

N601GE

**Zodiac 601XL, SN 6-6753
Corvair 3.0L Motor, Sensenich 63x44 Prop**

Pilo Opera Handbo ok

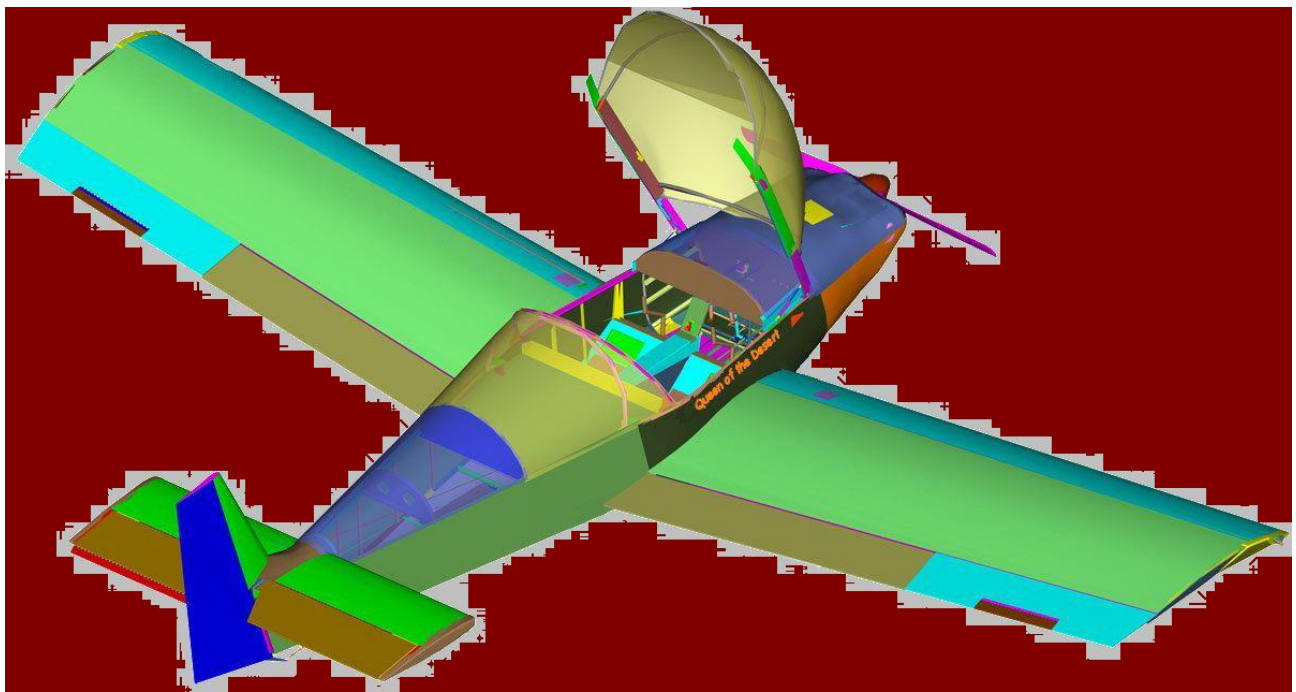


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Section 1 – Airplane and Systems Description

ENGINE

A modified Chevrolet Corvair engine is installed in this aircraft. This is a normally-aspirated, direct-drive, 6-cylinder, air-cooled engine, with redundant ignition sources driving single plugs per cylinder. This engine uses specially modified 92 mm Volkswagen cylinders and custom-made dish-top pistons giving a compression ratio of ~8.4:1 and a displacement of 3000 cc or 183 c.i. Its *approximate* rating of this engine is 115 HP at 3300 rpm maximum and 105 HP at 3000 RPM continuous. The long block was built up by Mark Petniunas from Falcon Machine, www.falconmachine.net.

The engine has been converted for flight use following the methods described in Corvair Flight Engines for use in Experimental Aircraft, by William Wynne and was installed very similarly to the methods described in Corvair/601 Firewall Forward Installation Manual, also by William Wynne. When questions about the engine come up that are not directly addressed in this POH, the answers will likely be found in one of those books.

The engine includes a Dan Weseman 5th bearing. See www.fly5thbearing.com. The construction manuals, as well as many of the conversion parts and lots of additional information, are available from www.flycorvair.com, Mr. Wynne's website.

FUEL SYSTEM

The fuel system consists of two 15 gallon wing tanks with float sensors, a console-mounted tank selector valve, primary and alternate fuel pumps, a fuel pressure sensor, a fuel flow sensor and the MA3-SPA carburetor. The carburetor has an accelerator pump to prime the engine for starting; there is no separate engine primer system.

The fuel flow sensor uses regular aircraft power, but the fuel pressure sensor gets 5VDC power from the avionics voltage regulator. If that regulator fails or is bypassed, the fuel pressure indication will be unreliable and should be ignored.

The primary and alternate fuel pumps are identical, however the primary pump is protected by an oil pressure switch which prevents pump operation below ~5 psi oil pressure. This prevents fuel dumping in a crash situation where the pilot is unable to turn off the fuel pump or main power. Therefore the primary fuel pump should be selected for normal flight operations, but the alternate pump must be used for engine start.

The float sensors in the tanks are limited in range to the last 6 gallons in each tank. From 0-6 gallons, they are fairly accurate. The sensors were calibrated using the MGL Ultra EFIS as follows:

Right Tank	EFIS Cal	Left Tank	EFIS cal	True Left	True Cal
0	250	0	250	0	272
1	195	3	128	1	208
2	164	6	83	2	156
3	140	12	82	3	128
4	124	18	81	4	112
5	112	24	80	5	100
6	100	30	79	6	83
7	88			6.5	83

The right tank quantity is displayed on the #2 tank indicator. The #1 indicator displays computed fuel quantity for the complete aircraft based on fuel used, as determined by the fuel flow sensor. The sensor has been calibrated over many test flights and a value of XXXXXX counts was found to give accurate indications.

In normal usage, the total fuel is entered in the EFIS prior to flight, and the fuel totalizer computes both fuel used and fuel remaining. The #1 gauge is the primary indicator. The #2 gauge only shows accurate indications for the last 6-7 gallons in the right tank.

Normal operation is to switch between tanks using the selector valve at 3 or 5 gallon increments, starting with the fullest tank (or left tank if both are equal). In case of a low fuel condition, the correct procedure is to finish the fuel from the left tank first, so that the final few gallons are correctly indicated on the #2 indicator.

