PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED FLIGHT MANUAL

TIGER
AG-5B

MANUFACTURED BY
AMERICAN GENERAL AIRCRAFT CORPORATION

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THIS HANDBOOK INCLUDES THE MATERIAL REQUIRED TO BE FURNISHED TO THE PILOT BY THE FEDERAL AVIATION REGULATIONS AND ADDITIONAL INFORMATION PROVIDED BY THE MANUFACTURER.

This handbook meets GAMA specification No.1, Specification for Pilot's Operating Handbook, issued February 15, 1975 and revised September 1, 1984.

Approved by the Federal Aviation Administration

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TABLE OF CONTENTS

SECTION 1	GENERAL
SECTION 2	LIMITATIONS
SECTION 3	EMERGENCY PROCEDURES
SECTION 4	NORMAL PROCEDURES
SECTION 5	PERFORMANCE
SECTION 6	WEIGHT AND BALANCE
SECTION 7	DESCRIPTION AND OPERATION OF THE AIRPLANE AND ITS SYSTEM
SECTION 8	AIRPLANE HANDLING, SERVICING AND MAINTENANCE
SECTION 9	SUPPLEMENTS

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SECTION 1

GENERAL

TABLE OF CONTENTS

Paragraph No.		Page No.
1.1	General	1-1
1.3	Introduction	1-1
1.5	Three View Drawing	1-2
1.7	Engine	1-3
1.9	Propeller	1-3
1.11	Fuel	1-3
1.13	Oil	1-4
1.15	Maximum Certified Weights	1-4
1.17	Typical Airplane Weights	1-4
1.19	Cabin Dimensions	1-5
1.21	Baggage Compartment Dimensions	1-5
1.23	Specific Loadings	1-5
1.25	Symbols, Abbreviations, and Terminology	1-6

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SECTION 1

GENERAL

1.1 GENERAL

Section 1 of this manual contains information of general interest to owners and operators of AG-5B aircraft. The end of this section contains a glossary of symbols, abbreviations and terminology used throughout the manual.

1.3 INTRODUCTION

This Pilot's Operating Handbook is designed for maximum utilization as an operating guide for the pilot. It includes the material required to be furnished to the pilot by the Federal Aviation Regulations and additional information provided by the manufacturer and constitutes the FAA Approved Airplane Flight Manual.

This handbook is not designed as a substitute for adequate and competent flight instruction, knowledge of current airworthiness directives, applicable federal air regulations or advisory circulars. It is not intended to be a guide for basic flight instruction or a training manual and should not be used for operational purposes unless kept in a current status.

The handbook has been divided into numbered (arabic) sections each provided with a "finger-tip' tab divider for quick reference. The limitations and emergency procedures have been placed ahead of the normal procedures, performance and other sections to provide easier access to information that may be required in flight. The Emergency Procedures Section has been furnished with a red tab divider to present an instant reference to the section. Provisions for expansion of the handbook have been made by the deliberate omission of certain paragraph numbers, figure numbers, item numbers, and pages noted as being "Intentionally Left Blank".

1.5 THREE VIEW DRAWING

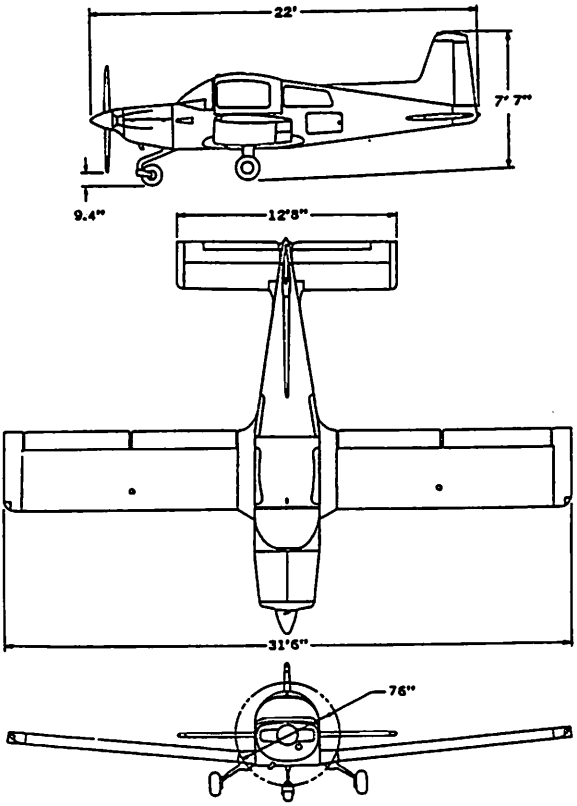

Figure 1-1 Three View Drawing

1.7 ENGINE

Number of Engines	1
Engine Manufacturer	Lycoming
Engine Model Number	O-360-A4K
Engine Type	Normally Aspirated Horizontally Opposed Four Cylinder Air Cooled Direct Drive 360 Cubic Inches
Maximum Continuous Power	180 BHP
Maximum Engine Speed	2700 RPM

1.9 PROPELLER

Number of Propellers	1
Propeller Manufacturer	Sensenich
Propeller Model Numbers	1A76EM8S10-0-61 1A76EM8S10-0-63 1A76EM8S10-0-65
Number of Blades	2
Propeller Diameter (No Further Reduction Permitted)	76 inches
Propeller Type	Fixed Pitch

1.11 FUEL

Fuel Grade	Aviation Grade 100/100LL(Blue)
Total Capacity	52.6 Gallons
Total Usable Fuel	51.0 Gallons

1.13 OIL

Oil Grade:
First 50 Hours of Operation — Straight Mineral Oil MIL-L-6082

Oil Grade:
After 50 Hours of Operation — Ashless Dispersing MIL-L-22851

AVERAGE AMBIENT AIR TEMPERATURE	STRAIGHT MINERAL MIL-L-6082B	ASHLESS DISPERSANT MIL-L-22851
ALL TEMPERATURES	----------	SAE 15W50 OR 20W50
ABOVE 80 DEGREES F.	SAE 60	SAE 60
ABOVE 60 DEGREES F.	SAE 50	SAE 40 OR SAE 50
30 TO 90 DEGREES F.	SAE 40	SAE 40
0 TO 70 DEGREES F.	SAE 30	SAE 40, 30 OR SAE 20W40
BELOW 10 DEGREES F.	SAE 20	SAE 30 OR 20W30
Total Oil Capacity		8 Quarts

1.15 MAXIMUM CERTIFIED WEIGHTS

Maximum Takeoff Weight (Normal Category)	2400 Lbs.
Maximum Landing Weight (Normal Category)	2400 Lbs.
Maximum Takeoff Weight (Utility Category)	2050 Lbs.
Maximum Landing Weight (Utility Category)	2050 Lbs.
Maximum Weight in Baggage Compartment	120 Lbs.

1.17 TYPICAL AIRPLANE WEIGHTS

Standard Empty Weight (No Optional Equipment)	1398 Lbs.
Useful Load; Normal Category	1002 Lbs.
Useful Load; Utility Category	652 Lbs.

1.19 CABIN DIMENSIONS

Width	40 Inches
Length	50 Inches
Height	46 Inches
Entrance Width	34 Inches

1.21 BAGGAGE COMPARTMENT DIMENSIONS

Width	29 Inches
Length	35 Inches
Height	30 Inches
Entrance Width	24 Inches
Entrance Height	12 Inches

1.23 SPECIFIC LOADINGS

Wing Loading	17.1 Lbs/Ft^2
Power Loading	13.3 Lbs/BHP

1.25 Symbols, Abbreviations, and Terminology

AIRSPEED SYMBOLS AND TERMINOLOGY

KCAS	**Knots Calibrated Airspeed** is the indicated airspeed corrected for position and instrument error, expressed in knots. KCAS is equal to KTAS in a standard atmosphere at sea level.
KIAS	**Knots Indicated Airspeed** is the speed shown on the airspeed indicator, expressed in knots.
KTAS	**Knots True Airspeed** is KCAS corrected for altitude and temperature.
V_A	**Maneuvering Speed** is the maximum speed at which application of full available control will not overstress the airplane.
V_{FE}	**Maximum Flap Extended Speed** marked by the upper end of the white arc on the airspeed indicator, is the highest speed the airplane can be flown with the wing flaps fully extended.
V_{NO}	**Maximum Structural Cruising Speed** marked by the lower limit of the yellow arc on the airspeed indicator, is the speed that should not be exceeded except in smooth air.
V_{NE}	**Never Exceed Speed** marked by a red line on the airspeed indicator, is the speed limit that may never be exceeded.
V_S	**Stalling Speed (clean)** is the minimum speed at which the airplane is controllable with the flaps up. This speed is marked on the airspeed indicator as the lower limit of the green arc.

V_{SO}	**Stalling Speed (dirty)** is the minimum speed at which the airplane is controllable with the flaps down. This speed is marked on the airspeed indicator as the lower limit of the white arc.
V_X	**Best Angle of Climb Speed** is the speed which results in the greatest gain in altitude per distance traveled.
V_Y	**Best Rate of Climb Speed** is the speed which results in the greatest gain in altitude in the shortest possible time.

METROLOGICAL TERMINOLOGY

OAT	**Outside Air Temperature** is free air static temperature.
STANDARD TEMPERATURE	15 degrees Celsius (59 degrees Fahrenheit).
PRESSURE ALTITUDE	The altitude read from an altimeter with the barometric scale set at 29.92 inches of mercury.

ENGINE POWER TERMINOLOGY

BHP	**Brake Horse Power** is the power developed by the engine.
RPM	**Revolutions per Minute** is the speed the engine is turning.

AIRPLANE PERFORMANCE TERMINOLOGY

DEMONSTRATED CROSSWIND COMPONENT	The velocity of the crosswind component for which adequate control of the airplane during takeoff and landing was actually demonstrated during certification test.

USABLE FUEL	The quantity of fuel available for flight.
UNUSABLE FUEL	The quantity of fuel that cannot be used in flight.
GPH	Gallons Per Hour is the rate at which fuel is being consumed by the engine.
G	A unit of acceleration equivalent to that produced by the force of gravity.

WEIGHT AND BALANCE TERMINOLOGY

REFERENCE DATUM	An imaginary reference from which all horizontal distances are measured for weight and balance purposes.
STATION	A location along the airplane's longitudinal axis expressed as the distance, in inches, from the REFERENCE DATUM.
ARM	The horizontal distance from the REFERENCE DATUM to the CENTER OF GRAVITY of an item or location in the airplane.
MOMENT	The product of the weight of an item multiplied by its arm. IN THIS HANDBOOK ALL MOMENTS HAVE BEEN DIVIDED BY 1000 TO REDUCE THE NUMBER OF DIGITS.
C.G.	Center of Gravity is the point at which an airplane would balance if suspended. It is DISTANCE from the REFERENCE DATUM is found by dividing the TOTAL MOMENT by the TOTAL WEIGHT of the airplane.
C.G. ARM	The quotient of the TOTAL MOMENTS divided by the TOTAL WEIGHT of the airplane.
C.G. LIMITS	The extreme C.G. locations within which the airplane can be operated at a given weight.
STANDARD EMPTY WEIGHT	The weight of a standard airplane with full operating fluids, engine oil, and unusable fuel.

BASIC EMPTY WEIGHT	The STANDARD EMPTY WEIGHT plus the WEIGHT OF OPTIONAL EQUIPMENT.
USEFUL LOAD	The difference between GROSS WEIGHT and the BASIC EMPTY WEIGHT.
GROSS WEIGHT	The maximum weight to which the airplane is certified.
TARE	The weight of chocks, blocks, stands, etc. used when weighing an airplane, that is included in the scale readings. Tare is subtracted from the scale reading to obtain an accurate weight.

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SECTION 2

LIMITATIONS

TABLE OF CONTENTS

Paragraph No.		Page No.
2.1	General	2-1
2.3	Airspeed Limitations	2-1
2.5	Airspeed Indicator Markings	2-2
2.7	Power Plant Limitations	2-2
2.9	Power Plant Instrument Markings	2-3
2.11	Weight Limitations	2-4
2.13	Center of Gravity Limitations	2-4
2.15	Maneuver Limits	2-5
2.17	Flight Load Factor Limits	2-5
2.19	Kinds of Operations	2-6
2.21	Fuel Limitations	2-6
2.23	Noise Level	2-6
2.25	Placards	2-7

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SECTION 2

LIMITATIONS

2.1 GENERAL

This section presents the operating limitations, instrument markings and placards necessary for the safe operation of the airplane. The limitations contained in this section are approved by the Federal Aviation Administration.

2.3 AIRSPEED LIMITATIONS

SYMBOL	SPEED	KCAS	KIAS
V_{NE}	NEVER EXCEED	174	172
V_{NO}	MAXIMUM STRUCTURAL CRUISING	143	142
V_A	MANEUVERING (2,400 pounds)	113	112
V_{FE}	MAXIMUM FLAP EXTENDED	104	103
	MAXIMUM CANOPY OPEN	113	112

Figure 2-1 Airspeed Limitations

2.5 AIRSPEED INDICATOR MARKINGS

MARKING	KIAS	EXPLANATION
WHITE ARC	53-103	FLAP OPERATING RANGE. The lower limit is V_{so} in the landing configuration. The upper limit is the maximum speed permissible with flaps extended.
GREEN ARC	56-142	NORMAL OPERATING RANGE. The lower limit is maximum weight stalling speed with the flaps up. The upper limit is the Maximum Structural Cruising Speed.
YELLOW ARC	142-172	Operations must be conducted in smooth air and then only with caution.
RED LINE	172	Never exceed speed.

Figure 2-2 Airspeed Indicator Markings

2.7 POWER PLANT LIMITATIONS

Number of Engines	1
Engine Manufacturer	Lycoming
Engine Model Number	O-360-A4K
Maximum Power	180 BHP
Maximum Engine Speed	2700 RPM

Fuel Grade	Aviation Grade 100 LL(Blue)
Oil Grade:	Straight Mineral Oil MIL-L-6082B (First 50 Hours of Operation)
Oil Grade:	Ashless Dispersing MIL-L-22851 (After 50 Hours of Operation)
Number of Propellers	1
Propeller Manufacturer	Sensenich
Propeller Model Numbers	1A76EM8S10-0-61 1A76EM8S10-0-63 1A76EM8S10-0-65
Propeller Diameter (No Further Reduction Permitted)	76 Inches

2.9 POWER PLANT INSTRUMENT MARKINGS

INSTRUMENT	RED LINE	YELLOW ARC	GREEN ARC	YELLOW ARC	RED LINE
TACHOMETER (RPM)	---	---	2250 To 2700	---	2700
OIL PRESSURE (PSI)	25	25-55	55-95	95-115	115
OIL TEMPERATURE (DEGREES F)	---	---	80-245	---	245
FUEL PRESSURE (PSI)	0.5	---	0.5-8	---	8
CYLINDER HEAD TEMPERATURE (DEGREES F)	---	---	150-400	---	500
VACUUM (Hg.)	---	---	4.6-5.4	___	___

Figure 2-3 Power Plant Instrument Markings

2.11 WEIGHT LIMITATIONS

Maximum Gross Weight; Normal Category	2400 Lbs.
Maximum Gross Weight; Utility Category	2050 Lbs.
Maximum Takeoff Weight	2400 Lbs.
Maximum Landing Weight	2400 Lbs.
Maximum Ramp Weight; Normal Category	2408 Lbs.
Maximum Ramp Weight; Utility Category	2058 Lbs.
Maximum Weight in Baggage Compartment	120 Lbs.

2.13 CENTER OF GRAVITY LIMITATIONS

NORMAL CATEGORY

WEIGHT	FORWARD LIMITS	AFT LIMITS
1920 Lbs.	81.00	92.50
2400 Lbs.	89.00	92.50

UTILITY CATEGORY

WEIGHT	FORWARD LIMITS	AFT LIMITS
1920 LBS.	81.00	85.32
2050 Lbs.	83.17	85.32

NOTES:

(1) Straight line variation between points given.

(2) Limits are given in inches aft of Reference Datum which is located 50 inches forward of the front face of the lower portion of the firewall.

(3) It is the responsibility of the airplane owner and the pilot to insure that the airplane is properly loaded (see Section 6 of this POH for proper loading instructions).

2.15 MANEUVER LIMITS

NORMAL CATEGORY

Authorized Maneuvers:	Any Maneuver Incidental To Normal Flying, Stalls (Except Whip Stalls), Lazy Eights, Chandelles, And Steep Turns (with not more than 60 degrees of bank)
Uauthorized Maneuvers:	All acrobatic maneuvers including spins prohibited

UTILITY CATEGORY

Maneuver	Recommended Entry Speed
Chandelles	112 KIAS
Lazy Eights	112 KIAS
Steep Turns	112 KIAS
Stalls (Except Whip Stalls)	Slow Deceleration

SPINS

INTENTIONAL SPINS ARE PROHIBITED

2.17 FLIGHT LOAD FACTOR LIMITS

NORMAL CATEGORY

Flaps Up	+3.8/ -1.52g
Flaps Down	+3.5

UTILITY CATEGORY

Flaps Up	+4.4/ -1.76g
Flaps Down	+3.5

2.19 KINDS OF OPERATIONS

The Standard AG-5B is approved for Day and Night VFR operations. With the appropriate navigation and communication equipment required by FAR 91 installed, the airplane is approved for IFR operations.

