Motor Vehicle Fire Research Institute
Awarded Contracts

Title: Measurement of Under Hood Temperatures

Contractor: Biokinetics and Associates Ltd.

Duration: August 1, 2004 – October 31, 2004

Purpose:

The primary purpose of this project is to conduct a series of measurements of under-hood temperatures at various locations in the engine compartment under various driving conditions. Temperature measurements will be recorded under three conditions:

1. While the vehicle is stationary – Temperatures will be recorded with the vehicle at idle speed. Additional readings will be recorded at 3 multiples of the idle speed for a total of 4 sets of readings. Temperatures will be recorded until steady state conditions are reached.
2. Under level highway driving conditions at speeds of 30, 40, 50, 60 and 70 mph – After steady state driving conditions are attained, the temperature will be measured for an additional 20 minutes with the engine turned off
3. While driving uphill at speeds similar to those in (2) – A hill, approximately 1.4 miles in length has been identified for these tests. The highest test speed will be determined to ensure safe driving conditions. At the top of the hill the vehicle will be pulled of to the side of the road and the rate of temperature decrease will be measured for 20 minutes with the engine turned off.

In each test a datalogger will record temperatures every 5 seconds. Testing will be performed in the Ottawa area with a minimum ambient temperature of 22^{O} C.
Each vehicle will be instrumented with 10 thermo couples (TC) or RTDs, the location of which will be determined in consultation with MVFRI. However, at least two TCs will be installed on the catalytic converter and on the exhaust manifold.

A total of 4 recent model year vehicles will be used for testing. Either employee vehicles or rental vehicles will be used. The vehicle selection will be confirmed with MVFRI prior to the installation of instrumentation and testing. Considering the source of the vehicles, the TCs will be installed in a non destructive manner (ie. no spot welding), probably with stainless steel hose clamps.

The deliverable for the work will include a test report detailing the test set-up and the electronic data from the test results.