The normal fuel for this engine is 100LL grade aviation fuel. When using straight 100LL, a lead scavenger such as Decalin RunUp or TCP should also be used consistently to prevent lead fouling on the exhaust valves. Alternate fuels are 93 and higher octane motor fuels or AVGAS/MOGAS mixtures. The fuel system is alcohol-capable, but care should be exercised as alcohol both absorbs water and increases susceptibility to vapor lock. It is acceptable to mix auto fuel and 100LL in the one tank. When mixed 3:1 with 100LL, 91 octane motor fuel is OK.

OIL SYSTEM

The oil system is a single wet sump system with a nominal capacity of 5 quarts. A high-capacity oil pump is used to account for the additional needs of the 5th bearing.

The specified oil is Shell Rotella T 15W-40 (non-synthetic). Other non-full-synthetic oils which meet the API CJ-4 specification can be used if Rotella T is unavailable. It is important that the oil have sufficient ZDDP for the Corvair engine. For example, Chevron Delo 400 LE 15W-40 and Conoco Kendall Super-D XA 15W-40 are acceptable if a small amount of ZDDP is added. Full synthetic oils should be avoided.

The oil change interval is 25-40 hours depending on operating conditions and usage. The standard oil filter is the K&N model HP-1008. The Mobil M1-108 or Fram TG6607 are acceptable alternatives.

IGNITION SYSTEM

The ignition system consists of a identical primary and alternate coils feeding a modified dual-points distributor through a coil joiner device. Only one coil may be powered at a time using the

ignition switch on the instrument panel. The distributor has one set of primary electronic points and one set of alternate mechanical points, and fires single spark plugs in each cylinder. Details of the ignition system design can be found the Wynne Corvair Installation Manual.

The specified spark plug for this engine is the AC Delco R44F, with a gap of 0.035-0.040 inches. Alternate equivalent (but not hotter) plugs may be used, including the NGK BR6HS. Maximum ignition advance should be set on both sides to 32° BTDC.

Normal operation is to start the engine using the alternate ignition and to switch to the primary ignition during engine run up. In this way, both sets are confirmed to be working before flight.

CARBURETOR & CABIN HEAT

Carburetor heat should be used for any extended in-flight operation at low power settings, below 2000 RPM, whenever ambient conditions are conducive to carburetor icing. This includes any time temperatures are below 75° with significant humidity. When ground conditions are conducive to carburetor icing, the carb heat should be use for a few minutes before takeoff.

A heat muff around the right side exhaust can provide cabin heat through a control valve at the bottom center of the firewall, or carburetor heat if the carb heat control is pulled, closing the airbox inlet door. **Note: Using the carburetor heat will significantly reduce available engine power.**

The system is set up so that the normal flow (carb heat off) is from the airbox, through the heat muff and either overboard at the firewall bottom center or into the cabin as cabin heat. When the carb heat control is pulled and the inlet door closes, the flow reverses, going from ambient or cabin air, through the heat muff into the airbox.

While it is not possible to have both carburetor and cabin heat working at the same time, but it is not necessary to shut off the cabin heat before pulling the carb heat control. The reversing operation is automatic.

ELECTRICAL SYSTEM

This aircraft is electrically dependent. There is no mechanical fuel pump and the ignition system requires power to operate.

Power is provided by an 18A permanent magnet alternator and two PC-680 SLA-type batteries, one under the passenger seat and one on the left side of the firewall. Alternator power is regulated by voltage regulator attached to the fuselage under the right side of the avionics area, and is controlled by an alternator switch at the left of the instrument panel. On the right side of the panel is the large manual battery selector switch.

Only the battery under passenger seat can be used to start the engine. This is selected by moving the battery to the START position. Attempting to start the engine on the backup battery will usually blow the back-up battery in-line fuse (Requires removing panel top cover to replace!)

After the engine is started and the alternator switch is turned on, the battery switch should be moved to the FLIGHT position, which connects both batteries to the system. In the event the starting battery should fail, it can be disconnected and the backup battery can be selected by changing the battery switch to RTB (return to base).

Should the voltage regulator or alternator fail, a warning light will illuminate at the upper left of the instrument panel. In this situation, reduce electrical loads as much as possible and land as conditions permit. The largest loads are the pitot heat, the landing light, the transponder, and the strobes. With these off and both batteries fully charged, you should have at least 2 full hours of flight time before the engine will fail.

Power to the EFIS, gyros, encoder and backup airspeed/altimeter is provided by a car-computer-type voltage regulator (Carnetix P1290) which provides very clean 12V power even during engine start. In addition, this regulator provides 5V power to the fuel pressure sensor. Power to the regulator is controlled by a switch on the panel. If this regulator should fail, all equipment *except the fuel pressure sensor* can be powered by moving the switch down to the BYPASS position.

FLIGHT CONTROLS

This aircraft has cable-operated ailerons, elevator and rudder. Cable tension on the elevators and ailerons should be checked regularly at 25-30 lbs. The ailerons have counter-balance weights and spades added to reduce roll control forces.

The roll forces may be trimmed out using an electrically operated trim tab on the left aileron. The pitch forces may be trimmed out using an electrically operated trim tab on the left side of the elevator. The “coolie hat” switch on the pilot’s stick and the two rocker switches on the center panel operate identically, but only one should be used at a time. Because of the large available CG range, a 2” fiberglass extension has been added to the elevator trim tab. This allows trimming out the elevator forces for full flaps when flying solo.

There are simply-hinged wing flaps which are electrically actuated and use a control tube-pin and slot arrangement. The flap actuator has built in stops which are not adjustable. Maximum operating speed with ½ flaps is 90 MIAS and with full flaps is 80 MIAS. Actuating the flaps creates a significant pitching moment which the pilot must control and/or trim out.

PROPELLER

A wood Sensenich propeller, type W64ZKL47S, SN AJ1354, was installed on 24 November 2010, at 256 tach hours. When the original engine was replaced with the current 3.0L version, the propeller was re-pitched by Gary Hertzler (Hertzler Propeller) to match. The propeller is now a 63” diameter x 44” pitch. The propeller bolts should be torqued to 17-18 ft-lbs not less often than every 3 months or 50 hours, whichever comes first. **Static RPM for this prop is 2725.** You may see a small drop in RPM during the first part of the takeoff roll, then a steady increase.