NOTE: The AG-5B is not approved for flight into known icing conditions.

2.21 FUEL LIMITATIONS

Total Capacity	52.6 Gallons
Total Usable Fuel	51.0 Gallons

2.23 NOISE LEVEL

The noise level of this airplane is 72.4 dB(A). No determination has been made by the Federal Aviation Administration that the noise level of this airplane should be acceptable or unacceptable for operation at any airport. The above statement not withstanding the noise level stated above has been verified by and approved by the Federal Aviation Administration in noise level test flight conducted in accordance with FAR 36, *Noise Standards Aircraft Type and Airworthiness Certification.* This aircraft model is in compliance with all FAR 36 noise standards applicable to this type.

2.25 PLACARDS

On the Left Side Panel:

THE MARKINGS AND PLACARDS INSTALLED IN THIS AIRPLANE CONTAIN OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS AIRPLANE IN THE NORMAL CATEGORY. OTHER OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS AIRPLANE IN THIS CATEGORY OR IN THE UTILITY CATEGORY ARE CONTAINED IN THE PILOT'S OPERATING HANDBOOK

NORMAL CATEGORY-

DESIGN MANEUVERING SPEED V_A---112 KNOTS IAS
NO ACROBATIC MANEUVERS INCLUDING SPINS APPROVED

UTILITY CATEGORY-

DESIGN MANEUVERING SPEED V_A---112 KNOTS IAS
REAR SEAR MUST NOT BE OCCUPIED

ACROBATIC MANEUVERS ARE LIMITED TO THE FOLLOWING:

MANEUVER	ENTRY SPEED---IAS
CHANDELLES	112 KNOTS
LAZY EIGHTS	112 KNOTS
STEEP TURNS	112 KNOTS
STALLS (EXCEPT WHIP STALLS)	SLOW DECELERATION

SPINS PROHIBITED

THIS AIRPLANE IS APPROVED FOR VFR, IFR, DAY AND NIGHT WHEN EQUIPPED IN ACCORDANCE WITH FAR 91. THIS AIRPLANE IS NOT APPROVED FOR FLIGHT INTO KNOWN ICING CONDITIONS.

S803007-131 AG-5B

FOR FLIGHTS WITH REAR SEAT OCCUPANTS AND-OR BAGGAGE-CARGO, CHECK WEIGHT & BALANCE

TIRE PRESSURE
NOSE 25 LBS.
MAIN 35 LBS.

On the Instrument Panel:

CAUTION: FLASHING BEACON IN CLOUDS MAY CAUSE VISUAL DISORIENTATION

CLOSE CANOPY WHEN USING ALTERNATE STATIC AIR SUBTRACT 6 KNOTS FROM IAS ABOVE 87 KNOTS IAS SUBTRACT 80 FEET FROM ALTITUDE ABOVE 86 KNOTS.

On the Instrument Panel (If Strobe Lights are Installed):

TURN OFF STROBE IN CLOUD, FOG OR HAZE, TAXI WITH STROBE OFF

In Baggage Compartment:

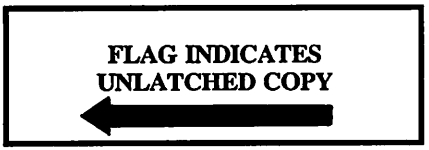
120 POUNDS MAXIMUM BAGGAGE
FOR ADDITIONAL LOADING INSTRUCTIONS SEE WEIGHT AND BALANCE DATA
NO HEAVY OBJECTS ON HAT SHELF

On Rear Seat Base: (Visible With Rear Seat Back Upright):

NO PASSENGERS 340 POUNDS MAXIMUM CARGO DISTRIBUTE EVENLY
FOR ADDITIONAL LOADING INSTRUCTIONS SEE WEIGHT AND BALANCE DATA AND PILOT'S OPERATING HANDBOOK

On Baggage Door:

Interior- Adjacent to Canopy Lock:



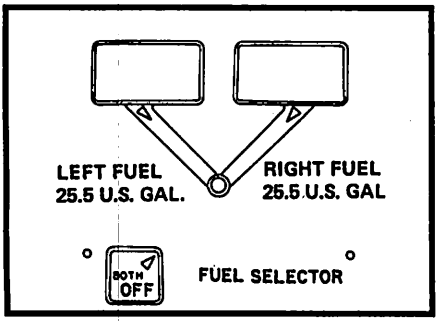
On the Inside Canopy Rail:

Under Rear Seat Base (Visible With Rear Seat Back Upright):

Aft of Fuel Tank Caps:

FUEL
MIN 100/100 LL OCT
26.3 U.S. GAL. TOTAL CAP.
19.0 U.S. GAL. TO TAB

On the Fuel Selector Valve:



On Glare Shield:

NO SMOKING

On Throttle Quadrant:

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SECTION 3

EMERGENCY PROCEDURES

TABLE OF CONTENTS

Paragraph No.		Page No.
3.1	General	3-1
3.3	Airspeeds for Emergency Operations	3-1
3.5	Emergency Procedures Checklist	3-1
3.7	Amplified Emergency Procedures	3-4
3.9	Engine Failure	3-4
3.10	Air Start	3-6
3.11	Smoke and Fire	3-6
3.12	System Failures	3-7
3.13	Glide	3-8
3.14	Landing Emergencies	3-9
3.15	Spins	3-10

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SECTION 3

EMERGENCY PROCEDURES

3.1 GENERAL

Procedures for coping with emergencies while operating the AG-5B are found in this section. Paragraph 3.5 contains an abbreviated checklist, while the remaining paragraphs contain the amplified procedures.

Pilots should thoroughly familiarize themselves with the contents of this manual and particularly with this section prior to operating the airplane. Additionally, adequate and recurrent training should be acquired.

3.3 AIRSPEEDS FOR EMERGENCY OPERATIONS

Engine Failure After Takeoff	72 KIAS
Maximum Glide Speed	72 KIAS
Precautionary Landing (Flaps Up)	72 KIAS
Precautionary Landing (Flaps Down)	70 KIAS

3.5 EMERGENCY PROCEDURES CHECKLIST

Engine Failure During Takeoff

(a) Engine Failure During Takeoff Run

(1) Throttle - IDLE
(2) Brakes - APPLY
(3) Mixture - IDLE CUTOFF
(4) Ignition Switch - OFF
(5) Master Switch - OFF

(b) Engine Failure Immediately After Takeoff

(1) Lower nose to maintain 72 KIAS
(2) Select landing sight
(3) Mixture - IDLE CUTOFF
(4) Fuel Selector Valve - OFF
(5) Ignition Switch - OFF
(6) Master Switch - OFF

ENGINE FAILURE DURING FLIGHT

(a) Airspeed - 72 KIAS
(b) Carburetor Heat - ON
(c) Fuel Selector Valve - SWITCH TANKS
(d) Mixture - RICH
(e) Master Switch - ON
(f) Auxiliary Fuel Pump - ON
(g) Throttle - OPEN ¼ INCH
(h) Ignition Switch - BOTH
(i) Starter - ENGAGE if propeller is stopped.

ENGINE FIRE

(a) In case of an engine fire in flight:

(1) Mixture - IDLE CUTOFF
(2) Fuel Selector Valve - OFF
(3) Master Switch - OFF
(4) Cabin Heat and Air - OFF
(5) Airspeed - 115 KIAS. If fire is not extinguished, increase glide speed to attempt to blow the fire out.
(6) Forced Landing - EXECUTE (as described in Landing Without Engine Power)

(b) In case of carburetor induction fire on the ground:

(1) Cranking - Continue in an attempt to start the engine.

If engine starts:

(2) Power - 1800 RPM for one minute
(3) Engine - SHUTDOWN and inspect for damage
    (a) Fuel Selector - OFF
    (b) Master Switch - OFF
    (c) Ignition Switch - OFF

If engine fails to start:

(4) Evacuate passengers
(5) Engine - SECURE
    (a) Mixture - IDLE CUTOFF
    (b) Master Switch - OFF
    (c) Ignition Switch - OFF
    (d) Fuel Selector Valve - OFF

ELECTRICAL SYSTEM EMERGENCY PROCEDURES

(a) Electrical Fire in Flight

If fire is in engine compartment:

(1) Master Switch - OFF
(2) Vents/Cabin Air/Heat - OFF/CLOSED
(3) Land airplane as soon as possible

If fire is in cockpit:

(1) Master Switch - OFF
(2) All other switches (except ignition switch) - OFF
(3) Vents/Cabin Air/Heat - CLOSED
(4) Fire extinguisher - ACTIVATE (if available)

If fire appears to be out and electrical power is necessary to continue flight:

(5) Master Switch - ON
(6) Circuit Breakers - CHECK for faulty circuit, do not reset
(7) Radio/Electrical Switches - ON one at a time, with delay after each until short circuit is located
(8) Vents/Cabin Air/Heat - OPEN when fire is out

(b) Electric Power Supply Failure

If the ALTNR (Alternator) Light on the left side of the Instrument Panel illuminates, the Alternator is not supplying energy to the battery.

If this occurs:

(1) Alternator Circuit Breaker - CHECK
Wait 15 seconds, then RESET
(2) Alternator Side of Master Switch - CYCLE

If Circuit Breaker Fails to reset:

(1) Turn off all non-essential electric loads
(2) Land as soon as practical

VACUUM SYSTEM FAILURE

A vacuum system failure will disable the directional gyro and attitude indicators. The pilot should then rely on the turn coordinator for bank information and the altimeter for pitch information.

STATIC SOURCE BLOCKED

If erroneous readings are suspected on the instruments associated with the pitot-static system (airspeed indicator, altimeter and vertical speed indicator) pitot heat should be applied (for erroneous airspeed indications) in case the problem is due to ice or water accumulation in the pitot head. Failure of pitot heat to correct the problem may indicate blockage of the static sources. Obviously in a situation such as this, a landing should be planned at the nearest suitable airport. If it is necessary to continue the flight, and particularly if the flight is in marginal conditions, a static source must be supplied to the airspeed indicator and altimeter.

An alternate static air source is installed on your airplane. Static air source can be applied to these instruments by pulling the ALT-STATIC AIR valve located on the left side of the instrument panel.

NOTE: Close the canopy when using alternate static air source. At airspeeds above 87 KIAS subtract 6 KIAS from indicated airspeed and 80 feet from indicated altitude.

3.7 AMPLIFIED EMERGENCY PROCEDURES

Amplified procedures for dealing with emergencies are provided in the following pages. These procedures should be thoroughly studied prior to the first flight in this airplane.

3.9 ENGINE FAILURE

The action taken by the pilot following an engine failure depends on whether the failure is total or partial. If a total failure has occurred the pilot, time permitting, can attempt to restart the engine. If the restart fails select a landing site, and execute a forced landing without engine power.

Engine Failure Immediately after Takeoff

Takeoff is one of the most critical phases of flight because of the possibility of an engine failure. Prior to each flight the pilot should consider runway length, obstacles and terrain, and have a plan for engine failure during takeoff. The Auxiliary Fuel Pump should be ON during takeoff and landing, because if the engine driven pump were to fail, the auxiliary pump would continue to supply fuel to the engine.

Maintaining a safe airspeed is the pilots first priority. If an engine failure occurs immediately after takeoff, lower the nose and maintain 72 KIAS.

Next a suitable landing site must be chosen. Landing straight ahead, making only small directional changes to avoid obstructions, is usually the best course of action. A 180 degree gliding turn back to the airport should not be attempted unless there is sufficient altitude to successfully land on the runway. It is a good practice to always use the full length of the runway for takeoff. If power is lost the airplane can be landed straight ahead on the runway remaining.

After the airplane is under control and the landing site has been selected, the pilot should secure the airplane. To reduce the possibility of fire, pull the Mixture Lever to IDLE CUT-OFF and turn the Fuel Selector Valve OFF, the Master Switch OFF, and the Ignition Switch OFF.

Engine Failure in Flight

If a partial engine failure occurs the pilot must decide whether to make a precautionary landing with engine power remaining to continue to the nearest airport. If the failure is total, immediately establish a glide at 72 KIAS, and select a landing site. When choosing a landing site the pilot should consider terrain, obstacles and wind direction. The next step is to determine the cause of the failure and if appropriate, attempt an air start.

If an engine fails due to fuel starvation or carburetor ice a restart may be possible. One cause of fuel starvation is running out of fuel in one tank. In this case, switching fuel tanks will very likely restore power to the engine. If the engine driven fuel pump has failed, turning ON the Electric Driven Fuel Pump may restore engine power.

Ice formed in the venturi of the carburetor could cause either partial or total loss of engine power. Conditions most favorable to forming carburetor ice are moist air between 20 degrees and 70 degrees Fahrenheit. Signs of carburetor ice are loss in engine RPM followed by engine roughness. Applying carburetor heat by positioning the Carb Heat lever in the HOT position will melt the ice and restore power to the engine. After the ice has melted return the lever to the COLD position. When using carburetor heat, always use full heat. Never apply partial carburetor heat.

A failed magneto or a fouled spark plug will cause the engine to suddenly run rough. Selecting different power and mixture settings may help the engine run smoother. If this occurs, land at the nearest airport.

3.10 AIR START

If the engine fails because of fuel starvation and the propeller is still windmilling, turning the Fuel Pump ON or switching fuel tanks may be the only action necessary to restart the engine. If the propeller has stopped it will be necessary to ENGAGE the starter to restart the engine. If the failure is caused by failure of a critical engine component an air start will not be possible.

3.11 SMOKE AND FIRE

Fire is often initially detected by the presence of smoke in the cabin. The pilot should determine the source of the smoke, and take appropriate action.

Engine Fire During Starting

When starting the engine do not over prime (over priming may cause a fire in the induction system). If this occurs before the engine starts, continue cranking in an attempt to draw the flames into the engine and thus extinguishing the fire. If the engine starts, continue to run the engine at 1800 RPM for one minute. Then turn the Fuel Selector Valve OFF. After the engine has stopped turn the Master and Ignition Switches OFF and evacuate the airplane.

Engine Fire in Flight

If a fire breaks out in the engine compartment during flight, attempt to cut off the source of the fire, turning the Fuel Selector Valve OFF. After a few seconds the engine will stop, requiring the selection of a suitable landing site. The pilot can increase the airspeed to between 115 KIAS and 142 KIAS in an attempt to extinguish the flames if still present. Side slip maneuvers may be used to direct the flames away from the cabin area. During the descent turn the Master and Ignition Switches OFF. The aircraft should be landed as soon as possible.

Electrical Fire

If an electrical fire occurs, close all vents and turn the Master Switch OFF. If the fire goes out, plan to land at the nearest airport. However, if the fire continues execute a precautionary landing as soon as possible. Turn all Radios and Electric Switches OFF, then turn the Master Switch back ON. If the fire does not return, turn ON only the equipment that is necessary, one item at a time. If the fire returns, repeat the process, but do not turn on the item that caused the fire to restart. Vents can be reopened after fire is out. Use a fire extinguisher as appropriate if available.

3.12 SYSTEM FAILURES

Vacuum System Failure

A failure to the vacuum system could be caused by mechanical failure of the vacuum pump or a leak in the plumbing system. In either case, the Directional Gyro and the Attitude Indicator will not function properly. When this happens the electric powered turn coordinator must be relied on for bank information, the altimeter for pitch information and the magnetic compass for heading information. Should a vacuum failure occur while in VFR conditions, remain VFR for the duration of the flight.

Pilot-Static System Failure

Failure of the Pilot-Static System could be caused by leaks or blockages in the system. If erroneous readings are suspected from the Altimeter, Airspeed and Vertical Speed Indicators, PULLING the Alternate Static Valve labeled, ALT-STATIC AIR, located on the upper left side of the instrument panel, may allow the system to function. The canopy should be CLOSED whenever the alternate static air is used. Use of the system can cause the Airspeed Indicator to read up to 6 KIAS and the altimeter as much as 80 feet higher than normal.

Erroneous readings in the Airspeed Indicator alone could be caused by a blockage in the pilot line. If the line is blocked by ice, turning Pitot Heat ON may melt the ice and restore the system. The pitot heat switch is located in the lower center portion of the instrument panel.

Electrical Power Supply Failure

The first indication of an alternator failure is the illumination of the ALTNR (alternator) light located on the top left portion of the instrument panel. This can be verified by a deflection toward -1 on the load meter. If the Alternator Circuit Breaker has not tripped; recycle the Alternator Side of the split Master Switch. If the alternator circuit breaker is tripped turn the Master Switch and all Electric Switches OFF, wait 15 seconds, reset the circuit breaker and turn the Master Switch ON. If the system fails to function; turn OFF all non-essential electric loads and land as soon as practical.

3.13 GLIDE

The Best Angle of Glide is achieved at 72 KIAS with the flaps up and the propeller windmilling. This airspeed maximizes the distance the airplane can travel across the ground with the least loss of altitude. This distance is approximately 1.6 nautical miles per 1000 feet of altitude. (see Figure 3-1).

