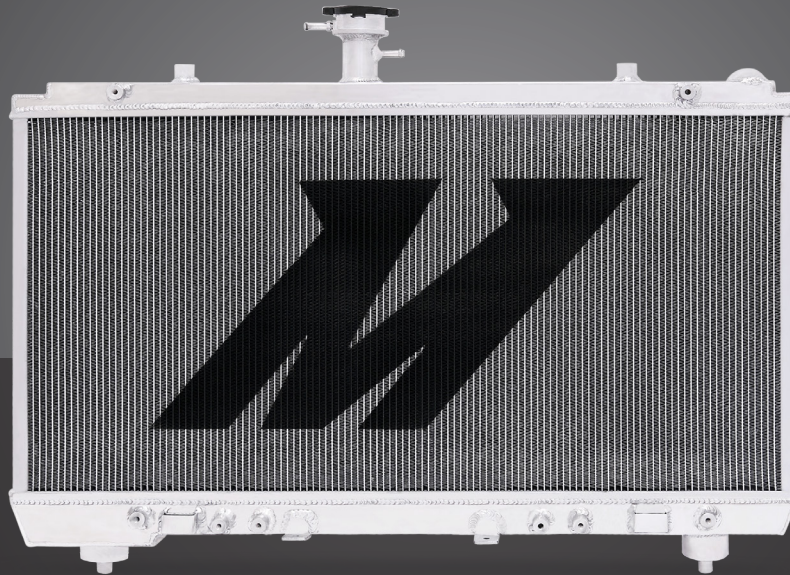




MISHIMOTO



ENGINEERING REPORT

2012–2015 Chevy Camaro SS Performance Aluminum Radiator | SKU: MMRAD-CSS-12

By Jason Wettig, *Mishimoto Engineer*

REPORT AT A GLANCE

- **Goal:** Create a radiator that outperforms the stock unit. The Mishimoto cooler should fit directly into the Camaro without any cutting or modification required.
- **Results:** The Mishimoto radiator showed temperature drops of up to 30°F when compared to the stock radiator. The increased fin surface area promotes greater heat transfer and takes advantage of the well-designed air ducting in the front of the Camaro.
- **Conclusion:** The Mishimoto radiator is a valuable upgrade for Camaro SS owners who drive their vehicles on tracks or in hot climates. The upgraded heat exchanger helps to ensure tha coolant temperatures stay at optimal values during all driving conditions.

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DESIGN OBJECTIVES

The design requirements assigned to this project are as follows:

- Create a radiator package that reduces fluid temperatures when compared with the stock configuration.
- Must be a direct fit, with no cutting or permanent modification necessary.

DESIGN AND FITMENTS

The R&D process began by evaluating the stock system and understanding how Chevy chose to package its heat exchangers. Before the core could be increased in size, a general understanding of the allotted space was needed. A larger core size was chosen, considering the fair amount of room behind the stock fan shroud. Upon removing the front bumper from the Camaro, it became clear that the engineers at GM wanted every bit of air to go through the heat exchangers on the front of the vehicle. Because the air ducting up front is very good, the fins and tubes

can be spaced more densely than stock. New tube-and-fin spacing, along with the thicker core and more tubes, will allow for better heat transfer.



FIGURE 1: The Camaro radiator mounted in the car, showing room behind the radiator.

