Lawnmower Power Generator With A Twist

by **cid2323** on December 11, 2010

Table of Contents

Intro: Lawnmower Power Generator With A Twist

This is a 500 watt power generator big enough to power tools, and home electronics. If you try plugging in kitchen appliances, heaters, window AC units etc....it will shut down, you need a 2k-3k watt power converter for large power comsumption appliances..

It's not difficult to build this project, if you know how to wrench things apart and have a basic understanding of how things work with engines and electrical components then you'll do just fine. If you want to save money on the build, go to junkyards, recycling centers, and landfills which is where I got most of the parts. You'll be surprised the stuff you can find for pennies or better yet FREE. I spent $40 for all the parts needed for this project.

There are a few optional parts not needed to run this little power jewel. The lawnmower tires, enclosure, vehicle battery, handle, voltage meter, 120VAC outlet, light, and on/off switch for light. I decided to go all out with this one by adding all those extra features, just took me longer to make, 3 months exactly. A schematic diagram will show how to wire everything up. The AC outlet you see on the panel is tapping from the power converter which already has AC outlets. I just wanted to make an extension of it so I wouldn't reach around the back to plug in things....

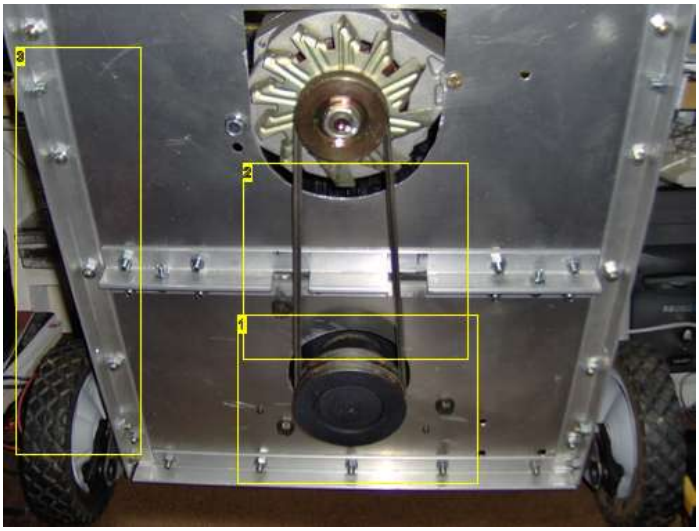
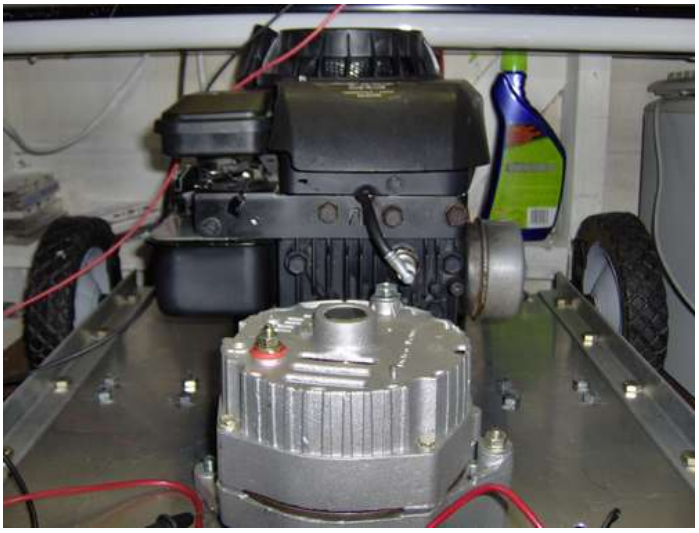
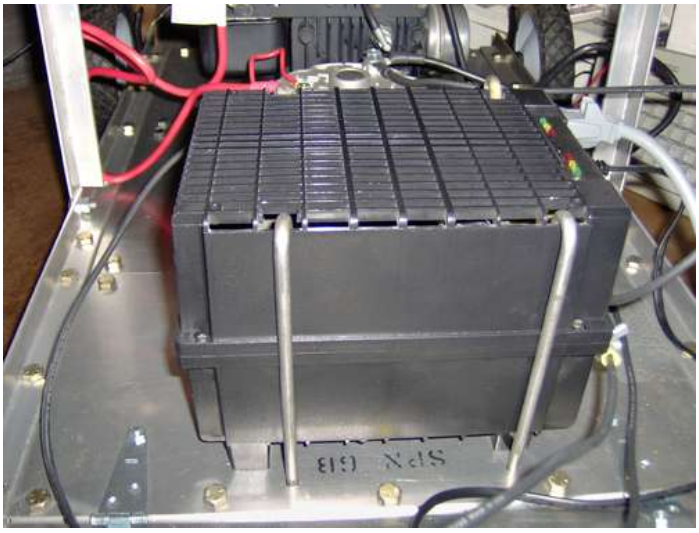


Image Notes
1. This one is a 4" iron pulley weighing more than the weight of the cutting blade which is what you want to help the engine rotate smoothly.
2. Here is the belt, nice and tight to help prevent slipping. not much to it...Notice how I had to cut the frame bar to prevent the belt from touching it.
3. Here are some of the bolts holding the frame together, not much to it.





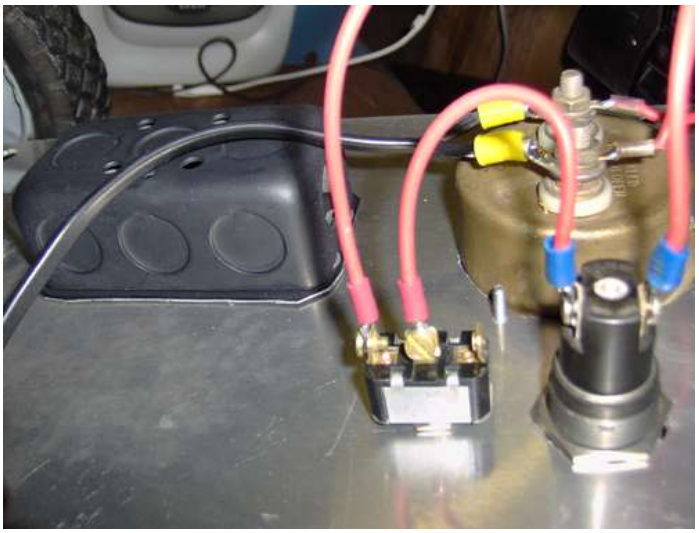


Image Notes
1. Here is the light dimmer switch, which controls the amount of amps going into the vehicle battery. The white wire coming from the alternator is connected to this switch in series, I recommend a two wire pin switch.
2. optional components added here, volt meter, light, on/off switch for light, and outlet....which you can tap directly into the power converter.