MAXIMUM GLIDE

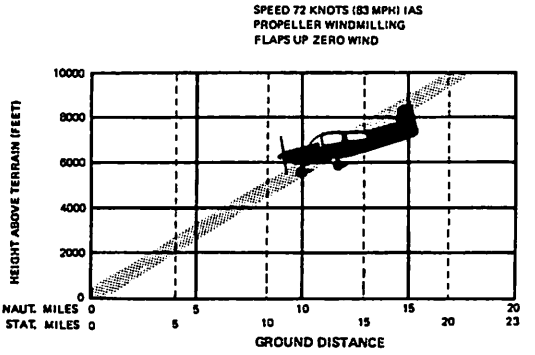

Figure 3-1 Maximum Glide

3.14 LANDING EMERGENCIES

Landing Without Engine Power

If the engine fails and cannot be restarted immediately, establish a 72 KIAS glide and select the best landing site available. Factors to consider in selecting an off airport landing site include: terrain, obstacles, and wind direction. The threat of fire can be reduced by turning the Fuel Selector Valve and the Ignition Switch OFF. Full flaps are recommended prior to touching down. After the flaps are DOWN turn the Master Switch OFF.

Precautionary Landing With Engine Power

If a partial engine failure has occurred the pilot may elect to make a precautionary landing, at an off airport site. When selecting a landing site the pilot needs to consider, terrain, obstacles and wind direction.

3.15 SPINS

Intentional spins are prohibited in the AG-5B. Should an unintentional spin occur, pull the throttle back to IDLE, apply FULL RUDDER deflection in the opposite direction of the spin and move the ELEVATOR FORWARD briskly. As soon as the rotation stops the airplane will be in a steep dive. Use caution while recovering from the dive.

Ditching

Ditching the AG-5B is not recommended. If no other alternative is available and ditching is attempted, secure all heavy objects in the baggage compartment. The approach to landing is made 70 KIAS with the flaps DOWN. Use engine power, if available, to establish a descent no greater than 360 ft./minute. After the flaps have been set turn the Master Switch OFF, and Fuel Selector to OFF, to reduce fire hazard. Prior to touching down, open the canopy, to make the evacuation from the airplane easier. Folded coats or cushions, if available, can be used by occupants for head and face protection. Touch down with the nose of the airplane in a slightly higher than normal attitude.

Note: Make sure the proper emergency equipment is on board before conducting extended flights over open water.

Recovery from a Pilot Induced Porpoise while Landing

On all landings the main landing gear should always contact the ground before the nose gear. If the nose wheel is allowed to contact the ground first, an out of control porpoise could occur. If this happen execute a balked landing by applying full power and pushing the Carb Heat lever to the COLD position. After a positive rate of climb is established slowly retract the flaps.

SECTION 4

NORMAL PROCEDURES

TABLE OF CONTENTS

Paragraph No.		Page No.
4.1	General	4-1
4.3	Airspeeds for Normal Operations	4-1
4.5	Normal Procedures Checklist	4-1
4.7	Amplified Procedures	4-9
4.9	Preflight Inspection	4-9
4.11	Before Engine Starting	4-10
4.13	Engine Starting	4-10
4.15	Before Taxiing/Taxiing	4-10
4.17	Engine Runup/Before Takeoff	4-11
4.19	Takeoff	4-11
4.21	Climb	4-12
4.23	Cruise	4-12
4.25	Descent	4-13
4.27	Stalls	4-13
4.29	Before Landing	4-13
4.31	Landing	4-13
4.33	Balked Landing (Go-Arounds)	4-14
4.35	Ground Handling and Tie Down	4-14

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SECTION 4

NORMAL PROCEDURES

4.1 GENERAL

This section provides check list and amplified procedures for operating the AG-5B under normal conditions. Operations procedures associated with optional systems are found in Section 9 SUPPLEMENTS.

4.3 AIRSPEEDS FOR NORMAL OPERATIONS

Best Rate of Climb (Sea Level)	90 KIAS
Best angle of climb (Sea Level)	70 KIAS
Landing Approach (Flaps Up)	72 KIAS
Landing Approach (Flaps Down)	70 KIAS
Balked Landing Climb	70 KIAS
Recommended Turbulent Air Penetration	112 KIAS

4.5 NORMAL PROCEDURES CHECKLIST

PREFLIGHT INSPECTION

1. **Cabin**

   (a) Canopy - OPEN (turn handle counterclockwise to open)
   (b) Ignition Switch - OFF
   (c) Master Switch - OFF
   (d) Mixture - IDLE CUTOFF

2. **Left Wing Trailing Edge**

   (a) Flap - Secure and undamaged
   (b) Aileron - Freedom of Movement

3. Left Wing

(a) Wing Tip and Light - Undamaged
(b) Aileron Counterweight Access - Unobstructed
(c) Wing Inspection Plates - Secure
(d) Tiedowns - Remove
(e) Pitot Tube - Unobstructed
(f) Fuel Tank Vent - Unobstructed

4. Left Wing Leading Edge

(a) Landing Light - Check
(b) Fuel Tank - Check quantity, cap seal checked for damage, cap secure
(c) Tank Drain - Fuel free of water and sediment, drain secure
(d) Sump Drain - Fuel free of water and sediment, drain secure
(e) Fuel - Proper color
(f) Landing Gear Wheel Fairing and Tire - Undamaged, tire properly inflated
(g) Chocks - Removed

5. Left Cowling

(a) Windshield - Clean, undamaged
(b) OAT Gauge - Secure, undamaged
(c) Fuel Pump Overflow Drain - Unobstructed
(d) Fresh Air Vents - Unobstructed
(e) Air Cleaner Drain - Unobstructed
(f) Oil Breather Vent - Unobstructed
(g) Cowling - Open, secured
(h) Baffles - Secure, undamaged
(i) Cowling - Closed, latches secured (flush with surface)

Note: If engine cowling is opened, ensure that its support tube is secured in the retainer clip prior to closing the cowling. Ensure that cowling latches are secure (flush with surface).

6. Nose

(a) Propeller and Spinner - Secure, undamaged
(b) Cowling - Secure, undamaged
(c) Nose Gear, and Fairing - Undamaged, tire properly inflated
(d) Tow Bar - Removed and stowed
(e) Chocks - Removed
(f) Engine Cooling Openings - Unobstructed

7. Right Cowling

(a) Cowling - Open
(b) Engine Cooling Openings - Unobstructed
(c) Engine Oil Level - 6 Quarts minimum, capacity 8 quarts
(d) Engine Oil Dipstick - Secured (finger tight)
(e) Vacuum Pump Vent - Unobstructed
(f) Battery - Secure
(g) Fuses - Check
(h) Baffles - Secured, Undamaged
(i) Cowling - Closed, latches secured (flush with surface)

8. Right Wing Leading Edge

(a) Fuel Tank - Check quantity, cap seal checked for damage, cap secured
(b) Sump Drain - Fuel free of water and sediment, drain secured
(c) Tank Drain - Fuel free of water and sediment, drain secured
(d) Fuel - Proper color
(e) Landing Gear, Wheel Fairing and Tire - Undamaged, tire properly inflated
(f) Chocks - Removed
(g) Stall Warning Vane - Check
(h) Fuel Tank Vent - Unobstructed
(i) Landing Light

9. Right Wing

(a) Wing Tip and Light - Undamaged
(b) Aileron Counterweight Access - Unobstructed
(c) Wing Inspection Plates - Secured
(d) Tiedown - Removed

10. Right Wing Trailing Edge

(a) Aileron - Freedom of movement
(b) Flap - Secure and undamaged

11. Right Side of Fuselage

(a) Static Source - Unobstructed
(b) Antennas - Secure, undamaged
(c) Fuselage - Undamaged

12. **Empennage**

(a) Elevators - Freedom of movement
(b) Rudder - Freedom of movement
(c) Trim Tabs - Secure, undamaged
(d) Tail Cone and Light - Secured, undamaged
(e) Tiedown - Removed

13. **Left Side of Fuselage**

(a) Static Source - Unobstructed
(b) Fuselage - Undamaged
(c) Baggage Door - Secure

14. **Night Flight Preflight**

(a) Fuses and Circuit Breakers - Check
(b) Flashlight - Aboard
(c) Required Charts - Aboard

ELECTRICAL SYSTEMS/NIGHT PREFLIGHT

1. **Cabin**

(a) Master Switch - ON
(b) Instrument Lights - CHECK
(c) Panel Lights - ON
(d) Dome Light - ON
(e) Navigation Lights - ON
(f) Flashing Beacon - ON
(g) Pitot Heat - ON
(h) Landing Light - ON

2. **Left Wing Tip**

(a) Navigation Light - Illuminated
(b) Strobe Light - Flashing
(c) Landing Light - Illuminated

WARNING: PITOT TUBE CAN BE HOT ENOUGH TO BURN SKIN.

(d) Pitot Tube - Check for heat

3. **Right Wing**

(a) Stall Warning Vane - Lift, check that stall warning horn sounds
(b) Landing Light - Illuminated

4. Right Wing Tip

(a) Navigation Light - Illuminated
(b) Strobe Light - Operating (if installed)

5. Empennage

(a) Navigation Light - Illuminated
(b) Flashing Beacon - Operating

6. Cabin

(a) Master Switch - OFF
(b) Navigation Lights - OFF
(c) Flashing Beacon - OFF
(d) Strobe Lights - OFF
(e) Pitot Heat - OFF
(f) Landing Light - OFF

BEFORE STARTING ENGINE

(1) Preflight Inspection - Complete
(2) Seats, Seat Belts and Shoulder Harness - Adjusted, locked
(3) Avionics Master and Electrical Equipment - OFF
(4) Parking Brake - SET
(5) Controls - Check for proper operation

STARTING ENGINE

Airplane Power

(1) Master/Alternator Switch - ON
(2) Avionics Master and Electrical Equipment - OFF
(3) Carburetor Heat - OFF
(4) Throttle - Open approximately 1/4 inch
(5) Mixture - FULL RICH
(6) Fuel Selector Valve - Set to fullest tank
(7) Flaps - UP
(8) Auxiliary Fuel Pump - ON (Check pressure 0.5 - 8 PSI)
(9) Prime - As required
(10) Propeller - CLEAR
(11) Starter - Switch to start
(12) Ignition Switch - Release to both
(13) Oil Pressure - Check, if no pressure within 30 seconds, shut down engine
(14) Engine - Warm up at 1000 to 1200 RPM
(15) Auxiliary Fuel Pump - OFF

BEFORE TAXIING

(1) Avionics Master Switch - ON
(2) Radios/Transponder - CHECKED - SET
(3) Altimeter/Gyros/Clock - SET
(4) Exterior Lights - AS REQUIRED
(5) Parking Brake - RELEASED

TAXIING

(1) Brakes - CHECKED
(2) Flight Instruments - CHECKED

Note: Avoid prolonged idling while on the ground.

ENGINE RUNUP

(1) Parking Brakes - SET
(2) Throttle - Set for 1800 RPM
(3) Engine Instruments - In green arc
(4) Loadmeter/Voltmeter - Checked
(5) Vacuum Gage - 4.6 to 5.4 in. Hg.
(6) Magnetos - Check, 175 RPM maximum drop, not over 50 RPM difference between left and right magnetos.
(7) Carburetor Heat - ON, check for RPM drop, then set to OFF
(8) Throttle - Set for 1000 RPM
(9) Radios - Transponder - SET
(10) Engine - Idles smoothly

NOTE: Engine is ready for takeoff when it will take throttle without hesitating or faltering and oil temperature is in green arc.

BEFORE TAKEOFF

(1) Trim Tab - SET
(2) Flaps - Checked for operation, set UP
(3) Mixture - FULL RICH (or as required by field elevation)
(4) Throttle Friction Lock - ADJUSTED
(5) Flight Instruments - SET (clock, directional gyro, altimeter, radios)
(6) Lights - ON, as required
(7) Parking Brake - OFF
(8) Seat Belts and Shoulder Harness - SECURE
(9) Transponder - ON

TAKEOFF

NORMAL TAKEOFF

(1) Flaps - UP
(2) Carburetor Heat - OFF
(3) Auxiliary Fuel Pump - ON
(4) Throttle - FULL OPEN
(5) Elevator Control - Raise nosewheel at 50 KIAS to 55 KIAS
(6) Climb Speed - 90 KIAS

OBSTACLE CLEARANCE TAKEOFF

(1) Flaps - UP
(2) Carburetor Heat - OFF
(3) Auxiliary Fuel Pump - ON
(4) Throttle - FULL OPEN
(5 Elevator - Apply light pressure at 50 KIAS, lift nosewheel at 55 KIAS
(6) Climb Speed - 70 KIAS

CLIMB

(1) Normal Climb Speed - 90 KIAS at full throttle
(2) Best Rate of Climb Speed - 90 KIAS at sea level, full throttle (reduce A/S 1 kt/1000')
(3) Best Angle of Climb Speed - 70 KIAS at seat level, full throttle

CRUISE

(1) Auxiliary Fuel Pump - OFF
(2) Power - SET at 2200 to 2700 RPM
(3) Trim Tab - SET as required
(4) Mixture - SET as required. Full rich when operating at more than 75% power. If in doubt of percentage of power being used, use full rich mixture for operation below 5000 ft.

CAUTION: DO NOT OPEN CANOPY AT SPEEDS IN EXCESS OF 112 KIAS.

DESCENT

(1) Power - As required for descent
(2) Mixture - As required by altitude
(3) Carburetor Heat - As required by engine power setting and weather conditions

BEFORE LANDING

(1) Seats, Seat Belts and Shoulder Harness - Adjust and lock
(2) Fuel Selector - On fullest tank
(3) Mixture - FULL RICH
(4) Auxiliary Fuel Pump - ON
(5) Carburetor Heat - as required
(6) Parking Brake - OFF
(7) Flaps - SET as required, below 103 KIAS
(8) Landing Light - ON as required

BALKED LANDING

(1) Power - Full Throttle
(2) Carburetor Heat - OFF
(3) Airspeed - 70 KIAS
(4) Establish Climb Attitude
(5) Flaps - Retract slowly
(6) Airspeed - Accelerate to 90 KIAS

LANDING

NORMAL LANDING

(1) Approach Airspeed- 70 KIAS

(2) Touch down on main gear

CAUTION: IF THE NOSE GEAR IS ALLOWED TO CONTACT THE RUNWAY PRIOR TO MAIN GEAR TOUCHDOWN, A PORPOISE MANEUVER MAY OCCUR. SHOULD THE AIRPLANE BEGIN PORPOISING, RECOVER AS FOLLOWS:

(a) Apply full power
(b) Maintain steady elevator back pressure for a normal climb
(c) Establish a normal climb at 90 KIAS
(d) Slowly retract flaps
(e) Execute a normal go-around

(3) Lower nosewheel slowly as speed decreases
(4) Use rudder to maintain directional control down to approximately 20 KIAS
(5) Brakes - Use as required for stopping and directional control

AFTER LANDING

(1) Carburetor Heat - OFF
(2) Flaps - UP
(3) Auxiliary Fuel Pump - OFF
(4) Landing Light - As required
(5) Wingtip Strobes (if installed) - OFF

SHUT-DOWN/SECURING AIRPLANE

(1) Avionics Master - OFF
(2) Mixture - IDLE CUTOFF
(3) Ignition - OFF (after propeller has stopped)
(4) Master Switch - OFF
(5) Chocks/Tiedowns - Installed
(6) Parking Brake - ON (as required)

4.7 AMPLIFIED PROCEDURES

Amplified procedures contain detailed information for operating the AG-5B under normal conditions.

4.9 PREFLIGHT INSPECTION

Prior to each flight give the airplane a thorough preflight inspection. this inspection includes checks for structural damage. The control surfaces should be checked for free and correct movement. During winter months all wings and control surfaces must be free of snow and ice before flight.

The static ports and pitot tube must be free of foreign material, otherwise the altimeter, VSI, and Airspeed Indicator will not function properly.

Check fuel quantity by removing the cap and looking in the tank. A tab inside each fuel tank marks the 19 gallon level for that tank. Fuel levels must be at or below the tabs in order to operate the airplane in the utility category. The fuel vents must be free of any foreign material.

Thoroughly inspect the engine compartment by lifting the cowl on each side of the airplane. The oil level should be between 6 and 8 quarts. Check for signs of oil leaks. Check for loose or damaged wires and hoses. After inspection, close the cowl and insure latches are secure.

Complete a thorough systems preflight - include checks of the stall warning horn and pitot heat. If flying at night check to insure that all interior/exterior lights are operational.

4.11 BEFORE ENGINE STARTING

If the engine is hot, priming will not be necessary for starting. If the engine is cold it may be necessary to use the electric priming system. The primer button on the left side of the instrument panel activates a solenoid operated valve that allows fuel to enter the cylinders only when the Auxiliary Fuel pump is ON. To prime the engine, the Master Switch and the Fuel Pump must be turned ON. If the temperature is above 40 degrees Fahrenheit, depress the primer button for one to two seconds. For temperatures below 40 degrees Fahrenheit, depress the primer button for three to four seconds. Care should be taken not to over prime the engine. During periods of extreme cold weather, preheating the engine motor oil before starting is recommended.

4.13 ENGINE STARTING

With brakes applied and preflight cockpit check complete, make sure the propeller area is clear and engage the starter. If the engine fails to start on the first attempt, a second attempt should be made without priming.

