FAA APPROVED
AIRPLANE FLIGHT MANUAL

for

WEATHERLY MODEL 620B AIRPLANE

(Restricted Category)

SERIAL NUMBER 1656

FAA APPROVED:

Manager, Flight Test Branch, ANM-160L
Federal Aviation Administration
Los Angeles Aircraft Certification Office
Transport Airplane Directorate

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1. LIMITATIONS

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

1.1 ENGINE LIMITS

Engine: Pratt & Whitney R985-AN-1, -AN-3, or –AN-14B

Engine Model AN-1 & AN-3

	RPM	In. Hg.	Pressure Alt. (ft.)	Pressure Alt. (Meters)
Takeoff (1 min.) at Sea Level	2300	37.5	Sea Level	Sea Level
Max. Continuous at Sea Level	2100	33.0	Sea Level	Sea Level
Max. Continuous	2100	32.0	3000 ft	914 m
(Rated Press Alt.)	2100	31.0	6000 ft	1829 m

Engine Model AN-14B

	RPM	In. Hg.	Pressure Alt. (ft.)	Pressure Alt. (Meters)
Takeoff (1 min.) at Sea Level	2300	36.5	Sea Level	Sea Level
Max. Continuous at Sea Level	2100	31.5	Sea Level	Sea Level
Max. Continuous	2100	30.5	3000 ft	914 m
(Rated Press Alt.)	2100	29.5	6000 ft	1829 m
		29.0	7800 ft	2377 m

1.2 PROPELLER

Hartzell HC-3R30-4B hub with R10152– 5½" blades of diameter not over or under 95½ inches. Pitch settings at 30 inch station: 16 degrees Low Pitch, 28 degrees High Pitch. Static RPM at maximum throttle, not over 2300 RPM, not under 2200 RPM.

1. LIMITATIONS – CONTINUED

1.3 AIRFRAME

Note: All fuel and oil capacities are in U. S. gallons. Metric equivalent in brackets (liters).

Fuel Capacity: 97.5 gallons. (369 liters) total.
Right wing tank – located (+36.0") aft of datum with capacity 40 gallons (151.4 liters) total - with 2.5 gallons (9.5 liters) unusable fuel.
Left wing tank - located +36.0" aft of datum with capacity (combined with center tank) 57.5 gallons (217.7 liters) total - with 5 gallons (18.9 liters) unusable fuel.

WARNING – NO TAKEOFFS WITH SELECTED FUEL TANK GAUGE READING IN RED ARC (approximately 3/16 full).

Fuel: 80/87 minimum grade aviation gasoline. ***Alternate fuel is 100LL.***

Oil Capacity: Located (-22.2") forward of datum, 6.7 gallons (25.5 liters) plus 1.0 gallon (3.8 liters) in system.

Max. Gross Weight: 4000 lbs. (1814 kilograms)

Hopper Capacity: 2000 lbs. (907 kilograms) located (+15.0") aft of datum

Baggage Capacity: 25 lbs (11.34 kilograms) located (+93.25") aft of datum

C.G. Range: Inches aft of datum +22.1" to +27.5" at all weights

Note: Datum is leading edge of wing, outboard of fillet.

1.4 AIR SPEED LIMITS

Without Spreader

V_{ne} – Never exceed 176 mph (153 knots) IAS
V_{no} – Normal Operating 140 mph (122 knots) IAS
V_A – Maneuvering 129 mph (112 knots) IAS

With P/N 50453 Spreader installed

V_{ne} – Never exceed 155 mph (135 knots) IAS

Air Speed Limits are unchanged with Cowl Speed Ring Weatherly P/N 50784 installed per Weatherly Drawing 50783.

1. LIMITATIONS – CONTINUED

1.4 AIR SPEED LIMITS – CONTINUED

Air Speed Indicator

Red Line	176 mph (153 knots)
Yellow Arc	140-176 mph (122-153 knots)
Green Arc	60-140 mph (52-122 knots)

1.5 ALTITUDE LIMIT

Maximum Operating Altitude – 15,000 ft. (4572 meters)

1.6 INSTRUMENT & GUAGE MARKINGS

- Fuel Quantity Gauges
  - Red Arc — Zero to 3/16 Full.
- Cylinder Head Temperature Gauge
  - Red Line — 288° C or 550° F.
- Tachometer – Horizon Instruments Electronic Digital
  - Red Light — 2300 RPM
  - Yellow Light — 2100 - 2299
  - Green Light — 1800 – 2099
- Manifold Pressure Gauge
  - Red Line — 37½ in. Hg. for AN-1 or AN-3 Engine
  - Red Line — 36½ in. Hg. for AN-14B Engine
  - Yellow Arc — 33-37½ in. Hg. for AN-1 or AN-3 Engine
  - Yellow Arc — 31½ - 36½ for AN-14B Engine
  - Green Arc — 20-33 in. Hg. for AN-1 or AN-3 Engine
  - Green Arc — 20 - 31½ in. Hg. for AN-14B Engine
- Oil Temperature
  - Red Line Maximum — 93°C
  - Minimum Takeoff — 40°C
- Oil Pressure
  - Min. Red Line — 50 psi
  - Max. Red Line — 100 psi
  - Green Arc — 50-100 psi
    - Above 2000 RPM — 70 psi minimum
    - Below 2000 RPM — 60 psi minimum
- Fuel Pressure
  - Minimum — 2 psi
  - Maximum — 6 psi
  - Green Arc — 2-6 psi

NOTE: *Engine cooling was demonstrated to a maximum ambient temperature of 100° F (38° C) at sea level.*

1. LIMITATIONS – CONTINUED

1.7 REQUIRED PLACARDS:

ON THE INSTRUMENT PANEL

"THIS AIRPLANE MUST BE OPERATED AS A RESTRICTED CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKING, AND MANUALS."

"THIS AIRCRAFT APPROVED FOR VFR DAY OR NIGHT OPERATION ONLY"

"DESIGN MANEUVERING SPEED 129 MPH. DEMONSTRATED CROSSWIND VELOCITY 15 MPH" (or MANEUVERING SPEED 112 KNOTS, CROSSWIND VELOCITY 13 KNOTS)

"WITH WEATHERLY P/N 50453 SPREADER INSTALLED DO NOT EXCEED 155 MPH" (or 135 KNOTS)

"PARKING BRAKE, DEPRESS PEDALS AND PULL ON, PUSH TO RELEASE"

"TO UNLOCK TAIL WHEEL PUSH STICK FORWARD"

"THIS AIRPLANE HAS NOT BEEN SHOWN TO COMPLY WITH THE NOISE LIMITS IN FAR PART 36 AND MUST BE OPERATED IN ACCORDANCE WITH THE NOISE OPERATION LIMITATION REQUIRED BY FAR 91.815."