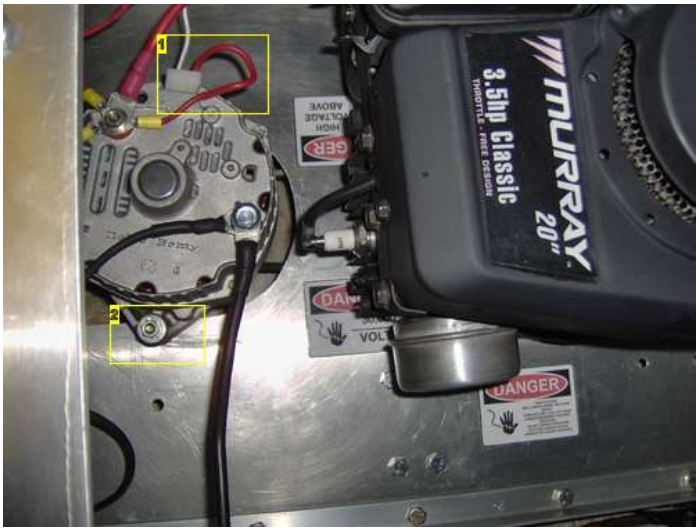
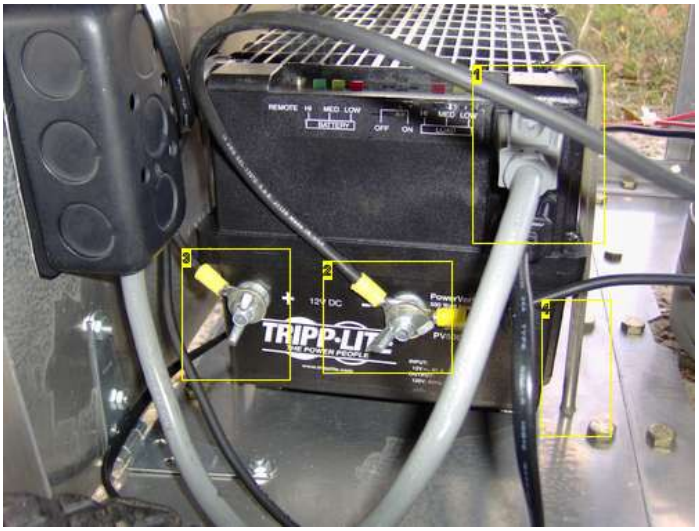


Image Notes
1. Connect the red wire back into the positive nut along with the white wire with the dimmer in series coming back to that positive nut
2. Here is one bolt showing securing the alternator in place, you can't see the other one on the other side, but just to give you an idea and size of hole to adjust alternator.

Image Notes
1. Here is the Main on/off power switch with internal green light to show power is on. more details later on schematics. also has a 10amp fuse in series.



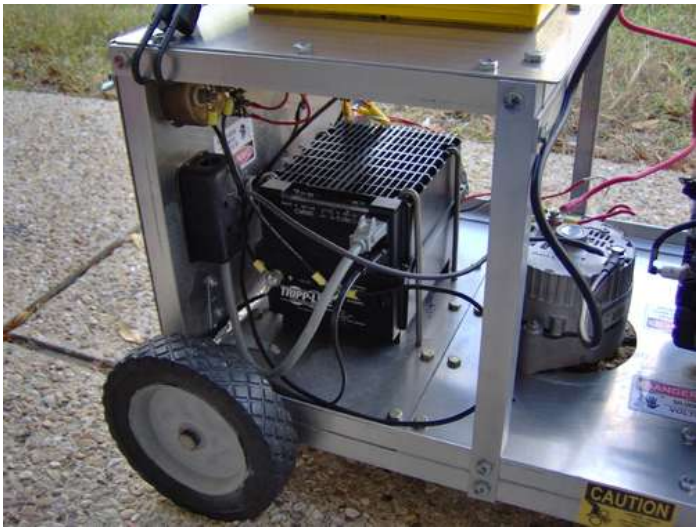
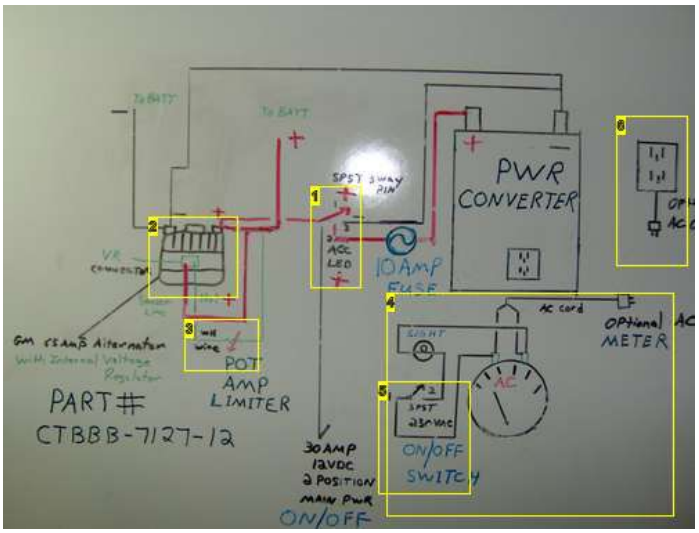


Image Notes
1. This GREY wire I got from a broken computer power cord, all I did was just plug in an external outlet extending out to the front panel to have easier access.
2. This is the NEGATIVE terminal. BLACK wire comes from the NEGATIVE(-) post(nut) of alternator, connect here.
3. This is your POSITIVE(+) terminal. connect RED(+) wire coming from POSITIVE(+) post of alternator....Notice how I have a BLACK wire instead of a RED..I ran out of RED wire(improvised)
4. Here I used 4 battery J-hooks to secure the coverter box, one on each corner...nice and snug.