If no oil pressure is indicated within 30 seconds, shut the engine down immediately. The minimum oil pressure is 25 PSI with the engine idling.

4.15 BEFORE TAXIING/TAXIING

All taxiing should be done at safe speeds with the controls positioned to minimize the effects of gusty winds. Since the rudder controls on the AG-5B are not directly coupled to the nose wheel, differential braking may be required to maintain directional control while taxiing at very slow speeds. Taxiing over loose gravel should be done at low engine speed to minimize damage to the propeller. Do not use carburetor heat on the ground (heated air is unfiltered and will cause excessive engine wear).

4.17 ENGINE RUNUP/BEFORE TAKEOFF

Prior to takeoff turn the airplane into the wind and set the power to 1800 RPM. The magneto check is done using the BOTH-RIGHT-BOTH-LEFT-BOTH sequence. Maximum RPM drop should not exceed 175 RPM, or a 50 RPM differential between magnetos. Check the carburetor heat for proper operation at this time. During the run up the engine instruments should all be indicating normal.

Prior to taking the runway make sure the Trim is SET, the Flaps are UP, the Mixture is FULL RICH and the Carburetor Heat is in the COLD position.

4.19 TAKEOFF

NORMAL TAKEOFF

During the takeoff roll apply full power, using a smooth and uniform throttle application. Directional control is maintained with light toe pressure on the brakes. At speeds above 15 KIAS the rudder becomes effective and using the brakes for steering is not necessary. Accelerate to 50 KIAS then apply light back pressure on the control wheel to rotate the nose wheel. As speed increases, slowly increase back pressure on the control wheel until airborne.

OBSTACLE CLEARANCE TAKEOFF

An obstacle clearance takeoff is accomplished with the Flaps set in the UP position. Full power should be applied swiftly while holding the brakes. After releasing the brakes, keep slight forward pressure on the elevator until the aircraft reaches 55 KIAS, then apply gentle yet positive back pressure until the aircraft lifts off the ground. Immediately establish a climb at the Best Angle of Climb Speed (70 KIAS) until all obstacles are cleared, then establish a normal climb.

Crosswind Takeoff

When taking off in a crosswind begin the takeoff roll with full aileron deflection into the wind. As the airspeed increases the ailerons are brought back toward neutral. Lift off at a slightly higher than normal airspeed. When clear of the ground, make a coordinated turn into the wind to compensate for drift to remain on a runway centerline track.

4.21 CLIMB

The Best Rate of Climb Speed (V_y) is 90 KIAS at sea level and decreases approximately 1 knot for each 1000 ft of altitude gained. At 10,000 ft MSL V_y is 79 KIAS. V_y allows the airplane to gain the greatest amount of altitude in the shortest length of time. If there are obstacles to be cleared, climbing at The Best Angle of Climb Speed (V_x) is recommended until all obstacles have been cleared. V_x is 70 KIAS at Sea level. This speed allows the airplane to gain the greatest amount of altitude over the shortest distance traveled. If obstacles are not a factor, a cruise climb of approximately 500 ft/minute is recommended which offers good visibility and provides better cooling for the engine.

Use maximum power, with the carburetor heat in the FULL COLD position for all climbs. The mixture should be set to FULL RICH when climbing below 5000 Ft. MSL. Above 5000 Ft. MSL leaning the mixture will help the engine run smoother and develop more power. However, use caution - lean mixtures can cause higher than normal cylinder head temperatures. During climbs, on hot days, the cylinder head and oil temperatures may rise above the normal indications. Decreasing the angle of climb (increasing airspeed) and enriching the mixture will provide for better engine cooling.

4.23 CRUISE

Upon leveling off at the desired cruising altitude, turn the Fuel Pump OFF. Recommended power settings are between 75% and 55% BHP. The percentage of brake horsepower is determined by throttle setting, altitude and temperature. High power settings will result in greater airspeed and fuel consumption than lower power settings. Refer to Section 5 Performance to determine the desired power setting.

To lean the mixture for cruising flight above 5000 feet, slowly move the mixture lever back until maximum RPM is obtained. If engine roughness is noted, ease the mixture lever forward just enough to smooth out the engine. A mixture setting that is too rich will result in a greater than normal fuel consumption, a loss of power and could cause the spark plugs to foul. A mixture setting that is too lean could cause the engine to overheat.

4.25 DESCENT

When making descents with the Power ON use caution to keep the power setting at or below 2700 RPM and in rough air the airspeed at or below 142 KIAS. Power reductions should be made gradually and smoothly to avoid cooling the engine too quickly. Apply FULL Carburetor Heat before reducing power below 1500 RPM, to reduce the chance of developing carburetor ice.

4.27 STALLS

The AG-5B possesses conventional stall characteristics. An audible stall warning horn will sound 5 KIAS to 10 KIAS before the stall occurs. Both rudder and ailerons are used to control the aircraft throughout the stall. Practice stalls can be done with Power ON or OFF and with Flaps UP or DOWN. When practicing stalls, raise the nose of the airplane gradually allowing the airspeed to decrease slowly until the stall is reached. Use Carburetor Heat when practicing Power OFF stalls. To recover from a stall, apply full power and lower the nose. Next push the Carburetor Heat Lever to the FULL COLD position and establish a 70 KIAS climb.

Note: Whip stalls are prohibited in the AG-5B.

4.29 BEFORE LANDING

Prior to landing, make sure all occupants have their Seat Belts and Shoulder Harness ON and properly adjusted. The Fuel Selector valve should be set on the FULLEST TANK. Turn the fuel pump ON and set the mixture to FULL RICH. Pull the carburetor heat lever to the FULL HOT position prior to reducing power below 1500 RPM. This will reduce the chance of ice forming in the venturi of the carburetor. Make the landing approach at 72 KIAS with the flaps UP. With flaps in the full down position, use an approach speed of 70 KIAS.

4.31 LANDING

Normal landings are made with full flaps and an approach speed of 70 KIAS. Touch down on the main wheels first and hold the nose wheel off the ground as long as possible while maintaining directional controls with the rudder. As the airspeed slows, lower the wheel nose gently and apply brakes as needed. After clearing the runway, retract the flaps and turn the electric Fuel Pump OFF.

Crosswind Landing

When landing in a crosswind, use the minimum flap setting required for the field length. The ailerons and rudder should be used to prevent the airplane from drifting. This is accomplished by lowering the upwind wing into the wind and applying opposite rudder to keep the airplane aligned with the runway centerline. Touch down on the upwind main gear first and as the airspeed slows allow the other main gear to contact the ground followed by the nose gear.

4.33 BALKED LANDINGS (GO-AROUNDS)

To make a go-around, apply full throttle, push the Carburetor Heat Lever to the COLD position and establish a positive rate of climb at 70 KIAS.

4.35 GROUND HANDLING AND TIE DOWN

The AG-5B is easily handled on the ground by hand with the aid of a tow bar attached to the nose wheel fork.

Properly securing the airplane is recommended. To prevent damage during gusty wind conditions, install the control wheel lock and use the tie down rings which are installed under each wing tip and under the tail.

SECTION 5

PERFORMANCE

TABLE OF CONTENTS

Paragraph No.		Page No.
5.1	General	5-1
5.3	Introduction to Performance and Flight Planning	5-1
5.5	Introduction to Tabulated Performance Charts	5-2
5.7	Flight Planning Example	5-2
5.9	Performance Graphs	5-7

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SECTION 5

PERFORMANCE

5.1 General

Section 5 contains data in the form of tables and charts that will assist the pilot in operating the AG-5B aircraft safely and efficiently. All of the required performance information applicable to the AG-5B aircraft is provided in this section.

Performance information, associated with optional systems and equipment which require handbook supplements, is provided in Section 9, SUPPLEMENTS when appropriate.

5.3 Introduction to Performance and Flight Planning

The performance information presented in this section is based on measured flight test data (corrected to standard day conditions) which is analytically expanded for various parameters of weight, altitude, temperature, etc.

The performance charts are unfactored and do not make allowance for varying degrees of pilot proficiency and/or mechanical deterioration of the aircraft. The performance, however, can be achieved by following the stated procedures in a properly maintained airplane.

The effects of conditions not considered on the charts must be evaluated by the pilot, such as the effect of a soft or grass runway surface on takeoff and landing performance or the effect of winds aloft on cruise and range performance. In addition, endurance can be grossly affected by improper leaning procedures. Periodic inflight checks of fuel flow and fuel quantity are recommended to insure optimum performance and safe aircraft operation.

The information provided in Paragraph 5.5 (Introduction to Tabulated Performance Charts) outlines the procedures that are used to interpolate between tabular values on the charts.

The information provided in paragraph 5.7 (Flight Planning Example) outlines a detailed flight planning analysis using the performance charts included in this section.

WARNING: PERFORMANCE INFORMATION OBTAINED BY EXPLORATION BEYOND THE LIMITS SHOWN ON THE CHARTS SHOULD NOT BE USED FOR FLIGHT PLANNING PURPOSES.

5.5 Introduction to Tabulated Performance Charts

Tabulations of performance are presented in increments of temperature, altitude, and any other variables involved. Performance for a given set of conditions may be approximated as follows:

Takeoff, climb, and landing - Enter tables at the next higher increment of altitude and temperature.

Cruise - Enter tables at next lower increment of temperature and altitude.

To obtain more exact performance values from tables, it is necessary to interpolate between the incremental values.

The following example is derived from the table for Takeoff distances (Figure 5-7):

Departure field conditions:

Pressure Altitude: 1200 ft.
OAT: 23° C
Headwind: 11 kts.
Aircraft Weight: 2400 lbs. (Assumed)

The field pressure altitude is 1200/2000 = 60% of the difference between the next lower altitude (S.L.) and the next higher altitude (2000 ft.). The field temperature is 3/20 = 15% of the difference between the next lower temperature (20° C) and the next higher temperature (40° C).

Summary of interpolated values:

Total distance at S.L. and 23° C = 2220 + (2510-2220) X .15=2264 ft.
Total distance at 2000 ft. and 23° C = 2490 + (2810-2490) X .15=2538 ft.
Total distance at 1200 ft. and 23° C = 2264 + (2538-2264) X .60=2428 ft.

The correction for headwind is noted as 1% per knot. Therefore, the final total distance required = 2428 -.11 X 2428 = 2161 ft.

5.7 Flight Planning Example

(a) Aircraft Loading

The first step in planning a flight is to calculate the airplane weight and center of gravity by utilizing the information provided in Section 6, WEIGHT AND BALANCE of this handbook.

The basic empty weight for the airplane as delivered from the factory is shown in Figure 6-2. For this flight planning example an assumed basic empty weight of 1400 pounds will be used. If any alterations to the airplane have been made affecting the weight and balance, reference to the aircraft Logbook and Weight and Balance Record should be made to determine the Current Basic Empty Weight of the airplane.

Make use of the Weight and Balance Loading Graph (Figure 6-5) and the Center Of Gravity Envelope (Figure 6-6) to determine the total weight of the airplane and center of its gravity position.

The following information is provided for our flight planning example. It should be pointed out that the landing weight of the aircraft cannot be determined until the weight of the fuel to be used during the flight has been established (refer to item (g)(1)):

(1)	Basic Empty Weight	1400 lbs.
(2)	Pilot & Co-Pilot	340 lbs.
(3)	Rear Seat Passengers	340 lbs.
(4)	Baggage	22 lbs.
(5)	Fuel (6 lb./gal. X 50)	306 lbs.
(6)	Fuel Used For Start/Taxi	-8 lbs.
(7)	Takeoff Weight	2400 lbs.
(8)	Landing Weight	2182 lbs.
	(a)(7) - (g)(1), (2400 lbs.- 218.5)	lbs.

Our takeoff weight is 2400 lbs. and our weight and balance calculations (Figure 6-4) have determined our c.g to be at 91.85 inches aft of the reference datum which is within the c.g. limits.

(b) Takeoff and Landing

Now that we have determined our aircraft loading, we can proceed with takeoff and landing performance.

All of the existing and/or forecast conditions for the departure and destination airports must be obtained.

Use departure airport conditions to enter the Takeoff Distance Table (Figure 5-7) to determine the ground roll distance and total takeoff distance to 50 feet.

The landing distance calculations are performed in the same manner using the forecast conditions for the destination airport. The Landing Distance Table is shown in Figure 5-15.

For our example flight, the conditions for Departure and Destination airports are listed below. The takeoff and landing distances required for our example flight are less than the available runway lengths.

		Departure Airport	Destination Airport
(1)	Pressure Altitude	1500 ft.	2500 ft.
(2)	Temperature	80°F (27°C)	75°F (24°C)
(3)	Wind Component	15 Knots Headwind	0 Knots
(4)	Available Runway Length	4800 ft.	7600 ft.
(5)	Runway Required	2152 ft.	1830 ft.

Note: The remainder of the performance charts used in this flight planning example assume a no wind condition. The effect of winds aloft must be considered by the pilot when determining climb, cruise, and descent performance.

(c) Climb

The next step in planning the flight is to determine the time, fuel, and distance during the climb to 5000 Feet pressure altitude.

The desired cruise pressure altitude and corresponding cruise outside air temperature values are the first variables to be considered. Figure 5-10 is used to determine the desired Time, Fuel, and Distance values. Since the departure airport is located at a pressure altitude of 1500 Feet with a temperature of 80°F (27°C) the Time, Fuel, and Distance values for a climb from sea level on a standard day need to be subtracted from the values determined for the climb to cruise altitude.

The resulting values are Fuel, Time, and Distance for the climb segment corrected for field pressure altitude and temperature.

The following values were determined for our flight planning example:

(1)	Cruise Pressure Altitude	5000 ft.
(2)	Cruise OAT	60°F (16°C)
(3)	Time to Climb (10.5 min. - 2.6 min.)	7.9 min.
(4)	Fuel to Climb (2.4 gal. - .6 gal.)	1.8 gal.
(5)	Distance to Climb (16.5 miles - 4.2 miles)	12.3 nau.mi.

(d) Descent

The descent data will be determined prior to the cruise data to provide the descent distance for establishing the total cruise distance.

Utilizing the cruise pressure altitude and OAT we determine the basic Time, Fuel, and Distance for descent. These figures must be adjusted for the field pressure altitude at the destination airport. To find the necessary adjustment values, use the existing pressure altitude and temperature conditions at the destination airport as variables. Find the Time, Fuel, and Distance values from the table (Figure 5-13). Now subtract the values obtained for the descent to field conditions from the values obtained for the descent from the cruise conditions to obtain

the true Time, Fuel, and Distance values needed for the flight plan. The values obtained for the descent segment are as follows:

(1)	Time to Descend (10.0 min. - 5.0 min.)	5.0 min.
(2)	Distance to Descend (24.0 nau.mi. - 11.5 nau.mi.)	12.5 nau.mi.
(3)	Fuel to Descend (1.5 gal. - .7 gal.)	.8 gal.

(e) Cruise

Using the total distance to be traveled during the flight, subtract the previously calculated distances to climb and descend to establish the Total Cruise Distance.

Refer to the appropriate AVCO Lycoming manual when selecting the cruise power setting. The established pressure altitude and temperature values and selected cruise power should now be utilized to determine the True Airspeed from the Cruise Performance Graph (Figure 5-10).

Calculate the Cruise Fuel Consumption from the cruise power setting from the Lycoming Manual.

The Cruise Time is found by dividing the cruise distance by the cruise speed. The Cruise Fuel is found by multiplying the cruise fuel consumption by the cruise time.

Specific Cruise Calculations Are As Follows:

(1)	Total Distance	300 nau.mi.
(2)	Cruise Distance (e)(1) - (c)(5) - (d)(2), (300-12.3-12.5)	275.2 miles
(3)	75% Power, Best Power Mixture	
(4)	Cruise Speed	132 KTAS
(5)	Cruise Fuel Consumption	11.5 GPH
(6)	Cruise Time (e)(2) + (e)(4), (275.2 nau.mi. + 132 KTAS)	2.08 hrs.
(7)	Cruise Fuel (e)(5) X (e)(6), (11.5 GPH X 2.08 hrs.)	24.0 gal.

(f) Total Flight Time

The Total Flight Time is determined by adding the time to climb, time to descend, and the cruise time. REMEMBER the times for climb and descent obtained from the graphs are in minutes and must be converted to hours before adding them to the cruise time.

The following flight time is required for our flight planning example.

(1)	Total Flight Time (c)(3) + (d)(1) + (e)(6), (.13 hrs. + .08 hrs. + 2.08 hrs.) Total Flight Time 0.13 + .08 + 2.08 = 2.29	2.29 hrs.

(g) Total Fuel Required

Determine the Total Fuel Required by adding the fuel to climb, the fuel to descend, and the cruise fuel. When the Total Fuel Required (in gallons) is determined, multiply the value by 6 lb/gal to determine the Total Fuel Weight used for the flight.

The Total Fuel calculations are as follows:

(1) Total Fuel Required

(c)(4) + (d)(3) + (e)(7),	
(1.8 gal.+.8 gal. + 24.0 gal.)	27.8 gal.
(27.8 gal. X 6 lb./gal.)	166.8 lbs.
45 min reserve at 75% power = 8.6 gal. (51.6 lbs.)	51.6
	218.5 lbs.