(Note: FAR 91.815 concerns Agricultural and fire fighting airplanes: Noise operating limitations.)

AT ENTRANCE TO COCKPIT:

"RESTRICTED"

NEAR OIL FILLER NECK:

"OIL TANK CAP. 6.7 GALS. USE AVIATION GRADE 100 OIL" (or 25.4 LITERS)

NEAR RIGHT FUEL TANK FILLER NECK:

"40 GALS - Total, 37.5 GALS. USABLE 80/87 OCTANE OR 100LL" (or 151.4 LITERS TOTAL, 142 LITERS USABLE)

NEAR LEFT FUEL TANK FILLER NECK:

"LT. TANK CAP. 57.5 GALS. TOTAL, 52.5 GALS. USABLE. 80/87 OCTANE OR 100LL" (or 217.7 LITERS TOTAL, 198.7 LITERS USABLE)

NEAR FUEL TANK FILLER NECKS:

"CAUTION: ALLOW SUFFICIENT TIME FOR INTERCONNECTED CELLS TO FILL BEFORE TOPPING OFF TANK"

1. LIMITATIONS – CONTINUED

1.7 REQUIRED PLACARDS - CONTINUED:

ON BAGGAGE SHELF AFT OF PILOT SEAT:

"Baggage Limit - 25 LBS" (or 11.34 KILO.)

NEAR HOPPER COMPARTMENT FILLER DOOR:

"2000 LBS. MAX (or 907 KILO.)

ON THE TOP AMMETER PANEL:

"PULL TO CLOSE OIL COOLER SHUTTER, CABIN HEAT ON. PUSH DOWN FOR HEAT OFF, SHUTTER OPEN. TWIST TO LOCK."

2. EMERGENCY PROCEDURES

2.1 ENGINE FIRE ON GROUND

- Mixture - IDLE CUT-OFF.
- Fuel Selector Valve - OFF.
- Ignition and electric switches - OFF.
- Use fire extinguisher.

NOTE: If carburetor fire should occur during engine start, continue to crank engine with starter ignition - ON. Attempt to suck fire into the engine.

2.2 ENGINE MALFUNCTION IN FLIGHT

The most common cause of engine stoppage in flight is loss of fuel flow. If engine stops in flight:

- Nose down to gliding flight (80 - 90 mph, 69-78 knots).
- Carburetor heat - ON.
- Auxiliary Fuel Pump – ON.
- Check fuel selector valve for selection of tank with available fue1.
- Mixture - RICH
- Ignition switch - BOTH
- Throttle to cruise position.

If engine does not start, maintain minimum safe flight speed while effecting emergency landing.

If engine re-starts turn auxiliary fuel pump off. If engine stops again, the engine driven fuel pump has failed. Turn on and leave on Auxiliary Fuel Pump. Land at nearest landing site for repair.

2.3 HOPPER EMERGENCY DUMP IN FLIGHT

- Trim to 120 mph (104 knots) in level flight, if possible.
- Trim nose down one additional turn of trim wheel while holding level flight so as to counter moderate pitch-up during dump.
- Push dump handle full forward.
- Resist pitch-up with forward stick or roll attitude.
- Re-trim for normal flight while closing dump handle.

3. NORMAL PROCEDURES

3.1 PRE-FLIGHT:

The airplane should be given a visual walk-around inspection prior to flight, which includes checking:

- Tires for condition and inflation (45 psi. all tires)
- Drain all fuel system quick-drains to clear water or sediment from the system.
- Check fuel and oil quantities. Be sure caps are securely fastened.
- Check all engine cowl panels, fuselage panels and inspection panels for proper installation and fastening of all Dzus buttons.
- Check pitot tube under right wing and static air source on right side of aft fuselage for condition and possible obstructions.
- Check fuel tank vents under wing for possible obstructions.
- Check propeller for general condition and check blade tips for severe nicks.
- After unlocking controls in cockpit, check all control surfaces for damage and for unrestricted movement. Check control surface hinges.
- Check tail wheel lock for condition and for free movement of the lock pin. Check tail wheel assembly for proper lubrication and operation.
- Check condition and mounting of agricultural dispersal equipment.
- Check mounting of wing tip vanes, if installed.
- If night flight, check operation of all lights.
- Check that tanks are properly filled.

WARNING – NO TAKEOFFS WITH SELECTED FUEL TANK GAUGE READING IN RED ARC (approximately 3/16 full).

- With ignition switch off, pull propeller blades through two engine revolutions.

3. NORMAL PROCEDURES – CONTINUED

3.2 BEFORE STARTING ENGINE

- Check fuel valve in cockpit to "ON" position for Rt. or Lt. tank.
- Seat, Seat Belt and Shoulder Harness - adjusted and fastened.
- All electric switches "OFF".
- Set parking brake by depressing pedals and pulling knob on instrument panel.
- Controls unlocked and check for proper movement.
- Set cockpit vents (at each side of seat and in canopy top) at desired position. Push cockpit heat down to "OFF" position prior to engine start.

3.3 ENGINE STARTING AND WARM-UP

Ignition	- Off
Mixture	- Full Rich
Carburetor Heat	- Cold
Propeller	- Lever Forward
Throttle	- Set ¼ inch forward of idle stop
Battery Switch	- ON
Alternator Switch	- OFF
Low Fuel Warning Lights	- TEST
Low Fuel Warning Lights Dim Switch	- SET
Control Stick Lock	- Disengage, check all controls for free and proper movement.

- Auxiliary Fuel Pump Switch – ON to build up fuel pressure not to exceed 6 psi.

NOTE: Pressure in excess of 6 psi may flood the carburetor.

- Auxiliary Fuel Pump Switch - OFF
- Prime – as required depending on temperature, then secure primer pump.
- Propeller Area - Clear
- Starter - Press
- Ignition – Have ignition OFF and switch to BOTH after one revolution of the crankshaft.

3. NORMAL PROCEDURES – CONTINUED

3.3 ENGINE STARTING AND WARM-UP – CONTINUED

- If a start is not effected almost immediately, reprime and repeat starting procedure.
  NOTE: If the engine does not start after two or three attempts, an investigation should be made to ascertain the cause.

- After engine starts, adjust engine speed to 500-600 rpm, watching for oil pressure rise.
  CAUTION: *If oil pressure does not register on gage almost immediately, STOP engine and investigate.*

- Adjust throttle to 1000 rpm.

- Alternator Switch - ON.

- Perform magneto grounding check by switching ignition from BOTH to OFF momentarily, then back to BOTH. Engine should cut off, then restart.

3.4 TAXI

Steer with differential brakes. Move the stick forward of neutral position to unlock tail wheel before attempting to turn aircraft.

