

PREPARED	PIPER AIRCRAFT CORP. DEVELOPMENT CENTER, VERO BEACH, FLA.	Airplane Flight Manual Model PA-28-180
CHECKED		
APPROVED	REPORT VB-355	PAGE 1 of 10

Piper Model PA-28-180  
Normal and Utility Categories

AIRPLANE FLIGHT MANUAL

1. Limitations Section      The following limitations must be observed in the operation of this airplane:
  - Engine                      Lycoming O-360-A4A
  - Engine Limits              For all operations, 2700 rpm, 180 hp.
  - Fuel                          91/96 minimum octane aviation fuel.
  - Propeller                    Sensenich M76EMMS or 76EM8S5. Maximum diameter 76 inches, minimum diameter 76 inches. Static RPM at maximum permissible throttle setting. Not over 2450, not under 2275. No additional tolerance permitted.
  - Power Instruments
    - Oil Temperature: GREEN arc (normal operating range)  
75° to 245°F  
RED line (maximum) 245°F
    - Oil Pressure: GREEN arc (normal operating range)  
60 psi to 90 psi  
YELLOW arc (caution range)  
25 psi to 60 psi  
RED line (minimum)  
25 psi when installed or  
60 psi when installed  
RED line (maximum) 90 psi
    - Fuel Pressure: GREEN arc (normal operating range)  
.5 psi to 8 psi  
RED line (minimum) .5 psi  
RED line (maximum) 8 psi
    - Tachometer: GREEN arc (normal operating range)  
500 to 2700 rpm  
RED line (maximum continuous power)  
2700 rpm

PREPARED	PIPER AIRCRAFT CORP. DEVELOPMENT CENTER, VERO BEACH, FLA.	Airplane Flight Manual Model PA-28-180
CHECKED		
APPROVED	REPORT VB-355	PAGE <u>2 of 10</u>

Airspeed Limits	Never exceed .....	171 mph
	Maximum structural cruise .....	140
	Maneuvering .....	129
	Flaps extended .....	115
	Maximum positive load factor .....	3.8 Normal Category
	Maximum positive load factor .....	4.4 Utility Category
	Maximum negative load factor .....	No inverted maneuvers approved

Maximum Weight 2400 lbs - Normal Category; 1950 lbs - Utility Category.

Baggage Capacity 200 lbs.

C. G. Range The datum used is 78.4 inches ahead of wing leading edge at the intersection of the straight and tapered section.

1. Normal Category

<u>Weight (Pounds)</u>	<u>Forward Limit (In. Aft of Datum)</u>	<u>Rearward Limit (In. Aft of Datum)</u>
2400	91.0	94.5
2200	87.8	95.9
2150	87.0	95.9
1650	84.0	95.9

2. Utility Category

<u>Weight (Pounds)</u>	<u>Forward Limit (In. Aft of Datum)</u>	<u>Rearward Limit (In. Aft of Datum)</u>
1950	85.8	86.5
1650	84.0	86.5

Straight line variation between points given.

NOTE: It is the responsibility of the airplane owner and the pilot to insure that the airplane is properly loaded. See weight and balance section for proper loading instructions.

FAA APPROVED 9/1/71

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PREPARED	PIPER AIRCRAFT CORP. DEVELOPMENT CENTER, VERO BEACH, FLA.	Airplane Flight Manual Model PA-28-180
CHECKED		
APPROVED	REPORT VB-355	PAGE 3 of 10

Maneuvers

1. Normal Category - All acrobatic maneuvers including spins prohibited
2. Utility Category - Approved maneuvers for Utility Category only.

A. Non - Air Conditioned Models

Entry Speed

Spins (Flaps Up) .....	Stall
Steep Turns .....	129 mph
Lazy Eights .....	129
Chandelles .....	129

B. Air Conditioned Models

Entry Speed

Steep Turns .....	129 mph
Lazy Eights .....	129
Chandelles .....	129

Placards

1. In Full View of the Pilot:

A. Non - Air Conditioned Models

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

ALL MARKINGS AND PLACARDS ON THIS AIRPLANE APPLY TO ITS OPERATION AS A UTILITY CATEGORY AIRPLANE. FOR NORMAL AND UTILITY CATEGORY OPERATIONS, REFER TO THE AIRPLANE FLIGHT MANUAL.

