

## 7.5 - LANDING GEAR

The TBM 850 is equipped with electro-hydraulically actuated, fully retractable tricycle landing gear.

Each landing gear is equipped with one wheel and an oil-air shock absorber integrated in the strut.

**Main landing gears** swivel on two ball joints installed on wing spars. Each landing gear retracts toward airplane centerline. The operation is accomplished by a hydraulic actuating cylinder which also provides up and down locking.

**Nose gear** swivels on two ball joints installed on a tubular steel mount frame. Its operation is accomplished by a hydraulic actuating cylinder which also provides up and down locking. The nose wheel is steerable. It is connected to pedals through a spring rod and is provided with a shimmy damper. In UP position, nose wheel is automatically disconnected.

**Actuating cylinders** have a locking device integrated at both ends. This device maintains landing gear in up or down position.

**Landing gear doors**, two on the nose gear, one on each main landing gear, are driven and kept in UP position by the landing gear itself.

All doors are mechanically kept in down position.

## HYDRAULIC PRESSURE

**Hydraulic pressure** required for landing gear operation and main landing gear door operation is accomplished :

- during normal operation, by an electro-hydraulic generator with integrated reservoir,
- during emergency extension operation by a hand pump supplied with an auxiliary reservoir.

## LANDING GEAR CONTROL (Figure 7.5.1)

Landing gear control, located on "LANDING GEAR" panel at the bottom of instrument panel left part, is accomplished by an electric selector actuated through a lever ending with a knob representing a wheel. Operation is carried out by pulling on lever and by putting it in the desired "UP" (retracted) or "DN" (extended) position. This selector controls hydraulic generator.

## LANDING GEAR INDICATOR (Figure 7.5.1)

Landing gear position indication is accomplished by 4 warning lights :

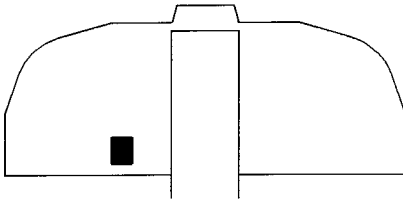
- 3 green indicator lights (one per landing gear) indicate that each landing gear is down-locked,
- 1 red warning light indicates that landing gears are operating, or not locked down or up.

### **NOTE :**

*The red warning light flashes as soon as landing gears are operating and remains continuously on in case of locking problem.*

When landing gear is correctly retracted, all warning lights are OFF. In case of doubt about "landing gear down-locked" position, an independant electrical circuit with the "CHECK DN" switch on the same panel as the warning lights allows testing of the control circuit, therefore providing a countercheck capability of the indication system.

Indication panel is provided with two tests which allow checking green indicator lights and red warning light bulbs through two distinct electric power supplies.



- 1) Red warning light (LDG GR)
- 2) Green indicator light (LDG GR)
- 3) Landing gear control selector
- 4) Test switch
- 5) Test knobs

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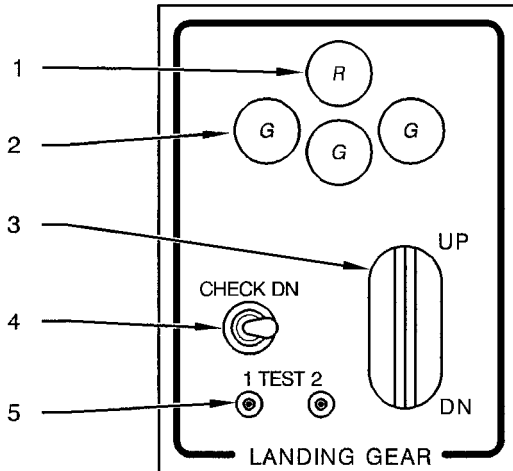


Figure 7.5.1 - CONTROL PANEL AND LANDING GEAR INDICATING

## **SAFETY**

### **Safety switch (landing gear retraction)**

A safety switch installed on each main landing gear prevents, by detecting shock strut compression, landing gear accidental retraction when airplane is on ground.

