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2004 Pontiac GTO Radiator

MISHIMOTO ENGINEERING REPORT

Testing of the 2004 Pontiac GTO Radiator

Test Vehicle

2004 Pontiac GTO (with manual transmission)

Objective

To make a performance radiator that is a direct fit into the 2004 Pontiac GTO, for both manual and automatic transmissions

Testing conditions

Testing took place on a hot day. Temperature range: 75-83°F (24°C-28°C)

Apparatus

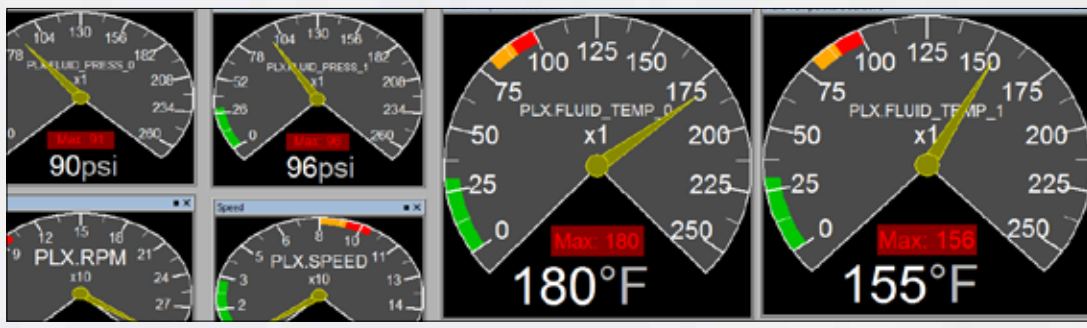
For hardware Mishimoto choose to use PLX sensor modules driven by the Kiwi WiFi plus IMFD. This is a wireless system from the sensor modules to the iPad or Laptop computer. The software used was the Palmer Performance Scan XL pro, which has full data logging capabilities.



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Fluid temperatures were taken from the inlet and outlet of both radiators using Mishimoto in-line water temperature sensor adapters and PLX fluid temperature sensors.



A thermocouple was mounted in the grille of the GTO to measure the temperature of the air as it entered the system.

Experiment:

The test compares the temperatures of the OEM radiator and the Mishimoto radiator. To conduct the test we drove the car on a highway at 65 mph (engine RPM ranged from 1500 to 2000) and cruised for approximately three miles. Special attention was given to the space of the car in front of the GTO to ensure that fresh air was flowing into the radiator. This experiment is 100% repeatable when the test is conducted under similar weather conditions.

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Special Notes: Water with no antifreeze was used in both tests because the water would be drained after testing. The OEM thermostat, relatively high at 186°F (85.5°C), was used during this test.

Product notes:

The OEM GTO radiator holds 0.88 gal (3.33 L) of coolant, whereas the Mishimoto radiator holds 1.05 gal (3.97 L) of coolant.



OEM Radiator Data

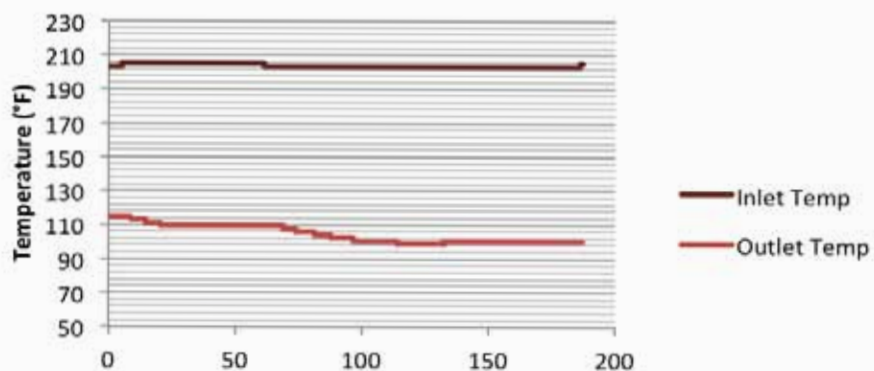


Figure 1: Highway test of OEM radiator.



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Mishimoto Radiator Data

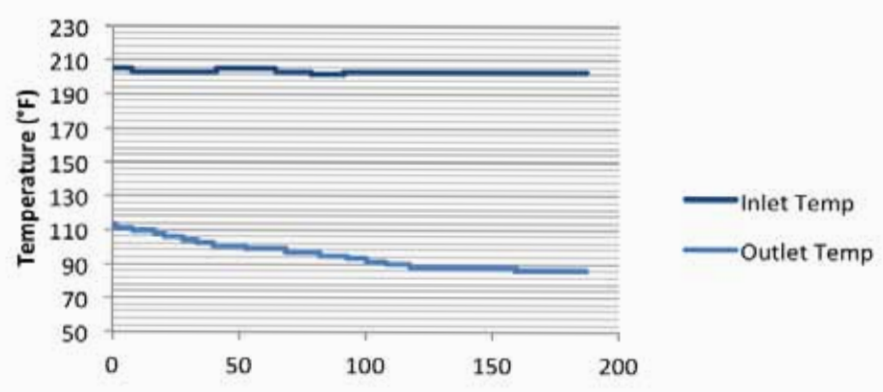


Figure 2: Highway test of Mishimoto radiator.