3.5 BEFORE TAKEOFF ENGINE CHECKS

1. The following tests must be made with a minimum oil temperature of at least 40 degrees centigrade and with carburetor heat in COLD position.

- Set 1700 RPM.

- Propeller control full low should drop RPM 400 or more from 1700 RPM.

- Propeller control full high.

2. Magneto Check (at manifold pressure of 23 in. Hg. or 1700 RPM).

   - Switch ignition from BOTH to RIGHT and back to BOTH.
   - Switch ignition from BOTH to LEFT and back to BOTH.

   Normal drop-off in either **RIGHT or LEFT** position is 50 to 75 RPM, and should not exceed 100 RPM. Difference in drop between LEFT and RIGHT magnetos should not exceed 30 to 40 RPM.

3. Carburator Heat Check (23 in. Hg. or 1700 RPM)

   - RPM should drop when Carb Heat Control is pulled out and restored when pushed in.

4. Fuel Pressure Check (23 in. Hg or 1700 RPM).

   - Fuel pressure should be 3½ +/- 1½ psi.

5. Oil Pressure Check (23 in. Hg. or 1700 RPM).

   - Oil pressure should be a minimum of 60 psi, preferably 70 psi.

3. NORMAL PROCEDURES – CONTINUED

3.4 BEFORE TAKEOFF ENGINE CHECKS – CONTINUED

BEFORE FIRST FLIGHT OF DAY

6. Carburetor Idling Mixture Check:

NOTE: This check should be made in relatively still air with stabilized rpm and with cylinder head temperatures at stabilized idling temperature. A strong wind may affect the propeller loading and the RPM change may be different from that noted above. A magneto check should precede this check to insure proper functioning of the ignition system.

- Set 1000 RPM.
- While observing tachometer, slowly move mixture control towards idle cut-off or full lean.
- Return mixture control to rich before engine dies.

If a momentary rise of no more than 20 RPM is observed before normal drop-off, the mixture strength is correct. If a greater rise in rpm is noted, the mixture is too rich; or, if no rise in rpm is noted or an immediate drop-off in rpm occurs, the mixture is too lean. In either event, adjust the idle mixture adjustment screw on the carburetor, per the engine maintenance manual.

3.5 FLIGHT OPERATION CHECKLIST PRIOR TO TAKE-OFF

- Mixture - Full Rich
- Propeller - High RPM
- Auxiliary Fuel Pump - ON 3 seconds, then OFF (observe approximately 1 psi increase in fuel pressure that returns to normal after the pump is switched OFF. RPM will not react.).
- Carburetor Heat - Cold

3.6 TAKE OFF

- Advance throttle not to exceed 37.5 in. Hg. (AN-1 or AN-3 Engine)
- Advance throttle not to exceed 36.5 in. Hg. (AN-14B Engine)
- Adjust propeller control – 2300 RPM. (Max.)
- Raise tail after 15 mph has been attained.
- Normal take-off procedure is followed.

3.7 CLIMB

- Mixture - Full Rich – Lean as required for smooth operation
- Propeller - Climb RPM – 2300 MAXIMUM
- Throttle - Climb manifold pressure 37.5 or 36.5 in. Hg MAXIMUM for one minute then reduce power to maximum continuous power of 2100 RPM and 33.0 in. Hg. (AN-1 or AN-3) or 31.5 (AN-14B).
- Speed - Climb at airspeeds between 80 – 95 mph (69 - 83 knots) depending upon load and atmospheric conditions.

3. NORMAL PROCEDURES – CONTINUED

3.8 CRUISE

- Adjust throttle to power setting as required for load and atmospheric conditions.
- Normal power settings for unloaded aircraft are 24 – 28 in. Hg. Manifold Pressure and 1900 – 1950 rpm.
- In agricultural operations, power is used as required.

3.9 GLIDE AND APPROACH

- Mixture -Full Rich
- Propeller Control -Full forward
- Carburetor Heat -Pull on
- Throttle -As Required

Glide at 80 – 90 mph (69 – 83 knots) indicated airspeed. Aircraft may be landed 3 point or on the main wheels. Be sure to pull stick all the way back to lock tail wheel when tail wheel contacts the ground. Move the stick forward of neutral position to unlock tail wheel before attempting to turn aircraft on the ground.

3.10 ENGINE SHUT DOWN

- Idle until cylinder head temperature is less than 350 degrees F.
- At any idling rpm, move mixture control to idle cut-off or full lean.
- If idle cut-off does not stop engine, turn fuel selector Off.
- Close throttle.
- Turn ignition off.
- Slowly open throttle.
- When engine is shut down, turn off electric switches.
- Engage control stick lock.

3.11 AGRICULTURAL OPERATIONS

3.11.1 CHEMICAL HOPPER

The chemical hopper should be rinsed and allowed to air-out after each days operations. The bottom gate should be left open, if the hopper is empty. The pilot/operator must comply with federal, state and local regulations controlling cleaning and disposal of chemical residues.

3.11.2 OPERATION OF WEATH-AERO CONTROLLABLE SPRAY PUMP WINDMILL

- To avoid damage from rocks or other objects to the fan blades, take-off and land with the blades in feathered position.
- Do not operate continuously with the fan blades in full flat position (high RPM) at airspeeds above 140 MPH (I22 knots).
- Reduce speed if difficulty is experienced in moving the blades from flat pitch to feathered position.
- Always have the blades in feathered position if flying with an empty or very low spray tank.
- Some slow rotation of the fan with the blades in feathered position is normal. If the rotation is rapid, the control rigging and operation should be checked and corrected.

3.11.3 HOPPER DUMP OPERATION

When discharging the contents of the chemical hopper using the dump handle, there will be a longitudinal pitch-up varying in pitch rate and duration with the amount of fluid in the hopper. This is caused by the deflection of the dump door and resultant fluid plume which produces an air dam effect causing high air pressure on the bottom of the aircraft forward of the center of gravity (CG) with reduced pressure aft of the CG, coupled with rapid reduction of weight of the aircraft and an aft CG shift, all of which induces an up pitch rate. Follow EMERGENCY PROCEDURES by trimming nose down prior to dumping fluid from the hopper to help counteract the nose up pitch rate and to re-trim nose down after the hopper is empty. The airplane is fully controllable during this operation.

3.11.4 NIGHT OPERATIONS

The installation of the Weatherly 50900 night operations electrical system provides lighting for night agricultural operations. This system includes navigation lights, strobe wing tip anti-collision lights, overhead cockpit lights, instrument panel lights, a 600 Watt forward directed light in each wing and a 450 Watt canted light in each wing for turn reference. The forward directed light beam may be tilted up or down through a range of about 15° by use of the toggle switches located on the left side of the instrument panel. The lights may be turned on or off by pressing the top trigger button on the control stick grip (the bottom trigger button operates the auto-flag solenoid, when one is installed).

