

TECHNICAL SOURCE GUIDE

SOLENOIDS FOR REMOTE STAGE EFFECTS

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At Northwestern University we have used electrical solenoids for a wide range of remote release effects. During our production of K2, a section of the mountain ledge which had previously been weight-bearing was released and dropped out of sight during an avalanche. In Cabaret a series of Nazi flags were released from catwalk-mounted drop boxes, and in The Christmas Schooner this fall, ship's rigging which had previously been used by actors fell to the deck during a storm.

All of these effects were achieved with electrical solenoids, which are electromagnets that push or pull a shaft upon the delivery of electricity. Solenoids are used in a wide variety of household appliances, including washing machines and dishwashers and are commonly available at commercial equipment dealers.

The solenoid's shaft typically ends in a drilled flange to which hardware is bolted. For all three of the effects previously mentioned, a round shaft, like a thin pipe, was bolted to the solenoid. At installation the pipe was then run through an eye bolt or pipe clamp to stabilize it, and then through a second clamp from which it retracted. The stroke length (how far the shaft moves) is enough to retract the pipe from the second clamp, which then falls away.

The solenoids which we have used only move in one direction, so they fire only once. After that, they must be manually reloaded. They may be purchased as "push" units, "pull" units, or units which have a bolting flange on either end and can be used in either direction.

We normally run solenoid effects from the non-dim circuits on our light board. We do, however, take one additional safety precaution which is not to turn the solenoid circuits on at our patch bay until the "stand-by" call for the effect. Because many of these effects arc above the stage, we want to be very sure they will not be triggered unexpectedly.

One of the few drawbacks of electrical solenoids is that they make a rather loud "slap" when they are fired. This is not a problem during an avalanche or a musical number, but it could be distracting during a quieter moment on stage. If a convenient source of compressed air is available, this problem can be overcome by using pneumatic solenoids which are both smaller and quieter. The pneumatic solenoids can then be fired by an electric valve positioned further away from the stage and controlled by any electrical switch.

Solenoids are available in a wide range of shapes, sizes, and strengths. For theatrical purposes, we often need a rather long stroke (3/4" to 1-1/4") and a knowledge of how we intend to mount the solenoid to the scenery. A knowledgeable salesperson should be able to help you identify the right product for your needs.

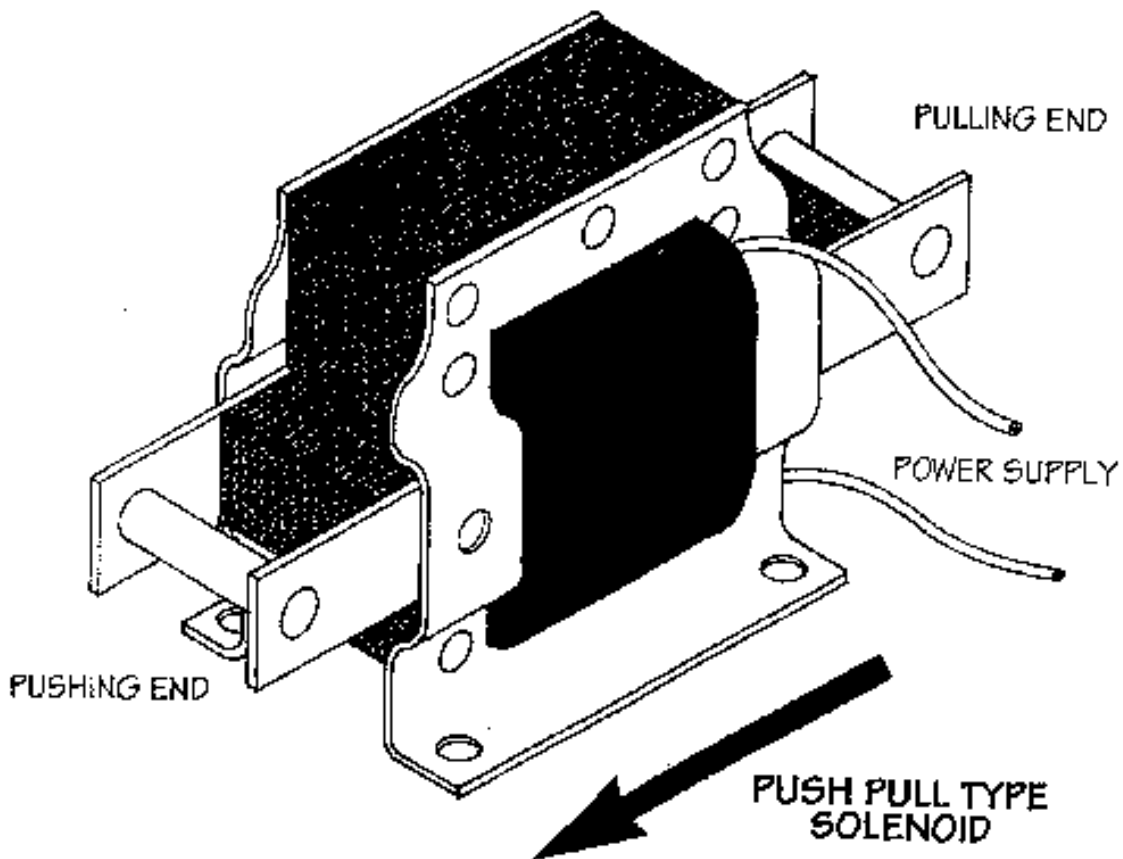
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Another piece of good news about solenoids is that they are not expensive. Most solenoids cost between \$5.00-\$20.00, and they usually are not needed in large supply. Because they are reusable, we have only purchased about six of two different sizes for a small overall cost.