### **Landing gear horn**

Landing gear horn is controlled by power lever and / or flaps. It sounds (continuous high-pitched sound) when :

- power lever is on IDLE position and landing gear is not down-locked,
- flaps are beyond "TO" position (Takeoff) and landing gear is not down-locked.

#### **NOTE :**

*If one of above conditions exists and airplane is in stall configuration, the audio-warning signal becomes alternated (high-pitched sound / low-pitched sound).*

### **Emergency landing gear extension control**

Emergency landing gear extension control consists of a hand pump and a by-pass selector.

This control is accessible by removing the floor panel located aft of the pedestal.

After bypass selector closing, hand pump operation sends hydraulic fluid directly into landing gear actuators ; landing gear full extension and locking requires about 65 cycles.

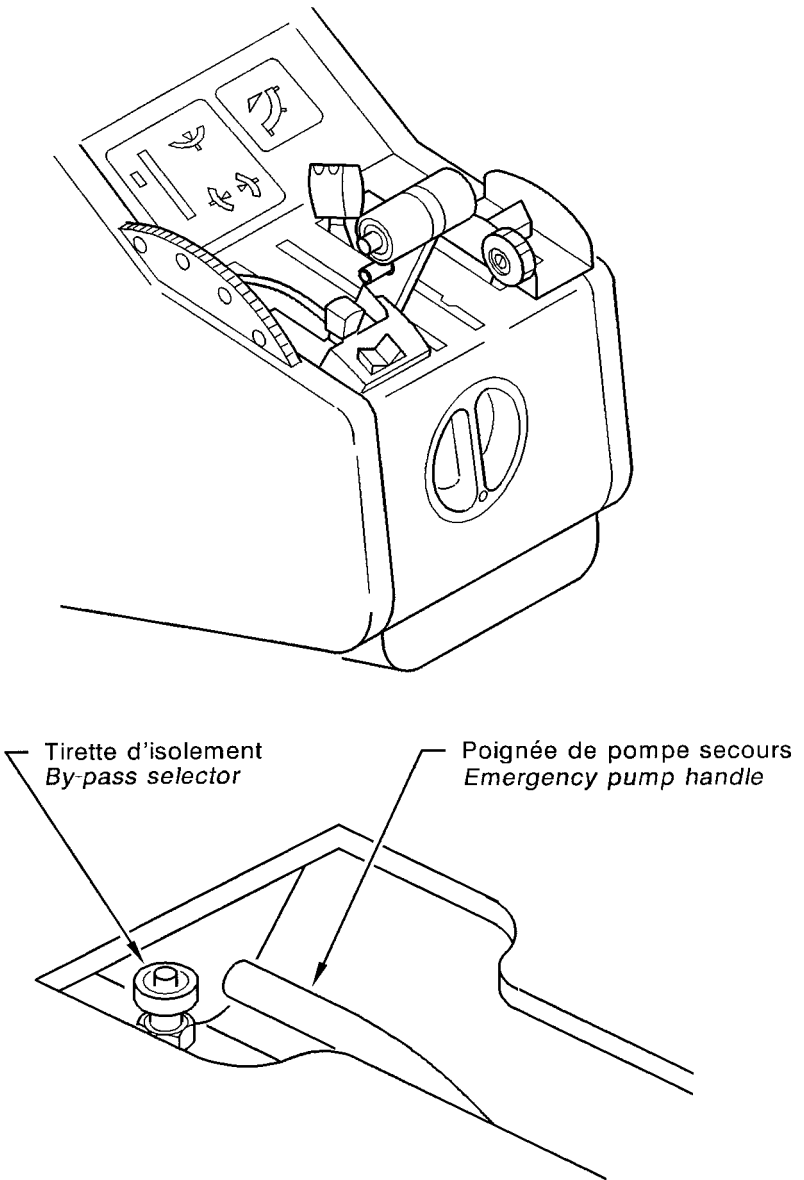


Figure 7.5.2 - EMERGENCY LANDING GEAR EXTENSION CONTROL

## **GROUND MANEUVERS**

### **Nose gear steering control** (Figures 7.5.3 and 7.5.4)

Nose gear steering control is combined with rudder pedals and is fitted with a shimmy damper. When one of rudder pedals is fully pushed, nose wheel swivels about 20°. Steering may be increased up to 28° by applying differential braking to each side.

