TQC Automation & Test Solutions

Case Studies: Automation

Automated Rotary Assembly & Test System for Oil Pump Lever Assemblies

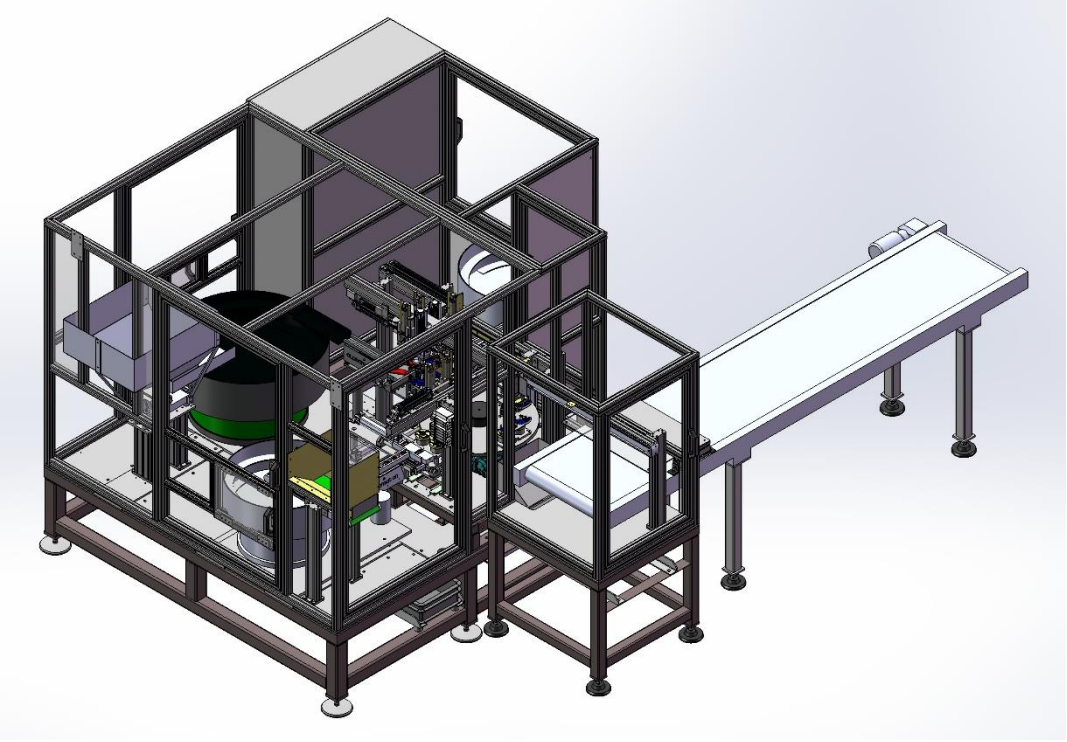
Client: Leading Power Transmission Component Manufacturer.

Part: Oil Pump Lever Assembly

Machine supplied: Fully Automated Assembly Solution

Overview: This system was designed and manufactured to give the customer the ability to automatically assembly oil pump lever assemblies at a rate of 720 per hour. TQC developed this system alongside the client to allow them to supply quality, assembled parts to their customers.

To meet the throughput requirements 2 assemblies are built at the same time using a 4-station indexing rotary table system. This rotary table allows the sequential assembly of 3 components at a rate of 2 assemblies every 10 seconds. Localised part checking is included at each station with final parts fed out onto a conveyor (passed parts) or rejected (failed parts).



Multiple Stations located around a 4-station rotary table carry out the following –

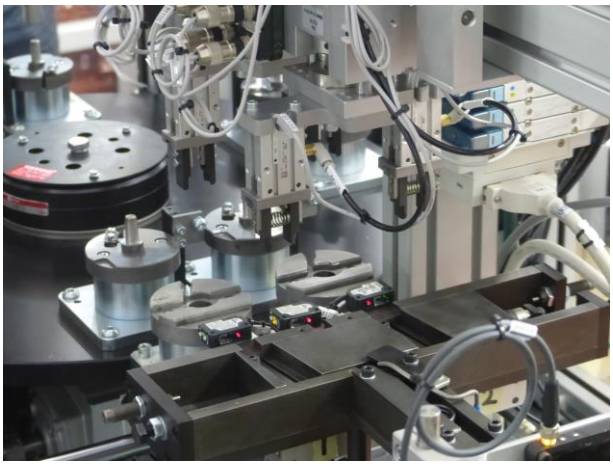
- Station 1 Spring Load
- Station 2 Lever Shoe Load
- Station 3 Stopper Pin Load & Insertion
- Station 4 Assembly unload – passed and failed parts

Station 1

Springs are automatically fed in pairs using bulk storage, a linear conveyor, and a vibratory bowl feeder. Good springs are transferred to nests on a rotary table, while rejects are separated and discarded via a reject chute.

Station 2

Lever shoes are fed in pairs from bulk storage and a vibratory bowl feeder. Good parts are placed onto a rotary table; rejects are removed via a reject chute

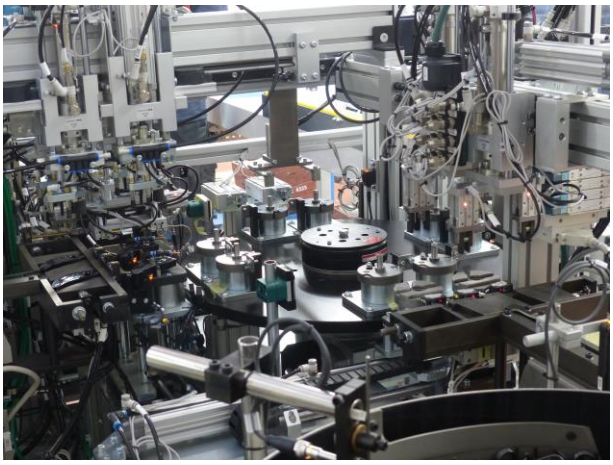


Station 3

Stopper pins are fed via a twin-track vibratory bowl feeder and picked in pairs by a transfer unit. Length is checked before placing correct pins into rotary table nests; rejects are dropped via a chute. Lever/spring assemblies are clamped and exercised to align the pin hole for assembly. Any assembly failures are flagged and rejected at the off-load station

Station 4

At the final station, assembled products are removed from the rotary table. Passed parts are placed onto a conveyor; failed parts go to a reject chute. A twin-head gripper on a programmable gantry transfers assemblies, placing them in two rows of eight per cycle. The conveyor indexes after each set and can buffer around 20 minutes of production. A sensor stops the machine when full, and a jog function allows clearing of remaining parts



Control System

The assembly and test system is controlled via an Omron PLC and HMI.

If you have an application that could benefit from TQC's expertise in automation please contact us by email or phone via the contact details

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