

ENGINEERING REPORT

INFINITI Q50/Q60 PERFORMANCE INTERCOOLER KIT, 2016+ | SKU: MMINT-Q50-16

By David Zdichowski, *Mishimoto Product Engineer*



REPORT AT A GLANCE

- **Goal:** Design an intercooler that increases flow, horsepower, and torque while maintaining a direct fit application in the stock location.
- **Results:** 51.4% decrease in flow restriction. 23°F drop in charge air temp. +8.25 HP and +12.29 lb.-ft. increase in peak power and torque. Max increase of 13.82 HP @ 5100 RMP, and 16.87 lb.-ft. of torque @4200 RPM.



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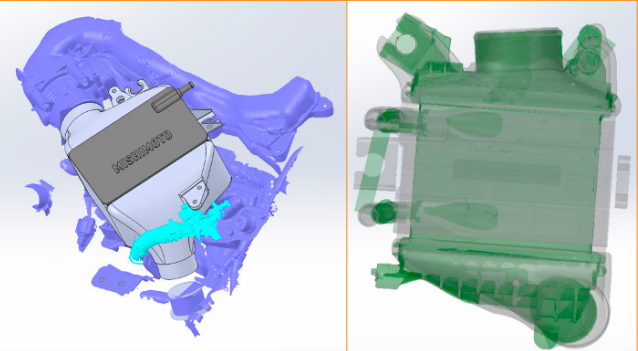
DESIGN OBJECTIVES

Create an air-to-water intercooler, with the largest possible core size, while retaining stock fitment. A direct-fit application was required with no cutting or modifications necessary with the option to reinstall the stock engine cover. Performance goals were to increase flow as well as horsepower, and torque on a tuned vehicle:

DESIGN AND FITMENTS

A bar-and-plate core with cast-aluminum end tanks would be used for a more robust intercooler than stock. This core configuration has been used successfully in the past and should provide good results. The design utilized the stock mounting location with custom brackets, while also keeping the same boost pressure sensor location.

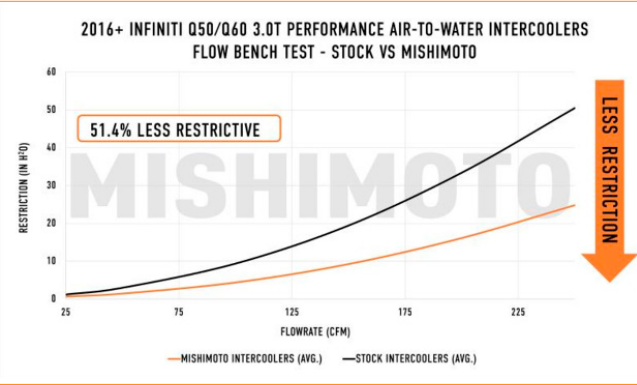
The stock Q50 engine bay was scanned to create the cast end tank designs and utilize available space as best as possible. The stock intercoolers are already a tight fit so increasing core size was challenging. An overall increase of 1.23” in width, and .75” in height was made for a 49.8% increase in core volume. The inlet pipe inner diameter was increased to allow better flow, but the outlet would stay the same due to its proximity to the throttle body.



