

# PIPER AIRCRAFT CORPORATION

LOCK HAVEN, PENNA.

REPORT 941

PAGE \_\_\_\_\_

MODEL PA-22"160"

PIPER AIRCRAFT CORPORATION

LOCK HAVEN, PENNA.

MODEL PA-22"160"

REPORT NO. 941

## DUPLICATE

AIRPLANE FLIGHT MANUAL - PIPER MODEL PA-22"160"

DATE: 8/27/57

Prepared by:

*C. R. Smith*

C. R. Smith  
Engineering Dept.

PREPARED \_\_\_\_\_

CHECKED \_\_\_\_\_

APPROVED \_\_\_\_\_

**PIPER AIRCRAFT CORPORATION**  
LOCK HAVEN, PENNA.

REPORT 941  
PAGE 1  
MODEL PA-22"160"

THIS DOCUMENT MUST BE KEPT IN THE AIRPLANE AT ALL TIMES

**DUPLICATE**

CAA APPROVED  
APPROVAL BASIS CAR 3 AND 410  
AUGUST 27, 1957  
NORMAL CATEGORY  
2000 POUNDS GROSS WEIGHT

C.A.A. Identification No. 22-6667

AIRPLANE FLIGHT MANUAL

1. Limitations

The following limitations must be observed in the operation of this airplane:

Engine	Lycoming O-320 Series
Engine Limits	For all operations 2700 RPM
Fuel	91/96 Octane Minimum Aviation Gasoline
Propellers	(a) Sensenich M74DM, Fixed Pitch Metal 74.0" Maximum Diameter 72.0" Minimum Diameter Static Limits: Maximum 2450 RPM Minimum 2250 RPM
Power Instruments	Oil Temperature-Unsafe if indicator exceeds Red Line (245 degrees F) Yellow Arc: Caution (40 degrees F to 120 degrees F.) Green Arc: Normal Operating Range (120 degrees F. to 245 degrees F.) Oil Pressure-Unsafe if indicator exceeds Red line (100 lbs.) or is below the Red line (25 lbs. minimum) Yellow Arc: Caution (85 lbs. to 100 lbs.) and (25 lbs. to 60 lbs.) Green Arc: Normal Operating Range (60 lbs. to 85 lbs.) Tachometer-Red line: Rated Engine Speed Green Arc: 500 RPM to 2700 RPM Normal Operating Range
Flap Position	Take-Off 0 Degrees Landing 40 Degrees
Airspeed Limits (True Ind. Airspeed)	Normal Category
Maneuvering	112 MPH 97.0 Knots
Max. Cruising Speed	135 MPH 117.0 Knots
Never Exceed	170 MPH 148.0 Knots
Flaps Extended	95 MPH 82.0 Knots

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Revised 4/20/59, 4/9/64

# PIPER AIRCRAFT CORPORATION

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MODEL PA-22 "160"

## Flight Load Factors

Max. Positive

3.8

Max. Negative

No Inverted Maneuvers Approved

## Airplane Loading

Max. Wgt. (Take-Off and Landing)

2000 Pounds

## C. G. Range

(Aft Wing Leading Edge)

{+17.5"} to {+23.0"} at 2000 lbs.

{+12.0"} to {+23.0"} at 1800 lbs.

{+9.5"} to {+23.0"} at 1400 lbs. or less

## Maximum Baggage

Allowed

100 Pounds

Note: It is the responsibility of the airplane owner and the Pilot to insure that the airplane is properly loaded. (See Weight and Balance.)

## Placards:

(a) On the instrument panel in full view of the Pilot:

(1) "Operate in Normal Category in compliance with the Approved Flight Manual. Acrobatics (including spins) prohibited."

(b) On the Baggage Compartment:

(1) "Maximum Baggage 100 Pounds."

## Maneuvers

(a) No acrobatic maneuvers approved for Normal Category Operation.

