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GenniPod



Introduction

Thank You for purchasing a Time proven product from JMHI Innovations LLC. We expect this product to meet your needs if used and installed within the design specifications. Great consideration has been given to quality materials and methods to provide a high quality product and reduce the cost of installation to the purchaser. Efforts taken during the design phase of this product ensures good weather resistance and protection of all key parts exposed to the elements.

Use of this product is intended strictly for the experimental use of the Purchaser. The purchaser assumes all responsibility for it's fitness and risk of use.

The staff of JMH have received many many requests for a commercially available version of this generator system over the years. Surprisingly this system seemed to bring as much if not more, attention than the pretty little craft it was mounted to where ever it landed! 28 hours of flying involved in a trip to Oshkosh and back, low battery charge was never observed. Many take off and landings taxi etc. . . .

This Product is **not** represented to be FAA Certified, or legal or even approved to be used on any FAA certified aircraft.

History and Design Goals

We hope you have studied the specs and found the abilities of this system consistent with your needs. The prototype was produced to provide for the maintenance of a battery supporting the Point/Condenser/Coil ignition system of a VW engine installed on a FFP Youngster "V". First goal - 12 volts DC at 75 mph with a 4 amp load: Why?: the target aircraft cruise speed was 75 mph with a range of 40 V_{so} to 110 V_{ne} (mph). (If your planned speeds are beyond this, Please contact the manufacturer!) In this arrangement the ignition will draw just under 1 amp at cruise (12 volt system). To support a trip to Oshkosh other loads that would be used were, an ICOM Hand held, Garmin III Pilot GPS, a fuel gauge, and a fuel transfer pump. The max design output of this system was to produce 4 amps. Never was there a desire or plan to be able to support a glass cockpit and full IFR systems.

Test aircraft Loads were approximately as follows. Yours may vary depending on many factors.

Common loads

Fuel Pump

VW In Line Fuel pump. 1.6 amps

Ignition

VW Stock ignition. points, condenser, blue coil

- Off Aprox. 3.5 amps
- Idle Aprox. 2.5 amps
- Cruise. 0.95 amps

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GPS

Garmin Pilot III 0.5 watts

ICOM

- Squelched 55 mA
- Receive 400 mA
- Transmit 1.0 amps

All added up, we are at approximately, 48 watts (4 amp) thus the target of design output. This also was never intended to provide primary or sole power for ignition or maintenance of flight.

Testing

This system was designed for an application using a 9 - 12 amp/hr lead acid battery. By nature they will absorb and stabilize a majority of all surplus volts/amps we may produce. If our aircraft always flew at an exact speed and exact load, then a system could be designed without regulation. That is not the nature of our planes.

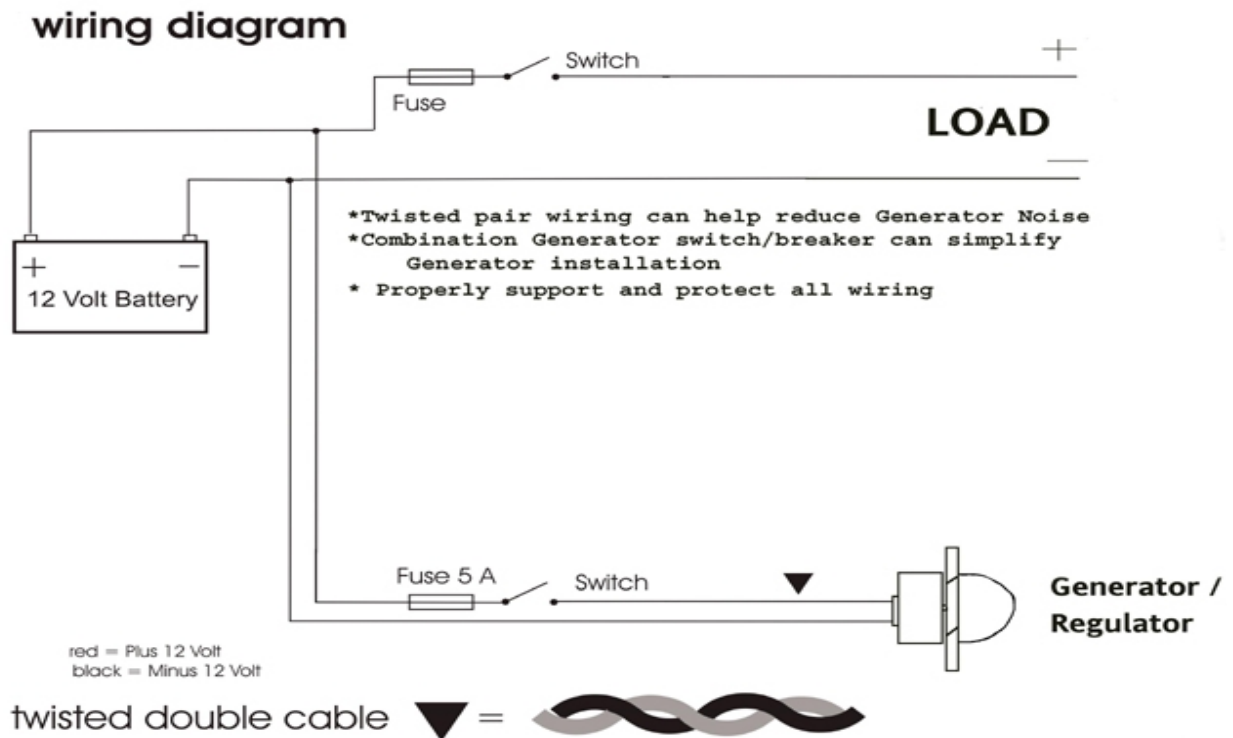
A mount was fashioned using 3/16" 6061 aluminum angle. The angle was mounted to the "X" brace center of the landing gear and employing stainless steel hose clamps then mounted to the generator body. Another test airframe's owner created a very good looking mount of a lesser material thickness and after about 25 hours, suffered a complete separation. There was no damage to the airframe, just damaged pride.

