

THE EGHIA PICTURE SHOW

AND STEP-BY-STEP CONVERSION MANUAL

BY DOUG TEEPLE, ILLUSTRATION BY OLIVIER LAI







FIRST BUY A KIT WITH ALL THE STUFF YOU NEED. YOU CAN GET A KIT FROM ELECTRO AUTOMOTIVE, OR KTA SERVICES, OR MANY OTHERS.



NEXT TAKE OUT THE OLD MOTOR. IN A VW OR KARMANN GHIA IT IS HELD ON BY 4 BOLTS CONNECTED TO THE BELL HOUSING. UNBOLT THOSE AND KEEP THEM, SINCE THEY SPECIALLY HARDENED PARTS – OR BUY NEW ONES.





AS YOU TAKE THE MOTOR OUT, MARK WHERE THE WIRES CONNECT AND THE WIRE COLORS – OR YOU'LL REGRET IT LATER!

THE MOTOR IS GONE, SO NOW TAKE OUT THE GAS TANK. THERE IS A FEED TUBE AT THE VERY BOTTOM, SO BE SURE TOPINCH IT OFF AS YOU PULL THE TANK OUT.



NOW, PUT THE ELECTRIC MOTOR ON A JACK STAND SO YOU CAN RAISE IT IN TO PLACE.

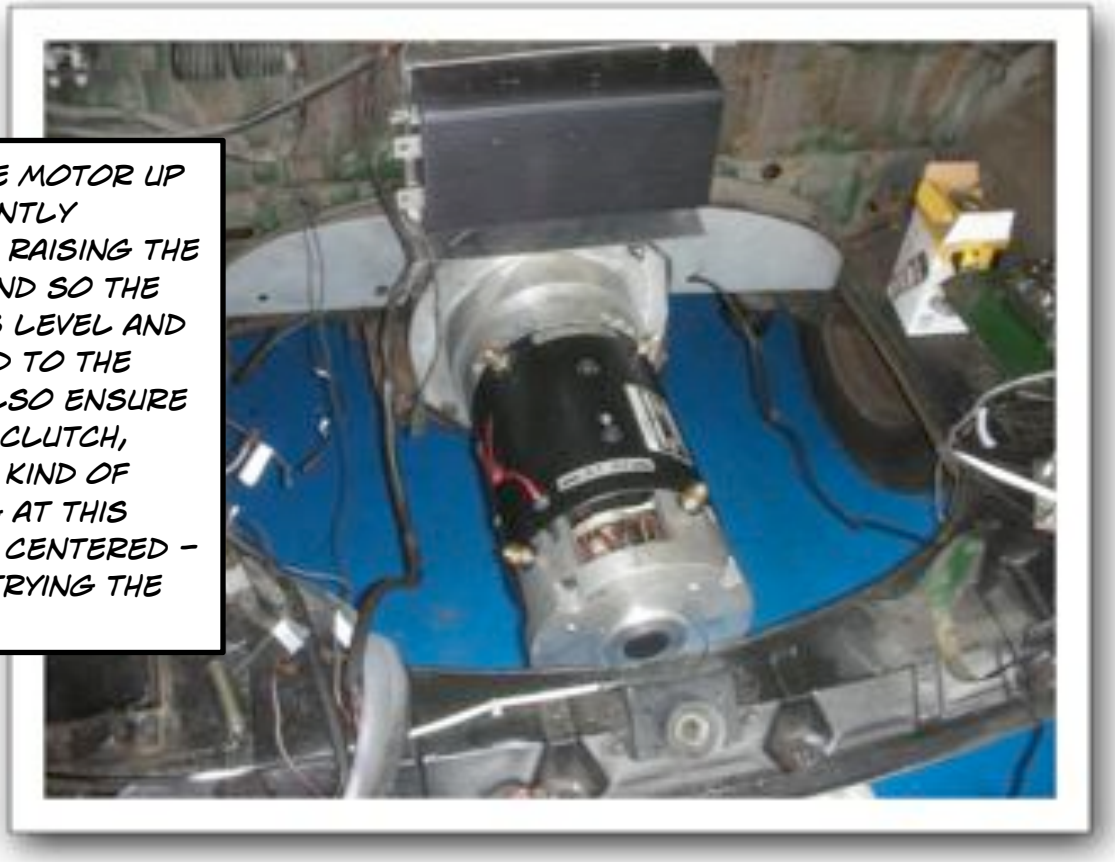
BOLT THE ADAPTER TO THE MOTOR FOLLOWING THE KIT INSTRUCTIONS. THE ADAPTER IS ALUMINUM SO YOU HAVE TO USE A TORQUE WRENCH TO GET THE BOLTS TIGHTENED EXACTLY RIGHT.



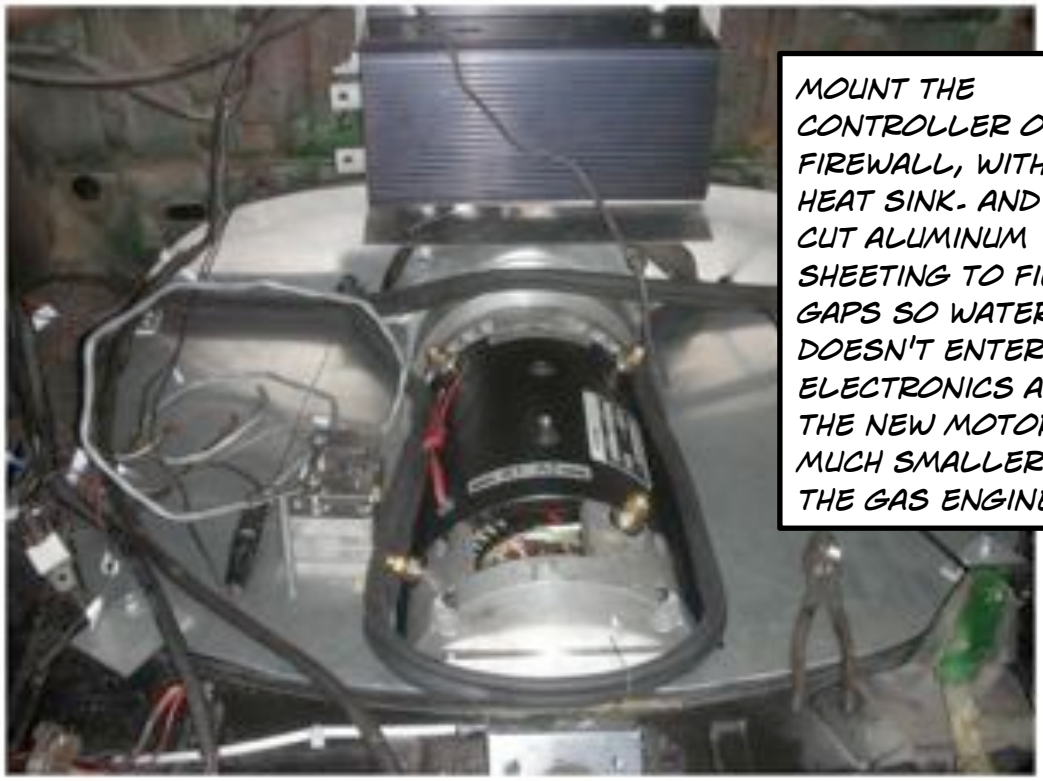
TAKE THE FLYWHEEL AND TIGHTEN THE SLEEVE TO THE SHAFT. USE A TORQUE WRENCH AGAIIN TO GET THE TENSION EXACTLY RIGHT.



TAKE THE MOTOR ASSEMBLY WITH THE ADAPTER AND FLYWHEEL ATTACHED AND APPROACH THE MOTOR ON THE JACK



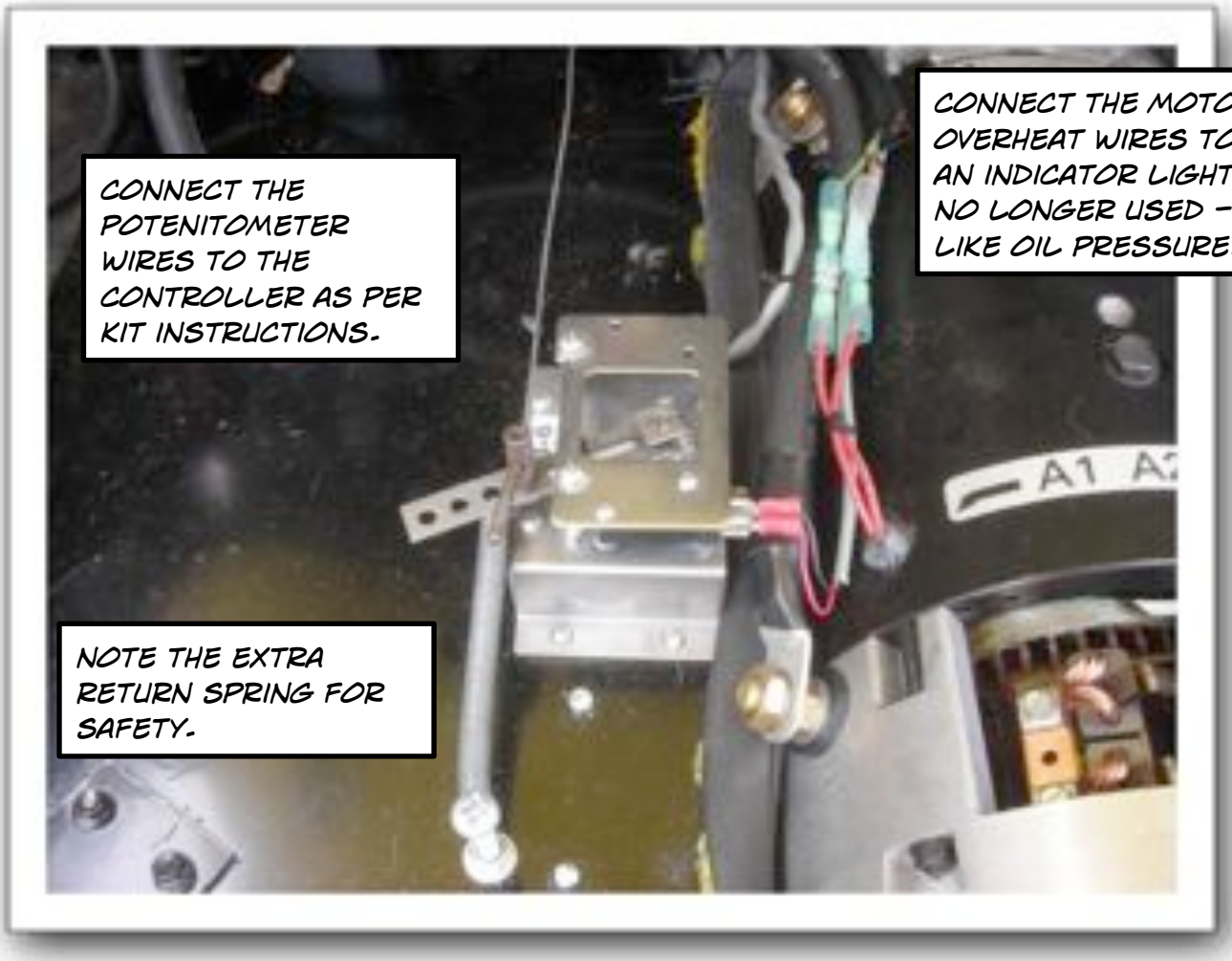
SLIDE THE MOTOR UP AND INGENTLY ROCKING, RAISING THE JACK STAND SO THE MOTOR IS LEVEL AND CENTERED TO THE SHAFT. ALSO ENSURE THAT THE CLUTCH, (WHICH IS KIND OF FLOATING AT THIS POINT) IS CENTERED - BEFORE TRYING THE MATING.



MOUNT THE CONTROLLER ON THE FIREWALL, WITH A HEAT SINK. AND THEN CUT ALUMINUM SHEETING TO FILL UP GAPS SO WATER DOESN'T ENTER THE ELECTRONICS AREA. THE NEW MOTOR IS MUCH SMALLER THAN THE GAS ENGINE.

