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## **1.1 - GENERAL**

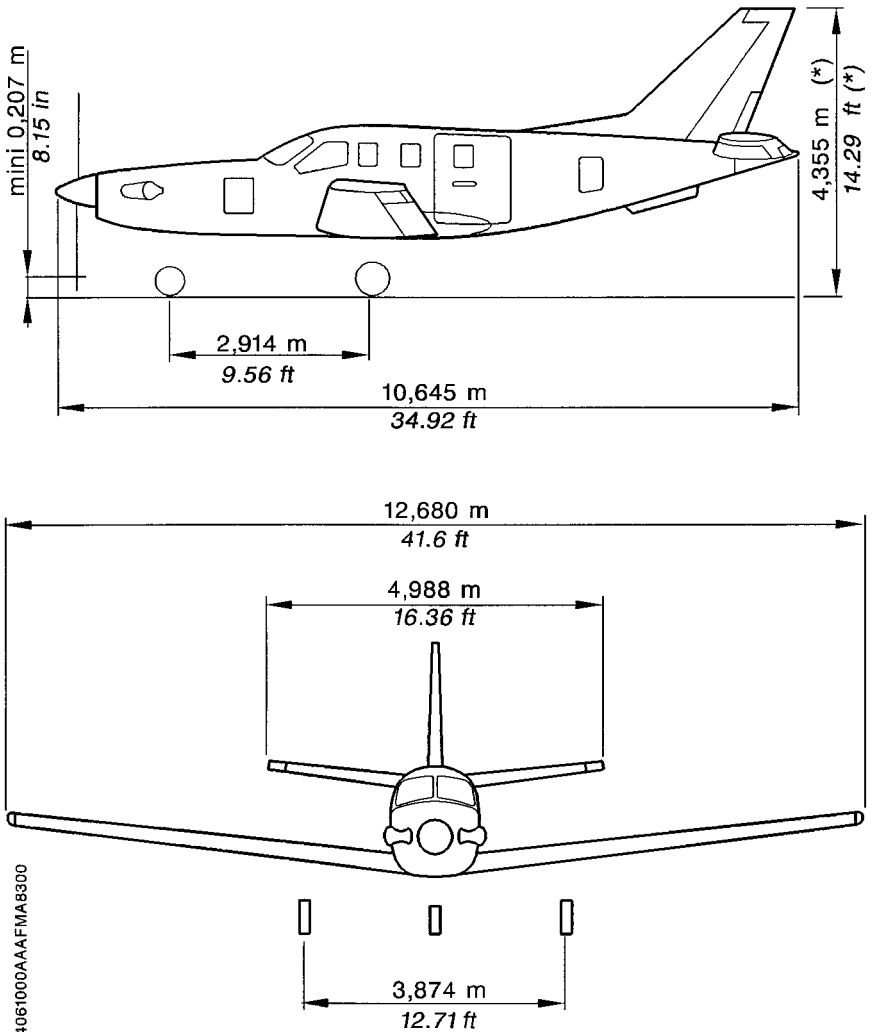
This Handbook contains 9 Sections, and includes the material required by FAR Part 23 to be furnished to the pilot for operation of the TBM 850 airplane. It also contains supplemental data supplied by the manufacturer.

Section 1 provides basic data and information of general interest. It also contains definitions or explanations of abbreviations and terminology commonly used.

The general for complex optional systems are given in Section 9, "Supplements" of the Pilot's Operating Handbook.

