figure 7.6).

LANDING GEAR

Aircraft not equipped with modification MOD. 118 or MOD. 120 :

The landing gear system is of stationary tricycle type with conventional steerable nose gear. Nose gear and main gears are equipped 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.

Aircraft equipped with modification MOD. 118 or MOD. 120 :

The landing gear system is of stationary tricycle type with conventional steerable nose gear. The nose gear is equipped with a telescopic and oil / air shock absorber incorporated in the landing gear leg. Each main gear includes a rear shock compensating rocker beam connected to the landing gear leg by means of an oil / air shock absorber. 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 :

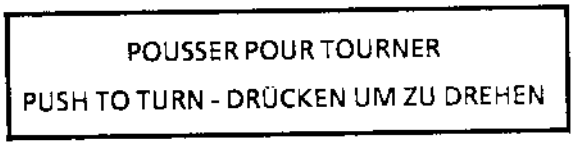


Figure 7.8

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 rearward (*) :
  Use the adjustment bar located on the front part of the seat, under the seating and grasp handle under instrument panel strip.
- 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 adjustment bar or lever to unlock ; when in desired position, release it and make sure it is locked.

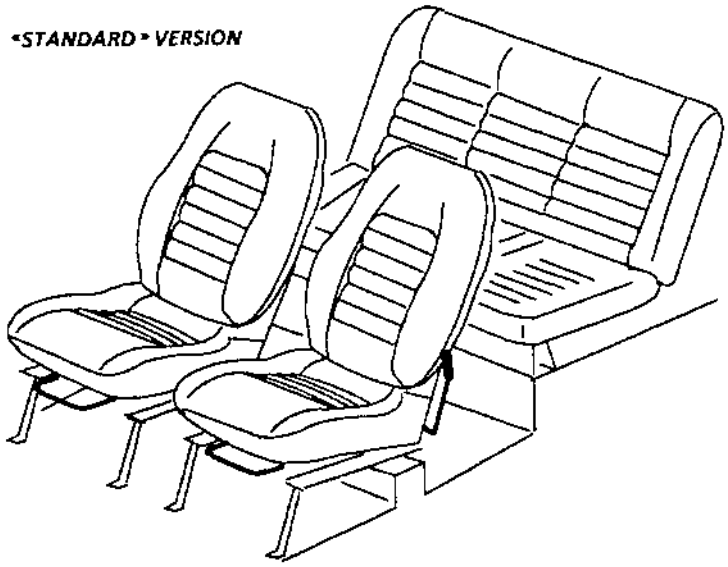
REAR SEAT

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

HEAD-RESTS (if installed)

- Before Model "95" :
  - To adjust and remove the head-rest :
    Simply make it slide vertically.
  - To fit the head-rest into the seat back :
    Turn the centering bush (bearing an arrow) of ¼ turn clockwise (in the arrow direction) and maintain it to fit the head-rest in the seat back.
- Model "95" :
  - To install, adjust and remove the head-rest, simply make it slide vertically.

«STANDARD» VERSION



«LUXE» AND
«EXECUTIVE» VERSIONS

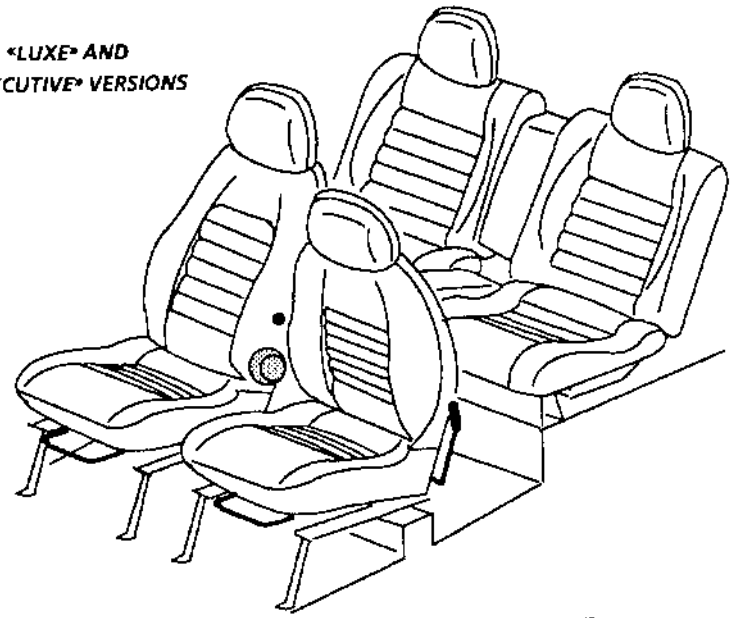


Figure 7.9 - FRONT SEATS AND REAR SEAT

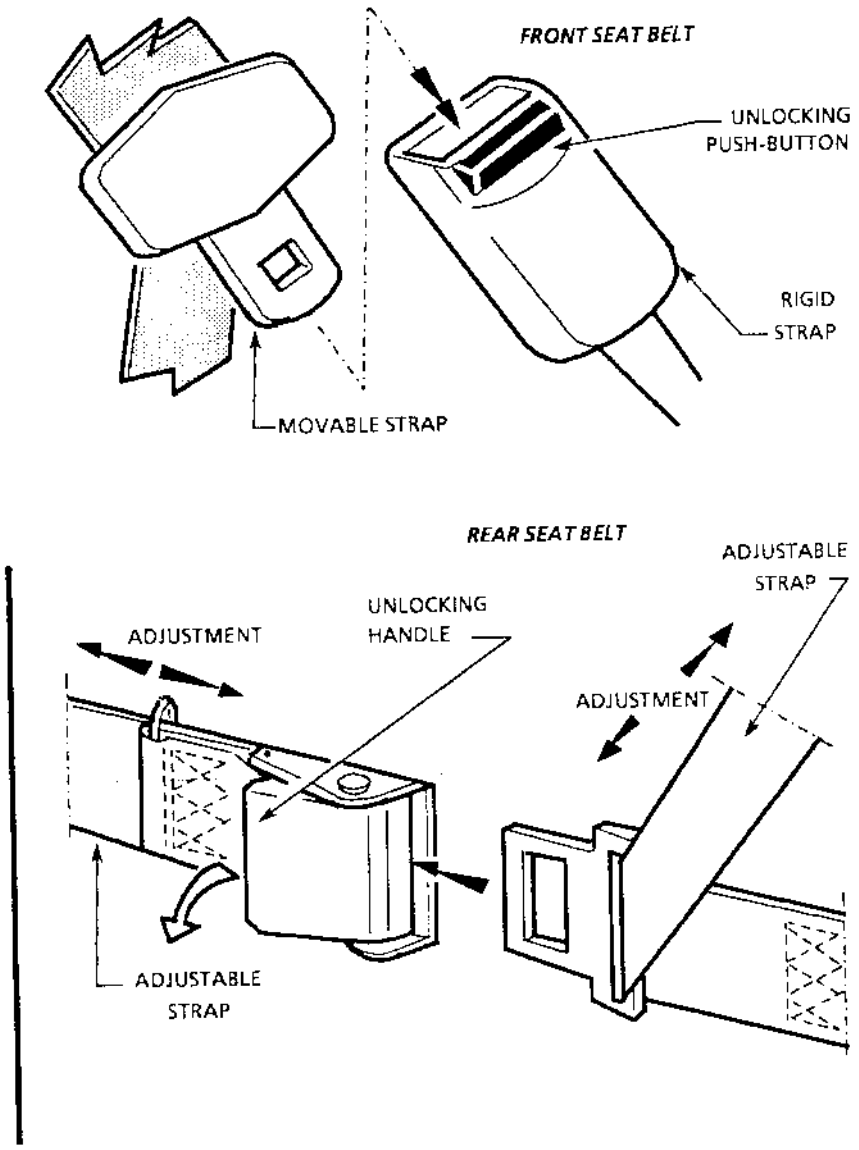


Figure 7 10 SEAT BELTS

SEAT BELTS (see Figure 7.10)

RECOMMENDATIONS

Misuse of the safety belt may introduce a risk.
Be sure the belt is tightened when it is fastened.
To be effective, the seat belt shall not be twisted.
In any case and for all types of belts, check that they are not impeded in their operation.
Further to a severe accident, replace the belts which were installed when the accident happened.

Front seat belts

- To lock them :
  Engage movable strap into rigid strap up to clipping.
  Should a blocking occur during operation, slightly ease back [5 in. (10 cm) approximately], then unwind strap again.
- To unlock them .
  Depress red unlocking push-button to free movable strap.

Rear seat belts

- To lock them :
  Engage both straps up to clipping.
  Be sure the belt is properly tightened (adjustement is possible on both straps).
- To unlock them :
  Pull on unlocking handle to release straps.

DOORS AND EXITS (see Figure 7.11)

DOORS

- To open them :
  Push handle forward.
  Lift the door at the location marked with a shaded arrow.
  Follow door up to maximum position.

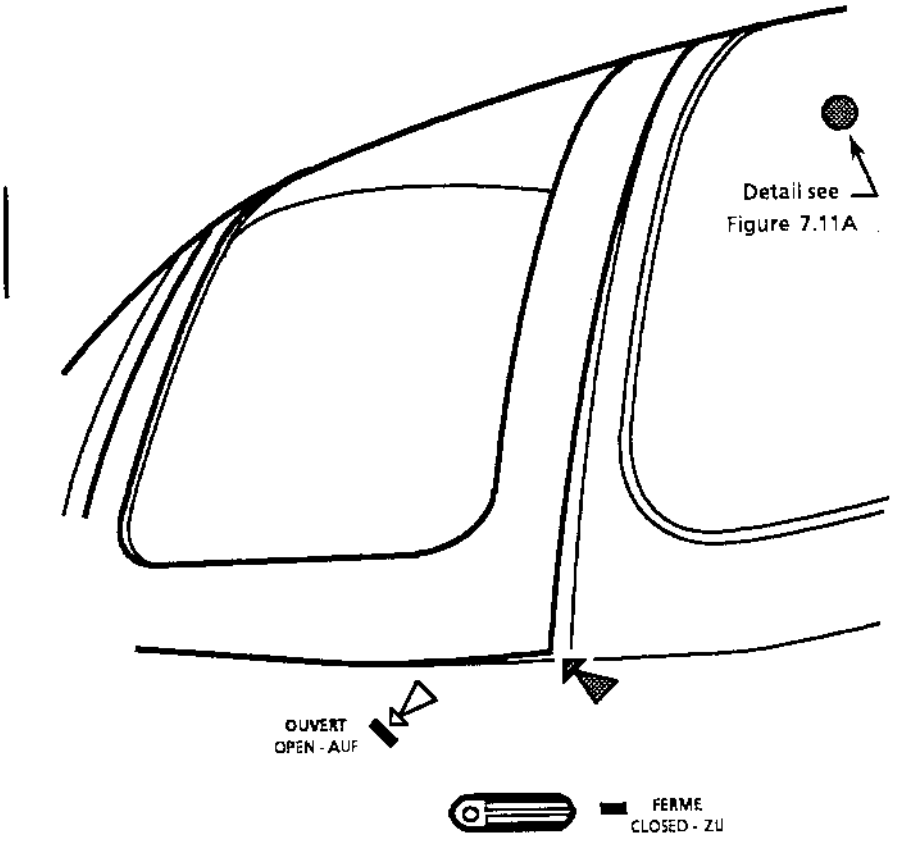


Figure 7.11 - DOORS OPENING AND CLOSING



Figure 7.11A - EMERGENCY EXIT

- 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 7.11A) 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 10 airplane is powered by a four-cylinder, horizontally opposed, direct drive LYCOMING O-360-A1AD engine rated at 180 BHP at 2700 RPM. It is provided with a starter, a 24-volt / 70-amp alternator, an all-weather shielded ignition harness, a dual magneto, 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 carburetor. The air duct comprises an alternate air intake with mechanical closing, the purpose of which is to supply the carburetor 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).
- The propeller governor is controlled by the propeller control (blue 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 carburetor heating control (grey 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 carburetor, if in the aft position, exchanger heated air, mixed with outside temperature air, is directly carried to the carburetor.
- 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 a dual magneto 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

NEW ENGINE BREAK-IN AND OPERATION

The engine has undergone a break-in at the factory and is ready for the full range of use. It is, however, recommended that cruising flights be accomplished at 65 to 75 % until a total of 50 hours has accumulated or oil consumption has stabilized.

The airplane is delivered from the factory with corrosion preventive engine oil. If, during the first 50 hours, oil must be added, use only aviation grade straight mineral oil in compliance with Specification MIL-L-6082.
Use dispersant oil in compliance with Specification MIL-L-22851 only after the first 50 hours.

ENGINE LUBRICATION SYSTEM

The engine is lubricated by an oil system powered by a pump located on engine rear accessory housing. A sump located at the bottom of the engine allowing oil recovery, a cartridge throw-away type filter located on engine rear accessory housing and a strainer type filter located in the sump complete the system.
A pressure probe and a temperature probe transmitting the values to two indicators located on upper edge of the console enable the pilot to check the oil system.
An inspection door located on engine upper cowl provides access to oil system filling port.
A dipstick attached on the port blanking cap enables to check oil level in the sump. A union located under the engine case enables a quick drain of the latter.

AIR INDUCTION SYSTEM

The engine is supplied with an air intake located on the L.H. side of the lower cowling. This air intake is fitted with a filter which removes dust and other foreign matters from the induction air so that they do not penetrate into the air duct. However, in the event the air filter becomes blocked, place carburetor heating control in the ON position to open an alternate air door allowing air to enter the engine.
For flights in sandy or dusty atmosphere, install a second specific filter.

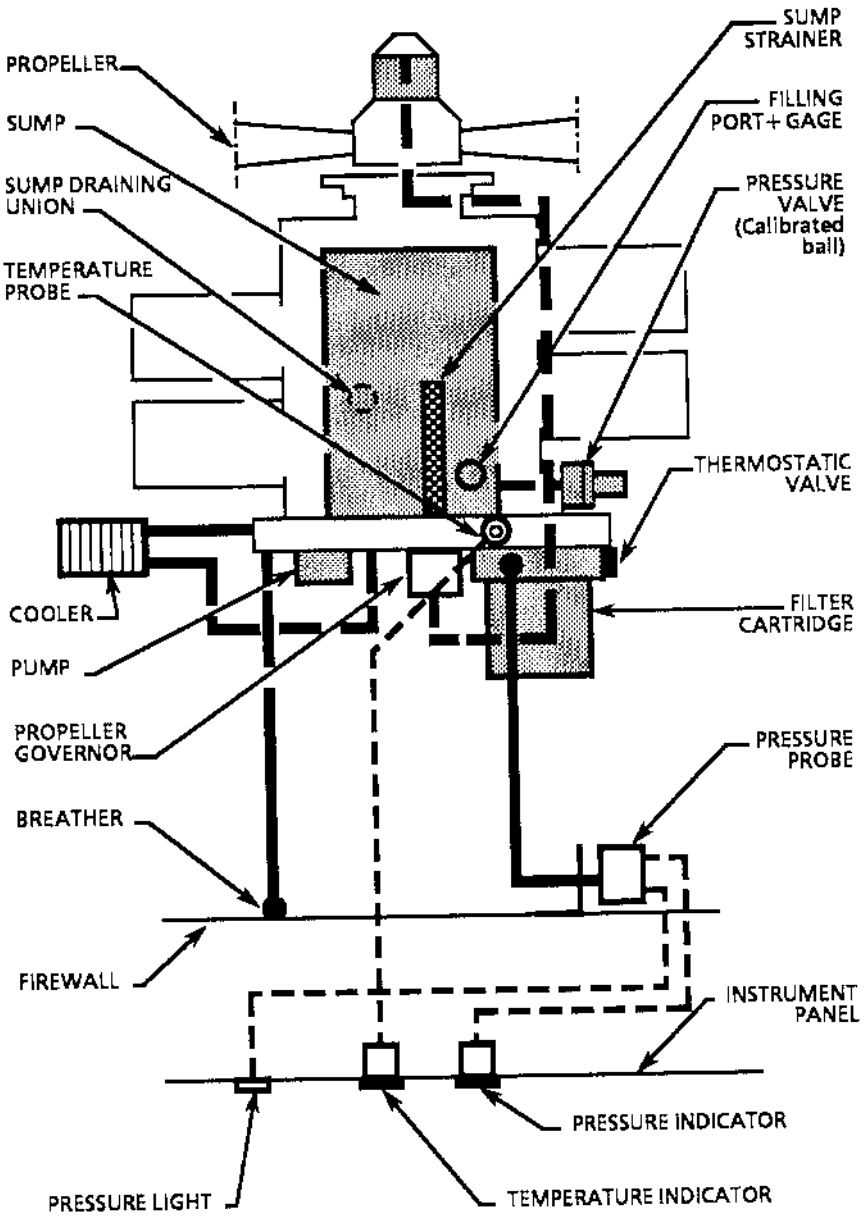


Figure 7.12 - OIL SYSTEM

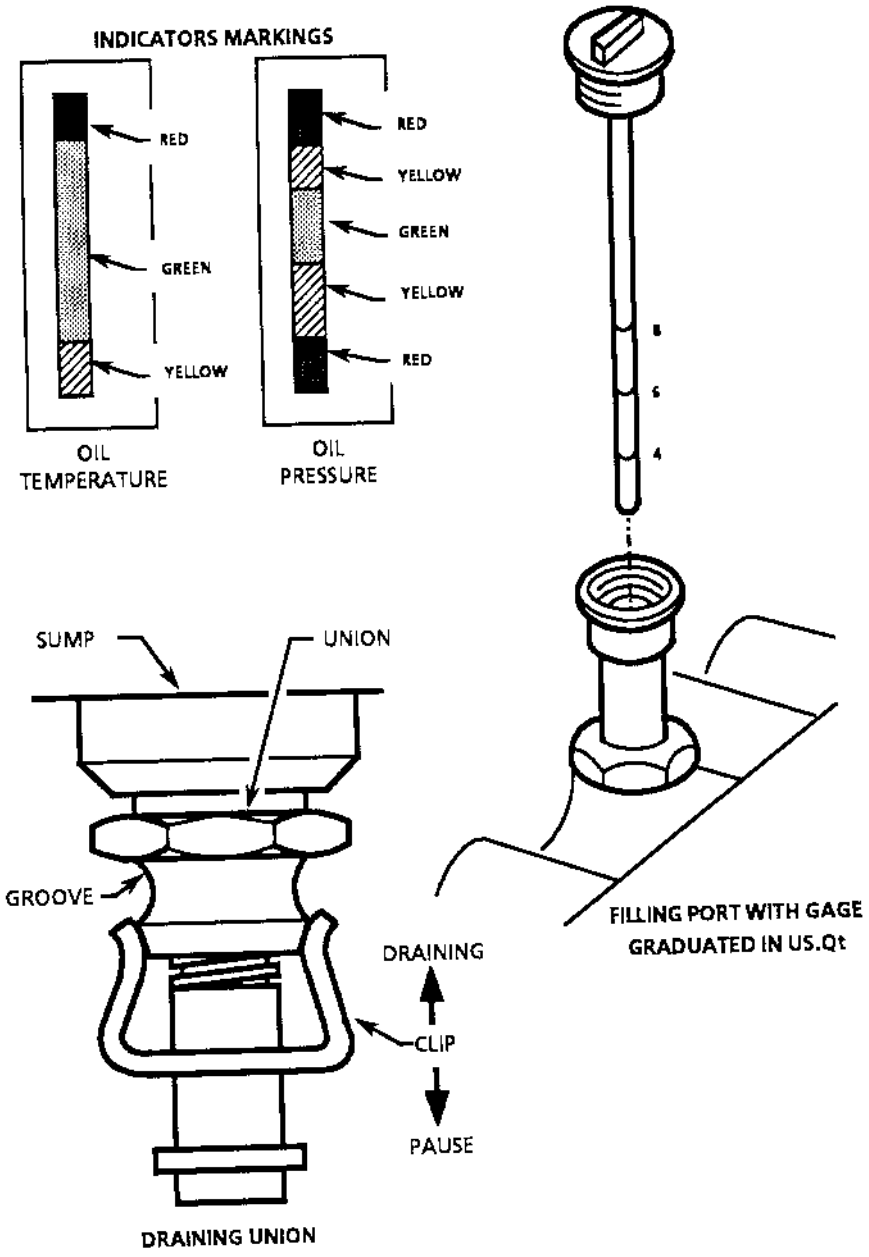


Figure 7.12A - OIL SYSTEM

EXHAUST SYSTEM

Exhaust gas from each cylinder is collected by pipes to be conducted, in order to reduce its noise level to an exhaust duct which vents it outboard on R.H. side of lower engine cowl.

PROPELLER

The airplane is fitted with all-metal, two-bladed, constant-speed, governor-regulated propeller. The propeller control actuates on the governor. According to the control position, the governor determines propeller rotation speed, and thus the engine speed to be maintained. The governor controls flow of engine oil, boosted to high pressure by the governing pump, on a piston located in propeller hub. Oil pressure twists the blades toward high pitch (low RPM). When oil pressure to the piston is relieved, the blades twist to low pitch (high RPM).

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, an auxiliary fuel pump as well as an engine-driven fuel pump and a carburetor.

Engine-driven fuel pump suction draws fuel from L.H. or R.H. tank through the three-position selector valve and a filter.
The selector valve is controlled through a knob labeled "FUEL SELECTOR"
The selector valve knob has following positions labeled : "CLOSED", "LEFT", "RIGHT".

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

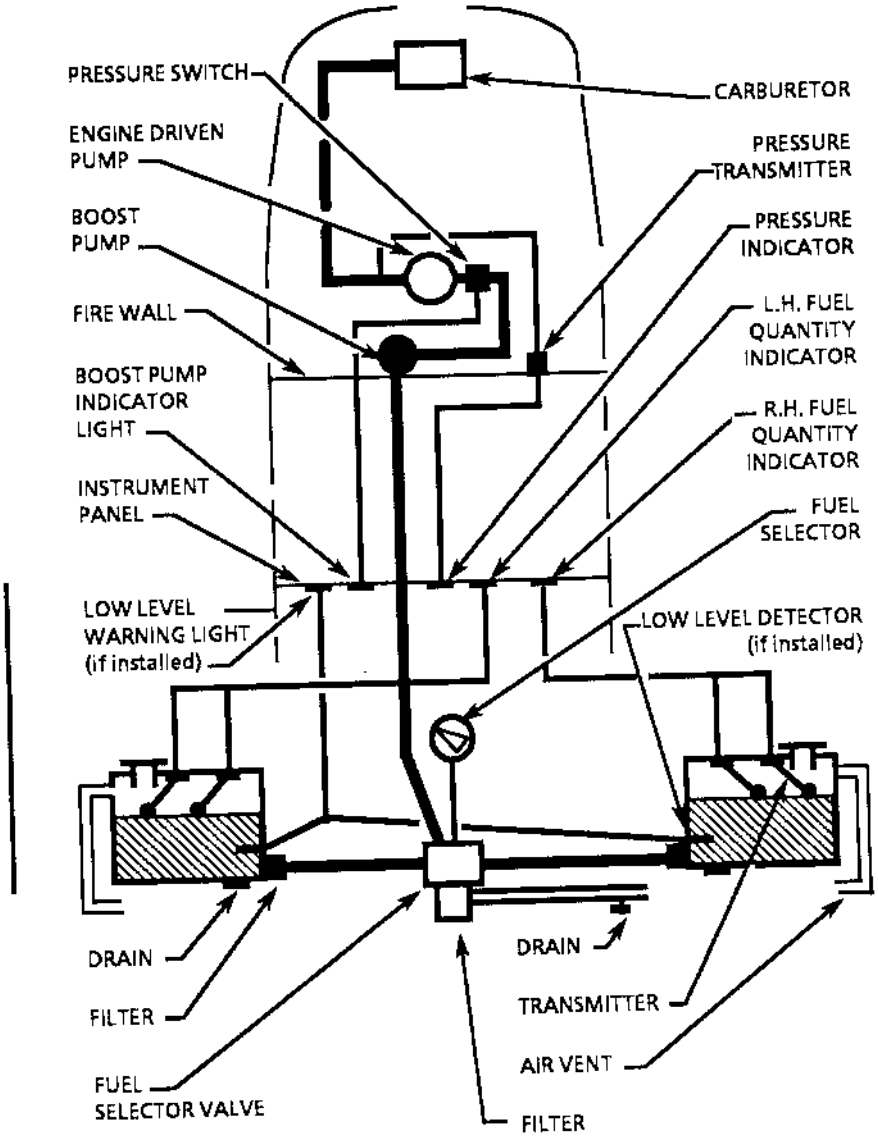


Figure 7.13 - FUEL SYSTEM

Fuel quantities :

- Total maximum : 55.4 U.S Gal. (210 l)
- Total usable : 53.9 U.S Gal. (204 l)
- Unusable : 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 ventilation system, an essential element in the operation of the fuel system. Should a vent become blocked, the fuel flow from the tank concerned is reduced and the engine may cut out. The ventilation is ensured by ducts which run to the lower surface of each wing.

The quantity of fuel is measured by four electric gage transmitters (two in each wing) and is displayed by two level indicators located at the top of the central console.
The indicators are graduated in 1/4, 1/2, 3/4 and 4/4, with the zero indicating an empty tank. When the pointer of the indicator is at zero, approximately 0.8 U.S Gal. (3 litres) of unusable fuel remains in the tank.
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.

A low level warning light (if installed), located on the advisory panel, comes on whenever fuel quantity, remaining in one of both tanks, (airplane in line of flight) reaches approximately 7.9 U.S. Gal (30 litres). In this configuration, the warning light illumination is controlled by a low level detector, located in each tank.

The auxiliary fuel pump is controlled by a switch-breaker located on front part of pedestal.
An indicator light located on the advisory panel shows operation of the auxiliary pump.

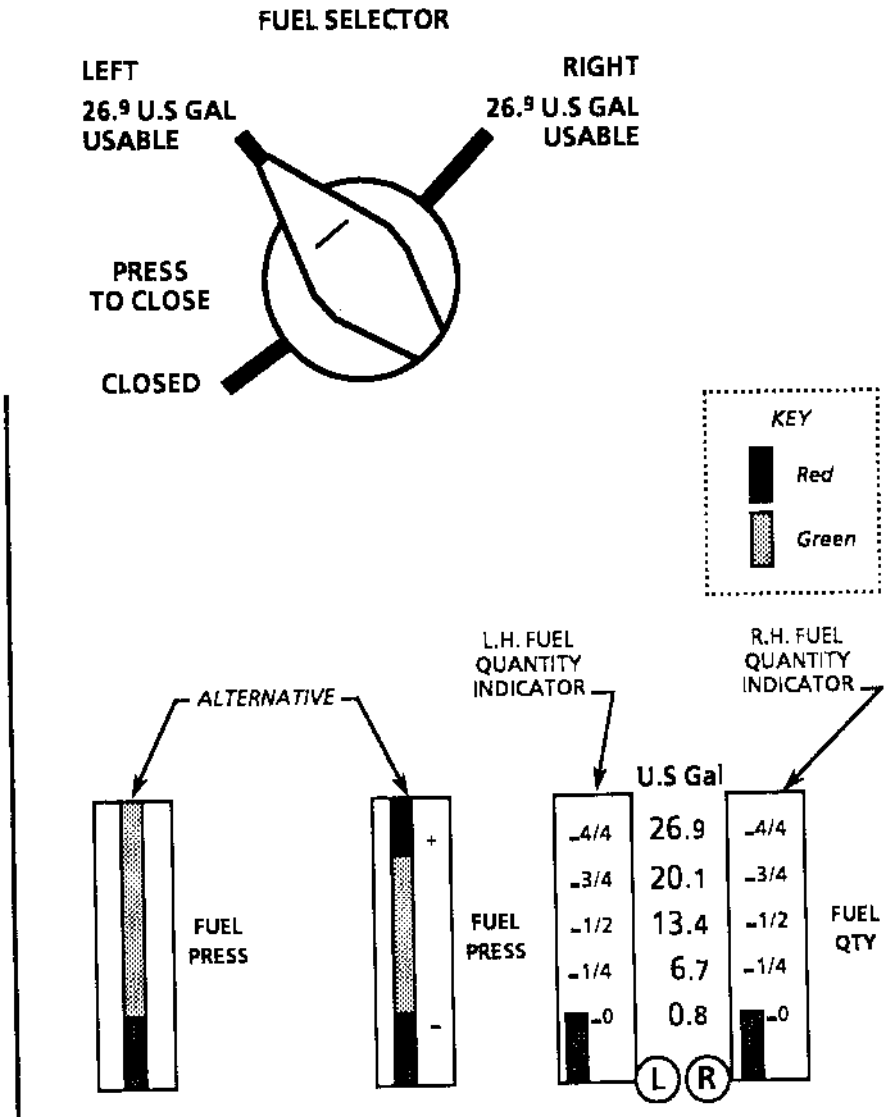


Figure 7.14 - FUEL SYSTEM MARKINGS

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 every day before the first flight and after each refueling by using the fuel sampler provided to drain fuel from the wing tank sump drain and the fuel strainers drains. The fuel tank sump drains are located just outboard of each main landing gear well and the fuel strainer drain is located under the R.H. front fuselage, near its intersection with R.H. wing.

The fuel tanks should be filled after each flight to minimize condensation, respecting the weight and balance limits.
The tanks are provided with a gage visible from the filling port.
Fuel tanks are full (fuel level not marked on the gage) when fuel is at the level of the filling port.

BRAKE SYSTEM

BRAKING

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

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

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

PARKING BRAKE

- 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 advisory panel shows the position of the parking brake knob.