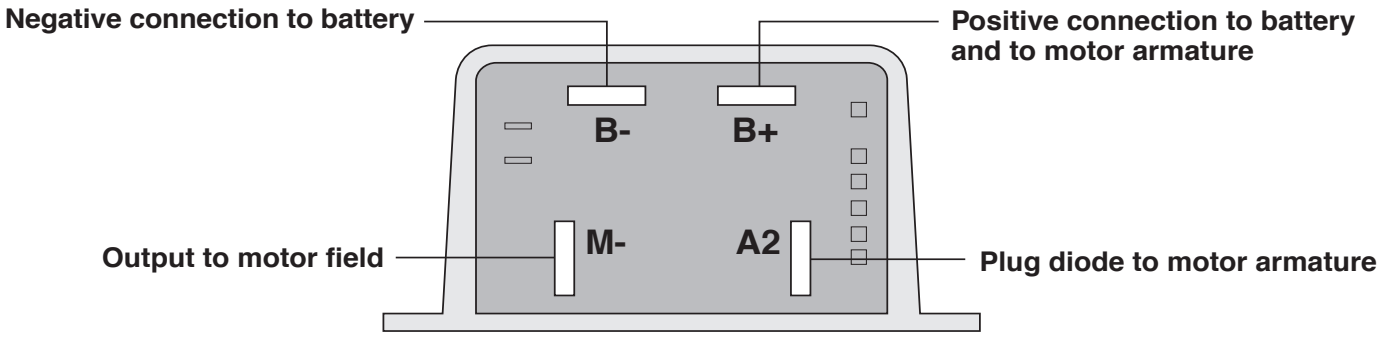


SEAL AROUND THE MOTOR AND START RECONNECTING THE KET PARTS OF THE WIRING HARNESS.

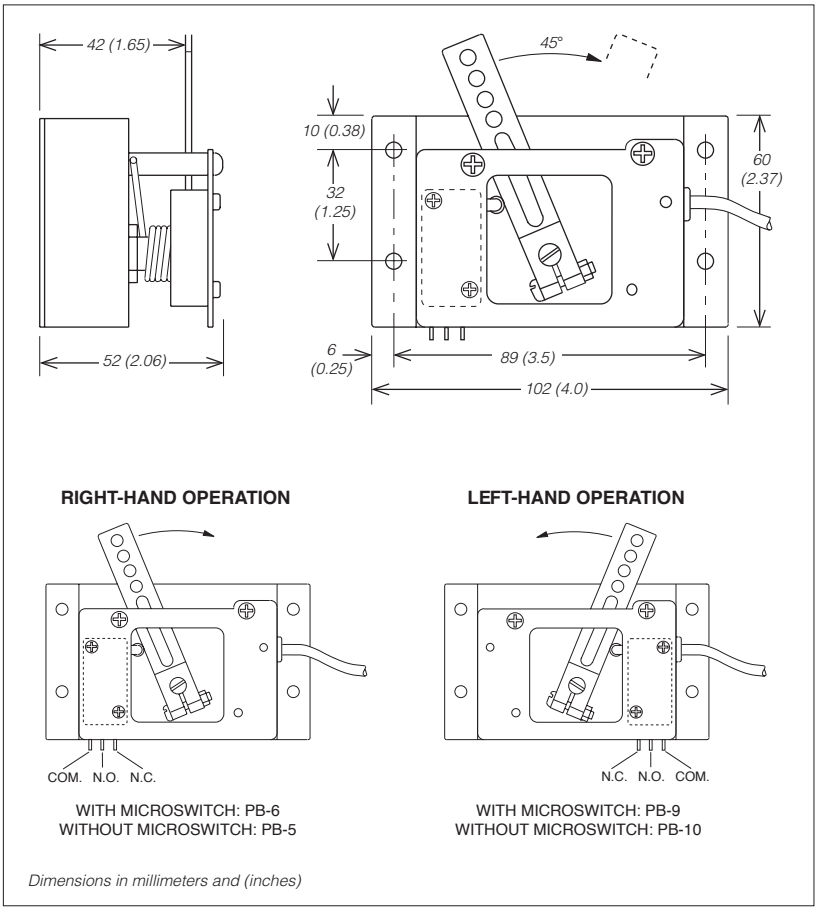


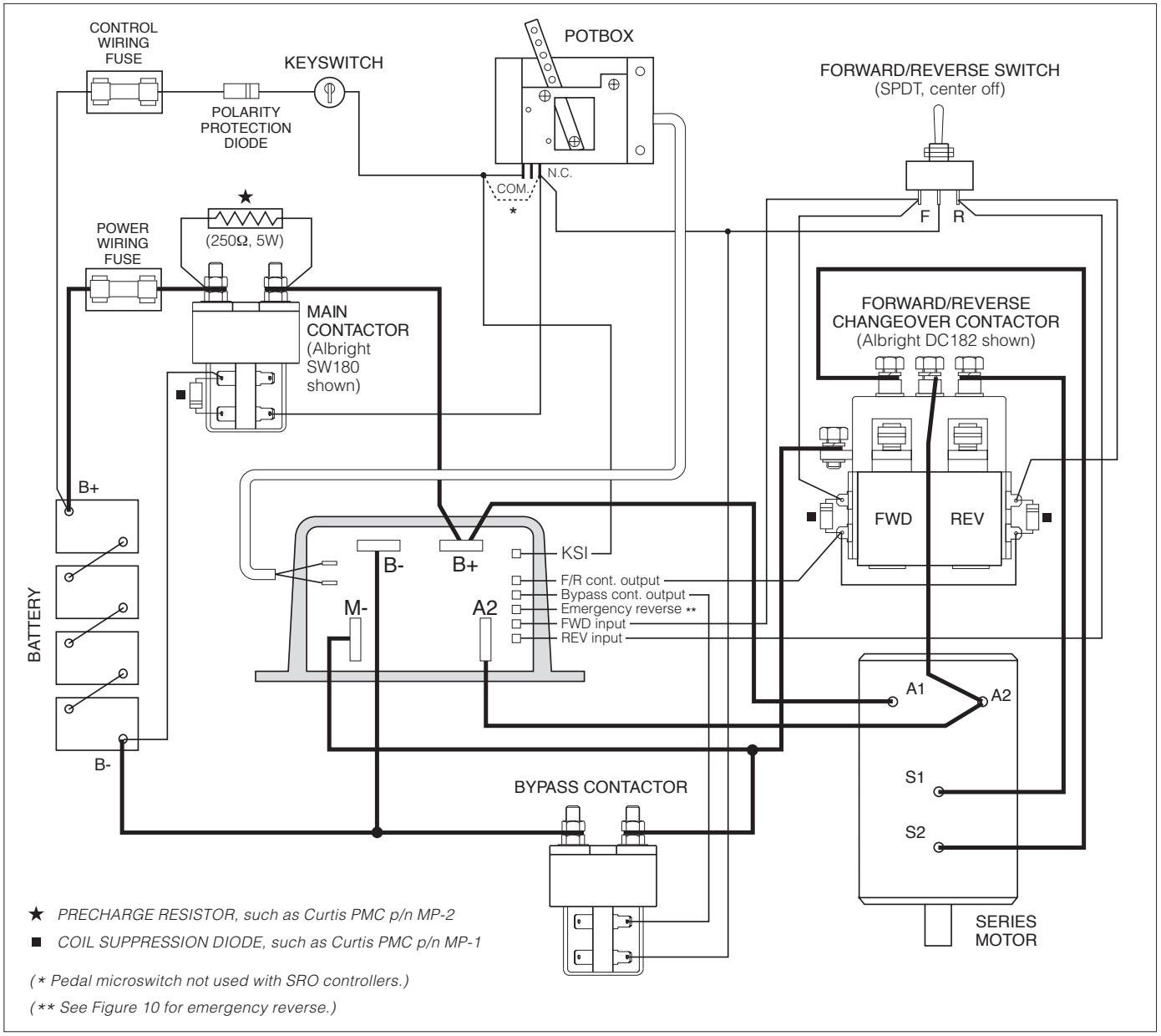
MOUNT THE POTENTIOMETER - YOUR NEW "GAS PEDAL" TO THE ALUMINUM COVER. CONNECT THE OLD GAS PEDAL LINE TO THE ARM OF THE POTENTIOMETER. MAKE SURE IS IS TIGHTAND THAT THE THROW OF THE PEDAL GICES YOU GOOD TRAVEL ON THE POTENTIOMETER.

HERE ARE THE BASIC CURTIS CONTROLLER HIGH VOLTAGE/ CURRENT



HERE IS THE POTENTIOMETER, USUALLY CALLED "THE POT BOX". IT CONTROLS YOUR SPEED. THE ARM IS CONNECTED TO THE FOOT PEDAL.

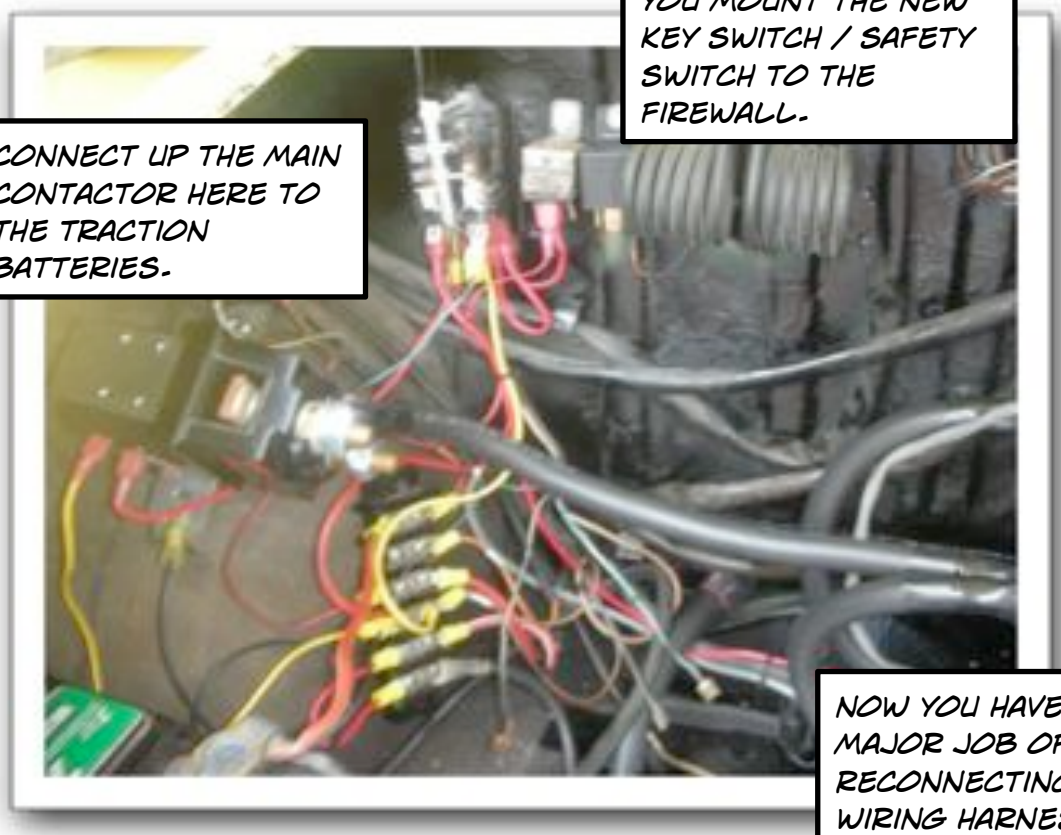




THIS IS THE BASIC CONNECTIONS FOR THE CURTIS CONTROLLER, FROM THE CURTIS MANUAL. MY CONTROLLER WAS A MODEL DOWN FROM THIS AND DID NOT HAVE PLUG BRAKING, REVERSE OR THE BYPASS CONTACTOR.