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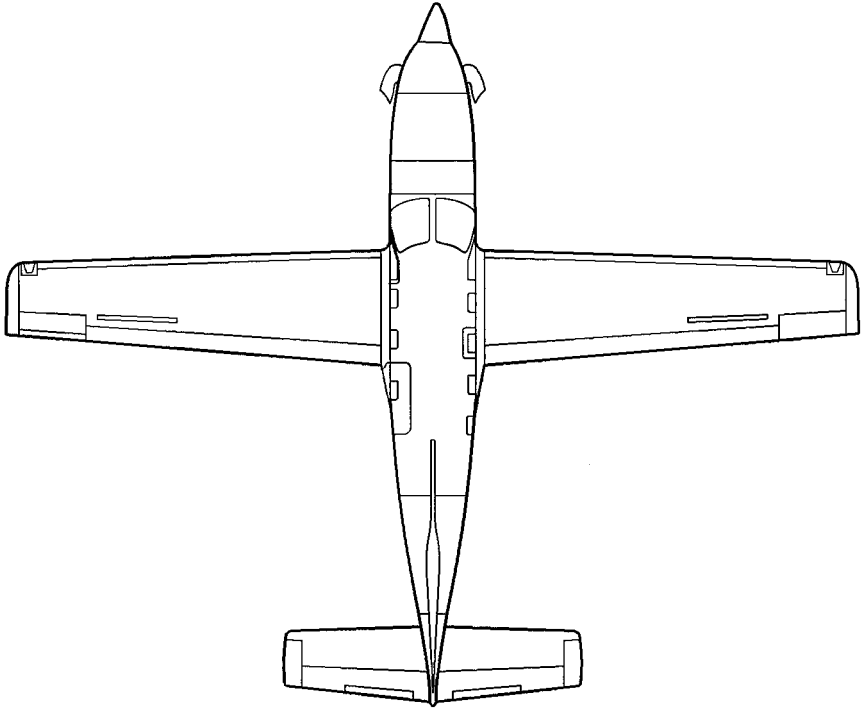
## 1.2 - THREE VIEW DRAWING



\* Avion en ligne de vol avec amortisseur AV détendu

\* Airplane on line of flight with extended FWD shock-absorber

Figure 1.2.1 (1/2) - THREE VIEW DRAWING



14061000AAA AFMA8101

Figure 1.2.1 (2/2) - THREE VIEW DRAWING

### 1.3 - DESCRIPTIVE DATA

#### ENGINE

Number of engines : 1

Engine manufacturer : PRATT & WHITNEY CANADA

Engine model number : PT6A - 66D

Engine type : Free turbine, reverse flow and 2 turbine sections

Compressor type : 4 axial stages  
1 centrifugal stage

Combustion chamber type : Annular

Turbine type : 1 gas generator turbine stage  
2 power turbines stages

Horsepower rating and propeller speed : 850 SHP at 2000 RPM

#### PROPELLER

Number of propellers : 1

Propeller manufacturer : HARTZELL

Propeller model number : HC-E4N-3 / E9083S (K)

Number of blades : 4

Propeller diameter :

Minimum : 90 inches (2.286 m)

Maximum : 91 inches (2.311 m)

Propeller type : Adjustable constant speed, with feathering and hydraulic control reverse

Propeller blade setting at 30 inches station

Low pitch : 21°

Feathering : 86°

Maximum reverse : - 11°

Propeller governor : 8210.007 WOODWARD

**FUEL**

Total capacity : 290.6 us gal (1100 Litres)  
 Total capacity each tank : 145.3 us gal (550 Litres)  
 Total usable : 281.6 us gal (1066 Litres)

**CAUTION**

**THE USED FUEL MUST CONTAIN AN ANTI-ICE ADDITIVE, IN ACCORDANCE WITH SPECIFICATION MIL-I-27686D or E or MIL-I85470A. ADDITIVE CONCENTRATIONS (EGME or DIEGME) SHALL BE COMPRISED BETWEEN A MINIMUM OF 0.06 % AND A MAXIMUM OF 0.15 % BY VOLUME. REFER TO SECTION AUCUN LIEN "HANDLING, SERVICING AND MAINTENANCE" FOR ADDITIONAL INFORMATION.**

**CAUTION**

**THE USE OF AVIATION GASOLINE (AVGAS) MUST BE RESTRICTED TO EMERGENCY PURPOSES ONLY. AVGAS SHALL NOT BE USED FOR MORE THAN 150 CUMULATIVE HOURS DURING ANY PERIOD BETWEEN ENGINE OVERHAUL PERIODS**

