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## CHAPTER 1

# AIRCRAFT - GENERAL

### INTRODUCTION TO THE PIPER MERIDIAN

This training and informational workbook describes the airframe, engine and systems of the Piper Meridian. It is a compilation of operating information and techniques gathered over my 12 years of Meridian Training. It is an excellent refresher program but it is intended for training purposes only and is not a substitute for the POH. The Pilot's Operating Handbook shall take priority over anything written here.

### OBJECTIVES

After completing this chapter, you will be able to:

*Locate and describe:*

Entry Door/Emergency Exit

Fuselage

Baggage Area

Cabin Area

Wing Section

Lights

### HISTORY OF THE PIPER MERIDIAN

The Piper Meridian was introduced in 2000 beginning with serial number 4697003. The airplane has a max gross weight of 5130 pounds and holds 173 gallons of fuel. With a 5.5 pressurization differential and a 260 knot cruise speed, the Piper Meridian was an instant best-seller. Early model Meridians had a max takeoff weight of only 4,850 pounds. Improvements included adding vortex generators to the wing and tail to increase load carrying capacity. These aircraft have 90 vortex generators on the wing and 80 underneath the horizontal tail. Up to five of these can be missing and still remain airworthy. The aircraft is equipped with a Pratt & Whitney PT 6A – 42 engine, rated at 850 hp. It has been flat rated to 500 hp at 2000 RPM. In 2009, Piper began offering the Meridian with the Garmin G1000 complete with the GFC 700 autopilot as a

replacement for the Avidyne Entegra system. The Meridian's base price in 2013 was \$2.18 million resulting in approximately 38 Meridians sold per year. In 2015 Piper introduced the Meridian M500. It has an updated G1000 system with an automatic level function and control overrides to prevent exceeding flight envelopes. Also in 2015, Piper introduced the 600 hp \$2.82 million M600 with the Garmin G3000. The aircraft also has a totally new wing allowing for an increase in gross weight. The Meridian is primarily owner flown.

## **GENERAL**

The Piper Meridian is a high performance, all metal, low wing aircraft. It is approved for day and night IFR/VFR flight operations as well as flight into known icing. The fuselage is pressurized to the skin between pressure bulkheads. The control cables, torque shafts, plumbing and wiring connections that pass through pressure walls are installed with fitted seals or plug connectors to minimize leakage. The Piper Meridian fuselage is of semi-monocoque construction and is fabricated from frames, bulkheads and keels reinforced by longerons and stringers. The manufacturer used extensive adhesive bonding in place of rivets. It is powered by an 850 SHP Pratt & Whitney PT 6A-42 turboprop engine. It is flat rated to 500 SHP at 2000 RPM. This engine incorporates a three-stage axial and a single stage centrifugal compressor which drives a two-stage power turbine. The engine has proven to be extremely reliable. Unscheduled engine shutdowns occur approximately once every 300,000 hours. Depending on the interior configuration, the airplane can accommodate 6 passengers. The carpets are glued to the floor or use Velcro. In the six seat interior option, two pyramid cabinets are located behind the pilot and copilot seats. In the five seat option, the aft facing seat behind the pilot is removed. It is



replaced with an entertainment cabinet. Power for this entertainment center is provided by a switch on the copilot's overhead panel, labeled ENT.

## **CONFERENCE TABLE**

A conference table is located on the right side wall between the passenger seats. It must be stored for take-offs and landings.

## NOSE SECTION

The nose section of the airplane houses the engine and the nose gear. The nose section is accessed via operable panels on each side of the compartment. This compartment incorporates the engine air inlets and oil cooler. The battery is also located in the nose section.

## COCKPIT

### Seats

The pilot and copilot seats are adjustable both fore and aft, as well as vertically. The seat adjustment lever is located under the front edge of the seat. When held in the up position, the seat can be moved forward or aft as required. Lifting the release lever under the front outboard corner of the seat allows vertical adjustments to be made. Consistently good landings can be made by adjusting the vertical position of the seat to create an eye level at the center point of the windshield. Lumbar support is provided by an inflatable bladder operated manually by a squeeze bulb.

### Seat Belts

The shoulder harness installation incorporates an inertia reel attached to the airframe structure. The strap is worn over shoulder and fastened into the lap belt. Spring loading at the inertia reel keeps the harness snug, but still allows normal movement required during flight. The inertia reel is designed to lock during sudden deceleration.



