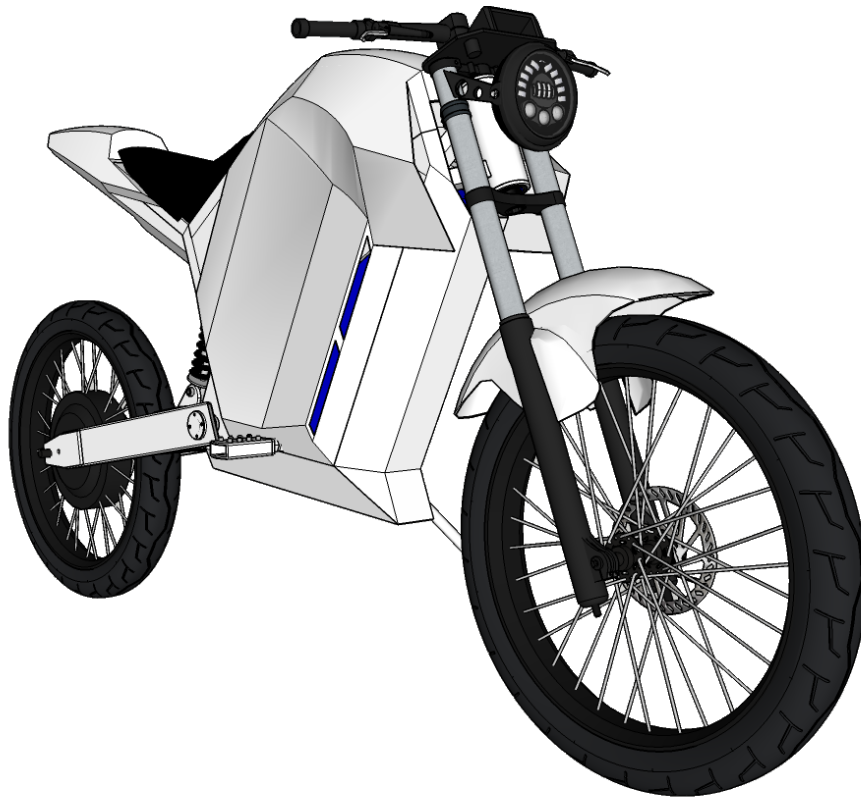


# 12 kW Electric Motorcycle

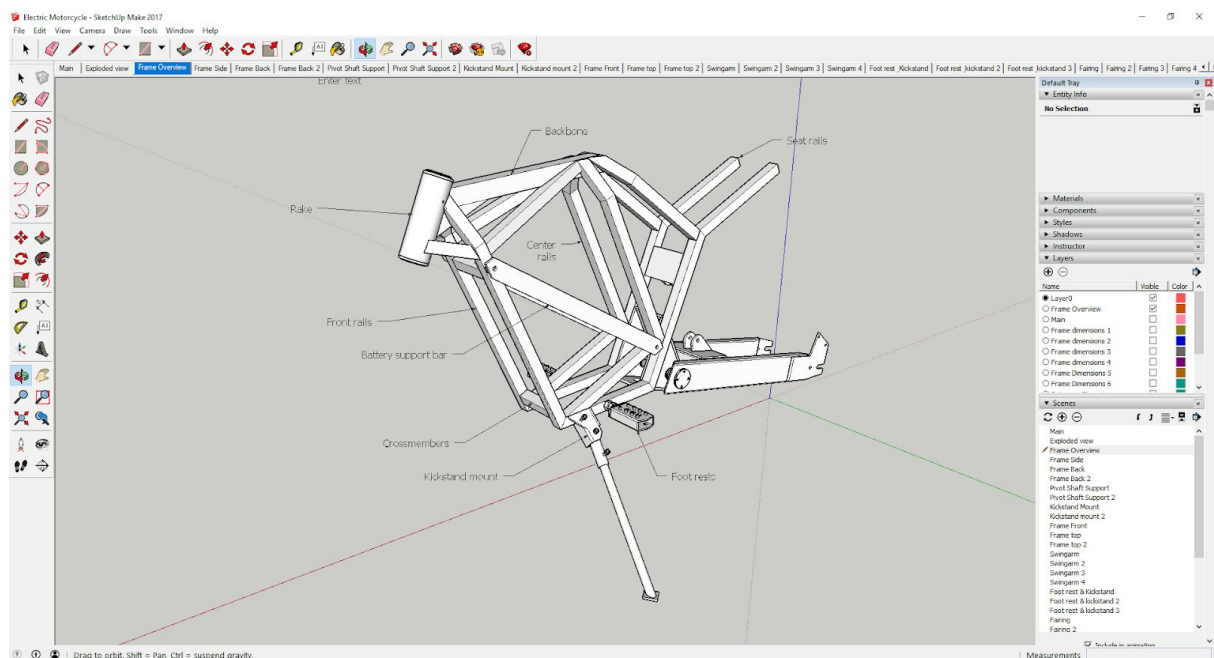


Created by  
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It's highly advised that you refer to the supplied 3D CAD model. The component dimensions are conveniently laid out in separate scenes - just click the tabs at the top of the page in Sketchup to navigate, and use the orbit tool to pan around the components for a clear view of the dimensional details (some of the images below may be difficult to interpret). If you don't have Google Sketchup software to open the file, you can use it online (for free) at the following link, no downloads necessary:

<https://www.sketchup.com/products/sketchup-for-web>



A build video for this project can be viewed for reference purposes at the following link, as well: <https://www.youtube.com/watch?v=UD3KymY86z8&t=1190s>

If you have any questions, don't hesitate to contact me at [jbiggar@resystech.com](mailto:jbiggar@resystech.com)

## TOOLS REQUIRED

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Tape measure

Builder's square

Hammer

Wood chisel

Hand saw

Jigsaw

Hack saw

Hole saw kit (1- $\frac{1}{4}$ " to 2- $\frac{1}{2}$ " )

Drill with drill bits ( $\frac{1}{8}$  to 1")

Screwdrivers or power driver

$\frac{3}{8}$ " drive ratchet and socket set, wrenches

Angle grinder with cut of and grinding wheels

Router with straight bit

Palm sander or belt sander, 80-200 grit sandpaper

Two 6" clamps

Tin snips

Wire cutters/strippers/crimpers

Voltmeter

Soldering iron

Air compressor

Welder (mig is fine)

Tap and die kit

Body fill applicators

Cheap small paint brushes

Lots of rags, acetone and mineral spirits for clean up  
(use acetone for cleaning resin, spirits for silicone)

## BILL OF MATERIALS

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### FRAME

20 feet of 1"x1" 11 gauge square steel tubing

6 feet of 1"x3" 11 gauge rectangular tubing

2 feet of 1.5"x1.5" 11 gauge square tubing

1 foot of 1"x2" 11 gauge rectangular tubing

2 square feet of 3/16" thick steel plate

1 square foot of 11 gauge steel plate

2 feet of 3/4" dia. steel round bar

4 feet of 1/4"x1.5" steel flat bar

6" length of 2" schedule 40 pipe (2.375" OD, 0.154" wall)

3" length of 1" schedule 40 pipe

Ten 1/2"-13 steel hex nuts

6" length of 1/2"-13 threaded rod

Four 1"x1/2"-13 bolts w/ flat washers & lock washers

Fifty 1"x1/4"-20 bolts w/ flat washers & lock washers

One 2.5"x1/4"-20 bolt w/ nut & washers

Six 3/4" ID Oilite self lubricating bronze bushings

Very strong, 3" long tension spring for kickstand

1 quart of primer and paint each

## SUSPENSION

Triple tree front fork suspension for 150-250cc motorcycle, such as:

<https://www.ebay.com/itm/Front-Fork-Suspension-Triple-Tree-SSR-Thumpstar-GPX-125-160cc-dirt-bike-110cc/132435363643?>

7/8" handlebars & handlebar risers

Rear motorcycle shock absorber (>1000lb), such as:

<https://www.aliexpress.com/item/32944117320.html?>

## DRIVE SYSTEM - follow the procedure in the build video for connections

8kW/12kWp brushless, gearless hub motor on 1.85x19" motorcycle rim  
(request a matching front wheel and hub to fit forks)

72V/150A speed controller, look for motor + controller kits that include a display and throttle, such as:

<https://www.aliexpress.com/item/32881656316.html?>

72V/60Ah lithium battery w/ 200A max discharge capability  
(battery compartment LxH = 12"x17.5") - the original bike uses two 72V/30ah batteries, each with 100A max discharge BMS's for a total 200A when connected in parallel:

<https://www.ebay.com/itm/72V-30ah-Lithium-LiFePO4-Battery-Pack-for-2200W-E-Bike-Scooter-5A-Charger-BMS/273527619566?>

72VDC/150A breaker:

<https://www.ebay.com/itm/100-150A-AMP-Circuit-Breaker-Car-Auto-Boat-Audio-Stereo-Fuse-Reset-Switch-US/123841360696?>

QS8-S anti-spark connector:

<https://www.ebay.com/itm/QS8-S-8mm-Anti-Spark-Connector-For-RC-ESCs-And-Lipo-Batteries/133144536065?>

5 feet of 12+awg stranded copper wire (power cables from battery to controller)

