Powertrain for EV links

Machine Design magazine - article

<https://www.machinedesign.com/motorsdrives/whats-difference-between-ac-induction-permanent-magnet-and-servomotor-technologies>

Golden Motors – China Supplier has motors end EV batteries

<https://www.goldenmotor.com/>

KB Electronics (US subsidiary of a Japanese company NIDEC)

<http://acim.nidec.com/drives/kbelectronics>

Sivetec MSA 3300

<https://phys.org/news/2014-10-space-weight-electric-cars.html#nRlv>

<https://www.siemens.com/global/en/home.html>

<https://w3.siemens.com/topics/global/en/electromobility/Pages/powertrain-ecar.aspx>

NAVAL POSTGRADUATE SCHOOL MONTEREY, CALIFORNIA THESIS by Bill J. Nytko , June2010 pdf

MODELING AND DEMONSTRATING REGENERATIVE BRAKING OF A SQUIRREL CAGE INDUCTION MOTOR WITH VARIOUS DECELERATION RATES USING V BY F CONTROL

<https://apps.dtic.mil/dtic/tr/fulltext/u2/a524868.pdf>

Induction Motor Braking Regenerative Plugging Dynamic Braking of Induction Motor

July 30, 2018 by Electrical4U

<https://www.electrical4u.com/induction-motor-braking/>

New SiC FET Option for EV Charging Applications from UnitedSiC Adds 4-Lead Kelvin Device

<https://www.allaboutcircuits.com/news/unitedsic-adds-a-4-lead-kelvin-device-to-the-uf3c-fet-family/?utm_source=All+About+Circuits+Members&utm_campaign=a6ecc18a4b-EMAIL_CAMPAIGN_2019_06_26_06_54_COPY_01&utm_medium=email&utm_term=0_2565529c4b-a6ecc18a4b-280381025/>

Vishay MOSFETs

<https://www.mouser.com/new/vishay/vishay-4th-gen-e-series-mosfets/>

How to Measure Ripple and Transient in Power Supplies

<https://www.cui.com/blog/how-to-measure-ripple-and-transient-in-power-supplies?utm_source=all-about-circuits&utm_medium=paid-advertising&utm_content=online-native&utm_campaign=how-to-measure-ripple-and-transient-in-power-supplies>

How to size a supercapacitor

<http://videos.eaton.com/detail/videos/electronic-components/video/6034887982001/how-to-size-a-supercapacitor?autoStart=true&utm_source=All+About+Circuits+Members&utm_campaign=eae877ea95-EMAIL_CAMPAIGN_2019_07_03_05_21&utm_medium=email&utm_term=0_2565529c4b-eae877ea95-280381025>

TI components and examples

<http://www.ti.com/applications/industrial/motor-drives/overview.html>

800VA Pure Sine Wave Inverter

<http://www.ti.com/lit/an/slaa602a/slaa602a.pdf>

[www.ti.com/noanforprocessors](http://www.ti.com/noanforprocessors)

<https://www.mouser.com/new/texas-instruments/national-simple-switcher-ti-processors/>

MSP430F676x1 Polyphase Metering SoCs

<http://www.ti.com/lit/ds/symlink/msp430f67641.pdf>

PowerPSoC Intelligent LED Driver

<https://www.mouser.com/datasheet/2/100/CY8CLED0xD01_CY8CLED0xD02_CY8CLED0xG01_001-46319_0-469898.pdf>

Here are some sources for motor drives

<https://www.driveswarehouse.com/dc-drives>

DC regenerative controller

<http://www.polyspede.com/?p=400>

<http://www.polyspede.com/wp-content/uploads/2015/05/spedesterb.pdf>

More

<http://www.evbeetle.com/>

<https://www.google.com/search?q=AC+motor+regenerative+breaking+schematics&rlz=1C1GGRV_enUS759US759&oq=AC+motor+regenerative+breaking+schematics&aqs=chrome..69i57.24351j1j8&sourceid=chrome&ie=UTF-8>