### Oxygen Masks

The quick donning oxygen mask for the pilot is housed in a storage cabinet behind the copilot's seat. The copilot's oxygen mask is stored in a pullout drawer under the copilot's seat. It utilizes an oxygen generation system. Passenger oxygen is provided by two oxygen generators and four oxygen masks stowed in a drawer

below the right aft-facing seat.



### **PILOT TIP**

*Beards and mustaches should be trimmed so that they do not interfere with the proper sealing of the oxygen mask.*

## **LIGHTING SYSTEMS**

### **Cockpit Lights**



An overhead-light control panel, easily accessible to the pilot incorporates a functional arrangement of all lighting systems in the cockpit. Each light group has its own back-lit rheostat which allows for dimming of the cockpit lights. These switches control the panel lights, radio panel lights, and EFIS instrument lights. The overhead cockpit ceiling lights are individually controlled by separate switches.

### **Cabin Lights**

The cabin courtesy lights consists of two ceiling lights in the baggage compartment one ceiling light in the forward cabin and one mid cabin. All of the lights illuminate when the cabin doors opened. An automatic timer prevents battery discharge. The timer extinguishes the lights after 12 minutes.

### **Exterior Lights**

Switches for the landing lights, taxi lights, wing ice lights, navigation lights, recognition lights, and strobe lights are located on the co-pilot's overhead panel. They are appropriately placarded as to their function.

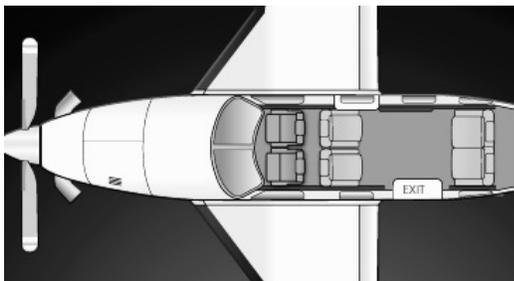


### PILOT TIP

*In fog or low visibility conditions, landing and taxi lights should be left off to reduce light reflections.*

## CABIN CONFIGURATION

Two configurations of passenger seating can be installed. The standard seating configuration is one pilot and five passengers. The passenger cabin is 47 inches high and 49.5 inches wide



providing room for up to four passengers. Two passengers can be accommodated on a rear bench seat and two more can be seated in aft facing individual seats. The copilot seat can also be used as a passenger seat. The cabin passenger seats are not adjustable fore and aft. The back of the bench seats fold forward to

allow access to the aft baggage compartment. The aft facing seat behind the pilot can be replaced with an entertainment center.

Each passenger seat is equipped with an inertia reel type shoulder harness and lap belt. Armrests are installed on the individual passenger seats and between the bench seat backs. Individual controls for the ventilation outlets and reading lights are located next to each seat.

A hand held Halon fire extinguisher is mounted in the lower drawer of the pilot's oxygen cabinet.



### Toilet

The aircraft is not equipped with a chemical or electrically operated toilet. A relief tube is located in a box on the aft side of the main spar.

## **Aft Baggage Compartment**

The 20 cubic foot aft cabin baggage compartment is separated from the cabin by the rear seats. It includes provisions for golf bags as well and providing for up to 100 pounds of baggage storage. All baggage and cargo must be properly secured with the webbing provided. Any item stored in the baggage compartment is accessible in flight.

## **Storage and Dispensing Cabinetry**

Large pyramid cabinets are located just behind the pilot and copilot seats. They provide storage for coffee, water, liquor decanters, trash, cold beverages and ice. The pyramid cabinet behind the copilot's seat also houses the oxygen bottle, pilot's oxygen mask and the Halon fire extinguisher.

## **Airstair Door**



The airstair entrance is attached to the airframe by a piano-type hinge at the bottom and top of the door. The door swings upward and downward when opened. The internal door steps are built into the lower half of the door. While the door is open, the bottom half is supported by a steel cable. Boarding lights provide for passenger boarding at night. The door lights are powered by the hot battery bus and are on a twelve minute timer. The door closes against an inflatable rubber seal which is installed around the opening in the door frame. The door seal is inflated by a series of small holes allowing pressurized air to enter the seal. Inspection ports are located on the door frame to visually confirm positive engagement of each locking pin. When the door is properly secured, a green indicator is visible in each inspection window. Additionally, the door ajar light in the cockpit will be extinguished. On early models of the Meridian, a single retractable cable supports the lower door. On new models, two plastic wrapped steel cables mounted on each side of the door support the lower door.