

# N3860T

## 1967 Piper Arrow

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# Weight & Balance



**MSN: 28R-30183**

*Prepared by the worldwide aviation specialists at RidgeAir, Inc.*

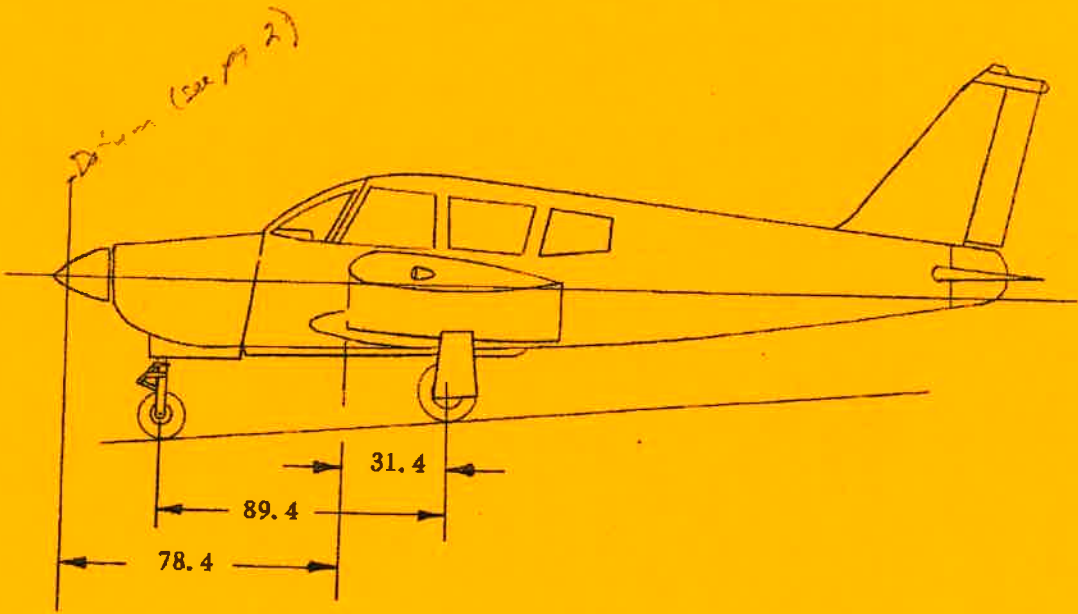
|          |  |   |
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COMPUTED  
~~XX TOTAL~~ WEIGHT AND BALANCE  
MODEL PA-28R-180  
(RETRACTABLE)

SERIAL NUMBER 28R- 30183

CERTIFICATE NUMBER N3860T

DATE NOV 4 1967



*Diagram (see p. 2)*

*A. G. Givens*  
Inspection Representative

# Aircraft Weight and Balance Revision Form

Date: 02/01/2017

| Aircraft |           |
|----------|-----------|
| Tail No: | N3860T    |
| Make:    | Piper     |
| Model:   | PA28R-180 |
| Serial:  | 28R-30183 |
| Time:    | T 3768    |
| TCD No:  |           |

| Registered Owner |              |
|------------------|--------------|
| Name:            | Mark Skinner |
| Address:         |              |

| Weight          |         | CG Range |      |
|-----------------|---------|----------|------|
| Maximum Weight: | 2,500.0 | FWD:     | AFT: |

| As Received                               |         |              |       |   |
|---|---------|--------------|-------|---|
| Previous Weight and Balance Date: 4/27/79 |         |              |       |   |
| Empty Weight:                             | 1,518.2 | Useful Load: | 981.8 | Empty Weight CG: 85.37 Moment: 129,604.35 |

| Item                           | Weight | Arm    | Moment    |
|--------------------------------|--------|--------|-----------|
| Added                          |        |        |           |
| GNS 530W s/n 78402203          | 8.5    | 62.00  | 527.00    |
| PMA 7000-1-3 s/n 602614-eo2463 | 1.5    | 60.00  | 90.00     |
| GTX330ES                       | 4.2    | 64.00  | 268.80    |
| KI 206 vor/gs s/n 12198        | 1.3    | 62.00  | 80.60     |
| Faststack hub                  | 0.6    | 46.00  | 27.60     |
| Removed                        |        |        |           |
| Narco vor-4                    | -2.9   | 62.00  | -179.80   |
| KLX135A                        | -4.4   | 62.00  | -269.70   |
| Airmarck 288                   | -1.5   | 60.00  | -90.00    |
| Narco AT150 txponder           | -2.8   | 64.00  | -179.20   |
| 2-MP12A power units            | -8.0   | 186.00 | -1,488.00 |

| New           |         |              |       |   |
|---------------|---------|--------------|-------|---|
| Empty Weight: | 1,514.8 | Useful Load: | 985.3 | Empty Weight CG: 84.76 Moment: 128,391.65 |

|                                      |
|--------------------------------------|
| Notes: Previous W&B dated 04/27/1979 |
|--------------------------------------|

