SECTION 2

LIMITATIONS

2.1 GENERAL

This section provides the FAA Approved operating limitations, instrument markings, color coding and basic placards necessary for operation of the airplane and its systems.

This airplane must be operated as a normal or utility category airplane in compliance with the operating limitations stated in the form of placards and markings and those given in this section and handbook.

Limitations associated with those optional systems and equipment which require handbook supplements can be found in Section 9 (Supplements).

2.3 AIRSPEED LIMITATIONS

SPEED	KIAS	KCAS
Never Exceed Speed (V_{NE}) - Do not exceed this speed in any operation.	160	153
Maximum Structural Cruising Speed (V_{NO}) - Do not exceed this speed except in smooth air and then only with caution.	126	122
Maximum Flaps Extended Speed (V_{FE}) - Do not exceed this speed with the flaps extended.	103	100

SPEED	KIAS	KCAS
Design Maneuvering Speed (VA) - Do not make full or abrupt control movements above this speed.		
At 2202 lbs. / 999 kg G.W.	107	105
At 1531 LBS. G.W.	88	89

CAUTION

Maneuvering speed decreases at lighter weight as the effects of aerodynamic forces become more pronounced. Linear interpolation may be used for intermediate gross weights. Maneuvering speed should not be exceeded while operating in rough air.

2.5 AIRSPEED INDICATOR MARKINGS

MARKING	KIAS
Red Radial Line (Never Exceed)	160
Yellow Arc(Caution Range - Smooth Air Only)	126 to 160
Green Arc (Normal Operating Range)	49 to 126
White Arc (Flap Down)	43 to 103

2.7 POWER PLANT LIMITATIONS

(a) Number of Engines	1
(b) Engine Manufacturer	Lycoming
(c) Engine Model No.	O-320-D3G
(d) Engine Operating Limits	
(1) Maximum Horsepower	160
(2) Maximum Rotation Speed (RPM)	2700
(3) Maximum Oil Temperature	245°F
(e) Oil Pressure	
Minimum (red line)	25 PSI
Maximum (red line)	115 PSI
(f) Fuel Pressure	
Minimum (red line)	.5 PSI
Maximum (red line)	8 PSI
(g) Fuel (AVGAS ONLY) (minimum grade)	100 or 100LL Aviation Grade

(h) Number of Propellers	1
(i) Propeller Manufacturer	Sensenich
(j) Propeller Model	74DM6-0-60
(k) Propeller Diameter	
Minimum	72 IN.
Maximum	74 IN.
(l) 74DM6-0-60 Propeller Tolerance (static rpm at maximum permissible throttle setting, Sea Level, ISA)	Not above 2430 RPM Not below 2330 RPM

NOTE

Refer to the airplane maintenance manual for test procedure to determine approved static rpm under non standard conditions.

2.9 POWER PLANT INSTRUMENT MARKINGS

(a) Tachometer	
Green Arc (Normal Operating Range)	500 to 2700 RPM
Red Line (Maximum Continuous Power)	2700 RPM
(b) Oil Temperature	
Green Arc (Normal Operating Range)	100° to 245°F
Red Line (Maximum)	245°F

2.9 POWER PLANT INSTRUMENT MARKINGS (Continued)

(c) Oil Pressure	
Green Arc (Normal Operating Range)	55 to 95 PSI
Yellow Arc (Caution Range) (Idle)	25 to 55 PSI
Yellow Arc (Ground Warm-Up)	95 to 115 PSI
Red Line (Minimum)	25 PSI
Red Line (Maximum)	115 PSI
(d) Fuel Pressure	
Green Arc (Normal Operating Range)	.5 to 8 PSI
Red Line (Minimum)	.5 PSI
Red Line (Maximum)	8 PSI

2.11 WEIGHT LIMITS

	Normal	Utility
(a) Maximum Takeoff Weight	2202 lbs / 999 kg	2020 lbs / 916 kg
(b) Maximum Landing Weight (lbs)	2202 lbs / 999 kg	2020 lbs / 916 kg
(c) Maximum Weight in Baggage Compartment (lbs / kg)	200 lbs / 90.7 kg	0

NOTE

Refer to Section 5 (Performance) for maximum weight as limited by performance.

2.13 CENTER OF GRAVITY LIMITS

(a) Normal Category

Weight Pounds	Forward Limit Inches Aft of Datum	Rearward Limit Inches Aft of Datum
2202	85.7	93.0
1950 (and less)	83.0	93.0

(b) Utility Category

Weight Pounds	Forward Limit Inches Aft of Datum	Rearward Limit Inches Aft of Datum
2020	83.8	93.0
1950 (and less)	83.0	93.0

NOTES

Straight line variation between points given.

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

It is the responsibility of the airplane owner and the pilot to insure that the airplane is properly loaded. See Section 6 (Weight and Balance) for proper loading instructions.