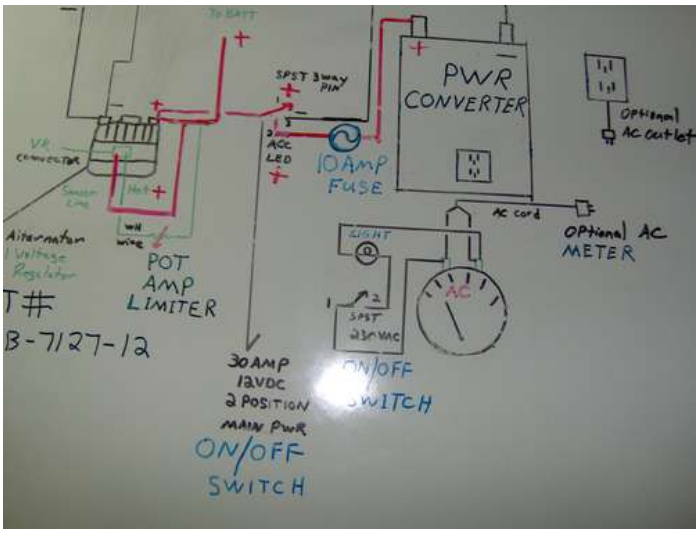
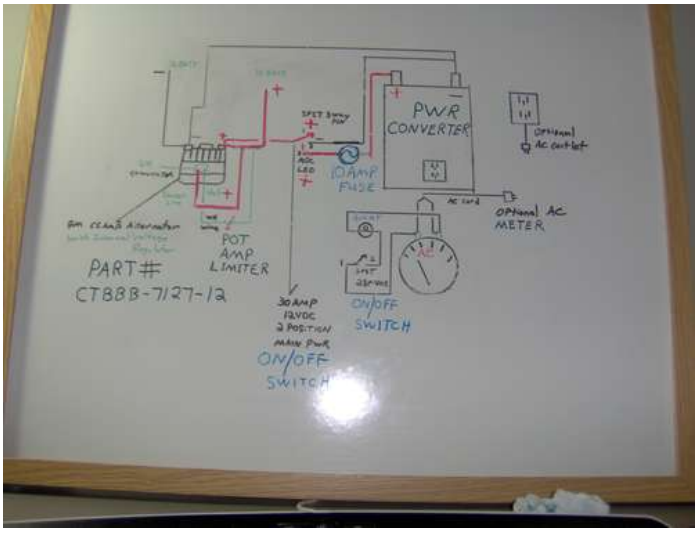
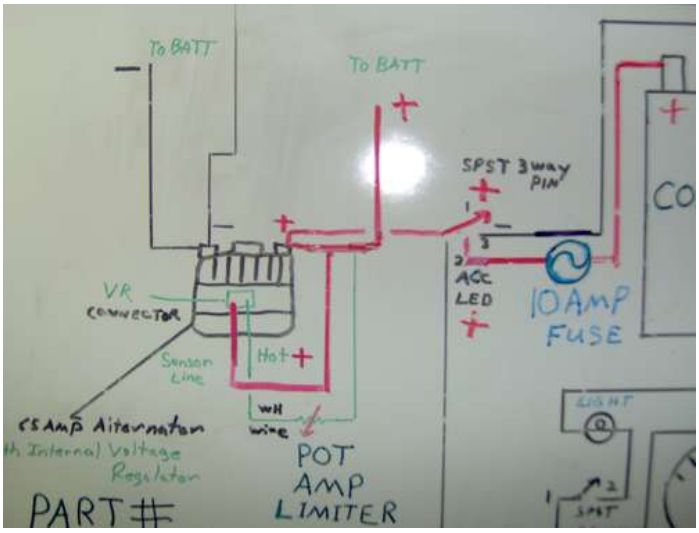
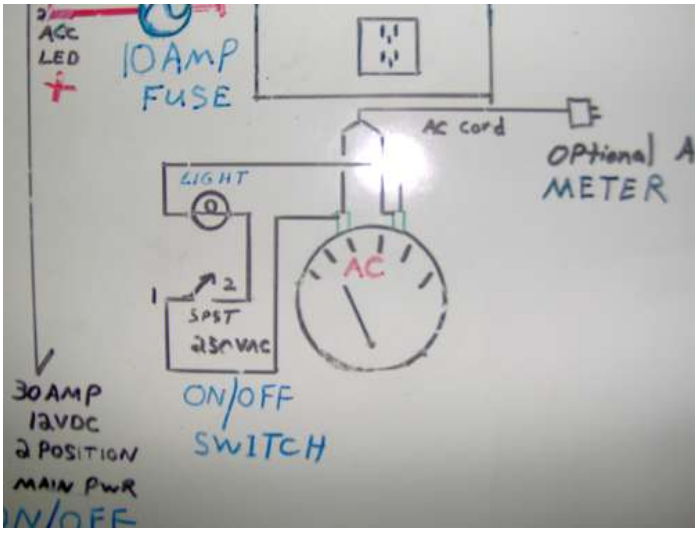
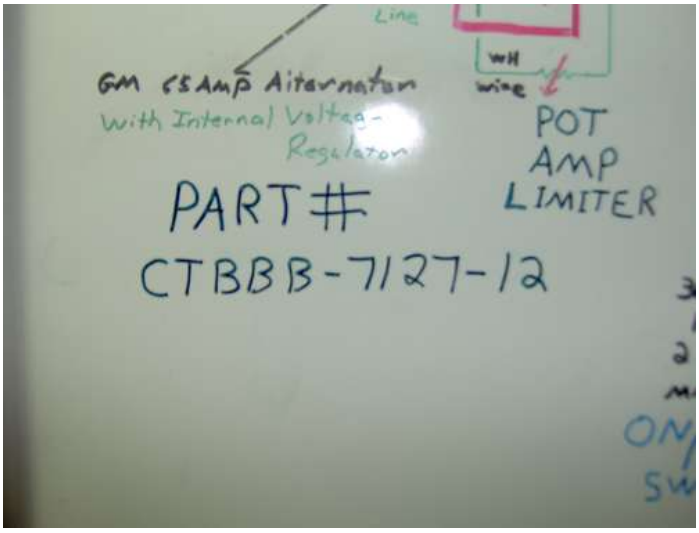


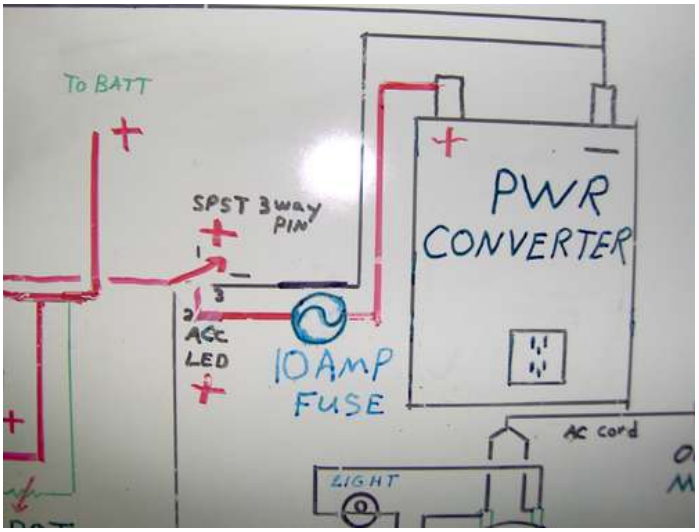
Image Notes
1. This is the main on/off switch with LED light.
2. Here is the alternator
3. This is the dimmer switch to control amount of amps
4. Optional voltage meter with on/off switch to work light..that pretty much it.....
5. on/off switch to turn the light on or off.....
6. Optional 120VAC outlet. you can connect directly to the converter box...