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

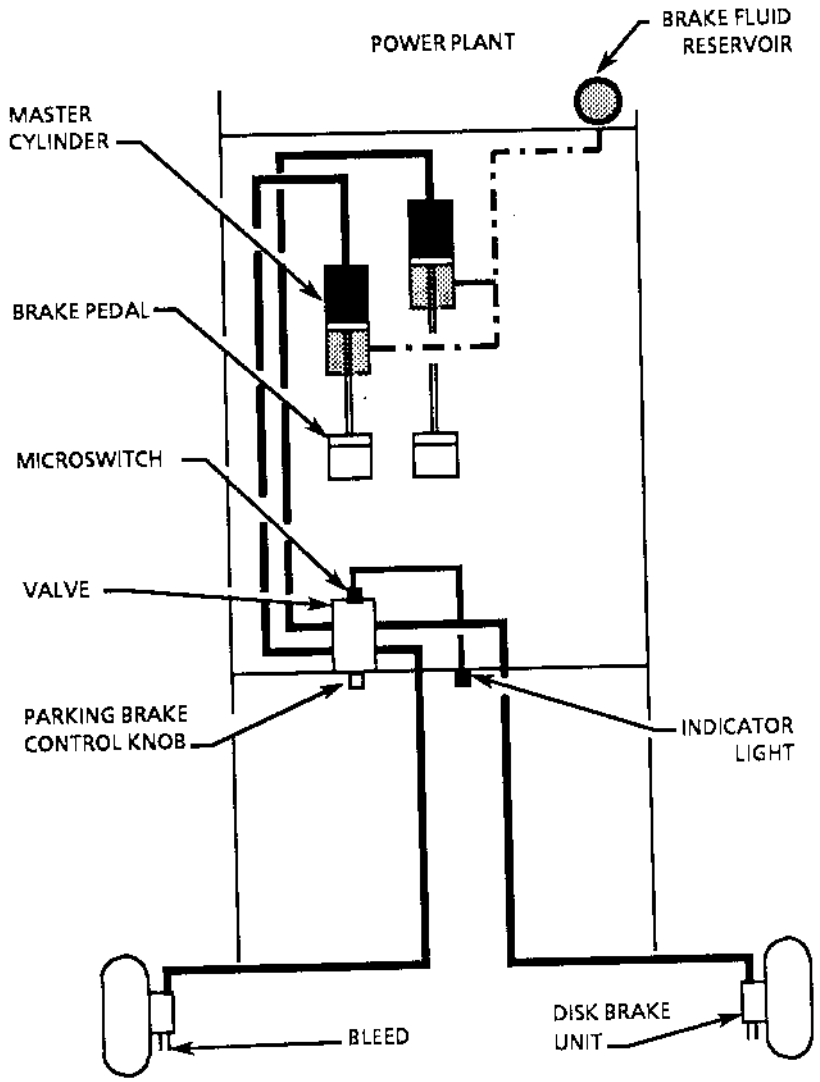


Figure 7.15 - BRAKE SYSTEM (L.H. station only)

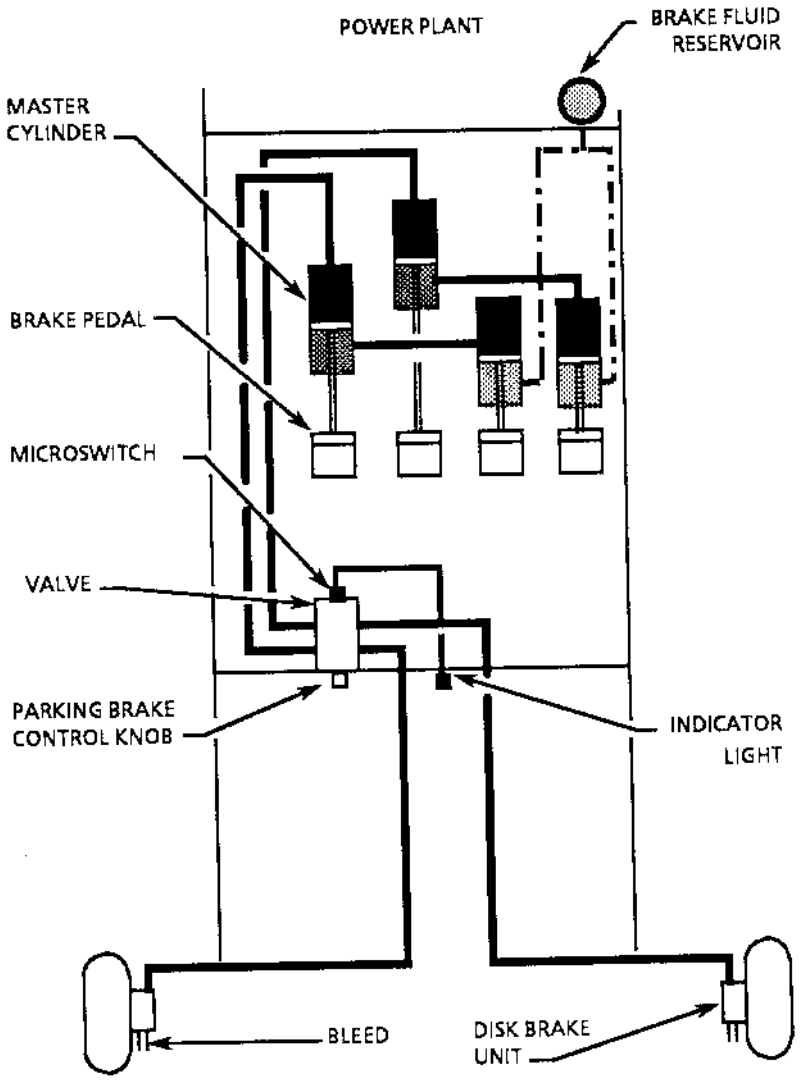


Figure 7.15A - BRAKE SYSTEM (L.H. + R.H. stations) (if installed)

STANDARD ELECTRICAL SYSTEM

The airplane is equipped with a 28-volt, direct-current electrical system (see Figures 7.16 and 7.16A). A belt-driven 70-amp alternator installed on the engine and a battery located in the engine compartment on firewall R.H. side supply the system.

The alternator is controlled by 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 located on the firewall, on cabin side provides the alternator voltage regulation and overvoltage protection.

In the event of overvoltage, the regulator disconnects the alternator and the amber (red on UK airplanes) 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 "ALTr FLD".

MAIN SWITCH

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

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

ALTERNATOR CONTROL

Located on the R.H. side of the main switch, the alternator switch-breaker labeled "ALTr FLD" controls the operation 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.

"MAIN SWITCH" and "ALTr FLD" disconnecting in flight disconnects simultaneously all electrical power supplies.

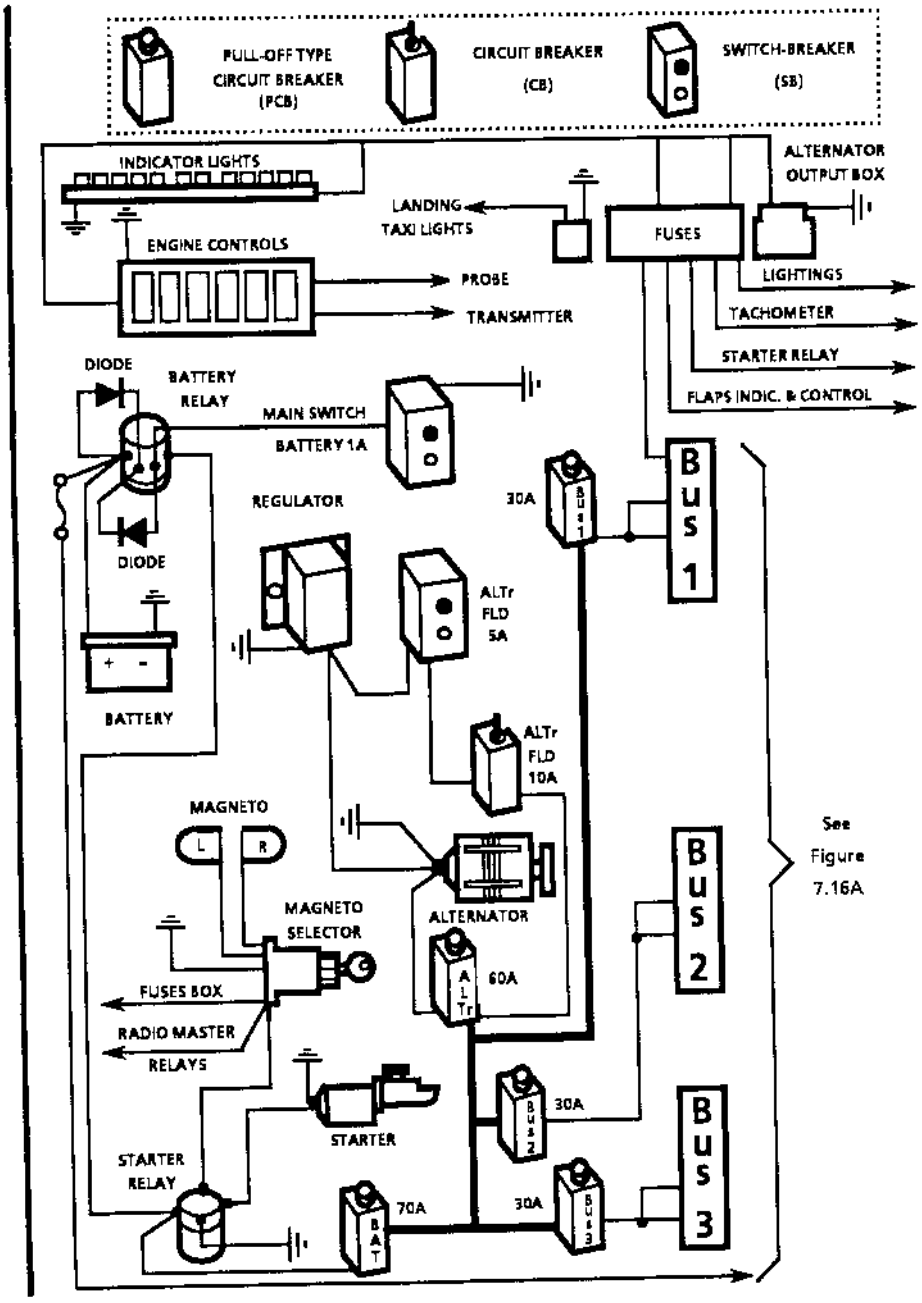


Figure 7.16 - TYPICAL ELECTRICAL SYSTEM

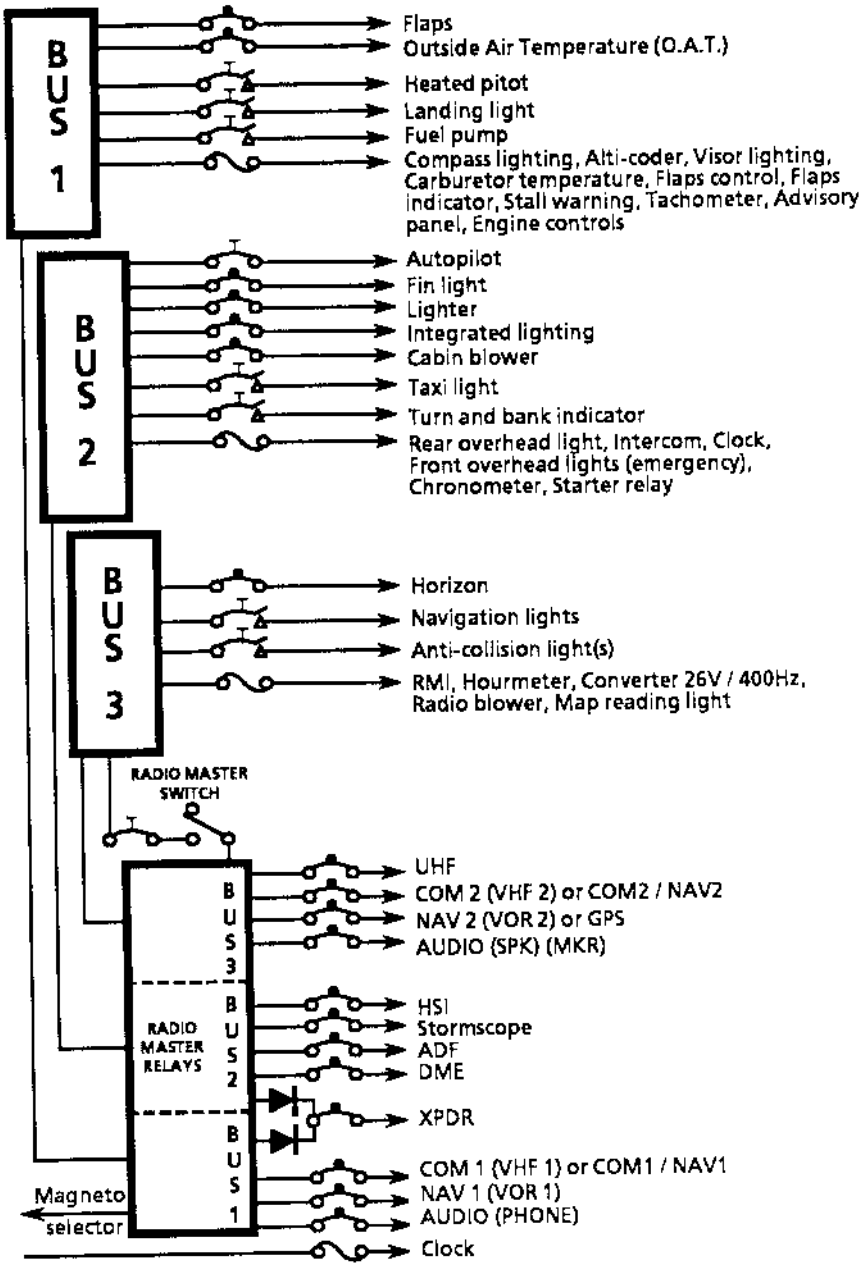


Figure 7.16A - TYPICAL ELECTRICAL SYSTEM

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AVIONICS POWER SWITCH (if installed)

A switch labelled "RADIO MASTER" is installed on R.H. side of the L.H. strip to control power supply to avionics and enables automatic disconnection 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.

Pulling off the "R.M.S." circuit breaker enables to inhibit the "RADIO MASTER" switch operation, and so to recover the power supply of the radio set in case of faulty operation of the "RADIO MASTER" switch.

"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 instruments module, located on the upper part of 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.

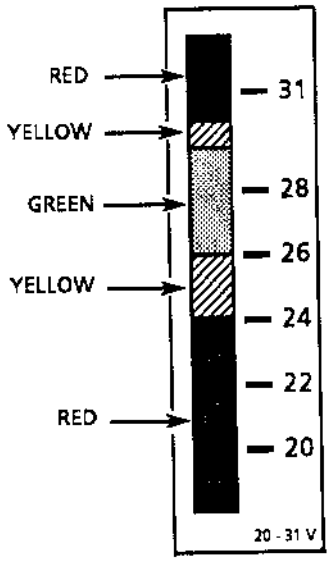


Figure 7.17 - VOLTMETER MARKING

AMMETER (if installed - standard equipment for "BRAZIL")
The ammeter indicates current flow, in amperes, from the alternator to the battery, or from the battery to the electrical system. With the engine operating and master switch "ON", the ammeter indicates the rate of charge being applied to the battery.

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.

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

- 70 A labeled "BAT" between battery and network
- 30 A labeled "BUS 1" on bus bar 1 supply
- 30 A labeled "BUS 2" on bus bar 2 supply
- 30 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.

Fuses located on L.H. firewall door protect following circuits (from left to right) :

Upper row :	warning lights panel, spare, warning lights panel, compass lighting, cabin lighting, starter relay, electric tachometer, emergency lighting,
and if installed :	carburetor temperature, RMI, converter 26 V / 400 Hz, radio fan, spare.
Lower row :	engine controls panel, engine controls panel, spare, flap indicator, flap control, stall warning, visor lighting,
and if installed :	chronometer, intercom, clock, alti-coder, map light, spare, hourmeter, spare.

UNDERVOLTAGE WARNING LIGHT

Anytime electrical system voltage falls below approximately 26 volts, as directly sensed by the distribution systems, an amber (red on UK airplanes) indicator light labeled "ALT" illuminates on advisory 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)

See Section 9 "Supplements".

LIGHTING SYSTEMS

EXTERIOR LIGHTING

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

The airplane may be equipped with an anticollision assembly, including a light on each wing tip and, as a replacement for the navigation light at the tail cone end, if required, with a double-function light (navigation light / strobe light).

In addition to the navigation lights, the exterior lighting may include a strobe light installed on the vertical stabilizer and under the fuselage.

Lighting controls :

The switch-breakers, located on the central pedestal front part (see Figure 7.5B), control the lighting of the landing and taxi lights, the navigation lights and anticollision lights.

NOTE :
The amperage of the wing tip anticollision light switch-breaker is increased when the airplane is equipped with the tail cone strobe light.

A switch, located on the circuit-breaker panel (see Figure 7.6), controls the strobe light illumination. This circuit is protected by a circuit-breaker located on the left of the switch.

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

Instrument 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 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 REGULATION, VENTILATION, FIRE CUT-OFF

The temperature and volume of airflow to the cabin are regulated by the air regulation system and the air outlets (see Figure 7.18).

DEMISTING

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 on the upper portion of the aft face of the firewall. This box may be shut off by a fire cut-off shutter and allows hot air distribution on both sides of the windshield.

Hot airflow is regulated from the control panel located on R.H. side of instrument panel strip.

AIR REGULATION

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 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.

Hot / cold air mixing in cabin air mixer

Hot and cold airflows in cabin air mixer are actuated through a single control. Regulation is obtained by moving the control ; rightwards air becomes warmer, leftwards air becomes colder, fully moved to the left in fire cut-off position for the cabin air mixer.

Distribution of regulated air

The mixed airflow in the cabin air mixer is regulated by a shutter before being distributed in the cabin towards pilot's feet, front and rear passengers' feet and in upper part of rear seat back-rest.

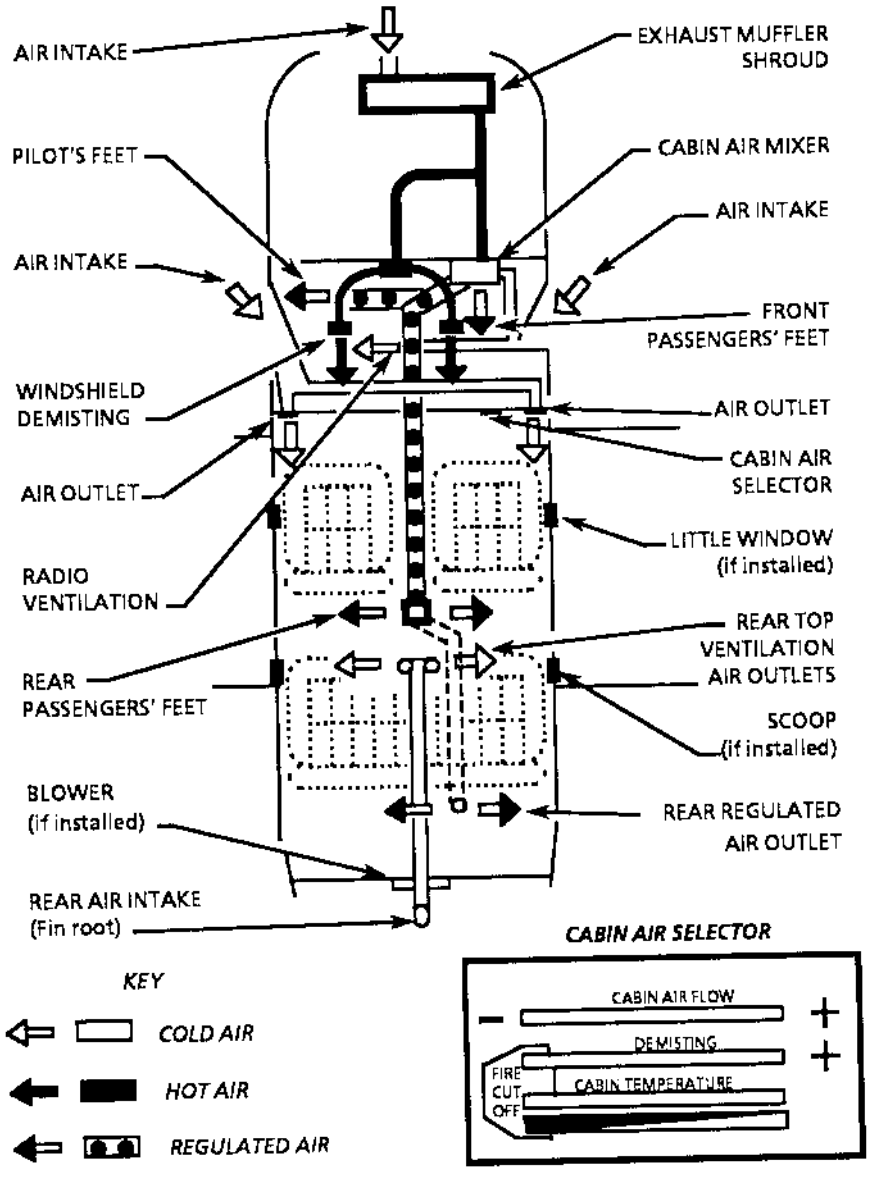


Figure 7.18 - DEMISTING, AIR REGULATION, VENTILATION, CUT-OFF SYSTEM

VENTILATION

Low ventilation

See "Cold air" and "Distribution of regulated air" of the previous "AIR REGULATION" paragraph.

High ventilation

- Pilot + front passenger

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

  A little window may be installed on the access doors to facilitate high ventilation for pilot and front passenger.

- Rear passengers

  An air intake (at outside temperature), located at the bottom part of the fin, supplies two air outlets (swivelling and which airflow may be regulated) installed on the upper duct.

  A swivelling scoop may be installed on rear windows to facilitate high ventilation for rear passengers.

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 air outlets (see Figure 7.4).

FIRE CUT-OFF

CAUTION

TO PROVIDE THE CUT-OFF OPERATION, BOTH "DEMISTING" AND "CABIN TEMPERATURE" CONTROLS MUST BE POSITIONED FULLY 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 to the true airspeed indicator and a static air pressure to the airspeed indicator or to the 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.

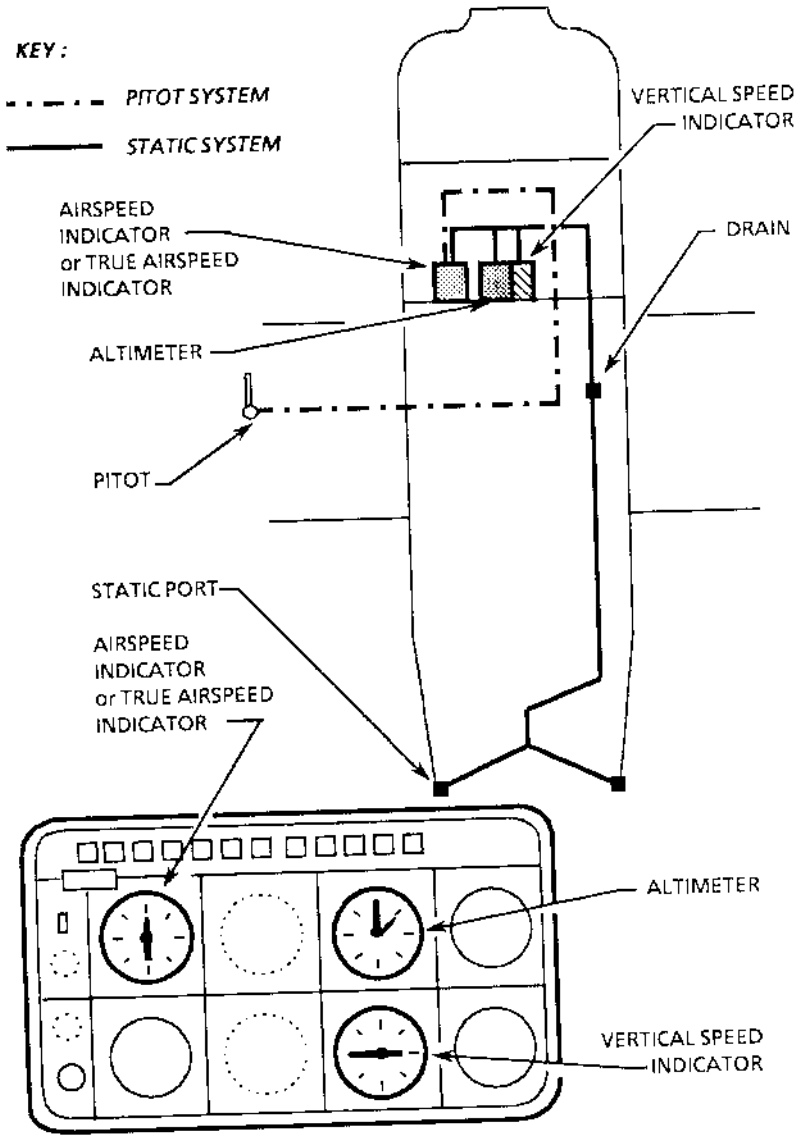


Figure 7.19 - AIRSPEED INDICATING STANDARD SYSTEM

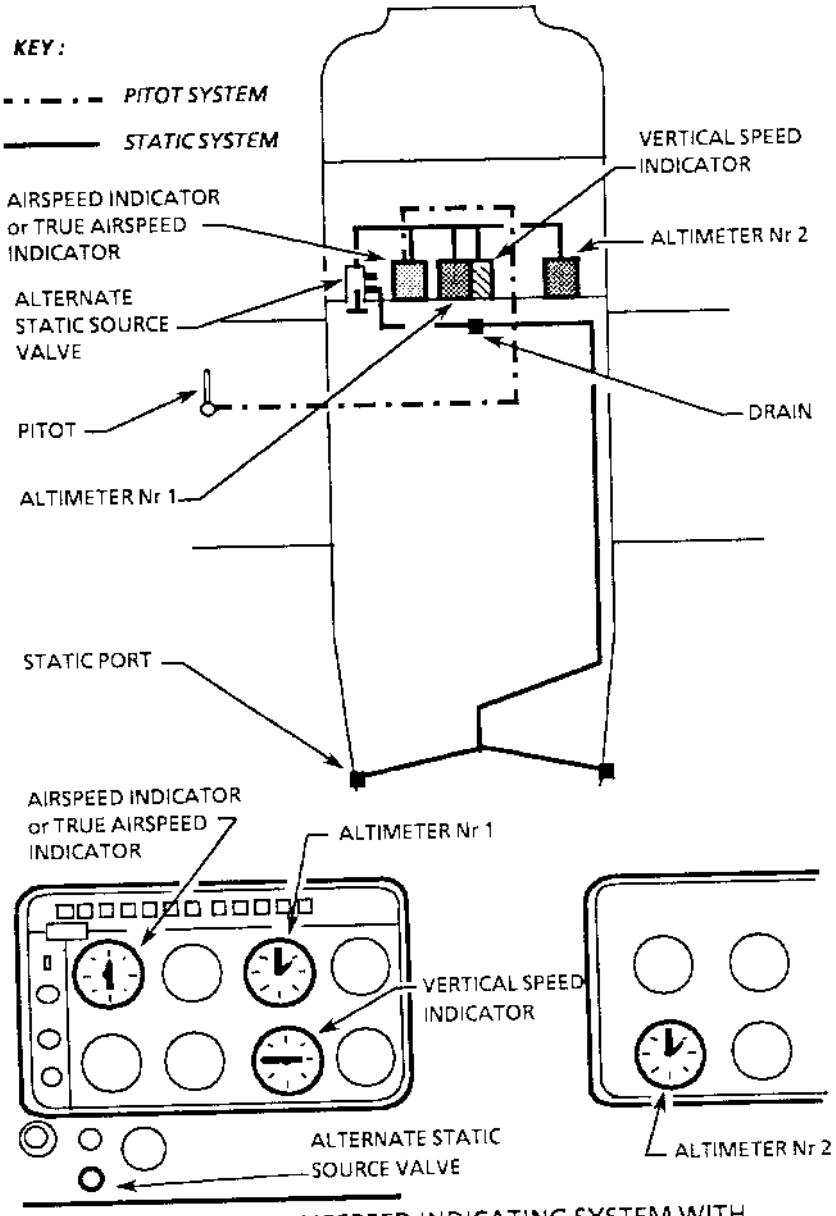


Figure 7.19A - AIRSPEED INDICATING SYSTEM WITH ALTERNATE STATIC SOURCE

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 ON position ("PULL") 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 Figures 7.20 and 7.20A) providing the suction necessary to operate an attitude indicator and heading 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 vacuum gage installed on L.H.panel strip, near the pilot's control wheel.

The system may be provided with an alarm, red warning light labeled "GYROS" on the advisory 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.