National sources for solenoids include:

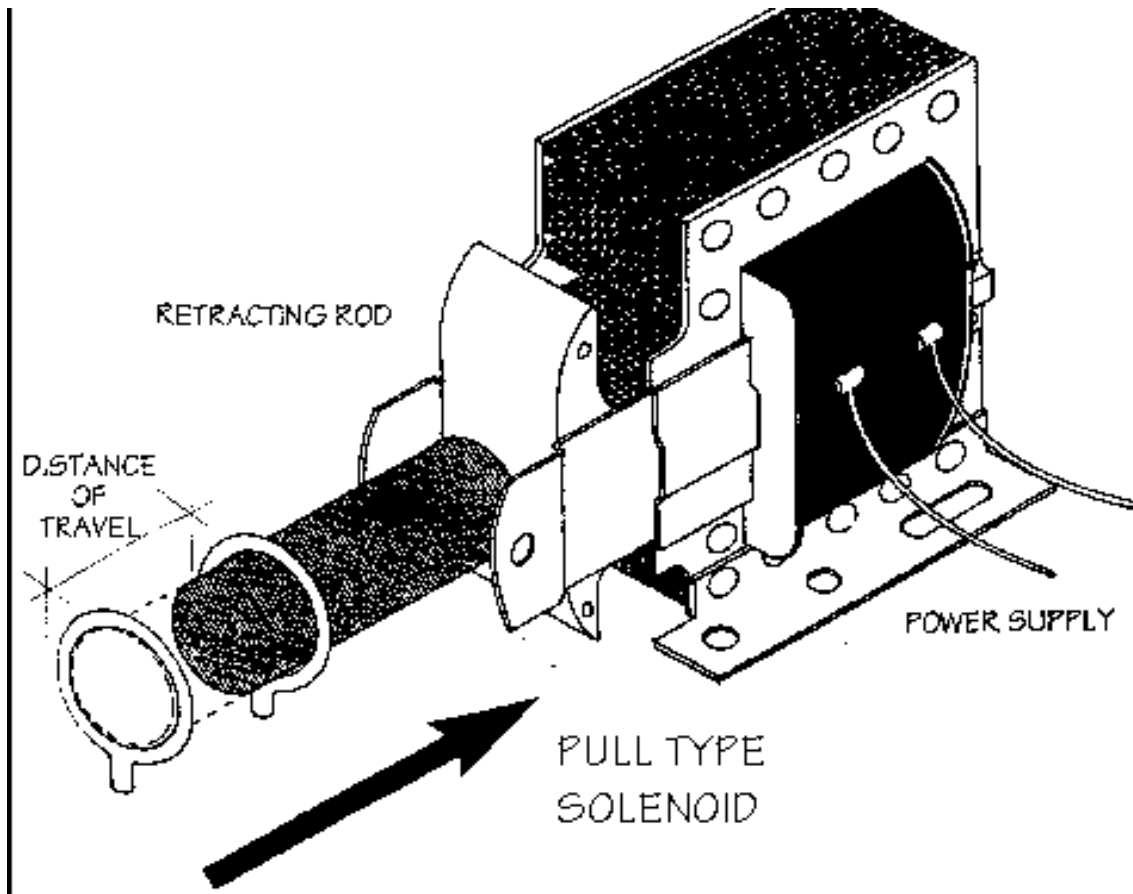
Grainger's - 1-800-225-5994 to locate nearest branch office

McMaster-Carr - 1-708-833-0300 to locate nearest branch office



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