As Calculated: ☒ As Weighed

Prepared By: JL Aero llc


Signature: \_\_\_\_\_

Printed Name: Tim Sipp AP 3071998

Repair Agency No:

## Aircraft Weight and Balance Revision

Steve Macdonald  
2 Copies

|  |  |  |                |   |  |
|--|--|--|----------------|---|--|
| <b>Tail Number: N3860T</b>   |  |  |                | Date: 02/12/2024                            |  |
| Prepared by:<br>JL Aero llc<br>48 Aviation Dr<br>Gilmer TX 75645                             |  |  |                | Work Order No:                              |  |
|  |  |  |                | Type Certificate<br>Data No:                |  |
| Aircraft Make:<br>Piper  | Model:<br>PA28R-180                      | Serial No:<br>28R-30183  | Time:          |   |  |
| Registered Owner:<br>Dean Lumber Co Inc  |  | Address:<br>PO Box 610<br>Gilmer TX 75644  |                |   |  |
| Maximum Weight 2500  |  | CG Range FWD AFT   |                |   |  |
| As Received; Date of Previous Weight and Balance:<br>02/01/2017                              | Useful Load:<br>981.8                    | EW:<br>1518.2  | EWCG:<br>85.37 | Moment:<br>129604.35                        |  |
| Notes:   |  |  |                |   |  |
|  |  | <b>Weight</b>  | <b>Arm</b>     | <b>Moment</b>                               |  |
| Removed GNS 530W s/n 78402203  |  | -8.5   | 62             | -527.00                                     |  |
| Removed AI and DG  |  | -3.6   | 62             | -223.20                                     |  |
| Removed vac pump   |  | -5   | 34.6           | -173.00                                     |  |
| Removed regulator  |  | -2.2   | 57             | -125.40                                     |  |
| Removed glide slope receiver   |  | -2.4   | 173.8          | -417.12                                     |  |
| Installed GNS 430W and GNS 430   |  | 13.2   | 62             | 818.40                                      |  |
| Installed Aspen EFD1000  |  | 2.9  | 62             | 179.80                                      |  |
| Installed Knots 2U light kit   |  | 4  | 85             | 340.00                                      |  |
| Removed MX12 nav com   |  | -6   | 62             | -372.00                                     |  |
|  |  | 0.00   | 0.00           | 0.00  |  |
| <input checked="" type="checkbox"/> As Calculated<br><br><input type="checkbox"/> As Weighed | Moment 129104.83<br><hr/> Weight 1510.60 | <b>New Empty Weight CG</b><br><br><b>85.47</b>   |                | <b>New Useful Load</b><br><br><b>989.40</b> |  |
|  |  | Signature<br><br><div style="text-align: center;"></div> |                |   |  |
|  |  | Repair Agency<br>or License No: A13071998  |                |   |  |



|          |  |   |
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IT IS THE RESPONSIBILITY OF THE PILOT AND AIRCRAFT OWNER TO INSURE THAT THE AIRPLANE IS LOADED PROPERLY. THE EMPTY WEIGHT C.G. IS FOR THE AIRPLANE AS DELIVERED FROM THE FACTORY. REFER TO FORM FAA-337 WHEN ALTERATIONS HAVE BEEN MADE.

### C. G. RANGE AND WEIGHT INSTRUCTIONS

1. Add the weight of all items to be loaded to the licensed empty weight.
2. Use the loading graph to determine the moment of all items to be carried in the airplane.
3. Add the moment of all items to be loaded to the licensed empty weight moment.
4. Divide the total weight moment by the total weight to determine the C.G. location.
5. By using the figures of item 1 and item 4, locate a point on the C.G. range and weight graph. If the point falls within the C.G. envelope, the loading meets all weight and balance requirements.