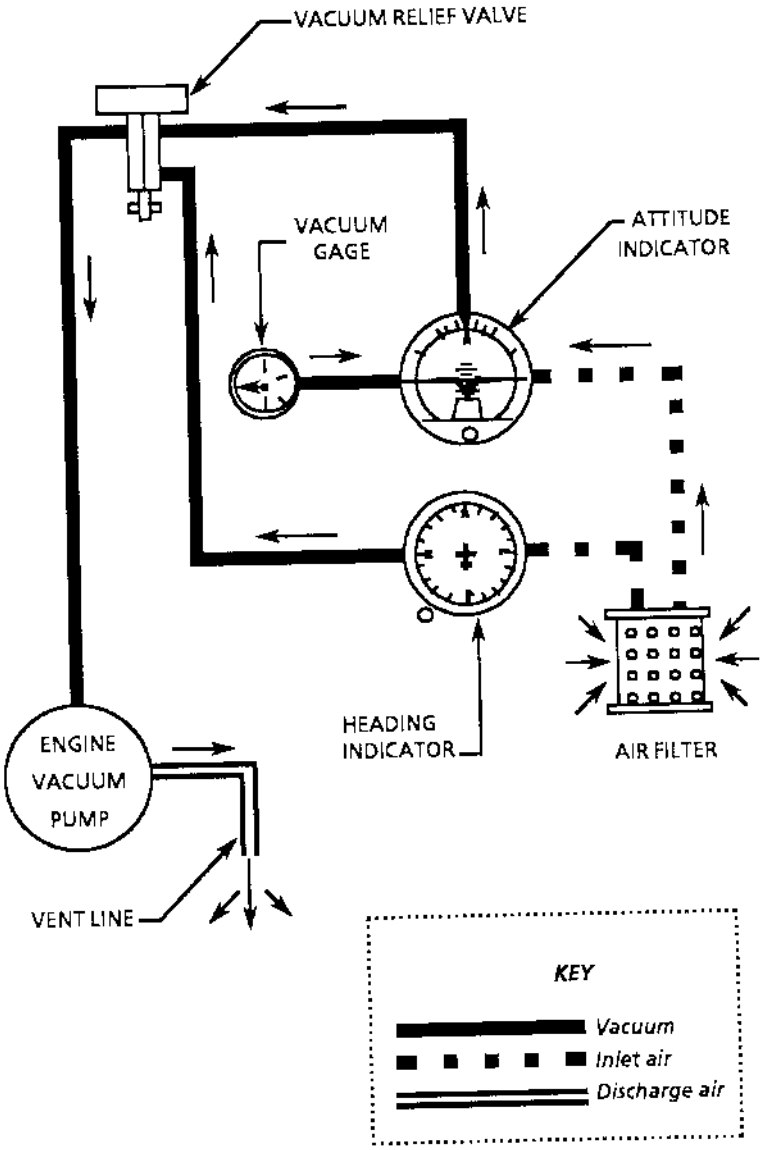


Figure 7.20 - VACUUM SYSTEM (With heading indicator)

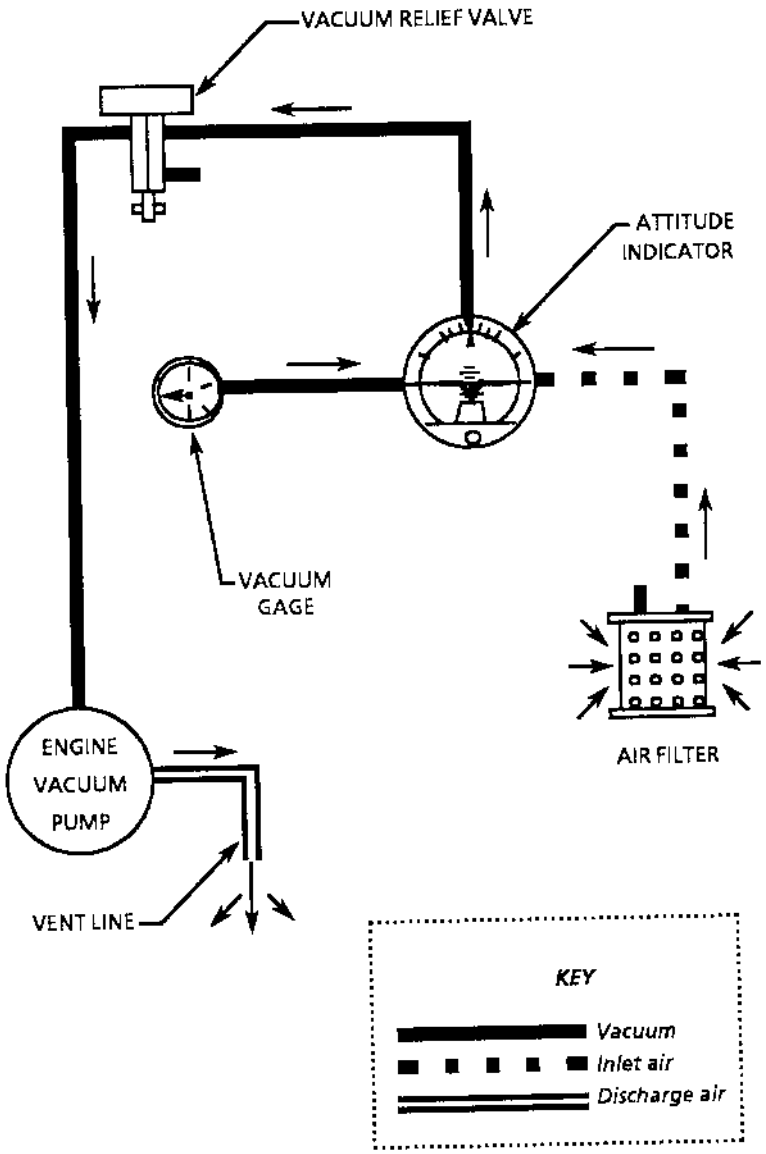


Figure 7.20A - VACUUM SYSTEM (Without heading indicator)

HEADING INDICATOR (if installed)

The heading indicator displays airplane heading on a compass card in relation to a fixed simulated airplane image and index. The heading 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.

VACUUM GAGE (if installed)

The vacuum gage is calibrated in inches of mercury and indicates the suction available for operation of the attitude and heading 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.

AUXILIARY DRY AIR PUMP (if installed)

Refer to Section 9 "Supplements".

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 discontinuous tone on the buzzer located on the upper duct. 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 discontinuous bell of the buzzer is heard.

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.".

CLEAR-VISION WINDOW (if installed)

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

NOTE :
Close the clear-vision window and lock it with both knobs prior to opening "gull-wing" access door.

SUN VISOR (if installed)

To remove sun visor, firmly pull downwards the foamed attachment pin.

Up to S / N 1115, the attachment pin is equipped (in its upper part) with an adjusting screw which provides friction on arm swivelling. After adjustment, lock the screw using varnish.

From S / N 1116, an adjusting knurled knob located under the attachment pin stiffens sun visor arm rotation without removing the pin.

To reinstall the sun visor, hit it firmly upwards, at the base 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.

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SECTION 8

AIRPLANE HANDLING, SERVICING AND MAINTENANCE

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GENERAL

This section contains the procedures recommended by SOCATA for the proper ground handling and routine care and servicing of your SOCATA Model TB 10 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

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 rear part of the fuselage beneath the horizontal stabilizer.

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
- Labor Allowance Guide

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 airworthiness 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.

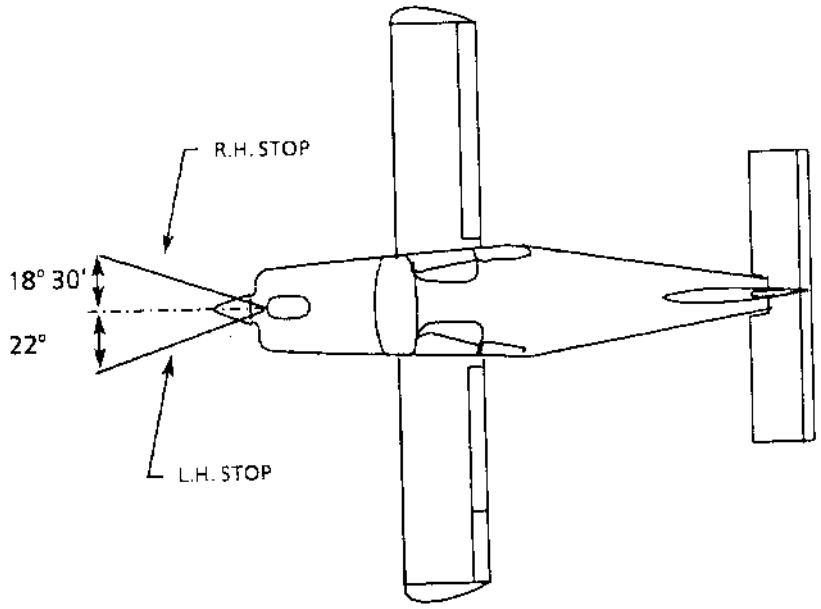


Figure 8.2 - TURNING ANGLE LIMITS

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 SELECTOR 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. During oil and filter changes 0.45 additional U.S. qt (0 4 litres) is required for the filter.

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 replace filter. It is recommended that the oil filter element be changed every 50 hours or sooner under unfavourable conditions. Engine oil is changed with the filter. Drain the engine oil sump and replace the filter 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 :
During the first 25-hour oil and filter change, a general inspection of engine compartment is required. Items which are not 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 : 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 lowering effect.

Alcohol, if used, is to be mixed 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.

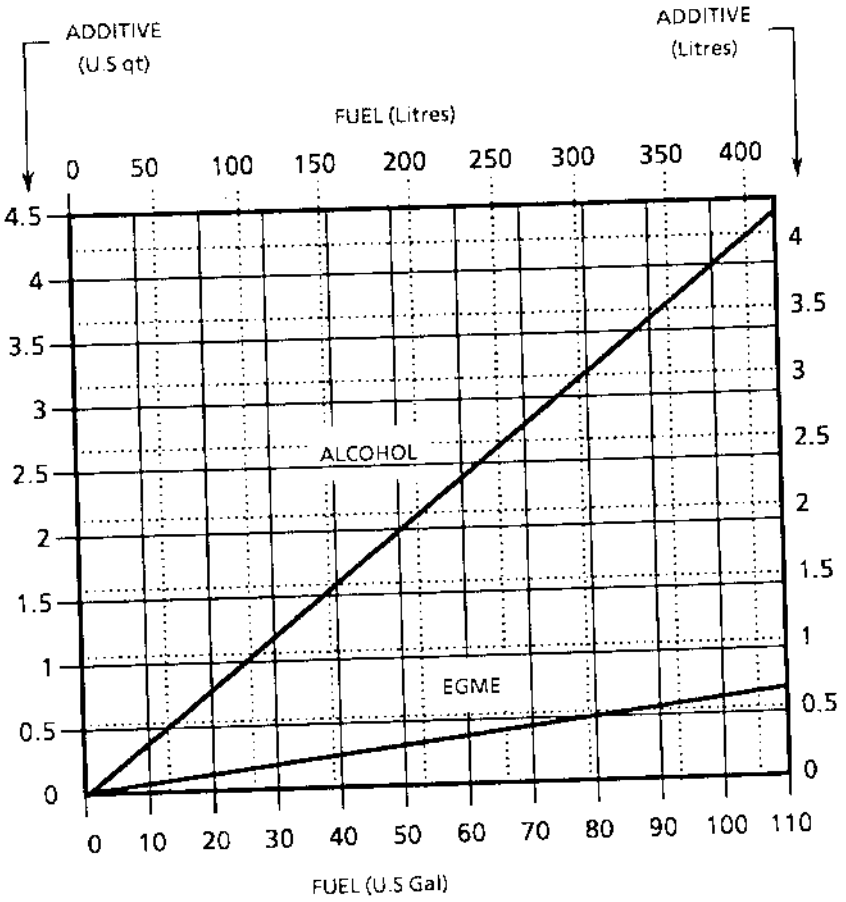


Figure 8.3 - ADDITIVE MIXING RATIO

LANDING GEAR

Nose gear tire :

5.00-5 6 PRTT - Inflating pressure : 44.9 psi (3.1 bars)

Main gear tires :

Aircraft not equipped with modification MOD. 118 or MOD. 120 :

Standard : 6.00-6 6 PRTT - Inflating pressure : 33.3 psi (2.3 bars)

Aircraft equipped with modification MOD. 118 or MOD. 120 :

6.00-6 6 PRTT - Inflating pressure : 40.6 psi (2.8 bars)

Nose gear shock absorber :

- Filling with hydraulic fluid MIL-H-5606 ; inflate with pressurized dry air or nitrogen to 98.6 psi (± 4) that is 6.8 bars (± 0.3).

Main gears shock absorbers :

Aircraft not equipped with modification MOD. 118 or MOD. 120 :

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

Aircraft equipped with modification MOD. 118 or MOD. 120 :

Filling with hydraulic fluid MIL-H-5606 ; inflate with pressurized dry air or nitrogen to 479 psi (+ 15 ; - 0) that is 33 bars (+ 1 ; - 0).

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.

CAUTION

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 ASH-TRAY

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

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

This section consists of a series of supplements, each covering a single system which may be installed in the SOCATA airplanes of the TB range. 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 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 31 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 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	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

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SUPPLEMENT

DAY AND NIGHT IFR EQUIPMENT

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2	- LIMITATIONS	9.1.14
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5	- PERFORMANCE	9.1.22

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SECTION 1
GENERAL

EQUIPMENT REQUIRED FOR IFR OPERATION

The airplane is approved for day & night IFR operations when appropriate equipment is installed and operating correctly.

The type certification requires following equipment in addition to the basic flight instruments. These equipment must be installed and operate perfectly according to the indicated type of use.

CAUTION

IT IS THE PILOT'S RESPONSIBILITY TO CHECK THAT THE FOLLOWING EQUIPMENT LIST IS IN ACCORDANCE WITH THE SPECIFIC NATIONAL OPERATING RULES OF THE AIRPLANE REGISTRATION COUNTRY DEPENDING ON THE TYPE OF OPERATION.

NOTE :
Systems and equipment mentioned hereafter do not include specific flight and radio-navigation instruments required by decree concerning main condition for civil airplanes operation or other foreign regulations (for example FAR PART 91 and 135).

EQUIPMENT	Day IFR	Night IFR
Vertical speed indicator	yes	yes
Horizontal attitude gyro	yes	yes
Turn-and-bank indicator	yes	yes
Heading indicator	yes	yes
Vacuum gage	yes	yes
Vacuum warning light	**	**
Heated pitot	yes	yes
Carburetor temperature indicator	yes	yes
OAT indicator	yes	yes
Stop watch	yes	yes
Alternate static source	yes	yes
Anticollision light	yes	yes
Landing and taxi lights	no	yes
Navigation lights	no	yes
Adjustable interior lighting	no	yes
Adjustable emergency lighting	no	yes
1 microphone and headset assy	yes	yes
1 hand microphone and cabin loud-speaker	yes	yes
For reference :		
Flashlight with flashing device	no	yes
Day and Night IFR placard	yes	yes

** Optional equipment ; mandatory for BRAZIL

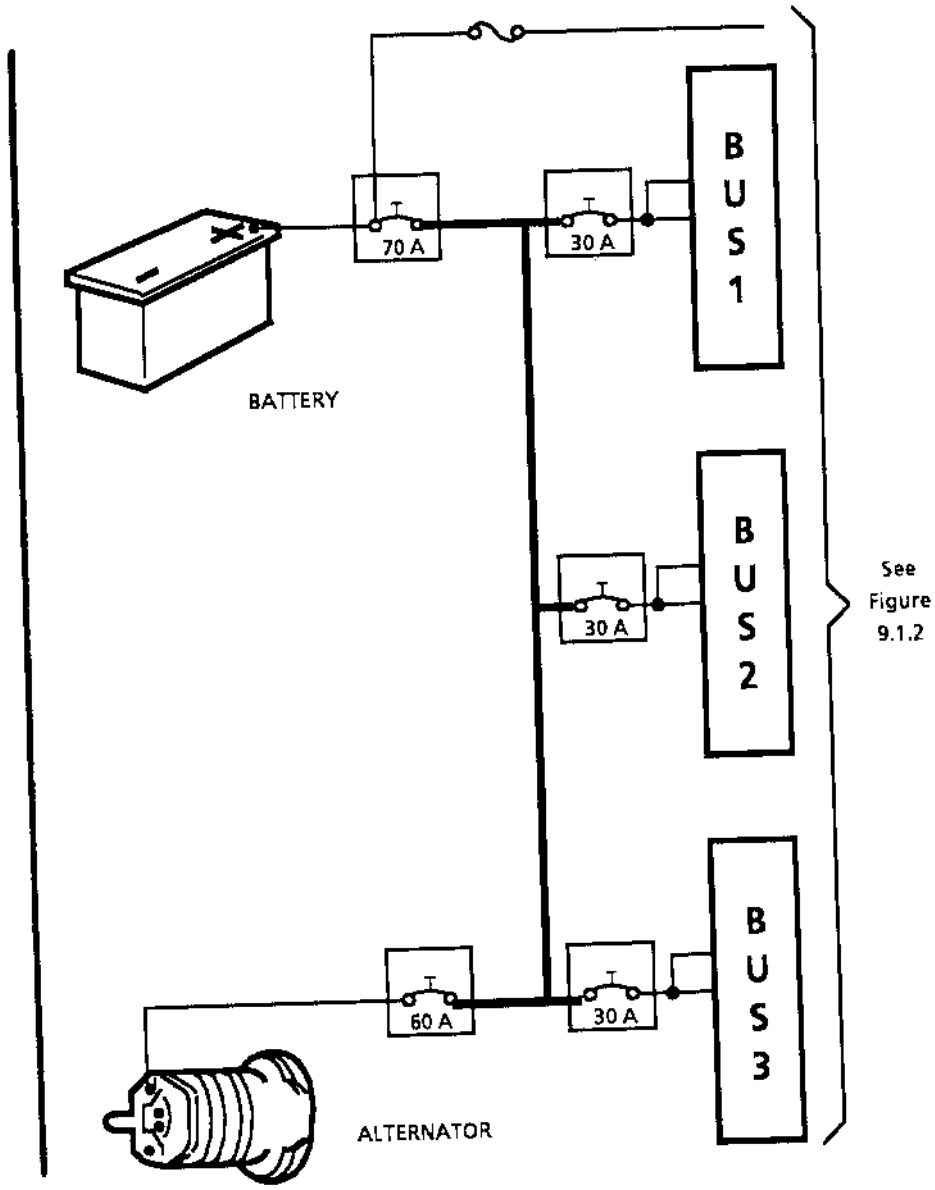


Figure 9.1.1 - BUS BARS POWER SUPPLY

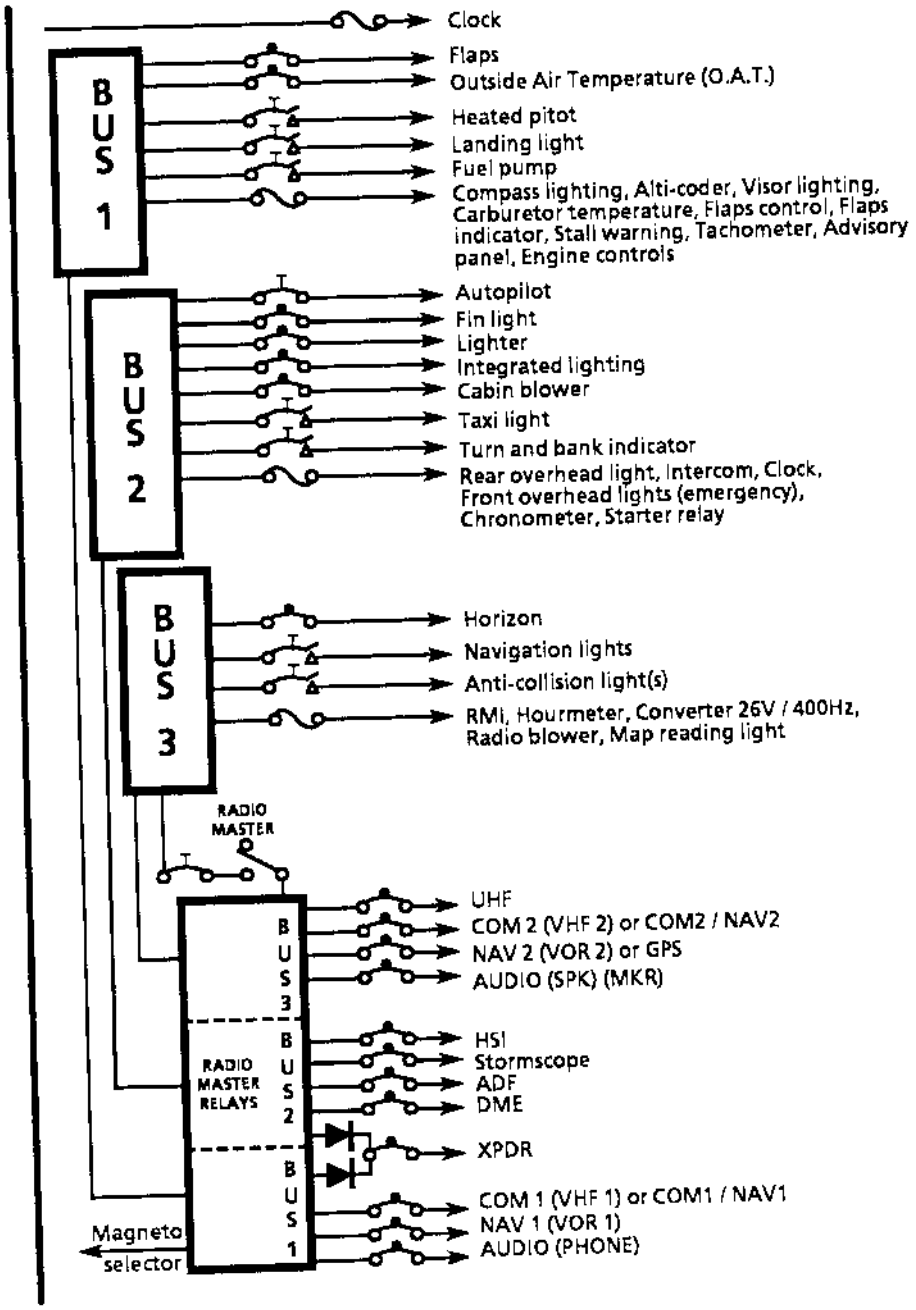


Figure 9.1.2 - POWER DISTRIBUTION IN IFR

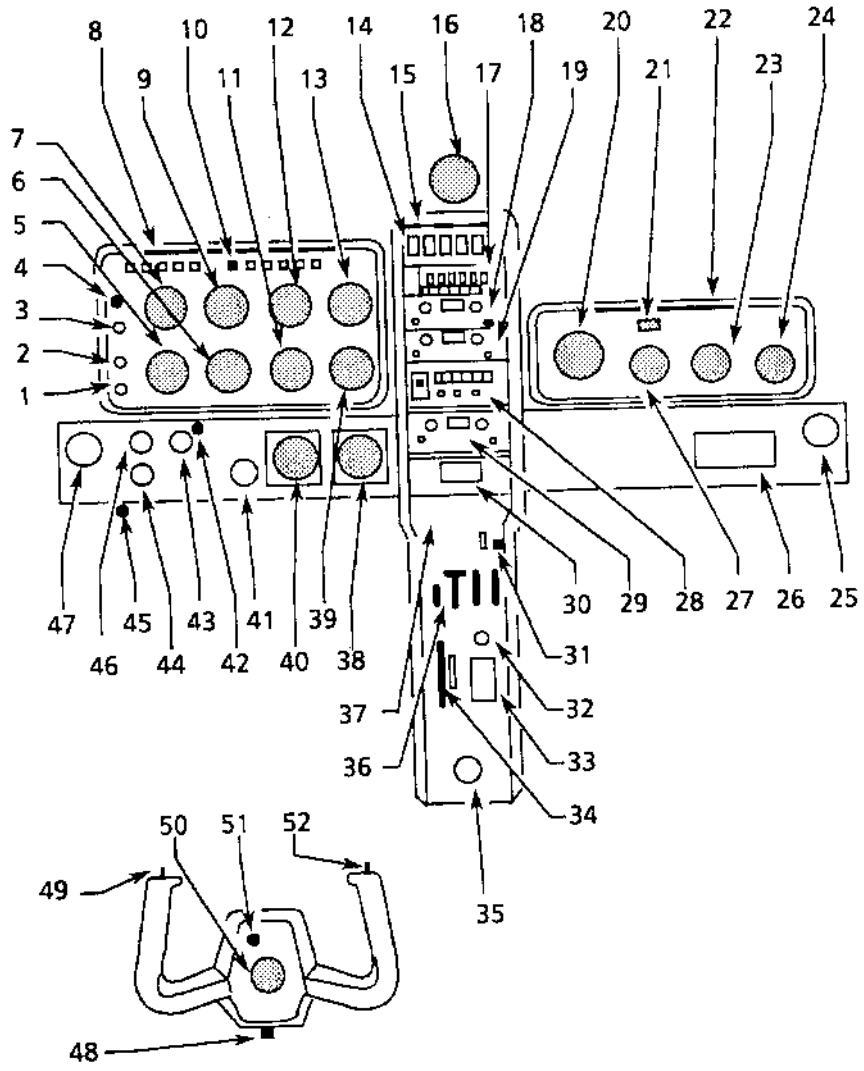


Figure 9.1.3 - EXAMPLE OF NARCO VERSION INSTRUMENT PANEL « IFR »

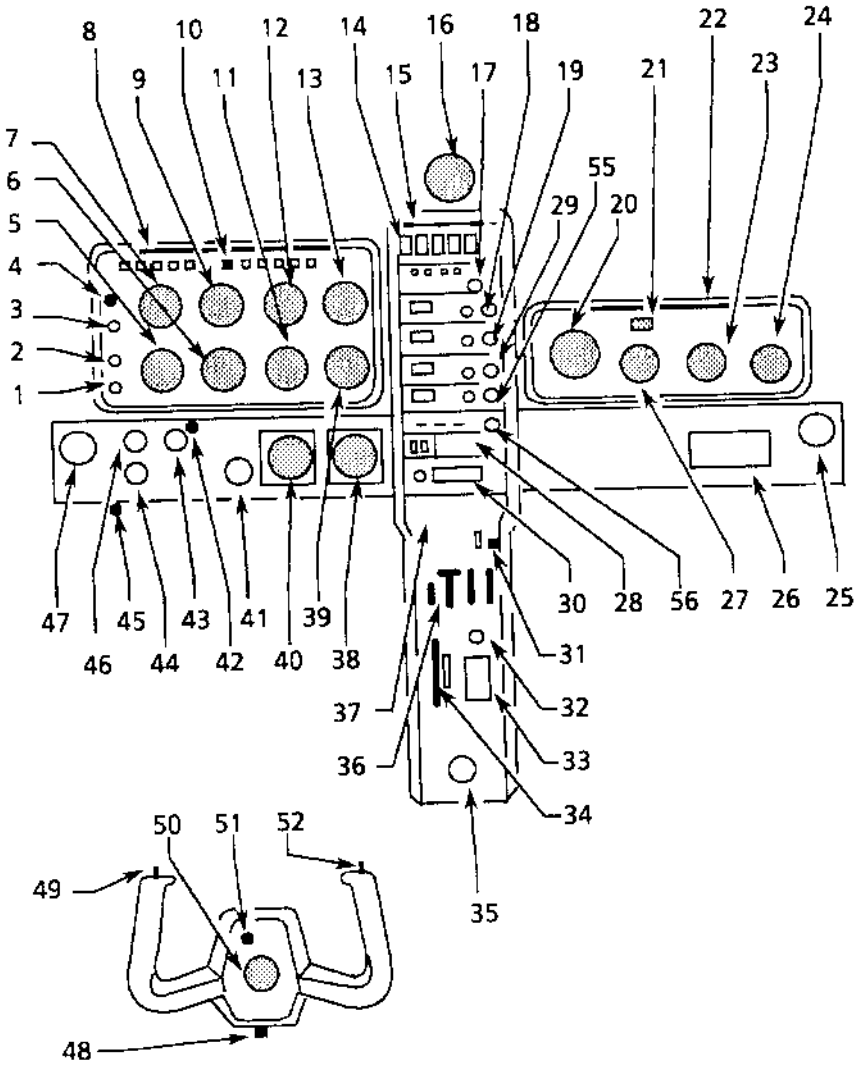


Figure 9.1.3A - EXAMPLE OF KING VERSION INSTRUMENT PANEL « IFR »

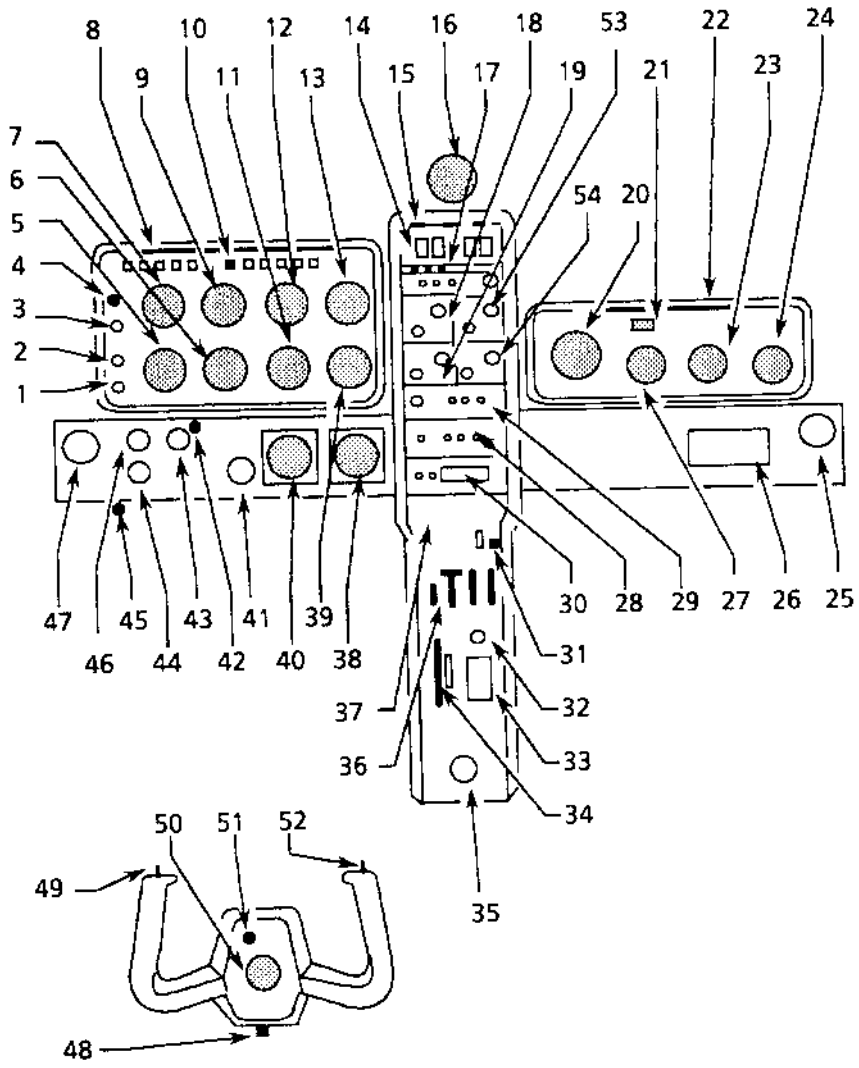


Figure 9.1.3B - EXAMPLE OF COLLINS VERSION
INSTRUMENT PANEL « IFR »

INSTRUMENT PANEL EXAMPLE (NARCO, COLLINS or KING)

1 - Normal lighting control (Std)
2 - Emergency lighting control (Std)
3 - Instruments and radio lighting control (Std)
4 - Emergency radio beacon switch (if installed)
5 - Illuminated turn-and-bank indicator
6 - Illuminated heading indicator
7 - Illuminated true airspeed indicator (Std)
8 - L.H. instrument panel visor lighting
9 - Illuminated horizontal attitude indicator
10 - Pitot heat indicator light
11 - Illuminated vertical speed indicator (Std)
12 - Illuminated altimeter (Std)
13 - VOR 1 receiver-indicator (NARCO)
13 - VOR 1 indicator (COLLINS - KING)
14 - Engine controls panel (Std)
15 - Radio support visor lighting
16 - Illuminated compass (Std)
17 - Audio control panel
18 - VHF 1
19 - VHF 2
20 - Manifold pressure gage (TB 9 - TB 10)
20 - Manifold pressure - fuel flow / pressure (TB 200)
21 - Carburator temperature indicator (TB 9 - TB 10)
22 - R.H. instrument panel visor lighting
23 - Illuminated combination CHT / EGT
24 - Illuminated OAT indicator
25 - R.H. air outlet (Std)
26 - Cabin air selector (Std)
27 - Illuminated tachometer (Std)
28 - Transponder
29 - Radio compass
30 - DME indicator
31 - Wing flaps control and illuminated indicator (Std)
32 - Lighter (Std)
33 - Ash-tray (Std)
34 - Pitch trim control wheel and illuminated indicator (Std)
35 - Fuel selector (Std)
36 - Engine controls (Std)
37 - Switch-breakers for turn-and-bank indicator, anti-collision, navigation lights, heated pitot and landing lights.