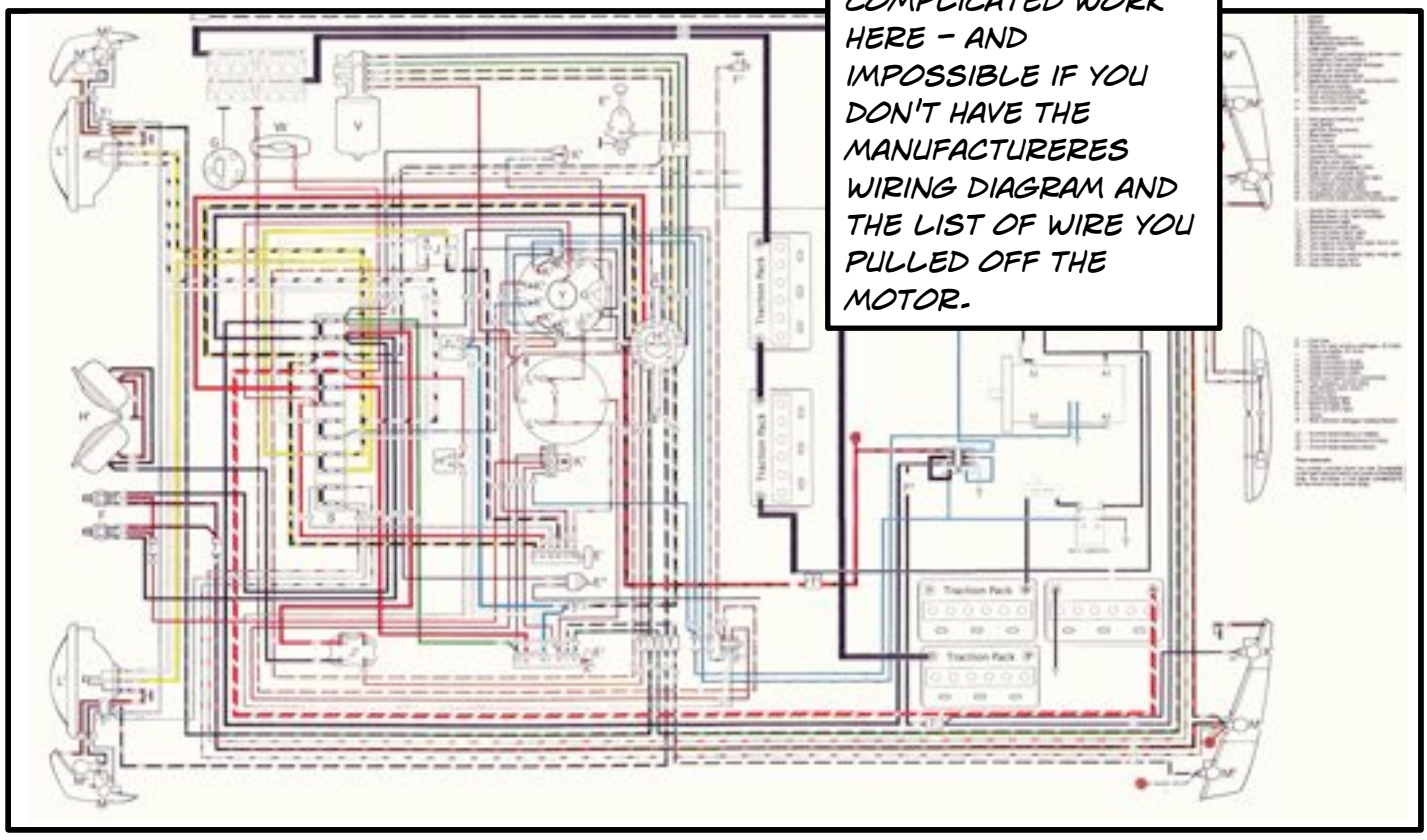
YOU MOUNT THE NEW KEY SWITCH / SAFETY SWITCH TO THE FIREWALL.

CONNECT UP THE MAIN CONTACTOR HERE TO THE TRACTION BATTERIES.





NOW YOU HAVE THE MAJOR JOB OF RECONNECTING THE WIRING HARNESS SO THE LIGHTS AND KEY WORK RIGHT. MAJOR COMPLICATED WORK HERE - AND IMPOSSIBLE IF YOU DON'T HAVE THE MANUFACTURERES WIRING DIAGRAM AND THE LIST OF WIRE YOU PULLED OFF THE MOTOR.





I PUT FOUR BATTERIES WHERE THE GAS TANK WAS, FOUR OVER THE MOTOR AND 2 UNDER THE BACK SEATS.

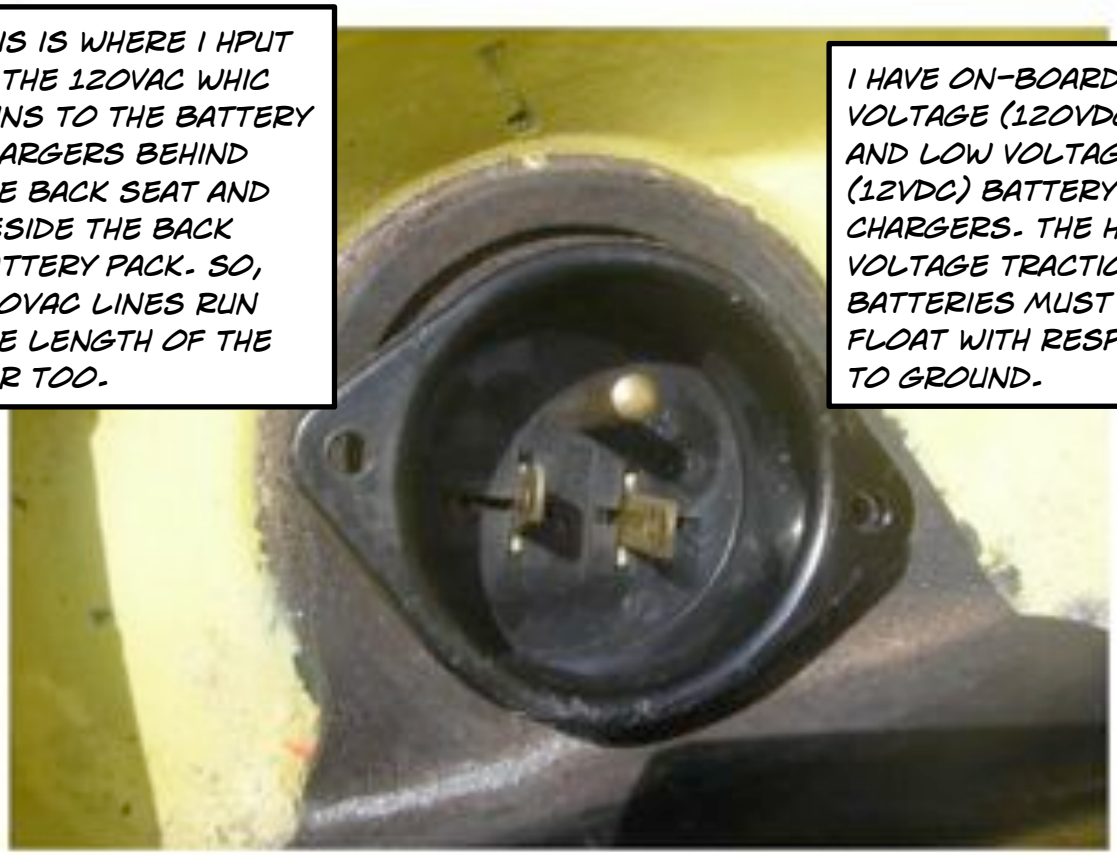
MAKE A CAGE TO HOLD THE BATTERIES IN PLACE.



HERE IS THE FRONT CAGE. NOTE THAT POWER LINES HAVE TO BE RUN THE LENGTH OF THE CAR TO CONNECT ALL THE BATTERIES IN SERIES.

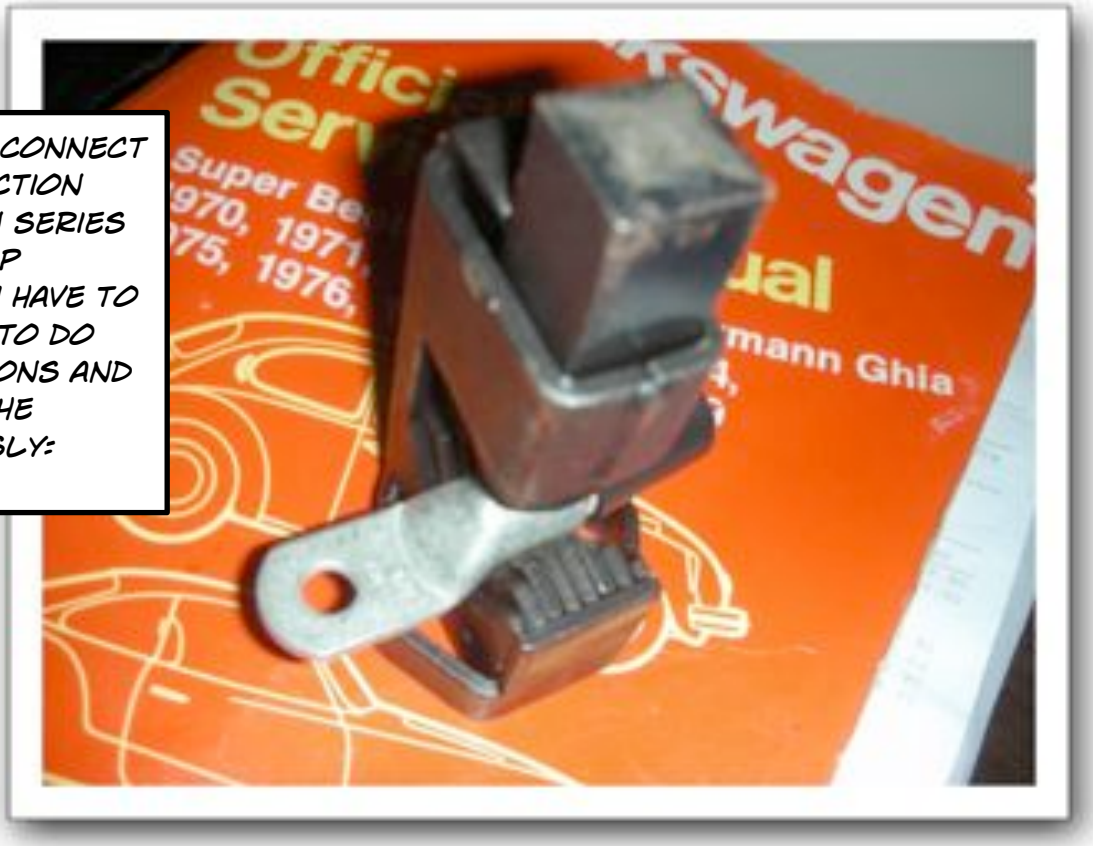
YOU NEED AT LEAST 10 TRACTION BATTERIES IN SERIES = 120VDC AND ONE LOW VOLTAGE BATTERY.

THIS IS WHERE I HPUT IN THE 120VAC WHIC RUNS TO THE BATTERY CHARGERS BEHIND THE BACK SEAT AND BESIDE THE BACK BATTERY PACK. SO, 120VAC LINES RUN THE LENGTH OF THE CAR TOO.