Step 1: Parts, Where, Tools, How Much$$

Here are some links for the power tools I used.....http://www.sears.com/shc/s/p_10153_12605_00921914000P?blockNo=2&blockType=G2&prdNo=2&i_cntr=1292168781911, http://www.sears.com/shc/s/p_10153_12605_00928223000P?prdNo=1&blockNo=1&blockType=G1, http://www.sears.com/shc/s/p_10153_12605_00911543000P?prdNo=10&blockNo=10&blockType=G10, (1) WOODEN or METAL platform- Helps bolt down the Alternator, Engine, and DC to AC power converter. I used aluminum sheet metal with L-frame bars for a sturdy frame. Got the sheet metal and L-bars for FREE from recycling center. I used a JIGSAW with a metal cutting blade to get the job done easy.(NOTE)..Do Not Try Using the jigsaw to cut IRON or STEEL...The blade will kick back and will break sending pieces flying...If you have better cutting tools for that kind of material then by all means use it.

Other tools include a drill press, vise grip, portable hand held drill, hacksaw, and a hand held file. If you have better tools to get the job done quicker and safer don't hesitate....It took me three months to build the crazy thing, and a few busted knuckles.

The platform size varies with how many components you want to throw on it, the one I made is a 2'x3' with a top shelf to hold vehicle battery. more details about that later.

(2) LAWNMOWER ENGINE- Vertical or Horizontal, 3.5HP or bigger. I got it for FREE from landfill (vertical shaft) with a key way slot, or you can buy a new one for $100+....

(3) ALTERNATOR- It's a delco part# CTBBB-7127-12 rebuilt, with internal voltage regulator, 65amp, two wire connector harness. paid $23, auto parts store. This is the heart of the system, I recommend using this one, it's simple to setup and comes with an internal voltage regulator.

(4) DC to AC POWER CONVERTER- The one I used is a 500 watt converter, got for FREE from recycling center. The bigger the better, pure sine wave is the best.

(5) VARIABLE RESISTOR- Also know as a Rotory Switch or POT. You can get one from an auto junkyard for $2... look for an older vehicle, 70's through late 80's any model, also known as a light dimmer switch or dashboard, panel lights dimmer....you just turn the knob in one direction and the lights dim or brighten....you need a 2 wire pin switch....this part is used to control the amps coming from the alternator.....

(6) ON/OFF Switch- There are a few different kinds...rotory, toggle, rocker, and push. I used a toggle with a built in green light.

(7) PULLEY- 3" or 4" diameter, IRON or STEEL, $3 from junkyard, Make sure it has a key way to help prevent it from slipping on the engine shaft. (NOTE) make sure the pulley is equal the weight of the cutting blade or greater, if not the engine will not hold it's spin cycle. Got mine for FREE from recycling center.

(8) BELT- $12 at lawnmower repair shop or auto parts store. If you want cheap try the landfill which I got from, or recycling center, auto junkyard or neighbor throwing it away. I recommend a belt from a self propelled lawnmower, makes a perfect fit.....which I used on this project.

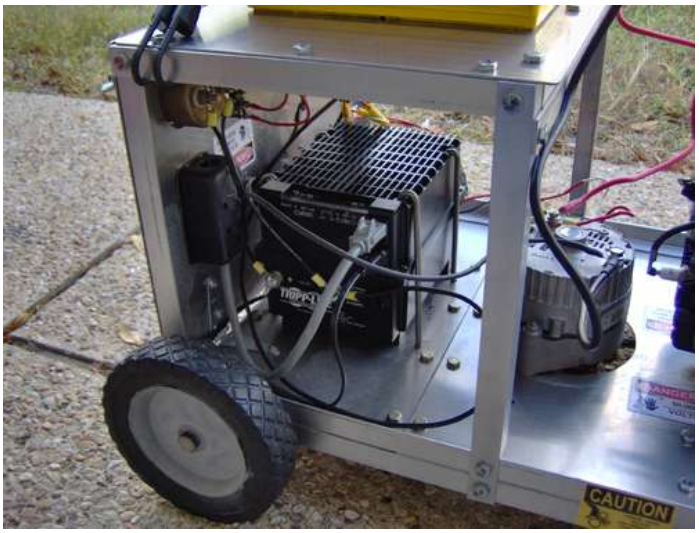
(9) BOLTS with NUTS & WASHERS- Paid $12 for nuts, bolts, and washers from home depot. Try to get rust proof hardware.

Other parts are optional like the voltage meter, light, on/off toggle switch for light, and extra 120VAC outlet, which are not required to operate a fully functional generator.

Step 2: The Frame

Not much to it, I built one using dimensions 2'x3' with aluminum sheet metal, I was able to collect for free from recycling center and land fill. The size will depend on how much you want to add to it, I decided to add a top shelf to hold a vehicle battery and lawnmower wheels to push around..also added a handle on top.

The frame is what took me the longest to make for lack of tools, I used a jigsaw with a metal cutting blade which was kicking my butt, the blade would sometimes kick back so I had to take it slow. To smooth out the rough edges I used a hand file, also used a drill press, hand drill, and hack saw for the L -bars. I recommend using a band saw to cut the sheet metal and L-bars, that would have saved me alot of time.



Step 3: The Engine

The engine is a 3.5HP throttle free design B&S engine, with a vertical shaft key way slotted on the shaft, got it free; the only thing I had to do to it was clean the carb and piston. you can also use a horizontal engine meaning the shaft sticks out from the side, electric start or string pulled. Try to get one with the shaft slotted, if you come across one with the end shaft threaded don't even bother unless you want to take the time welding the pulley to the hub....(NOTE) don't forget to remove the cutting blade.

You can use the same mounting bolts used to secure the engine to the lawnmower chassis..I used a jigsaw to cut out a hole big enough to have the pulley go through it, you first want to start a small hole with a large enough bit using a hand drill to fit the cutting blade through it

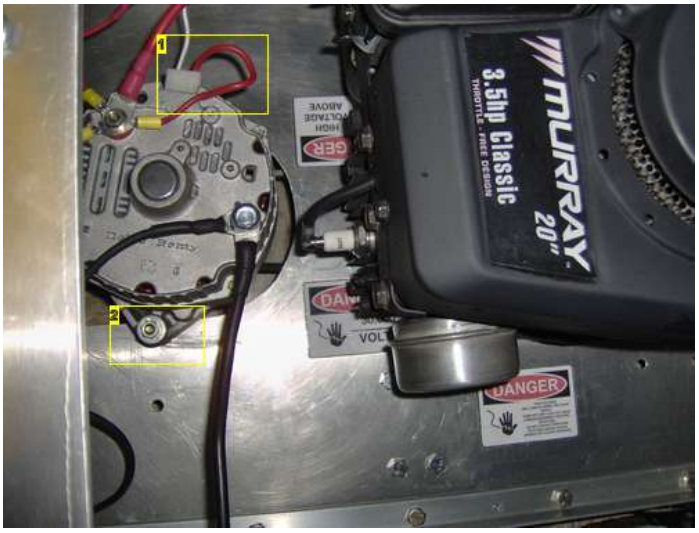


Image Notes
1. Connect the red wire back into the positive nut along with the white wire with the dimmer in series coming back to that positive nut
2. Here is one bolt showing securing the alternator in place, you can't see the other one on the other side, but just to give you an idea and size of hole to adjust alternator.