Section 2 – Operating Limitations

DESIGN AIRSPEEDS & AIRSPEED LIMITS

Speed	MIAS	MCAS	Remarks
V _S – No-Flap Stall Speed at Maximum Takeoff Weight	57		Stall speeds will be as much as 7 mph lower at lighter weights.
V _{S1} – ½-Flap Stall Speed at Maximum Takeoff Weight	55		Stall speeds will be as much as 7 mph lower at lighter weights.
V _{S0} – Full-Flap Stall Speed at Maximum Takeoff Weight	52		Stall speeds will be as much as 7 mph lower at lighter weights.
V _{FE} – Maximum Speed With Full Flaps Extended	80		Do not exceed this speed with full flaps extended
V _{F2} – Maximum Speed With ½ Flaps Extended	90		Use with caution as flaps are not marked
V _X – Speed for Best Angle of Climb	72		Gives highest feet per <u>mile</u>
V _Y – Speed for Best Rate of Climb	74		Gives highest feet per <u>minute</u>
V _{BG} – Speed for Best Glide	70		Gives highest L/D, maximum glide distance.
V _{MD} – Speed for Minimum Descent Rate	68		Gives maximum air time.
V _A – Design Maneuvering Speed	103		Do not make abrupt or full control movements above this speed
V _C – Design Cruising Speed	124		Do not exceed this speed except in smooth air and with caution
V _{NE} - Never Exceed Speed	160		Do not exceed this speed in any case or condition.

CROSSWIND LIMITS

Maximum demonstrated crosswind component is 15 knots. Use extreme caution with any winds above 30 knots as the plane will be difficult to control and keep on the ground.

SERVICE CEILING

Maximum service ceiling is 17,500 feet.

PROHIBITED MANEUVERS

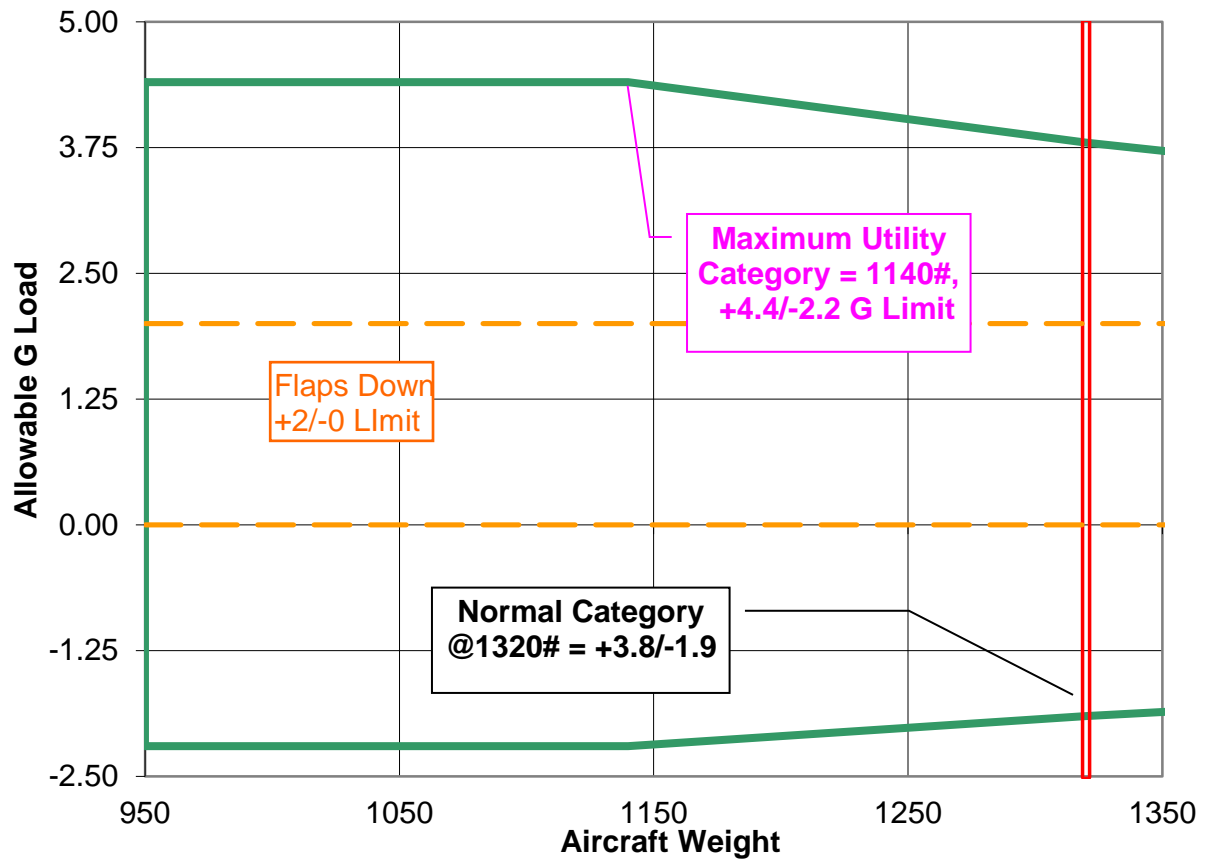
Intentional spins are prohibited.
Aerobatics are prohibited.

TYPES OF OPERATIONS

When appropriately equipped according to the FARs, this airplane may be operated Day and Night, VFR and IFR.

Flight into known or forecast icing conditions is prohibited.

