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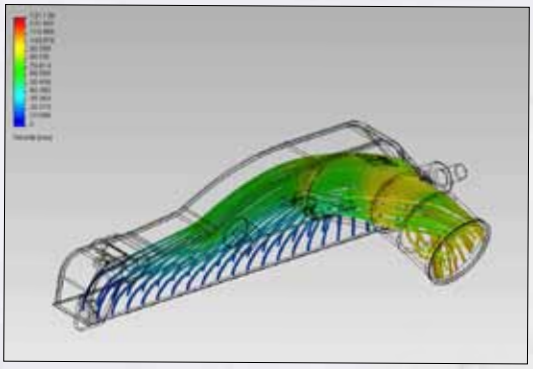
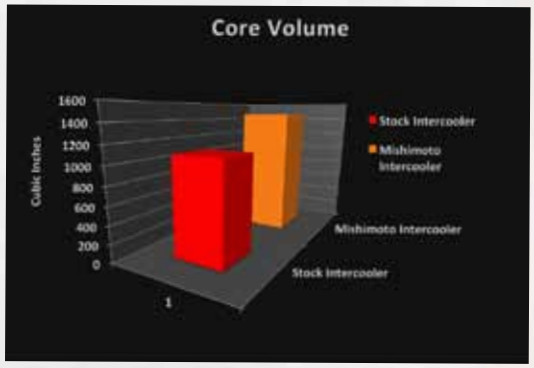
MISHIMOTO ENGINEERING REPORT

Subject: 2001-2005 Chevrolet/GMC 6.6L Duramax Mishimoto Intercooler

Mishimoto Disclaimer

We at Mishimoto would like to thank you for taking the time to read our Engineering Report. We know that many readers have questions regarding the efficiency of diesel truck intercoolers. Many companies make broad claims but fail to substantiate them with proven testing data. Each Mishimoto product has been tested in-house on our Dynojet 424LX dynamometer. Testing results were obtained using PLX K-type thermocouples and analog pressure gauges (0-100 psi range). The sensors were kept in the same location, from factory intercooler testing to Mishimoto intercooler testing, to ensure consistency in data collection. This controlled experiment allowed us to isolate the intercooler, so that we could determine the performance of the product alone. No variables such as intakes, exhausts, or tunes were changed or modified during testing. Performance results will vary from vehicle to vehicle depending on modifications.





The engineering team went through multiple iterations while designing the end tanks. They used CFD software to make sure that the flow was optimized for the Chevrolet/GMC 6.6L Duramax. The core of the Mishimoto intercooler is 23% thicker and 25% larger in volume than the stock unit.

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Testing of the 2001-2005 Chevrolet/GMC 6.6L Duramax Mishimoto Intercooler

Test Vehicle

2002 Chevrolet Duramax

- Built transmission
- EFILive tuning
- 5-inch exhaust

Apparatus

For hardware Mishimoto used the PLX sensor modulus driven by the Kiwi WiFi plus IMFD. This is a wireless system from the sensor modules to an iPad or laptop computer. The software used was the Palmer Performance Scan XL pro, which has full data logging capabilities.

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Air intake temperatures (AIT) were recorded from the inlet and outlet of both intercoolers using PLX K-type thermocouples. Boost pressure was also tested to ensure that no dramatic pressure drop occurs when installing the larger Mishimoto intercooler. Mechanical gauges were used because of the high boost levels.

Sensor locations

1. Pre-intercooler air intake temperature (data logger)
2. Pre-intercooler boost pressure (mechanical gauge)
3. Post-intercooler boost pressure (mechanical gauge)
4. Post-intercooler air intake temperature (data logger)

Testing conditions

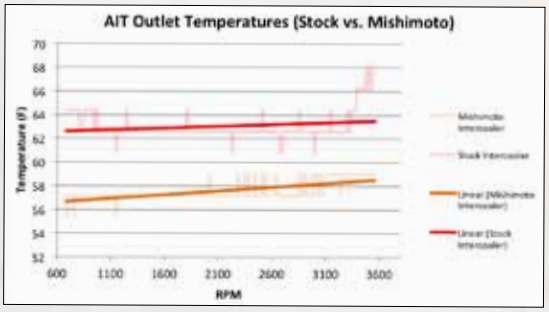
Ambient temperature range: 52°F to 53°F

Experiment

The test compares the stock intercooler with the Mishimoto intercooler under exactly the same conditions. To conduct the test we made three runs with each setup in top gear, and we ran the truck from 1600 to 3500 rpm. Between runs, a 3-minute break ensured that each run started with similar temperature conditions. Every test was conducted with the hood up and a blower fan placed directly in front of the core. Wind speed out of the blower was 20 mph. The truck was strapped down once, and the intercoolers were swapped out on the dynamometer so that both tests were conducted under exactly the same conditions.

Results

The results shown to the right are for the post-intercooled AIT temperatures. The graph shows that the Mishimoto intercooler had a maximum of about 15% lower outlet temperatures when compared with the stock intercooler.



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The mechanical boost gauges are shown below. Both the Mishimoto and stock intercoolers showed a pressure loss of approximately 1.5 psi at maximum. No significant gain or loss was observed with either setup.

Conclusion

The dyno testing indicated that the stock intercooler is a suitable unit for normal everyday driving. Under harsh driving conditions, however, the stock intercooler would not be able to keep up with the cooling needs of the Duramax engine. The Mishimoto intercooler is able to handle higher temperatures and pressure much better than the stock unit. Also, for highly modified or upgraded turbo trucks, the Mishimoto unit features casted end tanks and a bar-and-plate core, which will handle much higher boost levels than the factory tube-and-fin core of the stock unit.

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