INSTRUMENT PANEL EXAMPLE (Cont.)

38 - Illuminated altimeter Nr 2
39 - VOR 2 receiver-indicator (NARCO)
39 - VOR 2 indicator (COLLINS - KING)
40 - Illuminated ADF indicator
41 - Parking brake knob (Std)
42 - L.H. subpanel post light (Std)
43 - Vacuum gage
44 - Alternate static source valve
45 - Circuit-breakers panel post light
46 - Magneto / start selector (Std)
47 - L.H. air outlet (Std)
48 - Maps reading light (if installed)
49 - Push-to-talk switch
50 - Clock / stop watch
51 - Clock / stop watch post light (if installed)
52 - Maps reading light switch
53 - NAV 1 receiver (COLLINS)
54 - NAV 2 receiver (COLLINS)
55 - VOR / ILS receiver (KING)
56 - VOR / LOC receiver (KING)

LIGHTING DEVICES

INSTRUMENT PANELS LIGHTING

- See Figure 9.1.3.
- Controlled and modulated by "Normal" and "Radio" controls.

EMERGENCY LIGHTING

- Front overhead lights controlled by turning post lights, modulable by "Emergency" control. See Figure 9.1.3.

CABIN LIGHTING

- Front overhead lights controlled by turning post lights, modulable by "Emergency" control. See Figure 9.1.3.
- Rear overhead light (manual).

INSTRUMENT PANEL ADDITIONAL EQUIPMENT

ADDITIONAL SENSITIVE ALTIMETER (if installed)

The second sensitive altimeter is connected to the airplane static pressure. It may be switched over to cabin static pressure by means of alternate static source valve.

When alternate static source valve is pulled altitude compensation should be performed as per Section 5 "Performance".

CLOCK / STOP WATCH

The clock / stop watch and its post light are installed in the center of the pilot's control wheel.

OAT INDICATOR

The indicator is connected to the transmitter which is installed under L.H. wing. The instrument is provided with integral lighting.

A red warning light is provided on the dial. This warning light, permanently lit, becomes visible by the pointer rotation when the outside atmosphere is close to 32° F.

ALTERNATE STATIC SOURCE

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 ON position ("PULL") of the alternate static source valve admits cabin static pressure to the static system.

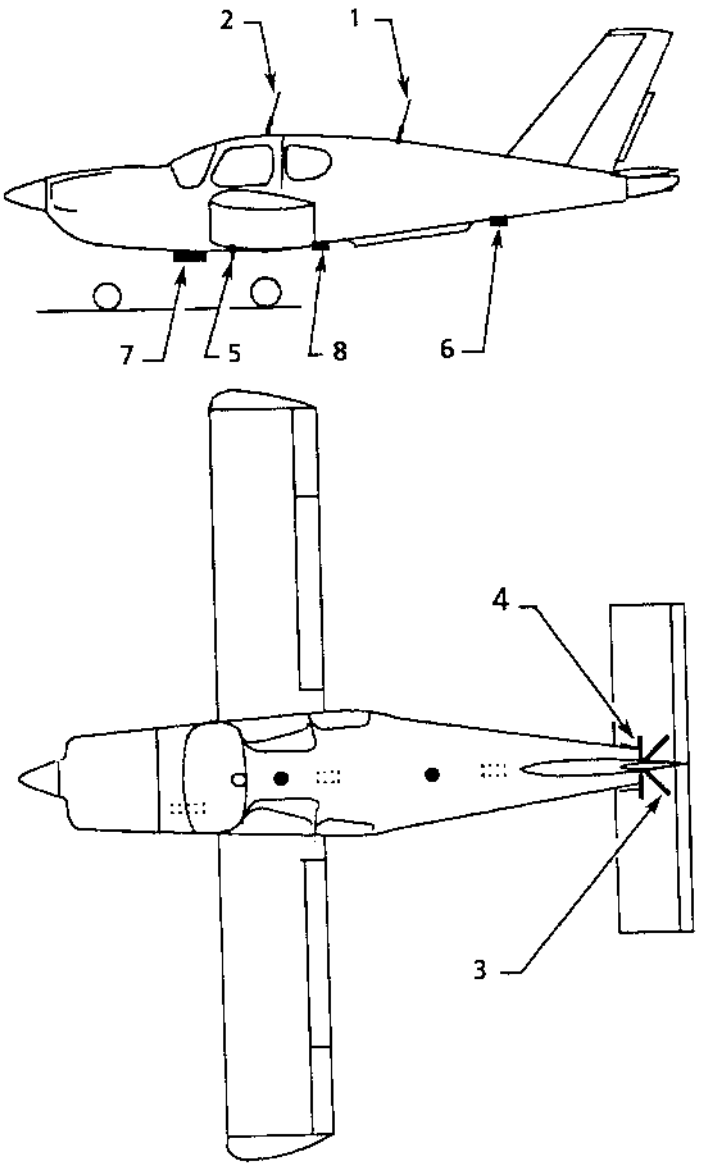


Figure 9.1.4 - ANTENNAS

ANTENNAS

1 - VHF 1 antenna

2 - VHF 2 antenna

3 - VOR antenna

4 - Glide ILS antenna

5 - ATC transponder antenna

6 - Radio compass - loop and sense antenna

7 - Marker antenna

8 - DME antenna

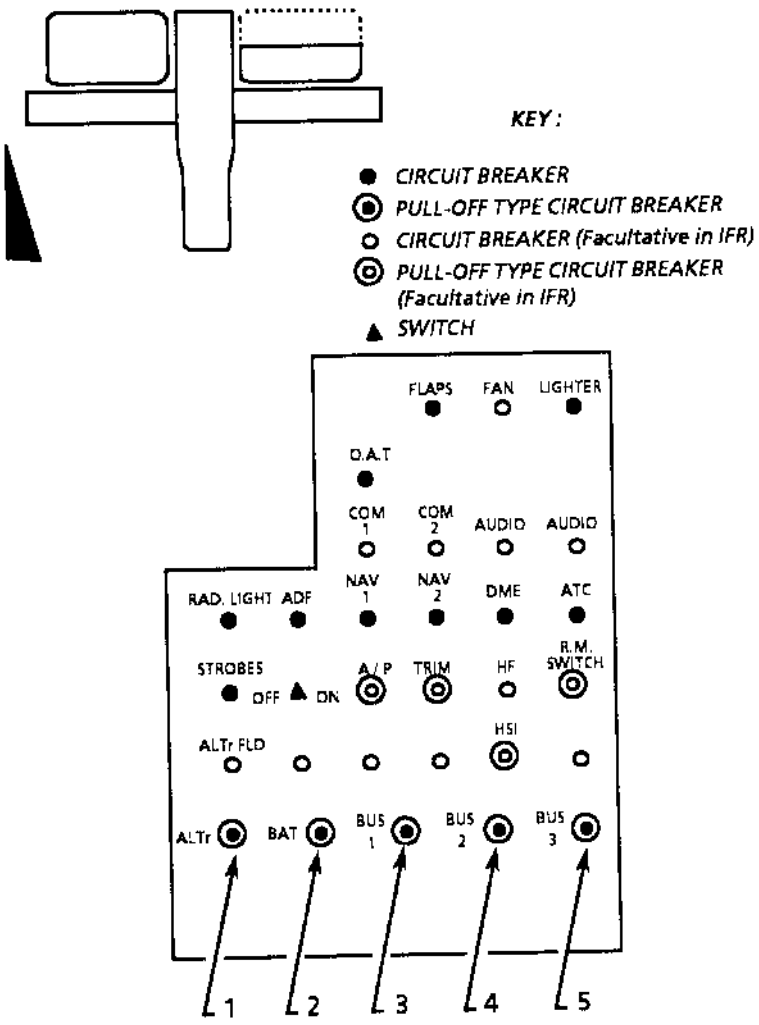


Figure 9.1.5 - CIRCUIT BREAKERS ASSEMBLY
(Typical arrangement)

CIRCUIT-BREAKERS ASSEMBLY

1 - Alternator "pull-off" type circuit-breaker (60 A)

2 - Battery "pull-off" type circuit-breaker (70 A)

3 - Bus bar 1 "pull-off" type circuit-breaker (30 A)

4 - Bus bar 2 "pull-off" type circuit-breaker (30 A)

5 - Bus bar 3 "pull-off" type circuit-breaker (30 A)

SECTION 2
LIMITATIONS

The installation and the operation of the day and night IFR equipment do not change the basic limitations of the airplane described in Section 2 "Limitations" of the basic Pilot's Operating Handbook.

PLACARDS

This placard is located near the instruction plate :

FLIGHT CONDITIONS : DAY AND NIGHT IFR AND VFR
ICING CONDITIONS NOT ALLOWED

This placard is located on L.H. instrument panel :

CAUTION : DURING ILS APPROACH
AVOID ENGINE RPM HIGHER THAN 2600

SECTION 3

EMERGENCY PROCEDURES

These procedures supplement those of standard airplane described in Section 3 "Emergency procedures" of the basic Pilot's Operating Handbook.

AIRSPEED INDICATING SYSTEM FAILURE

- Check the operation of the heated pitot, green indicator light "ON". If the switch-breaker is "ON" and the indicator light "OFF", check that BUS BAR 1 circuit-breaker is "ON".
- Erroneous indications of true airspeed indicator and altimeters.

Alternate static source "PULL"

Open air outlets and / or actuate cabin air regulation flow lever to open position. Then, airspeed indicator and altimeter errors are slight.

If the failure persists, perform a precautionary approach, maintaining an adequate airspeed margin above the stall warning activation speed using the pre-setting (see Figure 9.1.6).

NORMAL LIGHTING FAILURE

- Switch on emergency lighting system (front overhead lights)
- Check that radio and instruments lighting circuit breaker is "ON".

LANDING LIGHT FAILURE

The left light has a wide beam and is considered a taxi light, and the right has a narrow beam and is considered a landing light, but either or both can be used as desired.

When landing without lights, it is suggested to use the same pitch attitude as that required to maintain the ILS Glide Slope.

FIRE OR SMOKE OF ELECTRIC ORIGIN

- Disengage "pull-off" type circuit-breakers of bus bars 1, 2, 3.
- After a few moments reset "pull-off" type circuit-breakers in the numerical order with a delay between each operation for observation. Disengage the faulty bus bar and disconnect all the equipment supplied by the latter. See Figure 9.1.2.
- Reset "pull-off" type circuit-breaker and reconnect one after the other all the disconnected equipment to isolate the failed item. Leave the "pull-off" type circuit-breaker for this item tripped.

VACUUM SYSTEM FAILURE

Vacuum below green arc or zero : Pneumatically operated horizontal attitude and / or heading indicator / HSI inoperative. Electric turn-and-bank indicator and magnetic compass continue normal operation.

Leave IMC conditions, fly airplane carefully in partial panel mode, and proceed with landing as soon as possible.

SECTION 4
NORMAL PROCEDURES

These procedures complete those of standard airplane described in Section 4 "Normal procedures" of the basic Pilot's Operating Handbook.

4-1 - PROCEDURES FOR IFR FLIGHT OR NIGHT FLIGHT

PRELIMINARY STEPS

Study the meteorology in order to avoid flying in hazardous conditions (minima, icing...).

Check that fuel level is sufficient to comply with regulations.

BEFORE FLIGHT (may be undertaken or continued at night)

Check operation :

. of anti-collision light
. of navigation lights
. of cabin and instrument panel lighting
. of landing lights
. of day / night selector switch.

A flashlight must be provided on board the airplane.

TAXIING

Check operation of gyroscopic instruments by performing alternate turns :

- Horizontal attitude indicator - set miniature airplane as required
- Heading indicator - correct rotation
- Turn-and-bank indicator - proper direction.

At night, preferably use only the taxi light (left landing light).

BEFORE TAKE-OFF

- Heated pitot
- Check vacuum gage in green arc
- Check installed radio-navigation equipment
- Set transponder to "stand-by"
- At night or in damp weather, set the air regulation system to maximum demisting.

LINED UP ON RUNWAY

Check heading gyro and horizontal attitude gyro bar.

At night, turn on landing lights as required.

TAKE-OFF

See Section 4 "Normal procedures" of the basic Pilot's Operating Handbook.

Always maintain a positive rate of climb.

At night, switch off landing lights when safely airborne.

CLIMB, CRUISE AND DESCENT

See Section 4 "Normal procedures" of the basic Pilot's Operating Handbook.

Beware of the risk of eye-sight problems above 8000 feet (without oxygen).

ILS APPROACH (pre-setting)

These values are given for a weight of 2535 lbs (1150 kg - TB 10 - TB 200) - 2337 lbs (1060 kg - TB 9).

In order to facilitate air traffic, it is advisable to proceed with final approach at VIAS = 86 / 92 KIAS - 99 / 106 MPH IAS with flaps retracted.

In short final run, fully extend the flaps, VIAS will then drop to 70 / 76 KIAS - 81 / 87 MPH IAS. It is not necessary to modify the power to maintain the angle of descent.

	Wing flaps	KIAS	MPH IAS	MP in.Hg (TB10 - TB 200)	Propeller RPM	Vert. Speed indic. ft/min
Holding	0°	86 / 92	99 / 106	20.7	2500 (TB 10 - TB 200) 2350 (TB 9)	0
ILS Approach	0°	86 / 92	99 / 106	14.8	2500 (TB10 - TB 200) 2000 (TB9)	- 450
Final	25°30'	70 / 76	81 / 87	*	Full low pitch (TB10 - TB 200) (TB9) *	- 450

(*) As required

Figure 9.1.6 - PRE-SETTINGS, ILS APPROACH

ILS approach with KING ILS

"Erratic deviations have been observed with airplane flown down an ILS path with KING RADIO-NAV installations. Analysis of the phenomenon indicates that the fluctuations are due to an interference between propeller rotation frequency and one of LOC frequencies. The more sensitive conditions are met when the localizer beacon is right ahead and the engine speed is adjusted toward 2650 RPM.

The localizer use is not significantly impaired by the phenomenon when :

- engine speed is reduced to lower than 2600 RPM
- localizer beacon lies right or left by more than 30 degrees from airplane heading.

Autopilot APR mode operation should be discontinued whenever high engine power settings are anticipated. This can be done by switching to HDG mode or CWS mode or by switching off the autopilot. Of course from above one understands that REV mode or BCK COURSE mode are not concerned by this limitation after take-off (loc. beacon lies 180° from airplane heading in this case)."

LANDING

At night, preferably use the R.H. landing light (long range) or both lights simultaneously.

4-2 - USE OF AVIONICS

AUDIO CONTROL PANEL

The buttons allow selecting the transmission and reception of VHF 1 or VHF 2, double VHF reception, reception of VOR 1, VOR 2, ADF, Marker and DME.

TRANSMISSION

Transmission may be made either through hand microphone, or through the headset boom microphone with its push-to-talk-switches located on the control wheels. Headsets that will not be used should be unplugged.

RECEPTION

Select the loud-speaker or headset reception by means of the corresponding button on audio control panel (SPKR or PHONE).

In I.M.C. or at night, it is recommended to use the headset.

VOR, ADF, MKR and DME (if installed)

Operate independent of VHF comm transceivers, but at least one VHF comm transceiver must be turned on to provide an audio amplifier for loud-speaker operation unless the audio control panel contains an integral amplifier. Headphone operation is normal regardless of VHF operation on loud-speakers.

LIGHTING

Three controls are located on the left side of the L.H. instrument panel. See Figure 9.1.3 :

- Lower control (normal)

  Controls and modulates lighting of L.H. and R.H. instrument panels' visors.

- Central control (emergency)

  Modulates both forward overhead lights.

  Rotating the overhead lights turns them on and off.

- Upper control (radio-equipment) operates and modulates :
  - Radio equipment lighting
  - Instruments and indicators lighting on instrument panel
  - Circuit-breakers panel lighting

NOTE :
Both "normal" and "radio-equipment" 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" turning counterclockwise.
"Emergency" position control modulates lighting ; high position from "FULL INTENSITY" turn clockwise to modulate to "MINIMUM INTENSITY" ; turn back to high position "FULL INTENSITY" turning counterclockwise.

LANDING LIGHTS

The lights are controlled by two switch-breakers. See Figure 7.5B of the basic Pilot's Operating Handbook.

The L.H. light has a wide beam which facilitates taxiing.

The R.H. light has a long range beam and should be used for take-off and landing.

Simultaneous operation is possible.

DAY / NIGHT DIMMER

A day / night switch allows the indicator lights for the fuel pump, pitot heater and landing lights to be dimmed during night operations.

SECTION 5
PERFORMANCE

The installation and the operation of the day and night IFR equipment do not change the basic performance of the airplane described in Section 5 "Performance" of the basic Pilot's Operating Handbook.
However, the installation of the externally mounted antennas will result in a minor reduction in cruise performance. See Section 5 "Performance" of the basic Pilot's Operating Handbook.

SUPPLEMENT

NIGHT VFR EQUIPMENT

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SECTION 1
GENERAL

LIST OF APPROVED AND MANDATORY EQUIPMENT
ALLOWING FLIGHT OF THE AIRPLANE
IN NIGHT FLIGHT
(in addition to the basic flight instruments)

EQUIPMENT
- RADIO-NAVIGATION
VHF - Category 2 VOR / LOC - Category 2 (NAV) or Radio compass - Category 2 (ADF)
- NAVIGATION EQUIPMENT
Horizontal attitude gyro indicator Turn-and-bank indicator Heading gyro indicator Gyro "ON" indicator Vertical speed indicator Anti-collision light Navigation lights Landing and taxi lights Interior panel lighting Flashlight (Personal equipment) Night VFR placard

NOTE :
Refer to the prevailing regulation, which can evolve anytime.

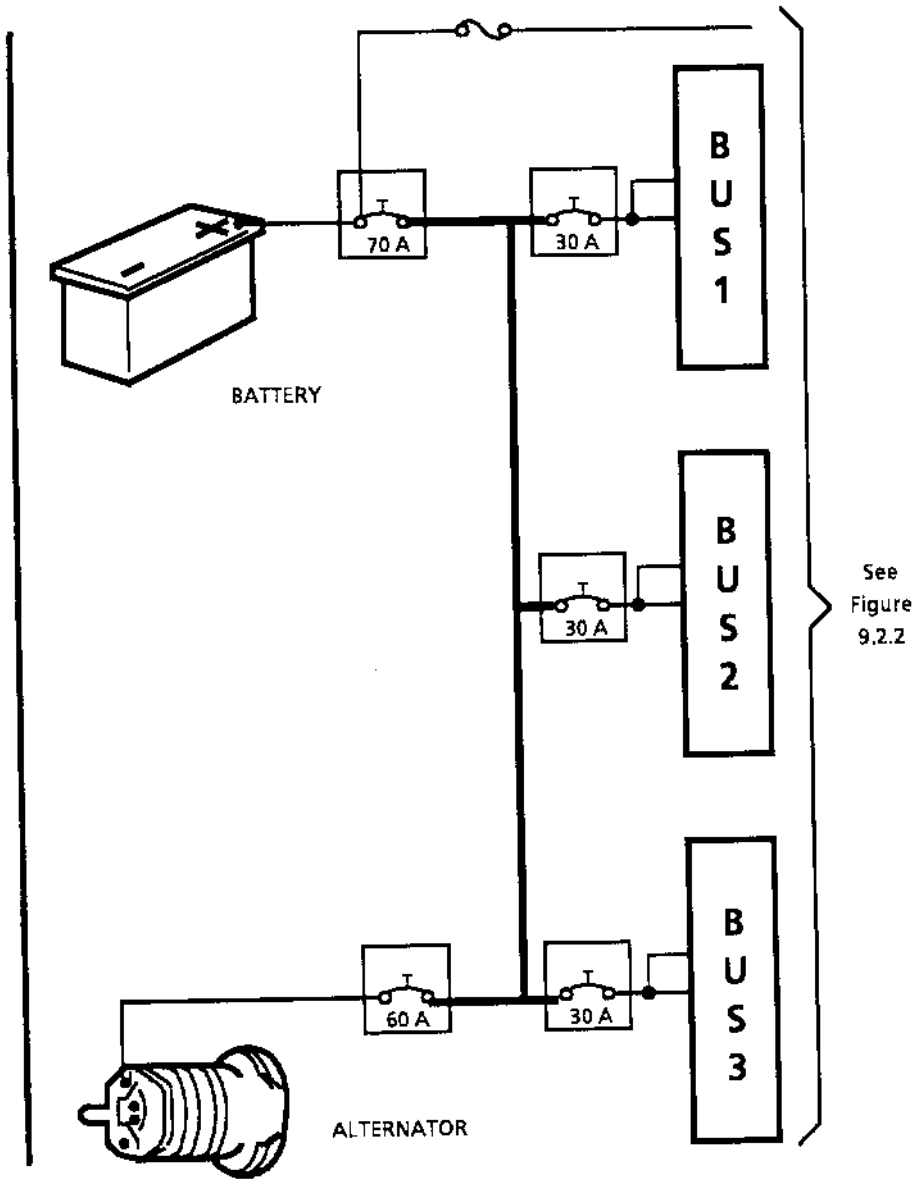


Figure 9.2.1 - BUS BARS POWER SUPPLY

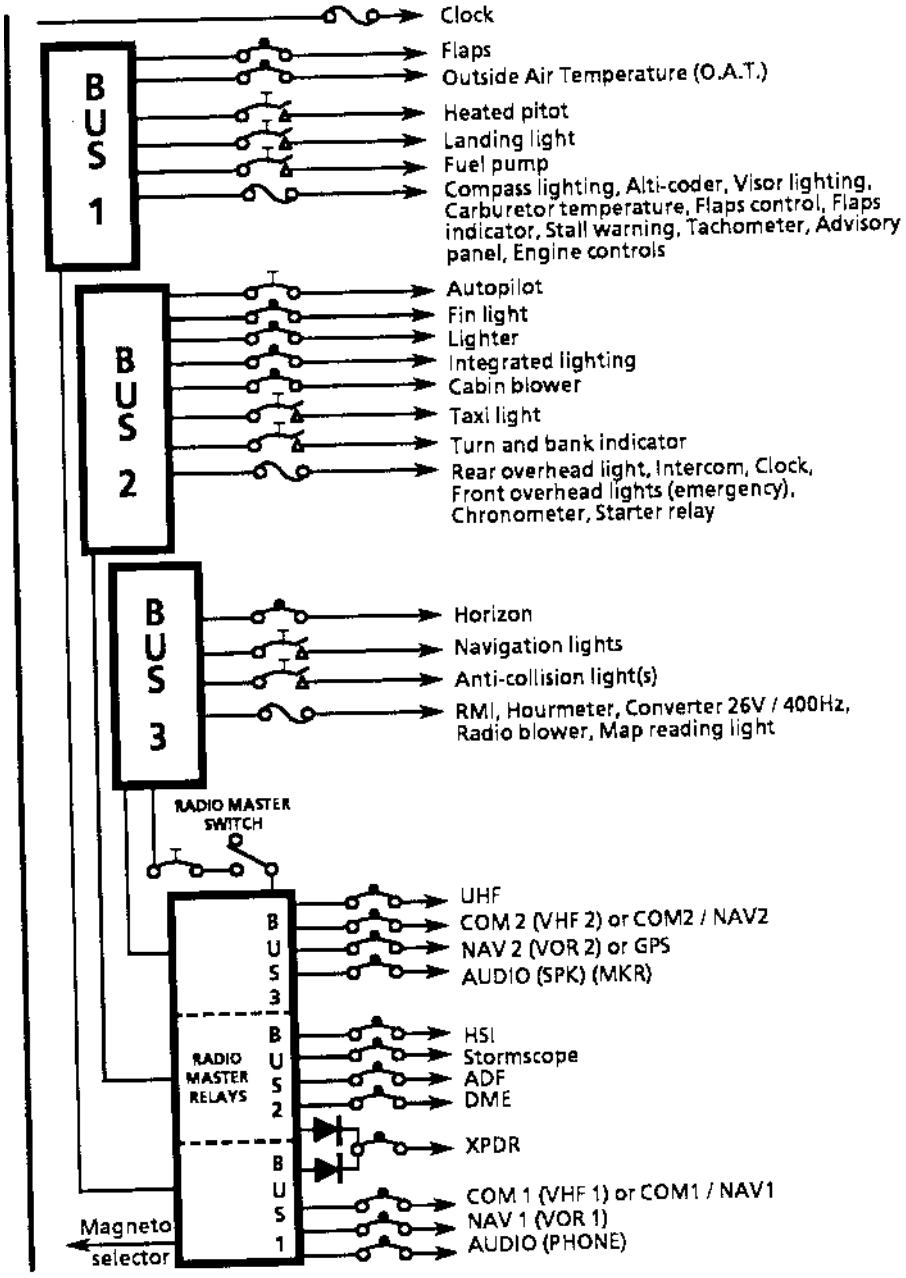


Figure 9.2.2 - POWER DISTRIBUTION IN IFR

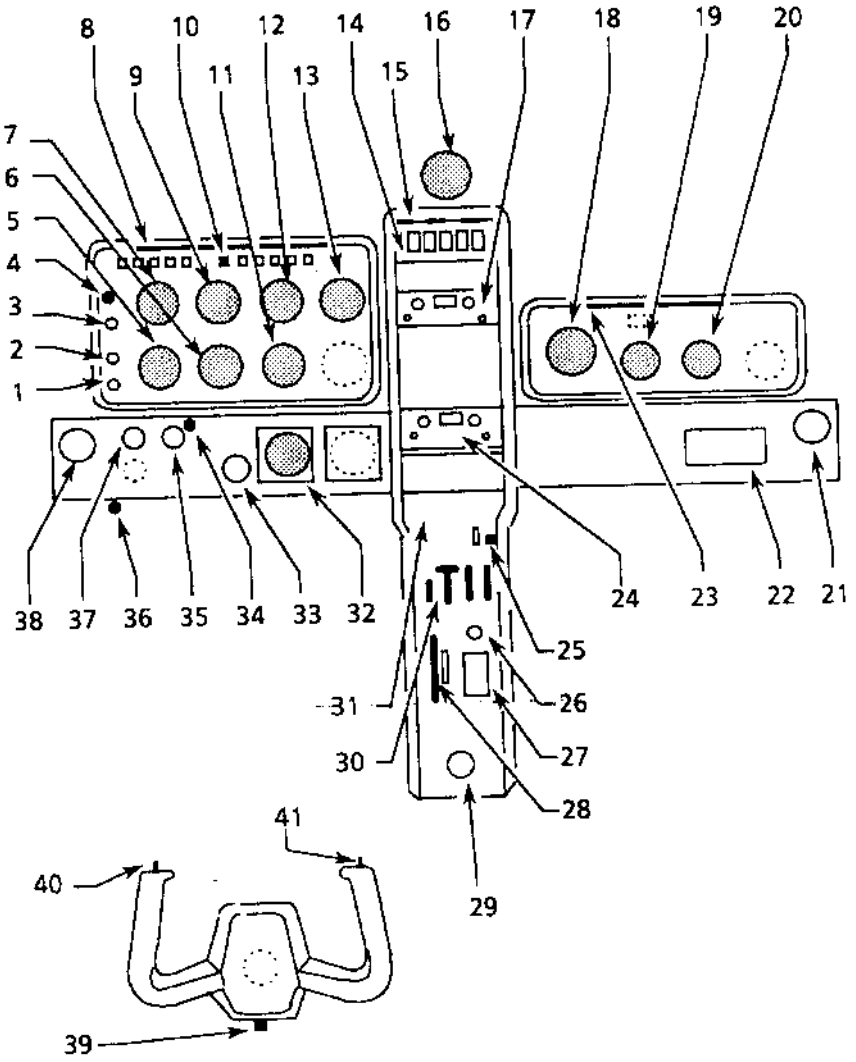


Figure 9.2.3 - EXAMPLE OF NARCO VERSION INSTRUMENT PANEL « VFR »

