Team # 4
Ryan Butler, Choi Rin, Cameron Gray, Puvanan Selvam

Step 1: Identify the need or problem

Harley Davidson was losing funds due to the new speedy motorcycles being produced by other companies. Harley Davidson wanted to create a new, fast bike that still had the harley davidson trademark. They wanted to keep the true customer while changing the performance bike. Harley Davidson wanted to create a liquid cooled engine instead of an air cooled one.

Step 2: Research the need or problem

They wanted to put a racing engine in the motorcycle. Harley Davidson turned to Porche for assistance in making the engine. They also researched different frame designs that could be used to hold the new engine without breaking.

Step 3: Develop possible solutions

Harley Davidson came up with the idea of splitting the frame into two rods instead of one right underneath the fuel tank. This gave them more room inside the frame. As for the racing engine, Porche had agreed to design its first model.

Step 4: Select the best possible solutions

The company found that Aluminum was the best option for the frame because it was lighter. They used many different pieces and welded them together to form the frame.

Step 5: Construct a prototype

With all the new developments in place, a prototype was finally constructed. During its road test however, the bike failed to operate. The team came to the conclusion that this was because the bike was not getting enough air flow.

Step 6: Test and evaluate the solutions

The new solutions designed by the company to fix the failed prototype included, splitting the exhaust pipe into two chambers that flowed into one then into two once again, making the gas tank out of plastic because it could be molded easier and it was heat resistant, and created a newly designed air intake that captured airflow coming from the side of the front tire.

Step 7: Communicate the solutions

The team realized that the frame was too weak so they turned to water pressure formed pieces that reduced the number of weldings required. This strengthened the frame. The designers and engineers worked together to incorporate all the parts into the frame.
Step 8: Redesign

The new air intake, the liquid cooled engine, the plastic fuel tanks, the exhaust pipe, and the aluminum frame worked well to keep the Harley Davidson trademark. This meant the trademark Harley Davidson engine sound and a strip down look. Lastly the team went through hundreds of name to find the one that fit the bike the best. After a few days they finally came up with the V-Rod.