## Airspeed

Instrument

Markings

And Their

Significance

(a) Radial Red line marks the never exceed speed which is the maximum safe airspeed 170 MPH. (148 Knots)

(b) Yellow Arc on indicator denotes range of speed in which operations should be conducted with caution and only in smooth air 135 to 170 MPH (117.0 to 148.0 Knots)

(c) Green Arc denotes normal operating speed range 53 to 135 MPH (39 to 117 Knots)

(d) White Arc denotes normal operating speed range with flaps extended 49 to 95 MPH (43 to 82 Knots)

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# PIPER AIRCRAFT CORPORATION

LOCK HAVEN, PENNSA.

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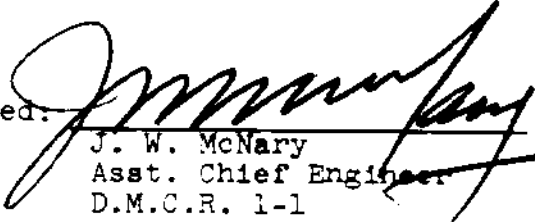
MODEL PA-22 "16"

## II. Procedures

(a) Except as noted above, all operating procedures for this airplane are conventional.

## III. Performance Information

(a) Loss of altitude during stall recovery with flaps extended 40° is 120 feet. Other stall configurations result in less altitude loss than that shown above.

Approved: 

J. W. McNary  
Asst. Chief Engineer  
D.M.C.R. 1-1

Date: 8/27/57

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# PIPER AIRCRAFT CORPORATION

LOCK HAVEN, PENNSA.

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MODEL PA-22"160"

SUPPLEMENT NO. 1

TO

AIRPLANE FLIGHT MANUAL DATED AUGUST 27, 1957.

THIS DOCUMENT MUST BE ATTACHED TO THE BASIC AIRPLANE FLIGHT MANUAL AND KEPT IN THE AIRPLANE WHEN THE ITEM OF EQUIPMENT DESIGNATED HEREINBELOW IS INSTALLED.

MODEL PA-22"160"

CAA APPROVED  
APPROVAL BASIS CAR 3 AND 410  
August 27, 1957.  
UTILITY CATEGORY  
1680 POUNDS GROSS WEIGHT

C.A.A. IDENTIFICATION NO. \_\_\_\_\_

INSTALLATION OF CONTROLS MODIFICATION  
KIT FOR OPERATION IN UTILITY CATEGORY  
PER PIPER DRAWING NO. 14926 (HARTZELL  
PROPELLER INSTALLATION NOT ELIGIBLE)

## AIRPLANE FLIGHT MANUAL SUPPLEMENT

### 1. LIMITATIONS

#### Airspeed Limits

(True Ind. Airspeed)

	Utility Category	
Maneuvering	112 MPH.	97.0 Knots
Max. Cruising	126 MPH.	109.5 Knots
Never Exceed	170 MPH.	148.0 Knots
Flaps Extended	95 MPH.	82.0 Knots

#### Flight Load Factors

Max. Positive 4.4  
Max. Negative No Inverted Maneuvers Approved

#### Airplane Loading

Max. Weight (Take-off and Land-  
ing). ~~1680~~ pounds  
When operating in the Utility Cat-  
egory the two front seats only  
may be occupied and the auxiliary  
fuel tank if installed must be  
empty. See Weight and Balance.

Max. Baggage

None

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# PIPER AIRCRAFT CORPORATION

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MODEL PA-22 "160"

C. G. Range (Aft Wing Leading Edge)  
{+9.5"} to {+13.5"} at 1400 lbs. or less  
{+12.0"} to {+13.5"} at 1665 lbs.  
{+13.5"} at 1680 lbs.  
Straight line variation between points given.

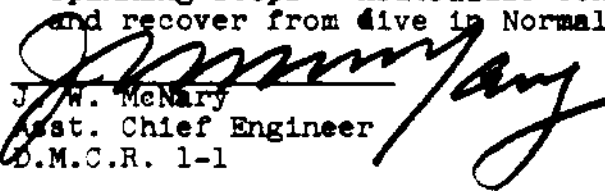
Placards (a) On the instrument panel in full view of the Pilot:  
  
(1) "Operate in Normal or Utility Category in compliance with the approved Flight Manual. Airplane marked for Normal Category. Acrobatics (including spins) prohibited in Normal Category."