**NOTE :**

*Use of AVGAS to be recorded in engine module logbook*

US Specification (US)	French Specification (FR)	English Specification (UK)	NATO Code
ASTM-D1655 JET A ASTM-D1655 JET A1 ASTM-D1655 JET B	AIR 3405C Grade F35	DERD 2494 Issue 9	F35 without additive
MIL-T-5624L Amdt1 Grade JP-4	AIR 3407B	DERD 2454 Issue 4 Amdt 1	F40 with additive
MIL-T-5624L Amdt1 Grade JP-5	AIR 3404C Grade F44	DERD 2452 Issue 2 Amdt 1	F44 with additive when utilization
MIL-T-83133A Amdt1 Grade JP-8	AIR 3405C Grade F34	DERD 2453 Issue 4 Amdt 1	F34 with additive S748
	AIR 3404C Grade F43	DERD 2498 Issue 7	F43 without additive

Figure 1.3.1 - RECOMMENDED FUEL TYPES  
 (Reference : Service Bulletin P & W C. No. 14004)



## ENGINE OIL

System total capacity :

12.7 Quarts (12 Litres) (oil cooler included)

Usable capacity :

6 Quarts (5.7 Litres)

Maximum consumption : 0.30 qt / hr (0.29 l / hr)  
[0.3 lb/hr (0.136 kg/h)]

### CAUTION

### DO NOT MIX DIFFERENT BRANDS OR TYPES

Nominal Viscosity	US Specification (US)	French Specification (FR)	English Specification (UK)	NATO Code
Type 5cSt	MIL-L-23699C Amdt1	MIL-L-23699C Amdt1	DERD 2499 Issue 1	O.156

Figure 1.3.2 - RECOMMENDED ENGINE OIL TYPES  
(Reference : Service Bulletin P & W C. No. 14001)

## MAXIMUM CERTIFICATED WEIGHTS

Ramp : 7430 lbs (3370 kg)

Takeoff : 7394 lbs (3354 kg)

Landing : 7024 lbs (3186 kg)

Baggage weight (refer to Section 6 for cargo loading instructions) :

- in rear part of pressurized cabin : 220 lbs (100kg)
- In aft compartment : 77 lbs (35 kg)

## STANDARD AIRPLANE WEIGHTS

Standard empty weight : 4762 lbs (2160 kg)

With "pilot" door : 4806 lbs (2180 kg)

Maximum useful load : 2632 lbs (1194 kg)

With "pilot" door : 2588 lbs (1174 kg)

### **CABIN AND ENTRY DIMENSIONS**

Maximum cabin width : 3' 11.64" (1.21 m)  
Maximum cabin length : 13' 3.45" (4.05 m)  
Maximum cabin height : 4' (1.22 m)  
Number of cabin entries : 1 (standard) + 1 "pilot" door (if installed)  
Entry width (standard) : 3' 6.52" (1.08 m)  
Entry height (standard) : 3' 10.85" (1.19 m)  
"Pilot" entry mean width : 2' 3.6" (0.70 m)  
"Pilot" entry mean height : 3' 2.16" (0.97 m)

### **SPECIFIC LOADINGS**

Wing loading : 38.16 lbs / sq.ft (186.3 kg / m<sup>2</sup>)  
Power loading : 8.7 lbs / SHP (3.95 kg / SHP)

## 1.4 - ABBREVIATIONS AND TERMINOLOGY

### METEOROLOGICAL TERMINOLOGY

- ISA** : *International standard atmosphere*
- OAT** : *Outside air temperature* is the free air static temperature. It is expressed in either degrees Celsius or degrees Fahrenheit.
- SAT** : *Static air temperature*
- IOAT** : *Indicated outside air temperature*
- QFE** : Atmospheric pressure at the airport reference point.
- QNH** : QFE value corrected according to the airport altitude.