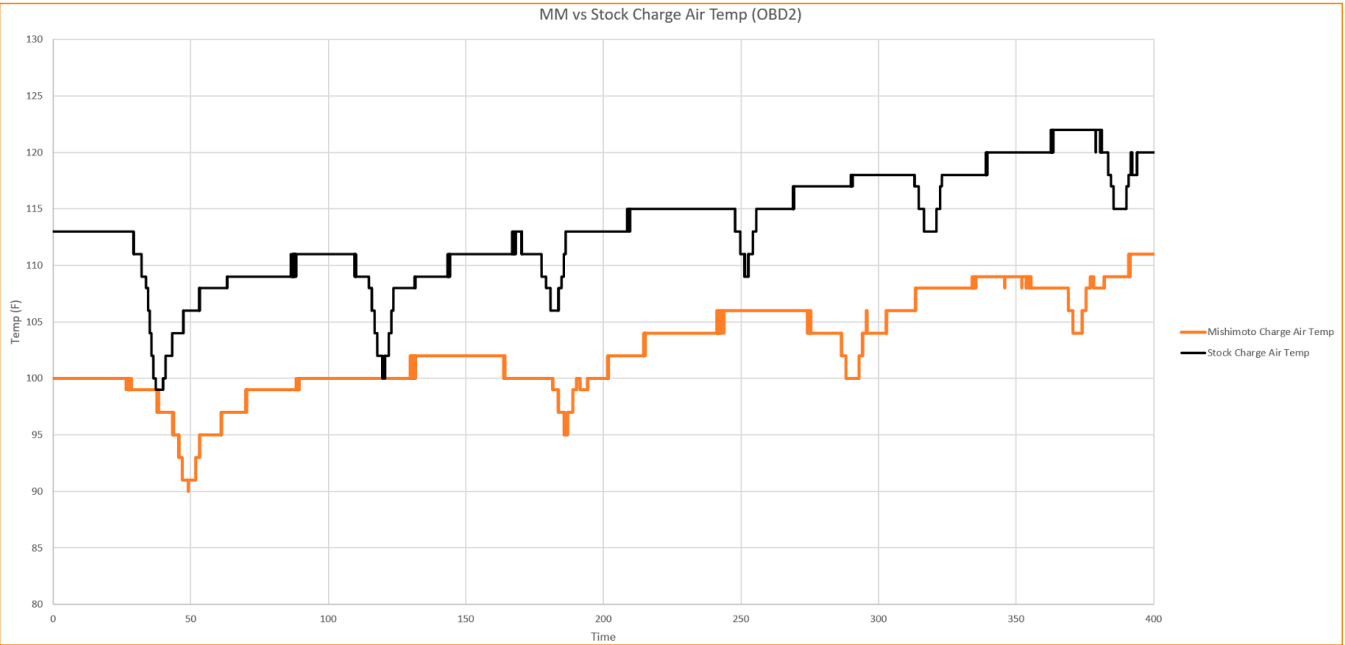
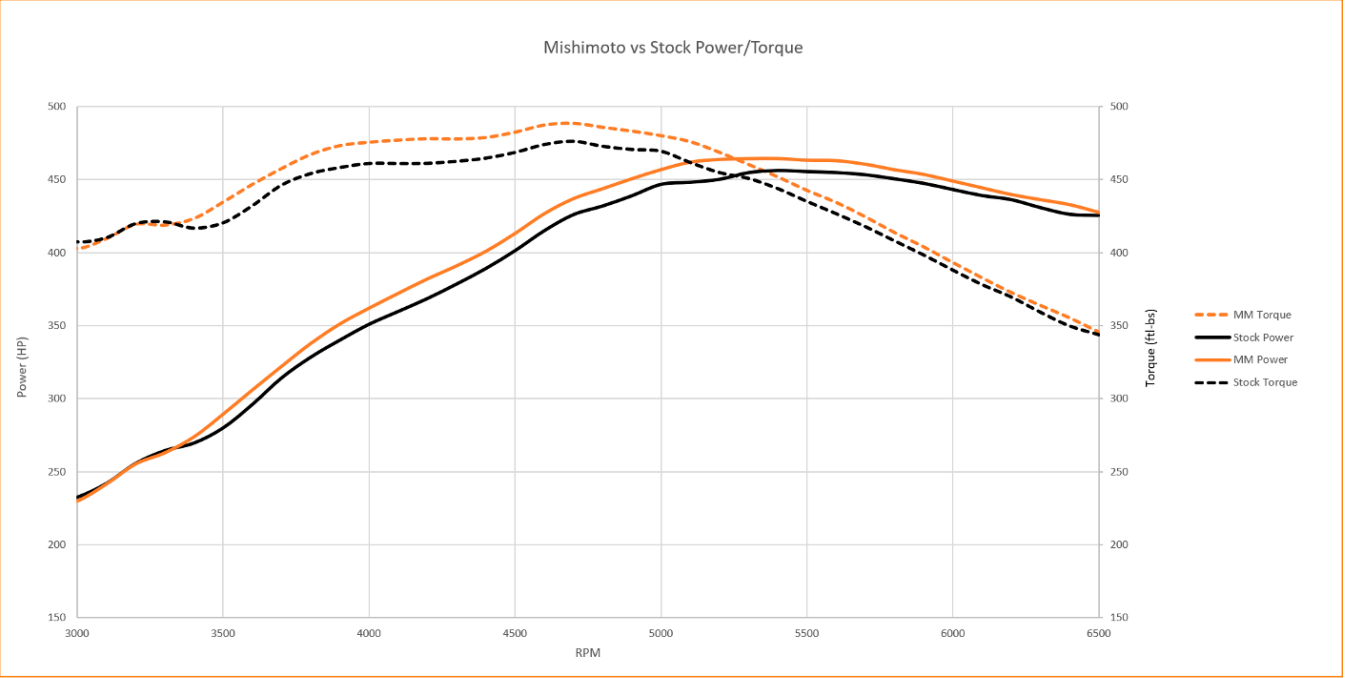
PERFORMANCE TESTING

Our test prototype utilized aluminum SLS 3d printed end tanks, welded to premade bar and plate cores.

Before installing onto the test vehicle, the intercoolers were set up on the flow bench. The Mishimoto intercoolers measured to be 51.4% less restrictive than stock. This will help increase power, while also working to decrease the hot-side charge pipe temperatures.



After flow testing, the intercoolers were installed onto a modified Q50 for dyno testing. To do this we set up the vehicle onto our Dynapack dyno.



Dyno runs showed a peak gain of +8.25 HP and 12.29 lb.-ft. of torque. With a maximum gain of 13.82 HP and 16.87 lb.-ft. as well as maximum 23°F drop in charge air temp.

for better flow and decreased charge-air temperatures, in turn increasing power, reducing heat soak in harsh conditions or hot temperatures.

CONCLUSION

The Mishimoto air-to-water intercoolers for the Q50 3.0T allow

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