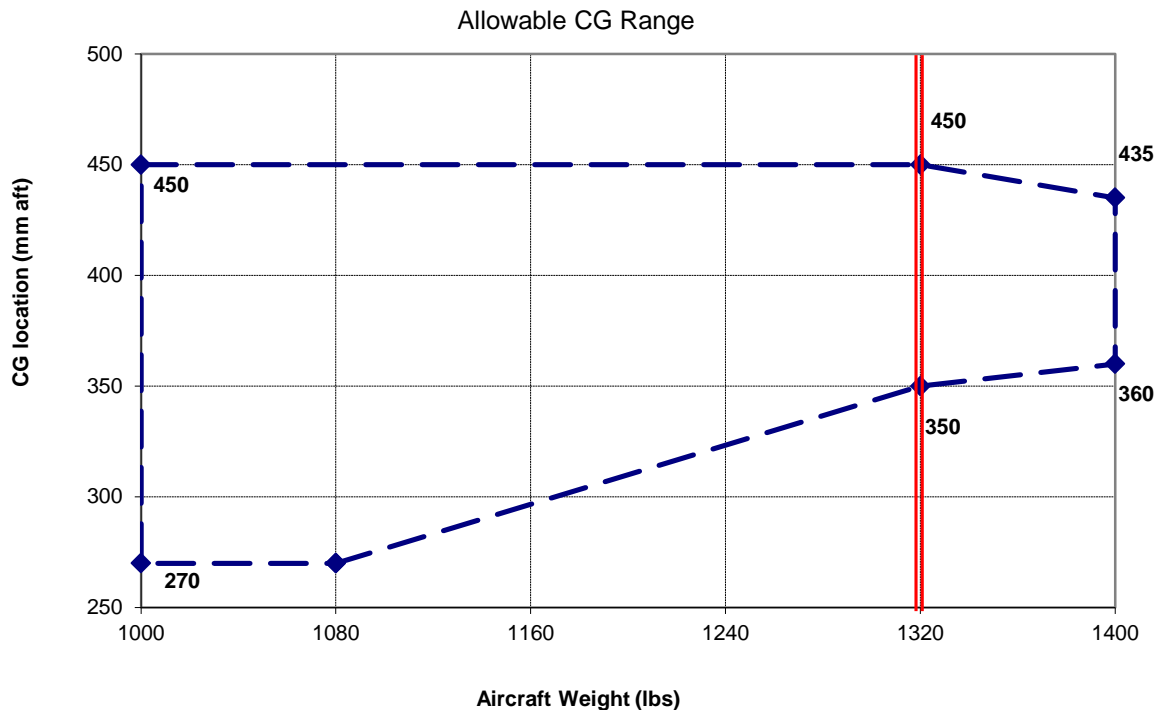
N601GE Reduced Flight Load Limits Zodiac 601XL (corresponds to FAA Normal Category @1320#)



LOAD FACTOR LIMITS

Section 3 – Weight and Balance Information

The CG envelope is based on the factory S-LSA aircraft POH.



Authorized maximum gross weight for this aircraft is 1320 pounds. The aircraft has been flight tested to 1450 pounds.

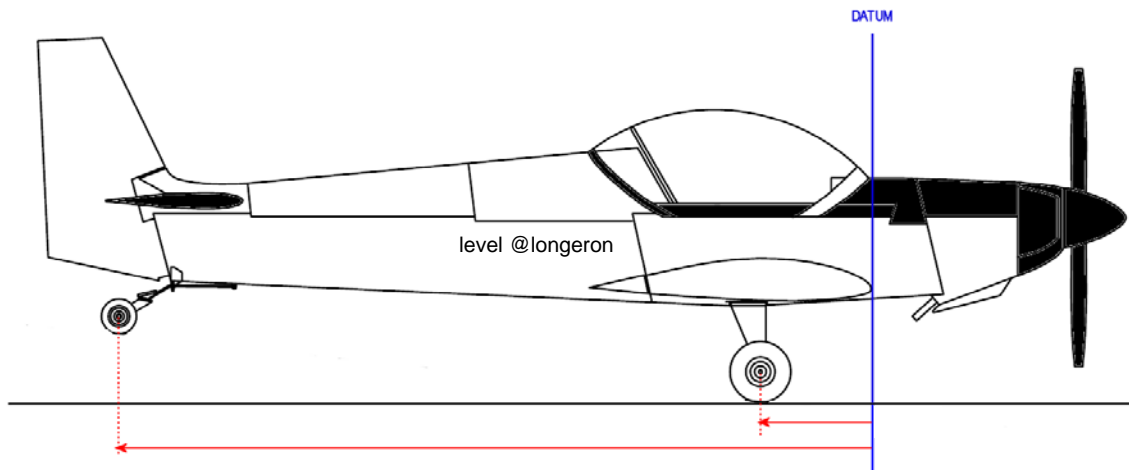
An example weight and balance sheet is on the following page. Similar sheets are carried in the aircraft, pre-computed for a wide-range of loading conditions. It is very hard to load the aircraft out of CG range as long as the maximum gross weight is respected.

An Example Weight and Balance sheet is on the next page. Current Weight & Balance sheets must be carried in the aircraft.

N601GE Weight & Balance

Zodiac 601XL S/N 6-6753

18-May-14



Datum line is plumb from wing leading edge.

Maximum takeoff weight is 1320 lbs.

$A_{main} =$	33	measured
$A_{tail} =$	4160.5	measured
MAC=	1500	mm

	Weight	Arm	Moment
Right Main	363	33	11979
Left Main	357	33	11781
Tailwheel	42	4160.5	174741
#2 Battery	15	-400	-6000
Added Fairings	10	1500	15000
Spar			
Modifications	6	0	0
additional equipment			0
Total Empty	793		207501

**Max Gross
X-Country**

Empty CG Location
262

Pilot	195	700	136500
Passenger	125	700	87500
Baggage	27	1600	43200
Full Fuel	180	180	32400
Takeoff Weight	1320		507101

Takeoff CG
Location

384

Fuel Burned	-156	180	-28080
Landing Weight	1164		479021

Landing CG
Location

412

Section 4 – Emergency Procedures

In all cases – **Maintain aircraft control. Analyze the situation and take appropriate action. Land as conditions permit.**

Engine Fire During Start

1. Starter – CONTINUE CRANKING

If engine starts:

2. RPM – 1500 momentarily
3. Engine - SHUTDOWN

If engine does not start:

4. Battery Switch – OFF
5. Fuel Selector Switch – OFF
6. Mixture – IDLE CUT-OFF
7. Abandon aircraft and fight fire.

Engine Failure During Takeoff

If tail is up

1. Apply brakes and aft stick carefully to avoid nose-over
2. If flaps are down and conditions permit, raise flaps.
3. Steer with pedals and brakes until tail is down

If/when tail is down:

1. Stick aft to keep tail down.
2. Steer with pedals and brakes.
3. Brakes – Apply smoothly as required
4. Engine - SHUTDOWN

Engine Failure Soon After Takeoff

1. **Lower nose** to maintain 70 MIAS.
2. Select landing area.
3. If time permits, lower flaps to full.
4. Land as slowly as possible without stalling.