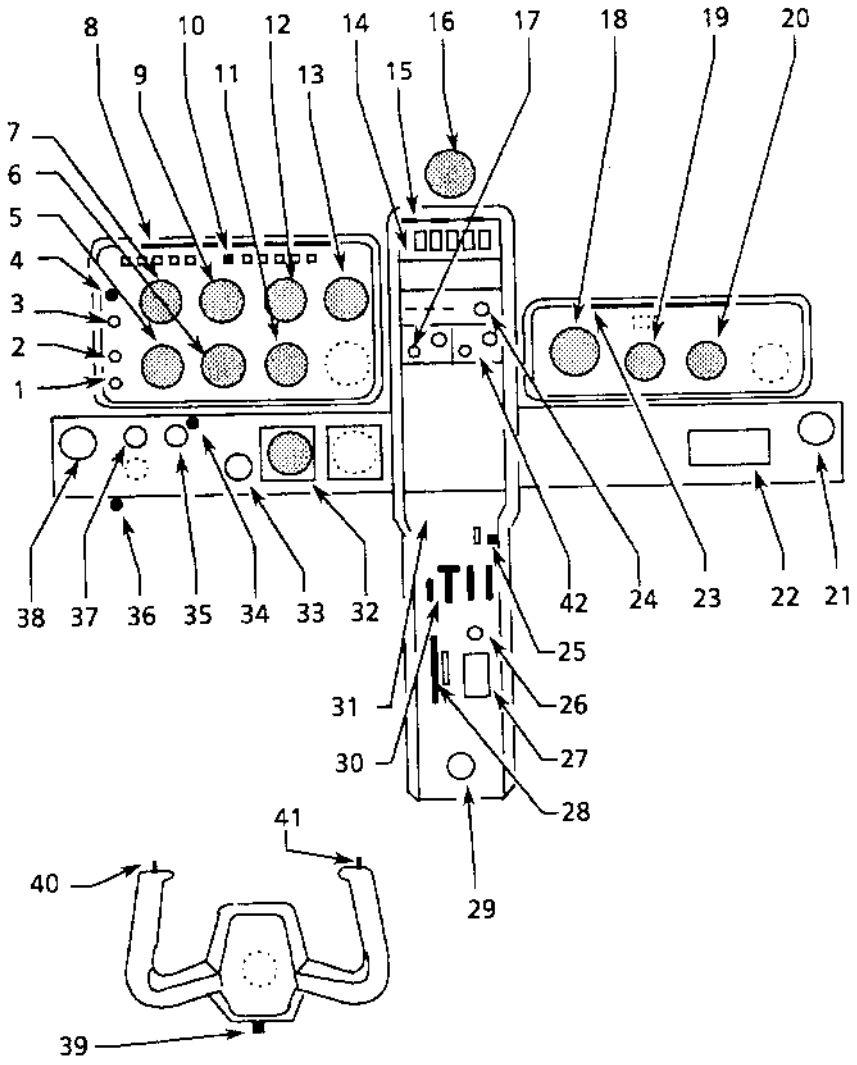


Figure 9.2.3A - EXAMPLE OF KING VERSION INSTRUMENT PANEL « VFR »

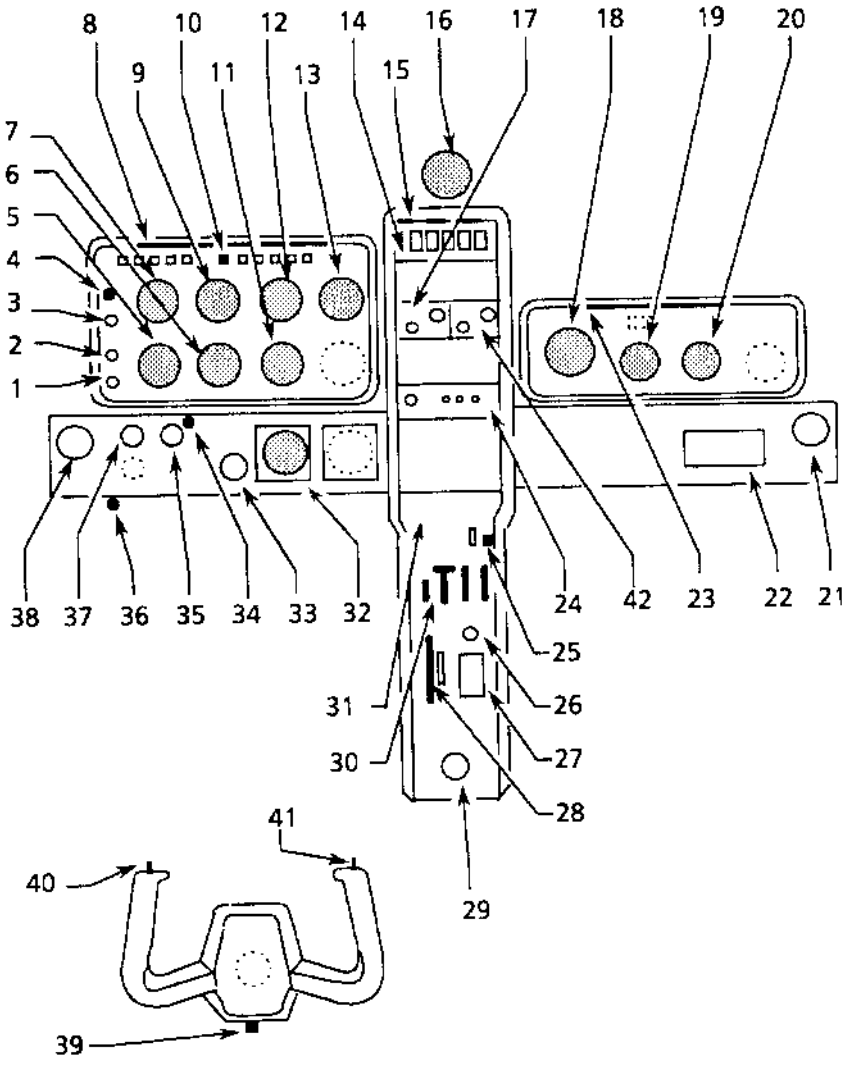


Figure 9.2.3B - EXAMPLE OF COLLINS VERSION INSTRUMENT PANEL « VFR »

INSTRUMENT PANEL EXAMPLE (NARCO, COLLINS or KING)

1 - Normal lighting control (Std)
2 - Emergency lighting control (Std)
3 - Instruments and radio lighting control (Std)
4 - Emergency radio beacon switch (if installed)
5 - Illuminated turn-and-bank indicator
6 - Illuminated heading indicator
7 - Illuminated true airspeed indicator (Std)
8 - L.H. instrument panel visor lighting
9 - Illuminated horizontal attitude indicator
10 - Pitot heat indicator light
11 - Illuminated vertical speed indicator (Std)
12 - Illuminated altimeter (Std)
13 - VOR indicator (COLLINS - KING)
13 - VOR receiver-indicator (NARCO)
14 - Engine controls panel (Std)
15 - Radio support visor lighting
16 - Illuminated compass (Std)
17 - VHF 1
18 - Manifold pressure gage (TB 10)
18 - Manifold pressure - fuel flow / pressure (TB 200)
19 - Illuminated tachometer (Std)
20 - Illuminated combination CHT / EGT
21 - R.H. vent (Std)
22 - Cabin air selector (Std)
23 - R.H. instrument panel visor lighting
24 - Radio compass
25 - Wing flaps control and indicator (Std)
26 - Lighter (Std)
27 - Ash-tray (Std)
28 - Pitch trim illuminated control wheel and indicator (Std)
29 - Fuel selector (Std)
30 - Engine controls (Std)
31 - Switch-breakers for turn-and-bank indicator, anti-collision, navigation lights, heated pitot and landing lights
32 - Illuminated ADF indicator
33 - Parking brake knob (Std)
34 - L.H. subpanel post light
35 - Vacuum system suction gage

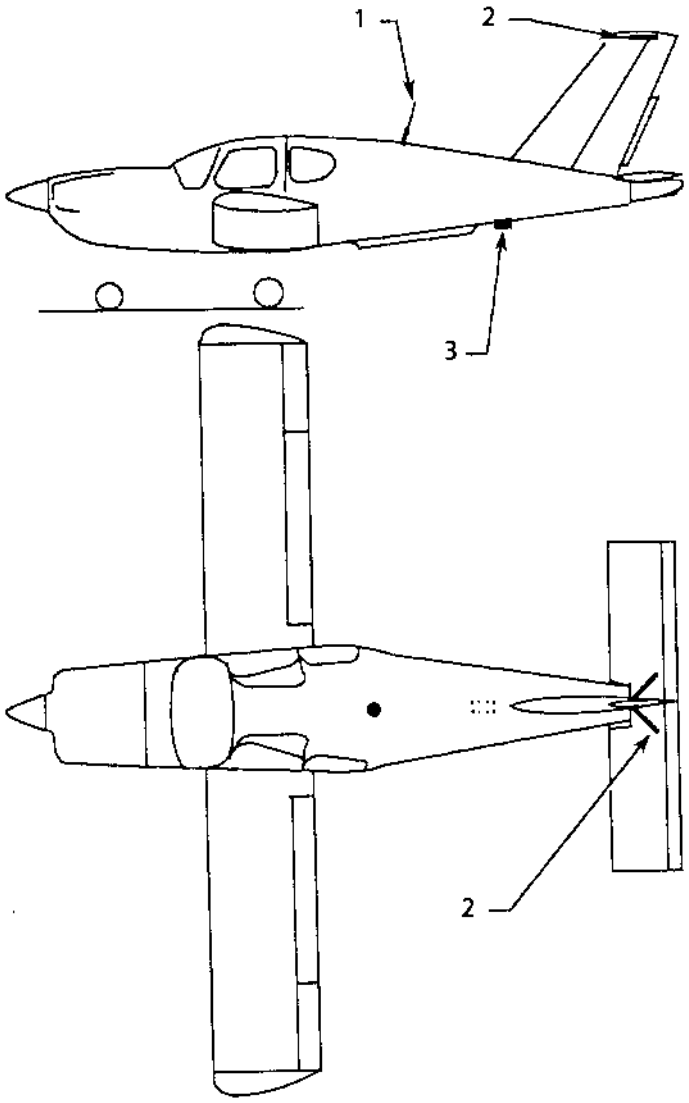


Figure 9.2.4 - ANTENNAS

INSTRUMENT PANEL EXAMPLE (Cont.)

36 - Circuit-breakers panel post light
37 - Magneto / start switch (Std)
38 - L.H. vent (Std)
39 - Maps reading light (if installed)
40 - Push-to-talk switch
41 - Maps reading light switch
42 - VOR / LOC receiver (KING - COLLINS)

LIGHTING DEVICES

INSTRUMENT PANELS LIGHTING

- See Figure 9.2.3.
- Controlled and modulated by "Normal" and "Radio" controls.

EMERGENCY LIGHTING

- Front overhead lights controlled by turning post lights, modulable by "Emergency" control. See Figure 9.2.3.

CABIN LIGHTING

- Front overhead lights controlled by turning post lights, modulable by "Emergency" control. See Figure 9.2.3.
- Rear overhead light (Manual).

ANTENNAS

1 - VHF antenna

2 - VOR antenna

3 - Radio compass - loop and sense antenna.

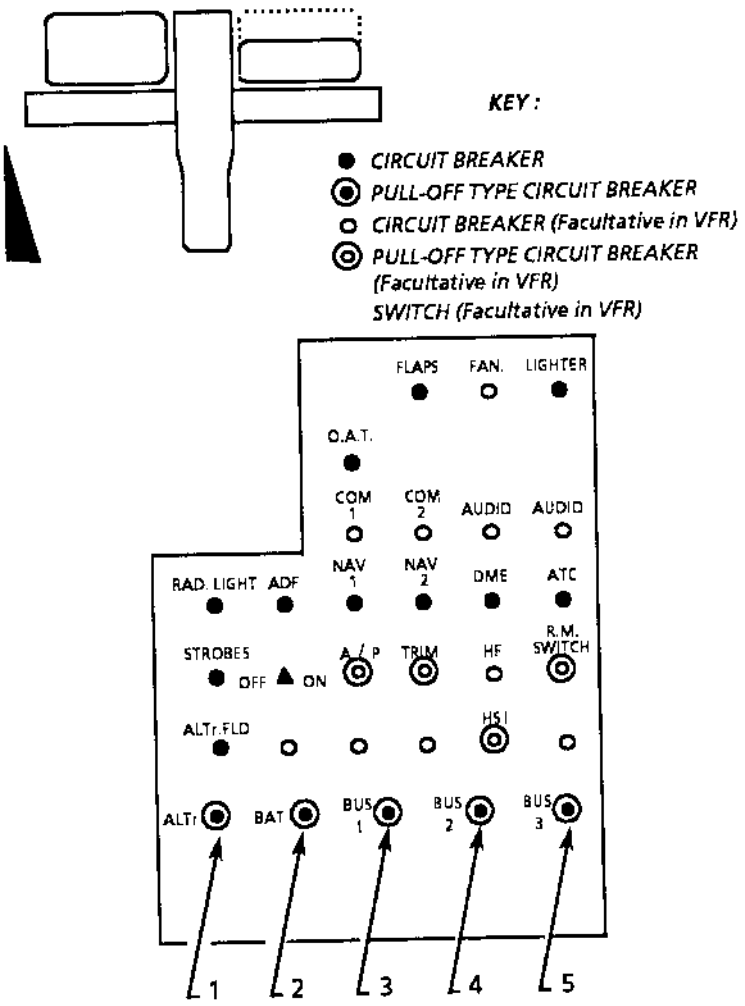


Figure 9.2.5 - CIRCUIT BREAKERS ASSEMBLY
(Typical arrangement)

CIRCUIT-BREAKERS ASSEMBLY

1 - Alternator "Pull-off" type circuit-breaker (60 A)

2 - Battery "Pull-off" type circuit-breaker (70 A)

3 - Bus bar 1 "Pull-off" type circuit-breaker (30 A)

4 - Bus bar 2 "Pull-off" type circuit-breaker (30 A)

5 - Bus bar 3 "Pull-off" type circuit-breaker (30 A)

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D.G.A.C. Approved

SECTION 2
LIMITATIONS

The installation and the operation of the night VFR equipment do not change the basic limitations of the airplane described in Section 2 "Limitations" of the basic Pilot's Operating Handbook.

PLACARDS

This placard is located near the instruction plate :

FLIGHT CONDITIONS : DAY AND NIGHT VFR
ICING CONDITIONS NOT ALLOWED

This placard is located on L.H. instrument panel :

CAUTION : DURING ILS APPROACH
AVOID ENGINE RPM HIGHER THAN 2600

SECTION 3
EMERGENCY PROCEDURES

These procedures complete those of standard airplane described in Section 3 "Emergency procedures" of the basic Pilot's Operating Handbook.

NORMAL LIGHTING FAILURE

- Switch on emergency lighting system (FWD overhead lights)
- Check that radio and instruments lighting circuit-breaker is "ON".

LANDING LIGHT FAILURE

The left light has a wide beam and is considered a taxi light, and the right has a narrow beam and is considered a landing light, but either or both can be used as desired.

When landing without lights, it is suggested to use the same pitch attitude as that required to maintain the ILS Glide Slope.

FIRE OR SMOKE OF ELECTRIC ORIGIN

- Disengage "pull-off" type circuit-breaker of bus bars 1, 2, 3.
- After a few moments reset "pull-off" type circuit-breakers in the numerical order with a delay between each operation for observation. Disengage the faulty bus bar and disconnect all the equipment supplied by the latter. See Figure 9.2.2.
- Reset "pull-off" type circuit-breaker and reconnect one after the other all the disconnected equipment until the faulty equipment is found and isolated. Leave the "pull-off" type circuit-breaker for this item tripped.

VACUUM SYSTEM FAILURE

Vacuum below green arc or zero : Pneumatically operated horizontal attitude and / or heading indicator / HSI inoperative. Electric turn-and-bank indicator and magnetic compass continue normal operation.

Fly the airplane carefully in partial panel mode, and proceed with landing as soon as possible.

D.G.A.C. Approved

SECTION 4
NORMAL PROCEDURES

These procedures complete those of standard airplane described in Section 4 "Normal procedures" of the basic Pilot's Operating Handbook.

4-1 - PROCEDURES FOR VFR NIGHT FLIGHT

FIRST STEPS

Study the meteorology in order to avoid flying in hazardous conditions (minima, icing...).

Check that fuel level is sufficient to comply with regulations.

BEFORE FLIGHT (may be undertaken or continued at night)

Check operation :

. of anti-collision light
. of navigation lights
. of cabin and instrument panel lighting
. of landing lights
. of day / night selector switch.

A flashlight must be provided on board the airplane.

TAXIING

Check operation of gyroscopic instruments by performing alternate turns :

- Horizontal attitude indicator - set miniature airplane as required
- Heading indicator - correct rotation
- Turn-and-bank indicator - proper direction.

At night, preferably use only the taxi light (left landing light).

BEFORE TAKE-OFF

- Check suction gage in green arc
- Check VHF
- VOR or radiocompass
- At night or in damp weather, set the air conditioning system to maximum demisting.

LINED UP ON RUNWAY

Check heading gyro and horizontal attitude gyro bar.

At night, turn on landing lights as required.

TAKE-OFF

See Section 4 "Normal procedures" of the basic Pilot's Operating Handbook.

Always maintain a positive rate of climb.

At night, switch off landing lights when safely airborne.

CLIMB, CRUISE AND DESCENT

See Section 4 "Normal procedures" of the basic Pilot's Operating Handbook.

Beware of the risk of eye-sight problems above 8000 feet (without oxygen).

ILS APPROACH (pre-setting)

These values are given for a weight of 2535 lbs (1150 kg).

In order to facilitate air traffic, it is advisable to proceed with final approach at VIAS = 86 / 92 KIAS - 99 / 106 MPH IAS with flaps retracted.

In short final run, fully extend the flaps, VIAS will then drop to 70 / 76 KIAS - 81 / 87 MPH IAS. It is not necessary to modify the power to maintain the angle of descent.

	Wing flaps	KIAS	MPH IAS	MP in.Hg	Propeller RPM	Vert. Sp. indicator ft/min
Holding	0°	86 / 92	99 / 106	20.7	2500	0
ILS Approach	0°	86 / 92	99 / 106	14.8	2500	- 450
Final	25°30'	70 / 76	81 / 87	*	Full low pitch	- 450

(*) As required

Figure 9.2.6 - PRE-SETTINGS, ILS APPROACH

ILS approach with KING ILS

"Erratic deviations have been observed with airplane flown down an ILS path with KING RADIO-NAV installations. Analysis of the phenomenon indicates that the fluctuations are due to an interference between propeller rotation frequency and one of LOC frequencies. The more sensitive conditions are met when the localizer beacon is right ahead and the engine speed is adjusted toward 2650 RPM.

The localizer use is not significantly impaired by the phenomenon when :

- engine speed is reduced to lower than 2600 RPM
- localizer beacon lies right or left by more than 30 degrees from airplane heading.

Autopilot APR mode operation should be discontinued whenever high engine power settings are anticipated. This can be done by switching to HDG mode or CWS mode or by switching off the autopilot. Of course from above one understands that REV mode or BCK COURSE mode are not concerned by this limitation after take-off (loc. beacon lies 180° from airplane heading in this case)."

LANDING

At night, preferably use the R.H. landing light (long range) or both lights simultaneously.

D.G.A.C. Approved

4-2- USE OF AVIONICS

TRANSMISSION

Transmission may be made either through the hand microphone, or through the headset boom microphone with its push-to-talk switches located on the control wheels. Headsets that will not be used should be unplugged.

RECEPTION

The loud-speaker is the main equipment, the headset being considered as a stand-by equipment.

A selector switch selects reception on the loud-speaker or headset.

On headset operation, all receptions are simultaneous.

LIGHTING

Three controls are located on the left side of the L.H. instrument panel. See Figure 9.2.3 :

- Lower control (normal)

  Controls and modulates lighting of L.H. and R.H. instrument panels'visors.

- Central control (emergency)

  Modulates both forward overhead lights.

  Rotating the overhead lights turns them on and off.

- Upper control (radio-equipment) operates and modulates :
  - Radio equipment lighting
  - Instruments and indicators lighting on instrument panel
  - Circuit-breakers panel lighting

NOTE :

Both "normal" and "radio-equipment" 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" turning counterclockwise.

"Emergency" position control modulates lighting ; high position from "FULL INTENSITY" turn clockwise to modulate to "MINIMUM INTENSITY" ; turn back to high position "FULL INTENSITY" turning counterclockwise.

LANDING LIGHTS

The lights are controlled by two switch-breakers. See Figure 7.5 of the basic Pilot's Operating Handook.

The L.H. light has a wide beam which facilitates taxiing.

The R.H. light has a long range beam and should be used for take-off and landing.

Simultaneous operation is possible.

DAY / NIGHT DIMMER

A day / night switch allows the indicator lights for the fuel pump, pitot heater and landing lights to be dimmed during night operations.

SECTION 5

PERFORMANCE

The installation and the operation of the night VFR equipment do not change the basic performance of the airplane described in Section 5 "Performance" of the basic Pilot's Operating Handook.
However, the installation of the externally mounted antennas will result in a minor reduction in cruise performance. See Section 5 "Performance" of the basic Pilot's Operating Handook.

SUPPLEMENT

"KING" AUTOPILOT
TYPE KAP 100

"OPTIONAL EQUIPMENT N° 668"

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Figure 9.7.1 - KC 190 AUTOPILOT COMPUTER

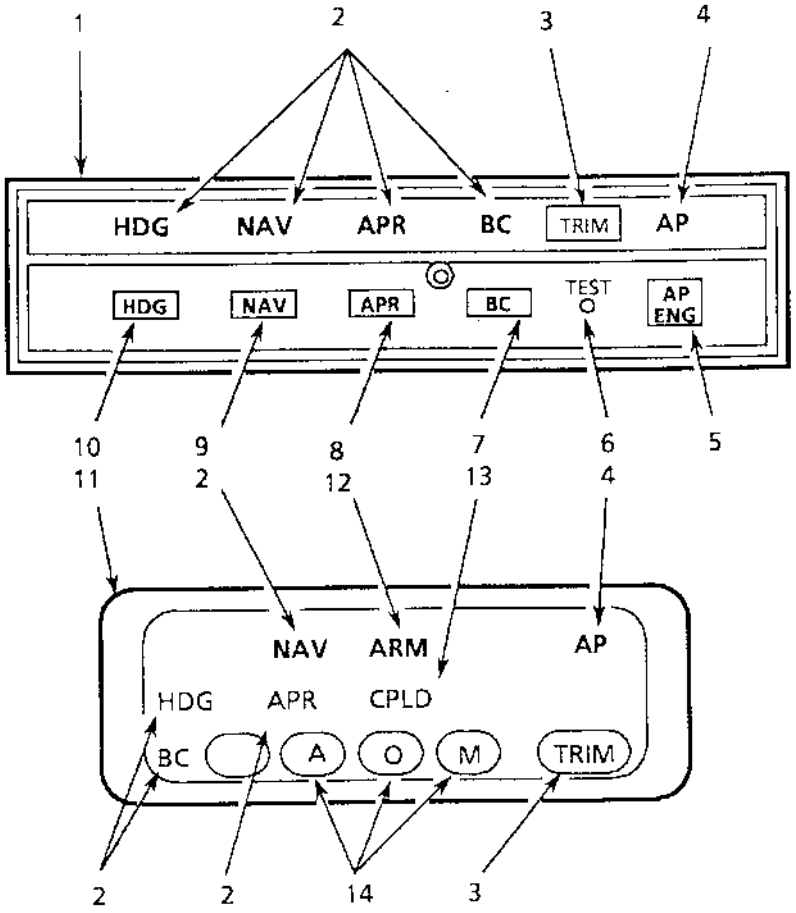


Figure 9.7.2 - KA 185 REMOTE MODE ANNUNCIATOR
(Option)

SECTION 1
GENERAL

This supplement is provided to acquaint the pilot with the limitations as well as normal and emergency operating procedures of the King KAP 100 Automatic Flight Control System. The limitations presented are pertinent to the operation of the KAP 100 System as installed in the SOCATA Models TB 10, TB 200, TB 20 and TB 21 airplanes ; the Flight Control System must be operated within the limitations herein specified.

The KAP 100 Autopilot is certified in this airplane with roll axis control. The various instruments and the controls for the operation of the KAP 100 Autopilot are described in the figures of this supplement.

The KAP 100 Autopilot has an optional electric pitch trim system. The trim system is designed to withstand any single inflight malfunction.
A trim fault is visually and aurally annunciated.

A lockout device prevents autopilot engagement until the system has been successfully preflight tested.

The following conditions will cause the Autopilot to automatically disengage :

A - Power failure

B - Internal Flight Control System failure

C - With the KCS 55A Compass System, a loss of compass valid (displaying HDG flag) disengages the Autopilot when a mode using heading information is engaged.
With the HDG flag present only the autopilot wings level mode can be selected.

D - (TB 21 only) Roll rates in excess of 14° per second will cause the Autopilot to disengage except when the CWS switch is held depressed.

Item 1 - KAP 100 KC 190 AUTOPILOT COMPUTER - Complete Autopilot Computer. Includes system mode annunciators and system controls.

Item 2 - MODE ANNUNCIATORS - Illuminate when a mode is selected by the corresponding mode selector button (PUSH ON - PUSH OFF).

Item 3 - TRIM WARNING LIGHT (TRIM) - Illuminates continuously whenever trim power is not on or the system has not been preflight tested. The TRIM warning light will illuminate and be accompanied by an audible warning whenever a manual pitch trim malfunction occurs (trim running without being commanded to run).

Item 4 - AUTOPILOT (AP) ANNUNCIATOR - Illuminates continuously whenever the autopilot is engaged. Flashes approximately 12 times whenever the autopilot is disengaged (an aural alert will also sound for 2 seconds).

Item 5 - AUTOPILOT ENGAGE (AP ENG) BUTTON - When pushed, engages autopilot if all logic conditions are met. When pushed again, disengages autopilot.

Item 6 - PREFLIGHT TEST (TEST) BUTTON - When momentarily pushed, initiates preflight test sequence which automatically turns on all annunciator lights, tests the roll rate monitor, checks the manual trim drive voltage, checks the manual electric trim monitor and tests all autopilot valid and dump logic. If the preflight is successfully passed, the AP annunciator light will flash for approximately 6 seconds (an aural tone will also sound simultaneously with the annunciator flashes).The autopilot can not be engaged until the autopilot preflight tests are successfully passed. When the autopilot is engaged, the test button should not be operated in flight.

Item 7 - BACK COURSE APPROACH (BC) MODE SELECTOR BUTTON - When pushed will select the Back Course Approach Mode. This mode functions indentically to the approach mode except that response to LOC signals is reversed.

Item 8 - APPROACH (APR) MODE SELECTOR BUTTON - When pushed, will select the Approach mode. This mode provides all angle intercept (with HSI) or a fixed angle intercept of 45° (with DG), automatic beam capture and tracking of VOR, RNAV or LOC signals. The tracking gain of the APR mode is greater than the gain in the NAV mode. The APR annunciator will flash until the automatic capture sequence is initiated. On the KA 185 remote mode annunciator, APR ARM will annunciate until the automatic capture sequence is initiated. At beam capture, APR CPLD will annunciate.

Item 9 - NAVIGATION (NAV) MODE SELECTOR BUTTON - When pushed will select the Navigation mode. The mode provides all angle intercept (with HSI) or a fixed angle intercept of 45° (with DG), automatic beam capture and tracking of VOR, RNAV or LOC signals.
The NAV annunciator will flash until the automatic capture sequence is initiated. On the KA 185 remote mode annunciator, NAV ARM will annunciate until the automatic capture sequence is initiated. At beam capture, NAV CPLD will annunciate.

Item 10 - HEADING (HDG) MODE SELECTOR BUTTON - When pushed will select the Heading mode, which commands the airplane to turn to and maintain the heading selected by the heading bug on the DG or HSI.
A new heading may be selected at any time and will result in the airplane turning to the new heading with a maximum bank angle of about 18°. Selecting HDG mode will cancel NAV, APR or BC track modes.

Item 11 - KA 185 REMOTE MODE ANNUNCIATOR (OPTIONAL) - Provides mode annunciation in the pilot's primary scan area as well as three Marker Beacon lights.

Item 12 - ARMED (ARM) ANNUNCIATOR - Illuminates continuously along with NAV or APR when either the NAV or APR mode selector button is depressed. The ARM annunciator will continue to illuminate until the automatic capture sequence is initiated at which time ARM will extinguish and CPLD will annunciate.

Item 13 - COUPLED (CPLD) ANNUNCIATOR - Illuminates continuoulsy along with NAV or APR at the initiation of automatic beam capture sequence in either the NAV or APR modes. Normally the CPLD condition follows an ARM condition but may be entered into directly if the beam capture criteria is met when NAV or APR is selected.

Item 14 - REMOTE MARKER BEACON LIGHTS - Remote Airway, Outer and Middle Marker Beacon lights driven by the Marker Beacon receiver.

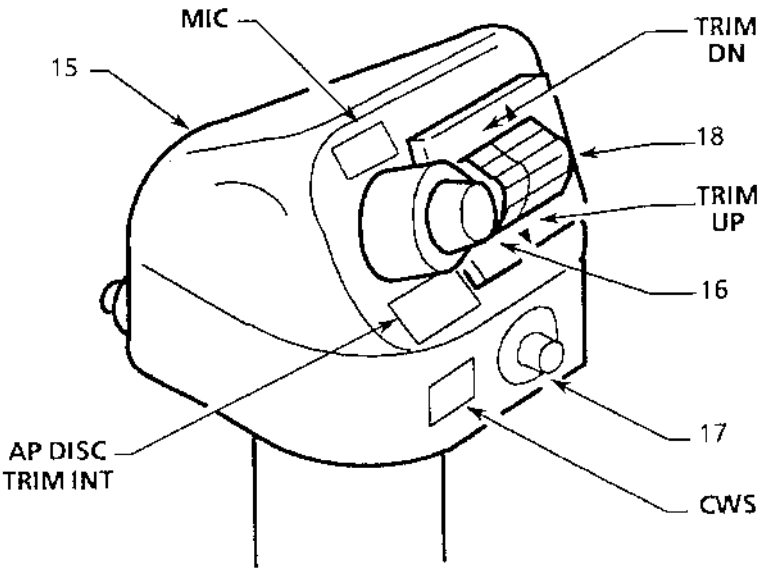


Figure 9.7.3 - AUTOPILOT CONTROL WHEEL SWITCH CAP

Item 15 - AUTOPILOT CONTROL WHEEL SWITCH CAP (installed with optional manual electric trim) (TB 20 - TB 21)
(installed on TB 10 and TB 200 airplanes without optional manual electric trim)
Molded plastic unit mounted on the left horn of the pilot's control wheel which provides mounting for the switch units associated with the autopilot and manual electric trim systems.