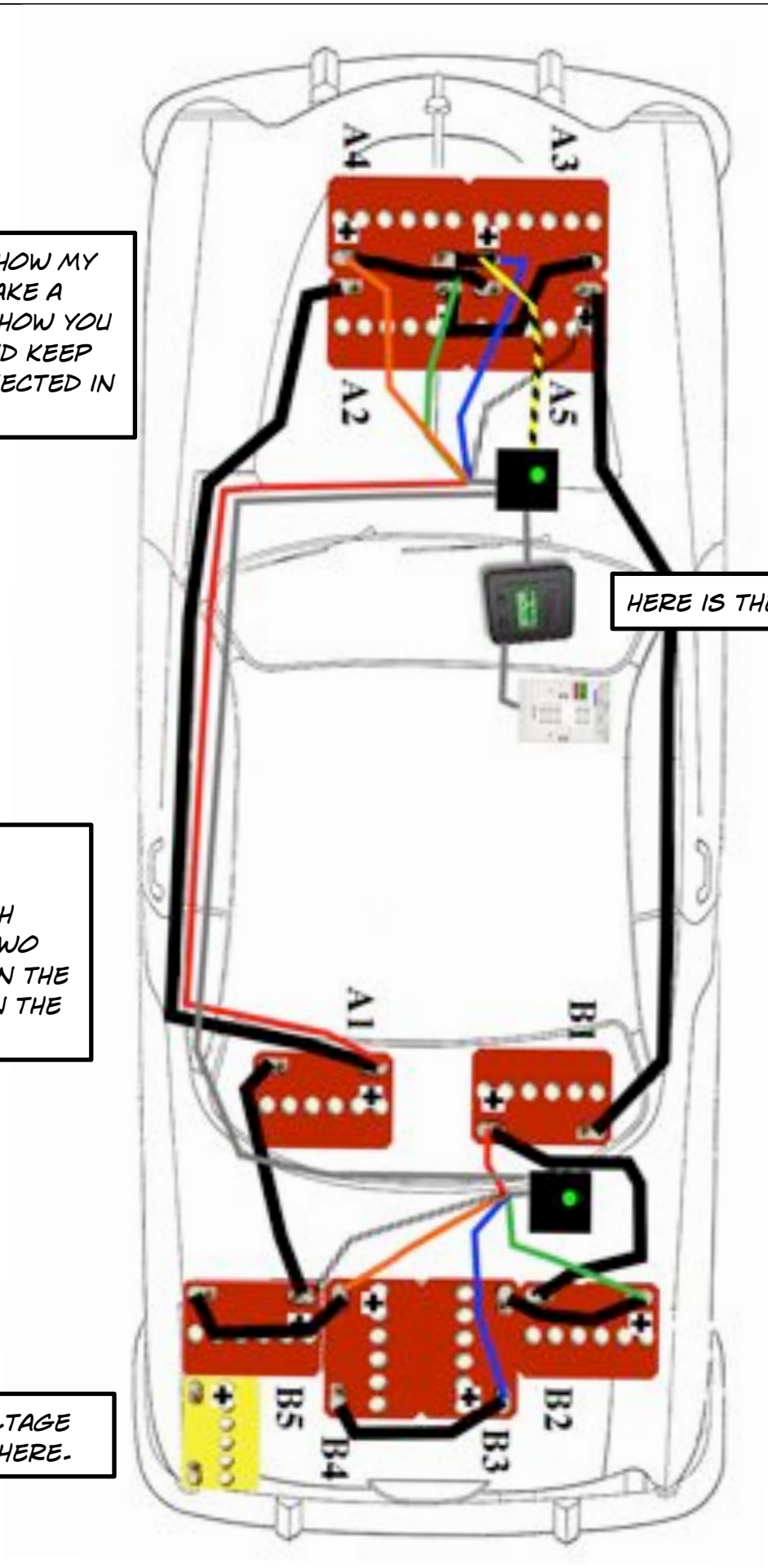


I HAVE ON-BOARD HIGH VOLTAGE (120VDC) AND LOW VOLTAGE (12VDC) BATTERY CHARGERS. THE HIGH VOLTAGE TRACTION BATTERIES MUST FLOAT WITH RESPECT TO GROUND.

YOU HAVE TO CONNECT ALL THE TRACTION BATTERIES IN SERIES WITH 400 AMP CABLES. YOU HAVE TO CUT LENGTH TO DO THE CONECTIONS AND TERMIANTE THE CABLES THUSLY:



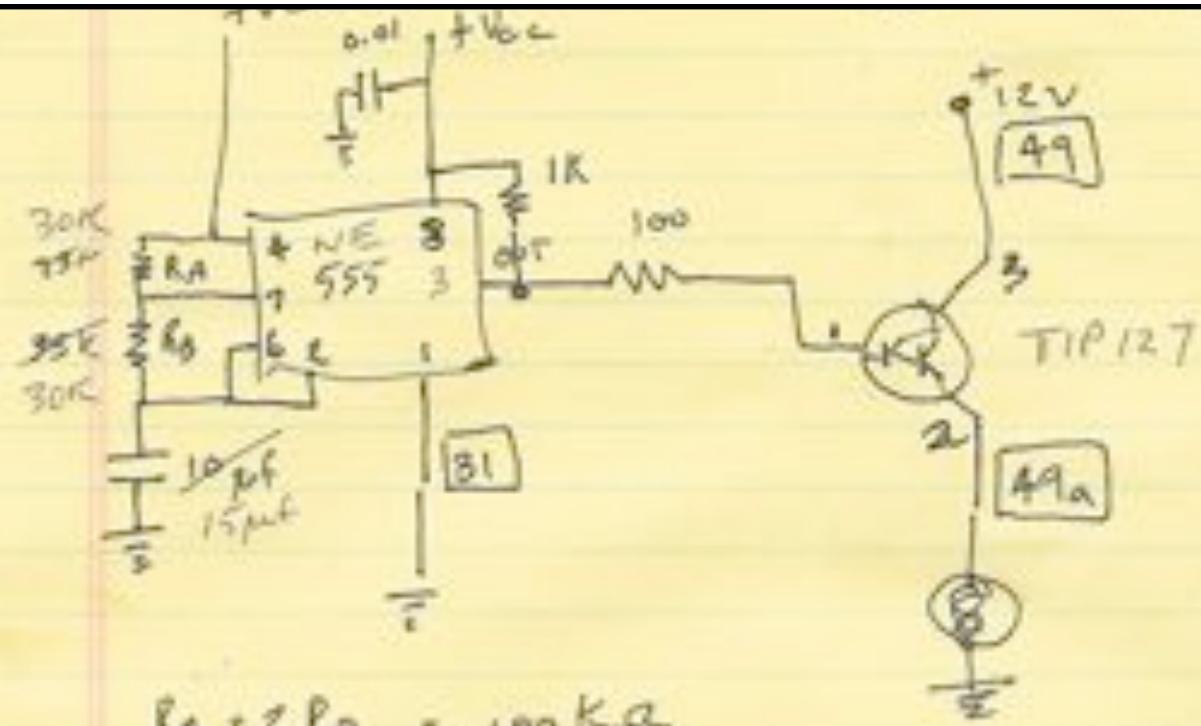
THIS SHOWS HOW MY TRACTION MAKE A DRAWING OF HOW YOU DO YOURS AND KEEP IT. ARE CONNECTED IN SERIES.



HERE IS THE PAKTRAKR.

I ALSO HAVE THE PAKTRAKR LINES RUNNING TO EACH BATTERY, WITH TWO REMOTES, ONE IN THE BACK AND ONE IN THE FRONT.

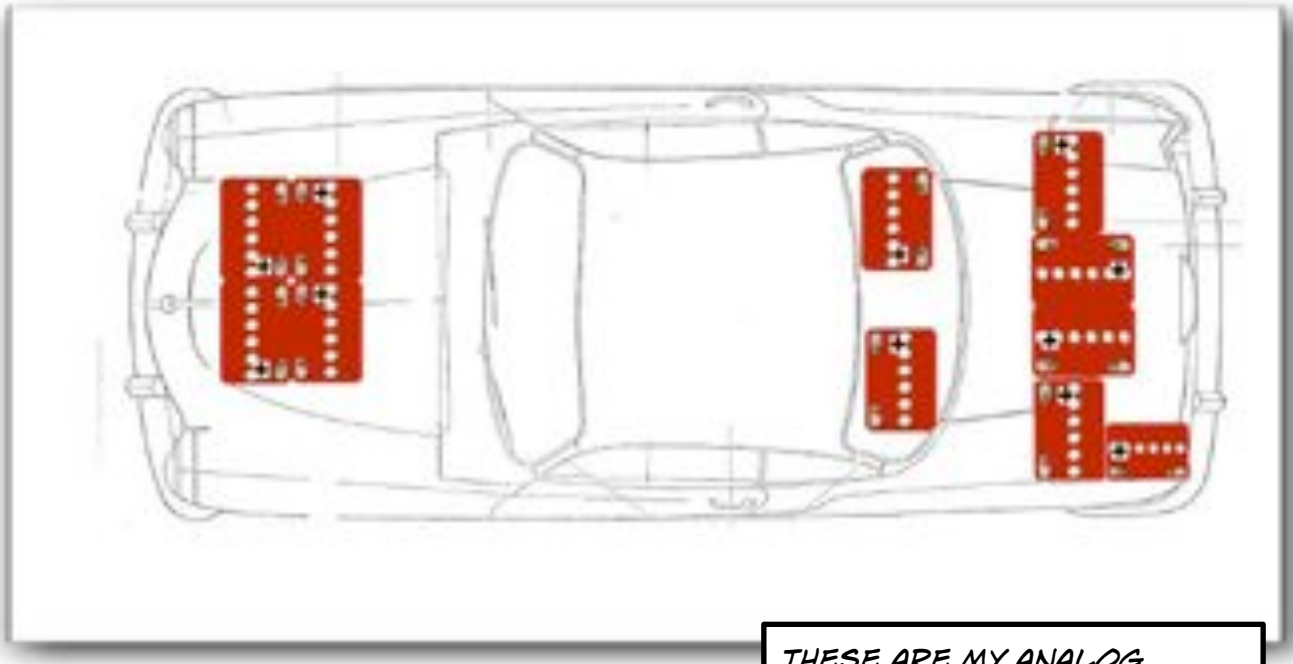
LOW VOLTAGE SYSTEM HERE.







HERE IS THE NEW FLASHER. I REPLACED ALL MY TURN SIGNALS WITH LEDS, AND REPLACED THE FLASHER WITH A SOLID STATE VERSION.

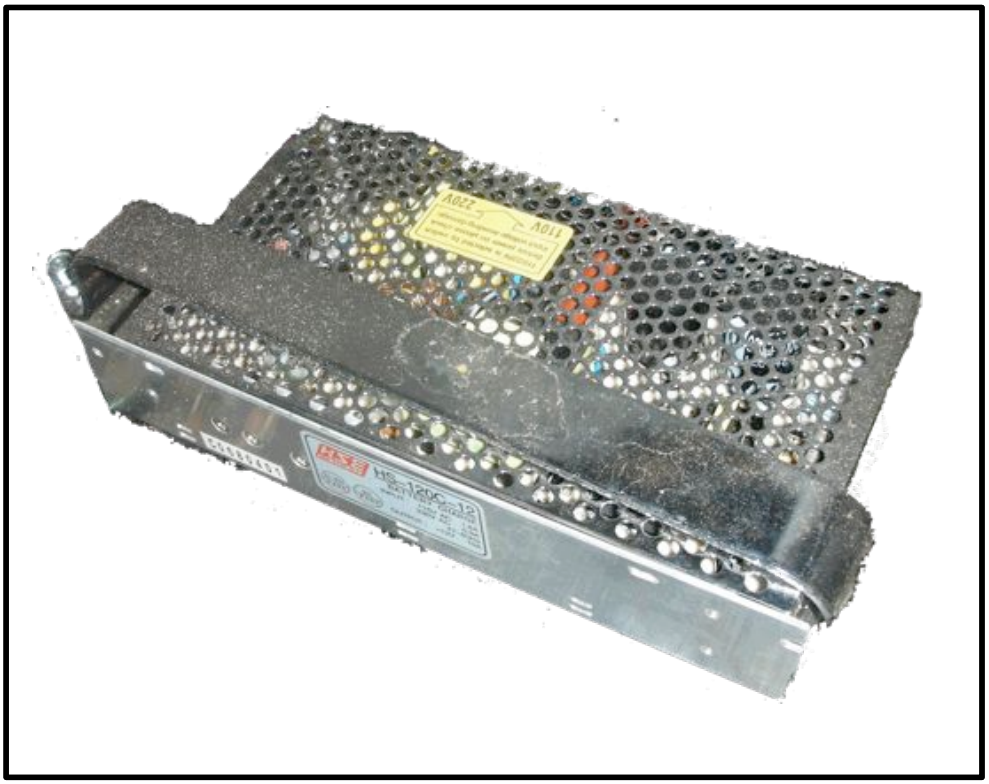


THESE ARE MY ANALOG GAUGES. I LIKE TO MEASURE EVERYTHING. LEFT IS LOW VOLTAGE, BOTTOM IS CURRENT AND RIGHT IS HIGH VOLTAGE.





HERE ARE THE ON-BOARD CHARGERS. ABOVE THE THE 120VDC TRACTION PACK CHARGER.