Alternator or Voltage Regulator Failure in Flight

1. Alternator switch - OFF.
2. Battery switch - FLIGHT.
3. Reduce electrical load as much as possible.

Avionics Regulator Failure in Flight

1. Regulator switch to BYPASS.
2. Fuel pressure indication will be unreliable..

Engine Failure in Flight

1. Establish speed for best glide, ~70 MIAS
2. Ignition and Fuel switches – ALTERNATE
3. Fuel Selector – OTHER TANK
4. Carb Heat - PULL

If engine will restart:

5. Land as soon as practical

If engine does not restart:

5. Select landing area.
6. Starter may be used to extend glide.
7. Power Off Landing

Engine Fire in Flight

1. Cabin Heat – OFF
2. Fuel Pumps & Ignitions – OFF
3. Throttle - CLOSED
4. Mixture – IDLE CUT-OFF
5. Fuel Selector – OFF
5. Select landing area.
6. Starter may be used to extend glide.
7. Power Off Landing

Electrical Fire in Flight

1. Alternator – OFF
2. Regulator – BYPASS
3. Air vents - OPEN
4. Electrical equipment – OFF as possible
5. Fire extinguisher – As required
6. Land as soon as practical

Power Off Landing

1. When committed to land:
 - > Seat Belts & Shoulder Harness - SECURE
 - > Battery Switch – OFF
 - > Fuel Selector Valve – OFF
 - > Mixture – IDLE CUT-OFF
2. Flaps – Full when landing is assured
3. Touchdown at lowest possible speed without stalling
(Using starter to get propeller horizontal will reduce chances of a nose-over.)

Spin Recovery

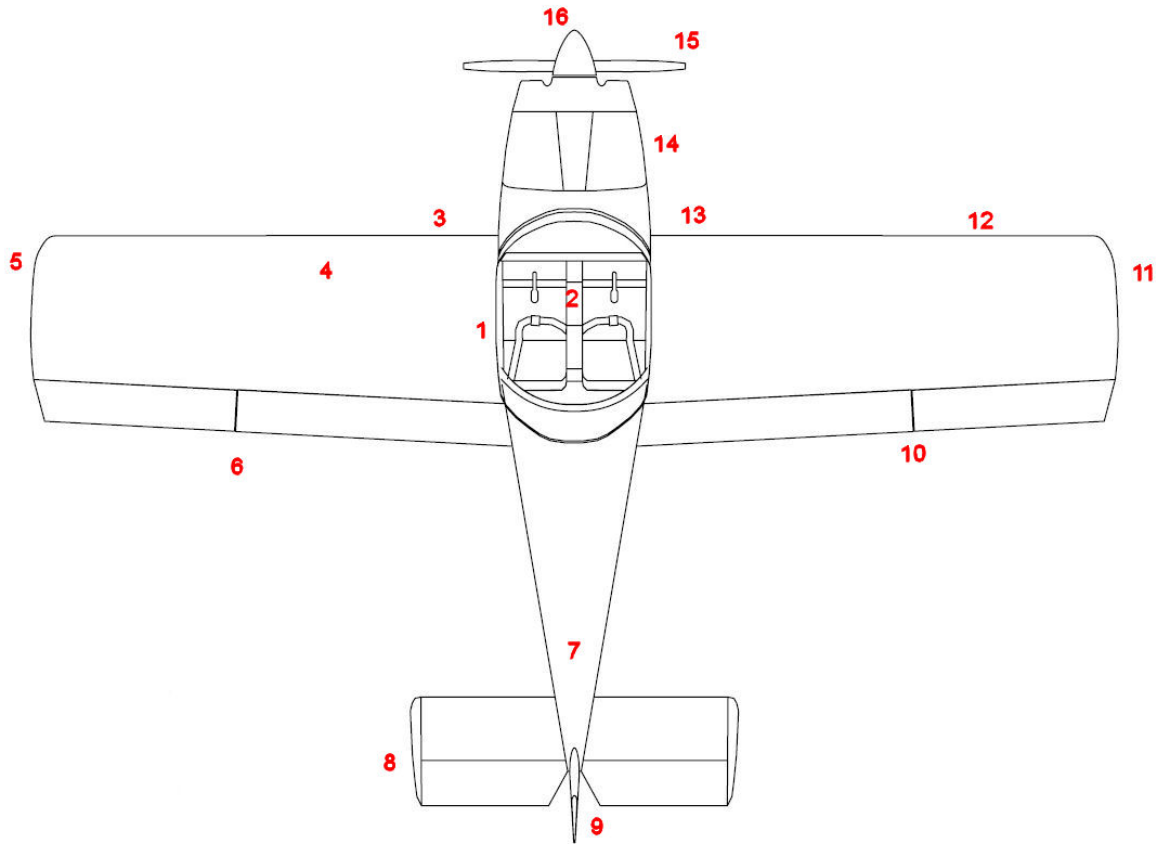
1. Determine direction of spin
2. Reduce throttle to idle
3. Rudder – Full opposite spin direction
4. Aileron – Full opposite spin direction
5. Elevator – Full forward
6. When rotation stops
 - > Neutralize rudder and ailerons
 - > If flaps were extended, Flaps – Up
 - > Elevator to recover from dive. Avoid overstressing airframe.
7. Return to controlled flight.

Trim Failure or Runaway Trim

1. Slow to 70 MIAS to lower control forces
2. Try other trim switches
3. Be prepared for high control forces, especially during landing.
4. Depending on trim condition, flaps or no-flaps may be best.

Section 5 – Normal Procedures

PREFLIGHT CHECK



1. Check condition of canopy. Unlock and open canopy
2. Cockpit check
 - a. All switches and avionics – OFF
 - b. Remove control lock and check controls free
 - c. Battery switch – RTB
 - d. Regulator – BYPASS
 - e. EFIS – Operating
 - f. Check beacon and strobes
 - g. Flaps – DOWN
 - h. For planned IFR or night flight:
 - i. Check pitot heat
 - ii. Check nav and landing lights
 - iii. Install and connect night LED panel power supply if needed.
 - i. Battery switch – OFF