FOR SPIN RECOVERY, USE FULL RUDDER AGAINST SPIN, FOLLOWED IMMEDIATELY BY FORWARD WHEEL.

NO ACROBATIC MANEUVERS (INCLUDING SPINS) ARE APPROVED FOR NORMAL CATEGORY OPERATIONS."

B. Air Conditioned Models

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

FAA APPROVED 9/1/71

REVISED

PREPARED	PIPER AIRCRAFT CORP. DEVELOPMENT CENTER, VERO BEACH, FLA.	Airplane Flight Manual Model PA-28-180
CHECKED		
REVISED	REPORT VB-355	PAGE 4 of 10

Placards  
(Cont'd)

ALL MARKINGS AND PLACARDS ON THIS AIRPLANE APPLY TO ITS OPERATION AS A UTILITY CATEGORY AIRPLANE. FOR NORMAL AND UTILITY CATEGORY OPERATIONS, REFER TO THE AIRPLANE FLIGHT MANUAL.

NO ACROBATIC MANEUVERS ARE APPROVED FOR NORMAL CATEGORY OPERATIONS. SPINS ARE PROHIBITED FOR BOTH NORMAL AND UTILITY CATEGORIES."

2. In full view of the pilot, the following takeoff and landing checklists will be installed:

TAKEOFF CHECKLIST

Fuel on proper tank	Mixture set	Fasten belts/harness
Electrical fuel pump on	Seat backs erect	Trim tab - set
Engine gauges checked		Controls - free
Flaps - set		Door - latched
Carb heat off		Air Conditioner - off

LANDING CHECKLIST

Fuel on proper tank		Flaps - set (115 mph)
Mixture rich	Seat backs erect	Fasten belts/harness
Electric fuel pump on		Air Conditioner - off

The "AIR COND OFF" item in the above takeoff and landing checklists is mandatory for air conditioned aircraft only.

3. In full view of the pilot, in the area of the air conditioner control panel when the air conditioner is installed:

"WARNING - AIR CONDITIONER MUST BE OFF TO INSURE NORMAL TAKEOFF CLIMB PERFORMANCE."

4. Adjacent to upper door latch: "ENGAGE LATCH BEFORE FLIGHT."

5. On inside of the baggage compartment door:

"BAGGAGE MAXIMUM 200 LBS."

"UTILITY CATEGORY OPERATION - NO BAGGAGE OR AFT PASSENGERS ALLOWED. NORMAL CATEGORY OPERATION - SEE AIRPLANE FLIGHT MANUAL WEIGHT AND BALANCE SECTION FOR BAGGAGE AND AFT PASSENGER LIMITATIONS."

FAA APPROVED 9/1/71

REVISED 12/10/71

PREPARED	PIPER AIRCRAFT CORP. DEVELOPMENT CENTER, VERO BEACH, FLA.	Airplane Flight Manual Model PA-28-180
CHECKED		
REVISED	REPORT VB-355	PAGE 5 of 10

Placards  
(Cont'd)

6. In full view of the pilot:
  - "ROUGH AIR OR MANEUVERING SPEED - 129 MPH."
  - "UTILITY CATEGORY OPERATION - NO AFT PASSENGERS ALLOWED."
7. On the instrument panel in full view of the pilot when the oil cooler winterization kit is installed:
  - "OIL COOLER WINTERIZATION PLATE TO BE REMOVED WHEN AMBIENT TEMPERATURE EXCEEDS 50° F."
8. On the instrument panel in full view of the pilot when the autoflite is installed:
  - "FOR HEADING CHANGES: PRESS DISENGAGE SWITCH ON CONTROL WHEEL. CHANGE HEADING, RELEASE DISENGAGE SWITCH."
9. In full view of the pilot: "Utility Category Only."
  - Acrobatic maneuvers are limited to the following:
 