Next - A completely separate but equal electric system and load was created and installed for Generation and load testing. Ground/taxi testing was first found to provide usable voltage though not under normally used power settings required for taxi. Take off and cruise provided all required voltage and load expectations. no notable temp rises were noted in either the battery or regulator's components after considerable cruise time, at varied speeds. Lastly engine idle and low speed behavior was explored. It was discovered that with the generator mounted well within the arc of the propeller, when idled, airflow was blocked sufficiently to pretty much drop the generator off line.

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The Final phase of Testing was to remove all test circuits and tie the generating system directly to the ship's power grid. Taxi, take off, cruise, decent, high speed, low speed, tests were made. There were no problems found or changes made to the original system's circuits or design. For aerodynamics and appearance a spinner was installed on the fan hub.



Installation considerations

Since there are numerous mounting configurations, there was no way all options and installation methods could be foreseen. Thus the mounting of your generator system must be left to your creativity. The initial test aircraft had its generator mounted to a 3/16" aluminum angle, with 2 hose clamps. Simplicity, and strength will always win in the end.

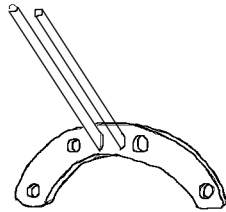
- Good air flow (I know, but I had to say it!)
- What are you mounting to must be able to take air load and vibrations
- Gear legs
- Gear supporting structure
- Fuselage surface

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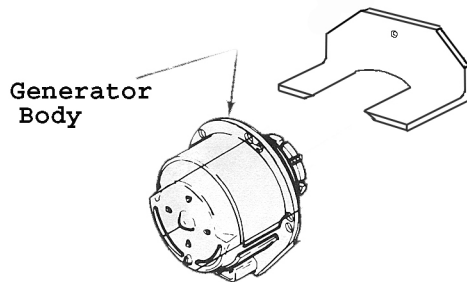
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Location considerations

- Clean air will give you less vibration
- Centerline will give less pitch or yaw deflection from air loading/drag on the unit



The Generator body can be mounted different ways. The flange on the Body is adequate for mounting strength as an option.



2" x 3/16 Angle Aluminum Saddle cut to accept Generator body. Angle aluminum then attached to Generator body using 3" Hose clamps. Angle mount then bolted to aircraft

Other thoughts to consider

- Breaker or fuse (consider 5 amp breaker switch)
- Wire routing
- Wire chafing protection
- Battery location, and mount strength
- C.G.
- In case of impeller failure, what might be damaged

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Maintenance, preflight, condition inspection

There is generally no maintenance for your generator system. All components are chosen to assure dependability in normal use. Like any aircraft component preflight of your generator system is always important: It is always important to maintain the health of your battery! Will this generator support the operation of your engine after a total battery loss? Possibly, however, that is not the designed purpose of this system!