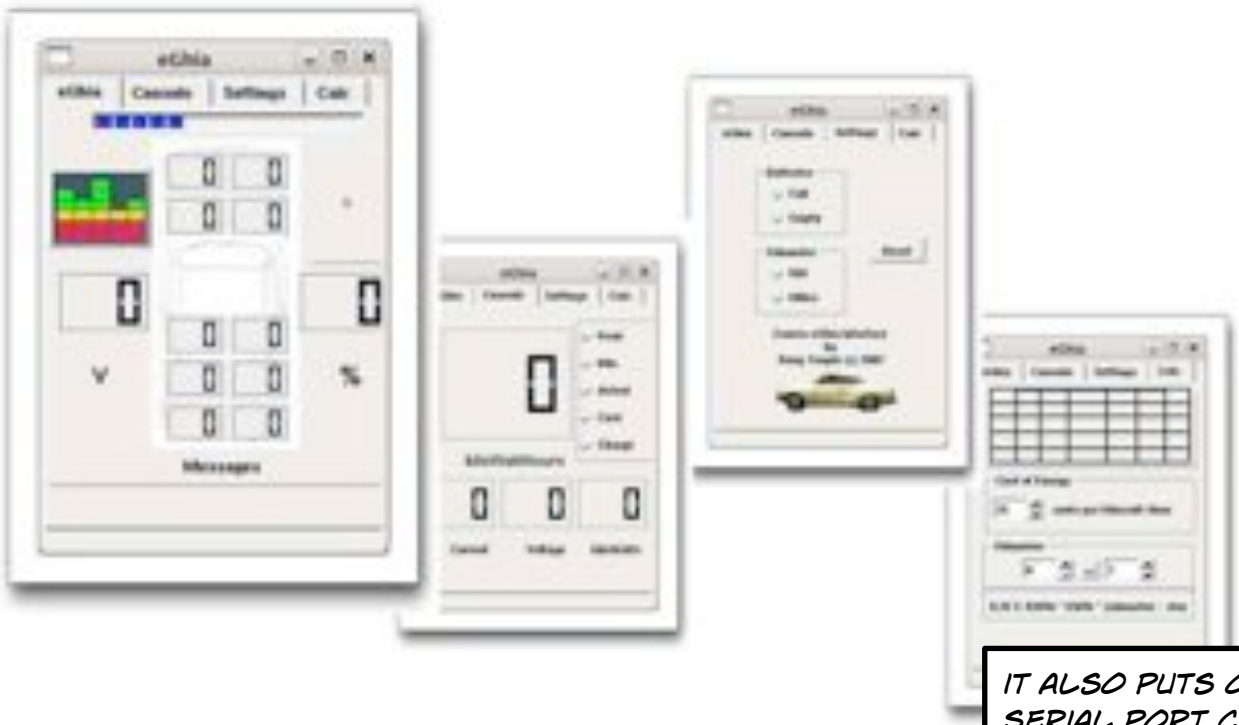


AND HERE IS THE LOW VOLTAGE BATTERY CHARGER.



THE BATTERIES ARE SO HEAVY I HAD TO REPLACE MY SHOCKS WITH COIL-OVER SHOCKS. YOU CAN GET THESE AT ANY VW SPECIALTY PLACE - ESPECIALLY THE "BAHA BUG" PLACES.





IT ALSO PUTS OUT A SERIAL PORT CSV STREAM, WHICH I SEND TO THE ZAURUS. I PROGRAMMED THE ZAURUS TO READ THE CSV AND PROVIDE A NICE COLOR DISPLAY. THE SOFTWARE SOURCE IS AVAILABLE FREE ON MY WEB SITE.



HERE IS THE PAKTRAKR. IT IS CONNECTED VIA TWO REMOTES TO EEERY BATTERY IN THE TRACTION PACK. IT MONITORS EVERY BATTERY AND PEPORTS THEIR STATE OF HEALTH.



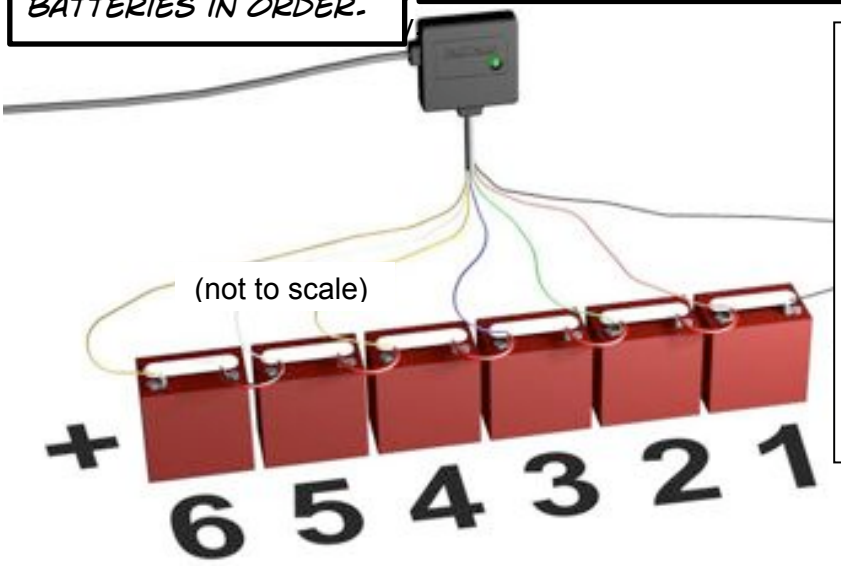


THIS SHOWS ALL THE PAKTRAKR WIRES RUNNING THE LENGTH OF THE CAR, AND CONNECTED TO EACH BATTERY.



EACH REMOTE CONNECTS TO BATTERIES IN ORDER.

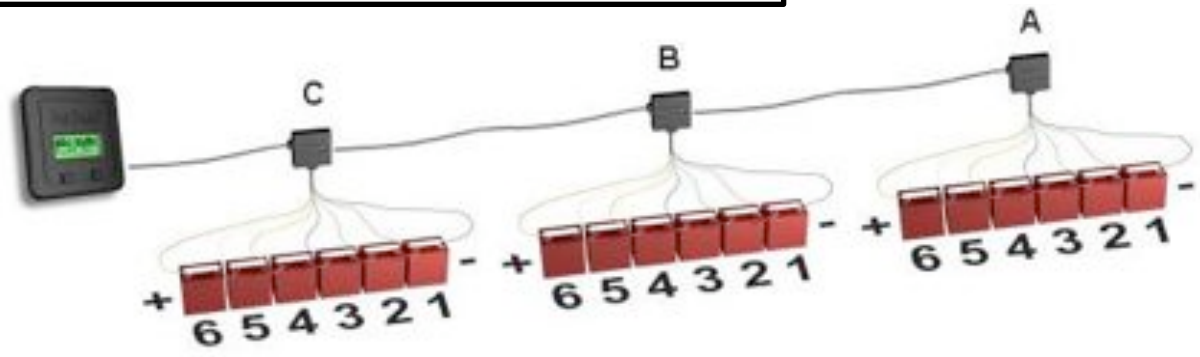
WITH A PACK IN THE FRONT AND A PACK IN THE BACK, THE REMOTES DAISY CHAIN RUNS THE LENGTH OF THE CAR.



Battery Connections:

Wire	Battery
Black	Battery 1 (-)
Red	Battery 1 (+)
Green	Battery 2 (+)
Blue	Battery 3 (+)
Orange	Battery 4 (+)
White	Battery 5 (+)
Brown	Battery 6 (+)
Yellow	Battery 7 (+)
Violet	Battery 8 (+)

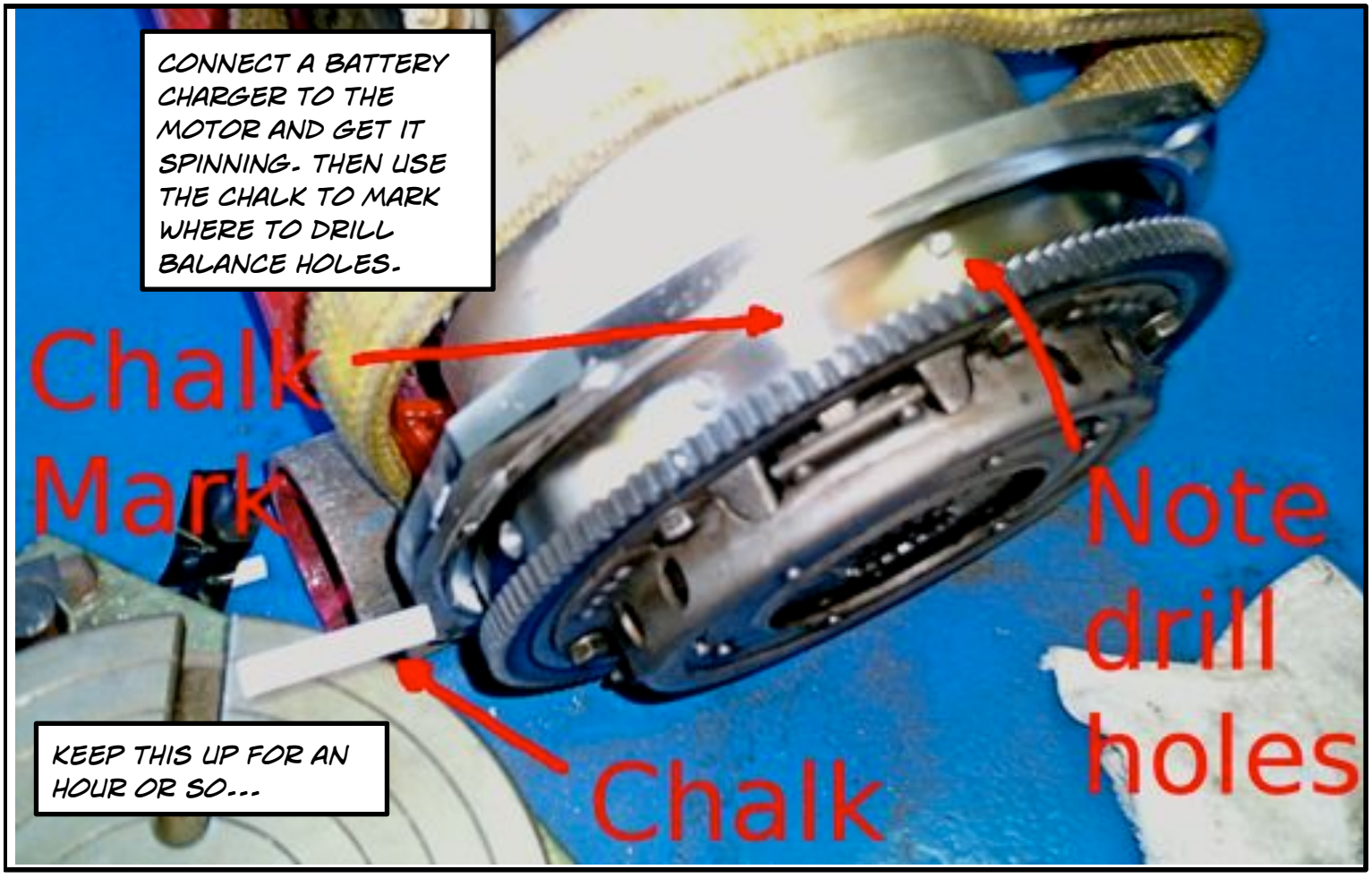
THE PAKTRAKR REMOTES ARE DAISY-CHAINED. WITH 10 BATTERIES, I HAVE 2 REMOTES.