3. NORMAL PROCEDURES – CONTINUED
3.11 AGRICULTURAL OPERATIONS - CONTINUED
3.11.4 NIGHT OPERATIONS – CONTINUED

The right and left turn lights are turned on or off with the left and right buttons on the top of the stick grip.

The overhead cockpit lights and panel lights illuminate when the navigation lights are turned on. They may be independently controlled by a rheostat switch on the back of each light. The light may be switched from white to red by rotating the lens on the front of the light.

The instrument panel lights are dimmed by use of the rheostat located at the right top of the instrument panel. The small push button near the low fuel test button dims the low fuel warning lights.

An amber warning light is installed to indicate that the alternator output voltage has fallen below system voltage. This light is located in the forward hole of the circuit breaker panel at the right side of the cockpit. The light should be off when the engine is running in normal battery charging range.

The JASCO 70A alternator, when installed with the Weatherly 50900 night operations electrical system, does not provide enough current to supply ALL of the electrical loads simultaneously on a continuous basis without battery drain. Do not use both forward directed lights (landing lights) and both turn lights simultaneously, or battery drain will occur. With navigation lights and strobe lights ON, any combination of three or less of the forward and turn lights ON is acceptable.

In aircraft where the Weatherly 50900 night operations electrical system is installed, the following placards are required on the instrument panel:

"CAUTION: OVERHEATING OF THE LANDING LIGHT LUCITE LENS WILL OCCUR IF LANDING LIGHT OR TURN LIGHT IS ON FOR MORE THAN 10 SECONDS WHEN AIRCRAFT IS ON THE GROUND."

"CAUTION: DO NOT USE BOTH LANDING LIGHTS AND BOTH TURN LIGHTS SIMULTANEOUSLY, OR BATTERY DRAIN WILL OCCUR. REFER TO FLIGHT MANUAL."

3. NORMAL PROCEDURES – CONTINUED

3.12 HORIZON ELECTRONIC TACHOMETER

3.12.1 System Description

The aircraft is equipped with a Horizon Instruments Model 10.1000 Electronic Digital Engine Tachometer. It is standard equipment for the Weatherly Model 620B, Serial No. 1570 and subsequent.

- The Tachometer uses super-bright LED indicators to indicate normal RPM range engine operation (Green LED), cautionary RPM range operation (Yellow LED), and do- not-exceed or restricted RPM range (Red LED) as substitutes for the arcs normally painted on the tachometer dial.

- The primary display consists of four 1/2" high characters on a back-lit Liquid Crystal Display (LCD), easily and clearly visible in daylight and night flying.

- Diagnostic features available include: alert indication of loss of magneto signal, indication that both magnetos are reporting different rpm, and the ability to mask RPM from either magneto.

- Magneto test, via the ignition switch, is indicated by the illumination of the grounded magneto system's alert light and the display of the amount of RPM that the engine has slowed. This is indicated as a negative number on the display (number is preceded by a leading hyphen or minus sign).

- LED indicators are dim-able (except the restricted RPM red-light indicator) to reduce pilot annoyance during night flying.

- A specific engine hour is pre-set at the factory to accommodate tachometer changes on non-zero-time engines. Engine time may be changed only by Horizon Instruments, Inc., and must be coordinated with an authorized FAA Airframe and Powerplant Mechanic or Repair Facility. Horizon Instruments, Inc. must be provided with the certificate number of a Mechanic, or repair station with an Instrument Rating of Class 2, per FAR 145.31. Refer to Horizon Instruments, Inc. Procedure Document P118042 for additional information.

3.12.2 Placards

The face of the Tachometer is placarded with the Engine RPM Operating Range information that normally appears on the face of the mechanical tachometer. This includes the red restricted RPM (2300-up), yellow cautionary or transient RPM (2100-2299), and green normal operation RPM (1800-2099) ranges.

The one (1) amp tachometer circuit breaker is located on the instrument panel next to the tachometer and is designated by a placard reading "TACHOMETER".

3. NORMAL PROCEDURES – CONTINUED
3.12 HORIZON ELECTRONIC TACHOMETER – CONTINUED

3.12.3 *Normal Procedures*

The operation of the Tachometer is straight-forward. After power has been supplied to the tachometer and the engine has been started, the default display of engine RPM appears on the display. The default display is insured via the use of internal timers that will restore the display to the current RPM even in the event that one of the panel buttons becomes stuck or defective.

Internally, two independent tachometers watch the pulses received from each magneto. Each tachometer is accurate to less than 1 RPM and can be individually enabled/disabled via buttons on the face of the Tachometer. Engine operating ranges are indicated on the large green, yellow, and red LEDs.

Three small LED magneto system alert indicator lights are located within the "Status" area on the upper left corner of the Tachometer face. The left and right red led alert indicator lights, when illuminated, indicate (because of a loss of ignition signal to the Tachometer) a possible malfunction of the respective left or right magneto ignition system.

While performing a magneto check during engine run-up, the red alert indicator lights will illuminate according to the table below, thus identifying the grounding of the respective right or left magneto systems.

IGNITION SWITCH	RED INDICATOR LIGHT	
Position	**Left**	**Right**
OFF	On	On
LEFT	Off	On
RIGHT	On	Off
BOTH	Off	Off

Between the left and right red magneto ignition system alert indicators is a yellow "RPM Synchronization" indicator. This small yellow indicator is illuminated when there is a difference of more than 80 RPM between the right and left tachometers. This indicator also may flicker during extreme RPM excursions of the engine.

There are three panel buttons, Hours & L (left), Clear & Dim (middle) and Trap & R (right). Each button has two modes of operation:

- Press-and-hold
- Press-and-release

3. NORMAL PROCEDURES – CONTINUED
3.12 HORIZON ELECTRONIC TACHOMETER – CONTINUED
3.12.3 NORMAL PROCEDURES – CONTINUED

Press-and-hold button operations instruct the Tachometer to perform a specific operation when a button is pressed and held for more than 2/3 of a second. Press-and-hold button operations are placarded on the face of the Tachometer above each button.

Similarly, press-and-release button operation instructs the Tachometer to perform a specific operation when a button is pressed and released in less than 2/3 of a second. Press-and-release button operations are placarded on the face of the Tachometer below each button.

Press-And-Hold Operations

The left button "Hours", upon depression, will cause the Tachometer to display the non-fractional portion (0000.) of the current accumulated engine hours. When the button is released, the fractional part of the engine hours (.00_ is displayed for a short period of time. The clock is started whenever the engine RPM exceeds 800 RPM and is recorded in real hours.

