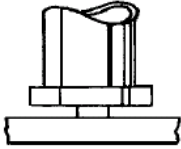


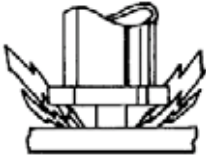
# STUD WELDING Reference Information

- STUD WELD INSPECTION / INFO
- CD STUD WELDING CRITERIA
- CD STUD SELECTION (P/N's)
- 110V. CD WELDERS / ACCESS..
- ARC STUD PWR UNITS / GUNS
- ARC STUD GUN CONSUMABLES
- ARC WELDING CRITERIA / INFO

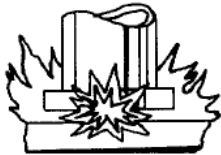
## CAPACITOR DISCHARGE PROCESS



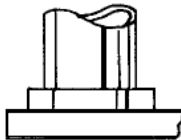
CD fasteners generally utilize a specially engineered projection or tip at the weld base. Its design configuration and length provide accurate welding time control, for consistently reproducible results.



Instantaneous energy is discharged from banks of low voltage DC electrostatic capacitors, electronically controlled, and triggered on demand by the operator.



Actuating the triggering circuit, releases the stored energy from the capacitors through the stud, and vaporizes the high resistance tip, creating an ionization path for peak current flow and arcing across the areas to be joined.



Spring or air pressure of the gun upon the partially melted stud fuses it to the parent metal surface, completing the weld in about four to six milliseconds, and creating a bond stronger than the fastener itself.



**Capacitor discharge stud welding**  
Mainly used for stud connections with thin sheet metals. Welding without marking or deforming the reverse-side of the sheet.



## TWO BASIC STUD WELDING SYSTEMS

### What is Stud Welding?

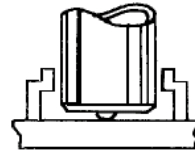
The stud welding process is a comprehensive method of attaching fasteners to products. There are two basic types of stud welding procedures;

Capacitor Discharge (CD) and Drawn Arc. The CD method uses a flanged fastener with a timing tip in the center of the flange. The weld stud is placed into a weld head or a hand held gun. An electrical charge is stored in a bank of capacitors in the power supply, and upon triggering the welding unit, the electrical charge is discharged through the timing tip producing an electrical arc. Spring pressure or pneumatic force is used to force the weld stud into the molten metal thus achieving fusion. The entire process takes about .004 seconds. This produces very little heat and minimal reverse side markings. This process can be used on almost all types of metals, and dissimilar metals can be stud welded effectively. This operation replaced drilling and tapping in just a fraction of the time, and can be used to weld fasteners up to 5/16" in diameter.

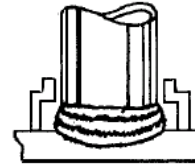
The drawn arc method uses a lifting action to initiate an arc, and then plunges the weld stud into the molten pool of metal. A ceramic ferrule is used to form the fillet around the base of the weld stud. This process can be used to weld fasteners up to 1" in diameter on all types of metals. The cost savings in stud welding is derived from the time/labor savings involved. The time it takes to perform a stud welding operation is a fraction of the time it takes to drill and tap or hand weld fasteners, insulation anchors, pins and a host of other pieces of hardware that can be stud welded.

## ARC WELDING PROCESS

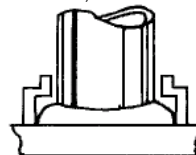
The stud fastener held in the weld gun is applied firmly to the work surface under spring tension. Arc Welding derives its source of energy from either DC rectifiers or motor-generator set, and its degree and intensity are automatically controlled by precision timing circuits.



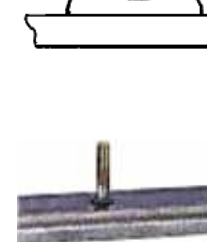
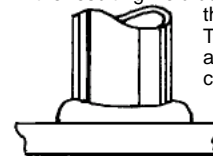
The trigger button initiates the cycle which energizes the gun solenoid, lifting the stud from the metal surface and creating an arc which melts a flux-loaded end of the fastener and its immediate area.



A ceramic ferrule shields the arc, concentrates the heat, and contains the molten metal in the weld zone. Simultaneously, the gun solenoid becomes de-energized, and the spring tension forces the fastener into the molten pool, integrating it with the parent metal.



The cycle is completed in less than a second, and the resulting weld bond develops the full strength of the fastener in the weld zone. The expendable ferrule is broken away to expose a smooth and complete fillet at the stud base.



**Stud welding with ceramic ferrule**  
The universal process with high reliability thanks to deep penetration and precisely calibrated weld fillet.