Maneuvers (a) No Acrobatic Maneuvers Approved For Normal Category Operation.  
  
(b) Intentional spinning with flaps down prohibited.  
  
(c) The following maneuvers are approved for operation in the Utility Category only, with recommended entry speeds shown:

<u>Maneuver</u>	<u>Entry Speed T.I.A.S</u>
Chandelles	130 MPH
Lazy Eights	130 MPH
Steep Turns	112 MPH
Spins	Stall
Stalls (Except whip stalls)	Stall

Procedures (a) Spin Recovery Control Use  
  
1. Apply full rudder against spin  
  
2. Apply full nose down elevator sharply  
  
3. Apply full aileron with spin ie. Right spin - right aileron  
  
4. Hold controls in positions noted until spinning stops - neutralize controls and recover from dive in Normal manner

APPROVED:

  
J. W. McNary  
Asst. Chief Engineer  
D.M.C.R. 1-1

DATE: August 27, 1957

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# PIPER AIRCRAFT CORPORATION

LOCK HAVEN, PENNSA.

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MODEL PA-22 "160"

SUPPLEMENT NO. 2 TO AIRPLANE FLIGHT MANUAL  
DATED AUGUST 27, 1957

THIS DOCUMENT MUST BE ATTACHED TO THE BASIC AIRPLANE FLIGHT  
MANUAL AND KEPT IN THE AIRPLANE WHEN THE ITEM OF EQUIPMENT  
DESIGNATED HEREINELOW IS INSTALLED.

CAA Approved  
Approval Basis  
CAR 3 and 410  
August 27, 1957  
Normal Category  
2000 Pounds Gross Weight

C.A.A. Identification No. \_\_\_\_\_

AIRPLANE FLIGHT MANUAL  
SUPPLEMENT PA-22 "160"  
INSTALLATION OF AUXILIARY  
FUEL TANK

## II. PROCEDURES

Use of the auxiliary fuel system shall be as follows:

1. Operate reserve fuel valve only when right main tank fuel supply is exhausted and before more than 1/2 of left main tank fuel supply is consumed.
2. Turn fuel selector valve to left tank.
3. Pull fuel reserve knob "ON"
4. Leave fuel reserve knob in "ON" position for not less than 25 minutes nor more than 30 minutes.
5. Push fuel reserve knob "OFF".

### CAUTION

Do not attempt flight, using fuel from right tank, during fuel transfer operation. Transfer fuel during level flight only.

J. W. McNary  
Asst. Chief Engineer  
Piper Aircraft Corporation  
Lock Haven, Pennsylvania  
DMCR 1-1  
August 27, 1957

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# PIPER AIRCRAFT CORPORATION

LOCK HAVEN, PENNA.

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PAGE 1  
MODEL PA-22"160

SUPPLEMENT NO. 3 TO AIRPLANE FLIGHT MANUAL  
DATED AUGUST 27, 1957

THIS DOCUMENT MUST BE ATTACHED TO THE BASIC AIRPLANE FLIGHT MANUAL  
AND KEPT IN THE AIRPLANE WHEN THE ITEM OF EQUIPMENT DESIGNATED  
HEREINBELOW IS INSTALLED.

Model PA-22"160"  
Serial No's 22-6328,  
22-6344, 22-6352 and up.

CAA Approved  
Approval Basis CAR 3 and 410  
August 7, 1958  
Normal Category  
2000 Pounds Gross Weight

C.A.A. Identification No. \_\_\_\_\_

AIRPLANE FLIGHT MANUAL  
SUPPLEMENT PA-22"160"  
INSTALLATION OF PIPER  
AUTOCONTROL MODEL AK064

Piper Autocontrol Model AK064

Placards:

On instrument panel in full view of pilot

1. Operating instructions.
2. "Push to engage" control identification.  
"Disengage during take-off and landing"
3. "Turn control".

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# PIPER AIRCRAFT CORPORATION

LOCK HAVEN, PENNA.