Step 4: The Alternator

The alternator is a 65 amp with a built in voltage regulator delco part# CT BBB-7127-12 which can be purchased at your favorite local parts store for $23 rebuilt including a two wire pin harness. Alternators with built in voltage regulators are easier to work with as far as wiring goes. Ask the desk clerk for that particular part# listed above, you shouldn't have any problems...

How to connect the alternator. Here you want to the RED wire coming from the wire harness back into that positive nut. The purpose of that is to trick the alternator in pushing out a steady 14VDC at any RPM. The wire harness is included which consists of a two wire RED & WHITE. the WHITE wire has the dimmer switch connected in series which is used to control the AMPS coming from the alternator to charge a vehicle battery. more details about the dimmer later...it will probably make more sense looking at the schematics shown later.. Notice the two thickest wires RED & BLACK, they are for charging a vehicle battery which is optional, not required to connect on alternator if you don't want to charge batteries.

For a simple setup all you need to connect is 2 wires, 10 gauge size, Positive + (RED wire) connect it to the upper left nut on back of alternator, the other end of that wire goes to the positive(+) terminal of the converter box. The Negative - (BLACK wire) connect to the lower right nut(that is your negative) on back of alternator, the other end of that wire connects to the Negative(-) terminal of converter box.....That is it, just start the engine and turn on the converter box you should have 120VAC.....If you want to add meter gauges, lights, dials etc....I have more details with schematics...which will take longer to build...

To install the alternator just cut out a hole big enough to adjust the belt along with two bolts to secure the alternator....if it wobbles just add brackets to make it sturdy.. nothing to it.

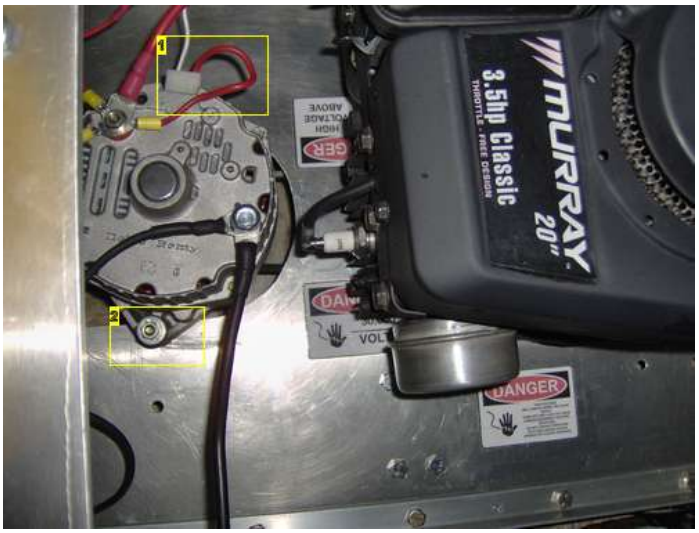


Image Notes
1. Connect the red wire back into the positive nut along with the white wire with the dimmer in series coming back to that positive nut
2. Here is one bolt showing securing the alternator in place, you can't see the other one on the other side, but just to give you an idea and size of hole to adjust alternator.

Step 5: The converter Box

Here I have a 500 watt DC to AC 120VAC output. Free from recycling center. If you want to power kitchen appliances, heaters, window AC units, and large power tools which require alot of power comsumption, you will need at least a 2k watt or greater power converter. I recommend a pure sine wave power box of at least 3k watts to be able to handle a large load.

Most converter boxes have built in 120VAC power outlets, just plug in directly to power up your home electronics or small power tools....you can also plug in a power strip directly into it like I did. GREY wire....Notice how I connected an outlet extending from the coverter box, that is so I wouldn't reach to the back end to plug in things...you can see the outlet showing in front of generator..

How to connect converter box to alternator. Simple, do you see that thick BLACK wire curving over, that is your NEGATIVE(-) wire coming from the NEGATIVE post(nut) from back of alternator. connect this wire to the NEGATIVE(-) terminal of converter box.

The POSITIVE(+) RED wire coming from POSITIVE(+) post(nut) of alternator connects to the POSITIVE(+) terminal of converter box...I ran out of red wire so had to use black wire....

You can custom make your own wire end terminals with a little bit of solder and heat shrink to have a custom professional look....You can secure the converter box with battery j-hooks, installed one on each corner....

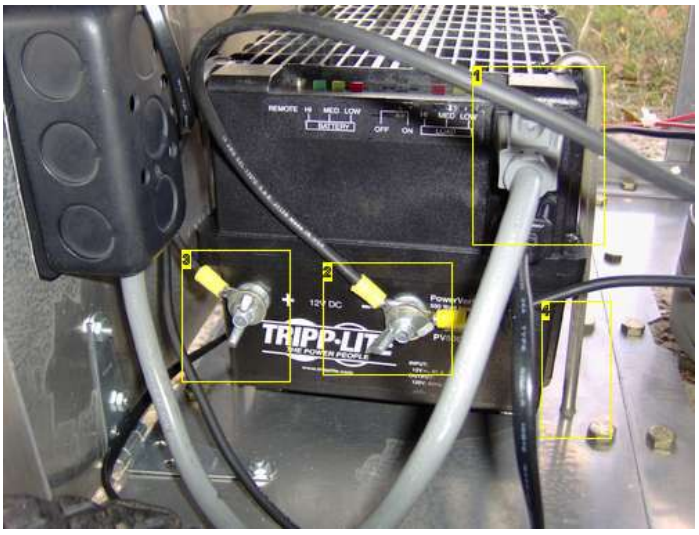


Image Notes
1. This GREY wire I got from a broken computer power cord, all I did was just plug in an external outlet extending out to the front panel to have easier access.
2. This is the NEGATIVE terminal. BLACK wire comes from the NEGATIVE(-) post(nut) of alternator, connect here.
3. This is your POSITIVE(+) terminal. connect RED(+) wire coming from POSITIVE(+) post of alternator....Notice how I have a BLACK wire instead of a RED..I ran out of RED wire(improvised)
4. Here I used 4 battery J-hooks to secure the coverter box, one on each corner...nice and snug.

Step 6: Variable Resistor(light dimmer switch)

This pot can be found on older vehicles, 70's through late 80's maybe older. It's purpose is to adjust the amount of amps coming from the alternator to charge a vehicle battery which is optional. This part has a two pin wire connected in series to the back end of alternator.