Item 16 - AUTOPILOT DISCONNECT / TRIM INTERRUPT (AP DISC TRM INT) SWITCH (installed with optional manual electric trim) (TB 20 - TB 21)
(installed on TB 10 and TB 200 airplanes without optional manual electric trim)
When depressed and released will disengage the autopilot and cancel all operating autopilot modes. When depressed and held will interrupt all electric trim power (stop trim motion), disengage the autopilot, and cancel all operating autopilot modes.

Item 17 - CONTROL WHEEL STEERING (CWS) BUTTON (installed with optional manual electric trim) - When depressed, allows pilot to manually control the airplane (disengages the servo) without cancellation of any of the selected modes.

Item 18 - MANUAL ELECTRIC TRIM CONTROL SWITCHES (installed with optional manual electric trim) - A split switch unit in which the left half provides power to engage the trim servo clutch and the right half to control the direction of motion of the trim servo motor. Both halves of the split trim switch must be actuated in order for the manual trim to operate in the desired direction.

Item 19 - KG 258 VERTICAL GYRO - Displays airplane attitude as a conventional attitude gyro. The gyro is air driven.

Item 20 - ROLL ATTITUDE INDEX - Displays airplane roll attitude with respect to the roll attitude scale.

Item 21 - ROLL ATTITUDE SCALE - Scale marked at 0, ± 10, 20, 30, 60 and 90 degrees.

Item 22 - PITCH ATTITUDE SCALE - Moves with respect to the symbolic airplane to present pitch attitude.
Scale graduated at 0, ± 5, 10, 15, 20 and 25 degrees.

Item 23 - SYMBOLIC AIRPLANE - Serves as a stationary symbol of the airplane. Airplane pitch and roll attitudes are displayed by the relationship between the fixed symbolic airplane and the movable background.

Item 24 - SYMBOLIC AIRPLANE ALIGNMENT KNOB - Provides manual positioning of the symbolic airplane for level flight under various load conditions.

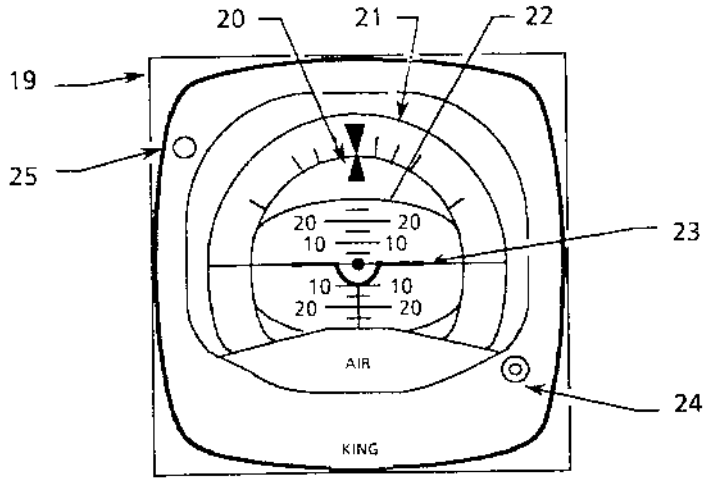


Figure 9.7.4 - KG 258 VERTICAL GYRO

Item 25 - DECISION HEIGHT (DH) ANNUNCIATOR LIGHT - Optional light for use with the airplane optional radar altimeter.

Item 26 - KI 525 A HORIZONTAL SITUATION INDICATOR (HSI) - Provides a pictorial presentation of airplane deviation relative to VOR radials or localizer beams. It also displays Glide Slope deviations and gives heading reference with respect to magnetic north.

Item 27 - NAV FLAG - Flag is in view when the NAV receiver signal is inadequate. When a NAV flag is present in the navigation indicator (CDI or KI 525 A) the autopilot operation is not affected. The pilot must monitor the navigation indicators for NAV flags to insure that the Autopilot is tracking valid navigation information.

Item 28 - LUBBER LINE - Indicates airplane magnetic heading on compass card (Item 35).

Item 29 - HEADING WARNING FLAG (HDG) - When flag is in view the heading display is invalid. If a HDG flag appears and a lateral mode (HDG, NAV, APR or APR BC) is selected, the Autopilot will be disengaged. The Autopilot may be re-engaged in the basic wings level mode. The CWS switch would be used to manually maneuver the airplane laterally.

Item 30 - COURSE BEARING POINTER - Indicates selected VOR course or localizer course on compass card (Item 35). The selected VOR radial or localizer heading remains set on the compass card when the compass card (Item 35) rotates.

Item 31 - TO / FROM INDICATOR FLAG - Indicates direction of VOR station relative to selected course.

Item 32 - DUAL GLIDE SLOPE POINTERS - Indicate on Glide Slope scale (Item 33) airplane displacement from Glide Slope beam center. Glide Slope pointers in view indicate a usable Glide Slope signal is being received.

Item 33 - GLIDE SLOPE SCALES - Indicate displacement from Glide Slope beam center. A Glide Slope deviation bar displacement of 2 dots, represents full scale (0.7°) deviation above or below Glide Slope beam centerline.

Item 34 - HEADING SELECTOR KNOB (⟲) - Positions heading Bug (Item 39) on compass card (Item 35) by rotating the heading selector knob. The Bug rotates with the compass card.

Item 35 - COMPASS CARD - Rotates to display heading of airplane with reference to lubber line (Item 28) on HSI or DG.

Item 36 - COURSE SELECTOR KNOB - Positions course bearing pointer (Item 30) on the compass card (Item 35) by rotating the course selector knob.

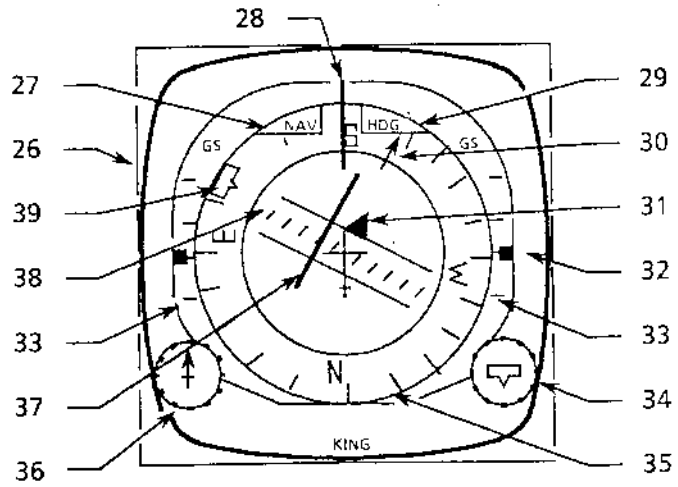


Figure 9.7.5 - KI 525 HSI

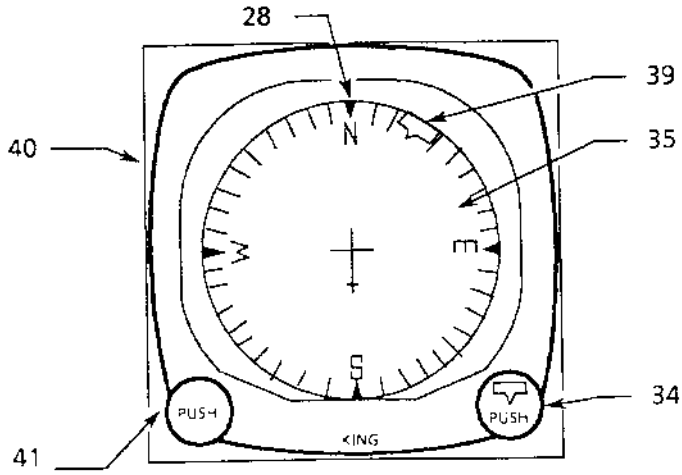


Figure 9.7.6 - KG 107 DG

Item 37 - COURSE DEVIATION BAR (D-BAR) - The center portion of omni bearing pointer moves laterally to pictorially indicate the relationship of airplane to selected course. It indicates in degrees of angular displacement from VOR radials and localizer beams or displacement in nautical miles from RNAV courses.

Item 38 - COURSE DEVIATION SCALE - A course deviation bar displacement of 5 dots represents full scale (VOR = ± 10° ; LOC = ± 2.5° ; RNAV = 5 NM ; RNAV APR = 1.25 NM) deviation from beam centerline.

Item 39 - HEADING BUG - Moved by ⊏▽⊐ knob (Item 34) to select desired heading.

Item 40 - KG 107 NON-SLAVED DIRECTIONAL GYRO (DG) - Provides a stable visual indication of airplane heading to the pilot. The gyro is air driven.

Item 41 - GYRO ADJUSTMENT KNOB (PUSH) - When pushed in, allows the pilot to manually rotate the gyro compass card (Item 35) to correspond with the magnetic heading indicated by the magnetic compass.
The unslaved compass card must be manually reset periodically to compensate for precessional errors in the gyro.

Item 42 - VOR / LOC / GLIDE SLOPE INDICATOR - Provides rectilinear display of VOR / LOC and Glide Slope deviation.

Item 43 - COURSE INDEX - Indicates selected VOR course.

Item 44 - COURSE CARD - Indicates selected VOR course under course index.

Item 45 - GLIDE SLOPE DEVIATION NEEDLE - Indicates deviation from ILS Glide Slope.

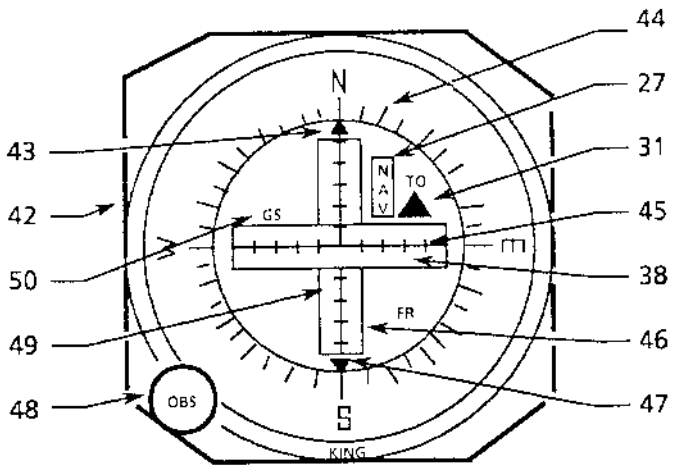


Figure 9.7.7 - KI 204 / 206 VOR / LOC / GS INDICATOR

Item 46 - GLIDE SLOPE SCALE - Indicates displacement from Glide Slope beam center. A Glide Slope deviation needle displacement of 5 dots represents full scale (0.7°) deviation above or below Glide Slope beam centerline.

Item 47 - RECIPROCAL COURSE INDEX - Indicates reciprocal of selected VOR course.

Item 48 - OMNI BEARING SELECTOR (OBS) KNOB - Rotates course card to selected course.

Item 49 - COURSE DEVIATION NEEDLE - Indicates course deviation from selected omni course or localizer centerline.

Item 50 - GLIDE SLOPE (GS) FLAG - Flag is in view when the GS receiver signal is inadequate.

The airplane MAIN SWITCH function is unchanged and can be used in an emergency to shut off electrical power to all flight control systems while the problem is isolated.

The AUTOPILOT MASTER switch supplies power to the AUTOPILOT (A / P) circuit-breaker.

The following circuit-breakers are used to protect the following elements of the KING KAP 100 Autopilot :

LABEL	FUNCTION
A / P	Supplies power to the KC 190, the autopilot roll servo, and the TRIM circuit-breaker.
TRIM	Supplies power to the optional manual electric pitch trim system.
HSI	Supplies power to the optional KCS 55A Compass System.

SECTION 2
LIMITATIONS

These limitations complete those of standard airplane described in Section 2 "Limitations" of the basic Pilot's Operating Handbook

A - The autopilot must be OFF during take-off and landing and during approach under 200 ft height.

A' - Engagement height in climb and cruise 1000 ft.

B - It is forbidden to operate TEST button in flight.

C - Maximum fuel imbalance :

20 U.S Gal (TB 20 - TB 21)	6 U.S Gal (TB 10 - TB 200)
75 litres	23 litres

D - Autopilot maximum airspeed limitation :

175 KIAS (TB 20 - TB 21)	150 KIAS (TB 10 - TB 200)
322 km/h	278 km/h

Placards :

CAUTION : DURING ILS APPROACH
AVOID ENGINE RPM HIGHER THAN 2600

D.G.A.C. Approved

SECTION 3
EMERGENCY PROCEDURES

These procedures complete those of standard airplane described in Section 3 "Emergency procedures" of the basic Pilot's Operating Handbook.

A - System with Autopilot only

- In case of Autopilot malfunction : (accomplish the two following items simultaneously)
  - . Airplane control wheel - GRASP FIRMLY and regain airplane control.
  - . AP ENG button (AP DISC button on TB 10 and TB 200 airplanes) - PRESS to disengage autopilot.

B - Systems with Autopilot and optional manual electric trim

- In case of Autopilot malfunction : (accomplish the two following items simultaneously)
  - . Airplane control wheel - GRASP FIRMLY and regain airplane control.
  - . AP DISC TRM INT Switch - PRESS.
- In case of manual electric trim malfunction :
  - . AP DISC TRM INT switch - PRESS and HOLD.
  - . TRIM circuit-breaker - PULL.
  - . Airplane - RETRIM manually.

CAUTION

MAXIMUM BANKS DUE TO AUTOPILOT MALFUNCTION :

Configuration	Maximum banks
Cruise, climb, descent	60°
Maneuvers	45° (TB 20 - TB 21) 40° (TB 10 - TB 200)
Approach	30° (TB 20 - TB 21) 20° (TB 10 - TB 200)

SECTION 4
NORMAL PROCEDURES

These procedures complete those of standard airplane described in Section 4 "Normal procedures" of the basic Pilot's Operating Handbook.

A - Preflight (Perform prior to each flight)

- GYROS - Allow 3-4 minutes for gyros to come up to speed.
- AUTOPILOT MASTER Switch - ON.
- PREFLIGHT TEST BUTTON - PRESS momentarily and NOTE :

a) All annunciator lights on (TRIM annunciator flashing).

b) After approximately 5 seconds, all annunciator lights off except AP which will flash approximately 12 times and then remain off.

NOTE :

If trim warning light stays on then the manual electric trim did not pass preflight test. The trim circuit-breaker should be pulled. The autopilot can still be used.

- MANUAL ELECTRIC TRIM (if installed) - TEST as follows :

a) Actuate the left side of the split switch to the fore and aft positions. The trim wheel should not move on its own. Rotate the trim wheel manually against the engaged clutch to check the pilot's overpower capability.

b) Actuate right side of split switch unit to the fore and aft positions. The trim wheel should not move on its own and normal trim wheel force is required to move it manually.

c) Press the AP DISC TRM INT switch down and hold. Manual Electric Trim should not operate either nose up or nose down.

- AP ENG button - Press to engage autopilot.
- Control wheel - MOVE left or right to verify that the autopilot can be overpowered.

- Autopilot - DISENGAGE by pressing AP ENG button or optional AP DISC TRM INT switch. Verify that the autopilot disconnects and all modes are cancelled.

- TRIM - SET to take-off position.

B - AUTOPILOT OPERATION

NOTE (Valid only for TB 10 and TB 200 airplanes) :

The minimum recommended airspeed for autopilot operation is 80 KIAS.

- Before take-off

Autopilot - DISENGAGE by pressing AP ENG button or optional AP DISC TRM INT switch.

- Inflight autopilot engagement

AP ENG button - PRESS. Note AP annunciator on. If no other modes are selected the autopilot will operate in the wings level mode.

- Heading changes

a) Manual heading changes (with optional CWS button only)

. CWS Button - PRESS and MANEUVER airplane to the desired heading.

. CWS Button - RELEASE. Autopilot will maintain airplane in wings level attitude.

NOTE :

Airplane heading may change in the wings level mode due to an airplane out of trim condition.

b) Heading hold

. Heading selector Knob - SET BUG to desired heading.

. HDG mode selector Button - PRESS. Note HDG mode annunciator ON. Autopilot will automatically turn the airplane to the selected heading.

c) Command Turns (Heading Hold mode ON)

. HEADING Selector Knob - MOVE BUG to the desired heading. Autopilot will automatically turn the airplane to the new selected heading.

- NAV Coupling

a) When equipped with HSI

. Course Bearing Pointer - SET to desired course.

NOTE :

When equipped with NAV 1 / NAV 2 switching and NAV 2 is selected, set OBS 2 to the desired course.

. HEADING SELECTOR KNOB - SET BUG to provide desired intercept angle.

. NAV Mode Selector Button - PRESS.

If the Course Deviation Bar is greater than 2 to 3 dots : the airplane will continue in HDG mode (or wings level if HDG not selected) with the NAV annunciator flashing ; when the computed capture point is reached the HDG will disengage, the NAV annunciator will illuminate steady and the selected course will be automatically captured and tracked.

If the D-BAR is less than 2 to 3 dots : the HDG mode will disengage upon selecting NAV mode ; the NAV annunciator will illuminate steady and the capture / track sequence will automatically begin.

b) When equipped with DG

. OBS Knob - SELECT desired course.

. NAV Mode Selector Button - PRESS.

. Heading Selector Knob - ROTATE BUG to agree with OBS course.

NOTE :

When NAV is selected, the lateral operating mode will change from HDG (if selected) to wings level for 5 seconds. A 45° intercept angle will then be automatically established based on the position of the bug.

If the D-BAR is greater than 2 to 3 dots : the autopilot will annunciate HDG mode (unless HDG not selected) and NAV flashing ; when the computed capture point is reached the HDG annunciator will go out, the NAV annunciator will illuminate steady and the selected course will be automatically captured and tracked.

If the D-BAR is less than 2 to 3 dots : the HDG mode will disengage upon selecting NAV mode ; the NAV annunciator will illuminate steady and the capture / track sequence will automatically begin.

- Approach (APR) Coupling

"Erratic deviations have been observed with airplane flown down an ILS path with KING RADIO-NAV installations. Analysis of the phenomenon indicates that the fluctuations are due to an interference between propeller rotation frequency and one of LOC frequencies. The more sensitive conditions are met when the localizer beacon is right ahead and the engine speed is adjusted toward 2650 RPM.

The localizer use is not significantly impaired by the phenomenon when :

- engine speed is reduced to lower than 2600 RPM
- localizer beacon lies right or left by more than 30 degrees from airplane heading.

Autopilot APR mode operation should be discontinued whenever high engine power settings are anticipated. This can be done by switching to HDG mode or CWS mode or by switching off the autopilot.

a) When equipped with HSI

. Course Bearing Pointer - SET to desired course.

NOTE :

When equipped with NAV 1 / NAV 2 switching and NAV 2 is selected, set OBS 2 to the desired course.

. HEADING Selector Knob - SET BUG to provide desired intercept angle.

. APR Mode Selector Button - PRESS.

If the Course Deviation Bar is greater than 2 to 3 dots : the airplane will continue in HDG mode (or wings level if HDG not selected) with the APR annunciator flashing ; when the computed capture point is reached, the HDG will disengage, the APR annunciator will illuminate steady and the selected course will be automatically captured and tracked.

If the D-BAR is less than 2 to 3 dots : the HDG mode will disengage upon selecting APR mode ; the APR annunciator will illuminate steady and the capture / track sequence will automatically begin.

b) When equipped with DG

. OBS Knob - SELECT desired approach course.

. APR Mode Selector Button - PRESS.

. Heading Selector Knob - ROTATE Bug to agree with OBS course.

NOTE :

When APR is selected, the lateral operating mode will change from HDG (if selected) to wings level for 5 seconds. A 45° intercept angle will then be automatically established based on the position of the bug.

If the D-BAR is greater than 2 to 3 dots : the autopilot will annunciate HDG mode (unless HDG not selected) and APR flashing ; when the computed capture point is reached the HDG annunciator will go out, the APR annunciator will illuminate steady and the selected course will be automatically captured and tracked.

If the D-BAR is less than 2 to 3 dots : the HDG mode will disengage upon selecting APR mode ; the APR annunciator will illuminate steady and the capture / track sequence will automatically begin.

- BC Approach Coupling

a) When equipped with HSI

. Course Bearing Pointer - SET to the ILS front course inbound heading.

NOTE :

When equipped with NAV 1 / NAV 2 switching and NAV 2 is selected, set OBS to the ILS front course inbound heading.

. HEADING Selector Knob - SET BUG to provide desired intercept angle.

. BC Mode Selector Button - PRESS.

If the Course Deviation Bar is greater than 2 to 3 dots : the airplane will continue in HDG mode (or wings level if HDG not selected) with BC annunciator steady and APR annunciator flashing ; when the computed capture point is reached the HDG will disengage, the BC and APR annunciators will illuminate steady and the selected course will be automatically captured and tracked.

If the D-BAR is less than 2 to 3 dots : the HDG mode will disengage upon selecting BC mode ; the APR BC annunciator will illuminate steady and the capture / track sequence will automatically begin.

b) When equipped with DG

. OBS Knob - SELECT the ILS front course inbound heading.

. BC Mode Selector Button - PRESS

. Heading Selector Knob - ROTATE Bug to the ILS front course inbound heading.

NOTE :

When BC is selected, the lateral operating mode will change from HDG (if selected) to wings level for 5 seconds. A 45° intercept angle will then be automatically established based on the position of the bug.

If the D-BAR is greater than 2 to 3 dots : the autopilot will annunciate HDG (unless HDG not selected) and BC modes with APR flashing ; when the computed capture point is reached the HDG annunciator will go out, the BC and APR annunciators will illuminate steady and the selected course will be automatically captured and tracked.

If the D-BAR is less than 2 to 3 dots : the HDG mode will disengage upon selecting BC mode ; the BC and APR annunciators will illuminate steady and the capture / track sequence will automatically begin.

- Missed Approach

a) Autopilot - DISENGAGE by pressing AP ENG switch (AP DISC TRM INT switch on TB 10 and TB 200 airplanes), or optional AP DISC TRM INT switch.

b) MISSED APPROACH - EXECUTE.

c) AP ENG Button - PRESS (if AP operation is desired)
Note AP annunciator ON.

- Before landing

a) Autopilot - DISENGAGE by pressing AP ENG switch (AP DISC TRM INT switch on TB 10 and TB 200 airplanes), or optional AP DISC TRM INT switch.

SECTION 5

PERFORMANCE

The installation and the operation of the autopilot do not change the basic performance of the airplane described in Section 5 "Performance" of the basic Pilot's Operating Handbook.

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SUPPLEMENT

"KING" AUTOPILOT
TYPE KFC 150 AND KAP 150

"OPTIONAL EQUIPMENT N° 669-670-G669-G670-G892"

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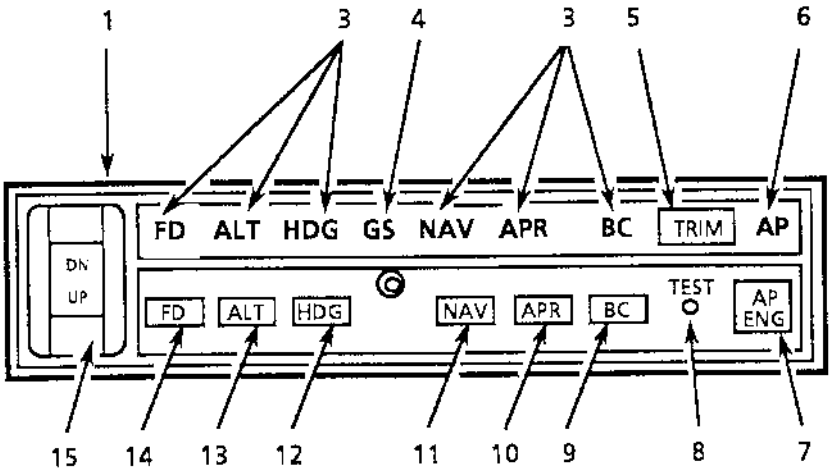


Figure 9.8.1 - KC 192 AUTOPILOT & FLIGHT DIRECTOR COMPUTER FOR KFC 150

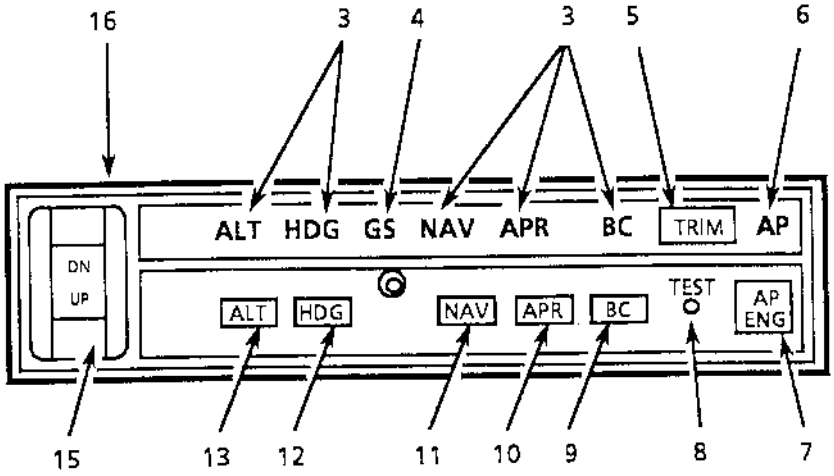


Figure 9.8.2 - KC 91 AUTOPILOT COMPUTER FOR KAP 150

SECTION 1
GENERAL

This supplement is provided to acquaint the pilot with the limitations as well as normal and emergency operating procedures of the King 150 AFCS (Automatic Flight Control Systems) Type KFC 150 and Type KAP 150. The limitations presented are pertinent to the operation of the King 150 System as installed in the SOCATA Models TB 10, TB 200, TB 20 and TB 21 airplanes ; the Flight Control Systems must be operated within the limitations herein specified.

The King 150 Series AFCS is certified in this airplane with 2 axis autopilot control, pitch and roll. The various instruments and the controls for the operation are described in the figures of this supplement.

The King 150 Series AFCS has an electric pitch trim system which provides autotrim during autopilot operation and manual electric trim for the pilot. The trim system is designed to withstand any single inflight malfunction.
Trim faults are visually and aurally annunciated.

A lockout device prevents autopilot engagement until the system has been successfully preflight tested.

The following conditions will cause the Autopilot to automatically disengage :

A - Power failure

B - Internal Flight Control System failure

C - With the KCS 55A Compass System, a loss of compass valid (displaying HDG flag) disengages the Autopilot when a mode using heading information is engaged.
With the HDG flag present, the Autopilot may be re-engaged in the basic wings level mode along with any vertical mode.

D - Pitch rates in excess of 5° (TB 20) 6° (TB 21) per second, and roll rates in excess of 14° per second (TB 21), will cause the autopilot to disengage except when the CWS switch is held depressed.

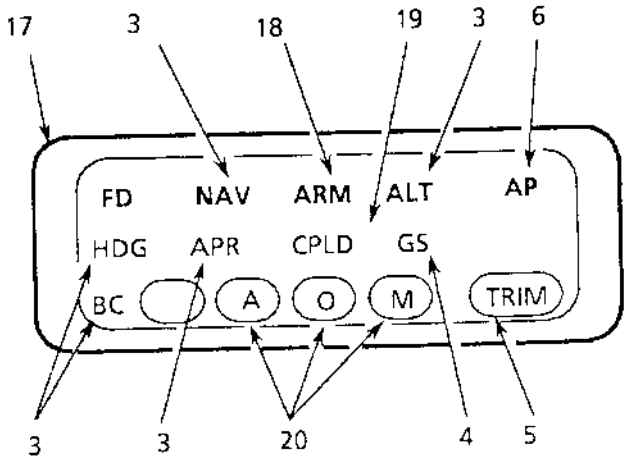


Figure 9.8.3 - KA 185 REMOTE MODE ANNUNCIATOR
(OPTIONAL)

Item 1 - KFC 150 System KC 192 AUTOPILOT COMPUTER - Complete Flight Director and Autopilot computer, including system mode annunciators and system controls.

Item 2 - Not used.

Item 3 - MODE ANNUNCIATORS - Illuminate when a mode is selected by the corresponding mode selector button (PUSH ON - PUSH OFF).

Item 4 - GLIDE SLOPE (GS) ANNUNCIATOR - Illuminates continuously whenever the autopilot is coupled to the Glide Slope signal. The GS annunciator will flash if the Glide Slope signal is lost (GS flag in CDI or absence of Glide Slope pointers in KI 525A). The autopilot reverts to pitch attitude hold operation. If a valid Glide Slope signal returns within six seconds, the autopilot will automatically recouple in the GS mode. If the valid signal does not return within six seconds, the autopilot will remain in pitch attitude hold mode until such time that a valid Glide Slope returns and the airplane passes thru the Glide Slope. At that point, GS couple will re-occur.

Item 5 - TRIM WARNING LIGHT (TRIM) - Illuminates continuously whenever trim power is not on or the system has not been preflight tested. The TRIM warning light illuminates and is accompanied by an audible warning whenever a manual trim fault is detected. The Manual Trim System is monitored for the trim servo running without a command. The TRIM warning light will illuminate and be accompanied by an audible warning whenever an autotrim failure occurs. The autotrim system is monitored for the following failures : trim servo running without a command ; trim servo not running when commanded to run ; trim servo running in the wrong direction.

Item 6 - AUTOPILOT (AP) ANNUNCIATOR - Illuminates continuously whenever the autopilot is engaged. Flashes approximately 12 times whenever the autopilot is disengaged (an aural alert will also sound for 2 seconds).

Item 7 - AUTOPILOT ENGAGE (AP ENG) BUTTON - When pushed, engages autopilot if all logic conditions are met. When pushed again, disengages autopilot.

Item 8 - PREFLIGHT TEST (TEST) BUTTON - When momentarily pushed, initiates preflight test sequence which automatically turns on all annunciator lights, tests the roll and pitch rate monitors, tests the autotrim fault monitor, checks the manual trim drive voltage and tests all autopilot valid and dump logic. If the preflight is successfully passed, the AP annunciator light will flash for approximately six seconds (an aural tone will also sound simultaneously with the annunciator flashes).
The autopilot can't be engaged until the autopilot preflight tests are successfully passed.