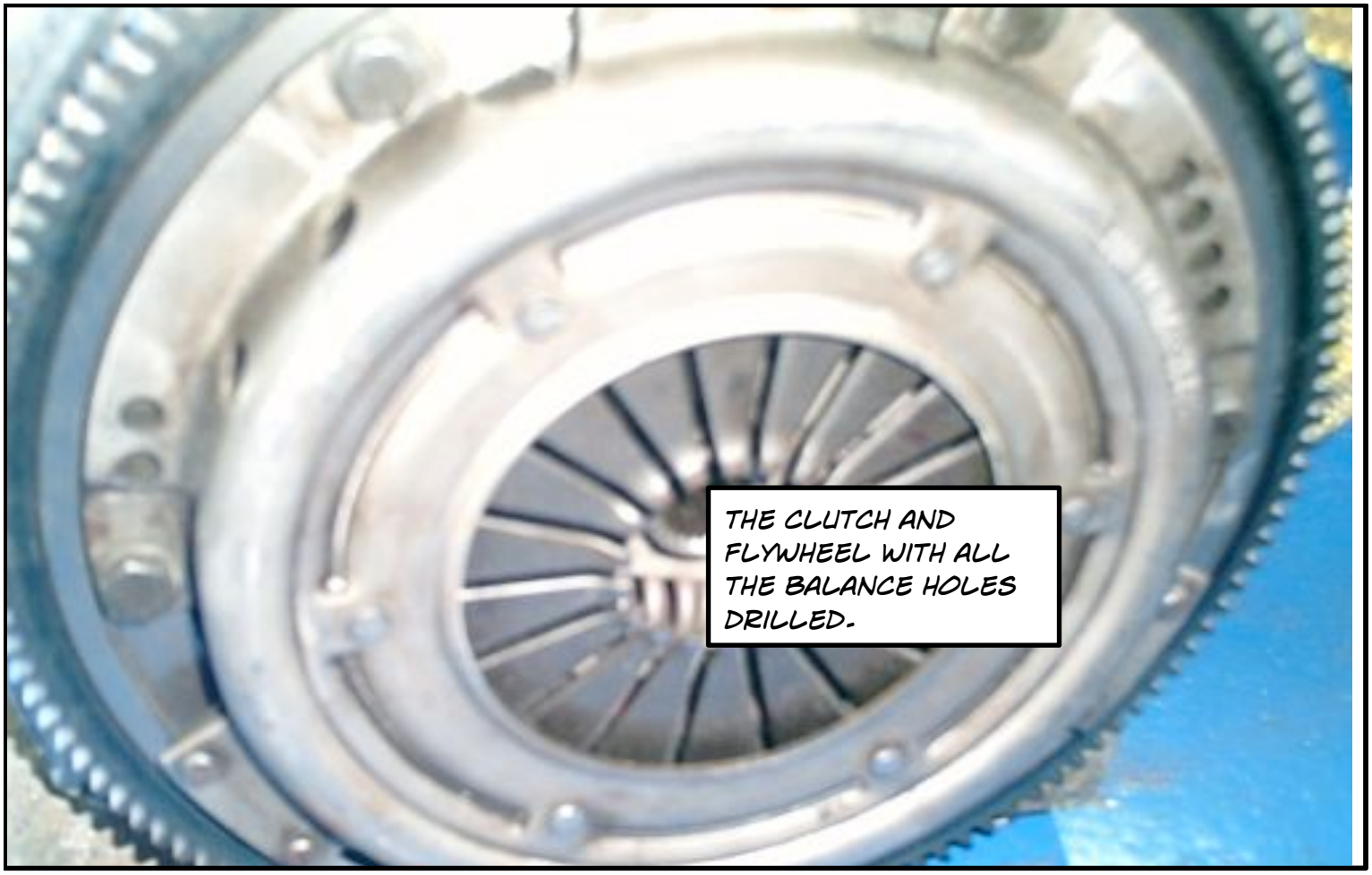


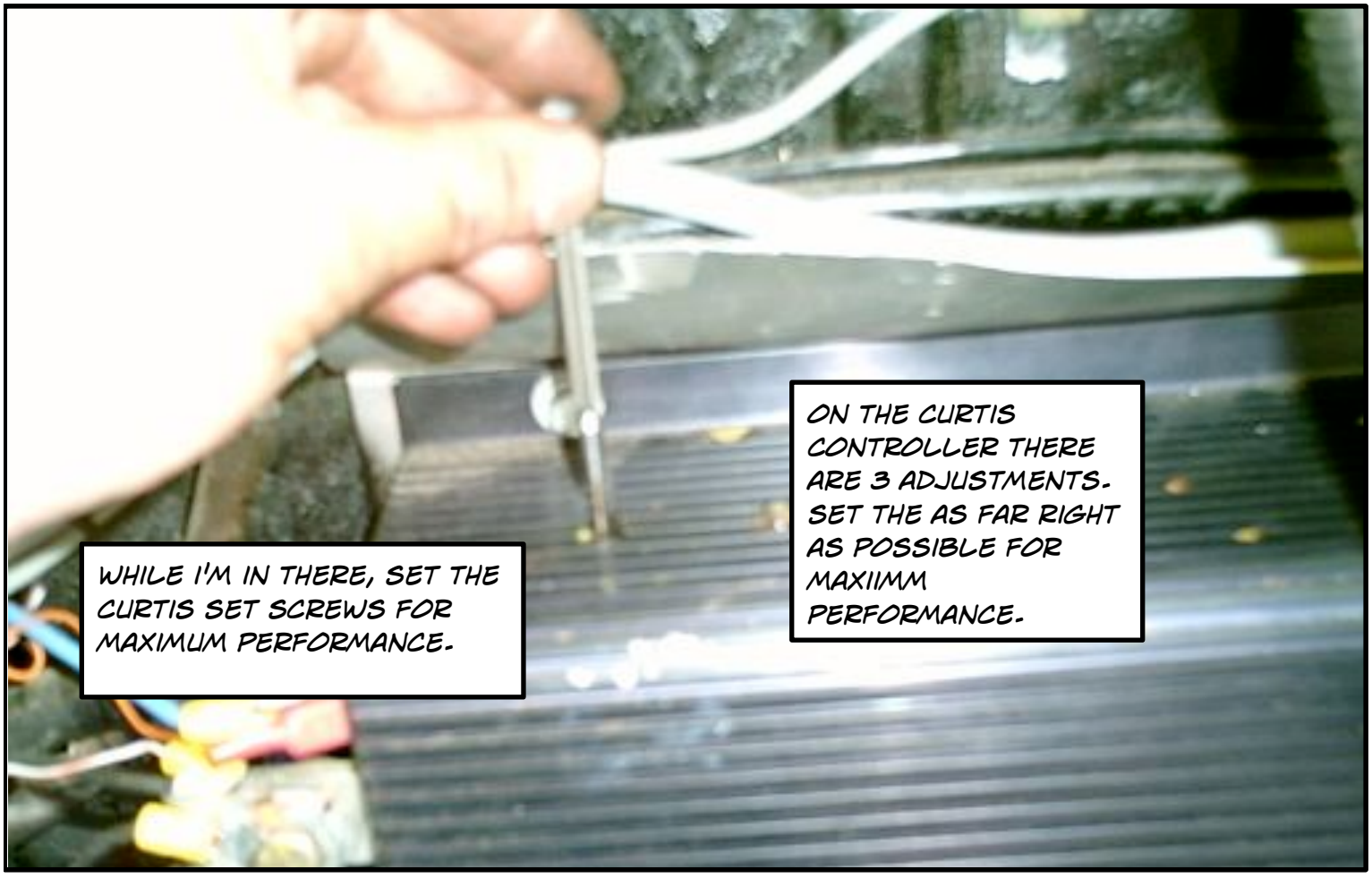
REVISION 2 REBALANCING THE MOTOR

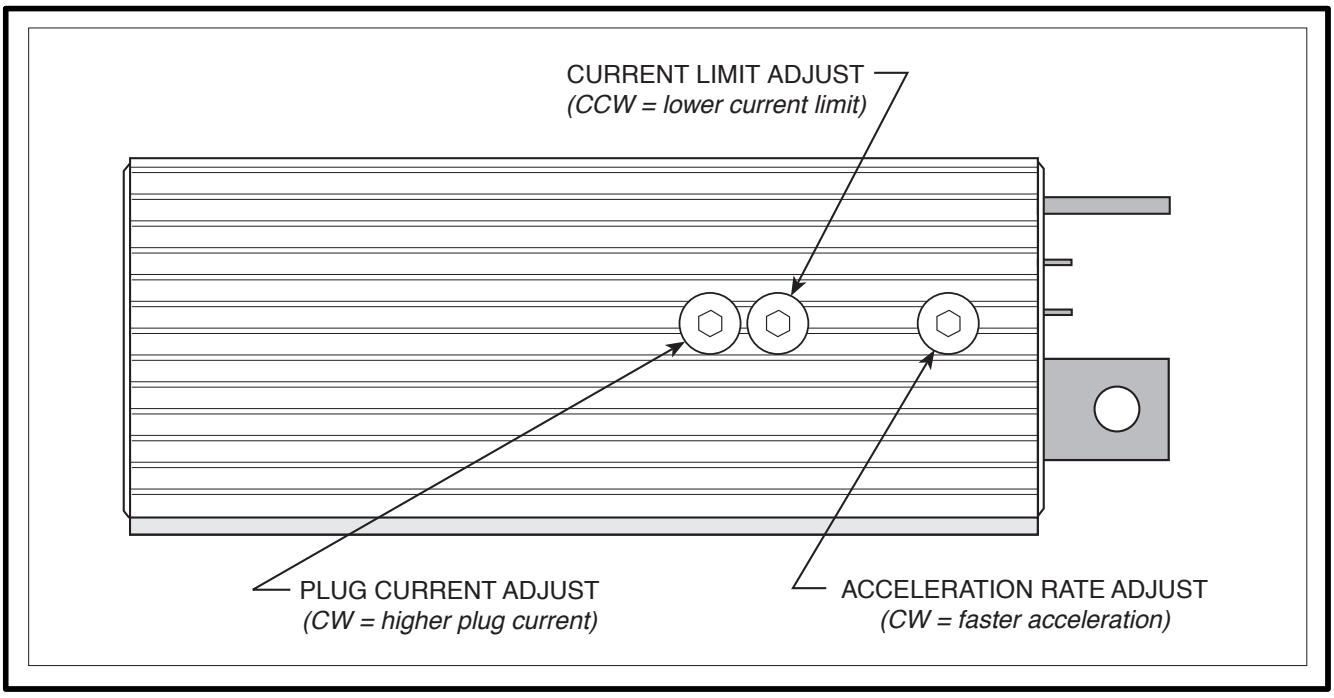
THIS SHOWS SOME SOUL SEARCHING.

I DIDN'T PROPERLY BALANCE THE FLYWHEEL ON THE MOTOR FIRST TIME ROUND. SO, I AD TO PULL OUT THE MOTOR AND DO IT RIGHT.




THE CLUTCH AND FLYWHEEL WITH ALL THE BALANCE HOLES DRILLED.

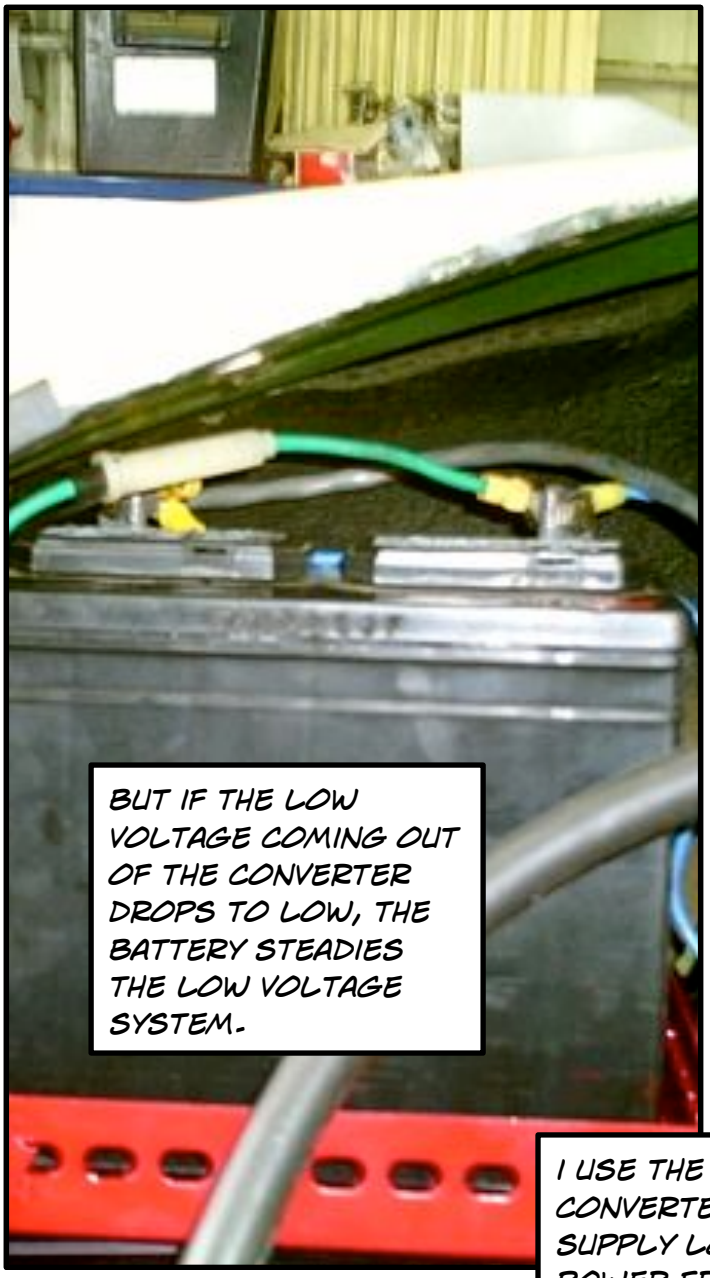

ON THE CURTIS CONTROLLER THERE ARE 3 ADJUSTMENTS. SET THE AS FAR RIGHT AS POSSIBLE FOR MAXIIMM PERFORMANCE.
WHILE I'M IN THERE, SET THE CURTIS SET SCREWS FOR MAXIMUM PERFORMANCE.