Here is how you connect the dimmer. On the back side of alternator there is a connector with two wires sticking out of it, shown in step 4.....one RED and one WHITE, you can connect any one of the wires from the DIMMER to the WHITE wire, the other wire from DIMMER connects to the POSITIVE(+) nut on back of alternator nothing to it.

That's it, the dimmer is connected in series and now you can adjust the amps by twisting the knob on dimmer, you have to play with it to have at a proper setting. If you allow to much current to charge a battery, the alternator will slow down a bit and might cause the engine to stop.....You can install a bigger engine with more power.

Image Notes

1. Here is the light dimmer switch, which controls the amount of amps going into the vehicle battery. The white wire coming from the alternator is connected to this switch in series, I recommend a two wire pin switch.
2. optional components added here, volt meter, light, on/off switch for light, and outlet....which you can tap directly into the power converter.

Step 7: Main Power Switch

This toggle switch has a built in green LED light, costs $2 new, before you throw away the package look at the schematic on the back side, wright it down or memorize the position of the 3 legs or pins and which is positive and negative....

Here is how you connect it. This particular switch has 3 pins on the back for attaching wires....I will refer to them as pin1, pin2, pin3.

Step One: connect a RED(+) wire to the POSITIVE(+) terminal of converter box, then connect the other end of wire to pin2(NOTE: do not forget to attach a 10amp fuse in series) this wire will be the main wire carrying POSITIVE voltage.

Step Two: connect a RED(+) wire to the POSITIVE(+) terminal(nut) of alternator, then connect the other end of wire to pin1.

Step Three: connect a BLACK(-) wire to the NEGATIVE(-) terminal of converter box, then connect the other end of wire to pin3. Thats it. Keep in mind! you can solder wire terminal at the end of the wires to help secure them tight and clean.

Image Notes

1. Here is the Main on/off power switch with internal green light to show power is on. more details later on schematics. also has a 10amp fuse in series.

Step 8: The pulley

Use an iron or steel 4" pulley to help with weight differences, the cutting blade helps the engine rotate easily because of it's weight and centrifugal forces. get one with a key way to help it lock on to the engine shaft, helps the pulley from slipping off. not much to it there.

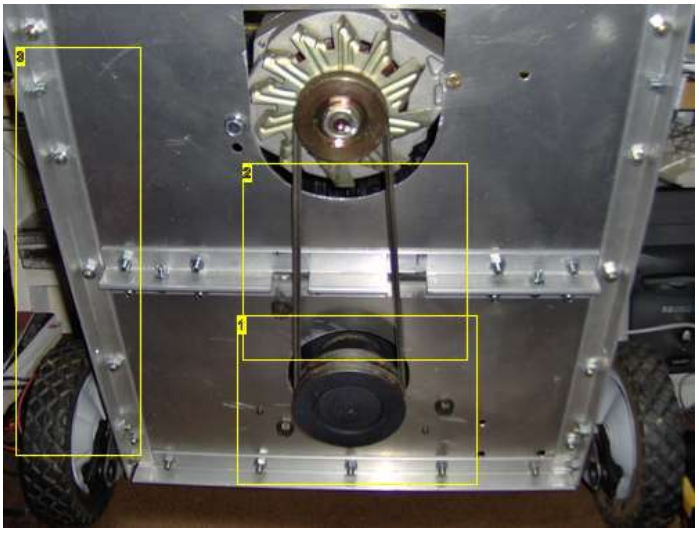


Image Notes

1. This one is a 4" iron pulley weighing more than the weight of the cutting blade which is what you want to help the engine rotate smoothly.
2. Here is the belt, nice and tight to help prevent slipping. not much to it...Notice how I had to cut the frame bar to prevent the belt from touching it.
3. Here are some of the bolts holding the frame together, not much to it.

Step 9: The Belt

Before cutting a hole, measure the distance it will take to install the belt between the lawnmower pulley and the alternator pulley. You don't want to end up to tight where you won't be able to install the belt, or too loose where there won't be any rotation of pulleys....you can make a track to adjust the alternator to release the belt or tighten...

I recommend the belt from a self propelled lawn mower, that makes a perfect fit for it.

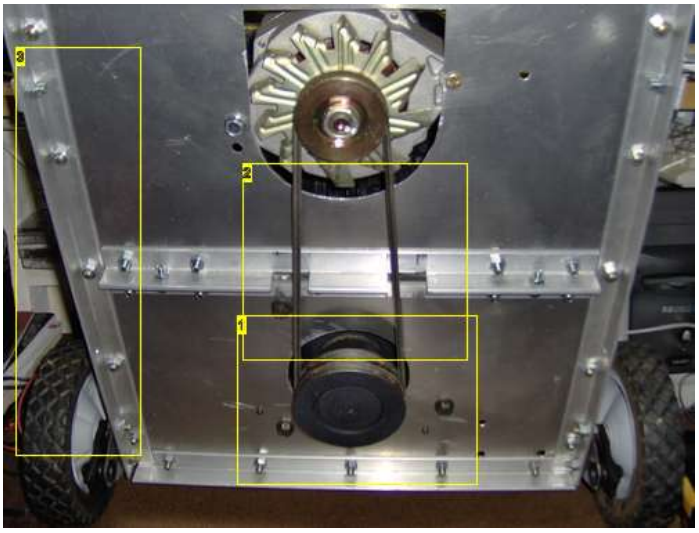


Image Notes

1. This one is a 4" iron pulley weighing more than the weight of the cutting blade which is what you want to help the engine rotate smoothly.
2. Here is the belt, nice and tight to help prevent slipping. not much to it...Notice how I had to cut the frame bar to prevent the belt from touching it.
3. Here are some of the bolts holding the frame together, not much to it.

Step 10: The Bolts

Not much to it except you can use rust proof ones....

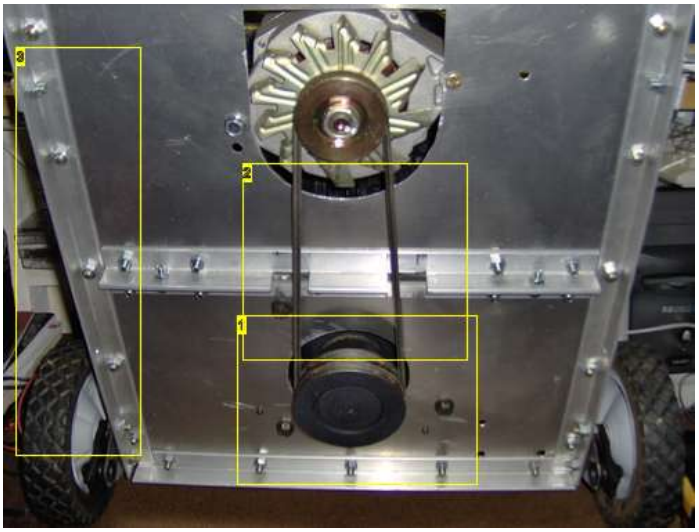


Image Notes

1. This one is a 4" iron pulley weighing more than the weight of the cutting blade which is what you want to help the engine rotate smoothly.
2. Here is the belt, nice and tight to help prevent slipping. not much to it...Notice how I had to cut the frame bar to prevent the belt from touching it.
3. Here are some of the bolts holding the frame together, not much to it.

