In the past several years, much development has been made in the direct driving of machines with servo motors. This has become possible as the size of servo motors and their electrical drives have increased. The first applications were in small stamping presses where the motion and speed could be controlled throughout the stroke of the press especially useful in drawing operations.

Seven years ago, research began to occur inside our company for the use of servo direct drive of hydraulic machines. The first application was a 400 ton press for forging. Since that time several machines have been designed and constructed using servo direct drive in the machine. The servo motors directly drive hydraulic pumps so that oil is only flowing when the motor is turning. The high torque capability of servo motors coupled with CNC control systems give great responsiveness of the axes. Several axes can be synchronized together, multiple pumps can be “ganged” to provide high flow rates, and motion and speed curves can be very tightly controlled.