

ERA16FA316

N3547Q

C188A Operating Manual Excerpts



MORE PEOPLE BUY AND
FLY CESSNA AIRPLANES
THAN ANY OTHER MAKE

188/188A

88a

AGWAGON "A"

PERFORMANCE - SPECIFICATIONS

WITH ANGLE-DRIVE PUMP

LIQUID DISPERSAL SYSTEM INSTALLED



ENGINE AND PROPELLER CONFIGURATIONS

230 HP FIXED PITCH	230 HP CONSTANT SPEED	300 HP CONSTANT SPEED
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GROSS WEIGHT	3300 lbs	3300 lbs	3300 lbs
SPEED, BEST POWER MIXTURE:			
Top Speed at Sea Level	110 mph at rated 2600 rpm	119 mph at rated power	128 mph at max. cont. power
Cruise Speed	70% power at 5000 ft 101 mph	75% power at 6500 ft 108 mph	75% power at 6500 ft 121 mph
RANGE, NORMAL LEAN MIXTURE:			
Cruise	70% power at 5000 ft 260 mi 2.6 hrs 101 mph	75% power at 6500 ft 280 mi 2.6 hrs 108 mph	75% power at 6500 ft 275 mi 2.3 hrs 120 mph 370 mi
36.5 Gallons, No Reserve	---	---	3.1 hrs 120 mph
Cruise	---	---	---
49 Gallons, No Reserve	---	---	---
RATE OF CLIMB AT SEA LEVEL	530 fpm	575 fpm	760 fpm
SERVICE CEILING	10,100 ft	10,800 ft	14,000 ft
TAKE-OFF:			
Ground Run	1000 ft	910 ft	660 ft
Total Distance Over 50-Foot Obstacle.	1600 ft	1500 ft	1040 ft
LANDING:			
Ground Roll	420 ft	420 ft	420 ft
Total Distance Over 50-Foot Obstacle.	1265 ft	1265 ft	1265 ft
EMPTY WEIGHT (Approximate)	1860 lbs	1880 lbs	1910 lbs

MAXIMUM GROSS WEIGHT, RESTRICTED CATEGORY	3800 lbs	3800 lbs	4000 lbs
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STALLS.

The stall characteristics are conventional, and aural warning is provided by a stall warning horn which sounds between 5 and 10 MPH above the stall in all configurations. The stall is also preceded by a mild aerodynamic buffet which increases in intensity as the stall is approached. All controls remain effective throughout the stall.

Power-off stall speeds at 3300 pounds gross weight are presented in figure 5-2 as calibrated airspeeds. Power-on stall speeds are approximately 5 MPH lower than the power-off stall speeds.

SPINS.

Intentional spins are prohibited in this airplane. Should an inadvertent spin occur, standard light plane recovery techniques should be used.

RESTRICTED CATEGORY.

In addition to the operations authorized under the Part 23 certification at 3300 pounds without special agricultural equipment, the airplane is designed as a specialized agricultural airplane. In this operation, it will be used under a restricted type certificate. The operations under the limitations of this restricted type certificate are spelled out for your information below. It should be noted that in all cases the judgment and skill of the pilot will become a large factor in properly interpreting the most suitable operating limitations of this airplane.

As a general guide, the following five areas should be considered when operating in this restricted category:

(1) GROSS WEIGHT:

This airplane has been satisfactorily demonstrated at gross weights of 3800 pounds for the 230 HP engine, and up to 4000 pounds for the 300 HP engine. Take-off performance at these gross weights is limited, and ideal field elevation, runway, and weather conditions are expected to exist in obtaining satisfactory take-off performance. Operation from fields in excess of 1000 feet above sea level, rough or soft runways, adverse runway gradients, high outside air temperature, turbulence, etc., may prevent a safe take-off at these gross weights. All of these things must be considered by the operator.