Step 11: Optional parts

I just added these components to add more features to it....not needed to run generator. included in schematics with details if interested in adding them....

Image Notes

1. Here is the light dimmer switch, which controls the amount of amps going into the vehicle battery. The white wire coming from the alternator is connected to this switch in series, I recommend a two wire pin switch.
2. optional components added here, volt meter, light, on/off switch for light, and outlet....which you can tap directly into the power converter.

Step 12: Labels

You can down load labels from internet for free, just look for hazmat labels..I just printed them, cut them out, and taped with clear tape.....

Step 13: Optional Meter Gauge

Not required to operate the generator I just wanted to add extra features, the next step shows the schematics. Not much to explain there too easy....

Image Notes

1. Here is the light dimmer switch, which controls the amount of amps going into the vehicle battery. The white wire coming from the alternator is connected to this switch in series, I recommend a two wire pin switch.
2. optional components added here, volt meter, light, on/off switch for light, and outlet....which you can tap directly into the power converter.

Step 14: Schematics

This should give a general idea of what it looks like on paper or board....will post more schematics for each section.....

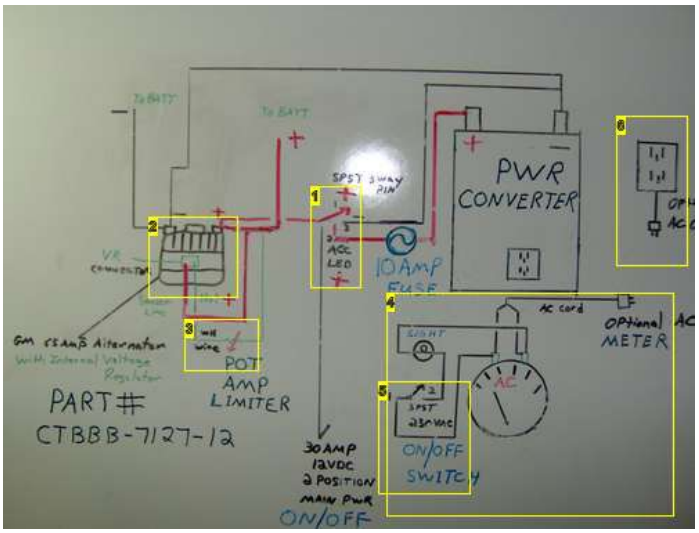
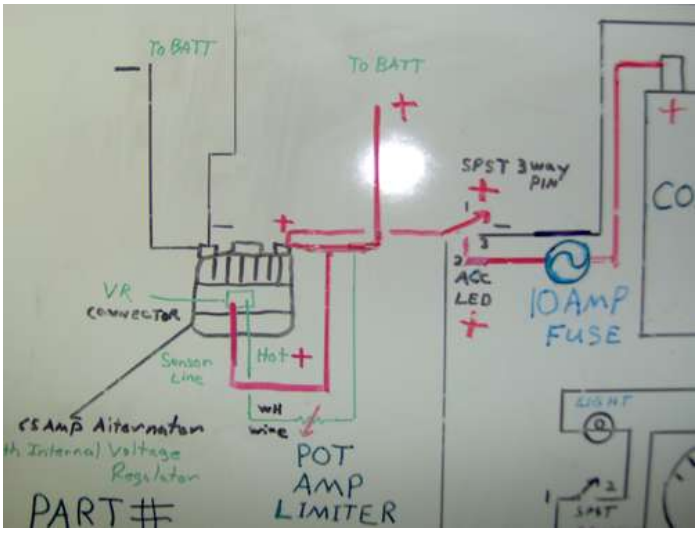


Image Notes

1. This is the main on/off switch with LED light.
2. Here is the alternator
3. This is the dimmer switch to control amount of amps
4. Optional voltage meter with on/off switch to work light..that pretty much it.....
5. on/off switch to turn the light on or off.....
6. Optional 120VAC outlet. you can connect directly to the converter box...

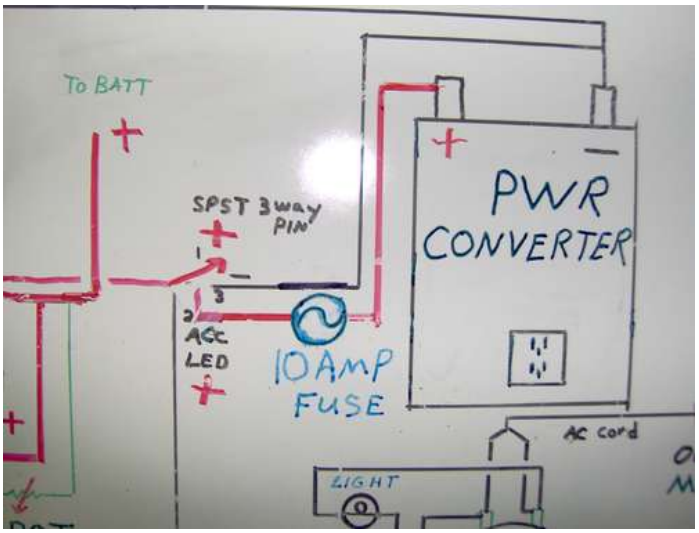
Step 15: Alternator Schematic

As you go through each step, it will show you what connects where....just follow the simple steps and it will all come together...



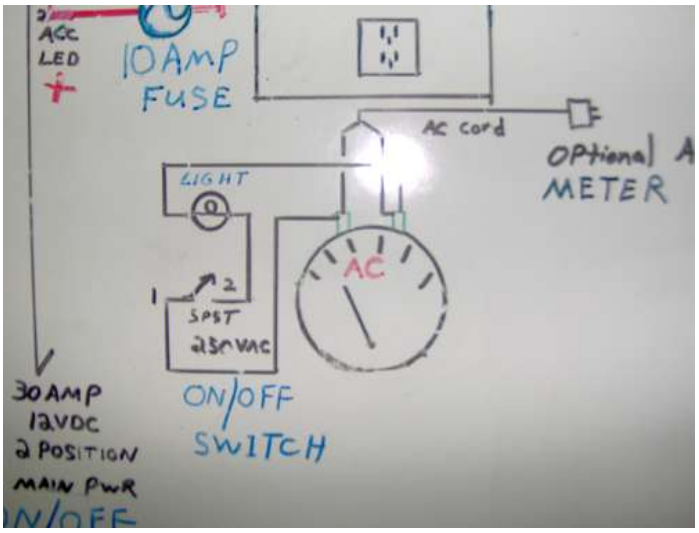
Step 16: LED Switch Schematic

Same here. each step will show how to connect each part, just follow the simple diagram and notes...



