

SPIROL[®]

PIN INSTALLATION TECHNOLOGY

Model DP Drilling and Pinning Machine

This self contained vertical drilling and pinning machine is ideally suited for moderate to high production applications that require accurate drilling and pinning of assemblies. The concept of drilling and pinning with one system eliminates tight tolerance and precision drilling of individual components to ensure proper alignment of holes for assembly. The Model DP machine consists of an automatic high-precision drilling unit, a SPIROL Model CR Pin Insertion Machine and a precision air-powered linear slide unit to move the assembly between the drill unit and installation station.

The Model DP operates as follows: the assembly is loaded into a custom fixture nest, and the machine is activated. The assembly is automatically clamped, advances to the drilling position and the hole is drilled. The assembly then slides back to the loading/pinning position, and the pin is automatically installed. The fixture un-clamps and the completed assembly is manually removed.



Design Features/Benefits:

- Precise:**
 - Drill guide bushing to support and guide drill bit during drilling operation
 - Drill pecking feature for straight, accurate holes
 - Fine pin insertion depth adjustment
 - Precision ground machine table
 - Critical components are doweled in place to maintain alignment
- Built to Last:**
 - Recirculating flood coolant in the drilling operation for drill bit life and chip removal
 - Cushioned cylinder return stroke to reduce shock and noise
 - Hardened pin guide bushings and hard coated vibratory feeder bowl
- Versatile:**
 - Allen Bradley Panel View Human Machine Interface for programming and control of all machine functions
 - Can be easily configured to accommodate a variety of applications
 - Capable of both wet and dry drilling operation
 - Hole sizes from 0.8mm (1/32") to 6mm (1/4") diameter
 - Capable of insertion forces up to 1,800 lbs.
- Efficient:**
 - Eliminate the need to handle components multiple times through several different processes
 - Automatic operation of drilling and pinning processes
 - Automatic feed, delivery and insertion of pins
 - Collet style drill chuck, with internal stop for quick no-measurement drill replacement
- Safe:**
 - Full perimeter guarding with electrically interlocked access door for operator safety
 - Infrared light curtain option readily available



Application: Gear to Shaft Assembly for Hydraulic Pump

A leading manufacturer of hydraulic pumps required a method to permanently affix various sized gears to shafts. The gears were bronze, and the shafts were 400 series stainless steel. After press fitting the gears into position, they would drill a hole partially through the assembly, install a heavy duty **SPIROL® Coiled Spring Pin**, and stake the entrance point for maximum security. Prior to SPIROL's involvement, this process was done manually using 3 different stations. SPIROL offered to consolidate all operations into one complete installation machine. Since the customer offered many different gear/shaft assembly sizes, the machine needed to be versatile enough to accommodate the 11 existing assemblies, as well as be able to handle new variations as designed. Tooling changeover had to be quick and simple, with little to no machine adjustment. The cycle time had to be less than a minute, and drill bits were expected to last at least 500 cycles.

The **SPIROL Model DP** machine consists of a standard **Model CR** Pin Insertion machine, an automatic, production quality, high-precision drilling unit, and a precision air-powered linear slide unit to move the assemblies between the drill unit and installation/staking station.

SPIROL's solution provides a machine cycle time of 45 seconds, drill bits yield 600 plus parts, and tooling change-over takes less than 15 minutes between assemblies. This machine doubled the previous production output, and provided a payback of less than 12 months.

SPIROL Application Engineers will review your application needs and work with your design team to recommend the best solution. One way to start the process is to select **Installation Systems** in our **Optimal Application Engineering** portal at www.SPIROL.com.

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