5.9 Performance Graphs

Figure No.		Page No.
5-1	Temperature Conversion	5-8
5-2	ISA Conversion	5-9
5-3	Crosswind Component	5-10
5-4	Airspeed System Calibration	5-11
5-5	Altimeter Calibration	5-12
5-6	Stall Speeds	5-13
5-7	Takeoff Distance	5-14
5-8	Climb Performance	5-15
5-9	Time, Fuel, and Distance to Climb	5-16
5-10	Cruise Performance	5-17
5-11	Range Performance	5-18
5-12	Endurance Performance	5-19
5-13	Time, Fuel, and Distance to Descend	5-20
5-14	Balked Landing Climb Performance	5-21
5-15	Landing Distance	5-22

TEMPERATURE CONVERSION CHART

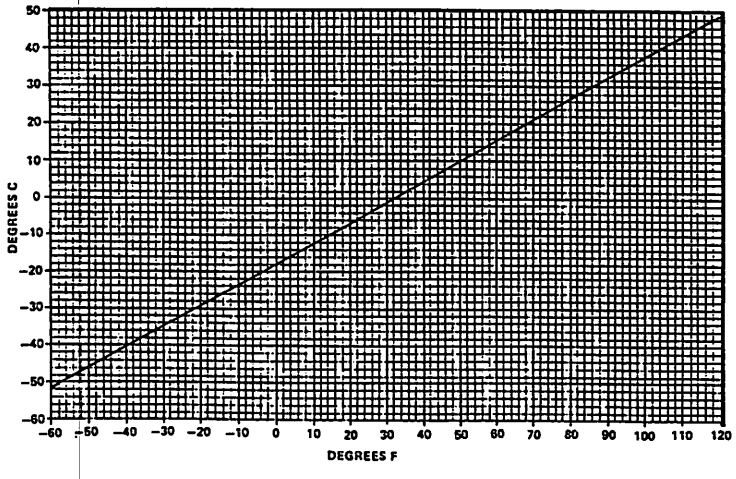

Figure 5-1 Temperature Conversion

ISA CONVERSION CHART

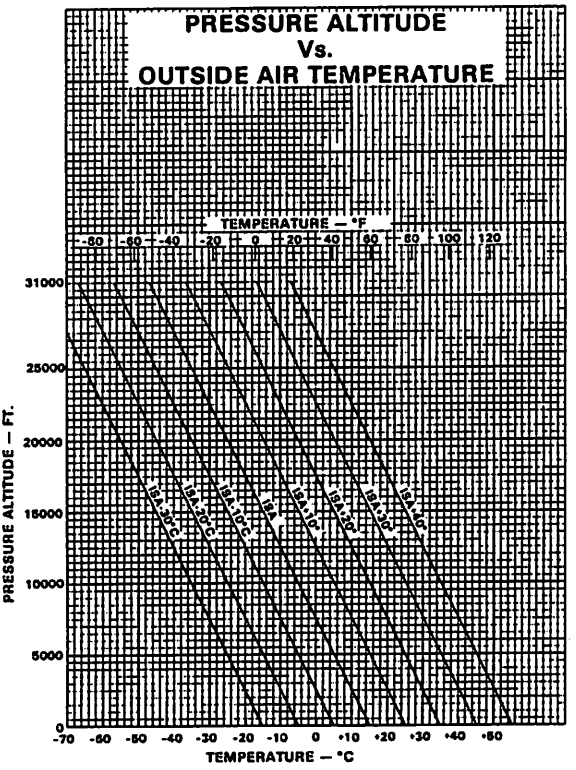

Figure 5-2 ISA Conversion

CROSSWIND COMPONENT CHART

EXAMPLE

WIND SPEED	10 KNOTS
ANGLE BETWEEN WIND DIRECTION AND FLIGHT PATH	20°
HEADWIND COMPONENT	9.5 KNOTS
CROSSWIND COMPONENT	3.5 KNOTS

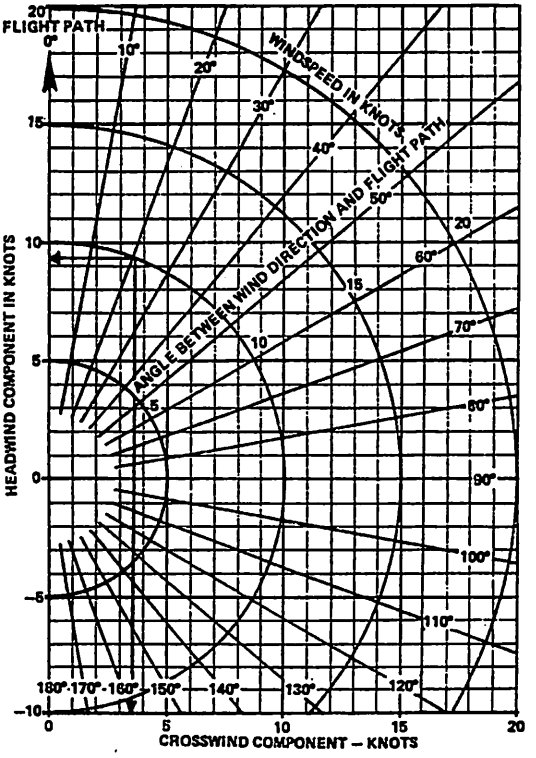

Figure 5-3 Crosswind Component

AIRSPEED SYSTEM CALIBRATION

NOTES:

1. Indicated airspeed assumes zero instrument error.
2. Corrections are not affected by flap position.

KNOTS				MILES PER HOUR			
NORMAL STATIC SYSTEM		ALTERNATE STATIC SYSTEM		NORMAL STATIC SYSTEM		ALTERNATE STATIC SYSTEM	
IAS	CAS	IAS	CAS	IAS	CAS	IAS	CAS
50	50	50	46	60	60	60	55
60	60	60	56	70	70	70	65
70	71	70	66	80	81	80	75
80	81	80	76	90	91	90	85
90	91	90	86	100	101	100	95
100	101	100	96	110	111	110	105
110	111	110	106	120	121	120	115
120	121	120	115	130	131	130	125
130	131	130	125	140	141	140	135
140	141	140	135	150	151	150	144
150	151	150	145	160	161	160	154
160	162	160	155	170	171	170	164
170	172	170	165	180	181	180	174
180	182	180	175	190	192	190	184
				200	202	200	194
				210	212	210	204

Figure 5-4 Airspeed System Calibration

ALTIMETER CALIBRATION

EXAMPLE:

INDICATED AIRSPEED	80 KNOTS (92 MPH)	
INDICATED PRESSURE ALTITUDE	6,000 FEET	
ALTIMETER CORRECTION	4 FEET	

ACTUAL PRESSURE ALTITUDE = 6,000 + 4 = 6004 FEET

NOTES

1. Applicable for all flap positions.
2. Indicated airspeed and indicated altitude assume zero instrument error.

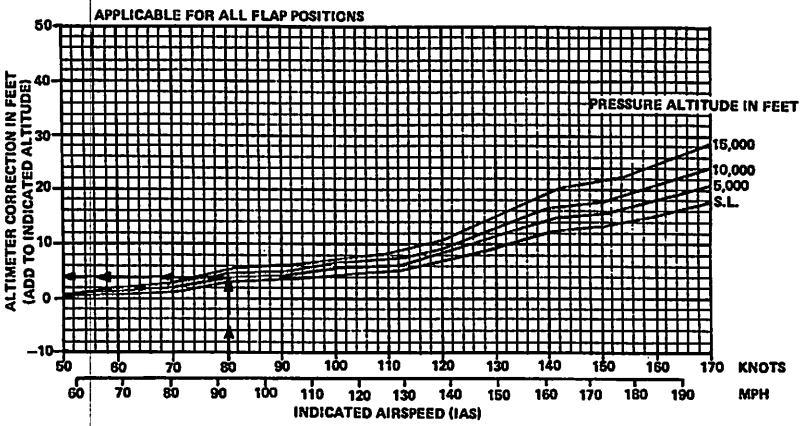

Figure 5-5 Altimeter Calibration

STALL SPEEDS-POWER IDLE

EXAMPLE	
WEIGHT	2200LBS.
FLAPS	0 DEGREES
ANGLE OF BANK	30 DEGREES
STALL SPEED	60 KNOTS (69 MPH)

NOTES
1. The maximum altitude lost in a normal stall recovery is approximately 350 feet.
2. Stall speeds apply for both calibrated and indicated airspeeds.

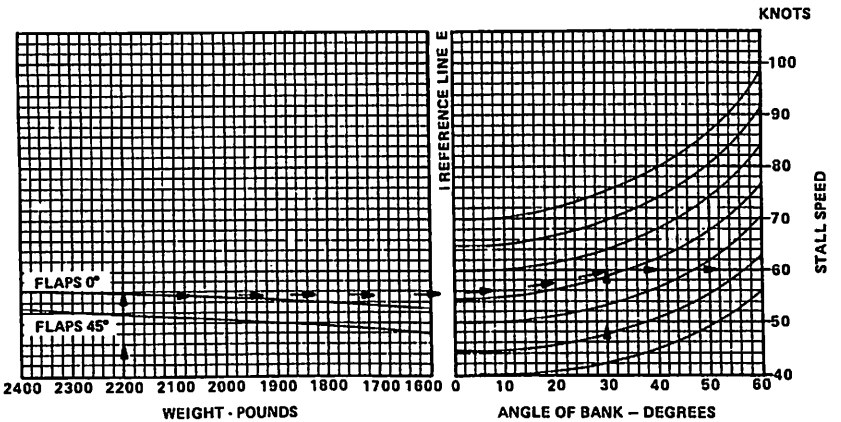

Figure 5-6 Stall Speed

TAKEOFF

Associated Conditions:		Example:	
Power:	Full Throttle	Pressure Altitude:	2000 ft.
Mixture:	Full Rich	OAT:	20 C
Flaps:	Retracted	Headwind Component:	5 kts.
Airspeed:	70 KIAS at Barrier	Ground Roll:	1420-71 = 1349 ft.
Weight:	2400 lbs.	Total:	2490-125 = 2365 ft.

Note: Data assume paved, level, dry surface. Increase distances shown by 3.5% per knot tailwind. Decrease distances shown by 1% per knot headwind.

PRESSURE ALTITUDE (FEET)	GROUND ROLL DISTANCE (TOTAL DISTANCE TO 50 FEET)			
	-20° C	0° C	+20° C	+40° C
S.L.	880 (1660)	1060 (1940)	1240 (2220)	1430 (2510)
2000	1010 (1850)	1220 (2170)	1420 (2490)	1630 (2810)
4000	1170 (2090)	1400 (2440)	1630 (2780)	1860 (3130)
6000	1360 (2340)	1620 (2760)	1910 (3170)	2240 (3660)
8000	1590 (2670)	1880 (3140)	2220 (3660)	2610 (4250)

Note: All Distances in Feet.

Figure 5-7 Takeoff Distances

RATE OF CLIMB

Associated Conditions:

Weight: 2400 lbs.
Power: Full Throttle
Mixture: Full Rich
Flaps: Up

Example:

Pressure Altitude: 6000 ft.
OAT: 20 C
Airspeed: 84 KIAS
Rate of climb: 270 FPM.

Note: Refer to Section 4 for additional leaning instructions.

PRESSURE ALTITUDE (FEET)	KIAS	RATE OF CLIMB			
		-20° C (-4° F)	0° C (+32° F)	+20° C (+68° F)	+40° C (+104° F)
S.L.	90	894	772	662	568
2000	88	726	622	530	444
4000	86	564	478	410	340
6000	84	390	332	270	210
8000	82	244	206	170	134
10,000	79	106	80	60	40

Note: Rate of climb in feet per minute.

Figure 5-8 Climb Performance

TIME, FUEL, AND DISTANCE TO CLIMB

Associated Conditions:

Power:	Full Throttle
Mixture:	Full Rich (Refer to Section 4)
Flaps:	Retracted
Weight:	2400 lbs.
Airspeed:	Best Rate of Climb

Example:

Cruise Altitude:	8000 ft.
Outside Air Temp.:	ISA +20C
Take-Off Altitude:	Sea Level
Time To Climb:	23.5 min.
Fuel To Climb:	4.9 gal.
Dist. To Climb:	37.0 N.M.

Note: Data Assume Zero Wind.

PRESSURE ALTITUDE (FEET)	ISA -20° C			ISA			ISA +20° C		
	TIME MIN.	FUEL GAL.	DIST N.M.	TIME MIN.	FUEL GAL.	DIST. N.M.	TIME MIN.	FUEL GAL.	DIST N.M.
S.L.	0.	0.	0.	0.	0.	0.	0.	0.	0.
2000	2.7	0.7	4.0	3.2	0.8	5.0	3.7	0.9	6.0
4000	6.0	1.5	9.0	7.1	1.7	11.0	8.3	1.9	13.0
6000	10.4	2.5	15.0	12.2	2.9	19.0	14.4	3.2	23.0
8000	16.9	3.8	25.0	19.6	4.4	30.0	23.5	4.9	37.0
10000	28.2	5.9	41.2	33.0	6.8	51.0	39.8	7.7	63.0

Figure 5-9 Time, Fuel, and Distance to Climb

CRUISE

Associated Conditions:

Mixture: Best Power
Weight: 2400 lbs.

Example:

Pressure Altitude: 2000 ft.
OAT: ISA + 20 C
Power Setting: 65%
Fuel Flow: 9.6 GPH.
True Airspeed: 122 kts.

PRESSURE ALTITUDE (FEET)	BHP %	ISA -20° C		ISA		ISA +20° C	
		WF GPH.	TAS KTS.	WF GPH.	TAS KTS.	WF GPH.	TAS KTS.
S.L.	75	11.1	124	11.2	126	11.3	128
	65	9.4	115	9.5	117	9.6	119
	55	7.9	105	7.9	107	8.0	108
2000	75	11.2	126	11.3	128	11.4	131
	65	9.4	117	9.5	119	9.6	122
	55	7.9	106	8.0	108	8.1	109
4000	75	11.2	128	11.4	130	11.4	132
	65	9.5	119	9.6	121	9.7	123
	55	8.0	108	8.1	110	8.1	111
6000	75	11.4	129	11.4	132	11.6	134
	65	9.6	120	9.7	123	9.8	125
	55	8.0	109	8.1	111	8.1	112
8000	75	11.4	132	11.6	134	N/A	N/A
	65	9.7	122	9.8	125	9.9	127
	55	8.1	110	8.2	112	8.2	113
10,000	65	9.8	124	9.9	126	10.0	129
	55	8.1	111	8.2	112	8.3	114

Figure 5-10 Cruise Performance

RANGE

Associated Conditions:

Mixture: Best power
Weight: 2400 lbs.
Fuel: 52.6 gal.

Example:

Pressure Altitude: 4000 ft.
OAT: ISA -20° C
Power Setting: 65%
Range: 530 nau. mi.

Note: Data assume zero wind. Range includes 1.3 gal. for start, taxi, and takeoff. Range includes climb and descent with a 45 minute reserve at selected cruise power.

PRESSURE ALTITUDE (FEET)	BHP %	RANGE (NAUTICAL MILES)		
		ISA -20° C	ISA	ISA +20° C
S.L.	75	463	467	471
	65	526	530	533
	55	584	590	594
2000	75	466	472	476
	65	529	533	536
	55	586	593	590
4000	75	468	475	473
	65	530	535	532
	55	584	590	587
6000	75	469	478	470
	65	526	534	528
	55	580	588	585
8000	75	466	475	N/A
	65	522	531	525
	55	576	585	578
10,000	65	512	524	514
	55	566	578	564

Figure 5-11 Range Performance

ENDURANCE

Associated Conditions:

Mixture: Best Power
Weight: 2400 lbs.
Fuel: 52.6 gal.

Example:

Pressure Altitude: 2000 ft.
OAT: ISA +20° C
Power Setting: 65%
Endurance: 4 hrs. 24 min.

Note: Endurance includes 1.2 gal. for start, taxi, and takeoff. Endurance also includes climb and descent with a 45 minute reserve at selected cruise power.

PRESSURE ALTITUDE (FEET)	BHP %	ENDURANCE (HRS.:MIN.)		
		ISA -20° C	ISA	ISA +20° C
S.L.	75	3:44	3:42	3:40
	65	4:34	4:31	4:28
	55	5:33	5:31	5:28
2000	75	3:42	3:40	3:38
	65	4:32	4:28	4:24
	55	5:29	5:27	5:22
4000	75	3:40	3:38	3:36
	65	4:28	4:24	4:19
	55	5:24	5:20	5:16
6000	75	3:38	3:36	3:34
	65	4:24	4:19	4:15
	55	5:18	5:13	5:11
8000	75	3:36	3:32	N/A
	65	4:18	4:14	4:11
	55	5:12	5:06	5:04
10,000	65	4:12	4:08	4:06
	55	5:03	4:58	4:54

Figure 5-12 Endurance Performance

TIME, FUEL, AND DISTANCE TO DESCEND

Associated Conditions:

Power: As Required to Maintain Airspeed and 500 RPM Rate of Descent
Flaps: Retracted
Weight: 2400 lbs.
Airspeed: 142 KIAS

Example:

Cruise Altitude: 6000 ft.
Destination Altitude: S.L.
Time to Descend: 12 min.
Fuel to Descend: 1.8 gal.
Dist. to Descend: 29.0 N.M.

