Reed Switch Extended Shock Capabilities

The maximum shock specifications in the Hamlin catalog are very conservative for most switches smaller than the DRx-xxx type. The 11 ms duration shock limit in particular is based upon early U.S. military specifications that predated the use of pneumatic shock tables. Since all reed switch manufacturers use similar ratings, the 11 ms duration specification remains. The 100 G maximum value for most switches is used because it is difficult to obtain higher shock levels at 11 ms with some test equipment.

DRR-129, DRR-DTH, DRT-DTH Switches
Large reed switches such as the DRR-129 are more shock sensitive than smaller switches. Although the 100 G, 11 ms specification is not extremely conservative, they have also passed tests at 400 G, 3 ms without false operations or changes in sensitivity. Care should be taken when handling the DRR-129, since tapping one end of it with moderate force upon a hard table can cause the contact gap and switch sensitivity to change. Such an apparently light shock results in thousands of G's of shock.

The G force rating for the DRR-DTH and DRT-DTH is only 10 G at 11 ms because of the spring-loaded N.C. contact. A higher shock on the lowest standard pull-in switches may cause the N.C. contact to temporarily open. Higher pull-in switches of both types can handle much higher shocks without N.C. contact opening. In addition, DRR-DTH switches have been tested at 400 G, 3 ms without permanent change in the gap (pull-in). The N.O. contact is more immune to shock effects, with no false closures found at 100 G, 11 ms.

Smaller (MRxx-x Size) Switches
As the size of reed switches decreases, the effects of shock become less. Tests have been run that indicate Hamlin's MRPR-x switches can withstand approximately 1000 G, 0.5 ms without changes in pull-in sensitivity. Hamlin MARR-x switches can withstand approximately 2000 G, 0.4 ms, and MDxx-x and MLRR-x switches can withstand over 3000 G at 0.3 ms without changes in pull-in sensitivity. MDRR-DT switches are rated at 50 G because they have a spring-loaded contact that can open under high shock, but they can also withstand very high G forces without pull-in changes.

Stability of the contacts when barely closed (zero overdrive) is very good with most switches. The worst results will be obtained with very close differential switches such as the MLRR-4, especially at the lower pull-in ranges. Most switches can withstand shocks over 200 G without false openings at zero overdrive. This is because the drop-out value is significantly less than the pull-in value for most switches.

Stability when open is similar to that when closed, and worst for low pull-in switches. False closures generally start to occur around 500 G.

Protection from Shock
Avoid hard mounting materials. Cushioning, such as mounting a proximity sensor with foam tape, can be highly successful.