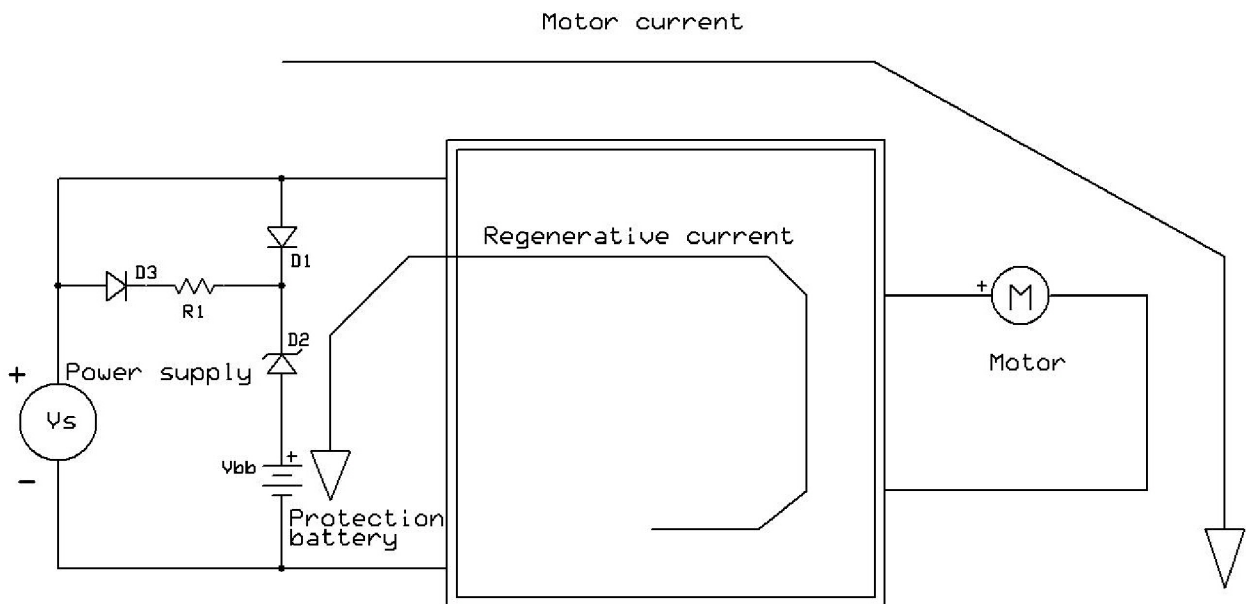


Power supplies are prone to failure if regeneration occurs at a voltage higher than the power supply can tolerate. A solution is to put in parallel to the power supply a rechargeable battery of higher voltage that absorbs the extra regeneration energy. The battery never conducts and mostly absorbs recharging regeneration current so the battery can be of fairly small size.

A simple circuit will:

- q Prevent that the power supply feeds into the battery (diode D1)
- q Maintain a minimum voltage (V_s) across the battery (diode D3)

The regenerative voltage is clamped to $(V_{bb} + D1 + D2)$. It is mandatory that the power supply is rated capable of handling such voltage. D2 is needed only if V_{bb} is too close to V_s so the clamping voltage needs to be slightly increased. A string of diodes will behave like a zener diode of few volts.



Please note:

- q Experiment with regeneration. Ensure the max battery temperature is not exceeded.
- q V_{bb} must be mechanically shielded in case of failure induced by excessive recharging current.
- q D1 and D2 conduct only during regeneration for a short period of time. They can be rated for relatively low current.
- q D3 purpose is to provide a recharging path to V_{bb} . R1 needs to be sized for a modest recharging trickle current.