Note: Data assume zero wind and may be used for ambient temperatures from ISA -20° C to ISA +20° C.

PRESSURE ALTITUDE (FEET)	TIME MIN.	FUEL GAL.	DIST. N.M.
10,000	20	3.3	50
8000	16	2.5	40
6000	12	1.8	29
4000	8	1.2	19
2000	4	0.6	9
S.L.	0	0.0	0

Figure 5-13 Time, Fuel, and Distance to Descend

BALKED LANDING RATE OF CLIMB

Conditions:

Weight: 2400 lbs.
Power: Full Throttle
Mixture: Full Rich
Flaps: Down

Example:

Pressure Altitude: 4000 ft.
OAT: 20° C
Airspeed: 70 KIAS
Rate of Climb: 102 RPM

Note: Refer to Section 4 for additional leaning procedures.

PRESSURE ALTITUDE (FEET)	KIAS	RATE OF CLIMB			
		-20° C (-4° F)	0° C (32° F)	20° C (68° F)	40° C (104° F)
S.L.	70	448	366	296	234
2000	70	324	256	192	134
4000	70	204	150	102	60
6000	70	82	46	12	-20

Note: Rate of climb in feet per minute.

Figure 5-14 Balked Landing Climb Performance

LANDING

Associated Conditions:

Power: Idle
Flaps: Extended
Airspeed: 70 KIAS at Barrier
Weight: 2400 lbs.
Braking: Maximum

Example:

Pressure Altitude: 4000 ft.
OAT: 0° C
Headwind Component: 10 kts.
Ground Roll: 870 - 87 = 783 ft.
Total: 1810 - 181 = 1629 ft.

Note: Data assume paved, level, dry surface. Increase distances shown by 3.5% per knot tailwind. decrease distances shown by 1% per knot headwind.

PRESSURE ALTITUDE (FEET)	GROUND ROLL DISTANCE (TOTAL DISTANCE TO 50 FEET)			
	-20° C	0° C	+20° C	+40° C
S.L.	690 (1630)	750 (1690)	810 (1740)	870 (1810)
2000	750 (1680)	810 (1740)	870 (1800)	930 (1860)
4000	810 (1750)	870 (1810)	930 (1870)	1000 (1930)
6000	870 (1810)	930 (1870)	1010 (1940)	1080 (2010)
8000	940 (1870)	1010 (1950)	1080 (2020)	1160 (2100)

Note: All Distances in Feet.

Figure 5-15 Landing Distance

SECTION 6

WEIGHT AND BALANCE AND EQUIPMENT LIST

TABLE OF CONTENTS

Paragraph No.		Page No.
6.1	General	6-1
6.3	Airplane Weighing Procedure	6-1
6.5	Weight and Balance Record	6-4
6.7	Airplane Loading	6-4
6.9	Weight and Balance Determination for Flight	6-5
6.10	Equipment List	6-9

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SECTION 6

WEIGHT AND BALANCE

6.1 GENERAL

A properly loaded airplane is essential for a safe flight. It is the responsibility of the pilot in command to ensure that the airplane is loaded properly and is within the center of gravity and gross weight limitations stated in this handbook.

6.3 AIRPLANE WEIGHING PROCEDURE

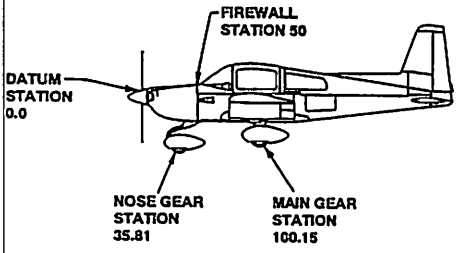
Weighing the Airplane

1. Inflate each tire to the recommended operating pressure.
2. Drain fuel lines and the usable fuel from the airplane.
3. Place the seats in the center of travel position.
4. Raise the flaps and place all control surfaces in the neutral position.
5. Remove all objects that are not a part of the Basic Empty Weight.
6. Place scales under each landing gear. (Use aircraft scales with a minimum capacity of 1500 lbs, for the nose wheel and 1000 Lbs. for each main wheel)
7. Level the airplane by letting air out of the appropriate tires. Check by placing a carpenters level on the canopy track rail.
8. Remove the level and close the canopy.

Computing the Basic Empty Weight and the Center of Gravity

1. Subtract the tare from each scale to obtain each net scale reading.
2. Multiply the net scale reading by the arm for that scale to obtain the moment, then divide each moment by 1000. (see Figure 6-1)
3. Add the net scale readings of each wheel to obtain the Basic Empty Weight.
4. Add the total moments/1000 to obtain the Total Moment/1000.
5. Divide the Total Moment/1000 by the Basic Empty Weight to obtain the c.g. Arm/1000. Then multiply by 1000 to obtain the Total Moment.

WEIGHING THE AIRPLANE



SAMPLE AIRPLANE WEIGHING

ITEM	SCALE READING	C.G ARM	MOMENT/1000
LEFT GEAR	530	100.15	53.08
RIGHT GEAR	524	100.15	52.48
NOSE GEAR	406	35.81	14.54
BASIC EMPTY WEIGHT	1460	82.26	120.10

Figure 6.1 Sample Airplane Weighing (Empty)

WEIGHT AND BALANCE RECORD

SERIAL NUMBER 10102 REGISTATION NUMBER N592SM

DATE	DESCRIPTION OF THE WEIGHT AND C.G CHANGE	WEIGHT AND C.G CHANGE			RUNNING BASIC EMPTY WEIGHT	
		WEIGHT	ARM	MOMENT /1000	WEIGHT	MOMENT /1000
05-12-92	AS DELIVERED	1520	84.13	127.87	1520	127.87

Figure 6-2 Weight and Balance Record

6.5 WEIGHT AND BALANCE RECORD

Whenever the airplane is reweighed or new equipment installed, the Weight and Balance Record must be updated to reflect the changes.

6.7 AIRPLANE LOADING

To place the airplane in the cargo configuration: (See Figure 6-3)

1. Remove the rear seat cushions.
2. Fold the rear seat bottom forward.
3. Unlatch and fold the rear seat back forward.

Note: With the airplane in the Cargo Configuration; no passengers are allowed in the cargo area

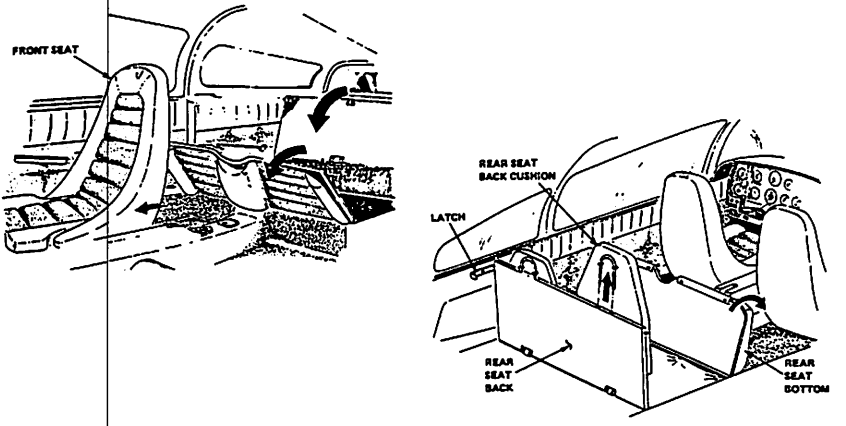


Figure 6-3 Cargo Configuration

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT

Computing the weight and c.g. location for flight can be accomplished by completing the following procedures.

1. Add the Weight of Each Occupant, the Usable Fuel and the Baggage/Cargo to the Basic Empty Weight. (See Weight and Balance Record, Figure 6-2 for Basic Empty Weight).

2. Refer to Figure 6-5 Loading Graph to obtain the Moment/1000 for Each Occupant, the Usable Fuel and the Baggage/Cargo.

3. Add the moments/1000 for the Basic Empty Weight, each occupant, the usable fuel and the baggage/cargo.

4. Refer to Figure 6-6 Center of Gravity envelope to determine if the airplane is loaded within the prescribed Weight and Center of Gravity Limits.

	SAMPLE AIRPLANE			YOUR AIRPLANE		
SAMPLE LOADING PROBLEM	WEIGHT (LBS)	ARM (IN)	MOMENT (LB-IN/ 1000)	WEIGHT (LBS)	ARM (IN)	MOMENT (LB-IN 1000)
1. *Basic Empty Weight (as calculated from Figure 6-2 or from Weight and Balance Data Sheet)	1400	82.30	115.22	1529	84.3	128.87
2. Fuel (In excess of unusable) Capacity 51 gallons.	306	94.80	29.01	——	94.80	——
3. Pilot and Co-Pilot	340	90.60	30.80	——	90.60	——
4. Rear Seat Passengers	340	126.00	42.84	——	126.00	——
5. **Baggage (in baggage compartment) Maximum allowable — 120 pounds	22	151.00	3.32	——	151.00	——
6. Cargo Area Loading Maximum allowable — 340 pounds	——	116.40	——	——	116.40	——
7. SUB TOTAL Airplane Ramp Weight	2408	91.88	221.19			
8. ***Less fuel for start, taxi, and runup	-8	94.80	-0.76	——	94.80	——
9. Total Airplane Take-off Weight	2400	91.83	220.44			

* Includes 40 pounds of optional equipment.

** Maximum allowable is 120 pounds if c.g. is within Center of Gravity envelope. Refer to Cargo Loading and Weight and Balance Section for cargo loading instructions.

*** Fuel for start, taxi, and runup is normally eight pounds at an average moment (LB-IN/1000) of 0.76.

NOTE:

Change in moment from upright to fold-down position of rear seat is negligible.

Figure 6-4 Sample Loading Configuration

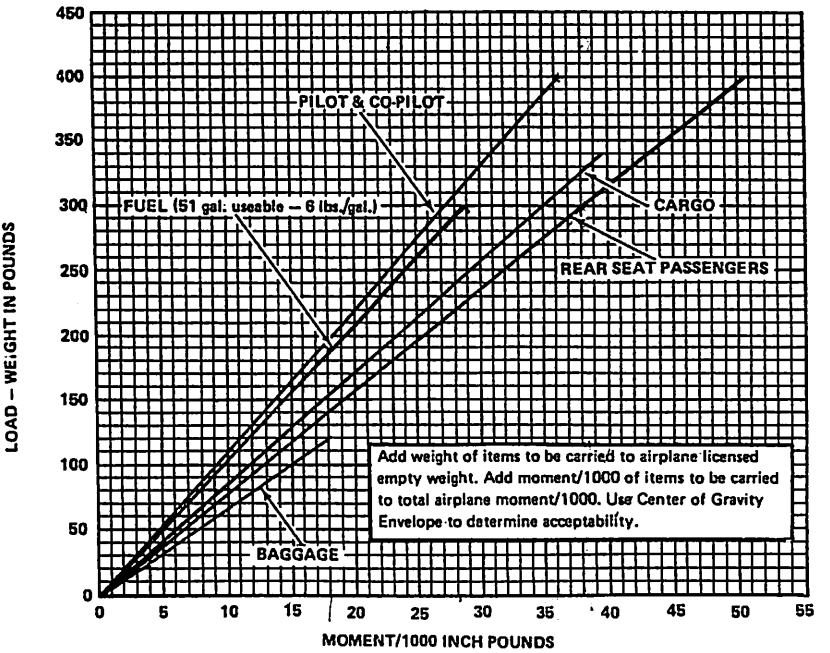


Figure 6-5 Loading Graph

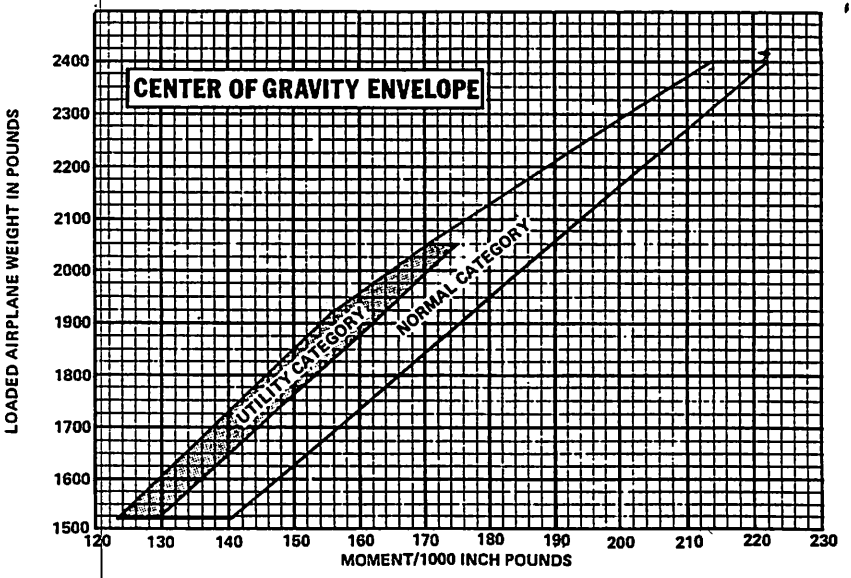


Figure 6-6 Center Of Gravity Envelope

6.10 EQUIPMENT LIST

ITEM NO.	DESCRIPTION	STATUS	WT. LBS	ARM INS.
001-R	Power Installation Includes Lycoming 180 HP engine, installation parts, fuel pump, vac pump drive, primer system, oil thermostatic bypass valve, alternator, carburetor air box, and filter	X	302.92	22.89
002-R	Propeller Installation including propeller, aluminum spacer and hardware	X	40.22	7.84
003-R	Muffler Assembly		14.00	23.30
004-R	Oil Cooler and Lines	X	2.67	36.00
005-R	Propeller Spinner	X	2.67	4.32
006-R	Vacuum Pump Pad	X	.01	.37
007-R	Quick Drain Oil Valve	X	–	–
008-R	Airspeed Indicator – Sigma-Tek	X	.70	68.25
009-R	Altimeter, Sensitive (Feet and Inches of Mercury)	X	1.10	68.00
011-O	Altemeter, Encoding		1.90	66.86
012-R	Magnetic Compass		.75	70.77
013-R	Instrument Cluster	X	1.70	69.25
014-R	Pitot System	X	1.78	122.65
015-O	Heated Pitot	X	.97	88.01
016-R	Recording Tachometer	X	1.00	69.00
017-R	Stall Warning(Audible)	X	.61	64.32
018-A	Gyro System (with Vacuum System)	X	10.55	59.69
019-A	Turn Coordinator Indicator	X	1.20	66.56
020-A	Vertical Speed Indicator	X	1.20	68.25
021-R	Alternator,24V,70A (included in Engine Wt.)	X	–	–
022-R	Battery, 24 volt, 300 amp-hour	X	26.01	47.00
023-R	Light Cabin Dome	X	.37	124.00
024-R	Navigation Lights	X	.95	111.70
025-R	Standard Wiring System	X	1.36	41.30
026-R	Over-voltage regulator	X	.75	49.00
027-R	Aileron and Elevator Lock	X	.08	71.00
028-R	Brake,Toe operated	X	2.80	54.43
029-R	Electric Flap Motor	X	9.56	124.40
030-S	Parking Brake	X	.74	65.75
031-S	Armrests Front and Rear(4)	X	.88	109.65
032-S	Baggage Straps	X	.30	150.00
033-S	Cabin Air Ventilators	X	2.28	66.03
034-S	Cabin Latch	X	.10	86.50
035-S	Center Console Fore and Aft	X	2.40	95.60
036-S	Coat Hook	X	.02	105.40
037-S	Fold Down Rear Seat	X	29.40	126.80
038-S	Headliner	X	.54	126.80
039-R	Cabin Heating System	X	5.28	52.39