#### NOTE :

*On the ground, the altimeter will indicate "zero" if it is set to QFE ; it will indicate airport altitude if it is set to QNH.*

#### Standard Temperature :

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

#### 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).

### GENERAL AIRSPEED TERMINOLOGY AND SYMBOLS

- KCAS** : *Knots Calibrated Airspeed* is the indicated airspeed expressed in knots corrected for position and instrument error. Knots calibrated airspeed is equal to KTAS in standard atmosphere at sea level.
- KIAS** : *Knots Indicated Airspeed* is the speed shown on the airspeed indicator and expressed in knots.
- KTAS** : *Knots True Airspeed* is the airspeed expressed in knots relative to undisturbed air which is KCAS corrected for altitude and temperature.

- $V_A$  : **Maneuvering Speed** is the maximum speed at which full or abrupt control movements may be used.
- $V_{FE}$  : **Maximum Flap Extended Speed** is the highest speed permissible with wing flaps in a prescribed extended position.
- $V_{LE}$  : **Maximum Landing Gear Extended Speed** is the maximum speed at which an airplane can be safely flown with the landing gear extended.
- $V_{LO}$  : **Maximum Landing Gear Operating Speed** is the maximum speed at which the landing gear can be safely extended or retracted.
- $V_{MO}$  : **Maximum Operating Speed** is the speed limit that may not be deliberately exceeded in normal flight operations.
- $V_R$  : **Rotation Speed** is the speed at which rotation is initiated during takeoff to achieve takeoff safety speed at screen height.
- $V_{SO}$  : **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.
- $V_x$  : **Best Angle of Climb Speed** is the airspeed which delivers the greatest gain of altitude in the shortest possible horizontal distance.
- $V_y$  : **Best Rate of Climb Speed** is the airspeed which delivers the greatest gain in altitude in the shortest possible time.

**POWER TERMINOLOGY****Recovery altitude :**

Maximum altitude at which it is possible, in standard temperature, to maintain a specified power.

**Overheated start :**

Engine start or attempt to start which causes the interturbine temperature to be higher than the maximum value permissible during start .

**Flame out :** Involuntary loss of the combustion chamber flame during operation.

**GTP** : *Groupe turbopropulseur.*

**GPU** : *Ground power unit.*

**Feathering :** Action which reduces the drag of a failed engine through propeller feathering.

**Maximum Cruise Power :**

Power developed at the couple limit, interturbines temperature limit or gas generator RPM limit without time limitations, corresponding to cruise conditions.

**Ng** : Gas generator RPM.

**Np** : Propeller rotation speed.

**Reverse** : Drag produced when the propeller blade setting is negative.

**RPM** : Revolutions per minute is engine speed.

**SHP** : Standard Horsepower is the power developed by the engine.

**TRQ** : *Torque.*

## AIRPLANE PERFORMANCE AND FLIGHT PLANNING TERMINOLOGY

### **Climb gradient :**

Is the 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 takeoff 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 :** Total fuel which can be effectively consumed by the engine.

## WEIGHT AND BALANCE TERMINOLOGY

### **Reference datum :**

Datum perpendicular to the longitudinal airplane centerline from which all distances are measured for balance purpose.

**Arm** : Is the 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.

### **Center of gravity (C.G.) :**

Airplane balance point. 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 and full operating fluids (oil and hydraulic fluids).

**Basic empty weight :**

Standard empty weight plus optional equipment.

**Useful load :** Is the difference between maximum ramp weight and the basic empty weight.

**Maximum ramp weight :**

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

**Maximum takeoff weight :**

Is the maximum weight approved at the beginning of the takeoff run.

**Maximum landing weight :**

Is the maximum weight approved for landing touchdown.