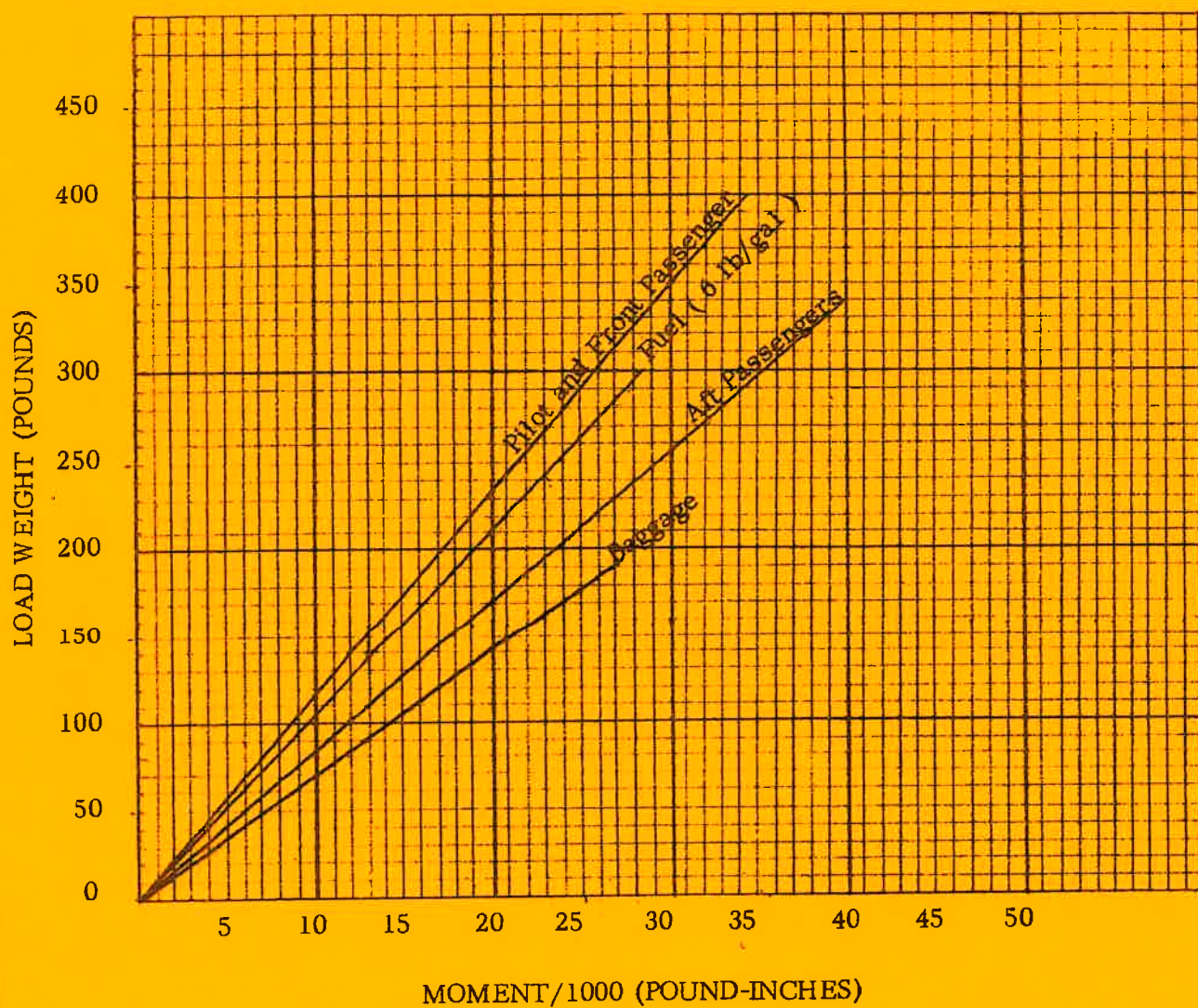
### SAMPLE LOADING PROBLEM (NORMAL CATEGORY)

|   | WEIGHT<br>(LBS) | ARM AFT DATUM<br>(INCHES) | MOMENT<br>(POUND-INCHES) |
|---|-----------------|---------------------------|--------------------------|
| LICENSED EMPTY WEIGHT                       | 1187            | 85.5                      | 127139                   |
| OIL (2 GAL)                                 | 15              | 29.5                      | 443                      |
| PILOT & PASSENGER                           | 340             | 85.5                      | 29070                    |
| FUEL 41.7 gals.                             | 250             | 95.0                      | 23750                    |
| PASSENGERS (REAR SEAT)                      | 340             | 118.1                     | 40154                    |
| BAGGAGE                                     | 68              | 142.8                     | 9710                     |
| MOMENT DUE TO RETRACTING<br>OF LANDING GEAR |                 |                           | 819                      |
| TOTAL LOADED AIRPLANE                       | 2500            |                           | 231085                   |
| <u>231085</u> = 92.4 INCHES (ARM AFT DATUM) |                 |                           |                          |
| 2500  |                 |                           |                          |