6.10 EQUIPMENT LIST (CONT.)

ITEM NO.	DESCRIPTION	STATUS	WT. LBS	ARM INS.
040-S	Instrument Panel Glare Shield	X	1.66	65.75
041-R	Seats Front	X	28.00	92.50
042-R	Seat Belts	X	3.38	119.65
043-S	Sound Proofing	X	1.88	100.00
044-S	Baggage Tie-Down Rings	X	.40	148.40
045-A	Clock	X	.30	69.50
046-A	Dual Controls	X	7.50	60.81
047-A	Tow Bar	X	2.00	136.00
048-A	Ventilation System, Rear Seat	X	.33	119.00
049-S	Paint Scheme	X	20.00	118.98
050-S	Walkway Strip	X	.05	89.50
051-S	Main Wheel, Tire and Brake (Two 6.00 x 6 Type II)	X	36.00	100.15
052-S	Nose Wheel, Tire and Tube (5.00 x 5 Type II)	X	10.00	36.10
053-S	Wing & Tail Tiedowns	X	.15	111.70
054-A	Beacon Omni Flash	X	1.40	231.60
055-A	Landing Lights	X	1.14	101.96
056-A	Wheel Fairings Main Gear (2)	X	16.36	99.76
057-A	Wheel Fairing Nose Gear	X	4.30	35.01
058-A	Outside Step Both RH and LH	X	5.05	127.68
059-A	Fuel Pump Electric	X	2.17	48.50
060-R	Fuel Pump Mechanical (included in the engine weight)	X	-	-
061-S	Engine Primer	X	1.98	48.50
062-S	Fuel Selector Valve	X	.55	76.40
063-S	Fuel Tank Quick Drains (4)	X	.20	93.50
064-S	Suction Gauge	X	.40	69.00
065-A	~~Sigma-Tek 1U445-HSI~~		1.80	68.00
066-A	~~Sigma-Tek R-443B Omni Receiver~~		1.40	66.86
067-A	~~Sigma-Tek R-443B Omni Receiver~~		1.40	66.86
068-A	~~Sigma-Tek ADF Receiver~~		1.00	66.86
069-A	~~II Morrow Model 618 Loran~~		3.68	67.38
070-A	~~S-Tec Sys 60 Auto Pilot Installation~~		10.85	61.92
071-A	~~Sigma-Tek Audio Panel~~		2.50	67.55
072-A	~~Sigma-Tek RT-385 Nav/Com~~		5.20	62.38
073-A	~~Sigma-Tek RT-385A Nav/Com~~		5.20	62.38
074-A	~~Sigma-Tek RT-1060A Transponder~~		2.50	62.14
075-A	~~Sigma-Tek R-546E ADF~~		3.20	71.47
076-A	~~Sigma-Tek RT-877A DME~~		2.50	66.41
077-S	Emergency Locator Beacon	X	4.38	132.00
078-A	2 Light Strobe Installation	X	3.10	101.96
079-S	~~Sun Visor (2)~~		0.68	80.25
080-R	Alternate Static Source	X	.22	68.50
081-S	Nose Gear Shock Absorbers	X	5.24	46.55
082-S	Instrument Lights	X	.06	69.00
083-A	Shoulder Harnesses	X	1.16	132.83

6.10 EQUIPMENT LIST (CONT.)

ITEM NO.	DESCRIPTION	STATUS	WT. LBS	ARM INS.
084-A	Microphone Installation	X	.50	91.80
085-O	Bendix/King KMA 24 Audio Panel	X	1.70	67.20
086-O	~~Bendix/King KX155 Nav/Com~~		4.74	62.38
087-O	Bendix/King KT76A Transponder	X	3.40	64.73
088-O	Bendix/King KR87 ADF	X	3.2	71.47
089-O	~~Bendix/King KMA24H Intercom~~		1.7	68.00
090-O	~~Bendix/King KI208 Omni Rec.~~		1.0	67.30
091-O	~~Bendix/King KI209 Omni Rec w/ Glide Slope~~		1.2	67.30
092-O	Bendix/King KI227 ADF Indicator	X	0.7	69.50
093-O	~~Bendix/King KEA130A Encoding Altimeter~~		2.3	67.55
094-O	~~Bendix/King KI525A~~ Pictorial Navigation Indicator	X	4.0	67.58
095-O	Bendix/King KG102A Directional Gyro	X	4.8	181.00
096-O	~~Bendix/King KN72 VOR/LOC~~ Converter		1.3	66.20
~~097-0~~	~~Fire Extinguisher~~	~~X~~	~~2.50~~	~~86.00~~
098-0	Avionics Cooling Fan	X	1.2	51.25
099-0	S-Tec System 50 Auto Pilot	X	6.80	61.92
100-0	Hour Meter	X	0.20	69.60
101-0	Bendix/King KNS80 RNAV	X	6.00	64.01
102-0	Bendix/King KX165 NAV/COM	X	4.74	62.38
103-0	Bendix/King KI206 IND	X	1.30	68.38
104-0	Bendix/King KY196A COMM	X	2.80	64.61
105-0	Garmin GPS	X	0.25	68.03
106-0	PM 2000 Intercom	X	0.10	67.13
107-0	Apollo Reporter	X	0.80	63.00
108-0	JPI EGT 701 ANALYSER	K	2.94	46.40
109-0	JPI ES450	K	1.20	68.95
110-R	POWERFLOW EXHAUST SYSTEM	K	21.25	25.50

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SECTION 7

DESCRIPTION AND OPERATION OF THE AIRPLANE AND ITS SYSTEMS

TABLE OF CONTENTS

Paragraph No.		Page No.
7.1	General	7-1
7.3	Airframe	7-1
7.5	Flight Controls	7-2
7.7	Instrument Panel	7-2
7.9	Flight Instruments	7-4
7.11	Ground Control	7-5
7.13	Flaps	7-5
7.15	Landing Gear System	7-5
7.17	Baggage Compartment	7-5
7.19	Seats, Seat Belts and Shoulder Harness	7-6
7.21	Canopy	7-6
7.23	Control Locks	7-6
7.25	Engine	7-7
7.27	Propeller	7-10
7.29	Fuel System	7-10
7.31	Electrical System	7-12
7.33	Lighting	7-14
7.35	Heating, Ventilating and Defrosting Systems	7-14
7.37	Stall Warning System	7-15

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SECTION 7

SYSTEMS DESCRIPTION

7.1 GENERAL

This section describes the systems for the basic airplane. Refer to Section 9, SUPPLEMENTS for descriptions of optional equipment and systems.

7.3 AIRFRAME

The AG-5B is a four place, low wing, single engine airplane, equipped with tricycle landing gear.

The cabin portion of the fuselage is constructed of bonded metal honeycomb panels assembled to form a rigid structure. Flat bonded metal floor panels extend the length of the cabin area and baggage compartment. The aft fuselage is constructed of sheet aluminum panels bonded to form a semi-monocoque structure.

Passenger and crew entrance into the cabin area is provided by a sliding canopy, which may be closed and latched, or partially opened during flight. Access to the baggage compartment, located behind the rear seats is provided by a baggage door on the left side of the fuselage.

A tubular carry-through spar, located beneath the pilot's seat, provides the attachment points for the wings and main landing gear.

The full cantilever, modified laminar flow wings are constructed of stamped metal ribs bonded to the metal wing skin, and supported by a tubular spar extending the length of the wing. Each wing contains integral fuel tanks located near the inboard ends.

The empennage consists of a conventional vertical stabilizer/rudder, and a horizontal stabilizer incorporating a conventional elevator with an anti-servo tab. Both horizontal and vertical stabilizers are of conventional rib-stiffened structure with the ribs bonded to a metal skin.

7.5 FLIGHT CONTROLS

The control surfaces are operated by a combination of torque tubes and cables. The elevator anti-servo trim tabs are located on the elevator trailing edges and are actuated manually by the trim wheel located on the center console. Ground adjustable tabs on the rudder and ailerons provide a simple method of adjusting directional and lateral trim.

7.7 INSTRUMENT PANEL

With the standard instruments and equipment installed, the AG-5B is certified for day or night VFR flight. The Instrument Panel, shown in Figure 7-1, is designed to accommodate a wide range of communication and navigation equipment. When the appropriate equipment is installed the airplane is certified for IFR flight.

All items required for VFR flight, come standard with each airplane. Additional instruments and gauges include an artificial horizon, turn coordinator, directional gyro, vertical speed indicator, suction gauge, clock, cylinder heat temperature gauge and outside air temperature gauge. An amber annunciator light, labeled ALTNR is located on the upper left area of the instrument panel, which illuminates whenever there is a malfunction in the alternator, or at engine idle speeds below 1200 RPM.

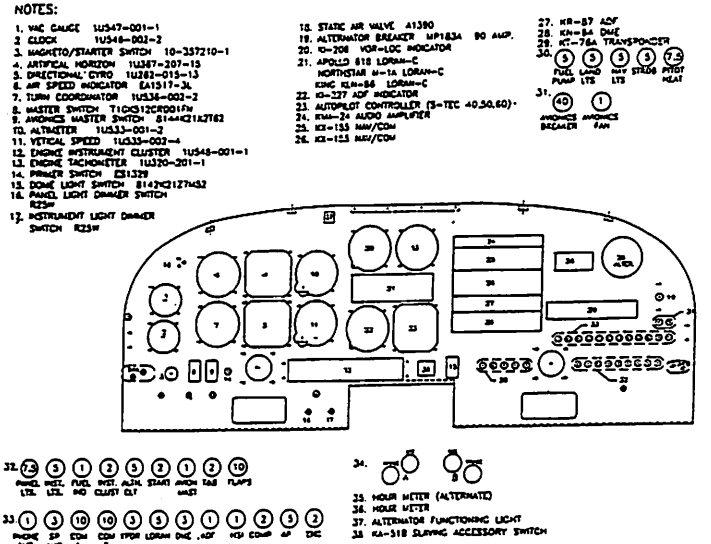

Figure 7-1 Instrument Panel

7.9 FLIGHT INSTRUMENTS

The flight instruments are arranged in the standard "T" configuration. The turn coordinator is electric driven. A red flag will be displayed whenever electric power is lost to this instrument.

Pitot Static System

The airspeed indicator, vertical speed indicator and altimeter are all part of the pitot static system. The system consists of a pitot tube (mounted on the lower surface of the left wing), two external static ports, one on each side of the fuselage, and the associated plumbing. If erroneous indications on these instruments are caused by a blockage or leak in the system pulling the alternate static source valve (located on the left side of the instrument panel) OPEN, may restore the system. This valve supplies static pressure from inside the cabin instead of from external static ports. The airplane is also equipped with a pitot heat system controlled by a toggle switch labeled **PITOT HEAT** located on the instrument panel. When the Pitot Heat Switch is turned ON, the element in the pitot tube is heated. If an erroneous indication in the airspeed indicator is caused by ice blocking the pitot tube, application of pitot heat may restore the system.

Vacuum System

An engine driven vacuum system drives the attitude indicator and directional gyro. The system consists of a vacuum pump mounted on the engine, a regulator, air filter and suction gauge. In the event of a vacuum system failure the attitude indicator and the directional gyro will be inoperative. The pilot must then rely on the turn coordinator for bank information and altimeter for pitch information.

7.11 GROUND CONTROL

The AG-5B nose wheel is free castering. Taxiing at slow speed is accomplished by use of differential braking. The nose wheel swivels approximately 90 degrees either side of center, giving the airplane an approximate turning radius of 20 feet. At higher speeds directional control is maintained with the rudder. During ground handling the airplane should be pushed or pulled using the tow bar which is provided with the airplane. The propeller is not to be used as a handle for pushing or pulling the airplane.

7.13 FLAPS

Electrically operated flaps provide a full range of settings by means of a flap actuator switch. To lower the flaps, the flap actuator switch is held down until the flaps are set to the desired position. To raise the flaps, move the flap actuator switch to the forward position and hold until the Flaps are returned to the UP position.

7.15 LANDING GEAR SYSTEM

The main landing gear struts are made of laminated fiberglass. The nose gear is free castering to approximately 90 degrees on either side of center line, giving the airplane an approximate turning radius of 20 feet.

The brakes are toe-operated, single-disc hydraulic systems with integral parking brakes. The parking brake is set by pressing the toe-brakes; pulling the Parking Brake Knob OUT, then releasing brake pedal pressure. To release, PRESS the Toe-Brakes firmly then PUSH the Parking Brake Knob IN.

7.17 BAGGAGE COMPARTMENT

The baggage compartment occupies the area extending from the back of the rear seats to the aft cabin bulkhead. This bulkhead also contains a hat shelf. Access to the baggage compartment is gained through a lockable baggage door on the left side of the airplane or through the airplane cabin. Tie down straps extend diagonally across the baggage compartment, for securing luggage. The baggage door can be operated from inside the airplane by actuating the sliding latch which is attached to the door.

7.19 SEATS, SEAT BELTS AND SHOULDER HARNESS

Contoured front seats are individually adjustable fore and aft using the adjustment levers located on the outboard side of each seat. The front seat backs fold forward for easy access to the rear seat.

The rear seat and seat back may be folded forward to provide a large cargo area. To put the rear seats in the cargo confirmation, first remove the rear seat back cushions, place both front seats in the full forward position, then swing the rear seat bottom up and fold it forward. The rear seat back must be folded down when the rear seat bottom is folded forward.

7.21 CANOPY

Entry into and exit from the airplane is accomplished by releasing the canopy latch and sliding the canopy aft. The canopy is actuated by external and internal handles. The external handle opens the latch by counterclockwise rotation and the internal handle opens the latch by rearward movement. A lock to the left of the external handle provides a means of externally locking the canopy. The canopy is designed to open a longitudinal distance of 34 inches and is limited by stops. The canopy may be partially opened in flight. However, the canopy must be completely Closed and Locked at airspeeds above 112 KIAS.

7.23 CONTROL LOCKS

A control lock is provided to lock the elevator control surfaces in the down position and the ailerons at neutral, to prevent damage to the control system by strong/gush wind conditions. To install the control lock, align the hole on the top of the pilot's control wheel shaft with the hole in the top of the shaft collar on the instrument panel and insert the rod. The control lock must be removed prior to starting the engine.

7.25 ENGINE

The Lycoming Model O-360-A4K is a horizontally-opposed, four-cylinder air-cooled carburetor equipped engine with a wet sump oil system. The engine is rated at 180 horsepower at 2700 RPM. Major accessories mounted on the engine include a direct-drive starter, a belt-driven alternator, dual magnetos, fuel pump, and vacuum pump.

Engine Controls

Three levers mounted on a pedestal, attached to the lower center portion of the instrument panel control carburetor heat, throttle, and mixture. A friction knob is located to the right side of the pedestal.

The levers pivot forward to close the carburetor heat (cold position), increase power, and to enrich the mixture. To reduce power, apply carburetor heat or lean the mixture, the levers pivot aft. Carburetor heat should be full forward for ground operation except when making ground checks because the heated air is not filtered.

Engine Instruments

Engine operation is monitored with four gauges mounted on the instrument panel. The gauges include cylinder head temperature, oil temperature, oil pressure, and fuel pressure. Each gauge is marked with red lines for minimum and maximum indications and green arcs indicating the normal operating range. The engine gauges will not operate without electric power. An engine driven tachometer is located in the upper center portion of the instrument panel.

New Engine Operation

The engine has been carefully run-in at the factory, therefore, no further break-in is necessary. However, it is recommended that cruising be done at 65% to 75% power for the first 50 hours. This will ensure proper seating of the rings and is applicable to: new engines, freshly overhauled engines, and following replacement of one or more cylinders.

The airplane is delivered from the factory with corrosion preventive oil in the engine. If, during the first 25 hours, oil must be added, use only aviation grade straight mineral oil conforming to Specification No. MIL-L-6082.

Engine Oil System

Oil for engine lubrication is supplied from a sump on the bottom of the engine. The capacity of the engine sump is eight quarts.

An oil filler cap/oil dipstick is located at the rear of the engine on the right side. The filler cap/dipstick is accessible by opening the right side of the cowling. The oil level in the engine should be kept between six and eight quarts.

An oil quick-drain valve is provided. To drain the oil, slip a hose over the end of the valve and push upward on the valve until it snaps into the open position. Spring clips will hold the valve open. After draining, snap the valve into the extended (closed) position.

Ignition/Starter System

Engine ignition is provided by two engine-driven magnetos. There are two spark plugs for each cylinder. The right magneto fires the lower right and upper left spark plugs, and the left magneto fires the lower left and upper right spark plugs. Normal operation is conducted with both magnetos.

Ignition and starter are controlled by a rotary, key-actuated switch located near the bottom, left of the instrument panel. The switch is labeled clockwise: **OFF, L/R, BOTH, PUSH TO START.** To engage the starter, the switch is rotated to the START position. The key must be held in the START position as long as starter operation is desired. When released, the key will return to the BOTH position.

Air Induction System

The engine air induction system receives ram air through an intake on the left side of the cowling. The ram air passes through a duct to the air filter located in the carburetor air box, which attached to the left side of the cowling. This filter is a foam type, which removes dust and foreign matter from the air prior to its entry into the carburetor.

When carburetor heat is applied, a flapper valve in the air box is closed. Induction air then passes through a shroud around the engine exhaust, is heated and is then drawn into the carburetor. Use of carburetor heat on the ground should be limited to operational checks, because the heated air is not filtered.

Exhaust System

Exhaust gas from each cylinder passes through heat riser assemblies to a muffler and exhaust pipe. The muffler is constructed with a shroud around the outside which forms a heating chamber for cabin and carburetor heat.

Carburetor And Priming System

The engine is equipped with a horizontal, float-type, fixed jet carburetor mounted on the rear of the engine. The carburetor is equipped with an enclosed accelerator pump and a manual mixture control. Fuel is delivered to the carburetor by an engine-driven fuel pump. An auxiliary electric fuel pump is provided in case the engine-driven pump fails. In the carburetor, fuel is atomized and mixed with intake air, and delivered to the cylinders through intake manifold tubes. The fuel to air ratio is controlled by the mixture control lever on the control pedestal.

For easy starting in cold weather, the engine is equipped with an electric primer. The electric fuel pump must be ON before fuel under pressure can be diverted through the primer system to the engine cylinders.

Cooling System

Ram air for engine cooling enters intake openings in the front of the cowling. The cooling air is directed around the cylinders by baffling, and is exhausted through openings in the bottom of the cowling.