(2) SPEED AND LOAD FACTORS:

The speed, while operating in the restricted category, is restricted to not more than 120 MPH. At the same time, it is expected that the airplane will not be maneuvered with load factors in excess of 2.5 g's while carrying heavy loads. It is obvious that the margin of strength is reduced at the higher gross weight, and therefore, the operator must take this into account when conducting pull-ups and turn around maneuvers at the end of the field.

Although the airplane is capable of working at speeds from 85 MPH to 120 MPH, it is suggested that a speed of 95 MPH to 115 MPH be used for very heavy loads. The use of very low airspeeds in combination with heavy loads is not recommended because it reduces the margin of safety.

(3) RUNWAY CONDITIONS:

Where the runway is unusually rough, and therefore, subjects the landing gear and airplane structure to high, sharply accelerated loads, the gross weight should be restricted. Such operation can exceed the limit load factors for the landing gear and fuselage, and seriously reduce the overall life of the airplane. The adverse effect of soft runways and long grass can only be determined by a series of take-offs at increasing gross weights on a trial basis.

(4) TAKE-OFF, CLIMB, AND CRUISE:

Conditions of high temperature, high altitude, rough take-off surfaces and terrain clearances at the end of the runway should obviously be taken into account in judging the proper take-off gross weight of this airplane. As a guide, take-off charts are included in Section V to show the normally expected take-off run for the airplane with optional spray equipment installed. Also included are charts for varying gross weights above 3300 pounds. When agricultural equipment is installed, the take-off ground run will not be affected significantly, but the air distance over an obstacle will be increased appreciably.

The optimum flap setting for take-off at the maximum restricted category gross weight with dispersal equipment installed is 10°. Best acceleration to take-off speed is attained in a level flight attitude. Rotation for lift-off should be initiated when the airplane becomes light on its main wheels. A speed of 75 MPH should be maintained after lift-off until all obstacles are cleared. Flaps should be retracted after obstacles are cleared and before a power reduction.

Climb and cruise performance differentials with various Cessna dispersal equipment options are shown in Section V. The smaller cruise speed differentials for the fixed-pitch propeller version are the result of a need for increased power settings to maintain a given RPM with the higher drag configurations. In contrast, the constant-speed propeller cruise speed differentials are based on a constant power for all configurations.

(5) LANDING WEIGHT:

The airplane landing gear is designed for a landing weight of 3300 pounds gross weight. It is normally expected that all land-

ings will be made at or below this gross weight figure. If a landing at a higher gross weight is required, caution should be exercised to prevent overstressing the landing gear.

When the airplane is operated within the restrictions noted above, it is expected that satisfactory performance can be obtained from the airplane. It must be stressed, however, that the judgement of the operator coupled with his own experience will provide the most useful guideline for operating the airplane. Judgement and caution are required at all times.

AIR SPEED LIMITATIONS (CAS)*

The following is a list of the certificated calibrated airspeed (CAS) limitations for the airplane.

Never Exceed Speed (glide or dive, smooth air)	181 MPH
Maximum Structural Cruising Speed	144 MPH
Maximum Speed, Flaps Extended	110 MPH
**Maneuvering Speed	127 MPH

*These airspeed limitations are only applicable to airplanes without agricultural dispersal equipment installed. For airplanes with dispersal equipment installed, refer to the placard located adjacent to the airspeed indicator: "MAX OPERATING SPEED IN AGRICULTURAL OPERATIONS 120 MPH (104 KNOTS)."

**The maximum speed at which abrupt control can be used without exceeding the design load factor.

AIR SPEED INDICATOR MARKINGS.

The following is a list of the certificated calibrated airspeed markings (CAS) for the airplane.

Never Exceed (glide or dive, smooth air)	181 MPH (red line)
Caution Range	144 to 181 MPH (yellow arc)
Normal Operating Range	64 to 144 MPH (green arc)
Flap Operating Range	58 to 110 MPH (white arc)

ENGINE OPERATION LIMITATIONS.