LOCATE THIS POINT ( 92.4 ) ON THE C.G. RANGE AND WEIGHT GRAPH. SINCE THIS POINT FALLS WITHIN THE C.G. ENVELOPE THE LOADING MEETS ALL WEIGHT AND BALANCE REQUIREMENTS.

|          |  |   |
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### LOADING GRAPH

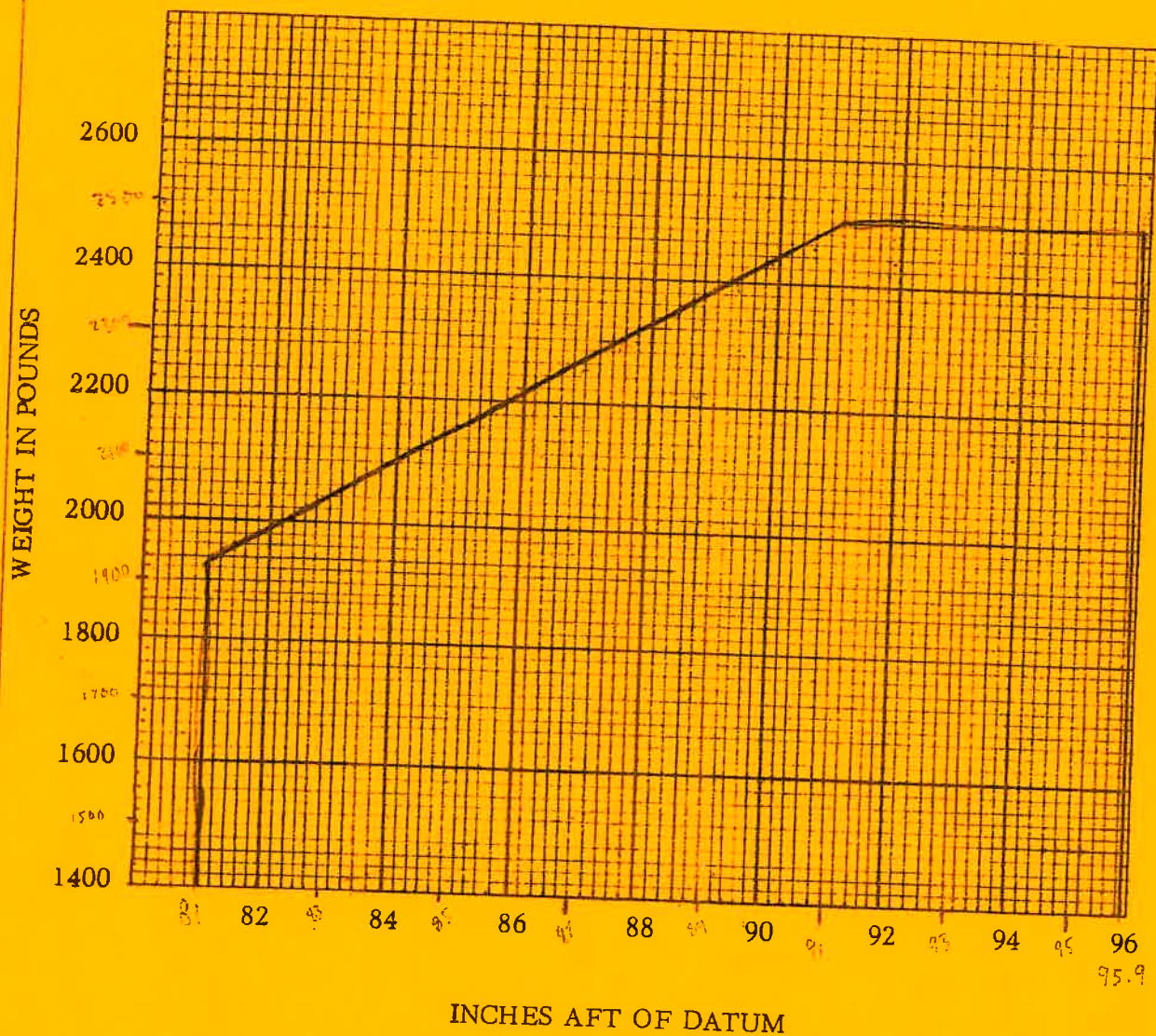




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C. G. RANGE AND WEIGHT

*See page 2*



MOMENT DUE TO RETRACTING LANDING GEAR = +819 IN-LBS

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Piper Model PA-28R-180  
Normal Category Only