2.15 MANEUVER LIMITS

(a) Normal Category - All acrobatic maneuvers including spins prohibited.

(b) Utility Category - Approved Maneuvers for bank angles exceeding 60°:

	Entry Speed
Steep Turns	111 KIAS
Lazy Eights	111 KIAS
Chandelles	111 KIAS

2.17 FLIGHT LOAD FACTORS

	Normal	Utility
(a) Positive Load Factor (Maximum)	3.8 G	4.4 G
(b) Negative Load Factor (Maximum)	No inverted maneuvers approved	

2.19 KINDS OF OPERATION EQUIPMENT LIST

This airplane may be operated in day or night VFR, day or night IFR when the appropriate equipment is installed and operable.

The following equipment list identifies the systems and equipment upon which type certification for each kind of operation was predicated and must be installed and operable for the particular kind of operation indicated. However, certain operations may be authorized with certain listed equipment and/or systems inoperative under certain conditions and under provisions defined by a current Minimum Equipment List (MEL) approved by the FAA which is dated concurrently with or after this Pilot's Operating Handbook and FAA Approved Airplane Flight Manual and authorized under an operating regulation which provides for use of an MEL.

(a) Day VFR
- (1) Airspeed indicator
- (2) Altimeter
- (3) Magnetic compass
- (4) Tachometer
- (5) Oil pressure indicator
- (6) Oil temperature indicator
- (7) Fuel pressure indicator
- (8) Fuel quantity indicator - each tank
- (9) Volt-ammeter
- (10) Elevator/rudder trim indicator
- (11) Alternator
- (12) Safety restraint - each occupant

(b) Night VFR
- (1) All equipment required for Day VFR
- (2) Position lights
- (3) Instrument lights
- (4) Anti-collision (strobe) lights

(c) Day IFR
- (1) All equipment required for Day VFR
- (2) Vacuum pump
- (3) Gyro suction indicator

(d) Night IFR
- (1) All equipment required for Day and Night VFR
- (2) All equipment required for Day IFR

NOTE

The above system and equipment list does not include specific flight instruments and communication/navigation equipment required by the FAR Part 91 and 135 operating requirements.

2.21 FUEL LIMITATIONS

(a) Total Capacity	50 U.S. GAL.
(b) Unusable Fuel The unusable fuel for this airplane has been determined as 1.0 gallon in each wing in critical flight attitudes.	2 U.S. GAL.
(c) Usable Fuel The usable fuel in this airplane has been determined as 24.0 gallons in each wing.	48 U.S. GAL.

2.25 PLACARDS

In full view of the pilot:

THIS AIRPLANE MUST BE OPERATED AS A NORMAL OR UTILITY CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS.

ALL MARKINGS AND PLACARDS ON THIS AIRPLANE APPLY TO ITS OPERATION AS A UTILITY CATEGORY AIRPLANE. FOR NORMAL AND UTILITY CATEGORY OPERATION, REFER TO THE PILOT'S OPERATING HANDBOOK.

NO ACROBATIC MANEUVERS ARE APPROVED FOR NORMAL CATEGORY OPERATIONS. SPINS ARE PROHIBITED FOR NORMAL AND UTILITY CATEGORY.

In full view of the pilot and passengers (serial numbers 2842019 and up):

NO SMOKING

Adjacent to upper door latch:

ENGAGE LATCH BEFORE FLIGHT

On inside of the baggage compartment door:

BAGGAGE MAXIMUM 200 LBS
UTILITY CATEGORY OPERATION — NO BAGGAGE OR AFT PASSENGERS ALLOWED. NORMAL CATEGORY OPERATION - SEE PILOT'S OPERATING HANDBOOK WEIGHT AND BALANCE SECTION FOR BAGGAGE AND AFT PASSENGER LIMITATIONS.

In full view of the pilot:

V_A = 107 KIAS AT 2202# (SEE A.F.M.)

UTILITY CATEGORY OPERATION - NO AFT PASSENGERS ALLOWED.

DEMO. X-WIND 17 KTS.

In full view of the pilot when the oil cooler winterization kit is installed:

OIL COOLER WINTERIZATION PLATE TO BE REMOVED WHEN AMBIENT TEMPERATURE EXCEEDS 50°F.

In full view of the pilot:

UTILITY CATEGORY OPERATION ONLY
(1) NO AFT PASSENGERS ALLOWED.
(2) ACROBATIC MANEUVERS ARE LIMITED TO THE FOLLOWING:

	ENTRY SPEED
SPINS PROHIBITED	
STEEP TURNS	111 KIAS
LAZY EIGHTS	111 KIAS
CHANDELLES	111 KIAS

In full view of the pilot:

WARNING - TURN OFF STROBE LIGHTS WHEN IN CLOSE PROXIMITY TO GROUND OR DURING FLIGHT THROUGH CLOUD, FOG OR HAZE.

Adjacent to fuel filler caps (serial numbers 28-8316037 and up):