The right button "Trap", upon depression, will cause the Tachometer to display the current contents of the RPM trap. This trap records the highest engine RPM achieved before the button was pressed.

The middle button "Clear" upon depression, clears the RPM trap. During depression of this switch, the RPM trap is zeroed. When the button is released, the trap will record the current engine RPM.

Press And Release Operations

During normal operation, the Tachometer presents the average of the left and right internal tachometers on the display. However, a mechanism exists to mask either tachometer from the display, leaving the remaining tachometer to display its RPM.

A masked tachometer is indicated by the regular flashing of the right or left signal loss status indicator LEDs. This feature is handy when attempting to determine magneto/ignition problems.

Quickly pressing the releasing the left button "L" causes the Tachometer to mask or unmask the left internal tachometer.

Quickly pressing the releasing the right button "R" causes the Tachometer to mask or unmask the left internal tachometer.

An internal interlock prevents masking both internal tachometers at the same time, therefore preventing total loss of RPM indication.

If the tachometer is masked, pressing the button will un-mask it and allow its RPM to show on the display, and conversely, if the tachometer is un-masked, pressing the button will mask it from the display.

Quickly pressing and releasing the middle button, "Dim", causes the Tachometer to alternately dim or brighten the LED indicators.

3. NORMAL PROCEDURES – CONTINUED
3.13 HORIZON ELECTRONIC TACHOMETER – CONTINUED
3.13.2 NORMAL PROCEDURES - CONTINUED

The LED indicators are bright enough to overcome daylight washout conditions. However, during night operations the large green, yellow, and small red and yellow LEDS are dimable. The large red restricted RPM LED still operates at full intensity to maximize the possibility of gaining pilot attention during excursion into restricted RPM ranges.

For additional information about operation of the electric tachometer refer to Horizon Instruments document, number P103050.

4. PERFORMANCE

The charts on the following pages reflect the performance of the 620B airplane in factory standard condition. This means also that factory standard spray equipment is installed. Take-off distances shown are for operations from a level, paved runway.

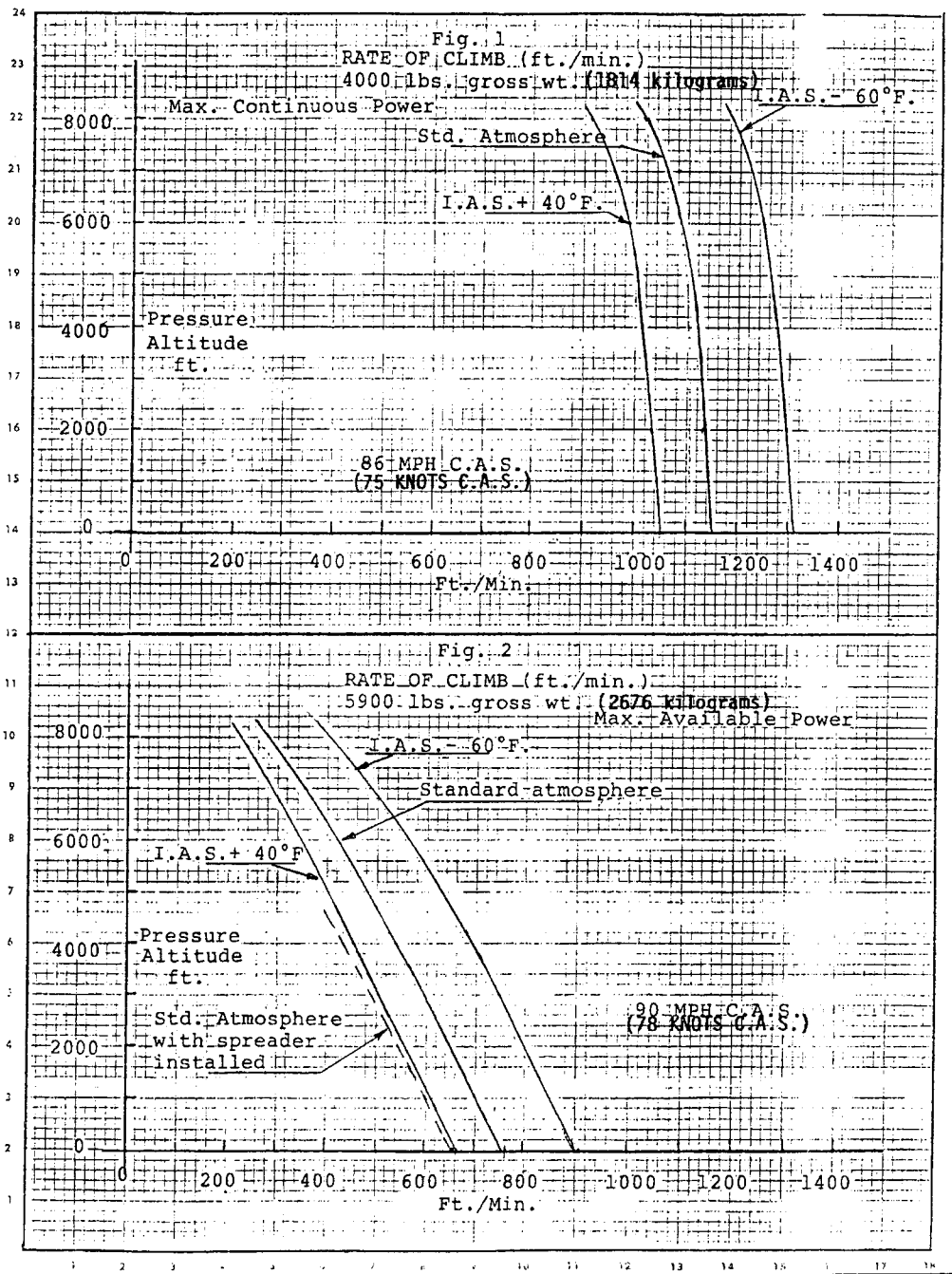
Caution: Air in the "standard" atmosphere is assumed to be perfectly dry (containing no water vapor), the sea level temperature is 59° F, and the barometric pressure is 29.92 inches of mercury. In the real atmosphere, some water vapor is nearly always present and, if the humidity is quite high, significant loss in engine and airplane performance will occur. This is because water vapor is lighter than air. Air turbulence can also cause a loss in performance.