When the autopilot is engaged, the test button should not be operated in flight.

Item 9 - BACK COURSE APPROACH (BC) MODE SELECTOR BUTTON - When pushed will select the Back Course Approach mode. This mode functions identically to the approach mode except that response to LOC signals is reversed. Glide Slope coupling is inhibited in the Back Course Approach mode.

Item 10 - APPROACH (APR) MODE SELECTOR BUTTON - When pushed, will select the Approach mode. This mode provides all angle intercept (with HSI) or a fixed angle intercept of 45° (with DG), automatic beam capture and tracking of VOR, RNAV or LOC signals plus Glide Slope coupling in the case of an ILS. The tracking gain of the APR mode is greater than the gain in the NAV mode. The APR annunciator on the Autopilot Computer will flash until the automatic capture sequence is initiated. On the KA 185 Remote Mode annunciator, APR ARM will annunciate until the automatic capture sequence is initiated. At beam capture, APR CPLD will annunciate.

Item 11 - NAVIGATION (NAV) MODE SELECTOR BUTTON - When pushed will select the Navigation mode. The mode provides all angle intercept (with HSI) or a fixed angle intercept of 45° (with DG), automatic beam capture and tracking of VOR, RNAV or LOC signals.
The NAV annunciator on the Autopilot Computer will flash until the automatic capture sequence is initiated.
On the KA 185 Remote Mode Annunciator, NAV ARM will annunciate until the automatic capture sequence is initiated. At beam capture, NAV CPLD will annunciate.

Item 12 - HEADING (HDG) MODE SELECTOR BUTTON - When pushed will select the Heading mode, which commands the airplane to turn to and maintain the heading selected by the heading bug on the DG or HSI. A new heading may be selected at any time and will result in the airplane turning to the new heading with a maximum bank angle of about 18°.
Selecting HDG mode will cancel NAV, APR or BC track modes.

Item 13 - ALTITUDE HOLD (ALT) MODE SELECTOR BUTTON - When pushed will select the Altitude Hold mode, which commands the airplane to maintain the pressure altitude existing at the moment of selection.
Engagement may be accomplished in climb, descent, or level flight. In the APR mode, altitude hold will automatically disengage when the Glide Slope is captured.

Item 14 - FLIGHT DIRECTOR (FD) MODE SELECTOR BUTTON - When pushed will select the Flight Director mode (with KC 192 Autopilot Computer only), bringing the Command Bar in view on the KI 256 and will command wings level and pitch attitude hold. The FD mode must be selected prior to Autopilot engagement.

Item 15 - VERTICAL TRIM CONTROL - A rocker switch (fitted with a return to neutral position through a spring) allows nose-down and nose-up maneuvers :

- adjusts, in ALT, altitude at a rate of about 500 ft / min.
- adjusts, when not in ALT, pitch attitude at a rate of 0.7 deg / sec.
- cancels GS couple.
- the airplane must pass thru the Glide Slope again to allow GS recouple

Item 16 - KAP 150 SYSTEM KC 191 AUTOPILOT COMPUTER - Complete Autopilot computer, including system mode annunciators and system controls.

Item 17 - KA 185 REMOTE MODE ANNUNCIATOR (OPTIONAL) - Provides mode annunciation in the pilot's primary scan area as well as three Marker Beacon lights.

Item 18 - ARMED (ARM) ANNUNCIATOR - Illuminates continuously along with NAV or APR when either the NAV or APR mode selector button is depressed.
The ARM annunciator will continue to illuminate until the automatic capture sequence is initiated at which time ARM will extinguish and CPLD will annunciate.

Item 19 - COUPLED (CPLD) ANNUNCIATOR - Illuminates continuously along with NAV or APR at the initiation of automatic beam capture sequence in either the NAV or APR modes. Normally the CPLD condition follows an ARM condition but may be entered into directly if the beam capture criteria is met when NAV or APR is selected.

Item 20 - REMOTE MARKER BEACON LIGHTS - Remote Airway, Outer and Middle Marker Beacon lights driven by the Marker Beacon receiver.

Item 21 - Not used.

Item 22 - AUTOPILOT CONTROL WHEEL SWITCH ASSEMBLY - Switch assembly mounted on the pilot's control wheel associated with the autopilot and manual electric trim systems.

Item 23 - AUTOPILOT DISCONNECT / TRIM INTERRUPT (AP DISC TRM INT) Switch - When depressed will disengage the autopilot and cancel all operating Flight Director modes. When depressed and held will interrupt all electric trim power (stop trim motion), disengage the autopilot and cancel all operating Flight Director modes.

Item 24 - CONTROL WHEEL STEERING (CWS) BUTTON - When depressed, allows pilot to manually control the airplane (disengages the pitch and roll servos) without cancellation of any of the selected modes.
Will engage the Flight Director mode if not previously engaged. Automatically synchronizes the Flight Director / Autopilot to the pitch attitude present when the CWS switch is released, or to the present pressure altitude when operating in the ALT hold mode.
Will cancel GS couple.
The airplane must pass through the Glide Slope again to allow GS recouple.

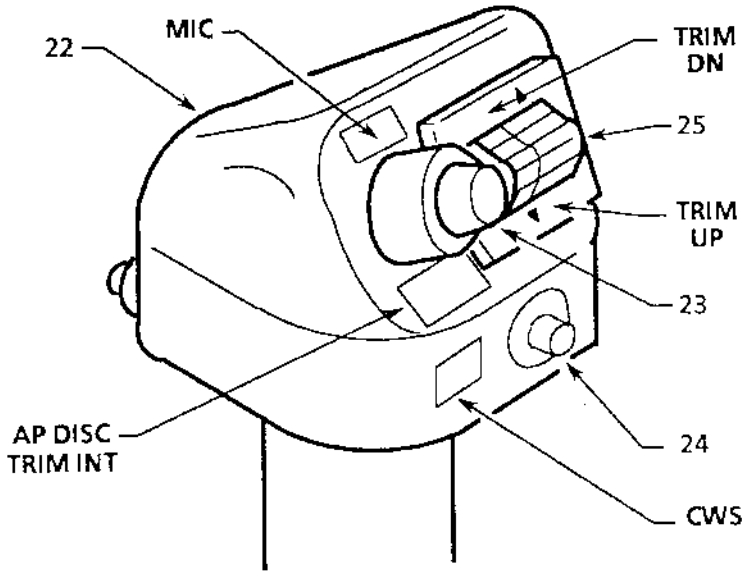


Figure 9.8.4 - AUTOPILOT CONTROL WHEEL SWITCH CAP

Item 25 - MANUAL ELECTRIC TRIM CONTROL SWITCHES - A split switch unit in which the left half provides power to engage the trim servo clutch and the right half to control the direction of motion of the trim servo motor. Both halves of the split trim switch must be actuated in order for the manual trim to operate in the desired direction. When the autopilot is engaged, operation of the manual electric trim will automatically disconnect the autopilot.

Item 26 - KI 256 FLIGHT COMMAND INDICATOR (FCI) - Displays airplane attitude as a conventional attitude gyro and displays commands for flight director operation. The gyro is air driven.

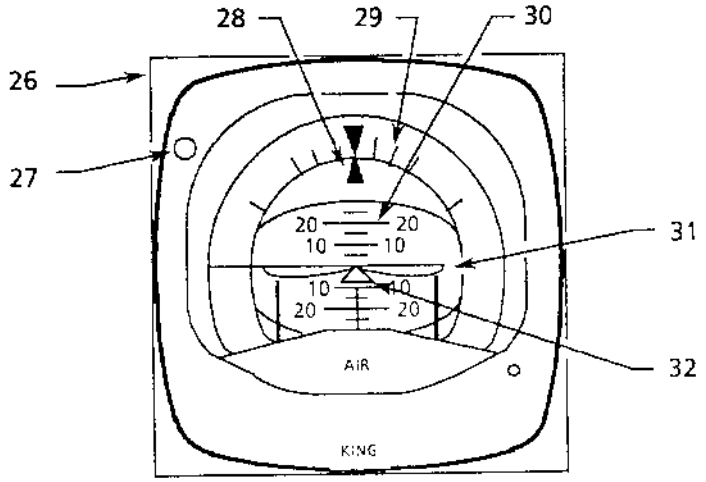


Figure 9.8.5 - KI 256 FLIGHT COMMAND INDICATOR FOR KFC 150

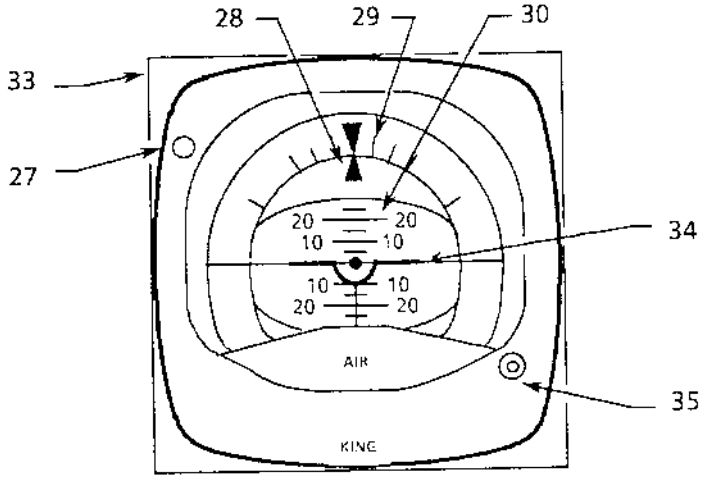


Figure 9.8.6 - KG 258 VERTICAL GYRO FOR KAP 150

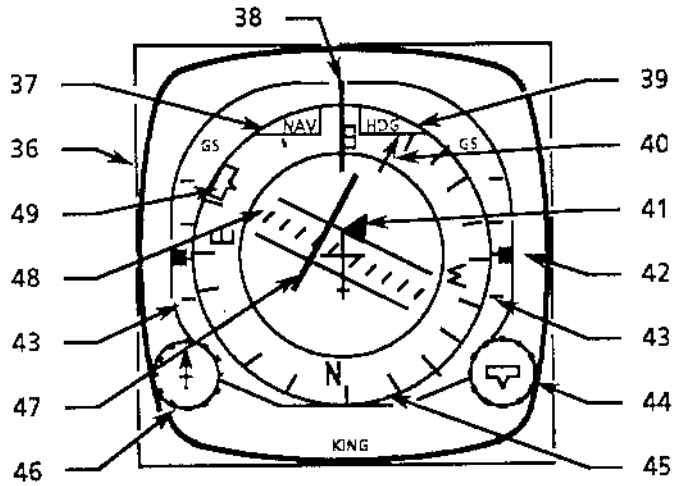


Figure 9.8.7 - KI 525A HSI FOR KFC 150

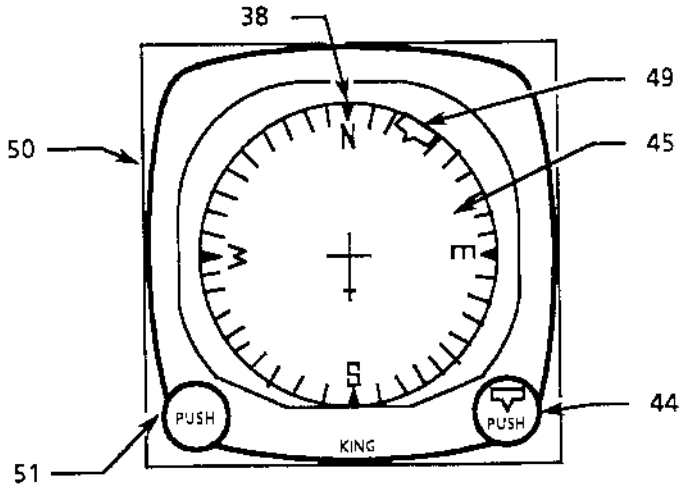
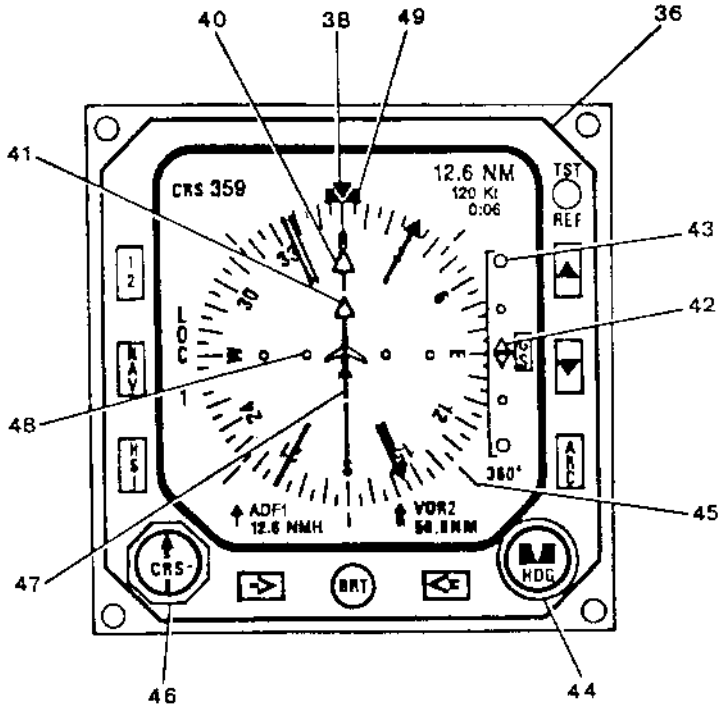


Figure 9.8.8 - KG 107 DG FOR KAP 150



54342800AAAEMAMV00A

Figure 9.8.8A - EHSI

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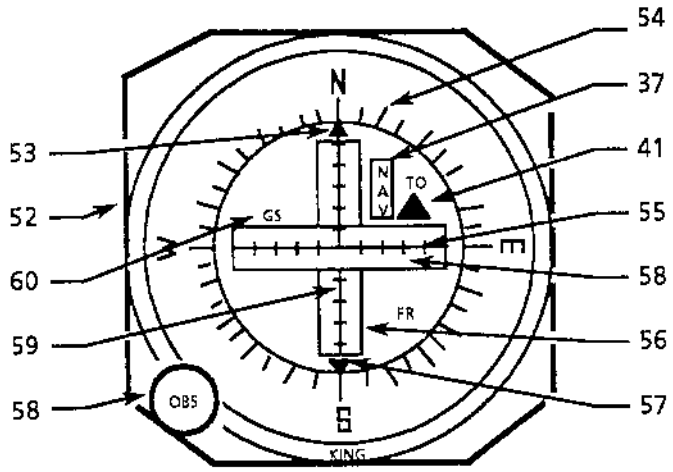


Figure 9.8.9 - KI 204 / 206 VOR / LOC / GS INDICATOR

Item 27 - DECISION HEIGHT (DH) ANNUNCIATOR LIGHT - Optional light for use with the airplane optional radar altimeter.

Item 28 - ROLL ATTITUDE INDEX - Displays airplane roll attitude with respect to the roll attitude scale.

Item 29 - ROLL ATTITUDE SCALE - Scale marked at 0, ± 10, 20, 30, 60 and 90 degrees.

Item 30 - PITCH ATTITUDE SCALE - Moves with respect to the symbolic airplane to present pitch attitude.
Scale graduated at 0, ± 5, 10, 15, 20 and 25 degrees.

Item 31 - COMMAND BAR - Displays computed steering commands referenced to the symbolic airplane. The command bar is visible only when FD mode is selected. The command bar will be biased out of view whenever the system is invalid or a Flight Director mode is not engaged.

Item 32 - FCI SYMBOLIC AIRPLANE - Airplane pitch and roll attitude is displayed by the relationship between the fixed symbolic airplane and the movable background.

During flight director operation, the symbolic airplane is flown to align it with the command bar to satisfy the flight director commands.

Item 33 - KG 258 VERTICAL GYRO - Displays airplane attitude as a conventional attitude gyro. The gyro is air driven.

Item 34 - SYMBOLIC AIRPLANE - Serves as a stationary symbol of the airplane. Airplane pitch and roll attitudes are displayed by the relationship between the fixed symbolic airplane and the movable background.

Item 35 - SYMBOLIC AIRPLANE ALIGNMENT KNOB - Provides manual positioning of the symbolic airplane for level flight under various load conditions.

Item 36 - KI 525A HORIZONTAL SITUATION INDICATOR (HSI or EHSI) - Provides a pictorial presentation of airplane deviation relative to VOR radials or localizer beams.
It also displays Glide Slope deviations and gives heading reference with respect to magnetic north.

Item 37 - NAV FLAG - Flag is in view when the NAV receiver signal is inadequate. When a NAV flag is present in the navigation indicator (CDI or KI 525A or EHSI) the autopilot operation is not affected.
The pilot must monitor the navigation indicators for NAV flags to insure that the Autopilot and / or Flight Director are tracking valid navigation information.

Item 38 - LUBBER LINE - Indicates airplane magnetic heading on compass card (Item 45).

Item 39 - HEADING WARNING FLAG (HDG) - When flag is in view, the heading display is invalid.
If a HGD flag appears and a lateral mode (HDG, NAV, APR or APR BC) is selected, the Autopilot will be disengaged.
The autopilot may be re-engaged in the basic wings level mode along with any vertical mode.
The CWS switch would be used to manually maneuver the airplane laterally.

Item 40 - COURSE BEARING POINTER - Indicates selected VOR course or localizer course on compass card (Item 45).
The selected VOR radial or localizer heading remains set on the compass card when the compass card (Item 45) rotates.

Item 41 - TO / FROM INDCATOR FLAG - Indicates direction of VOR station relative to selected course.

Item 42 - DUAL GLIDE SLOPE POINTERS - Indicate on Glide Slope scale (Item 43) airplane displacement from Glide Slope beam center. Glide Slope pointers in view indicate a usuable Glide Slope signal is being received.

Item 43 - GLIDE SLOPE SCALES - Indicate displacement from Glide Slope beam center. A Glide Slope deviation bar displacement of 2 dots, represents full scale (0.7°) deviation above or below Glide Slope beam centerline.

Item 44 - HEADING SELECTOR KNOB () - Positions heading bug (Item 49) on compass card (Item 45) by rotating the heading selector knob. The bug rotates with the compass card.

Item 45 - COMPASS CARD - Rotates to display heading of airplane with reference to lubber line (Item 38) on HSI or DG.

Item 46 - COURSE SELECTOR KNOB - Positions course bearing pointer (Item 40) on the compass card (Item 45) by rotating the course selector knob.

Item 47 - COURSE DEVIATION BAR (D-BAR) - The center portion of omni bearing pointer moves laterally to pictorially indicate the relationship of airplane to the selected course. It indicates degrees of angular displacement from VOR radials and localizer beams, or displacement in nautical miles from RNAV courses.

Item 48 - COURSE DEVIATION SCALE - A course deviation bar displacement of 5 dots represents full scale (VOR = ± 10°, LOC = ± 2.5°, RNAV = 5 NM, RNAV APR = 1.25 NM) deviation from beam centerline.

Item 49 - HEADING BUG - Moved by ⊂⊃ knob (Item 44) to select desired heading.

Item 50 - KG 107 NON-SLAVED DIRECTIONAL GYRO (DG) - Provides a stable visual indication of airplane heading to the pilot. The gyro is air driven.

Item 51 - GYRO ADJUSTMENT KNOB (PUSH) - When pushed in, allows the pilot to manually rotate the gyro compass card (Item 45) to correspond with the magnetic heading indicated by the magnetic compass. The unslaved compass card must be manually reset periodically to compensate for precessional errors in the gyro.

Item 52 - KI 204 / 206 VOR / LOC / GLIDE SLOPE INDICATOR - Provides rectilinear display of VOR / LOC and Glide Slope deviation.

Item 53 - COURSE INDEX - Indicates selected VOR course.

Item 54 - COURSE CARD - Indicates selected VOR course under course index.

Item 55 - GLIDE SLOPE DEVIATION NEEDLE - Indicates deviation from ILS Glide Slope.

Item 56 - GLIDE SLOPE SCALE - Indicates displacement from Glide Slope beam center. A Glide Slope deviation needle displacement of 5 dots, represents full scale (0.7°) deviation above or below Glide Slope beam centerline.

Item 57 - RECIPROCAL COURSE INDEX - Indicates reciprocal of selected VOR course.

Item 58 - OMNI BEARING SELECTOR (OBS) KNOB - Rotates course card to selected course.

Item 59 - COURSE DEVIATION NEEDLE - Indicates course deviation from selected omni course or localizer centerline.

Item 60 - GLIDE SLOPE (GS) FLAG - Flag is in view when the GS receiver signal is inadequate.

The airplane MAIN SWITCH function is unchanged and can be used in an emergency to shut off electrical power to all flight control systems while the problem is isolated.

The AUTOPILOT MASTER switch supplies power to the AUTOPILOT or A / P circuit-breaker.

The following circuit-breakers are used to protect the following elements of the King 150 Series Autopilot.

LABEL	FUNCTION
A / P	Supplies power to the KC 192 or the KC 191 computer, the autopilot pitch and roll servos, the optional KA 185 Annunciator and the Trim Circuit-breaker.
TRIM	Supplies power to the autotrim and manual electric pitch trim systems.
HSI	Supplies power to the optional KCS 55A Compass System.

SECTION 2
LIMITATIONS

These limitations complete those of standard airplane described in Section 2 "Limitations" of the basic Pilot's Operating Handbook.

A - During autopilot operation, a pilot with seat belt fastened must be seated at the left pilot position.

B - The autopilot must be OFF during take-off and landing and during approach under 200 ft height.

C - Engagement height in climb and cruise 1000 ft.

D - The system is approved for Category I operation only (Approach mode selected).

E - It is forbidden to operate TEST button in flight.

F - Autopilot maximum airspeed limitation :

175 KIAS 322 km/h	(TB 20 - TB 21)	150 KIAS 278 km/h	(TB 10 - TB 200)

G - Maximum fuel imbalance :

20 U.S Gal 75 litres	(TB 20 - TB 21)	6 U.S Gal 23 litres	(TB 10 - TB 200)

NOTE :

In accordance with FAA recommendation, use of "ALTITUDE HOLD" mode is not recommended during operation in severe turbulence.

Placards (TB10 - TB200) :

CAUTION : DURING ILS APPROACH
AVOID ENGINE RPM HIGHER THAN 2600

SECTION 3

EMERGENCY PROCEDURES

These procedures complete those of standard airplane described in Section 3 "Emergency procedures" of the basic Pilot's Operating Handbook.

A - In case of Autopilot malfunction : (accomplish the two first following operations simultaneously).

- Airplane control wheel - GRASP FIRMLY and regain airplane control.
- AP DISC TRM INT switch - PRESS and HOLD.
- AP DISC TRM INT switch - RELEASE while observing pitch trim wheel. If pitch trim wheel is in motion, follow the "B" procedure given hereafter.

B - In case of manual electric trim malfunction :

- AP DISC TRM INT switch - PRESS and HOLD throughout recovery.
- TRIM circuit-breaker - OFF.
- Airplane - RETRIM manually.

CAUTION

WHEN DISCONNECTING THE AUTOPILOT AFTER A TRIM MALFUNCTION, HOLD THE CONTROL WHEEL FIRMLY ; UP TO 45 POUNDS OF FORCE ON THE CONTROL WHEEL MAY BE NECESSARY TO HOLD THE AIRPLANE LEVEL.

Maximum altitude losses and maximum banks due to autopilot malfunction :

Configuration	Alt Loss		Bank	
Cruise, climb, Descent	500' *	450' **	60°	
Maneuvering	300' *	50' **	40° *	45° **
Approach	100' *	50' **	20° *	30° **

* TB 10 - TB 200 - ** TB 20 - TB 21

SECTION 4
NORMAL PROCEDURES

These procedures complete those of standard airplane described in Section 4 "Normal procedures" of the basic Pilot's Operating Handbook.

A - PREFLIGHT (Perform prior to each flight)

- GYROS - Allow 3-4 minutes for gyros to come up to speed.
- AUTOPILOT MASTER switch - ON.
- PREFLIGHT TEST BUTTON - PRESS momentarily and NOTE :

  a) All annunciator lights ON (TRIM annunciator flashing)

  b) After approximately 5 seconds, all annunciator lights off except AP which will flash approximately 12 times and then remain off.

  NOTE :

  If trim warning light stays on then the autotrim did not pass preflight test. The autopilot circuit-breaker should be pulled (Manual electric trim and autopilot will be inoperative).

- MANUAL ELECTRIC TRIM - TEST as follows :

  a) Actuate left side of split switch unit to the fore and aft positions. The trim wheel should not move on its own. Rotate the trim wheel manually against the engaged clutch to check the pilot's trim overpower capability.

  b) Actuate right side of split switch unit to the fore and aft positions. Trim wheel should not move on its own and normal trim wheel force is required to move it manually.

  c) Press the AP DISC TRM INT switch down and hold. Manual electric trim should not operate either nose up or nose down.

- FLIGHT DIRECTOR (KFC 150 ONLY) - ENGAGE by pressing FD or CWS button.
- AP ENG button - Press to engage autopilot.
- FLIGHT CONTROLS - MOVE fore, aft, left and right to verify that the autopilot can be overpowered.
- AP DISC TRM INT Switch - PRESS. Verify that the autopilot disconnects and all flight director modes are canceled.
- TRIM - SET to take-off position.

B - AUTOPILOT OPERATION

NOTE (Valid only for TB 10 and TB 200 airplanes) :

The minimum recommended airspeed for autopilot operation is 80 KIAS.

- Before take-off

  AP DISC TRM INT Switch - PRESS.

- Inflight Autopilot engagement.

  a) FD Mode Selector Button (KFC 150 Only) - PRESS.

  b) AP ENG Button - PRESS. Note AP annunciator on. If no other modes are selected the autopilot will operate in wings level and pitch attitude hold.

CAUTION

DO NOT HELP THE AUTOPILOT AS THE AUTOPILOT WILL RUN THE PITCH TRIM TO OPPOSE YOUR HELP.

- Climb or descent

  a) Using CWS

  . CWS Button - PRESS and MOVE airplane nose to the desired attitude.

  . CWS Button - RELEASE. Autopilot will maintain airplane pitch attitude up to the pitch limits of + 15° or - 10°.

b) Using vertical Trim

. VERTICAL TRIM Control - PRESS either up or down to modify airplane attitude at a rate of 0.7 deg / sec. up to the pitch limits of + 15° or - 10°.

. VERTICAL TRIM Control - RELEASE when desired airplane attitude is reached. The autopilot will maintain the desired pitch attitude.

- Altitude Hold

a) ALT Mode Selector Button - PRESS. Note ALT mode annunciator ON. Autopilot will maintain the selected pressure attitude.

b) Change selected altitude

. Using CWS (recommended for altitude changes greater than 100 ft).

CWS Button - PRESS and reach desired pressure altitude.

CWS Button - RELEASE when desired pressure altitude is reached. The autopilot will maintain the desired pressure altitude.

. Using Vertical Trim (Recommended for altitude changes less than 100 ft).

VERTICAL TRIM Control - PRESS either up or down.
Vertical Trim will seek an altitude rate of change of about 500 ft / min.

VERTICAL TRIM Control - RELEASE when desired pressure altitude is reached. The autopilot will maintain the desired pressure altitude.

- Heading changes

  a) Manual Heading Changes

  . CWS Button - PRESS and MANEUVER airplane to the desired heading.

  . CWS Button - RELEASE. Autopilot will maintain airplane in wings level attitude.

  NOTE :
  Airplane heading may change in the wings level mode due to an airplane out of trim condition.

  b) Heading Hold

  . Heading Selector Knob - SET BUG to desired heading.

  . HDG Mode Selector Button - PRESS. Note HDG mode annunciator ON. Autopilot will automatically turn the airplane to the selected heading.

  c) Command Turns (Heading Hold mode ON)

  . HEADING Selector Knob - MOVE BUG to the desired heading. Autopilot will automatically turn the airplane to the new heading selected.

- NAV Coupling

  a) When equipped with HSI or EHSI

  . Course Bearing Pointer - SET to desired course.

  NOTE :
  When equipped with NAV 1 / NAV 2 switching and NAV 2 is selected, set OBS 2 to the desired course.

  . HEADING Selector Knob - SET BUG to provide desired intercept angle.

. NAV Mode Selector Button - PRESS.

If the Course Deviation Bar is greater than 2 to 3 dots : the airplane will continue in HDG mode (or wings level if HDG not selected) with the NAV annunciator flashing ; when the computed capture point is reached the HDG will disengage, the NAV annunciator will illuminate steady and the selected course will be automatically captured and tracked.

If the D-Bar is less than 2 to 3 dots : the HDG mode will disengage upon selecting NAV mode ; the NAV annunciator will illuminate steady and the capture / track sequence will automatically begin.

b) When equipped with DG

. OBS Knob - SELECT desired course.

. NAV Mode Selector Button - PRESS.

. Heading Selector Knob - ROTATE BUG to agree with OBS course.

NOTE :

When NAV is selected, the lateral operating mode will change from HDG (if selected) to wings level for 5 seconds. A 45° intercept angle will then be automatically established based on the position of the bug.

If the D-Bar is greater than 2 to 3 dots : the autopilot will annunciate HDG mode (unless HDG not selected) and NAV flashing ; when the computed capture point is reached, the HDG annunciator will go out, the NAV annunciator will illuminate steady and the selected course will be automatically captured and tracked.

If the D-Bar is less than 2 to 3 dots, the HDG mode will disengage upon selecting NAV mode ; the NAV annunciator will illuminate steady and the capture / track sequence will automatically begin.

- Approach (APR) Coupling (TB10 - TB200)

"Erratic deviations have been observed with airplane flown down an ILS path with KING RADIO-NAV installations. Analysis of the phenomenon indicates that the fluctuations are due to an interference between propeller rotation frequency and one of LOC frequencies. The more sensitive conditions are met when the localizer beacon is right ahead and the engine speed is adjusted toward 2650 RPM.

