

Motor Vehicle Fire Research Institute Awarded Contracts

Title: Survey of the State-Of-The-Art in Fuel System Fire Safety - Phase 4
Comparisons of Internal Tank Components – 20 Fuel Systems

Contractor: Biokinetics and Associates Ltd.

Duration: March 1, 2004 – June 30, 2004

Purpose:

In the ongoing effort to support the review of fuel system technologies, MVFRI has contracted Biokinetics to investigate fuel fed fire potential through the analysis of fuel tank technologies. To this end, Biokinetics will conduct leakage tests on 20 fuel tanks to study the fuel containment technologies employed and their performance. The tests will simulate a vehicle rollover by rotating a tank, filled to capacity, about an axis that when installed in a vehicle, would be parallel to the vehicle's longitudinal axis. The tanks will be filled with water instead of gasoline or Stoddard, which is typically used in automotive testing. It is understood that the properties of these liquids are different; however, it is believed that any leakage encountered solely because of the difference between the liquids would be negligible. Nevertheless, liquid soap will be added to the water to reduce surface tension and promote capillary flow as much as possible.

The tanks will be rotated to seven discreet positions during the rollover simulation. In each position the fuel system hoses will be disconnected to represent a damaged or severed line and the resulting leaks will be observed. Biokinetics will consult with MVFRI to make the final determination on the 20 fuel tanks to be studied. It is anticipated that a variety of tanks (based on technologies employed) will be chosen to adequately represent the largest possible volume of the vehicle fleet.

The connections to the tank systems will be compared to ascertain the design features or components that may influence the amount of leakage (or absence of leakage) observed. The comparisons will be extended to include internal features that can only be accessed by cutting the tanks open. The results of the design evaluations and component comparisons will be described in a final report.