## GENERAL ABBREVIATIONS

<b>A</b>	: Ampere or Amber
<b>ADC</b>	: Air Data Computer
<b>AGL</b>	: Above ground level
<b>AIL TRIM</b>	: Aileron trim
<b>ALT. SEL.</b>	: Altitude selector
<b>ALTI</b>	: Altimeter
<b>AMP.</b>	: Ampere
<b>AP</b>	: Autopilot
<b>AUTO SEL</b>	: Automatic selector
<b>AUX BP</b>	: Auxiliary boost pump
<b>BAT</b>	: Battery
<b>BAT OVHT</b>	: Battery overheat
<b>BRT</b>	: Brightness
<b>CAB PRESS</b>	: Cabin pressure
<b>°C</b>	: Celsius degree
<b>CONT.</b>	: Control
<b>DIEGME</b>	: Diethylene glycol monomethyl ether
<b>DIM</b>	: Dimmer
<b>DISC</b>	: Disconnect
<b>DN</b>	: Down
<b>ECS</b>	: Environmental control system
<b>EGME</b>	: Ethylene glycol monomethyl ether
<b>EMER</b>	: Emergency
<b>ENCOD. ALTI</b>	: Encoding altimeter
<b>ESHP</b>	: Estimated shaft horsepower
<b>ESS. BUS TIE</b>	: Essential BUS tie
<b>ETM</b>	: Engine Trend Monitoring
<b>EXT. LIGHTS</b>	: Exterior lightings
<b>°F</b>	: Fahrenheit degree
<b>FCU</b>	: Fuel control unit
<b>FIRE EXTING</b>	: Fire extinguisher
<b>FL</b>	: Flight level
<b>ft</b>	: Feet
<b>ft/min</b>	: Feet per minute
<b>G</b>	: Green
<b>HI</b>	: High
<b>HP</b>	: High pressure
<b>hPa</b>	: Hectopascal
<b>hr</b>	: Hour



<b>HTR</b>	: Heater
<b>IGNIT</b>	: Ignition
<b>in</b>	: Inch
<b>INERT SEP</b>	: Inertial separator
<b>INDIC</b>	: Indicator
<b>in.Hg</b>	: Inch of mercury
<b>INT. LIGHTS</b>	: Interior lightings
<b>INSTR.</b>	: Instrument
<b>ITT</b>	: Interturbine temperature
<b>kg</b>	: Kilogram
<b>kt</b>	: Knot (1 nautical mile/hr – 1852 m/hr)
<b>kW</b>	: Kilowatt
<b>l</b>	: Litre
<b>L</b>	: Left
<b>l/h</b>	: Litre / hour
<b>lb or lbs</b>	: Pound(s)
<b>L / D</b>	: Lift-to-drag
<b>LDG</b>	: Landing
<b>LDG GR</b>	: Landing gear
<b>LRCR</b>	: Long Range Cruise
<b>LO</b>	: Low
<b>LP</b>	: Low pressure
<b>LRN</b>	: Long range navigation
<b>LTS TEST</b>	: Lightings test
<b>m</b>	: Metre
<b>m.a.c.</b>	: Mean aerodynamic chord
<b>MAIN GEN</b>	: Main generation
<b>MAN</b>	: Manual
<b>MAN OVRD</b>	: Manual override
<b>MAX RPM</b>	: Maximum revolutions per minute
<b>MIN</b>	: Minimum
<b>min</b>	: Minute
<b>mm</b>	: Millimetre
<b>MXCR</b>	: Maximum cruise
<b>MZFW</b>	: Max. Zero Fuel Weight
<b>NM</b>	: Nautical mile
<b>NOCR</b>	: Normal cruise (recommended)
<b>NORM</b>	: Normal
<b>PHF</b>	: Plan Horizontal Fixe (Horizontal stabilizer)
<b>PRESS</b>	: Pressure