Thesis on regenerative breaking

<https://apps.dtic.mil/dtic/tr/fulltext/u2/a524868.pdf>

<https://auto.howstuffworks.com/auto-parts/brakes/brake-types/regenerative-braking1.htm>

### Sources

* BrakeByWire.com. (Jan. 13, 2009) <http://www.brakebywire.com/>
* Cantwell, Katie. "Regeneration Overview." Rockwell Automation Allen-Bradley. May 7, 2002. (Jan. 13, 2009) <http://www.ab.com/drives/techpapers/RegenOverview01.pdf>
* Chen, Jason. "Panasonic Makes Electric Bike with Regenerative Braking." Gizmodo. July 7, 2008. (Jan. 13, 2009) <http://gizmodo.com/5022587/panasonic-makes-electric-bike-with-regenerative-braking>
* Continental Corporation. "ISAD and EHB Make Cars More Economical and More Environmentally Friendly." March 17, 2002. (Jan. 13, 2009) <http://www.conti-online.com/generator/www/com/en/continental/portal/themes/press_services/press_releases/products/automotive_systems/brakesystems/pr_2002_03_17_7_en.html>
* Gitlin, Jonathan M. "McLaren and Freescale partner up for regenerative braking." Ars Technica. Nov. 5, 2008. (Jan. 13, 2009) <http://arstechnica.com/news.ars/post/20081113-mclaren-and-freescale-partner-up-for-regenerative-braking.html>
* HybridCars.com. "Hydraulic Hybrids." April 3, 2006. (Jan. 13, 2009)<http://www.hybridcars.com/related-technologies/hydraulic-hybrids.html>
* Torrens, Richard. "Regen Braking." 4QD. Nov. 3, 2008. (Jan. 13, 2009) <http://www.4qd.co.uk/fea/regen.html>
* Tur, Okan, et al. "Application Note on Regenerative Braking of Electric Vehicles as Anti-Lock Braking System." Ansoft, LLC. April 11, 2006. (Jan. 13, 2009)<http://www.ansoft.com/news/articles/RegenBrakingAsABS.pdf>

SEARCHING FOR A MOTOR TO DRIVE OUR DIY EV

<https://www.wired.com/2009/11/diy-ev/>

<https://w3.siemens.com/topics/global/en/electromobility/pages/powertrain-ecar.aspx>

<https://w3.siemens.com/topics/global/de/elektromobilitaet/PublishingImages/antriebe-pkw/pdf/innovative-technology-hybrid-ecar_en.pdf>

Scott Drive 100 AC Motor Controller for Siemens 1PV5135 4WS14 Price:  $4,888.00

<https://www.evwest.com/catalog/product_info.php?products_id=293>

<http://www.metricmind.com/category/ev-ac-drive-systems/>

This vender has a dual encoder harmonic drive FHA-C mini series that looks interesting.

<https://www.harmonicdrive.net/products/rotary-actuators/solid-shaft-actuators/fha-mini-dual-absolute>

These sources have EV conversion kits and individual components

<https://evsource.com/pages/conversion-components-and-kits>

<https://www.evwest.com/catalog/index.php?osCsid=94rt8jb9oolt10o3mbtu421qa7>

<https://www.thunderstruck-ev.com/>

<https://www.electriccarpartscompany.com/>

This pdf has helpful info about choosing conversion kit and motor sizing

<http://www.electriccarpartscompany.com/assets/images/Motor-Primer1.pdf>

Hp Required Formula: Rolling Resistance (hp) + Aerodynamic Drag (hp) + Hill Climbing ((hp) + Acceleration (Hp) Rolling Resistance is typically 1% for every 1000 pounds of vehicle weight on level ground traveling at a speed of 25 MPH. Or 1.5 HP for each 1000 pounds of vehicle on level ground. Thus a 4000 pound vehicle would require a minimum of 6 Hp. 4000 x 1.5 Hp =6 Hp.