Caution: *The FAA approved design gross weight for the 620B is 4,000 lbs. (1814 kilograms). The approved design structural limit for the wing is 4,800 (2177 ki1ggrams). The maximum approved maneuvering speed is 129 mph (112 knots). Although the FAA regulations under which this airplane was certified permit agricultural operations over the above limits, it is the responsibility of the pilot to perform these operations safely. Sharp pull-ups should be kept below the maneuvering speed limit. The performance curves for 5900 lbs. (2676 kilograms) gross weight in this section are for reference only.*

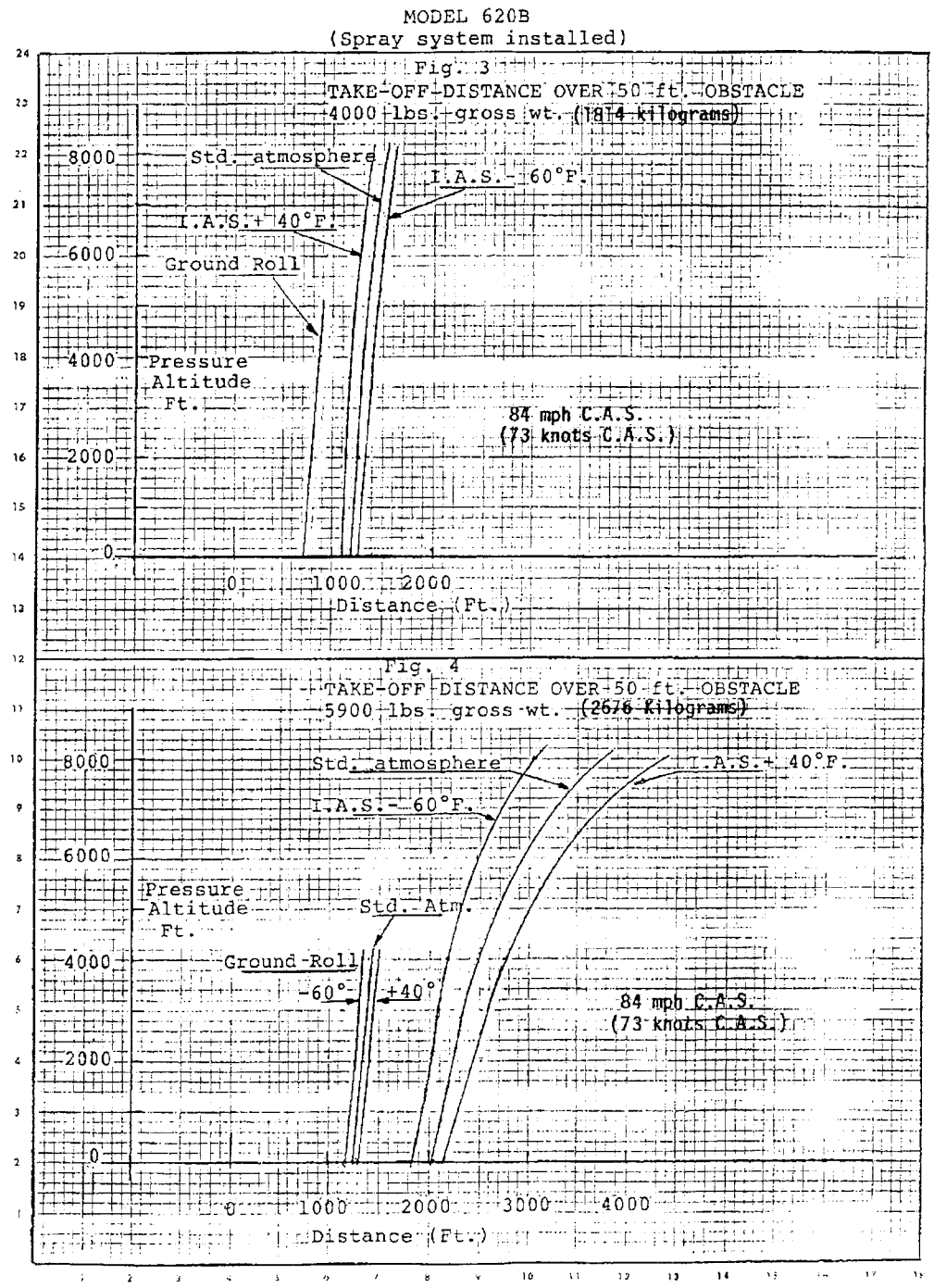
Note: The "ESTIMATED SPECIFIC FUEL CONSUMPTION CURVE" and the "SUGGESTED ENGINE OPERATION TABLE" are engine manufacturer's data and are not FAA approved.

RATE OF CLIMB

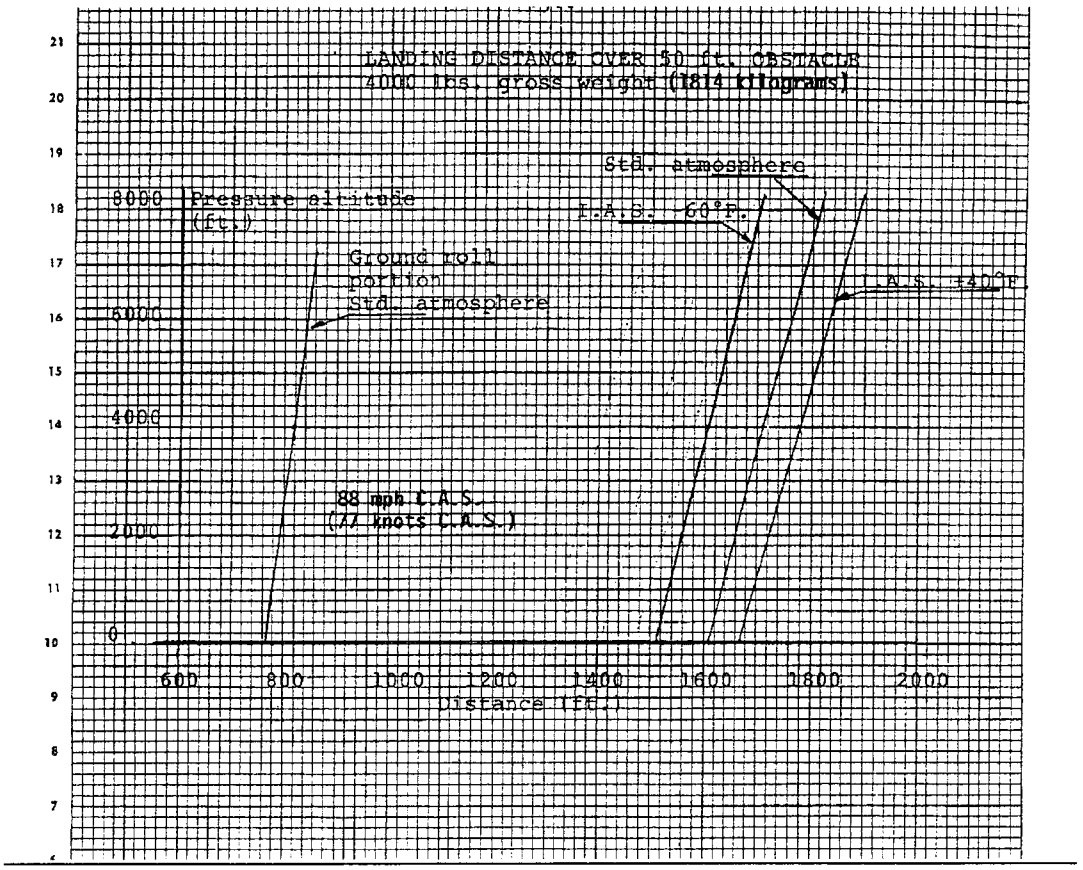
MODEL 620B
(Spray system installed)