<b>PROP</b>	: Propeller
<b>psi</b>	: Pounds per square inch
<b>qt</b>	: Quart (1/4 us gal)
<b>QTY</b>	: Quantity
<b>R</b>	: Red or Right
<b>RUD</b>	: Rudder
<b>s or sec</b>	: Second
<b>SEL</b>	: Selector
<b>SHP</b>	: Shaft horsepower
<b>SIG</b>	: Signalization
<b>SL</b>	: Sea level
<b>S/N</b>	: Serial number
<b>SPKR</b>	: Speaker
<b>ST - BY</b>	: Stand-by
<b>STALL HTR</b>	: Stall heater
<b>Std</b>	: Standard
<b>T°</b>	: Temperature
<b>TEMP</b>	: Temperature
<b>TO</b>	: Takeoff
<b>TURN COORD</b>	: Turn coordinator
<b>us gal</b>	: Gallon U.S
<b>V</b>	: Volt or Voltage
<b>VACUUM LO</b>	: Vacuum low
<b>WARN</b>	: Warning
<b>W / S</b>	: Windshield
<b>WSR</b>	: Weather surveillance radar
<b>XPDR</b>	: Transponder

**RADIO - NAVIGATION ABBREVIATIONS**

<b>ADF</b>	: Automatic Direction Finder System
<b>ADI</b>	: Attitude Director Indicator
<b>ATC</b>	: Transponder
<b>CDI</b>	: Course Deviation Indicator
<b>COM</b>	: Communications Transceivers
<b>DME</b>	: Distance Measuring Equipment
<b>EGPWS</b>	: Enhanced Ground Proximity Warning System
<b>ELT</b>	: Emergency Locator Transmitter
<b>GPS</b>	: Ground Positioning System
<b>HF</b>	: High Frequency
<b>HSI</b>	: Horizontal Situation Indicator
<b>IFR</b>	: Instrument Flight Rules
<b>ILS</b>	: Instrument Landing System
<b>IMC</b>	: Instrument Meteorological Conditions
<b>MFD</b>	: Multi-function Display
<b>MKR</b>	: Marker Radio Beacon
<b>NAV</b>	: Navigation Indicators or Receivers
<b>RMI</b>	: Radio Magnetic Indicator
<b>TAS</b>	: Traffic Advisory System
<b>TAWS</b>	: Terrain Awareness Warning System
<b>VFR</b>	: Visual Flight Rules
<b>VHF</b>	: Very High Frequency
<b>VMC</b>	: Visual Meteorological Conditions
<b>VOR</b>	: VHF Omnidirectional Range
<b>VOR / LOC</b>	: VHF Omnidirectional Range Localizer

## EFIS ABBREVIATIONS

**ATTITUDE FAIL:** Attitude failure

**CMPST** : Composite  
(EFIS composite mode )

**CP** : Control Panel

**CRS** : Course

**DU** : Display Unit

**FD** : Flight director

**EADI** : Electronic Attitude Deviation Indicator

**EFIS** : Electronic Flight Instrument System

**EHSI** : Electronic Horizontal Situation Indicator

**ERMI** : Electronic Radio Magnetic Indicator

**HDG** : Heading

**RCP** : Radar Control Panel

**REF** : Reference

**SG** : Symbol Generator

**TST** : Test

## 1.5 - 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
us gal	3.785	Litre	Litre	0.264	us gal
lb	0.45359	kg	kg	2.2046	lb