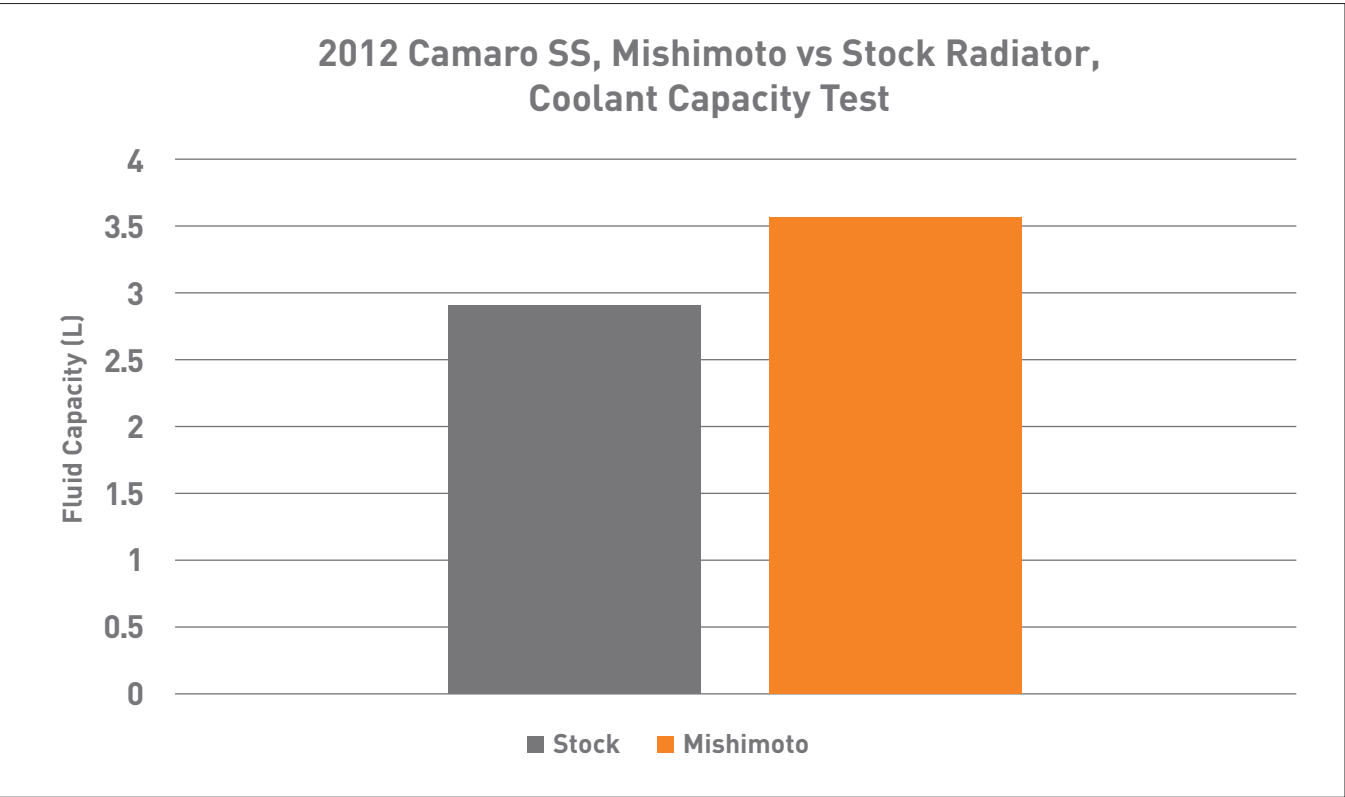


FIGURE 2: The Mishimoto radiator features an increase in coolant capacity, which promotes greater heat transfer.

The Mishimoto radiator increases fluid capacity area by 22.5%. The radiator is slightly thicker and has more rows; therefore, it can hold more fluid. Figure 2 below shows the fluid capacity comparison between the stock and Mishimoto radiators.

The Mishimoto radiator also increases fin surface area by 13.2%. With the thicker core and more rows, a larger amount of fin surface area can be created. Figure 3 displays this difference between the stock and Mishimoto radiators. More information on the R&D process for the radiator can be found on the Mishimoto Engineering Blog here:

[MISHIMOTO ENGINEERING BLOG](#)

PERFORMANCE TESTING

The Camaro was tested on a normal highway where the ambient temperature was approximately 70°F (21.1°C) with 65% humidity. The highway included different grades such as uphill, downhill, and flat road. The vehicle was taken up to 60 mph at 3,500 rpm, where the cruise control was set. Special attention was given to any surrounding motorist to provide a more accurate side-by-side comparison. Thermocouples were placed in the coolant lines at the inlet and outlet of the radiator to measure the temperature drop across the radiator. An AEM datalogger was used to record the results, which can be seen in Figure 4