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MODEL PA-22"160

## Normal Operation:

1. Check vacuum (4 in.  $\pm$  .25), level horizon and push "Turn Control" knob in and center.
2. Push in "Autocontrol Engage" knob, rocking control wheel if necessary.
3. Rotate the "Turn Control" knob full right and full left. Determine that the control wheel describes a corresponding right and left turn, then center knob.
4. Mechanically cage the directional gyro and move card to zero heading and uncage.
5. Pull "Turn Control" knob out.

The Autocontrol is now "locked-in" for directional control. The "Turn Trim" knob in center of "Turn Control" knob is for vernier trimming and is necessary to maintain zero heading for various conditions of power, load etc.

6. Turns may be accomplished by either of the following methods:
  - a. Push the "Turn Control" knob in and move in desired direction.
  - b. Mechanically cage the directional gyro. Move card number of degrees of turn desired.

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# PIPER AIRCRAFT CORPORATION

LOCK HAVEN, PENNA.

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MODEL PA-22"160

## Normal Operation: (Continued)

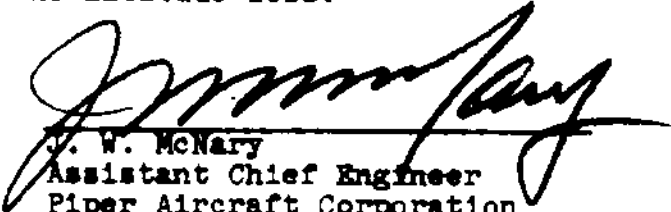
7. For course control push the "Turn Control" knob in and turn until on desired heading. Set directional gyro to zero "0" and engage gyro by pulling "Turn Control" knob.

(Maximum angle of bank is 20 degrees. For banks in excess of 20 degrees disengage the autocontrol).

8. Disengage the autocontrol by pulling the "Autocontrol Engage" knob out. ("Off").

## Emergency Procedures:

1. In the event of a malfunction in the autocontrol, pull the "Autocontrol Engage" knob out. This completely disengages the autocontrol from the control system.
2. Autocontrol may be overpowered manually by exertion of 16 lbs. force on the control wheel.
3. In cruise configuration autocontrol malfunction with a 3 second recovery delay resulted in a 15 degree bank and no altitude loss.
4. In approach configuration autocontrol malfunction with a 1 second recovery delay resulted in a 5-8 degree bank and no altitude loss.

  
J. W. McNary  
Assistant Chief Engineer  
Piper Aircraft Corporation  
Lock Haven, Pennsylvania

DMCR 1-1  
August 7, 1958

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# PIPER AIRCRAFT CORPORATION

LOCK HAVEN, PENNSA.

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MODEL PA-22"160

## FLIGHT MANUAL SUPPLEMENT NO. 4

THIS DOCUMENT MUST BE ATTACHED TO THE BASIC FLIGHT MANUAL AND KEPT IN THE AIRPLANE WHEN THE MODIFICATION DESCRIBED BELOW IS MADE.

Approval Basis CAR 3 & 410  
September 15, 1961.  
Piper Model PA-22"160"  
With Rear Door Removed  
Normal Category Only

FAA IDENTIFICATION NO. N

REMOVAL OF REAR DOOR - PA-22"160"

### LIMITATIONS:

#### A. Placards

1. Airplane maneuvers are limited to normal take-offs, climbs, banks not to exceed 30 degrees, glides and landings, and speeds not in excess of 128 MPH.
2. No smoking permitted.

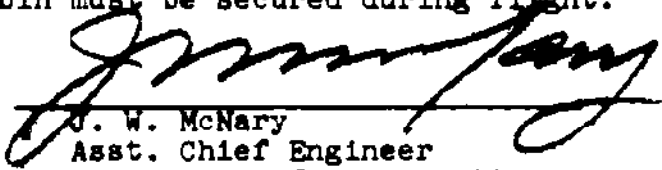
#### B. Airspeed Limitations

The operating speeds shown below must be observed when the airplane is flown with the rear door removed:

Vne (Never exceed)	128 MPH TIAS
Vc (Max. structural cruise)	100
Vp (Maneuvering)	100
Vf (Flaps down)	80

#### C. Loading

No baggage is to be carried when the airplane is flown with the rear door removed. All removable objects in the cabin must be secured during flight.



