

Installation Tips

An SRE Bulletin on Making Your Installations Easier!

Application Note #10: Using an External Plug Resistor or Diode

What an External Plug Diode or Resistor Does

During plug braking the motor of a truck is driven in reverse and becomes a generator. The motor generates a voltage¹ high enough to cause current to flow through the controller's plugging diodes. The level of this current is controlled by the controller. The energy from the motion of the truck is dumped into the motor and the controller as heat. This heat is the ultimate limiting factor on the strength of plugging that the controller and motor can withstand.

The strength of the plugging is a result of both the voltage and the current. Increasing either one, while keeping the other constant, will increase the plugging strength. The current can

¹ The voltage required to cause current to flow through a plugging diode is approximately 0.7 - 1 volt. It varies slightly with the level of current flowing through the diode but can be considered approximately constant.

only be increased to the capability of the controller. The voltage can be increased by increasing the voltage drop that must be overcome for a specific current. This is what the external plug resistor or diode does. Also, since a significant amount of energy is lost in the external diode or resistor the amount of heat the controller is subject to for a given amount of plugging is decreased².

Trucks With an Existing Plugging Resistor³

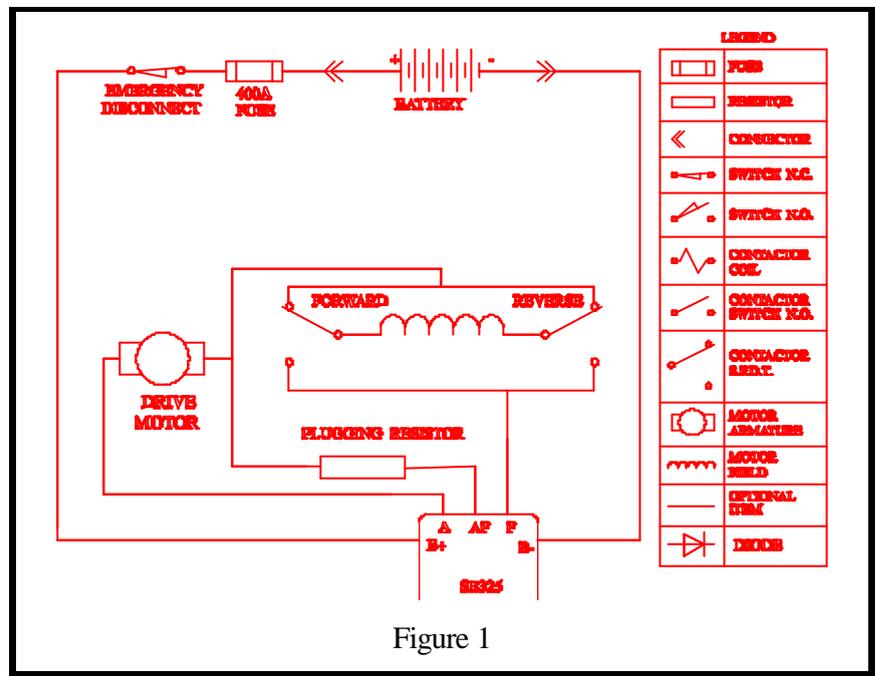


Figure 1

For trucks that had a plugging resistor already installed wire the resistor in as shown in figure 1. This resistor is already sized appropriately for the truck. Other than that the installation

² Note: The controller will be subject to the same level of heat for a given current with or without the external device, but since the external device increases the plugging strength you get greater braking for the same heat.

³ Sometimes called aB resistor.



can be treated as any truck without a plugging resistor.

Trucks Without an Existing Plugging Resistor

Normally trucks without a plugging resistor will not need any external plugging device. Only consider this technique if you cannot get enough braking strength with the SE325 alone.

Wire a plugging diode⁴ in the power section as

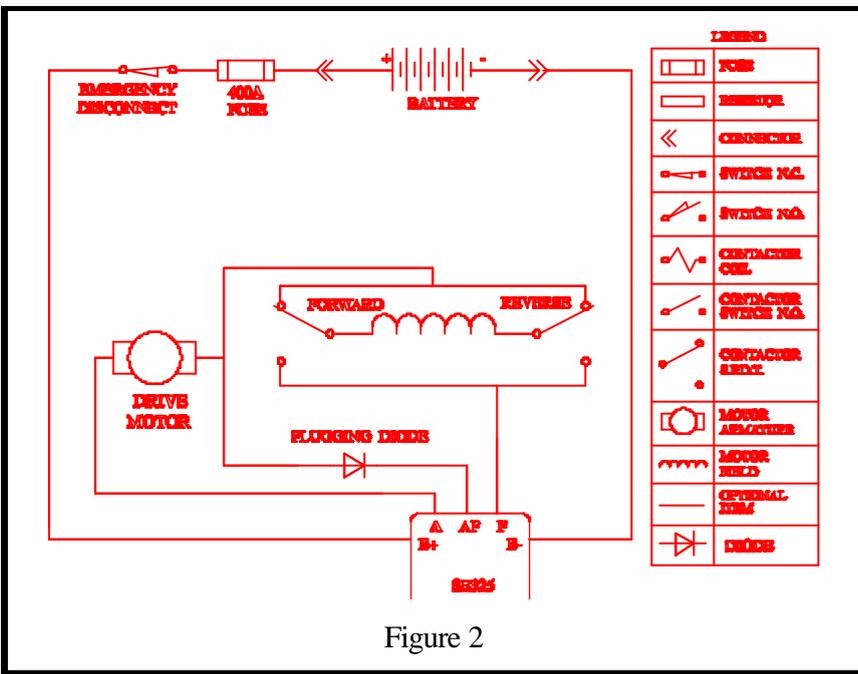


Figure 2

shown in figure 2. Readjust the plugging to take into account the added voltage drop of the diode. The addition of the extra diode may or may not have a sufficient effect on the braking to justify its use. The only way to be sure is to try it. It is a relatively simple technique to try to increase braking strength.

Revision History:

96-01-20 RTA -- Original Version.

⁴ Although a resistor could be used instead of a diode sourcing and specifying the proper sized power resistor is more difficult than sourcing a power diode.