Generator	Mounting solid and unchanged
Impeller	<ol style="list-style-type: none">1. Look for excessive play either fore/aft or a wobble in the blades that may indicate loose prop or generator bearing wear2. Nicks and cracks
Wiring	Loose frayed wires
Battery	<ol style="list-style-type: none">1. Check voltage engine off2. Check fluid levels3. Check cleanliness
Spinner	<ol style="list-style-type: none">1. Nicks and cracks2. Tracking true

Operation

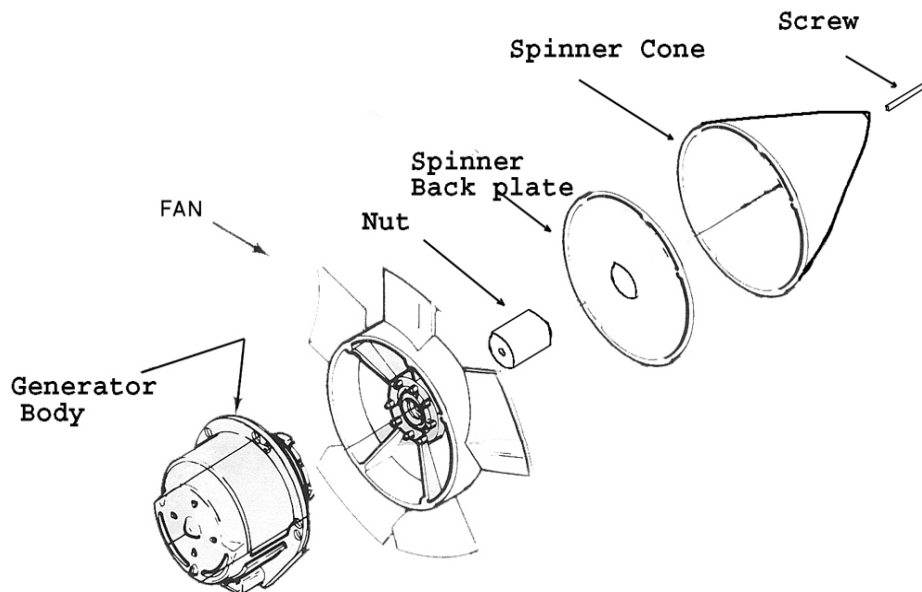
Once installed and fully tested to your satisfaction, you can pretty much forget your generator is installed. Prudence of flight will of course require constant observation of your aircraft's systems, obviously including the electrical system. Your first and most telling instrument for your generator system will be your volt meter. If your voltage is anything less than 12.5 volts, only one of the three issues may be causing a problem..

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Generator Failure	Assume you are now running strictly on battery. know how long your battery will support your critical systems and land before time is up. an older battery will not give you the duration that you received when your batter was new. be able to load shed quickly to critical systems only. I have one switch that powers voltmeter and ignition, the other brings the ancillary needs. hour meter, fuel gauge, power for fuel transfer pump, gps, ICOM navcom
Popped Breaker	Only reset if required for safety of flight. once on ground try to determine cause and rectify
Overload	.Reduce load requirements. Not a "bad" situation, just realize, that you might be draining your battery.

Disassembly



Your generator system will come assembled and ready to mount to your airframe. Removing the propeller and spinner assembly will assist your efforts in accessing the body of the generator for mounting purposes.

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- To remove the spinner. a single flat blade screw driver rotated **counter clockwise**, will allow removal of both the spinner cone, and back plate. (Normal Right Hand Screw)
- To remove the fan blade from the generator, the nut must be rotated, **CLOCKWISE!** When reinstalling the prop nut, no great amount of force is needed to tighten. There are no flat areas to put a wrench! None needed! I merely hand tighten till snug, then grab with pliers, and turn **Counter Clockwise** no more than 1/8 a turn. (Opposite than normal, It is a Left Hand Thread Nut)

Parts list

Generator Body

Nut (The main nut holding the Prop blade to the Generator body, is a LEFT HAND THREAD. Lefty tighty, Righty loosey!)

washer

Prop

Spinner cone

Back Plate

Screw (Spinner cone screw is standard Right Hand Threaded. Righty Tighty, lefty loosey)

Regulator

Specifications

Design specifications and capabilities based on a 75 mph cruise speed.

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Generator

Airspeed

- This system has been tested to the max of 110 mph. (If your aircraft will be at, or above these speeds, contact the manufacturer.)

Voltage

- 13.5volts and 4 amps.
Actual output is dependent on airspeed. (Faster a bit more, slower a bit less.)

Regulator

Maximum Input

voltage = 55 VDC

amperage 8

Maximum Output

13.5 volts at 8 amps

- A point to consider is that 13.5 volts is the voltage the regulator targets. If the regulator while charging your battery detects 13.5 volts, it will shut off. It constantly rechecks for battery voltage. With this in mind, your volt meter probably will not be fast enough to display to you the 13.5 volts it sees.

Assembly weight 3 pounds 3.5 oz

Spinner	7oz
Prop, washer and nut	8oz
Generator body.	2 lbs 4.5oz

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Regulator is carefully plugged into the Generator body as seen Above. Press in place using the the back end of the module plug until latch clip is properly seated.