Engine Power Components
Automated Camshaft Key Press

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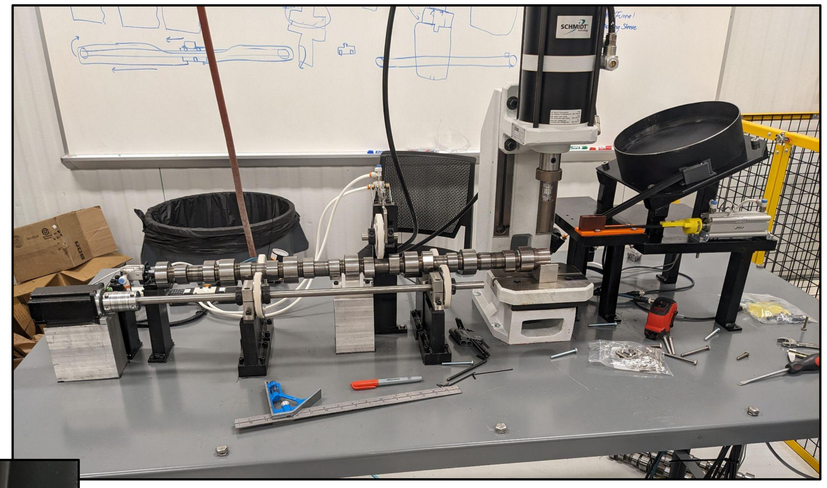
Background:

Engine Power Components is the world's leading manufacturer of engine camshafts and balance shafts. Camshafts are used to open and close valves in engines. A woodruff key is used to secure the shaft to a rotating flywheel.

Project Purpose:

The purpose of this project is to replace the manual key press at epc with an automated system. Our product is designed to sort and separate keys, rotate camshafts, press keys into the shaft and measure the force and distance exerted by the press.



Pneumatic Press:

- Schmidt Technology Press
- Maximum pressing force: 20 kN
- Incorporates Kistler load cell to measure force.
- LVDT measures press distance.
- Digiforce 9311 monitor plots the pressing force.
- Press head with the loaded key presses the key down into the shaft key slot.

Shaft Orientation:

- Shaft is placed on servo driven wheels where the end of the shaft rests on the v-block.
- Shaft rotates until the key slot faces upward at the press head.
- Pneumatic pin inserts into the opposite end of the shaft to correctly orient the shaft.

Key Transfer:

- Centrifugal bowl collects and sorts keys, then dispenses one at a time.
- Keys transfer down a track into a key carriage powered by a pneumatic linear actuator.
- Actuator pushes the key, and it loads to the press head magnetically.

Specifications Overview:

- Design automated press system to replace manual press.
- Design to be compatible with robot loader in the future.
- Cycle time of 1 minute or less.
- Record press force and distance.
- Budget: $40,000
- Allen Bradley PLC