Hydraulic e-brake levers, calipers, and rotors (E-brakes connect to the controller and must be used for the drive system to work safely, but you should convert them to work with a master cylinder and motorcycle calipers/rotors):

<https://www.aliexpress.com/item/33037933512.html?>

## PLUG, MOLDS, FAIRING

Two sheets of 3/4"x4'x8' plywood

10 square yards of fiberglass mat

10 square yards of fiberglass cloth

~8 liters of polyester resin

2 gallons of pourable RTV mold silicone

3-4 tubes of 100% silicone caulking

Petroleum jelly

Wood glue

Wax paper

Front wheel fender:

[https://www.ebay.com/itm/Lowbrow-Customs-Shorty-Steel-Front-Fender-Harley-Sportster-Dyna-39mm-bobber-cafe/391547601667?ssPageName=STRK%3AMEBIDX%3AIT&\\_trksid=p2057872.m2749.l2649](https://www.ebay.com/itm/Lowbrow-Customs-Shorty-Steel-Front-Fender-Harley-Sportster-Dyna-39mm-bobber-cafe/391547601667?ssPageName=STRK%3AMEBIDX%3AIT&_trksid=p2057872.m2749.l2649)

## LIGHTING

72V-12V step down converter - connect this between the battery and the light circuits to step the voltage down from 72V to 12V:

<https://www.ebay.com/itm/36V-48V-60V-72V-12V-13-8V-5A-10A-20A-30A-40A-50A-DC-DC-Step-Down-Buck-Converter/223203115313?>

12V, 2 pin flasher relay:

<https://www.ebay.com/itm/2-Pin-12V-Electronic-LED-Flasher-Relay-Fix-Turn-Signal-Bulbs-Hyper-Flash-Issue/254168324313?>

12V 5" long led tail lights:

<https://www.ebay.com/itm/4PCS-5in-17LED-Motorcycle-SUV-Brake-Stop-Turn-Signal-Tail-LED-Strip-Light-Bar/372637762162?>

12V flowing led turn indicators:

<https://www.ebay.com/itm/Universal-Water-Flowing-LED-Motorcycle-Turn-Signal-Indicators-Blinkers-Dirt-bike/312746776091?>

12V headlight:

<https://www.ebay.com/itm/Motorcycle-HeadLight-Assembly-Headlamp-Fairing-Black-Fit-for-BAJAJ-PULSAR150-200/273202214874?>

12V horn:

<https://www.ebay.com/itm/12V-Waterproof-Loud-105dB-Universal-Motorcycle-Car-Electric-Bike-ATVs-Horn-New/254281537436?>

Universal multi-function handlebar switch:

<https://www.ebay.com/itm/Sicass-Racing-Multi-Function-Handlebar-Switch/333246508646?>

50 feet of 18 awg stranded copper wire

Electrical tape, male/female bullet connectors

## SEAT

~8"x6"x24" low, medium, or high density foam (user preference):

<https://www.ebay.com/itm/UPHOLSTERY-FOAM-SHEET-LOW-MEDIUM-HIGH-DENSITY-60-x-20-ANY-THICKNESS-SIZE/161506978664?>

4 way stretch vinyl fabric:

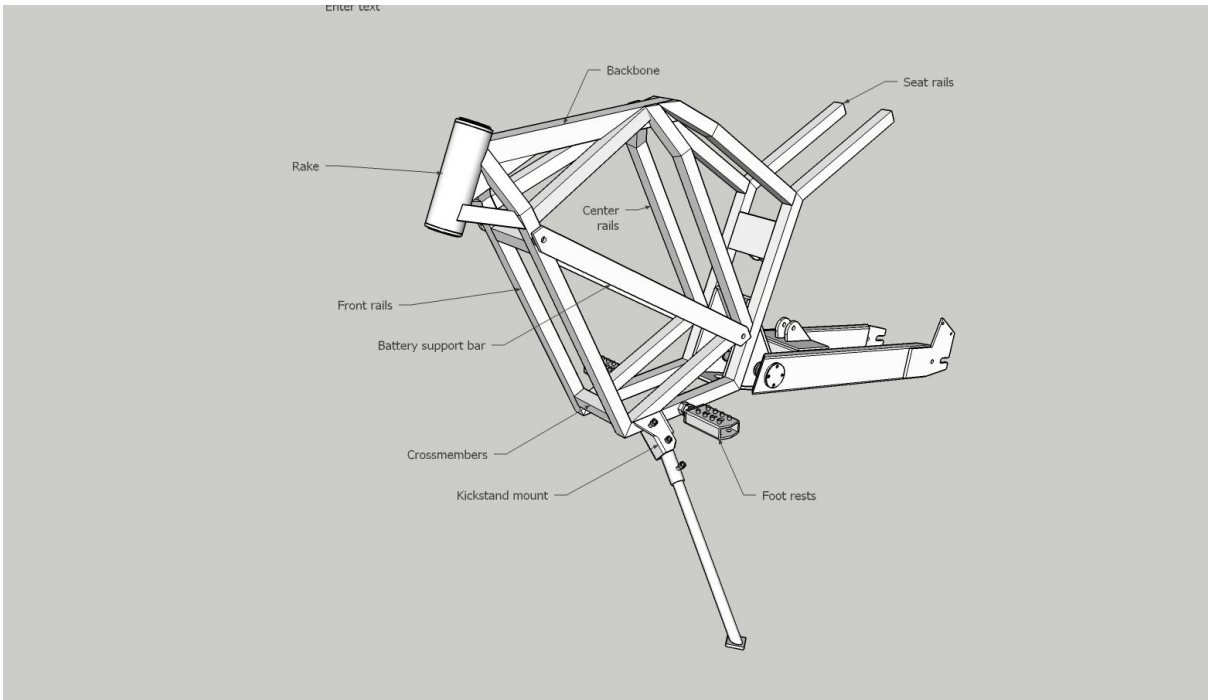
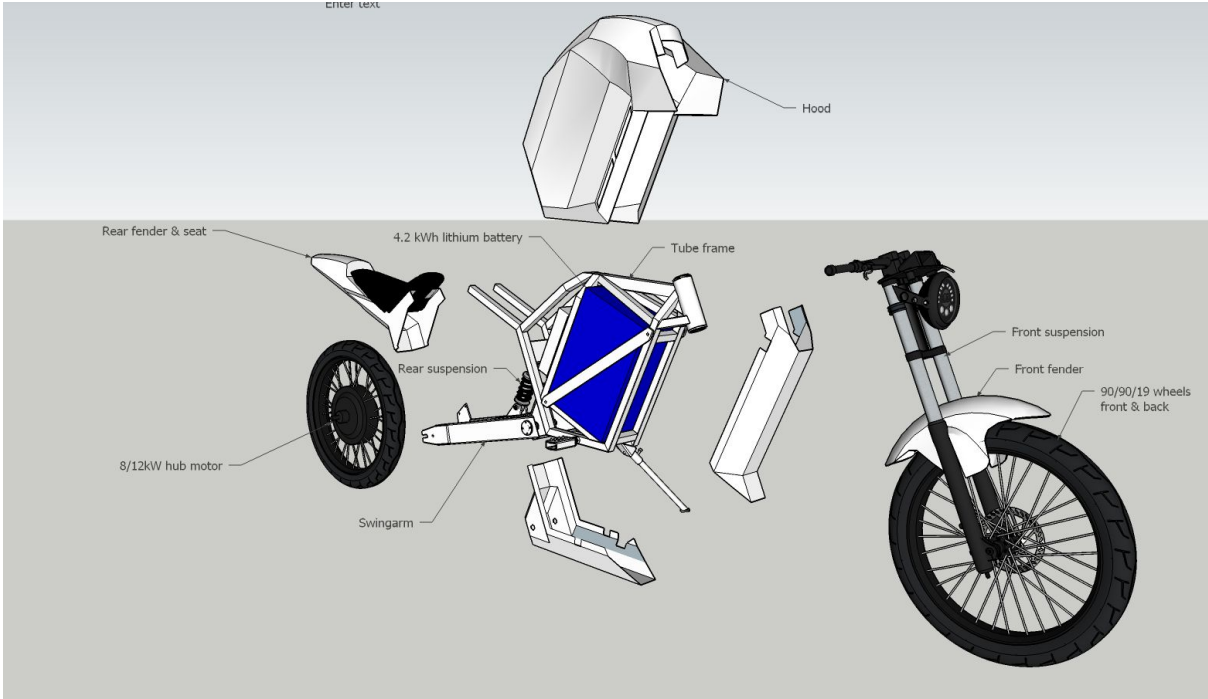
<https://www.ebay.com/itm/Polaris-9009-Black-4-Way-Stretch-Vinyl-Auto-Seat-Vinyl-Now-Mobile-Vinyl/201648110968?>

Torsion spring:

[https://www.ebay.com/sch/i.html?\\_from=R40&\\_trksid=p2047675.m570.l1313.TR12.TRC2.A0.H0.Xtorsion+spring.TRS0&\\_nkw=torsion+spring&\\_sacat=0](https://www.ebay.com/sch/i.html?_from=R40&_trksid=p2047675.m570.l1313.TR12.TRC2.A0.H0.Xtorsion+spring.TRS0&_nkw=torsion+spring&_sacat=0)

1/4"x7" steel round bar





Tip: layout the profile of the frame on a sheet of plywood, and use it as a template

