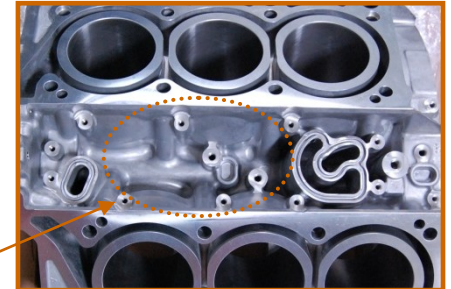




## SST Cold Spray for Rapid Prototyping of Engineering Changes

### Background

A major manufacturer of automotive engines was required to add an anti-knock sensor to a new engine block design. In order to determine the most effective location for the sensor, the manufacturer decided to test four (4) anti-knock sensor locations on a series of engine blocks. To mount these sensors to the proposed locations, the manufacturer needed to add four corresponding bosses (spot faced, drilled, and tapped) to each engine block (see figure on the right).



Four bosses to be added in this area

### The Problem

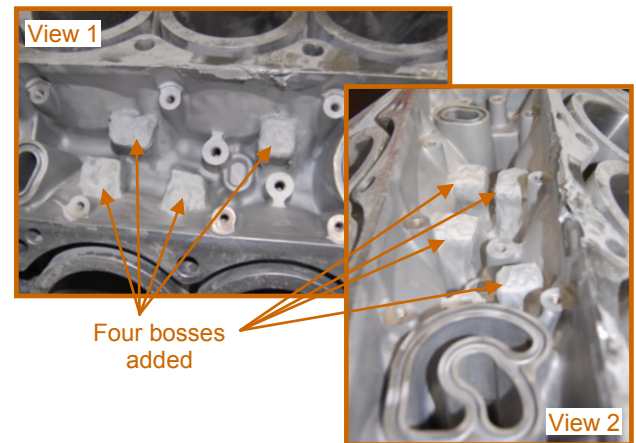
Originally, the manufacturer considered welding the four test bosses directly on the machined surface of the already built engines. Unfortunately, it was determined that this approach would not be feasible for this application because the machined surfaces would be distorted by the high heat generated during the welding process.

### The Solution

The customer decided to use CenterLine's SST™ Cold Spray process because this coating technology does not introduce excessive heat and/or distortion into the machined casting.

CenterLine's SST-A0027 powder was selected for the test. This powder blend containing aluminum, zinc, and alumina was manually sprayed using a standard CenterLine SST Series P Cold Spray Machine equipped with a standard UltiLife™ Modular Nozzle.

After the spraying process was finished, each boss was machined, drilled, and tapped to accept the anti-knock sensor.

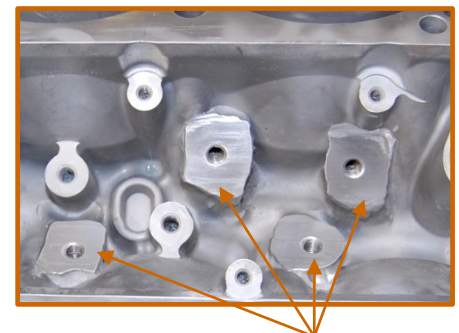


Four bosses added

### Customer Benefits

The SST Cold Spray process gave the customer the flexibility of testing the most beneficial anti-knock sensor location without the need of performing any tooling modifications or manufacturing new engine blocks. The time and cost aspects from the SST Cold Spray process helped the customer address this challenge with minimal delay to the testing schedule, while salvaging the existing stock of engine blocks.

As of this report date, the customer is awaiting the completion of new engine block castings. Until the updated design becomes available, the customer is continuing to modify existing engine blocks by adding the single anti-knock sensor mounting boss. This solution continues to offer the benefit of using existing inventory while the production cycle is not interrupted.



Machined Bosses

If you require more information about this project, please contact CenterLine, the SST Division.