7.27 PROPELLER

AG-5B is equipped with an all metal, two-bladed, fixed pitch propeller. Refer to the equipment list to determine the propeller installed on your airplane.

7.29 FUEL SYSTEM

The AG-5B's fuel system consists of two tanks with a total capacity of 52.6 gallons (51 gallons usable), two sump tanks, independent fuel gauges, and a fuel selector valve. The flush mounted fuel tank vents are located in the bottom of the outboard wing panels. A mechanical fuel pump, mounted on the engine, transfers fuel from the tanks to the carburetor.

An auxiliary electric fuel pump supplements the engine-driven pump. Fuel pressure is indicated on a gauge in the engine instrument cluster. The electric pump must be turned ON if the engine-driven pump fails. The electric pump is used to provide fuel pressure redundancy during takeoff and landing and is also used for engine priming.

There are four fuel drains on the airplane, one located in each fuel tank and one in each sump. They can be reached from under the front side of each wing. Each tank and sump should be drained and inspected for water and/or sediment contamination, prior to each flight.

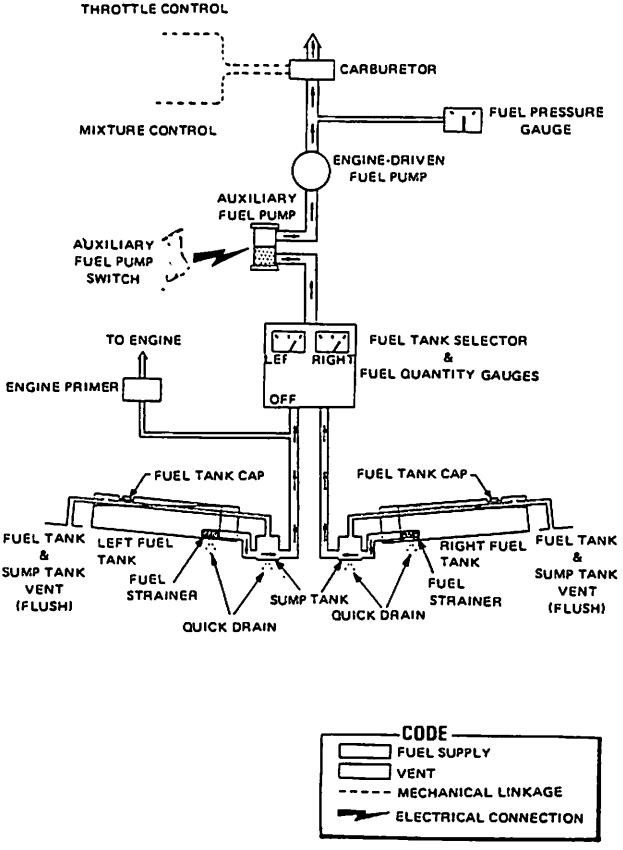

Figure 7-2 Fuel System

7.31 ELECTRICAL SYSTEM

The electrical system uses a 24 volt, 70 amp alternator with internal power diodes which delivers DC power directly to the main bus through a 90 amp circuit breaker. An external voltage regulator controls the alternator output voltage and automatically adjusts the battery charging rate to maintain the proper charge.

The master switch is a split rocker type which serves two functions. One side (master) energizes the battery circuit for engine starting and operating electrical systems. The Alternator side energizes the alternator field circuit which produces the electrical field in the alternator. With the electrical field energized, the alternator supplies all of the required current for the aircraft system through the bus bar.

A combination load and volt meter located within the engine gauge cluster indicates alternator output in percent of load. A reading of 1.0 on the load meter would mean the alternator output was 100% capacity or 70 amps while a reading of .5 would mean the alternator was working at one half its rated capacity, or 35 amps. A spring loaded button on the lower right corner of the gauge when depressed will give the electrical system voltage reading. System voltage should read 22 to 28 volts with a fully charged battery.

An amber annunciator labeled **ALTNR** is located on the right side of the instrument panel. This annunciator will illuminate in the event of alternator failure. Alternator failure can be verified by an indication of -.1 on the load meter. Note: The light will also illuminate at low engine RPM below 1200 RPM.

Circuit breakers for the electrical systems are located on the right side of the instrument panel. Electrical switches for exterior lighting and accessories are located above the engine control pedestal.

The engine dual-magneto ignition system is completely independent of the airplane electrical system and will continue to operate in the event of an electrical system failure.

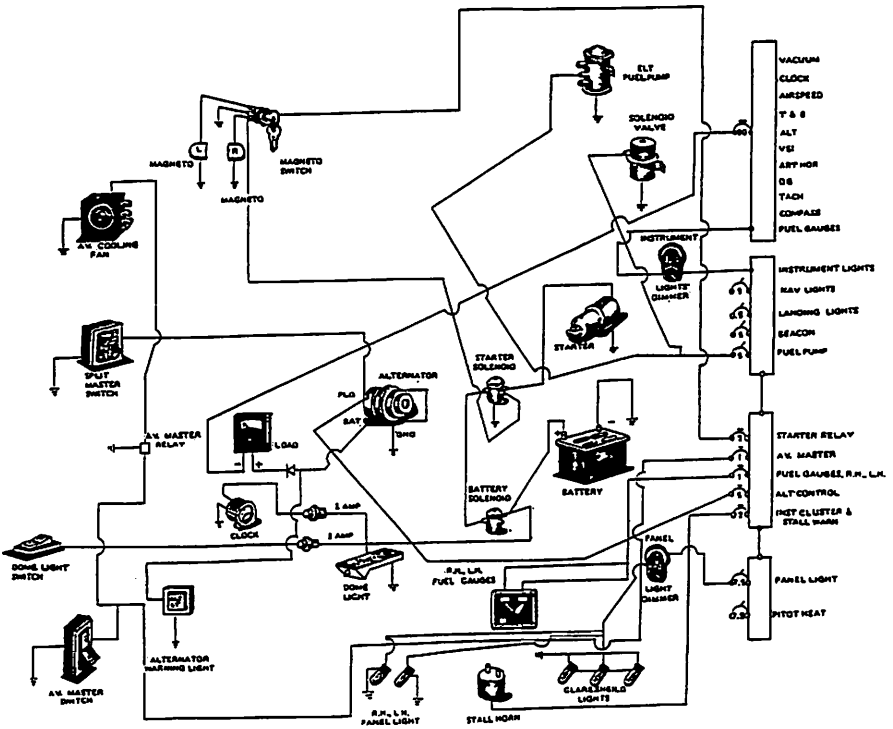

Figure 7-3 Electrical System

7.33 LIGHTING

Exterior Lighting

Conventional navigation and landing lights are located on the wing tips. A flashing beacon is mounted on top of the rudder and a white position light is located in the tail cone. All external lights are controlled by toggle switches on the instrument panel.

NOTE: Excessive use of the landing lights on the ground can cause the lens covers to overheat.

Cabin Dome Light

A cabin dome light is provided for illuminating the cabin area and baggage compartment. It is controlled by a rocker switch, located on the instrument panel. It is energized directly from the battery and will operate regardless of the master switch position. The fuse for this light is located on the battery box inside the engine compartment.

Instrument Panel Lights

The instrument panel is illuminated for night flight by adjusting the instrument flight and the panel lights. Separate rheostats mounted on the instrument panel control these lights. The one labeled "INST. LT. DIMMER", controls the internal instrument and post lights. The other rheostat, labeled "PANEL LT. DIMMER", controls lights under the eyebrow and inside the speaker boxes.

7.35 HEATING, VENTILATING AND DEFROSTING SYSTEMS

The heating, ventilation and defrosting systems can be operated simultaneously during cold weather operations to provide a comfortable cabin atmosphere.

Heating System

The knob located on instrument panel labeled "**CABIN HEAT**", when pulled, directs hot air through the air vents on the lower instrument panel, through the defrost line and through two ducts that run through the center console and release hot air under the main spar to the feet of the rear seat passengers. The knob labeled "**FLOOR HEAT**" when pulled, directs heat to the feet of the front seat passengers only.

There are two knobs located on either side of the instrument panel labeled Fresh Air. The knob on the left side allows fresh air to enter the cabin through the louver vent on the left side. The knob on the right side controls the louver vent on the right side of the cabin.

Fresh air ventilation for the rear cabin area is optional. These vents, if installed, are located just forward of the rear arm rests. They are operated by a twisting motion and air may be directed by positioning the vent to the desired direction.

For maximum ventilation, the canopy may be partially opened in flight at speeds below 112 KIAS. A placard located on the left canopy track indicates how far the canopy can be opened in flight.

Defrosting

Defrosting the windshield is accomplished by pulling the cabin heater ON and opening the two sliding doors located on the glare shield. This allows hot air to be directed to the windshield.

7.37 STALL WARNING SYSTEM

The AG-5B airplane is equipped with an electrically operated stall warning system. A lift detector, located on the outboard leading edge of the right wing actuates the system. As the angle of attack of the wing increases to the point that a stall is imminent, the tab on the detector is lifted. This completes a circuit that applies electrical power to the stall warning horn. The stall warning horn provides an aural indication of an impending stall 5 to 10 KIAS above the stall speed.

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SECTION 8

AIRPLANE HANDLING, SERVICING AND MAINTENANCE

TABLE OF CONTENTS

Paragraph No.		Page No.
8.1	General	8-1
8.3	Airplane Inspection Periods	8-1
8.5	Preventive Maintenance Conducted By Pilots	8-2
8.7	Alterations Or Repairs	8-2
8.9	Ground Handling	8-2
8.11	Servicing	8-3
8.13	Cleaning And Care	8-4
8.15	Prolonged Storage	8-5

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SECTION 8

AIRPLANE HANDLING, SERVICING AND MAINTENANCE

8.1 GENERAL

This section contains the procedures for servicing and maintaining the AG-5B. Included in this section are the inspection and maintenance requirements which must be followed for the airplane to be airworthy. It is recommended that a planned schedule of lubrication and preventive maintenance be followed that is appropriate for the conditions to which the airplane is subjected.

Much valuable knowledge and experience is available to you through your AGAC dealer. It is suggested that you take advantage of these services.

Service Bulletins and Service Letters

AGAC has a Service Bulletin and Service Letter program to supply service information to dealers to assist them in the servicing and maintenance of airplanes in the field.

Service Bulletins contain information and instructions concerning inspections and repairs which AGAC considers mandatory.

Service Letters, while not mandatory, contain information and instructions, which AGAC recommends should be accomplished.

All correspondence regarding your airplane should include the aircraft serial number. This number along with the model number, type certificate number and production certificate number are stamped on the identification plate attached to the left side of the fuselage beneath the horizontal stabilizer.

Maintenance Manuals, Parts Catalog and revisions thereto are available from American General Aircraft Corporation.

8.3 AIRPLANE INSPECTION PERIODS

Federal Aviation Regulations require all civil airplanes of U.S. registry to have had an annual inspection within the preceding twelve calendar months. Additionally airplanes operated for hire must have a 100 hour inspection. The FAA may require other inspections by issuance of airworthiness directives applicable to the airplane, engine, propeller or other components. It is the responsibility of the owner or operator to maintain the airplane in an airworthy condition.

8.5 PREVENTIVE MAINTENANCE CONDUCTED BY PILOTS

A pilot is authorized by Federal Aviation Regulations to perform limited maintenance on airplanes he owns or operates.

A Maintenance Manual should be obtained prior to performing any preventive maintenance to ensure that proper procedures are followed.

8.7 ALTERATIONS OR REPAIRS

The FAA must be contacted prior to any alterations on the airplane to ensure that airworthiness of the airplane is not violated. Alterations or repairs to the airplane must be accomplished only by licensed personnel.

8.9 GROUND HANDLING

Towing the airplane is accomplished by the use of a tow bar attached to the nose gear. Using the propeller or pushing the airplane may cause damage.

It is best to always park the airplane into the wind. The parking brake should not be set during cold weather when accumulated moisture may freeze the brakes or when the brakes are overheated. Also, care should be taken when using the parking brakes for an extended period of time because the hydraulic fluid may expand due to rising temperatures and cause difficulty in releasing the parking brakes.

Any time the airplane is parked outside it should be tied down, to prevent damage caused by strong winds. The control wheel lock should be installed and the wheels chocked.

When necessary to jack the entire airplane off the ground, refer to the Maintenance Manual for specific procedures and equipment required.

The nose wheel may be raised off the ground by pressing down on the root of the horizontal stabilizer. Do not apply pressure on the outboard horizontal stabilizer surfaces. Also, do not allow the tail of the airplane to contact the ground.

8.11 SERVICING

The Maintenance Manual outlines all items which require attention at 25, 50, 100 and 1000 hour intervals plus those items which require servicing, inspection and/or testing at special intervals.

Engine Oil

AVERAGE AMBIENT AIR TEMPERATURE	STRAIGHT MINERAL MIL-L-6082B	ASHLESS DISPERSANT MIL-L-22851
ALL TEMPERATURES	---	SAE 15W50 OR 20W50
ABOVE 80° F.	SAE 60	SAE 60
ABOVE 60° F.	SAE 60	SAE 40 OR SAE 50
30° TO 90 °F.	SAE 40	SAE 40
0° TO 70° F.	SAE 30	SAE 40, 30, OR SAE 20W40
BELOW 10 °F.	SAE 30	SAE 30 OR 20W30

After the first 25 hours of operation, drain engine oil sump and oil cooler. Clean the oil suction strainer. Refill sump with straight mineral oil and use until a total of 50 hours have accumulated; then change to a dispersant type oil. Drain the engine oil sump and clean oil suction strainer, every 25 hours thereafter. Change engine oil at least every 4 months even though less than the recommended hours have accumulated.

Fuel

Only 100 Low Lead Aviation Grade Fuel (blue) is allowed for the AG-5B. There is a fuel tank and sump in each wing with a drain installed in each tank and sump. Each tank and sump should be drained and checked for water and/or other contaminants prior to each flight.

Tire Service

Nose Wheel Tire Pressure	25 psi on 5.00-5, 4-ply rated tire
Main Wheel Tire Pressure	35 psi on 6.00-6, 6-ply rated tires

8.13 CLEANING AND CARE

The painted surfaces of the AG-5B have a long-lasting, all-weather finish and should require no buffing or rubbing out under normal conditions. However, it is desirable to use wax and polish to preserve the exterior finish. It is recommended that wax or polish operations be delayed at least 60 days after date of certification to allow proper curing of the paint.

The paint can be kept bright simply by washing with water and mild soap. Avoid abrasive or harsh detergents. Rinse with clear water and dry with terry cloth towels or a chamois. Oil and grease spots may be removed with kerosene or mineral spirits.

NOTE: No commercial paint removers are to be used on any airframe component unless specific approval has been received from the factory, prior to its use.

If you choose to wax your airplane, use automotive-type wax. The use of wax in areas subject to high abrasion, such as wing leading edges, tail surfaces, propeller spinner and blades, is recommended.

It is recommended that you keep the windshield and cabin windows clean. If large deposits of mud and dirt have accumulated on the windows, flush with clean water, then wash with soap and water useing a sponge or a soft cloth. Do not rub, as the abrasive action in the dirt and mud residue will cause fine scratches in the surface. After cleaning, wax the surface with a thin coat of polish-wax.

Note: Never use Gasoline, Benzine, Alcohol, Acetone, Carbon Tetrachloride, Fire Extinguisher Fluid, Anti-Ice Fluid, Lacquer Thinner or Glass Cleaner to clean plastic. These materials will damage the plastic and may cause severe crazing.

Clean the interior regularly with a vacuum cleaner to remove dust and loose dirt from the upholstery and carpet.

Oily spots may be cleaned with household spot removers. Never saturate the fabric with a volatile solvent; it may damage the padding and backing materials. Soiled upholstery and carpet may be cleaned with foam-type detergent.

8.15 PROLONGED STORAGE

Airplanes placed in storage for a maximum of 30 days or those which receive only intermittent use for the first 25 hours are considered in flyable storage. Every seventh day during these periods, the propeller should be rotated by hand through several revolutions. This action distributes oil on engine cylinder walls and reduces the possibility of corrosion forming inside the cylinders.

WARNING: CHECK THAT THE MASTER IGNITION SWITCHES ARE OFF, THE THROTTLE IS CLOSED, THE MIXTURE CONTROL IS IN THE IDLE CUT-OFF POSITION, AND THE AIRPLANE IS SECURED BEFORE ROTATING THE PROPELLER BY HAND. DO NOT STAND WITHIN THE ARC OF THE PROPELLER BLADES WHILE TURNING THE PROPELLER.

After 30 days in storage, run the airplane for at least 30 minutes. This helps to eliminate excessive accumulations of water in the fuel system and other air spaces in the engine. Keep fuel tanks full to minimize condensation in the tanks.

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SECTION 9

SUPPLEMENTS

TABLE OF CONTENTS

Paragraph No.		Page No.
9.1	General	9-1

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SECTION 9

SUPPLEMENTS

9.1 GENERAL

This section provides information in the form of supplements which are necessary for efficient operation of the airplane when it is equipped with one or more of the various optional systems and equipment not approved with the standard airplane.

All of the supplements provided in this section are "FAA Approved" and consecutively numbered as part of this handbook. The information contained in each supplement applies only when the related equipment is installed in the airplane.

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