Airplane may be towed by attaching a steering or towing bar on nose gear (Refer to Chapter 8.6 for operation). In that case nose wheel steering angle is limited to  $\pm 28^\circ$ .

### **Minimum turn diameter**

Minimum turn diameter, Figure 7.5.4, is obtained by using nose gear steering and differential braking. Since tight turns lead to untimely tire wear, turns should be made using the largest possible turning radius.

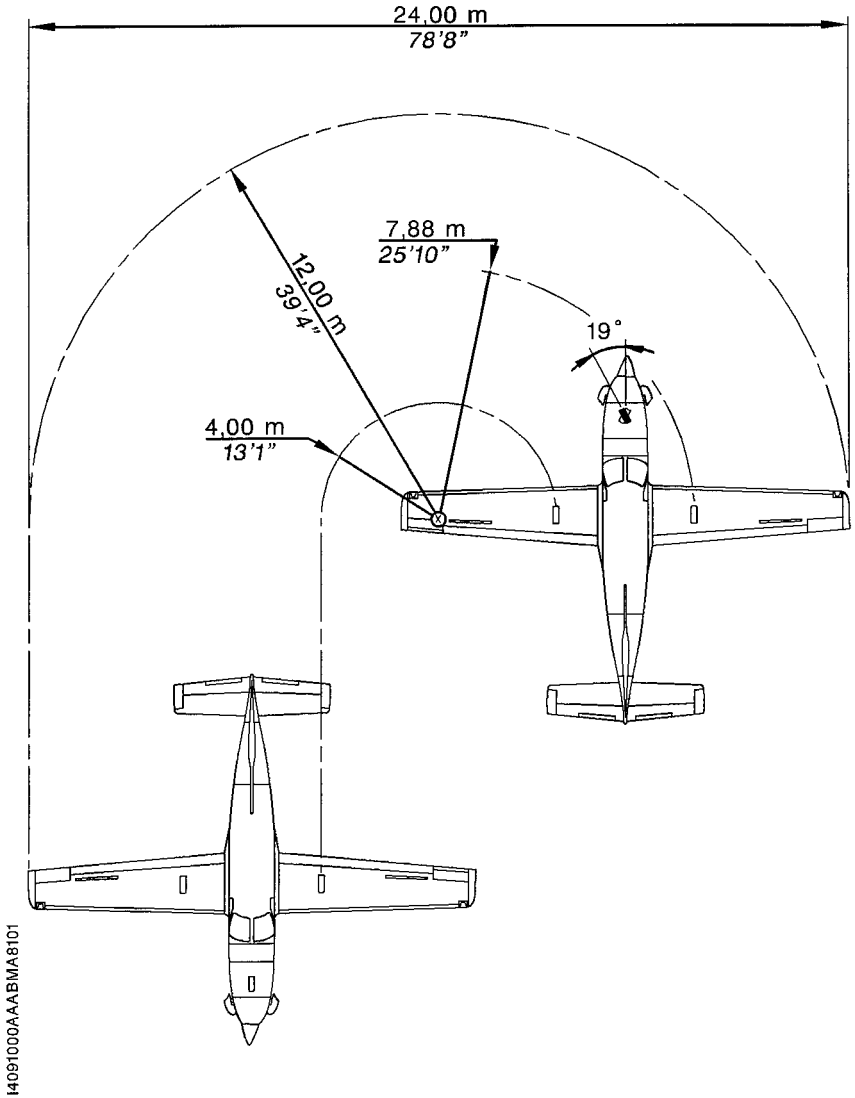


Figure 7.5.3 - MINIMUM TURN DIAMETER  
(Full rudder pedals travel without  
using differential braking)