Step 17: Optional meter,light,on/off switch Schematic

Like I said before this section is not required to work or operate the generator, I just added for extra features....schematic shows how to connect if you wish to follow through...



Step 18: Final step optional Handle

This is the last part I put on, once again it's optional. Picked it out from recycling center and bolted it on...not much to it.....That's pretty much it, took me 3-months to build this thing, what took the longest was building the frame because of lack of tools and finding parts at little to no cost. That alone was a bargain.

Good luck with this project, if you have any questions about the schematic let me know, some of the pics are far away. The battery is used for backup in case the motor runs out of fuel which is not being used indoors.....That would be to loud!

Related Instructables

Stirling generator powering radio demonstration. (video) by scraptopower

How to start a Bio-mass Gasifier (video) by allenergies

Chainsaw flashlight (gas engine powered spotlight) by robbtoberfest

Fitnerds: Pedal Power Generator for a Greener School by samtab

My Improvised DC Generator Build by mdavis19

DIY Plug-In Hybrid Car by bennelson

Comments

22 comments **Add Comment**

kill-a-watt says: Dec 13, 2010. 6:16 AM **REPLY**

Nice, I'm looking at building one of these. I want to add a circut to recharge or jump car batteries and maybe add field control to convert mine to a light-duty welder.

The 3.5 HP engine is limited to maybe 2500 watts total.

You are using a GM Delco 10si alternator, which can only put out about 900 watts at 14volts times 63 amps. I assume the unit is self-excited, so if you pulled one out of a junked car, you would probably have to install a "one wire" kit. Although the 10si is ubiquitous, with that engine I guess you have headroom to use a larger alternator.

Technically, that cooling fan on the alternator is running the wrong way, but I'll bet it works fine because it's not located in a hot under hood area of a car. The alternator itself doesn't care which way it spins.

"Battery" is not in your parts list. I'd recommend a deep cycle type. If you use the less expensive wet-cell type, get a battery box for the battery and bolt it down. Acid burns.

Good job with the safety-nazi stickers. No one could fault you there!

kill-a-watt says: Dec 13, 2010. 7:46 AM **REPLY**

confirmed with a search: 7127 is "self-exciting" or "one-wire". The "-12" means that alternator is "clocked" at the "12 o'clock" position.

Looking at the back of the alternator, think of the field winding contacts as the hour hand and the pivot bolt hole (the unthreaded mounting bolt hole) as "12" on a clock. By assembly, the alternator can be in four positions. 3, 6, 9, and 12 o'clock. If you know how to restrain the brushes, you can take apart the alternator and "re-clock" it for different applications in different cars.

cid2323 says: Dec 13, 2010. 2:23 PM **REPLY**

I bought the alternator at a parts store with a 2 wire harness connector. I didn't mention the battery because it is not required to start the generator, it's just an optional feature.

dsandds2003 says: Jan 18, 2011. 1:41 PM **REPLY**

This is a great idea. HOWEVER i did not see anything about NOT using this indoors. If you use it in a garage MAKE SURE you leave the door open. You WILL need lots of ventalation.
I love the portability of this, would be a GREAT item to use with my electric branch trimmer. GREAT job on the pics and diagrams.

paleotool says: Jan 16, 2011. 5:17 PM **REPLY**

Excellent work! It looks like a well thought out and explained instructable. I have been intending to make one from a junk lawn mower I have and this looks like a nice, neat design.

mackjr says: Dec 17, 2010. 10:37 AM **REPLY**

Very nice and clean

cid2323 says: Dec 19, 2010. 9:35 AM **REPLY**

Thanks. Happy Holidays.....

tedervlad says: Dec 13, 2010. 7:12 AM **REPLY**

www.tender.pro

drbill says: Dec 18, 2010. 3:56 PM **REPLY**

Looked at it.
Translated it.
Whatzit for?

cid2323 says: Dec 19, 2010. 9:31 AM **REPLY**

It's a power generator, DC to AC 120VAC. you can use it for electronics, some power tools, lights, etc. makes perfect for camping or light up a small cabin. Happy Holidays.....

drbill says: Dec 18, 2010. 4:01 PM **REPLY**

This would be good for ham radio field days.
Shore do wish I had more room to work on stuff.
I give you a 5.0

cid2323 says: Dec 19, 2010. 9:26 AM **REPLY**

would make perfect for ham or camping.

ContraptionMaker says: Dec 13, 2010. 8:53 PM **REPLY**

Nice build, just a word of caution!!!! DO NOT RUN THIS INSIDE A CLOSED BUILDING!!!! I notice in one pic you show this inside your house running a TV. This is an internal combustion engine and produces carbon dioxide which can kill you.

UncleBuild says: Dec 15, 2010. 1:04 PM **REPLY**

Carbon Monoxide is killer when running IC engines indoors or using BBQ grills for space heating purposes. DO NOT USE INDOORS, including a garage.

cid2323 says: Dec 15, 2010. 4:16 PM **REPLY**

Engine is not on, the battery on top is powering the converter without having to run the engine, that is one of the features I included within the circuit as a backup.

Was getting dark outside so brought GEN indoors just to take pics, at no point was the motor turned on....The battery is doing it's work, that's the beauty of it....

cid2323 says: Dec 14, 2010. 2:10 AM **REPLY**

No worries!! that yellow battery you see on top is what's running the converter as a backup....good catch though. Never would I run a gas engine in my home.

possum888 says: Dec 14, 2010. 3:23 AM **REPLY**

That is brilliant! Our lawnmower's frame disintegrated, so it's essentially useless, and this would be a cool project to try out.

cid2323 says: Dec 14, 2010. 4:53 AM **REPLY**

That would make a nice project, you can also modify the engine for a cool pressure washer.

karossii says: Dec 12, 2010. 5:17 PM **REPLY**

I'm curious... have you any idea on the efficiency of this unit? gallons of gas per KWH, for example...?

cid2323 says: Dec 14, 2010. 2:18 AM **REPLY**

Almost forgot, with the battery as a backup will last 24hrs with the same load...

cid2323 says: Dec 14, 2010. 2:14 AM **REPLY**

I don't know the specs for the engine, it's something I picked out from landfill....I do know with a small load and the tiny gas tank it will last up to two hrs none stop, which can be upgraded with a larger fuel tank.....I recommend stopping the engine every hr to check up on oil levels, especially with small engines..

tedervlad says: Dec 13, 2010. 7:11 AM **REPLY**

Good