Mishimoto vs. OEM: Radiator Outlet Temps

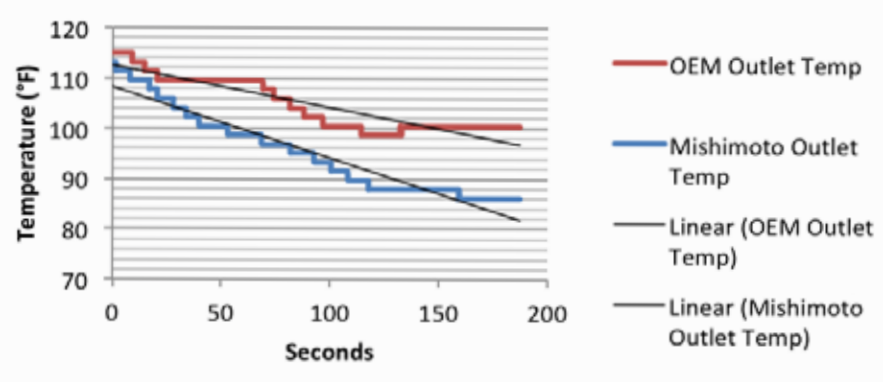


Figure 3: Comparison of radiator outlet temperatures measured from both the OEM and Mishimoto radiators. Both radiators were heat soaked before beginning the tests. Notice that by the end of our test the difference in outlet temperatures had risen to 20°F.



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Mishimoto vs. OEM: Efficiency

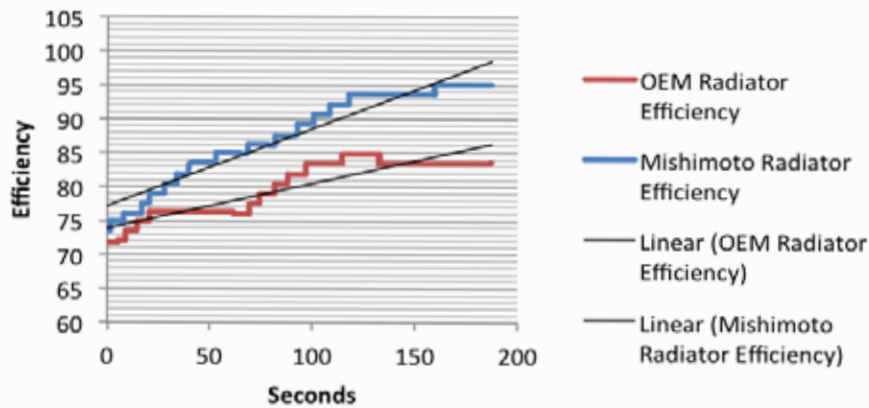
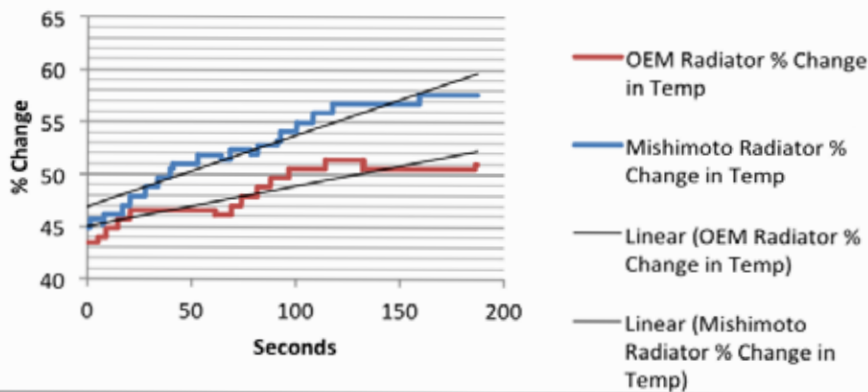


Figure 4: Comparison of efficiency between the OEM and Mishimoto radiators. Notice that at the beginning of the test, the Mishimoto radiator was actually less efficient than the OEM radiator. This is because the radiators were heat soaked before beginning testing. Once we began the tests, you can see that the Mishimoto radiator quickly becomes more efficient than the OEM radiator, proving that the Mishimoto radiator has a higher capacity to keep the GTO running cooler.

Mishimoto vs. OEM: % Change in Outlet Temperature



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Figure 5: The chart above is a comparison of percent change in the outlet temperatures of the OEM and Mishimoto radiators. The Mishimoto radiator has a 7% greater change in temperature than the OEM radiator.

Summary:

From the data above we have concluded that the Mishimoto radiator is significantly more efficient than the OEM radiator. The Mishimoto radiator holds 0.17 gal (0.64 L) more coolant than the OEM radiator. The Mishimoto radiator decreases coolant temps exiting the radiator by 20°F over that of the OEM radiator. Also, the Mishimoto radiator has an all-aluminum construction, making it more efficient under highway driving conditions.

Note: The effectiveness of the Mishimoto radiator can be expected to increase under harsh driving conditions.