The localizer use is not significantly impaired by the phenomenon when :

- engine speed is reduced to lower than 2600 RPM
- localizer beacon lies right or left by more than 30 degrees from airplane heading.

Autopilot APR mode operation should be discontinued whenever high engine power settings are anticipated. This can be done by switching to HDG mode or CWS mode or by switching off the autopilot.

a) When equipped with HSI or EHSI

. Course Bearing Pointer - SET to desired course.

NOTE :
When equipped with NAV 1 / NAV 2 switching and NAV 2 is selected, set OBS 2 to the desired course.

. HEADING Selector Knob - SET BUG to provide desired intercept angle.

. APR Mode Selector Button - PRESS.

If the Course Deviation Bar is greater than 2 to 3 dots : the airplane will continue in HDG mode (or wings level if HDG not selected) with the APR annunciator flashing ; when the computed capture point is reached the HDG mode will disengage, the APR annunciator will illuminate steady and the selected course will be automatically captured and tracked.

If the D-Bar is less than 2 to 3 dots : the HDG mode will disengage upon selecting APR mode ; the APR annunciator will illuminate steady and the capture / track sequence will automatically begin.

b) When equipped with DG

. OBS Knob - SELECT desired approach course.

. APR Mode Selector Button - PRESS.

. Heading Selector Knob - ROTATE Bug to agree with OBS course.

NOTE :
When APR is selected, the lateral operating mode will change from HDG (if selected) to wings level for 5 seconds. A 45° intercept angle will then be automatically established based on the position of the bug.

If the D-Bar is greater than 2 to 3 dots : the autopilot will annunciate HDG mode (unless HDG not selected) and APR flashing ; when the computed capture point is reached the HDG annunciator will go out, the APR annunciator will illuminate steady and the selected course will be automatically captured and tracked.

If the D-Bar is less than 2 to 3 dots : the HDG mode will disengage upon selecting APR mode ; the APR annunciator will illuminate steady and the capture / track sequence will automatically begin.

- BC Approach Coupling

a) When equipped with HSI or EHSI

. Course Bearing Pointer - SET to the ILS front course inbound heading.

NOTE :
When equipped with NAV 1 / NAV 2 switching and NAV 2 is selected, set OBS to the ILS front course inbound heading.

. HEADING Selector Knob - SET BUG to provide desired intercept angle.

. BC Mode Selector Button - PRESS.

If the Course Deviation Bar is greater than 2 to 3 dots : the airplane will continue in HDG mode (or wings level if HDG not selected) with BC annunciated steady and APR annunciator flashing ; when the computed capture point is reached the HDG will disengage, and the BC and APR annunciators will illuminate steady and the selected course will be automatically captured and tracked.

If the D-Bar is less than 2 to 3 dots : the HDG mode will disengage upon selecting BC mode ; the APR BC annunciator will illuminate steady and the capture / track sequence will automatically begin.

b) When equipped with DG

. OBS Knob -SELECT the ILS front course inbound heading.

. BC mode Selector Button - PRESS.

. Heading Selector Knob - ROTATE Bug to the ILS front course inbound heading.

NOTE :

When BC is selected, the lateral operating mode will change from HDG (if selected) to wings level for 5 seconds. A 45° intercept angle will then be automatically established based on the position of the bug.

If the D-Bar is greater than 2 to 3 dots : the autopilot will annunciate HDG (unless HDG not selected) and BC modes with APR flashing ; when the computed capture point is reached the HDG annunciator will go out, the BC and APR annunciators will illuminate steady and the selected course will be automatically captured and tracked.

If the D-Bar is less than 2 to 3 dots : the HDG mode will disengage upon selecting BC mode ; the BC and APR annunciators will illuminate steady and the capture / track sequence will automatically begin.

- Glide Slope coupling

  NOTE :

  Glide Slope coupling is inhibited when operating in NAV or APR BC modes. Glide Slope coupling occurs automatically in the APR mode.

  a) APR Mode - ENGAGED.

  b) At Glide Slope centering - NOTE GS annunciator ON.

  NOTE :

  Autopilot can capture Glide Slope from above or below the beam while operating in either pitch attitude hold or alt hold modes.

- Missed Approach

  a) AP DISC TRM INT Switch - PRESS to disengage A / P.

  b) MISSED APPROACH - EXECUTE.

  c) CWS Button - PRESS (KFC 150 only) as desired to activate FD mode during go-around maneuver.

  d) AP ENG BUTTON - PRESS (If A / P operation is desired).
  Note AP annunciator ON.

  NOTE :

  If it is desired to track the ILS course outbound as part of the missed approach procedure, use the NAV mode to prevent inadvertent GS coupling.

- Before Landing

  AP DISC TRM INT Switch - PRESS to disengage A / P.

C - FLIGHT DIRECTOR OPERATION (KFC 150 System Only)

NOTE :

The flight director modes of operation are the same as those used for autopilot operations except the autopilot is not engaged and the pilot must maneuver the airplane to satisfy the flight director commands.

SECTION 5
PERFORMANCE

The installation and the operation of the autopilot do not change the basic performance of the airplane described in Section 5 "Performance" of the basic Pilot's Operating Handbook.

SUPPLEMENT

GROUND POWER RECEPTACLE

"OPTIONAL EQUIPMENT N° C519, C825, C835 and C836"

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SECTION 1
GENERAL

The ground power receptacle permits the use of an external power source for cold weather starting and during lenghty maintenance work on the electrical and avionics equipment. The receptacle is located under the baggage compartment access door, near the anti-twist edge.

NOTE :
If no avionics equipment is to be used or worked on, the avionics power switches should be turned off or the circuit-breakers should be released. If maintenance is required on the avionics equipment, it is advisable to utilize a battery cart external power source to prevent damage to the avionics equipment by transient voltage.

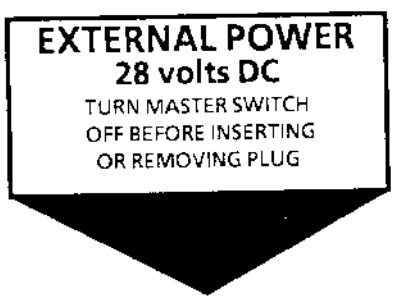
NOTE :
Use of the ground power receptacle for starting an airplane with a "dead" battery or charging a "dead" battery in the airplane is not recommended. The battery should be removed from the airplane and serviced in accordance with Maintenance Manual procedures. Failure to observe this precaution could result in loss of electrical power during flight.

SECTION 2

LIMITATIONS

These limitations complete those of standard airplane described in Section 2 "Limitations" of the basic Pilot's Operating Handbook.

The following information must be presented in the form of a placard located above the ground power receptacle access door.



Valid for English speaking countries



Valid for Brazil

SECTION 3

EMERGENCY PROCEDURES

The installation and the operation of the ground power receptacle do not change the basic emergency procedures of the airplane described in Section 3 "Emergency procedures" of the basic Pilot's Operating Handbook.

SECTION 4
NORMAL PROCEDURES

These procedures complete those of standard airplane described in Section 4 "Normal procedures" of the basic Pilot's Operating Handbook.

The engine starting using auxiliary power does not change the basic procedures, however :

WARNING

IF THE BATTERY HAS BEEN REMOVED, BEFORE CONNECTING THE AUXILIARY POWER SOURCE, ISOLATE USING RUBBER OR PLASTIC, OR CHECK THE ISOLATION OF THE ELECTRICAL HARNESS TERMINAL LUGS

- The avionics power switches should be turned off, and the battery switch turned off.
- Let the engine run with the auxiliary power only if the "radio master" is off.

WARNING

WHEN TURNING ON THE BATTERY SWITCH, USING AN EXTERNAL POWER SOURCE, OR PULLING THE PROPELLER THROUGH BY HAND, TREAT THE PROPELLER AS IF THE MAGNETO SWITCHES WERE ON. DO NOT STAND, NOR ALLOW ANYONE ELSE TO STAND, WITHIN THE ARC OF THE PROPELLER, SINCE A LOOSE OR BROKEN WIRE, OR A COMPONENT MALFUNCTION, COULD CAUSE THE ENGINE TO START

The ground power receptacle circuit incorporates a polarity reversal protection. Power from the external power source will flow only if the ground power receptacle is correctly connected to the airplane. If the plug is accidentally connected backwards, no power will flow to the electrical system, thereby preventing any damage to electrical equipment.

The following check should be made after starting engine and removing the external power source, if there is any question as to the condition of the battery.

1 - Battery Switch-breaker - "OFF".

2 - Taxi and Landing Lights switch-breakers - "ON".

3 - Engine RPM - REDUCE the engine to idle.

4 - Battery Switch-breaker - "ON" (with taxi and landing lights turned on).

5 - Engine RPM - INCREASE the engine to approximately 1500 RPM.

6 - Voltmeter - CHECK.

NOTE :
If the voltmeter is in red sector : remove and charge the battery.

7 - Landing lights switch-breaker - "OFF".

SECTION 5

PERFORMANCE

The installation and the operation of the ground power receptacle do not change the basic performance of the airplane described in Section 5 "Performance" of the basic Pilot's Operating Handbook.

SUPPLEMENT

AUXILIARY DRY AIR PUMP

"OPTIONAL EQUIPMENT Nr 632"

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SECTION 1
GENERAL

The auxiliary dry air pump system, electrically driven, provides an independent backup source of pneumatic power to operate the gyro flight instruments in the event the engine driven air pump fails. This "Pump-Electric motor" assembly is located on the L.H. side under cabin floor.

The auxiliary pump operates through the switch on L.H. instrument panel strip.

The auxiliary system electrical protection is provided by 2 circuit-breakers labeled "AUX SUCT" and located on L.H. side instrument panel, on the pilot's left hand :

- a 2 amp. circuit-breaker for the control circuit
- a 10 amp. circuit-breaker for the power circuit

At the head of the L.H. instrument panel, 2 lights incorporating a press-to-test feature, located on the alarms panel, enable to check for condition the vacuum system. Two vacuum switches illuminate these lights :

- the L.H. red light labeled "GYRO SUCT", when illuminated, indicates the drop of "normal" or "auxiliary" suction,
- the R.H. green light labeled "AUX SUCT", when illuminated, indicates that "auxiliary" pump is activated and operates correctly.

CAUTION

THE AUXILIARY PUMP USE, WHEN SUCTION IS NORMAL (main pump operating correctly), AFFECTS NEITHER THE GENERAL OPERATION OF VACUUM SYSTEM, NOR THE GYRO FLIGHTS INSTRUMENTS.

THE AUXILIARY PUMP OPERATION MAY LEAD TO AN ELECTRICAL OVERLOAD AND, THEREFORE, IS NOT RECOMMENDED DURING NORMAL OPERATION.

SECTION 2
LIMITATIONS

These limitations complete those of standard airplane described in Section 2 "Limitations" of the basic Pilot's Operating Handbook. These limits must be on a placard located at level with control switch of the auxiliary pump, on L.H. instrument panel strip :

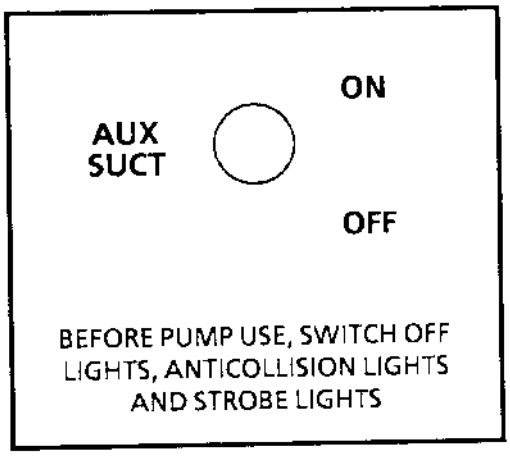


Figure 9.14.1 - AUXILIARY DRY AIR PUMP SWITCH PLACARD

D.G.A.C. Approved

SECTION 3
EMERGENCY PROCEDURES

These procedures complete those of standard airplane described in Section 3 "Emergency procedures" of the basic Pilot's Operating Handbook.

MAIN VACUUM PUMP FAILURE

"GYRO SUCT" red light	ILLUMINATED
Suction gage	OUT OF GREEN SECTOR
Landing and taxiing lights	OFF
Anticollision light (if installed)	OFF
Strobe lights (if installed)	OFF
"AUX SUCT" switch	ON
"AUX SUCT" green light	ILLUMINATED
"GYRO SUCT" red light	OFF
Suction gage	GREEN SECTOR

SECTION 4
NORMAL PROCEDURES

These procedures complete those of standard airplane described in Section 4 "Normal procedures" of the basic Pilot's Operating Handbook.

BEFORE STARTING ENGINE

Main switch	ON
"AUX SUCT" switch	ON
"AUX SUCT" green light	ILLUMINATED
"GYRO SUCT" red light	OFF
Suction gage	GREEN SECTOR
Gyro flight instruments	ON
"AUX SUCT" switch	OFF
"GYRO SUCT" red light	ILLUMINATED
"AUX SUCT" green light	OFF
Main switch	OFF

DURING FLIGHT

The auxiliary pump operation may lead to an electrical overload and therefore must only be used in the event main vacuum pump fails. See Section 3 "Emergency procedures" of this supplement.

SECTION 5
PERFORMANCE

The installation and the operation of the AUXILIARY DRY AIR PUMP do not change the basic performance of the airplane described in Section 5 "Performance" of the basic Pilot's Operating Handbook.

SUPPLEMENT

LOW NOISE EXHAUST

"OPTIONAL EQUIPMENT N° A887"

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SECTION 1
GENERAL

This supplement is intended to inform the pilot about the equipment limitations, description and operations necessary to the operation when the aircraft is equipped with the option "LOW NOISE EXHAUST".

SECTION 2
LIMITATIONS

The installation and the operation of the option "LOW NOISE EXHAUST" do not change the basic limitations of the aircraft described in Section 2 "Limitations" of the basic Pilot's Operating Handbook.

SECTION 3
EMERGENCY PROCEDURES

The installation and the operation of the option "LOW NOISE EXHAUST" do not change the emergency procedures of the aircraft described in Section 3 "Emergency procedures" of the basic Pilot's Operating Handbook.

SECTION 4
NORMAL PROCEDURES

The normal procedures hereafter partially replace those of the standard aircraft described in Section 4 "Normal procedures" of the basic Pilot's Operating Handbook, when the aircraft is equipped with the option "LOW NOISE EXHAUST".

PREFLIGHT INSPECTIONS

AIRFRAME

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
Exhaust muffler	Check condition and attachment
Fuel filter draining	Fuel free of water and sediment
Fuel filter drain	Check CLOSED

SECTION 5
PERFORMANCE

The performance hereafter partially replace those of the standard aircraft described in Section 5 "Performance" of the basic Pilot's Operating Handbook.

ACOUSTIC LIMITATION

With a noise level lower than the limit noise level by 7.3 dB (A) the TB 10 aircraft complies with Chapter 10, appendix 6, annex 16 of the agreement relative to International Civil Aviation Organization (ICAO).

The noise limit authorized in above-mentioned ICAO conditions is 85.2 dB (A).

The noise level which was determined in above-mentioned ICAO conditions at maximum continuous power and at 2700 RPM is 77.9 dB (A).

Consequently, according to above-mentioned ICAO conditions, the noise limitation type certificate is extended to SOCATA TB 10 aircraft equipped with the option Nr A887.

SECTION 6
WEIGHT AND BALANCE

The weight and balance hereafter complete those of the standard aircraft described in Section 6 "Weight and balance" of the basic Pilot's Operating Handbook.

A or O	ITEM N°	OPTIONAL EQUIPMENT	*	WEIGHT lb	ARM in
		A - ENGINE & ACCESSORIES			
A	A88700M	LOW NOISE EXHAUST		15.43	15.75

SECTION 7
DESCRIPTION

The description hereafter partially replaces those of the standard aircraft described in Section 7 "Description" of the basic Pilot's Operating Handbook.

EXHAUST SYSTEM - see Figure 9.28.1

Exhaust gases from each cylinder are collected by pipes to be conducted, in order to reduce their noise level to an exhaust duct which is located at the front, crosswise under the power plant.

Then, exhaust gases route through a pipe under engine compartment R.H. side up to an additional muffler located longitudinally under the fuselage, in aircraft centerline. Then they are discarged in the atmosphere.

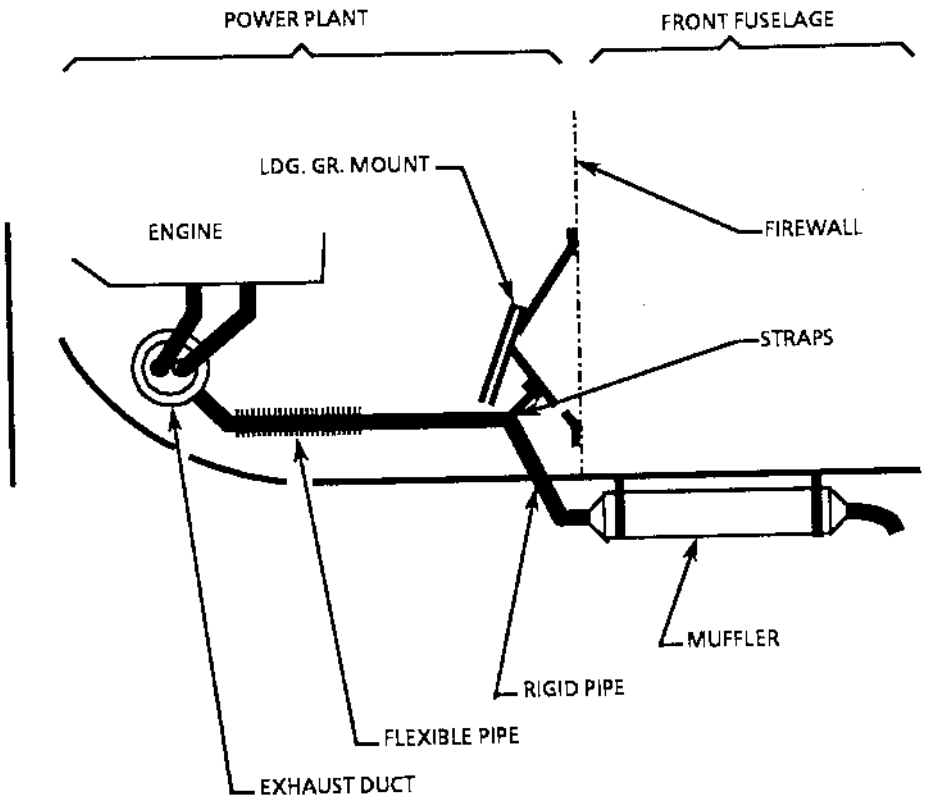


Figure 9.28.1 - EXHAUST SYSTEM (PRINCIPLE)

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SUPPLEMENT

"GARMIN" 150 GPS NAVIGATION SYSTEM - "STAND ALONE"

OPTIONAL EQUIPMENT No. J925 00M

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SECTION 1
GENERAL

This supplement is intended to inform the pilot about the equipment limitations, description and operations necessary to the operation when the TB aircraft is equipped with the option ""GARMIN" 150 GPS NAVIGATION SYSTEM - "STAND ALONE"".

The generalities hereafter supplement those of the standard aircraft described in Section 1 "General" of the basic Pilot's Operating Handbook, when the TB aircraft is equipped with the option ""GARMIN" 150 GPS NAVIGATION SYSTEM - "STAND ALONE"".

Using information provided by satellites ("GARMIN" 150 GPS is able to track up to 8 satellites at a time), GPS is an automatic tridimensional (latitude, longitude, altitude) location and navigation means. It also uses data recorded in a data base (three different data bases are available : Americas, International and Worldwide). The data base is contained in a NavData card plugged into the front face of the "GARMIN" 150 GPS and is updated every 28 days by means of new cards.

Each data base contains information about airports, communication frequencies, VORs, NDBs, Intersections ...

There is also room for 1000 user defined waypoints and 20 reversible flight plans.

The "GARMIN" 150 GPS can be connected to a "SHADIN" or "ARNAV" fuel flowmeter.

SECTION 2
LIMITATIONS

The limitations hereafter supplement those of the standard aircraft described in Section 2 "Limitations" of the basic Pilot's Operating Handbook, when the TB aircraft is equipped with the option ""GARMIN" 150 GPS NAVIGATION SYSTEM - "STAND ALONE"".

Data base updating must be verified before each flight.

"GARMIN" 150 GPS can only be used as a navigation source in day VFR in sight of ground or water (the instruments required for navigation in VFR must be available onboard).

GPS USED ONLY FOR NAVIGATION IN DAY VFR IN SIGHT OF GROUND OR WATER

Figure 9.39.1 - GPS limitation placard

The GPS integrity is not ensured.

It is therefore the responsibility of the pilot to verify that its position is correct using the other available navigation sources.

"GARMIN" 150 GPS Pilot's Guide at its latest revision shall be readily available to the pilot.

SECTION 3
EMERGENCY PROCEDURES

The emergency procedures hereafter supplement those of the standard airplane described in Section 3 "Emergency procedures" of the basic Pilot's Operating Handbook, when the TB aircraft is equipped with the option ""GARMIN" 150 GPS NAVIGATION SYSTEM - "STAND ALONE"".

"MSG" ANNUNCIATOR ILLUMINATION

1 - "STAT" button ..... **PRESS**

Check the message.

If the message mentions the loss of GPS system or part of the system :

2 - Continue the VFR flight with the primary sources of navigation (VOR, ADF...) if they exist.

When the system is restored, the return to GPS mode must be accompanied by the validation of the followed and desired track concordance by using the other sources of navigation, if they exist.

SECTION 4
NORMAL PROCEDURES

The normal procedures hereafter supplement those of the standard airplane described in Section 4 "Normal procedures" of the basic Pilot's Operating Handbook, when the TB aircraft is equipped with the option ""GARMIN" 150 GPS NAVIGATION SYSTEM - "STAND ALONE"".

Normal operating procedures of the "GARMIN" 150 GPS are outlined in the "GARMIN" 150 GPS Pilot's Guide at the latest revision.

However, it is important to precise the following points for the use of "GARMIN" 150 GPS on TB :

SET UP CONDITIONS

- Verify if the data base is current.
- Check that the proper criteria are used for nearest airport selection.
- Check that the CDI sensitivity scale is set to ± 5 NM.
- Check that MAP DATUM is set to WGS 84 or as indicated on the used navigation charts.

COURSE DEVIATION INDICATOR

The course deviation indicator sensitivity is adjustable with a maximum value which is the default value selected by the "GARMIN" 150 GPS. It is recommended not to change the default value which is ± 5 NM full scale.

NOTE :
Transmission on VHF 1 or 2 communication frequencies 121.15, 121.175, 121.20, 131.25, 131.275 and 131.30 MHz may adversely affect reception of the GPS signal. Transmissions in excess of 10 seconds may result in loss of GPS signal reception. Navigation will be restored within 5 seconds after the completion of the transmission. If UHF communication system is installed, the same behaviour can be observed on the first harmonic of the VHF frequencies, 242.30, 242.35, 242.40, 262.50, 262.55 and 262.60 MHz.

SYSTEM ANNUNCIATORS / SWITCHES / CONTROLS

"MSG" message annunciator

CAUTION

"MSG" ANNUNCIATOR MAY BE PERMANENTLY ILLUMINATED IF THERE EXISTS A PERMANENT MESSAGE. WHEN A NEW MESSAGE APPEARS, "MSG" ANNUNCIATOR ONLY FLASHES.

It will flash to alert the pilot of a situation that requires his attention. Press the "STAT" button on the "GARMIN" 150 GPS to view the message. (Appendix C of the "GARMIN" 150 GPS Pilot's Guide contains a list of all the messages likely to appear on the "Message" page and their meanings).
"MSG" annunciator is amber.

"WPT" Waypoint annunciator

About 1 minute before reaching a waypoint, **"MSG"** and **"WPT"** warning lights come on and audio warning is ON for 15 seconds. The message "Approaching waypoint" can be displayed by pressing the "STAT" button.
"WPT" and **"MSG"** annunciators are amber.

SECTION 5
PERFORMANCE

Installation and operation of the ""GARMIN" 150 GPS NAVIGATION SYSTEM - "STAND ALONE"" do not change the performance of the aircraft described in Section 5 "Performance" of the basic Pilot's Operating Handbook.

SECTION 6
WEIGHT AND BALANCE

Information hereafter supplement those given for the standard aircraft in Section 6 "Weight and balance" of the basic Pilot's Operating Handbook.

A or O	ITEM No.	OPTIONAL EQUIPMENT	WEIGHT lb	ARM in.
A	J925 00M	"GARMIN" 150 GPS - "Stand Alone"	4.696	25.59

SECTION 7
DESCRIPTION

Normal operating procedures are described in the "GARMIN" 150 GPS Pilot's Guide at the latest revision.

CONTROLS - see Figure 9.39.2

The front panel consists of 3-line, 20-character LCD display and 10 keys. Information displayed on the LCD is commonly referred to as a page.

Access to the pages is made by the keys on the right and bottom of the LCD.

Item 1 - POWER / BRIGHTNESS KNOB - This knob controls unit power and screen brightness.

Item 2 - "DIRECT TO" KEY - The direct-to key performs an instant direct-to, allows to enter a waypoint and sets a direct course to the destination.

Item 3 - "NRST" KEY - The nearest key is used to obtain information on the 9 nearest airports, VORs, NDBs, intersections, user waypoints and 2 nearest FSSs. This key also accesses any active SUA information.

Item 4 - "SET" KEY - The set key allows to customize the settings on the "GARMIN" 150 GPS to pilot's preference.

Item 5 - "RTE" KEY - The route key enables to create, edit, activate and invert routes. Search-and-rescue, parallel offset and closest point of approach are also performed using the route key.

Item 6 - "WPT" KEY - The waypoint key is used to view information such as runways, frequencies, position and comments on airports, VORs, NDBs, intersections and user waypoints.

Item 7 - "NAV" KEY - The navigation key is used to view navigation and position information. Planning operations are also performed using the "NAV" key.

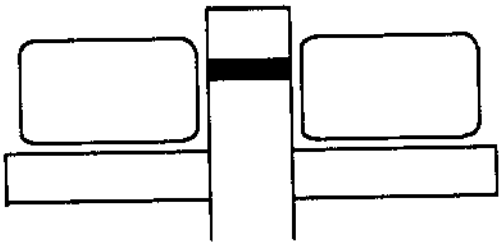
Item 8 - DOUBLE CONCENTRIC KNOB (INNER / OUTER) - The outer knob is used to advance through pages, advance the cursor or move through data fields. The inner knob is used to change data or scroll through information that cannot fit on the screen all at once.

Item 9 - "ENT" KEY - The enter key is used to approve an operation or complete data entry. It is also used to confirm information, such as during power on.

Item 10 - "STAT" KEY - The status key is used to view receiver and satellite status, as well as system messages.

Item 11 - "CRSR" KEY - The cursor key is used to activate / deactivate the cursor. An active cursor is indicated by flashing characters on the screen. It is used to highlight fields for data entry, changing information or cycling through available options.

Item 12 - "CLR" KEY - The clear key is used to erase information or cancel an entry.



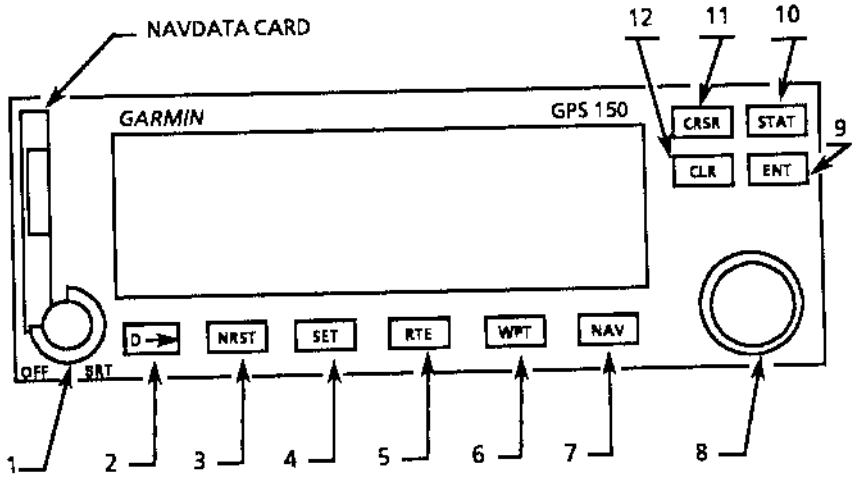
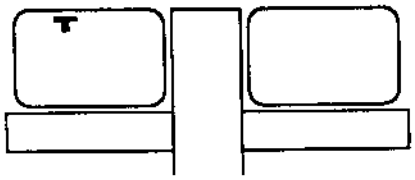


Figure 9.39.2 - Controls

ANNUNCIATORS - See Figure 9.39.3

The annunciators include 2 amber warning lights marked "MSG" and "WPT".



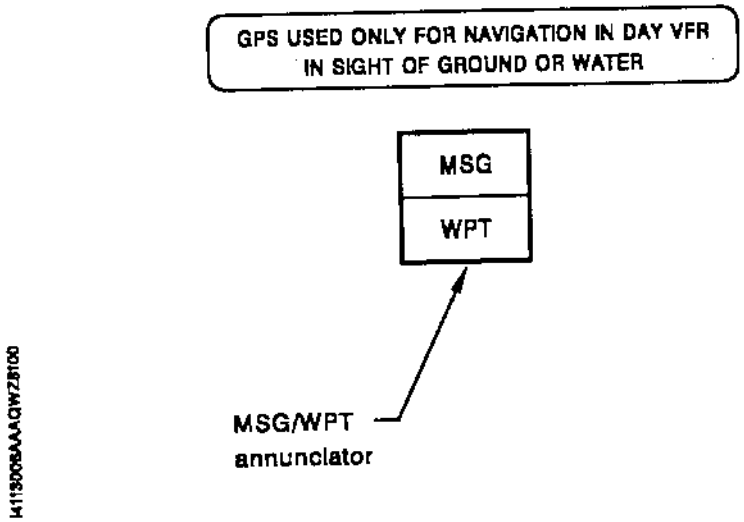


Figure 9.39.3 - GPS placard and annunciators