Power and Speed (230 HP Engine)	230 BHP at 2600 RPM
(300 HP Engine)	300 BHP at 2850 RPM
	(5-Minutes Take-Off)
	285 BHP at 2700 RPM
	(Maximum Continuous)

ENGINE INSTRUMENT MARKINGS.

OIL TEMPERATURE GAGE.

Normal Operating Range	Green Arc
Do Not Exceed (230 HP Engine)	225°F (red line)
(300 HP Engine)	240°F (red line)

OIL PRESSURE GAGE.

Idling Pressure	10 psi (red line)
Normal Operating Range	30-60 psi (green arc)
Maximum Pressure	100 psi (red line)

MANIFOLD PRESSURE GAGE.

Normal Operating Range	
(230 HP Engine, CSP)	15-23 in. Hg (green arc)
(300 HP Engine)	15-25 in. Hg (green arc)

TACHOMETER.

Normal Operating Range	
(230 HP Engine, FPP)	2200-2600 RPM (green arc)
(230 HP Engine, CSP)	2200-2450 RPM (green arc)
(300 HP Engine)	2200-2550 RPM (green arc)
Caution Range (300 HP Engine)	2700-2850 RPM (yellow arc)
Do Not Exceed (Engine rated speed)	
(230 HP Engine)	2600 RPM (red line)
(300 HP Engine)	2850 RPM (red line)

FUEL QUANTITY INDICATOR(S).

Empty	E (red line)
0.5 gallon total unusable (standard fuselage fuel tank system)	
7.0 gallons total unusable (optional wing tank fuel system)	

FUEL FLOW INDICATOR (300 HP Engine).

Normal Operating Range	7.0-17.0 gal/hr (green arc)
Minimum and Maximum	3.5 and 19.5 psi (25.2 gal/hr)(red line)

STALL SPEEDS, POWER OFF			
Gross Weight 3300 LBS.	ANGLE OF BANK		
CONFIGURATION	0° 	30° 	60° 
FLAPS UP	64	69	91
FLAPS 10°	60	65	85
FLAPS 20°	58	62	82
SPEEDS ARE MPH, CAS			

Figure 5-2.

5-1

Restricted Category Performance

To determine expected performance with dispersal equipment installed, subtract the differential factors in figure 5-7 from data shown in figures 5-3 thru 5-5. Figure 5-8 shows take-off data. Stall speeds for restricted category gross weight with 0° angle of bank are as follows:

	3800 LBS	4000 LBS
FLAPS UP	69	70
FLAPS 20°	62	64

FUEL SYSTEM.

Fuel from the standard fuselage fuel tank system is supplied to the engine from a 37-gallon aluminum tank located just aft of the engine compartment firewall. The tank is enclosed in a plastic vapor barrier bag equipped with three drain tubes equally spaced across the bottom of the fuel tank. The tank is vented from the filler neck through a vent line routed to a point under the left side of the fuselage ahead of the landing gear attach structure. In addition, small bleed holes are located in the internal portion of the fuel filler cap to provide tank venting if the main fuel vent becomes obstructed.

Fuel flows from the tank to a shutoff valve beneath the tank. When the shutoff valve is open and the mixture control is in the rich position with the engine running, fuel flows by gravity through the fuel strainer to the carburetor on 230 HP airplanes. On 300 HP airplanes, fuel is drawn through a check valve in the auxiliary fuel pump, through the fuel strainer to the engine-driven fuel pump, where it is pumped into the fuel metering unit. In the metering unit, fuel is regulated by the setting of the throttle and mixture controls. The metered fuel is pumped through the fuel distribution valve to the injection nozzles. The remainder of the unmetered fuel is returned to the engine-driven fuel pump where excess fuel and vapor are directed through a return line to the top of the fuel tank. For operation of the auxiliary fuel pump, refer to the "Auxiliary Fuel Pump Switch" paragraph in this section.

An optional wing tank fuel system is available for aircraft having the 300 HP engine. Refer to Section VI for discussion of this system.