

Why battery cells may degrade or be defective in a group of batteries, designed in series and formed into a pack, with poor connection weld tabs.

Battery cells are a very fragile component of the final assembled battery insert. The cell can not be soldered together with wire, due to high heat transfer to the cell, and will cause the cell to break down or become defective quickly. Therefore, each cell is welded together using thin tab stripes of tin connectors. Each connector tab is welded to each end of the battery cell using a precisely timed and shaped pulse of high current through the connector tab to the surface of the battery electrodes. Thus, creating a permanent, rigid, and highly electrical conductive connection to and from multiple battery cells, hence forming a complete battery pack insert.

The final assembled battery pack with proper weld connections may now be charge and discharge to its full potentials properly without any defects. With factory techniques, a properly developed battery pack will become balanced, with maximum power delivery, quickly in time. When balanced, each cell is working equally together to present smooth current flow and maximum time of power.

However, if final assembled battery pack inserts are manufactured with poor or defective weld tab connections, several occurrences will arise. First, high resistive current connection tabs will exist, developing the equivalent to a spark gap. Abnormal high current spikes can jump small spark gaps and cause a single battery cell in a battery pack to overwork excessively or a series of spark gaps can cause a small group of battery cells to spike excessive current flow and become overburden. Secondly, the overburden cells will cause the battery pack insert to become imbalanced, and can not be corrected with factory techniques of charging and discharging. Thirdly, the imbalanced battery pack cells can no longer work uniformly as a battery pack insert, thus causing a much decrease in current flow and time of power delivery.

Since these over drained battery cells, with poor weld tab connections, in a final assembled battery pack insert have experienced constant spikes of discharge and also constant spikes of charging current from the charging devices, the organic insulation between electrodes in the battery cell have degraded or deteriorated to null and causing the battery to hold a zero volt charge. Even with replacing the degraded battery cells with new ones to the existing battery pack, the process will endure hours, up to 4hrs each pack, of analyzing, charging and controlled discharging techniques to properly balance the used cells and new cells uniformly, thus creating a balanced battery insert for the second time around.