Hill Climbing: Hills naturally require more Hp. A 1% grade means that the elevation will increase 1 foot for each 100 foot traveled. You can use 1 HP for each percentage of grade. This calculation is the same as your rolling resistance. A 6% grade will require you to take 6 times the car weight rolling resistance to calculate the Hp required. (Remember that it takes 6 to 8 Hp for every 1000 pounds of car) Thus a 4000 pound car would require 4x6Hp x 2 or 48 Hp to push it 50 MPH up a 2% grade.

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<https://www.wired.com/2009/11/diy-ev/>

<https://w3.siemens.com/topics/global/en/electromobility/pages/powertrain-ecar.aspx>

<https://w3.siemens.com/topics/global/de/elektromobilitaet/PublishingImages/antriebe-pkw/pdf/innovative-technology-hybrid-ecar_en.pdf>

Scott Drive 100 AC Motor Controller for Siemens 1PV5135 4WS14 Price:  $4,888.00

<https://www.evwest.com/catalog/product_info.php?products_id=293>

<http://www.metricmind.com/category/ev-ac-drive-systems/>

Siemens

<https://www.industry.usa.siemens.com/drives/us/en/electric-drives/ac-drives/ac-drives-apps/power-regendrives/pages/power-regenerative-drives.aspx>

<https://www.industry.usa.siemens.com/drives/us/en/electric-drives/ac-drives/high-performance-and-servo-drives/sinamics-s120-modular-drive-system/Documents/Catalog_D21_3-SINAMICS_S120_S150.pdf>

Regenerative Drive – these are DC

<https://www.precision-elec.com/shop/dcs800-s02-0050-05/>

<https://www.precision-elec.com/shop/dcs800-s02-0075-05/?gclid=EAIaIQobChMIs7m879e94gIVRkOGCh0WuQBCEAQYAiABEgJauPD_BwE>

regenerative breaking

<https://www.engineering.com/ElectronicsDesign/ElectronicsDesignArticles/ArticleID/17625/How-Regenerative-Braking-Works.aspx>

<https://www.machinedesign.com/mechanical-drives/three-phase-induction-motors-put-brakes>

Electric Car Thesis

<http://www.chalmers.se/SiteCollectionDocuments/Energi%20och%20milj%C3%B6/Elteknik/EmmaGrunditz_PhDthesis_lowrez.pdf>

<https://www.vfds.com/variable-frequency-drives#/rated-hp-20hp-a17-v20HP/sort=p.sort_order/order=ASC/limit=15>

<https://www.vfds.com/outlet#/rated-hp-20hp-a17-v20HP/input-voltage-460v-a21-v460V/sort=p.sort_order/order=ASC/limit=15>

<http://irtfweb.ifa.hawaii.edu/~tcs3/tcs3/Misc/CFHT/Dome_drive_upgrade/Baldor/Brouchers%20and%20catalogs/Baldor%20drives%20and%20capabilites-pgs4-6,46,48,102-103.pdf>

<https://www.practecllc.com/product/1298376874>

<https://www.yaskawa.com/products/drives/industrial-ac-drives/system-components/rc5-regenerative-unit>

drive

[www.abb.com/cawp/seitp202/027f170181f200e885256d6b00533fa6.aspx](http://www.abb.com/cawp/seitp202/027f170181f200e885256d6b00533fa6.aspx)

<https://www.driveswarehouse.com/D4Q1-200-P21897.aspx>

Siemens regenerative drives

<http://www.industry.usa.siemens.com/drives/us/en/electric-drives/ac-drives/ac-drives-apps/power-regendrives/Pages/power-regenerative-drives.aspx>

<http://www.emersonindustrial.com/en-EN/documentcenter/Emerson%20IA%20Automation%20Solutions%20Documents/OilandGas/White_Paper_Variable_Speed_Drive_regenerative_type_ESP_pumps.pdf>

<https://www.electrical4u.com/induction-motor-braking/>

<http://www.engineeringtoolbox.com/electrical-motor-calculator-d_832.html>