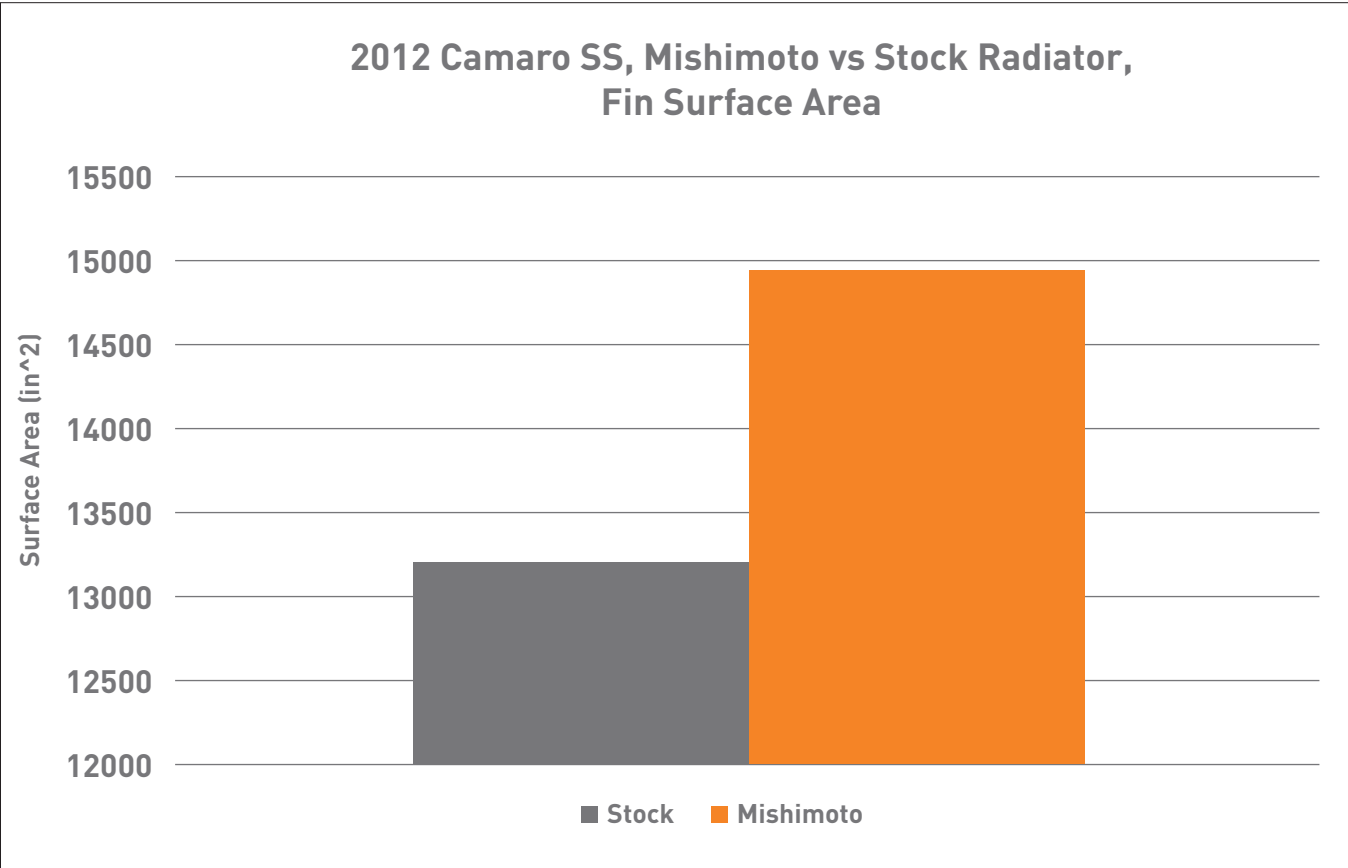


FIGURE 3: The Mishimoto radiator features an increase in Fin Surface Area, which promotes greater heat transfer.

As seen in Figure 4, the Mishimoto core outperformed the stock core by 30°F. The new Mishimoto Performance Radiator for the 2012 Camaro SS was designed to decrease coolant temperatures without taking up too much precious space in the engine bay. This radiator lowers coolant temperatures, has increased fluid capacity, and features a more durable all-aluminum construction. All these features will help your Camaro SS perform better when driving in hot weather or under track conditions.