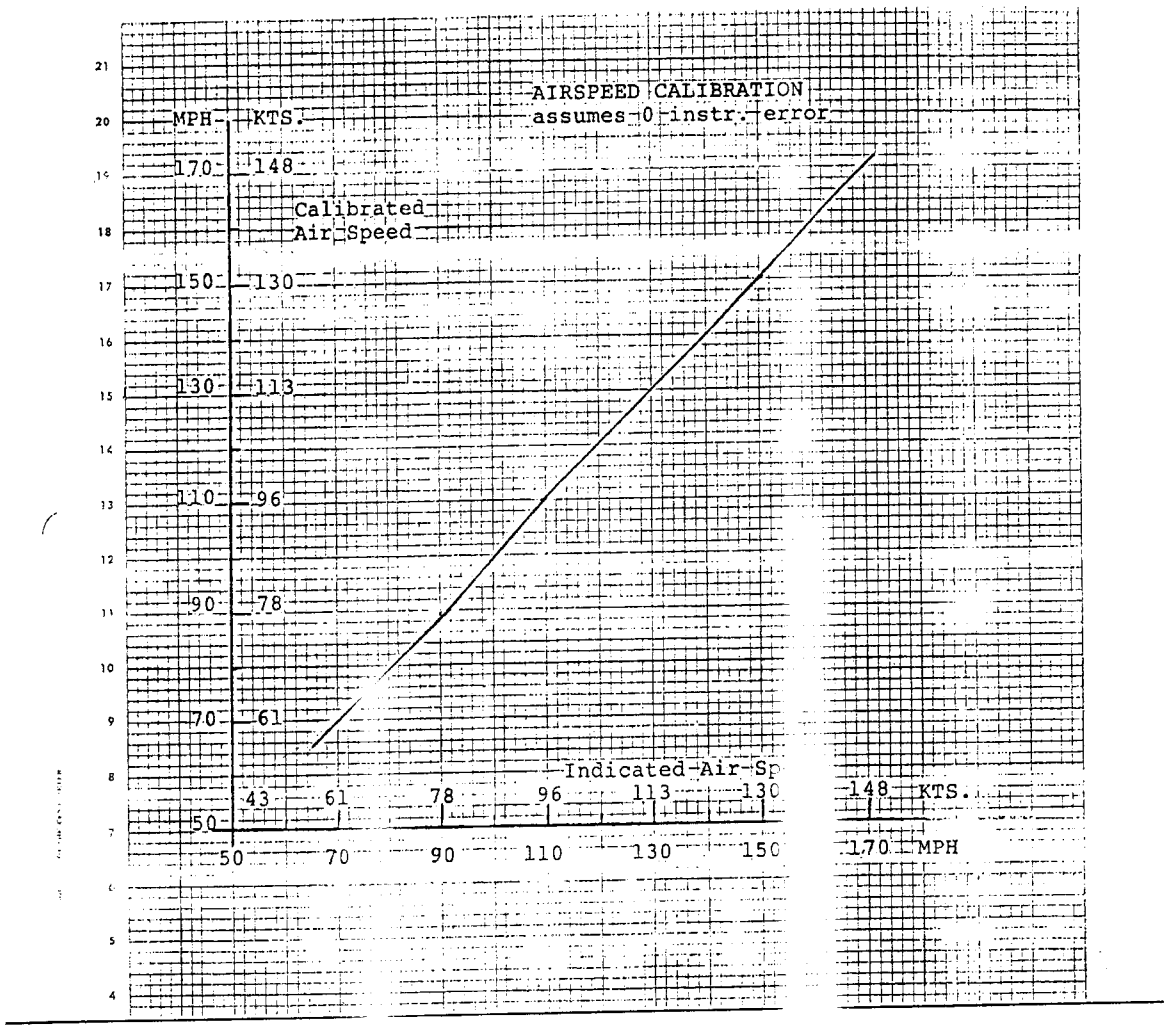
TAKE OFF DISTANCE GRAPH



LANDING DISTANCE OVER 50' OBSTACLE GRAPH

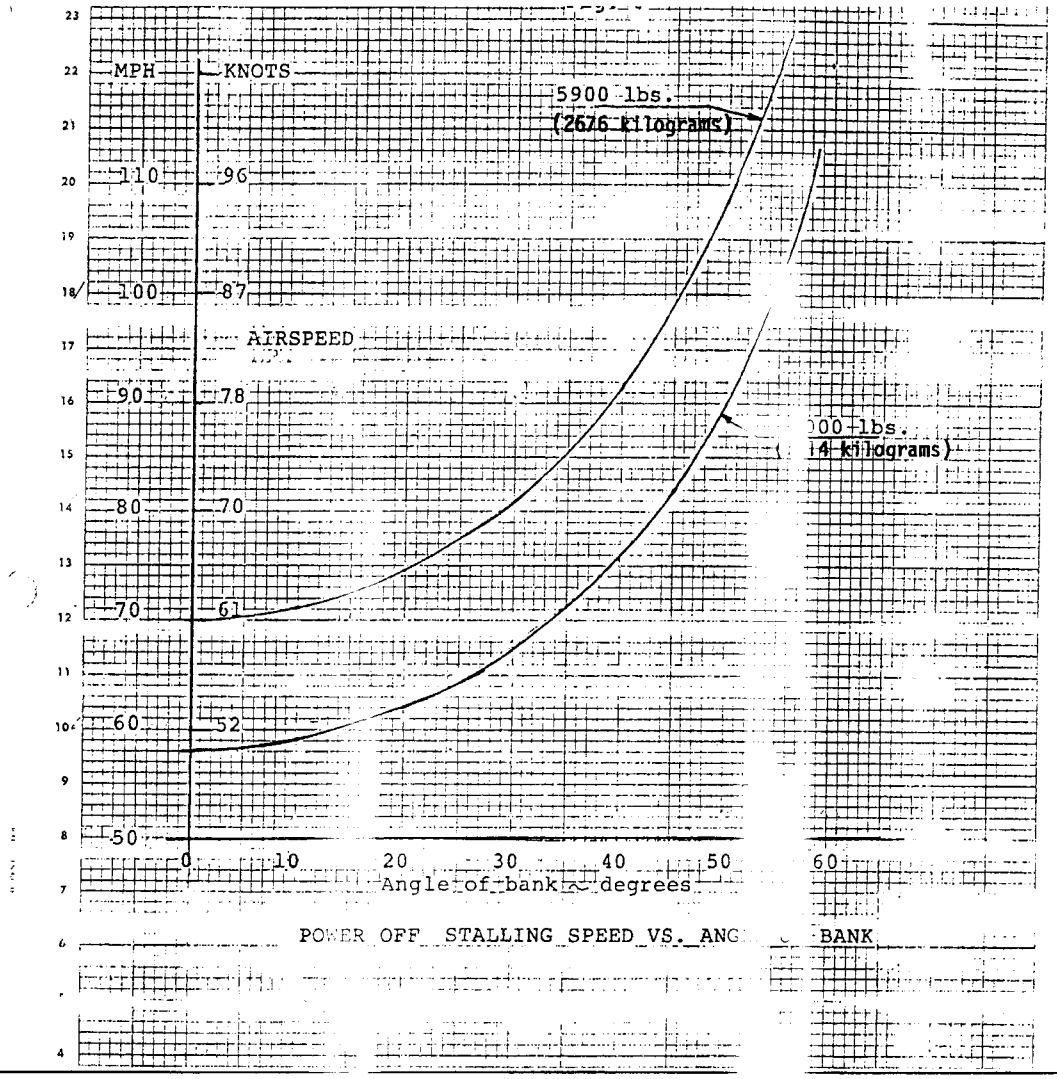


AIRSPEED CALIBRATION GRAPH



GRAPH:

POWER OFF STALLING SPEED VS. ANGLE OF BANK GRAPH

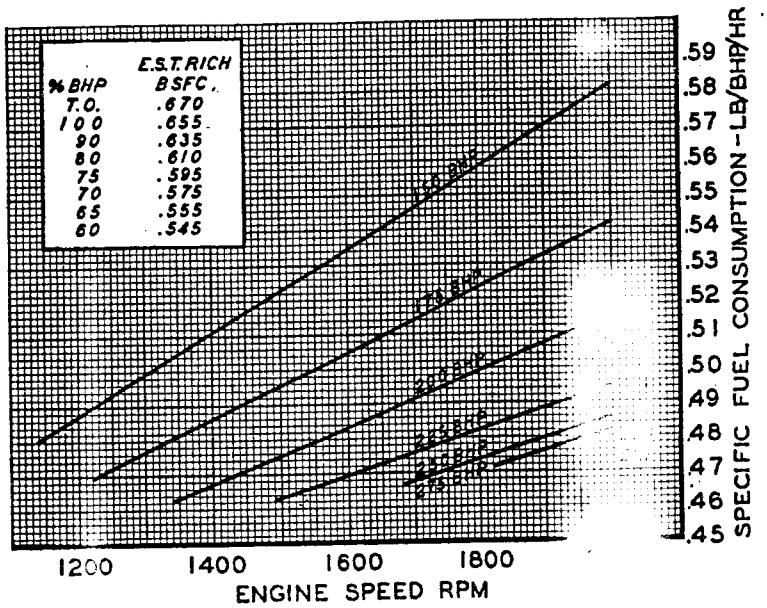


ENGINE MANUFACTURER'S DATA

GRAPH:

ESTIMATED SPECIFIC FUEL CONSUMPTION CURVE
WASP JR. ENGINES

TAKEN FROM CURVE NO. T-1002 11-7-45



NOTE: THESE CURVES SHOW MINIMUM SPECIFIC FUEL CON
OBTAINABLE ONLY WITH MANUAL MIXTURE CONTROL
NOT MORE THAN TWO INCHES OF MERCURY ABOVE
ALTITUDE PRESSURE ON THE EXHAUST.

WHEN USED IN CONJUNCTION WITH THE OPERATING
IT WILL GIVE APPROXIMATE VALUES OF FUEL CONSUM

PRATT & WHITNEY AIRCRAFT

ENGINE MANUFACTURER'S DATA

SUGGESTED ENGINE OPERATION TABLE GRAPH

SUGGESTED ENGINE OPERATION TABLE
R985-AN-1, AN-3, and AN-14B
TAKE-OFF, CLIMB, and CRUISE – NO RAM (4)

POWER CONDITION	% NORMAL RATED POWER	BHP (2)	RPM	MANIFOLD PRESSURE IN. HG.	MIXTURE (5)	APPROX. FUEL [illegible]	CRITICAL ALTITUDE (1)
Take-off		450	2300	36.5	Full Rich	50	2000
Normal Rated	100	450	2300	36.5	Full Rich	50	2000
Climb	91	410	2200	34.5	Full Rich	45	3000
Climb	84	380	2100	33.0	Full Rich	40	4000
Climb	75	340	2000	31.5	Full Rich	34	5000
Max. Cruise	67	300	2000	27.5	0.077	25	9000
Cruise (3)	60	270	1950	25.5	0.077	22	10500
Cruise	60	270	1800	27.5	0.077	22	7500
Cruise (3)	50	225	1800	23.0	0.072	19	12500
Cruise	50	225	1650	25.5	0.072	18	9000
Cruise	50	225	1500	28.5	0.072	18	5000