J. W. McNary  
Asst. Chief Engineer  
Piper Aircraft Corporation  
Lock Haven, Pennsylvania  
DMCR 1-1  
September 15, 1961

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PIPER AIRCRAFT CORPORATION  
LOCK HAVEN, PENNA.

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PA-18 "135"  
PA-18A "135"  
PA-20 "135"  
PA-22 "135"  
PA-18 "150"  
PA-18A "150"  
PA-22 "150"  
PA-22 "160"  
PA-25

PIPER AIRCRAFT CORPORATION  
LOCK HAVEN, PENNA.

REPORT NO. 790

WINTERIZATION SUPPLEMENT  
TO  
AIRPLANE FLIGHT MANUALS


PIPER MODELS PA-18 "135", PA-18A "135",  
PA-18 "150", PA-18A "150", PA-20 "135",  
PA-22 "135", AND PA-22 "150", PA-22 "160"  
PA-25

DATE: DECEMBER 29, 1952.

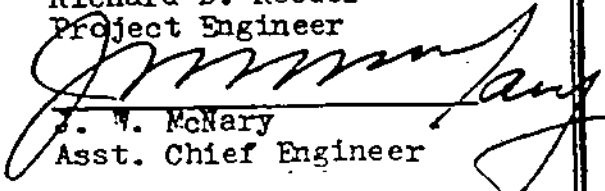
REVISED: SEPTEMBER 30, 1954.

REVISED: AUGUST 19, 1958

REVISED: JANUARY 19, 1959 Prepared by:

  
Richard D. Reeder  
Project Engineer

Checked by:

  
J. W. McNary  
Asst. Chief Engineer

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# PIPER AIRCRAFT CORPORATION

LOCK HAVEN, PENNSA.

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MODEL

4/3/56  
19/59

CAA Approved  
Approval Basis CAR 3 and 410  
December 29, 1952.  
Revised September 30, 1954

PA-18 "135"  
PA-18A "135"  
PA-20 "135"  
PA-22 "135"  
PA-18 "150"  
PA-18A "150"  
PA-22 "150"  
PA-22 "160"  
PA-25

## WINTERIZATION SUPPLEMENT TO PIPER

PA-18 "135", PA-18A "135", PA-18 "150", PA-18A "150",  
PA-20 "135", PA-22 "135", PA-22 "150", PA-22 "160", PA-25  
AIRPLANE FLIGHT MANUAL

Airplane Identification No. \_\_\_\_\_

Note: This Supplement must be attached to the C.A.A. Approved Airplane Flight Manual when the alternate equipment specified below is installed. Information contained herein supplements or supersedes corresponding information of the basic manual.

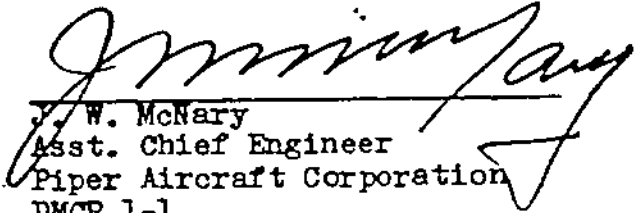
## Alternate Equipment - Piper Winterization Kit

### I. Installation Instructions

Winterization kit consists of oil radiator cover Piper No. 14793 installed on the front of the oil radiator, Placard, Piper No. 14090 installed in the cockpit in front of and in full view of the pilot, and Winterization Supplement Piper Report No. 790, attached to the C.A.A. Approved Airplane Flight Manual.

### II. Limitations

Winterization Kit for use on airplanes operating in outside air temperatures below 40°F. Kit must be removed when operating in temperatures above 40°F.

  
J. W. McNary  
Asst. Chief Engineer  
Piper Aircraft Corporation  
DMCR 1-1

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