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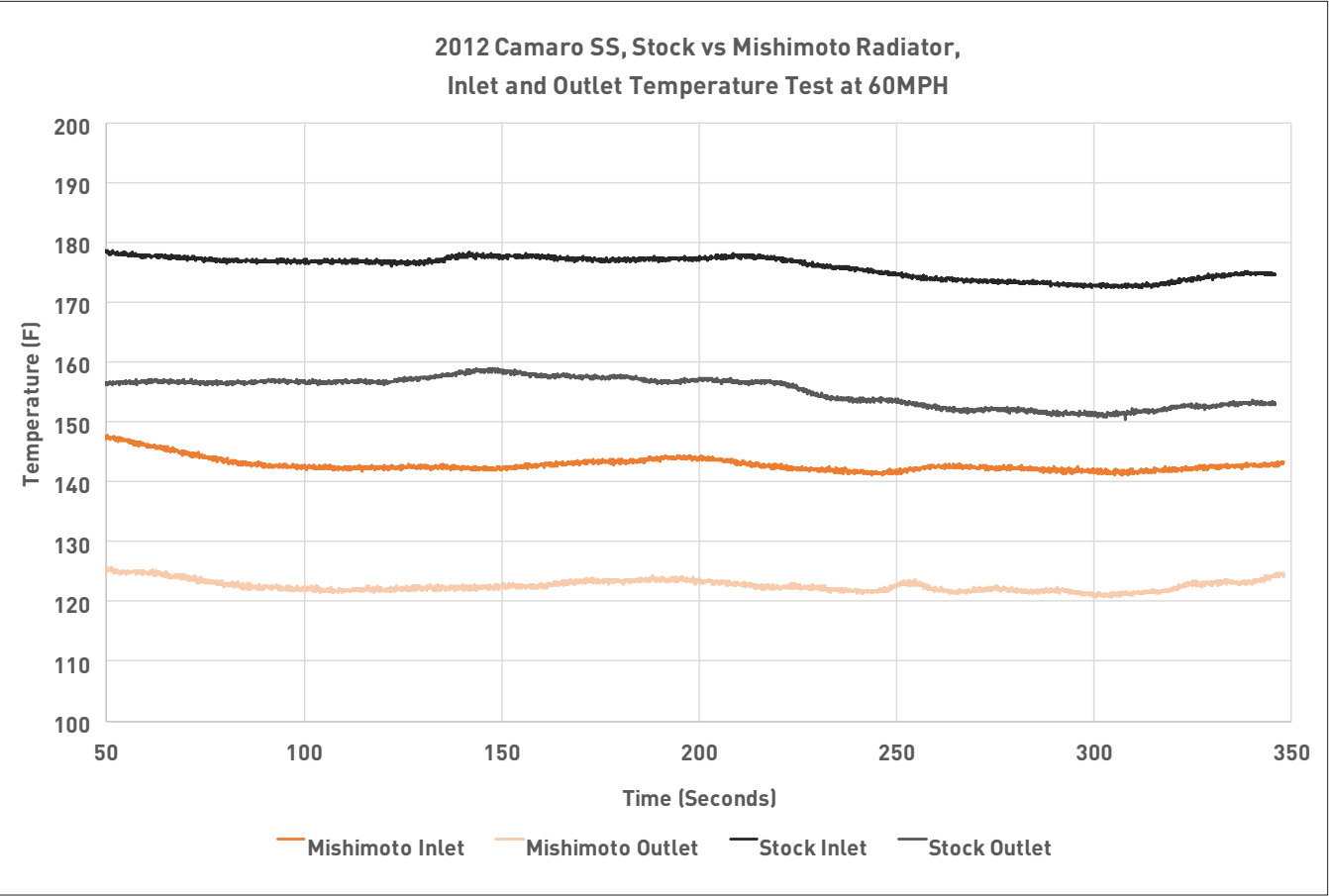


FIGURE 4: The stock radiator and Mishimoto radiator were tested using the same technique. Mishimoto’s core showed an increase in heat transfer when compared to stock.

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