

The quality of resistance welds depends largely on controlling the contact tip force (or pressure). To reduce flash (expulsion) and ensure the proper nugget formation, it is critical to achieve a minimum force, F_1 , before firing current and to control the peak force, F_p , during the weld to keep it below a maximum force level, F_2 .

Types of Force Measuring Sensors

1. WeldThru Force Sensor (see Tech Note 109)
2. Non WeldThru Force Sensor (see Tech Note 110)
3. Pressure Transducer (see Tech Note 111)

Basic Force Control Functions

1. Force-Triggered Current Firing

Description--use force sensor with meter to fire current at preset limit (F_1).

Benefits--assure adequate nugget formation, reduce flash (expulsion), and improve throughput by minimizing squeeze time.

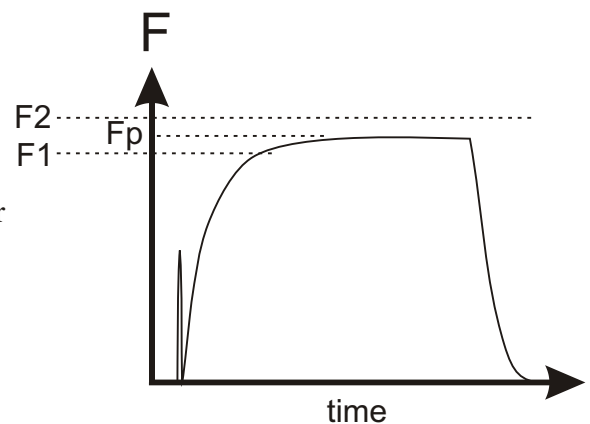
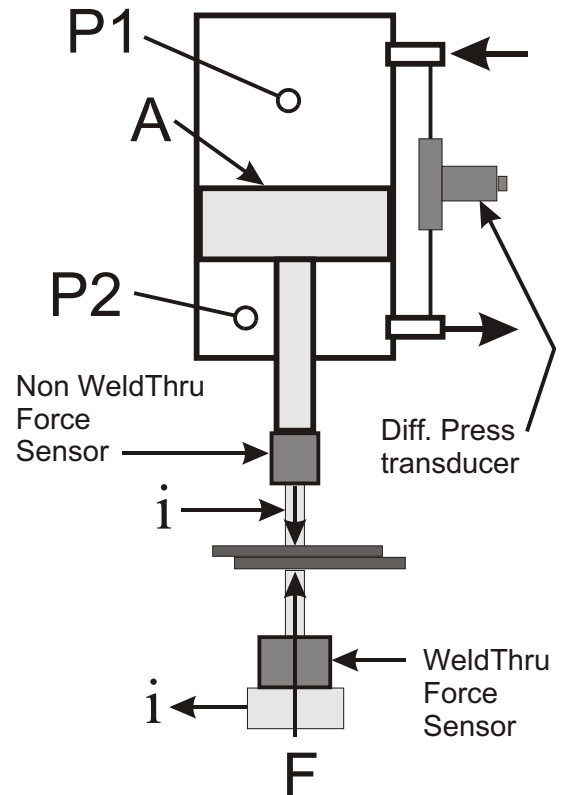
Applications--spot, projection, and stud welding on all welding heads including microjoining.

2. Maximum Force Detection

Description--use force sensor with meter to detect over force levels (F_2) occurring during weld.

Benefits--eliminate cold weld (incomplete nugget formation), reduce tip mushrooming.

Applications--spot, projection, and stud welding on all welding heads including microjoining.



Typical force trace for one weld.