



This is a basic design for a DC motor with two limit switches that employs dynamic braking. It's presented in the best way I can using the free Scheme-it at Digikey.com who is an electronics distributor. I agree, it's hard to understand in this form, but bear with me. RY1 and RY2 are typical automotive style relays. Note that at rest both sides of the motor are grounded. If either relay is energized, power flows to ground through the unenergized relay. If they both happen to be activated, then both sides of the motor are connected to Vaa, or a high current motor supply. The wires to the NC (Normally closed contacts should be short). The inverted triangles without the D, designate a high current ground. Note the diode polarity across the coil. This relay symbol is for a relay with an integral diode. Some automotive relays come with one. Most do not. One can be added by soldering carefully at the pins. The automotive relay has a polarity convention which no one pays attention to. A dual socket with wire leads is available. Across the motor is a bridge rectifier with an optional RC filter/current limiter. With this, one can detect if the motor is moving. The circuit needs more work to be effective because, minus of the bridge cannot be grounded, thus an OPTO-Isolator or OPTOMOS relay (a chip) needs to be added. OK, now what? The signal chosen to operate the relay is a positive voltage (Bridge the "Goto A" or "Goto B" connection). If the system is not at a limit the signal gets to the A or B relay. If both are activated at the same time, nothing happens. The common connection is digital ground or a low current ground compared to the motor. Furthermore, the "@ Limit A" and "@ Limit B" provide +12V if the device is at a limit.