Left Front & Bottom

- j. Check cowling secure
- k. Drain fuel sample
- l. Check left main gear
- m. Remove pitot cover and check pitot tube
- 3. Left Fuel Tank
 - a. Check fuel quantity with dipstick
 - b. Secure fuel cap
- 4. Left wing tip
 - a. Remove left wing tiedown
 - b. Check condition of wing and wing tip
 - c. Check security of tip lights
- 5. Left side control surfaces
 - a. Check left aileron for freedom of movement
 - b. Check aileron hinge safeties
 - c. Check aileron pushrod secure
 - d. Check spar flange doubler**
 - e. Check rear spar attachment bolt secure**
 - f. Check flap secure and torque tube clear
 - g. Check flap hinge safeties
- 6. Fuselage
 - a. Check top of fuselage condition
 - b. Check ELT antenna secure
 - c. Check lower hatch secure
 - d. Check COMM antenna secure
- 7. Horizontal tail
 - a. Check condition of stabilizer and elevator
 - b. Check trim tab secure
 - c. Check elevator and trim tab hinge safeties
 - d. Check elevator freedom of movement and down stop
- 8. Vertical Tail and Tailwheel
 - a. Remove tail tiedown
 - b. Check condition of rudder
 - c. Check hinge bolts secure
 - d. Check condition of tailwheel and tire

- e. Check tailwheel actuating connections
- 9. Right side control surfaces
 - a. Check right aileron for freedom of movement
 - b. Check aileron hinge safeties
 - c. Check aileron pushrod secure
 - d. Check spar flange doubler**
 - e. Check rear spar attachment bolt secure**
 - f. Check flap secure and torque tube clear
 - g. Check flap hinge safeties
- 10. Right wing tip
 - a. Remove right wing tiedown
 - b. Check condition of wing and wing tip
 - c. Check security of tip lights
- 11. Landing light
 - a. Check condition and security of cover
 - b. Visually check landing light mounting secure
- 12. Right Front & Bottom
 - a. Drain fuel sample
 - b. Check right main gear
- 13. Engine
 - a. Check condition of cowling
 - b. Open right side top cowling
 - c. Check security of all wiring and hoses
 - d. Check oil quantity 5 quarts
 - e. Check condition of baffling
 - f. Secure cowling
- 14. Propeller
 - a. Check propeller secure
 - b. Check condition of both blades
- 15. Nose
 - a. Check nosebowl condition
 - b. Check spinner secure
 - c. Remove cowl plugs if installed
 - d. Check air inlets clear and no foreign objects inside

CHECKLISTS

Before Starting Engine

- Seat Belt / Shoulder Harness: Buckled
- Brakes: Set
- Control Lock: Removed
- Controls: Free & correct
- Lights: Off
- Avionics: Off
- Canopy: Closed

Starting Engine

- Battery Switch: Start
- Anti-collision Light: Day or Night
- Regulator: On
- EFIS : Alive and working
- Ignition & Fuel Pump: Alternate
- Fuel Selector: Fullest Tank
- Mixture: Full rich
- Carburetor Heat: Off
- Clear Propellor
- Starter Switch: Start
- Throttle: Prime as needed, then ¼" Open
- Oil Pressure: Up within 15 secs
- Throttle: 700-800 RPM
- Mixture: Set
- Battery Switch: Run
- Avionics: Comm & GPS On
- Transponder: Standby

Engine Runup

- Ignition & Fuel Pump: Primary
- Battery Switch: RTB, then Run
- Mixture: Set
- Throttle: 1700 rpm
- Engine Instruments: Checked and normal
- Carburetor Heat: Check for minimum drop of 25 rpm.
- Throttle: Idle

Before Takeoff

- Flaps: Check operation, then Set
- Trim: Set for takeoff
- GPS: Initialize as required
- Mixture: Set
- Carburetor Heat: Off
- Controls: Free & clear
- Flight Instruments: Checked
- Engine Instruments: Normal
- -- Before Taking Active --
- Canopy: Closed and **Locked**
- Transponder: On with Mode C
- Lights: As Desired

Before Landing

- Fuel Selector: Fullest tank
- Mixture: Set for altitude
- Carburetor Heat: As required
- Brakes: Checked
- Downwind: <80 mph
- Base Leg: 75 mph, Flaps as desired
- Final Approach: 75 mph, No Flaps
70 mph, ½ Flaps
65 mph, Full Flaps

After Landing

- Flaps: Up
- Transponder: Off
- Lights: As Desired
- Carburetor Heat: Off
- Pitot Heat: Off
- Mixture: Lean as desired

Section 6 – Flight Characteristics and Performance

Normal Flight Handling Characteristics

This airplane has very light wing loading, between 7.6 and 10.6 lbs/ft², depending on the gross weight. Power loading is 12.7 lb/hp. For a similar comparison, a Cessna 150 with the O-235 engine has a wing loading between 8.2 and 10.4 lbs/ft², and a power loading of 15.2 lb/hp.

The control system has been modified from the plans, so that with the aileron spades, reduced elevator authority (+27/-15) and elevator damper installed, the controls are fairly well harmonized, The ailerons are still somewhat heavier than the elevator and rudder.

Since the aircraft has no vertical fin, a large amount of fixed rudder trim has been installed. Still , the aircraft is very sensitive to the rudder. A fairly significant amount of left rudder is necessary at takeoff and during low speed climbs. Above about 100 MIAS, the rudder trim is more effective and the airplane will fly close to coordinated at straight and level.

Like most light aircraft that do not have differential ailerons, you do need to coordinate turns with the rudder. A little rudder pressure to lead the turn is most effective. The rudder is very powerful and large rudder deflections are not required for normal maneuvering. Of course, a lower speeds, especially in the pattern, more coordinating rudder is needed.

Stalls

This airplane is very stall-resistant, possibly due to the slight less-than-spec up elevator travel (26.5° instead of 30°). Stalls in this aircraft are very benign, with the aircraft easily controllable with aileron and rudder down to very low airspeeds and no tendency for a wing to drop. The aircraft feels quite “loose” below 50 MIAS, however.

Regardless of configuration, and even for accelerated stalls, with about 1500 RPM set, the nose will drop as the pre-stall buffet begins and the airspeed will quickly jump up to ~ 3 MIAS above the stall speed. With a bit more power set, the aircraft will just mush into and out of the stall with little or no loss of altitude. At 2000 RPM, the aircraft will continue to fly to below 40 MIAS.

Only with idle power, it is possible to get a defined, but very soft stall break.
Indicated airspeeds at average weights for power-off stalls:

No flaps:	50 MIAS
Half flaps:	48 MIAS
Full flaps:	45 MIAS

Normal Patterns

Normal downwind pattern entry is at 90 MIAS. After entering the downwind, reduce power to slow to 75-80 MIAS and extend ½ flaps. (Up to ½ flaps can be extended below 90 MIAS. You must be below 80 MIAS to extend more than ½ flaps.) As the flaps extend, aft trim will be required to reduce stick forces. Approximately 2150 rpm is required to maintain level flight at average weights with ½ flaps and 75 MIAS.