A.	Non - Air Conditioned Models	<u>Entry Speed</u>
	Spins (Flaps Up) . . . . .	Stall
	Steep Turns . . . . .	129 mph
	Lazy Eights . . . . .	129
	Chandelles . . . . .	129
B.	Air Conditioned Models	<u>Entry Speed</u>
	Steep Turns . . . . .	129 mph
	Lazy Eights . . . . .	129
	Chandelles . . . . .	129
10. On the instrument panel in full view of the pilot when the AutoFlite II is installed:

FAA APPROVED 9/1/71

REVISED 12/10/71

PREPARED	PIPER AIRCRAFT CORP. DEVELOPMENT CENTER, VERO BEACH, FLA.	Airplane Flight Manual Model PA-28-180
CHECKED		
REVISED	REPORT VB-355	PAGE 6 of 10

Placards  
(Cont'd)

"TURN AUTOFLITE ON. ADJUST TRIM KNOB FOR MINIMUM HEADING CHANGE. FOR HEADING CHANGE, PRESS DISENGAGE SWITCH ON CONTROL WHEEL, CHANGE HEADING, RELEASE SWITCH. ROTATE TURN KNOB FOR TURN COMMANDS. PUSH TURN KNOB IN TO ENGAGE TRACKER. PUSH TRIM KNOB IN FOR HI SENSITIVITY. LIMITATIONS AUTOFLITE OFF FOR TAKEOFF AND LANDING."

11. On the instrument panel in full view of the pilot when the supplementary white strobe lights are installed:

"WARNING - TURN OFF STROBE LIGHTS WHEN TAXIING IN VICINITY OF OTHER AIRCRAFT, OR DURING FLIGHT THROUGH CLOUD, FOG OR HAZE."

Airspeed  
Instrument  
Markings

RED radial line	Never Exceed	171 mph (148 knots)
YELLOW arc	Caution Range (Smooth Air Only)	140 to 171 mph (121 to 148 knots)
GREEN arc	Normal Operating Range	67 to 140 mph (58 to 121 knots)
WHITE arc	Flap Down Range	57 to 115 mph (50 to 100 knots)

Air Conditioned  
Airplanes

Air conditioner must be off for takeoff and landing.

2. Procedures  
Section

1. The stall-warning system is inoperative with the master switch off.
2. Electric fuel pump must be on for both landing and takeoff.
3. The PA-28-180 airplane is approved under FAA Regulation CAR 3 which prohibits intentional spins for normal category operation. The following information is noteworthy:
  - a. The stall characteristics of the PA-28-180 are normal with the nose pitching down moderately following the stall, occasionally with a moderate roll which can be corrected by normal use of ailerons and rudder against the roll.

FAA APPROVED 9/1/71

REVISED 12/10/71

PREPARED	PIPER AIRCRAFT CORP. DEVELOPMENT CENTER, VERO BEACH, FLA.	Airplane Flight Manual Model PA-28-180
CHECKED		
REVISED	REPORT VB-355	PAGE <u>7 of 10</u>

Procedures

Section  
(Cont'd)

- b. Prolonged use of full rudder during stall practice may result in a rapid roll followed by a spin and should be avoided. Recovery from an incipient spin may be effected in less than one additional turn by use of opposite rudder followed by full forward control wheel.
  - c. In the event that a fully developed spin is inadvertently experienced, recovery is best made by using full opposite rudder followed by full forward wheel and full opposite aileron. The control positions against the spin should be maintained during the entire recovery, which may require several turns and a substantial loss of altitude if the airplane is loaded heavily with a rearward center of gravity.
4. Except as noted above, all operating procedures for this airplane are normal.
5. (Electric Pitch Trim Installation Only with Pitch Trim Switch)
- The following emergency information applies in case of electric pitch trim malfunction:
- a. In case of malfunction, disengage electric pitch trim by pushing pitch trim switch on instrument panel to OFF position.
  - b. In an emergency, electric pitch trim may be overpowered using manual pitch trim.
  - c. In cruise configuration, malfunction results in 10° pitch change and 30 ft. altitude variation.
6. (Autoflite Installation Only)
- The following emergency information applies in case of autoflite malfunction:
- a. In case of malfunction PRESS disconnect switch on pilot's control wheel.
  - b. Rocker switch on instrument panel - OFF.
  - c. Unit may be overpowered manually.