# AIRPLANE FLIGHT MANUAL

## 1. Limitations Section

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

- |                   |  |
|-------------------|--|
| Engine            | Lycoming IO-360-B1E  |
| Engine Limits     | For all operations 2700 rpm, 180 hp  |
| Fuel              | 100/130 minimum octane aviation fuel   |
| Propeller         | Hartzell HC-C2YK-1/7666A-0   |
|                   | Low pitch stop 13.0°   |
|                   | High pitch stop 29.0°  |
|                   | Maximum diameter 76 inches, minimum diameter 74.5 inches                           |
|                   | Avoid continuous operation 2000 - 2200 rpm   |
| Power Instruments | Oil Temperature: GREEN arc (normal operating range)<br>75° F to 245° F             |
|                   | RED line (maximum) 245° F  |
|                   | Oil Pressure: GREEN arc (normal operating range)<br>60 psi to 90 psi               |
|                   | YELLOW arc (caution range) 25 psi to 60 psi  |
|                   | RED line (minimum) 60 psi  |
|                   | RED line (maximum) 90 psi  |
|                   | Fuel Pressure: GREEN arc (normal operating range)<br>14 psi to 45 psi              |
|                   | RED line (minimum) 14 psi  |
|                   | RED line (maximum) 45 psi  |
|                   | Tachometer: GREEN arc (normal operating range)<br>500 to 2000 and 2200 to 2700 rpm |
|                   | RED arc 2000 to 2200 rpm   |
|                   | RED line (maximum continuous power)<br>2700 rpm                                    |

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|  |                                    |                                      |
|--|------------------------------------|--------------------------------------|
| Airspeed Limits<br>(Calibrated Airspeed)<br>(Miles per Hour) | Never exceed .....                 | 214                                  |
|  | Maximum structural cruise .....    | 170                                  |
|  | Maneuvering .....                  | 134                                  |
|  | Flaps extended .....               | 125                                  |
|  | Maximum gear extension .....       | 150                                  |
|  | Maximum gear retraction.....       | 125                                  |
|  | Maximum positive load factor ..... | 3.8                                  |
|  | Maximum negative load factor ..... | No inverted<br>maneuvers<br>approved |

Maximum Weight 2500 lbs

Baggage Capacity 200 lbs

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

| <u>Weight</u><br><u>(Pounds)</u> | <u>Forward Limit</u><br><u>(In. aft of datum)</u> | <u>Rearward Limit</u><br><u>(In. aft of datum)</u> |
|----------------------------------|---|--|
| 2500                             | 91.0  | 95.9   |
| 1925                             | 81.0  | 95.9   |

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.

Maneuvers All acrobatic maneuvers including spins prohibited.

- Placards
- In full view of the pilot:  
 "THIS AIRCRAFT APPROVED FOR NIGHT IFR NON-ICING FLIGHT WHEN EQUIPPED IN ACCORDANCE WITH FAR 91 FAR 135."  
 "THIS AIRCRAFT MUST BE OPERATED AS A NORMAL CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS."
  - In full view of the pilot:  
 "NO ACROBATIC MANEUVERS INCLUDING SPINS APPROVED."

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Model PA-28R-180

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## Placards (Continued)

3. On the instrument panel in full view of the pilot:  
"MANEUVERING SPEED - 134 MPH."
4. On the instrument panel in full view of the pilot:  
"DEMONSTRATED CROSS WIND COMPONENT - 20 MPH."
5. Adjacent to upper door latch:  
"ENGAGE LATCH BEFORE FLIGHT."
6. On the inside of the baggage compartment door:  
"BAGGAGE MAX. 200 LBS. SEE WEIGHT AND BALANCE  
DATA FOR BAGGAGE LOADINGS BETWEEN 150 LBS AND  
200 LBS."
7. Near EMERGENCY GEAR LEVER: "EMERGENCY DOWN"  
"OVERRIDE UP"
8. Near landing gear selector switch:  
"GEAR UP 125 MPH MAX"  
"DOWN 150 MPH MAX"
9. 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."