Figure 1.5.1 - IMPERIAL AND U.S UNITS TO METRIC UNITS

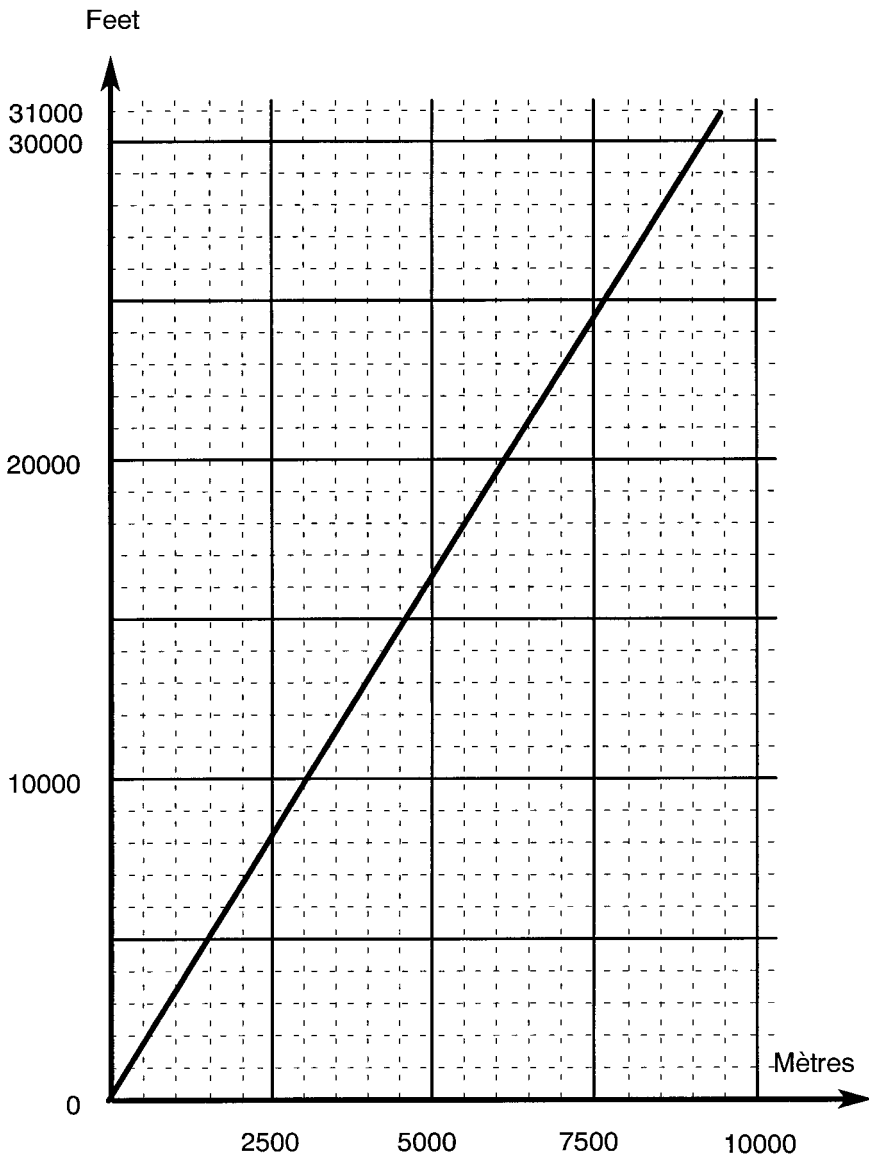


Figure 1.5.2 - FEET VERSUS METRES

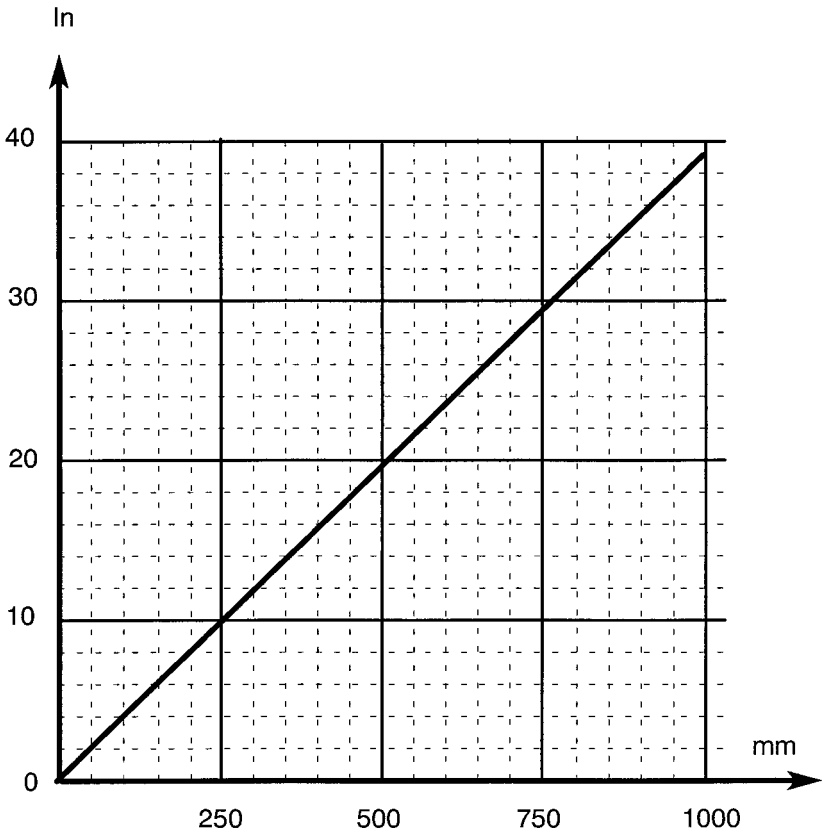


Figure 1.5.3 - INCHES VERSUS MILLIMETRES

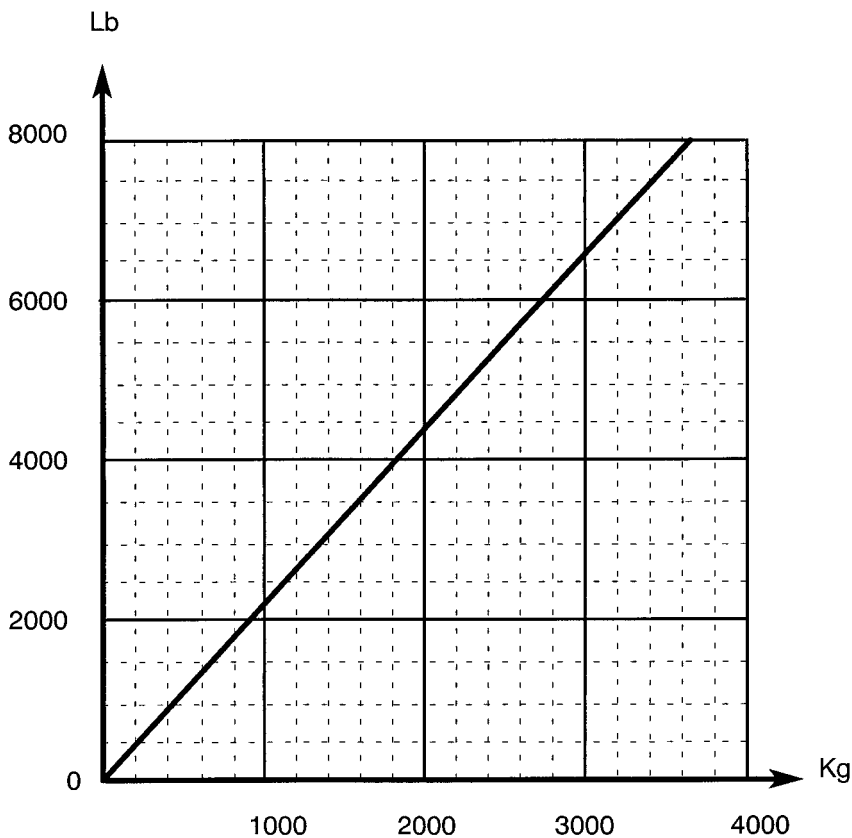


Figure 1.5.4 - POUNDS VERSUS KILOGRAMS



## 1.6 - PRESSURE AND STANDARD ATMOSPHERE

### 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
22000	427.8	- 28.5	- 19.3
24000	392.6	- 32.5	- 26.5
26000	359.8	- 36.5	- 33.6
28000	329.3	- 40.4	- 40.7
30000	300.8	- 44.4	- 47.8
31000	287.4	- 46.4	- 51.6

Figure 1.6.1 - STANDARD ATMOSPHERE