**Elimination of Lubricant in Stanadyne**
**Gen V+ GDI SPP Component Press**

### Original Objectives

1. Determine root cause of lubricant requirement.
2. Develop solution to eliminate use of lubricant for the operation.
3. Quantify improvement of production
4. Demonstrate repeatability of results.

### Problem Statement

Stanadyne currently has an automated assembly process on their Gen V+ Gasoline Direct Injection Single Piston Pump line in which two components are pressed together. A laser weld compatible lubricant is applied to one of the mating surfaces to allow for a successful press operation. The use of lubricant was not intended during the design process and elimination will increase first-pass yield and reduce variation/scrap at the station.

### Final Design/Results *

Upon receiving part samples from Stanadyne that had been cut by a diamond saw, galling was visually evident on both mating surfaces. The photographs to the left illustrate the galling on both the housing and valve.

### Concepts

Initial concepts:
- Laser Etching
- Tolerance Refit
- Thermal Expansion
- Friction Reduction
- Press Alignment
- Best Practices

### Modified Objectives*

- What had to be modified due to COVID-19?
  - The team's final round of testing was halted, and the report had to be written with the progress made at the time.
- How did the team operate in the new environment?
  - Smoothly, most of the project was an analysis of data. The important primary round of testing was already conducted, which could not have happened during the outside of school operations.
- What was the impact on the overall project?
  - An overall slow-down, but the meetings became less important and thus, happened less frequently.

### Summary

- Failed parts had failed to reach a critical depth and were scraped
- Galling was identified as the cause of failure in parts.
- Alternative solutions to lubricant were devised and analyzed.

### Team & Acknowledgements

Team:
- Dakoda Hawkins – M.E.
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* On March 16, 2020 classes and labs were closed to students due to the COVID-19 Pandemic. Without access to fabrication and testing equipment, Objectives and Deliverables were modified accordingly.