SURGE SUPPRESSION

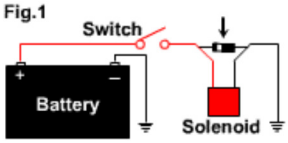
Surge Suppression Explained

Inductive kick (surge) occurs any time an electrically generated field collapses. A voltage, opposite in polarity to the original applied voltage is generated by the collapsing magnetic field.

A good example of this is in an automobile ignition system. When the breaker points open, the current flowing to the ignition coil is shut off and the magnetic field built up in the coil collapses. The resulting inductive kick voltage is high enough to jump the gap at the spark plug.

The same effect also happens whenever solenoid used on a hydraulic valve is shut off. The voltage surge can reach several hundred volts which will arc across the switch contacts and quickly destroy them. Switch life can be reduced to one-tenth of normal.

Fig.1



The solution is to add a diode in parallel across the solenoid terminals (See Fig.1). A diode acts as a one-way valve for electricity. In normal operation, the electric current can't flow through the diode, so it flows through the solenoid coil. When the operator releases the switch, the current is shut off to the solenoid and the inductive kick flows backwards through the diode rather than through the switch contacts, bleeding off the high voltage spike.

Installation Tips

Diodes should be installed as close as possible to the solenoid. Soldering a diode directly across the 2 solenoid terminals is ideal.

Use a diode with a voltage rating of at least 10 times the circuit voltage and a current rating at least as big as the current flowing through the solenoid. In practice, diodes rates at 200 volts and 1 amp are readily available for a few cents and are appropriate for most applications.

Diodes have a stripe on one end of the case (Cathode). On equipment wired with negative grounds, the end with the stripe should be installed on the most positive side of the solenoid. This is usually the side that has the wire from the switch (See Figures 1 and 2).

Sure Grip manufactures a diode pack which can be used to provide surge suppression.

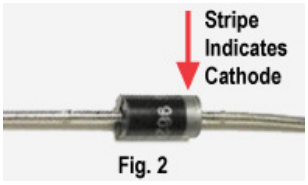


Fig. 2