Cruise (3)	40	180	1700	19.5	0.072	16	16000
Cruise	40	180	1550	22.0	0.072	15	12500
Cruise	40	180	1400	24.5	0.072	15	8500
Cruise	40	180	1200	30.5	0.072	15	1000

NOTES

(1) Critical altitudes will be increased by the amount of ram developed in any particular installation.

(2) Specified bhp is at the critical altitude shown, at the designated rpm, manifold pressure, and mixture settings. To obtain this bhp at lower altitudes with part throttle, increase manifold pressure approximately 0.5 in. Hg for each thousand feet below the critical altitudes shown.

(3) The cruise power settings include a range of rpm, the highest rpm being on propeller load and the lowest at approximately 120 bmep. ($bmep = 805 \times \frac{bhp}{rpm}$)

(4) All power settings are based upon NACA standard atmospheric conditions of temperature and [illegible] pressure with no carburetor heat. During climb, cruise and descent it is desirable whenever practicable to maintain 32°C carburetor air temperature for best engine operation. This will require increased manifold pressure at part throttle and increased rpm at full throttle to obtain the specified power. The correction amounts to about 0.5 in. Hg more manifold pressure (part throttle) or 20 more rpm (full throttle) for each 10°C increase above NACA standard day values.

(5) With NA-R9B carburetor when above 5000 feet altitude lean the mixture to the minimum required for smooth engine operation, or to the desired F/A ratio if such instrumentation is provided.