

AIMS² Research Project for Fall 2019 – Spring 2020

Title of Project: Metal Additive Manufacturing of Harley Davidson
Milwaukee 8 Engine

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Goals and Objectives of the Project, Expectations and Outcomes

Briefly describe what students can expect to learn by participating in this project. Please be specific and include the approximate number of hours/week that students should expect to devote to the project.

The Cam Support Plate is critical to the success of this engine design. A failed cam support plate results in catastrophic engine failure. The Cam Support Plate supports one side of the flywheel, allowing the pinion shaft to turn the oil pump, a chain drive, and the camshaft. The Cam Support Plate directs the flow of oil from the oil pump throughout the engine. Working in conjunction with the oil pump, it is considered to be the heart of the engine. This project details the process of reverse engineering a Cam Support Plate used in the Harley Davidson Milwaukee 8 Engine. During this project, we have reverse engineered the Cam Support Plate by attempting a variety of processes including: white light and laser scanning, physical measuring, virtual recreation, redesign its oil channels, investigate surface finish and reduce the weight of the Cam support plate by using software tools such as SolidWorks, Autodesk Inventor, and SolidThinking Inspire. The focus of this project is to redesign the internal oil channels by removing the edges and making a curvy channel in order to make the oil flow smoother, look into the surface finish, change the topology, and eventually reduce the weight of the plate. Redesigned Cam Support Plate will be printed with Aluminum by an emerging metal 3D printer: Renishaw AM400, laser powder bed fusion system.

Students are expected to devote to the project 8 hours per week.