When abeam the numbers, reduce power to ~1500 rpm (depending on winds, pattern altitude and pattern spacing) and apply carburetor heat as needed to begin descent. Maintain ~75 MIAS on

base. Reducing power below 1500 rpm can give very high sink rates. The airplane is very pitch sensitive to power changes and reducing power will require more aft stick pressure.

Turning final, you can reduce airspeed to ~70 MIAS, ± 3 MIAS depending on weight. At light weights, this will require full aft trim. As noted above, sink rate is very power sensitive and slipping is rarely required to adjust position. However, the up to $\frac{1}{2}$ rudder can be used to slip the aircraft and further increase the sink if required. Do not exceed $\frac{1}{2}$ rudder deflection for slipping on final, as the rudder is extremely powerful and unrecoverable sink rates may occur.

Crossing the threshold, or at about 5 feet altitude, reduce power slightly to about 1300 rpm. Holding the aircraft off the runway is very easy and you may choose to either wheel land or 3-point the plane. Beware of high elevator sensitivity if your airspeed is higher than desired.

For wheel landings, you will still need make a fairly large pitch change while flying the aircraft onto the wheels. This plane does not fly onto the wheels in a flat attitude like some others. For 3-point landings, just establish the 3-point attitude and the aircraft will slowly settle onto the runway. After touchdown, smoothly reduce the power to idle and brake as necessary.

For touch & go landings or go-arounds, close the carburetor heat, raise the flaps and smoothly apply power while trimming forward. It requires a lot of forward trim to transition from approach to climbing flight, approximately a 5-count of continuous application at the stick hat switch. Be careful to not change the aileron trim at the same time.

Crosswind Landings

The rudder is very powerful and crosswind landings are straightforward up to 15 knots of steady crosswind component. Normal crosswind technique is to fly wing low on final and wheel-land the aircraft on the upwind wheel first. The plane is very controllable down to below 50 MIAS, so that the downwind wheel can be gently lowered to the runway and then the tail lowered while maintaining runway alignment. After the downwind wheel is on the runway, differential brakes can be used to maintain alignment if necessary.

Cruise Performance with Sensenich 63x44 Propeller

The following tested data are approximate and will change as modifications are made to the airframe and the engine ages. These data are valid as of March, 2013. **Note that indicated and true airspeeds are in MPH.**

At density altitude of 7500', leaned to peak power:

MIAS	Fuel Flow	MTAS	RPM	MPG
86	3.4	96	2400	27.4
94	3.6	105	2500	28.3
97	3.8	108	2600	27.0
106	4.7	118	2800	24.1
115	5.2	128	3000	23.7

Section 7 – Required Placards & Markings

External

1. In accordance with 14 CFR 45.23, the word “**EXPERIMENTAL**” must be displayed in letters at least 2” high at each entrance to the cabin. Currently, this is displayed in relief in the wing walk.
2. Warning: In accordance with 14 CFR 45.29, this aircraft displays 3” tall registration marks on the vertical tail. These markings may not be acceptable for flights into foreign airspace.

Internal

1. The following warning must be clearly displayed in the cabin and visible from the passenger seat:

**THIS AIRCRAFT IS AMATEUR BUILT AND DOES NOT COMPLY WITH
FEDERAL SAFETY REGULATIONS FOR STANDARD AIRCRAFT.**

2. The electronic flight information system (EFIS) of this aircraft does not display “red line”, “green arc” or “white arc” airspeeds. Therefore a placard is required adjacent to the EFIS which displays at least the following speeds: V_{S0} , V_{FE} , V_A and V_{NE} .

Section 8 – Maintenance Information

Inspection Date _____

**N601GE, Zodiac 601XL, 6-6753
Condition Inspection Checklist**

Airframe Hours: _____

Engine Hours / SMOH: _____/_____

PROPELLER GROUP (Sensenich Wood Propeller)

1. Inspect blades and hub for damage and corrosion....._____
2. Inspect spinner and back plate for damage and corrosion_____
3. Re-torque prop bolts to 17 ft-lbs and re-safety_____

ENGINE GROUP (Corvair Engine)

1. Warm up engine, check for fuel and oil leaks....._____
2. Perform cylinder compression checks (set TDC before removing plug!)_____
- #1 _____ #2 _____ #3 _____ #4 _____ #5 _____ #6 _____
3. Check distributor cap and rotor condition, and check timing_____
4. Drain and replace engine oil with 5 qts Rotella T 15W-40 or equivalent....._____
5. Replace oil filter with K&N filter HP-1008 or equivalent_____
6. Check fuel filter element, replace if necessary_____
7. Check spark plugs. Replace worn plugs with AC R44F gapped @0.038"_____
8. Inspect L & R exhaust manifolds....._____
9. Inspect motor mount and fuselage attachment bolts_____
10. Inspect urethane engine mount bushings....._____
11. Inspect condition, security and proper operation of throttle and mixture controls.._____
12. Drain carburetor, clean strainer and float bowl_____
13. Inspect inlet airbox for leaks and cracks_____
14. Clean and service inlet air filter_____
15. Inspect cowling for damage and loose rivets....._____
16. Inspect firewall for damage and check pass-through seals_____
17. Inspect cabin heat box for cracks or other damage....._____
18. Check starter and alternator mounts for security and damage_____
19. Check condition of all fuel lines and connections_____
20. Check condition and security of grounding strap....._____
21. Inspect all wiring for condition, security, damage, etc....._____
22. Run engine and check:
 - a. No oil or fuel leaks

- b. Operation of fuel safety switch
- c. Operation on primary and alternate ignitions
- d. Operation on primary and alternate fuel pumps
- e. Operation on left and right tanks
- f. Idle RPM ~700
- g. Static RPM at least 2700
- h. All engine instrumentation operating correctly

BEFORE AIRFRAME INSPECTION

Prior to beginning airframe inspection, complete the following items:

- 1. Check AD's and manufacturer service bulletins
- 2. Clean aircraft and engine
- 3. Remove mid-span and wing root access panels
- 4. Remove lower fuselage access panel
- 5. Remove main landing gear attachment fairings
- 6. Remove rudder fairing and under-stabilizer fairings
- 7. Remove engine cowling
- 8. Remove main wheel spats, pants and tail spring cover
- 9. Remove seats and seat backs