FAA APPROVED 9/1/71

REVISED 12/10/71

PREPARED	PIPER AIRCRAFT CORP. DEVELOPMENT CENTER, VERO BEACH, FLA.	Airplane Flight Manual Model PA-28-180
CHECKED		
APPROVED	REPORT VB-355	PAGE 8 of 10

Procedures  
Section  
(Cont'd)

- d. In cruise configuration malfunction, 3 seconds delay results in 60° bank, and 100 ft. altitude loss.
  - e. In approach configuration malfunction, 1 second delay results in 10° bank and 0 ft. altitude loss.
7. (AutoControl III Installation Only)
- I. Limitations: Autopilot off during takeoff and landing.
  - II. Procedures:
    - a. Normal Operation  
Refer to Manufacturer's Operation Manual.
    - b. Emergency
      - 1. In case of malfunction, turn off autopilot.
      - 2. In emergency, autopilot may be overpowered manually.
      - 3. In cruise configuration malfunction, 3 seconds delay results in 60° bank and 100 ft. altitude loss.
      - 4. In approach configuration malfunction, 1 second delay results in 10° bank and 0 ft. altitude loss.
8. (AutoFlite II Installation Only)
- I. Limitations: AutoFlite off for takeoff and landing.
  - II. Procedures:
    - a. Normal Operation - Refer to Manufacturer's Operation Manual.
    - b. Emergency
      - 1. In case of malfunction PRESS disconnect switch on pilot's control wheel.
      - 2. Rocker switch on instrument panel - OFF.

FAA APPROVED 9/1/71  
REVISED 12/10/71

PREPARED	PIPER AIRCRAFT CORP. DEVELOPMENT CENTER, VERO BEACH, FLA.	Airplane Flight Manual Model PA-28-180
CHECKED		
REVISED	REPORT VB-355	PAGE <u>9 of 10</u>

Procedures

Section  
(Cont'd)

3. Autopilot may be overpowered manually.
4. In cruise configuration malfunction, 3 seconds delay results in 60° bank, and 100' altitude loss.
5. In approach configuration malfunction, 1 second delay results in 10° bank and 0' altitude loss.

9. (Air Conditioned Models Only)

Prior to takeoff, the air conditioner should be checked for proper operation as follows:

- a. Check aircraft master switch on
- b. Turn the air conditioner control switch to "AIR COND" - the "AIR COND DOOR OPEN" warning light will turn on, thereby indicating proper air conditioner condenser door actuation.
- c. Turn the air conditioner control switch to OFF - the "AIR COND DOOR OPEN" warning light will go out, thereby indicating the air conditioner condenser door is in the up position.
- d. If the "AIR COND DOOR OPEN" light does not respond as specified above, an air conditioner system or indicator bulb malfunction is indicated and further investigation should be conducted prior to flight.

The above operational check may be performed during flight if an inflight failure is suspected.

10. Air Conditioned Models only: Warning - The air conditioner must be off to insure normal takeoff performance.

3. Performance  
Section

The following performance figures were obtained during FAA type tests and may be realized under conditions indicated with the airplane and engine in good condition and with average piloting technique. All performance is given for 2400 pounds.

FAA APPROVED 9/1/71

REVISED 12/10/71

PREPARED	PIPER AIRCRAFT CORP. DEVELOPMENT CENTER, VERO BEACH, FLA.	Airplane Flight Manual Model PA-28-180
CHECKED		
APPROVED	REPORT VB-355	PAGE <u>10</u> of <u>10</u>

3. Performance  
Section  
(continued)

Loss of altitude during stalls varied from 125 to 200 feet, depending on configuration and power.

Stalling speeds, in mph, power off, versus angle of bank  
(Calibrated Airspeed):

Angle of bank	0	20	40	50	60
Flaps Up	67	69	76	83	94
Flaps Down	57	--	--	--	--

Air Conditioned Models only:

When the full throttle position is not used or in the event of a malfunction which causes the compressor to operate and the condenser door to remain extended, a decrease in rate of climb of as much as 100 fpm can be expected at all altitudes.

FAA APPROVED 12/10/71

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