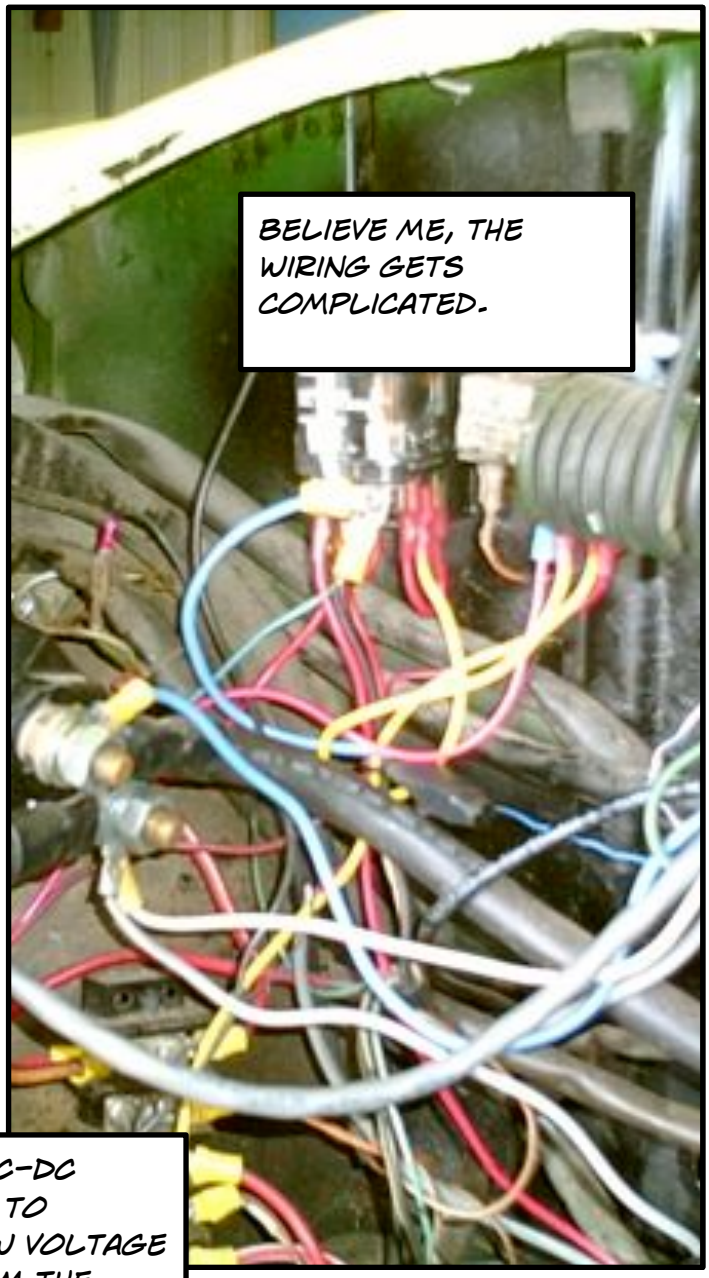
HERE ARE THE CURTIS CONTROLLER ADJUSTMENT SCREWS. SET THEM AS TURNING AS FAR RIGHT AS POSSIBLE.


PUT THE MOTOR BACK AGAIN...


HERE IS MY CUSTOM SOLAR PANEL THAT I BUILT FROM PLEXIGLAS AND EXTRUDED ALUMINUM. 18 VOLTS, 2 AMS

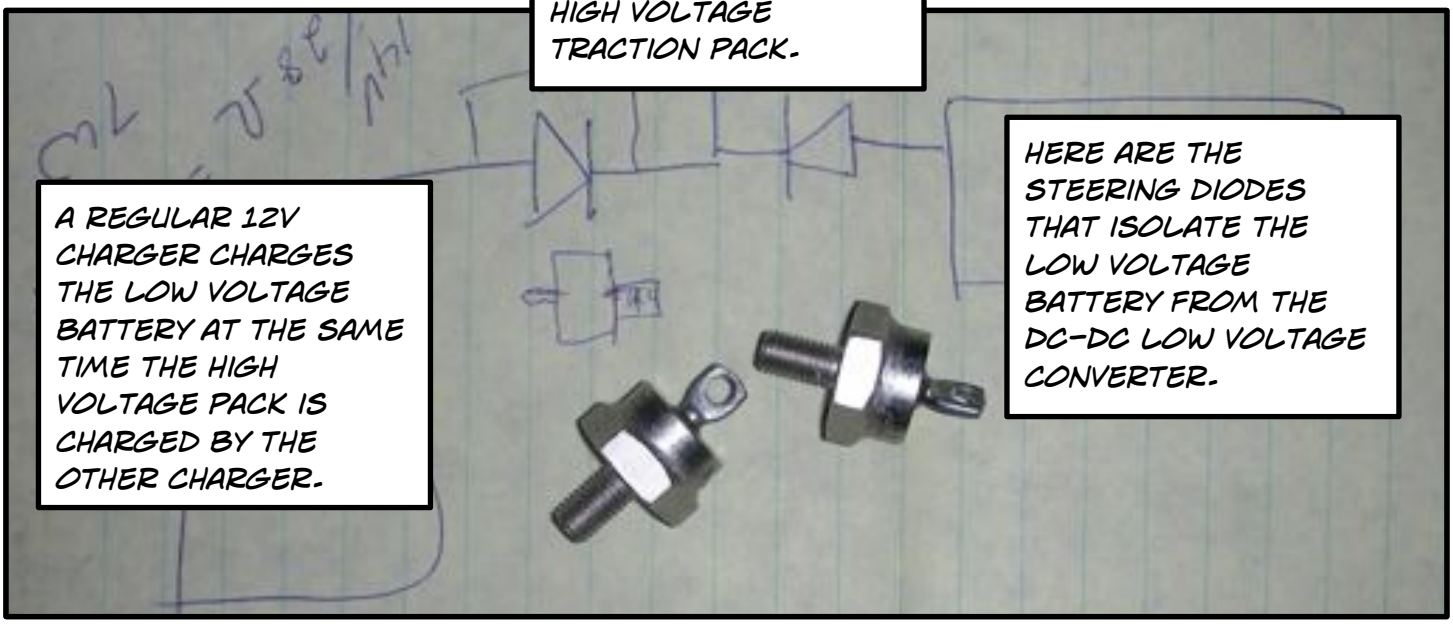


BUT IF THE LOW VOLTAGE COMING OUT OF THE CONVERTER DROPS TO LOW, THE BATTERY STEADIES THE LOW VOLTAGE SYSTEM.



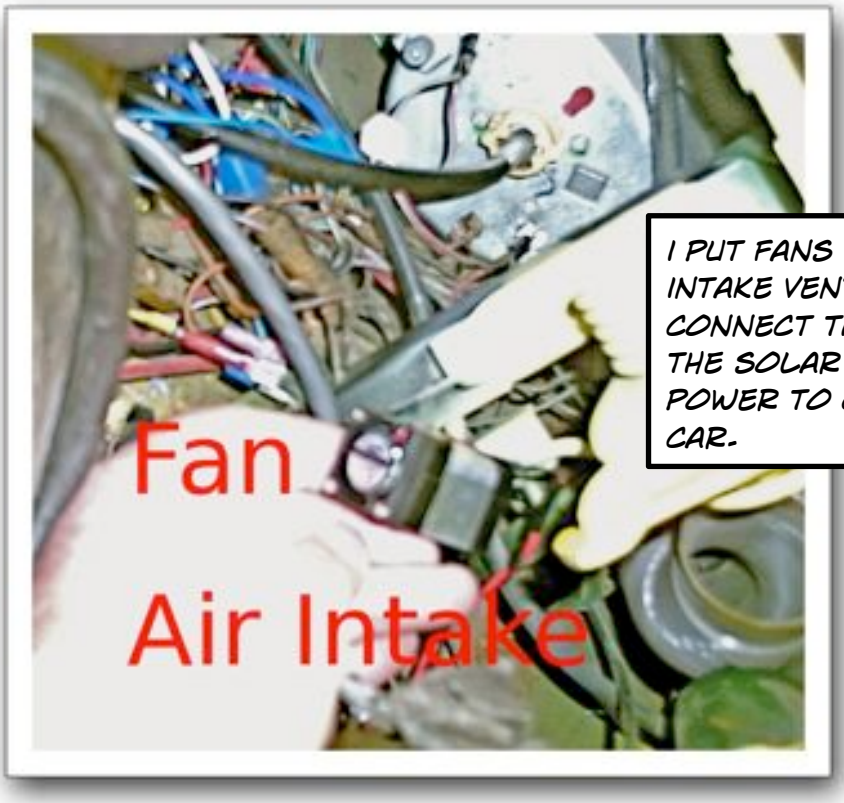
BELIEVE ME, THE WIRING GETS COMPLICATED.

I USE THE DC-DC CONVERTER TO SUPPLY LOW VOLTAGE POWER FROM THE HIGH VOLTAGE TRACTION PACK.

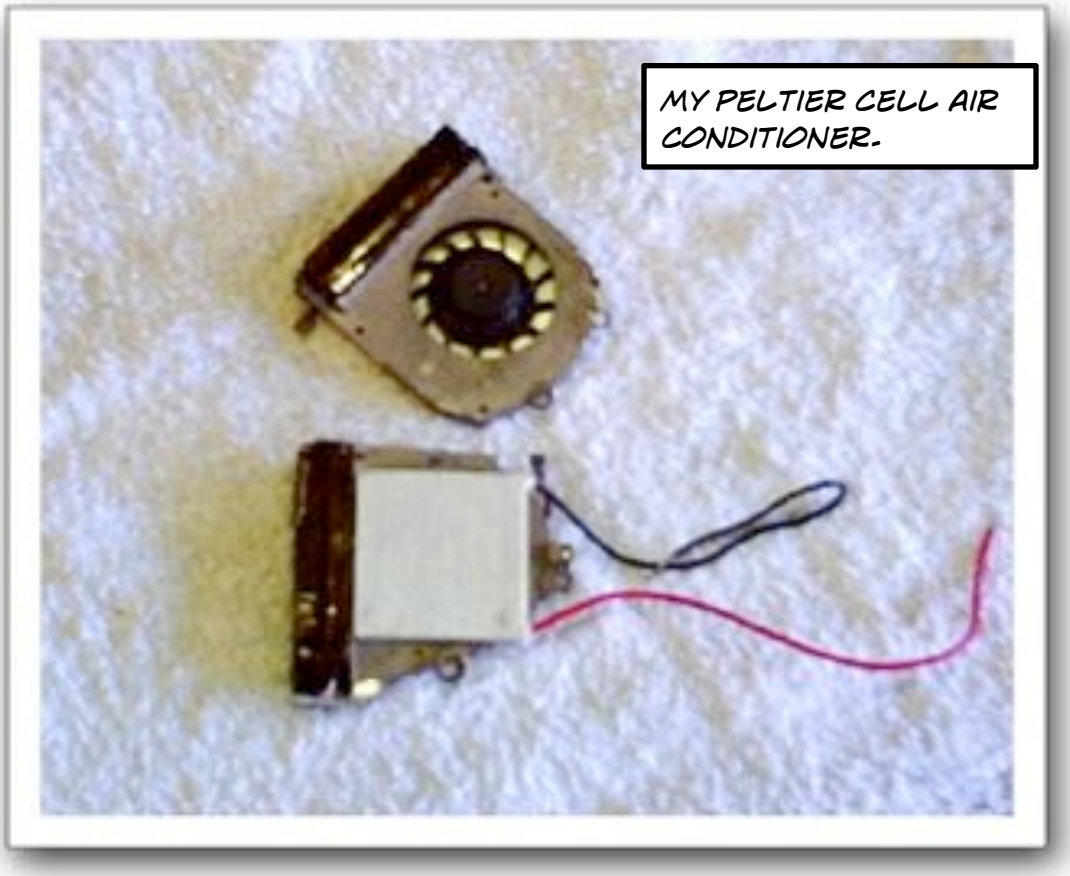


A REGULAR 12V CHARGER CHARGES THE LOW VOLTAGE BATTERY AT THE SAME TIME THE HIGH VOLTAGE PACK IS CHARGED BY THE OTHER CHARGER.

