

# CASE STUDY

HOW FOCUSED ON MACHINING SAVED AN OEM CUSTOMER'S ASSEMBLY AFTER A BUDGET MARKETPLACE DELIVERED LOW-QUALITY PARTS.



## THE COMPANY —

FOCUSED ON MACHINING'S CUSTOMER IS A US-BASED ORIGINAL EQUIPMENT MANUFACTURER (OEM) THAT BUILDS ROBOTIC LASER WELDING MACHINES FOR USE IN A BROAD RANGE OF INDUSTRIES, INCLUDING AUTOMOTIVE, ELECTRONICS, EYEWEAR, HARDWARE, MEDICAL, SANITATION, AND MORE.

**INDUSTRY:** AUTOMATION

**LOCATION:** DENVER

## THE PROJECT —

**THE CHALLENGE:** THE OEM ORDERED ASSEMBLY SERVICES FROM FOCUSED ON MACHINING FOR HIGHLY COMPLEX HOUSINGS MADE BY A BUDGET MARKETPLACE. UNFORTUNATELY, THE HOUSINGS ARRIVED WITH SERIOUS QUALITY AND ACCURACY ISSUES.

**THE SOLUTION:** AFTER IDENTIFYING THE ISSUE, FOCUSED ON MACHINING IMMEDIATELY NOTIFIED THE OEM OF OUR CONCERNS, PRESENTING POTENTIAL SOLUTIONS AND THEIR CORRESPONDING COSTS.

**THE OUTCOME:** FOCUSED ON MACHINING MANUFACTURED A NEW SET OF HOUSINGS AND DELIVERED A TOP-QUALITY ASSEMBLY TO OUR OEM CUSTOMER.

## ACCEPTING THIRD-PARTY PARTS FOR HARDWARE ASSEMBLY —

FOCUSED ON MACHINING QUOTED OUR REPEAT OEM CUSTOMER FOR MACHINING AND ASSEMBLY. HOPING TO SAVE MONEY, HOWEVER, THE CUSTOMER TURNED TO AN ON-DEMAND INDUSTRIAL PARTS MARKETPLACE FOR BUDGET MACHINING. THE MACHINED PARTS WOULD THEN COME DIRECTLY TO OUR PRECISION MACHINE SHOP FOR ASSEMBLY, PACKING, AND DELIVERY TO OUR CUSTOMER. AFTER A TWO-MONTH DELAY, THE ON-DEMAND MARKETPLACE FINALLY SHIPPED THE PARTS: 5 GEAR HOUSINGS THAT HOLD ELECTRONICS AND LASER DIODES FOR A LASER WELDING APPLICATION. EVEN AT THE MARKETPLACE'S LOW RATES, THE HOUSINGS HAD BEEN EXPENSIVE FOR A FEW REASONS:



- THE PRINT CONTAINED THREE PAGES DOCUMENTING OVER 150 FEATURES WITH TOLERANCE CALLOUTS FROM  $\pm 0.005$ " TO AS TIGHT AS  $+0.0015$ ".
- THESE PARTICULAR HOUSINGS WERE MADE FROM COPPER ALLOY 110, ALSO CALLED ELECTROLYTIC TOUGH PITCH COPPER, AN EXPENSIVE MATERIAL WITH HIGH ELECTRICAL CONDUCTIVITY.
- EACH HOUSING RECEIVED GOLD PLATING, OR ELECTROPLATING, BEFORE GETTING TAPPED FOR THE MORE THAN 50 PIECES OF HARDWARE THAT FOCUS ON MACHINING WOULD INSTALL.

## DISCOVERING CATASTROPHICALLY LOW QUALITY —

THOUGH OUR CUSTOMER WAS MERELY SEEKING LESS EXPENSIVE MANUFACTURING, THE ON-DEMAND MARKETPLACE DELIVERED PARTS THAT WERE NOTHING SHORT OF CHEAP.

UPON EXAMINING THE PARTS, WE FIRST NOTICED THE PROBLEMATIC THREADED HOLES. THEY'D BEEN THREADED FOR HELI-COILS BUT NOT DEBURRED. GROUND METAL DUSTED EACH HOUSING, AND WE BEGAN PULLING ADDITIONAL METAL CHIPS OUT OF EVERY HOLE USING OUR FINGERS.