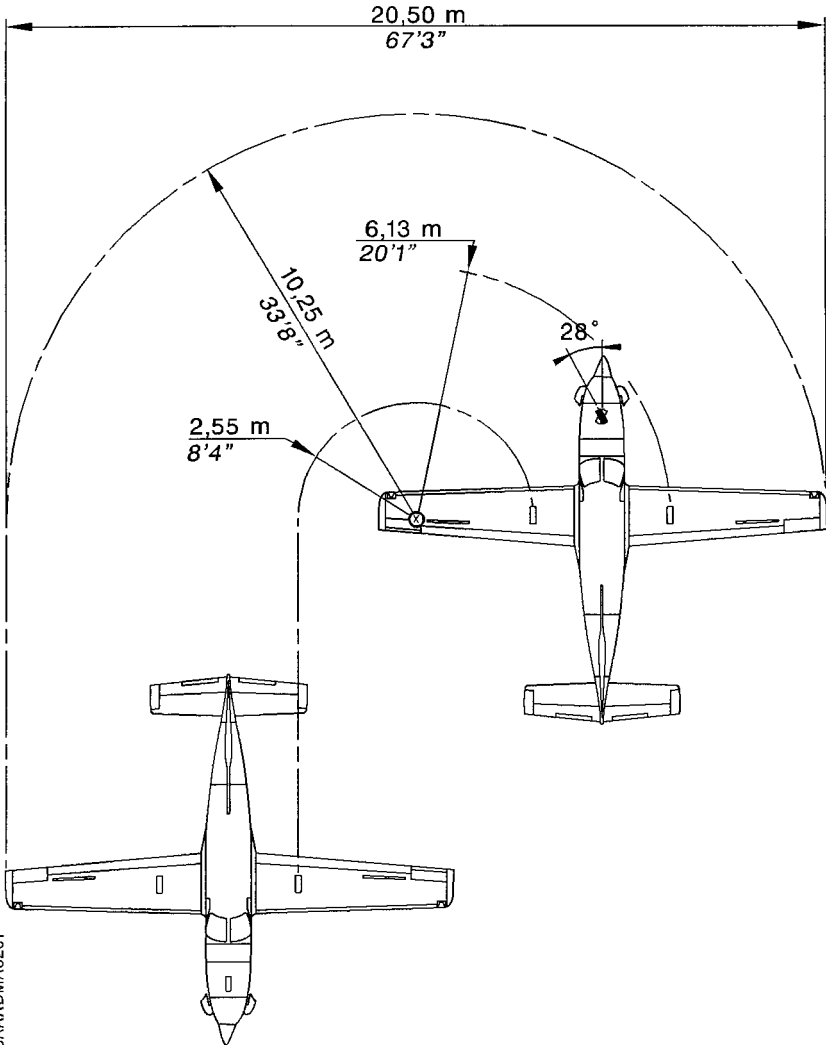


Figure 7.5.4 - MINIMUM TURN DIAMETER  
(Full rudder pedals travel by  
using differential braking)



**BRAKE SYSTEM** (Figure 7.5.5)

Airplane is equipped with a hydraulically actuated disc braking system installed on the main landing gear wheels.

Each toe brake at L.H. and R.H. stations is equipped with a master cylinder which sends hydraulic pressure to the corresponding disc brake : L.H. pedals L.H. brake ; R.H. pedals R.H. brake. This differential braking helps maneuvering during taxiing.

**PARKING BRAKE** (Figures 7.5.5 and 7.5.6)

Parking brake control consists of a control knob located on pilot's side lower instrument panel, a valve which regulates brake pressure and a "PARK BRAKE" warning light located on advisory panel.

To apply parking brake, press on toe brake of rudder pedals and position control knob on "ON".

"PARK BRAKE" warning light illuminates when control knob is positioned on "ON".

**NOTE :**




*Operating the parking brake knob without applying pressure on rudder pedals does not cause the wheels to be braked.*

To release the parking brake, turn the selector to the left in order to set the index upwards to "OFF" position and check at the same time that the "PARK BRAKE" warning light is OFF.