HERE ARE THE STEERING DIODES THAT ISOLATE THE LOW VOLTAGE BATTERY FROM THE DC-DC LOW VOLTAGE CONVERTER.



I PUT FANS IN THE AIR INTAKE VENTS, AND CONNECT THEM TO THE SOLAR PANEL POWER TO COOL THE CAR.



MY PELTIER CELL AIR CONDITIONER.

REVISION 3 - REPLACE THE DEEP CYCLE MARINE BATTERIES WITH NICKEL-ZINC.

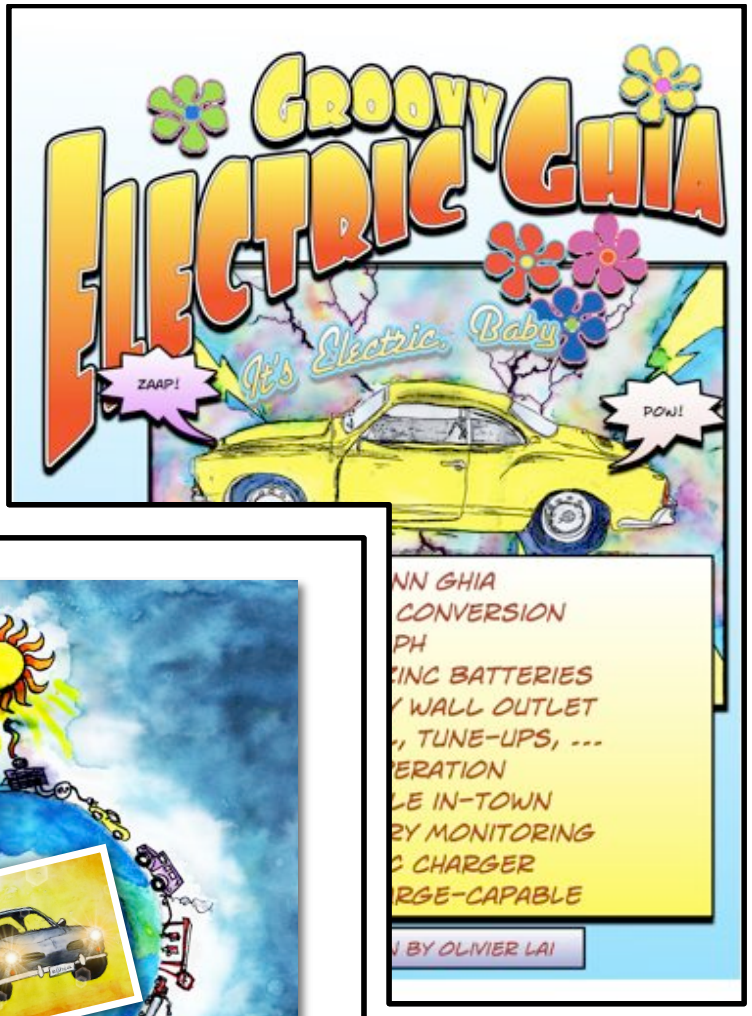


THESE ARE THE NEW NICKEL-ZINC BATTERIES I AM TRYING OUT.



PUBLIC RELATIONS SECTION



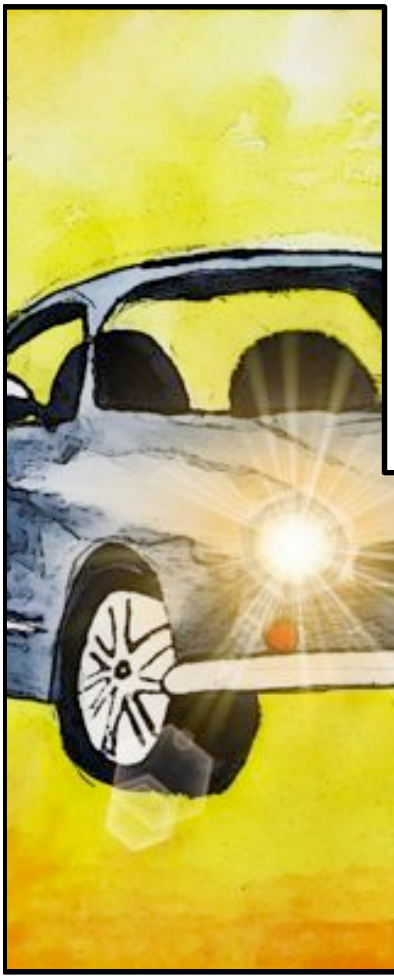


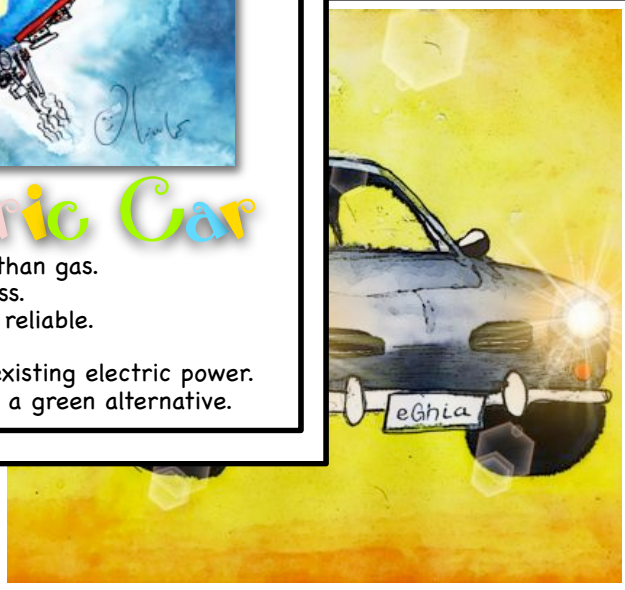


The Electric Car



Electricity is cheaper than gas.
Electric cars pollute less.
Electric cars are more reliable.
No foreign oil.
Electric cars can use existing electric power.
Better for the earth - a green alternative.





THE ELECTRIC FUTURE OF TRANSPORTATION

Dec 9

4:00PM
CFHT

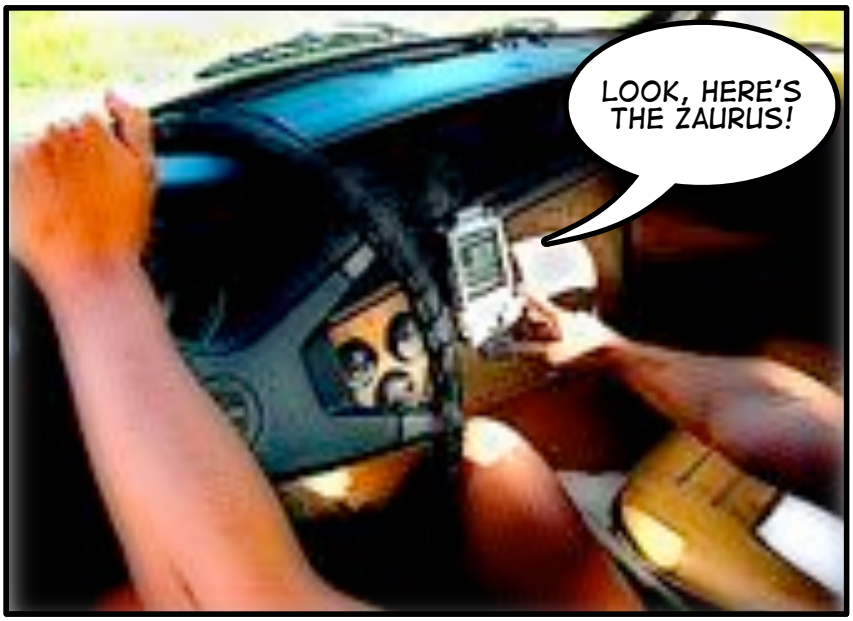
Followed by
Pau Hana

Be a Part of America's Energy Future

You are Cordially Invited to a Technicolor Multimedia Presentation on the Conversion of Gas to Electric Vehicles.

by
Doug Teeple
Illustrations by Olivier Lai, Music by the Blues Brothers, Meatloaf, Steppenwolf, George Harrison, Debbie Reynolds and more!


I PREFER MEN WHO HAVE ELECTRIC DRIVE, TO MEN WHO HAVE GAS!


LOOK, HERE'S THE ZAURUS!


ISN'T IT A GAS?
NO, IT'S A PLUG FOR THE EGHIA!!!


I GET A CHARGE OUT OF THIS!
WE DO TOO!!!


CAN YOU SPOT THE BATTERIES?
HERE WE ARE!!

HPA SUSTAINABILITY CONGRESS IN WAIMEA. SUMMER 2008.

A LOCAL NEWSPAPER REPORT.



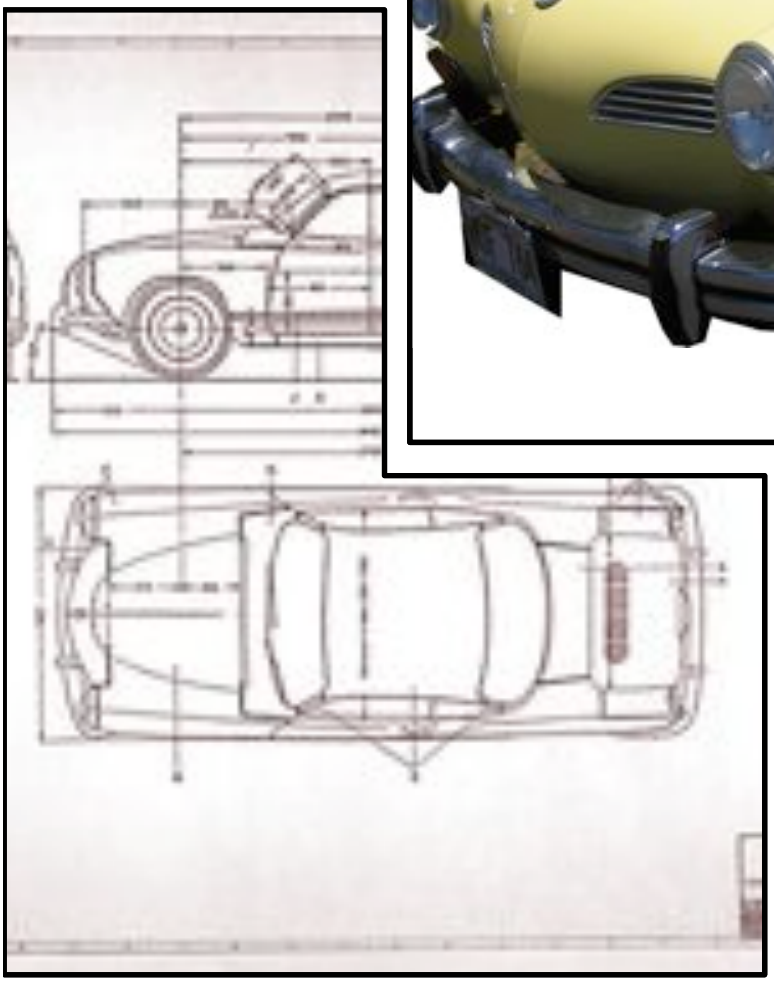
Plug it in

Students from around the Big Island preview the future of transportation —an electric car — during a workshop at the first annual Student Congress on Sustainability held June 8-11 at Hawaii Preparatory Academy. The electric car, formerly a gas-powered Carmen Ghia, was converted by workshop presenter Doug Temple (left), who has not been to a gas station in more than a year. Temple, a resident of Waimea, was one of 10 workshop leaders at the Congress, which was attended by about 80 high school students and teachers.




Electra-Glide for the








THE END