NEXT, WE INSPECTED THE PRESS-FIT HOLES. BY DEFINITION, "PRESS-FIT" HOLES ARE MEANT TO BE SLIGHTLY SMALLER THAN THEIR HARDWARE. THESE PLATED THROUGH-HOLES ARE DESIGNED TO HOLD CONNECTOR LEADS SECURELY WITHOUT SOLDERING.

UNFORTUNATELY, THE BUDGET MARKETPLACE HAD TAPPED PRESS-FIT HOLES 0.05" TOO SMALL FOR THE HARDWARE. HAD WE FORCED THE PINS INTO THESE PRESS-FIT HOLES, THE EXCESSIVE PRESSURE WOULD HAVE DEFORMED THE HARDWARE AND LED TO THE ASSEMBLY'S TOTAL FAILURE.

## CRAFTING A CUSTOMER-FOCUSED SOLUTION —

FOCUSED ON MACHINING WAS NOT THE CAUSE OF THE HOUSINGS' LOW QUALITY, BUT WITH THE PARTS AND HARDWARE IN OUR PRECISION MACHINE SHOP, THE PROBLEM BECAME OURS TO SOLVE.

OUR FIRST STEP WAS COMMUNICATING WITH OUR CUSTOMER, WHO HAD NO IDEA THAT THEIR HOUSINGS HAD FALLEN VICTIM TO SLOPPY MACHINING. WE PRESENTED A SERIES OF POSSIBLE SOLUTIONS, BUT EACH FIX INTRODUCED NEW CHALLENGES.

THE BURRS COULD BE REMOVED FROM THE THREADED HOLES, BUT THAT WOULD HAVE REQUIRED MACHINING INTO THREAD. WE COULD REMOVE THE METAL CHIPS STILL EMBEDDED IN THE PART'S NON-THREADED HOLES, BUT CLEANING WOULD BE TIME-CONSUMING AND TEDIOUS. AND THE ONLY WAY TO FIX THE TOO-SMALL PRESS-FIT HOLES WAS TO REMACHINE ALL 50 HOLES, WHICH WOULD REQUIRE 0.5-1 HOUR OF MACHINE TIME PER HOLE TO ALIGN AND INDICATE THE PART IN PERFECTLY.

AFTER MUCH DISCUSSION WITH OUR CUSTOMER, WE ALL AGREED: THE COST OF FIXING THE LOW-QUALITY PARTS WAS GREATER THAN THE COST OF STARTING OVER.

THE GOLD-PLATED COPPER HOUSINGS WOULD HAVE TO BE REMADE ENTIRELY. BUT THIS TIME, FOCUSED ON MACHINING WOULD MAKE THEM.



## DELIVERING HIGH-QUALITY PARTS —

FOCUSED ON MACHINING BEGAN AT THE BEGINNING, REMAKING THE 5 HOUSINGS THAT THE ON-DEMAND MARKETPLACE HAD RUINED WITH CARELESS WORKMANSHIP.

WE MACHINED THE WORKPIECES, ANNEALED THE PARTS, TAPPED AND THREADED THE HOLES AND PRESS-FITTINGS, ALL WHILE MAINTAINING CLEAN WORKSTATIONS AND EVEN CLEANER PARTS. WHEN WE HAD 5 FLAWLESS HOUSINGS ON THE SHELF, WE ASSEMBLED EACH WITH ITS HARDWARE AND THEN SHIPPED THE COMPLETED ASSEMBLIES TO OUR VERY RELIEVED CUSTOMER.

THOUGH IT PAINS US THAT OUR VALUED CUSTOMER WAS FORCED TO TOLERATE THE UNNECESSARY DELAYS AND POOR QUALITY PROVIDED BY A BUDGET PARTS MARKETPLACE, FOCUSED ON MACHINING IS PROUD THAT OUR PRECISION MACHINE SHOP COULD STEP IN, STEP UP, AND DELIVER A SATISFYING SOLUTION.