- 1) Reservoir
- 2) Vent
- 3) R.H. station master cylinders
- 4) Parking brake control knob
- 5) Parking brake valve
- 6) Drain
- 7) Pilot's station master cylinders
- 8) L.H. brake assembly
- 9) R.H. brake assembly

Figure 7.5.5 (1/2) - BRAKE SYSTEM

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*Pressure flexible pipe*
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*Pressure rigid pipe*

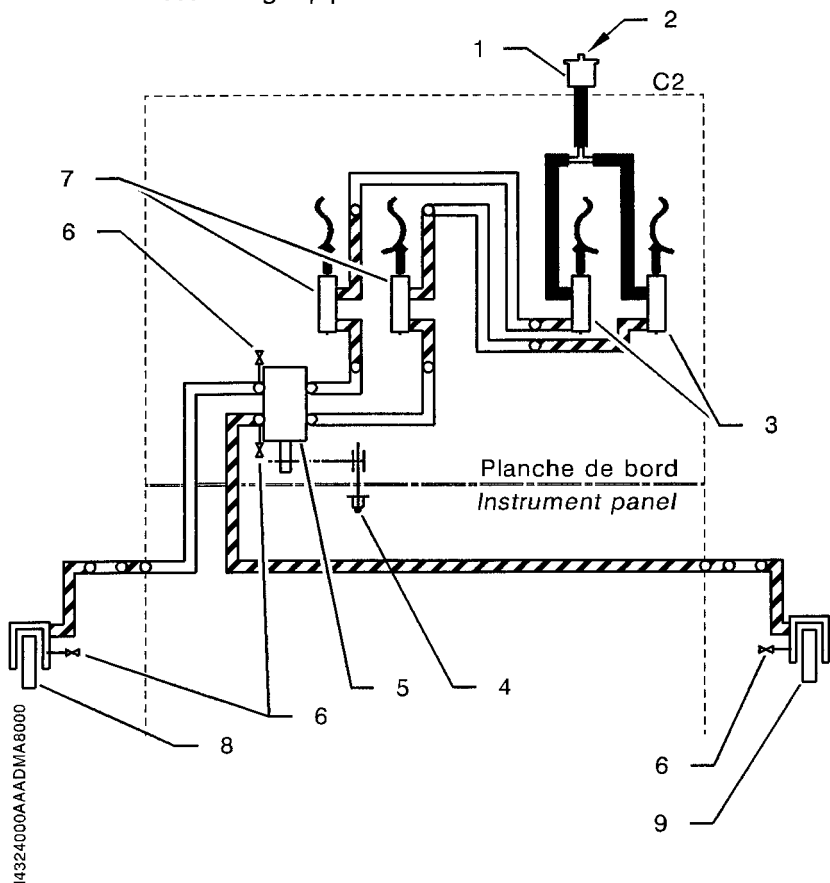
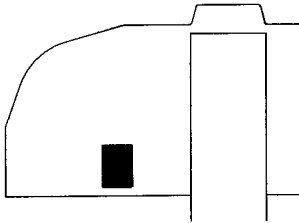


Figure 7.5.5 (2/2) - BRAKE SYSTEM



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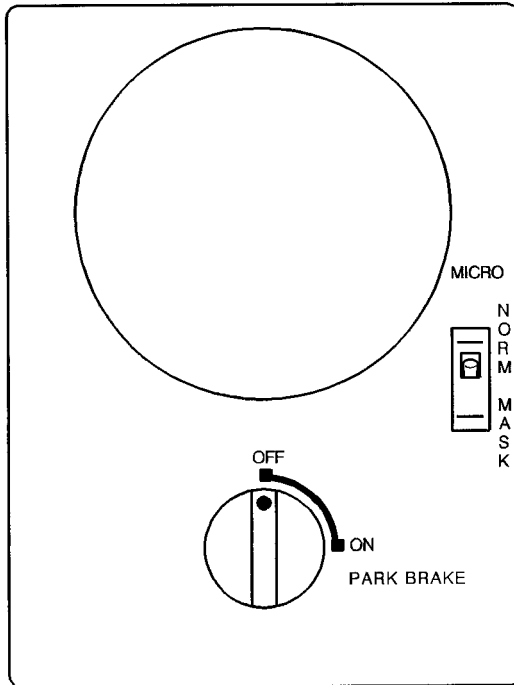


Figure 7.5.6 - PARKING BRAKE