## Airspeed Instrument Markings

|                 |                                    |                                      |
|-----------------|------------------------------------|--------------------------------------|
| RED radial line | Never exceed                       | 214 mph (186 knots)                  |
| YELLOW arc      | Caution range<br>(Smooth air only) | 170 to 214 mph<br>(148 to 186 knots) |
| GREEN arc       | Normal operating<br>range          | 69 to 170 mph<br>(60 to 148 knots)   |
| WHITE arc       | Flap down range                    | 63 to 125 mph<br>(55 to 109 knots)   |

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## 2. Procedures Section

1. The stall-warning system is inoperative with the master switch off.
2. The electric fuel pump must be on for both landing and takeoff.
3. This airplane is equipped with an airspeed-power sensing system (back-up gear extender) which extends the landing gear under low airspeed-power conditions\* even though the pilot may not have selected gear down. This system will also prevent retraction of the landing gear by normal means when the airspeed power values are below a predetermined minimum. (See Item 5, Procedures Section)

For normal operation, the pilot should extend and retract the landing gear with the gear selector switch located on the instrument panel, just as he would if the back-up gear extender system were not installed.

\* Approximately 105 mph IAS at any altitude, power off.

### 4. Landing gear position indication and warning lights:

- (a) The red gear warning light on the instrument panel and the horn operate simultaneously when:
  - (1) In flight, when the throttle is reduced to where the manifold pressure is approximately 14 inches of mercury or below, and the gear selector switch is not in the down position.
  - (2) In flight, when the back-up gear extender system has lowered the landing gear and the gear selector switch is not in the down position and the throttle is not full open.
  - (3) On the ground, when the master switch is on and the gear selector switch is in the up position.
- (b) The three green lights on the instrument panel operate individually as each associated gear is locked in the extended position.
- (c) The yellow "In Transit" light on the instrument panel operates whenever any of the three gears is not in either the fully retracted position or the fully extended and locked position.

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2. Procedures Section  
(Continued)

5. Takeoff considerations:

During takeoff, if the gear selector switch is placed in the gear up position before reaching the airspeed at which the back up gear extender system no longer commands gear down, \* the gear will not retract. For obstacle clearance on takeoff and for takeoffs from high altitude airports, the landing gear can be retracted at the pilot's discretion by placing the gear selector switch in the up position and then holding the emergency gear lever in the override up position. It is necessary to hold the lever in the override up position until the speed required for retraction by the back up gear extender system has been attained.

- \* Approximately 85 mph IAS at sea level to approximately 100 mph IAS at 10,000 ft, with a straight line variation between.

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2. Procedures Section  
(Continued)

6. Emergency landing gear extension instructions:

- (a) Reduce airspeed below 100 mph.
- (b) Move landing gear selector switch to gear down position.
- (c) If gear has failed to lock down, raise emergency gear lever to "Override Up" position.
- (d) If gear has still failed to lock down, move emergency gear lever to "Emergency Down" position.
- (e) If gear has still failed to lock down, yaw the airplane abruptly from side to side with the rudder.

7. Gear up emergency landing:

In the event a gear up landing is required, make an initial approach at not less than 110 mph to prevent the gear from free falling.

- (a) Leave flaps up (to reduce wing and flap damage).
- (b) Close the throttle and shut off the master and ignition switches.
- (c) Turn the fuel selector valve to off.
- (d) Hold the emergency gear lever in the override up position while reducing airspeed and until the airplane has come to rest. Contact the surface at minimum airspeed.

NOTE: With the master switch off, the landing gear cannot be retracted.

8. (Electric Pitch Trim Installation Only)

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.

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2. Procedures Section  
(Continued)

9. (Automatic Pilot Installation Only)

- (a) Automatic pilot off during takeoff and landing.
- (b) For normal operation, refer to Manufacturer's Operation Manual.
- (c) For other than normal operation:
  - (1) In case of malfunction, disengage automatic pilot controls.
  - (2) In emergency, automatic pilot may be over-powered manually.
  - (3) Delay malfunctions in cruise or approach configurations result in bank and altitude loss as follows:

| Automatic Pilot System | Cruise              |          | Approach            |          |
|------------------------|---------------------|----------|---------------------|----------|
|                        | 3-Second Delay Bank | Altitude | 1-Second Delay Bank | Altitude |
| Autoflite              | 60°                 | 200'     | 10°                 | 0'       |
| Autocontrol III        | 60°                 | 200'     | 10°                 | 0'       |

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### 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 2500 pounds.

Loss of altitude during stalls varied from 100 to 310 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 (gear down)   | 69 | 71 | 79 | 86 | 98 |
| Flaps down (gear down) | 63 | 65 | 72 | 79 | 89 |

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