CONTROLS GROUP

- 1. Inspect control sticks, linkages and torque tubes for damage or cracks
- 2. Check controls for proper operation and limits
- 3. Check flight control cables for routing, condition, corrosion and fraying
- 4. Check tension at 25-30# on elevator and aileron cables
- 5. Check control cable turnbuckles for condition and safeties
- 6. Check control cable attachments for condition and cotter pins
- 7. Inspect condition of cable guides
- 8. Check condition and security of elevator damper
- 9. Check security of aileron spades
- 10. Check elevator and aileron trim for proper operation, stick and panel switches ...
- 11. Check trim indicators for proper operation and markings
- 12. Check flaps system for condition and proper operation
- 13. Lubricate controls

CABIN GROUP

1. Inspect canopy for damage and cracks, and for attachment security
2. Inspect canopy fit and latching mechanism for proper operation
3. Check fuel selector valve for proper operation and safety lock.....
4. Check upholstery condition
5. Inspect safety belts and attaching hardware for condition and security
6. Inspect avionics mountings for condition and security
7. Inspect wiring for condition, security, damage, etc
8. Inspect static and pitot lines for condition and security
9. Inspect starting battery mounting and ground strap
10. Inspect comm and transponder antenna installations
11. Inspect instruments for mounting security, condition and markings.....
12. Check brake fluid level
13. Inspect fuel lines and attachments for condition and security.....
14. Inspect components mounted on aft side of firewall, including ignition coils, coil joiner, starter relay and pass-throughs
15. Check attitude gyro mounting and wiring
16. Swap under-seat battery (#1) to firewall. Install new #1 battery

LANDING GEAR GROUP

1. Inspect main and tailwheel tires for tread depth and condition
2. Inspect main gear attachment bolts for safeties
3. Check condition of main landing gear position blocks
4. Check condition of main gear rubber pads.....
5. Check condition of lateral stop pins in main gear
6. When removing wheels, inspect brake assemblies, axles, spacers, etc. for security, condition, leaks, etc
7. Check brake pads and brake discs for wear
8. Inspect main wheels for cracks, corrosion or damage.....
9. Re-pack main wheel bearings.....
10. Inspect brake lines and fittings for condition and leaks.....
11. Check tire pressures (main and tail) at 30 psi
12. Inspect tail spring and tailwheel for cracks, corrosion or damage.....
13. Inspect tail spring attachment bolts and rubbers for security and condition
14. Inspect tailwheel steering spring and connections for security and condition

WING GROUP

1. Check main spar bolts for security. Re-torque if necessary.....
2. Check rear spar bolt for security. Re-torque if necessary.....
3. Inspect surfaces of ailerons and flaps for cracks, working rivets or damage
4. Inspect rear spar reinforcement straps at aileron pushrod holes for cracks.....
5. Inspect root moldings for security and condition.....
6. Inspect aileron and flap hinge pins for corrosion, wear, safeties
7. Inspect aileron bellcranks, stops, and cable ends
8. Inspect lower rivets on main spar for any indication of working
9. Lubricate aileron bellcranks
10. Lubricate aileron and flap hinges
11. Inspect landing light for lens condition and mounting condition
12. Check landing light operation.....
13. Check wingtip strobes and position lights for security and proper operation.....
14. Check wing tanks sump drains for water and leaks.....
15. Drain tanks and check tank fuel filter screen. Reinstall
16. Check condition and security of in-wing fuel lines
17. Inspect fuel tank filler caps for condition and markings
18. Check pitot heat operation
19. Check proper operation of fuel quantity indicating system

FUSELAGE GROUP

1. Inspect outer fuselage skin for cracks, loose rivets, damage, etc.....
2. Inspect internal fuselage structure for cracks, loose rivets, damage, etc.....
3. Inspect all electrical wiring for condition, security, routing, etc.....
4. Check magnetometer mounting and wiring
5. Inspect condition of static lines
6. Inspect condition and mounting security of backup battery
7. Inspect ELT antenna for connection and mounting
8. Inspect beacon drivers and beacon for condition

EMPENNAGE GROUP

1. Inspect rudder, stabilizer and elevator skins for cracks, loose rivets and damage _____
2. Inspect elevator trim tab control horn and wiring _____
3. Check elevator and trim tab hinge pins for corrosion, wear, safeties _____
4. Lubricate elevator and trim tab hinges _____
5. Inspect elevator down stop _____
6. Inspect rudder bearings and bolts for security and wear _____
7. Lubricate rudder bearings _____
8. Check security of elevator trim wiring and connector _____
9. Inspect control cable attachments and check cotter pins _____

POST-INSPECTION

10. Re-install mid-span and wing root access panels _____
11. Re-install lower fuselage access panel _____
12. Re-install main landing gear fuselage fairings _____
13. Re-install rudder fairing and under-stabilizer fairings _____
14. Re-install engine cowling _____
15. Re-install spinner _____
16. Re-install main wheel pants and tail spring cover _____
17. Re-install seats and seat backs _____
18. Clean aircraft _____

RETURN TO SERVICE

This aircraft's condition has been inspected in accordance with this checklist and found airworthy for return to service. All logbooks have been updated.

SIGNED: _____

DATE: _____

TITLE: _____

Section 9 – Other Information

Section 10 – Revision History

V1.0:	24 Nov 08	Initial release with airworthiness inspection
V1.2:	23 Dec 09	Adjusted flight load limits, maximum zero fuel weight and maximum gross weight. Updated weight and balance calculations accordingly. Added additional detail to stall and cruise operations sections. Added additional detail to condition inspection checklist, including checks for structural integrity. Added additional placard for RPM avoidance range.
V1.3:	09 Aug 11	Added Weseman 5 th bearing and Sensenich 64x47 wood propeller, with removed the RPM avoidance range and eliminated requirements to fly extra conservatively to minimize G loads. Added some additional oil and oil filter options.
V1.4:	21 Oct 12	Added ignition timing and spark plug gap specifications. Replaced performance section with numbers for Sensenich propeller.
V1.5:	16 Apr 14	Various small changes to account for change from previous 3.1L engine to new 3.0L engine, including optional use high-octane auto fuel.
V1.6L:	16 Apr 14	Formatting and editorial clean-up.