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New Technology Research & Development Program
Grant Contract 582-5-65591-0010

Task 3 Deliverable Report

The preparation of this report is based on work funded in part
by the State of Texas through a Grant from the
Texas Commission on Environmental Quality.

Report on the Installation and Optimization of Eaton Corporation's Hydraulic Launch Assist™ (HLA®) System

TCEQ Contract Number: 582-5-65591-0010

The preparation of this report is based on work funded in part
by the State of Texas
through a grant from the Texas Commission on Environmental Quality.

Doug Gilbert
Eaton Corporation
June 20, 2006

Contents

Introduction

This report describes the results of a portion of the work funded in part by the State of Texas, through a grant from the Texas Commission on Environmental Quality. The activities and results discussed in the report are limited to hardware installation in the test vehicle, and system function optimization. These activities are described in the task #3 portion of the contract's Scope of Work.

Installation

The HLA® system was installed in a Peterbilt 320 truck. The installation went smoothly with all the parts fitting in the vehicle as planned. The HLA system is modular containing 3 main components that are mounted separately: pump/motor/transfer case assembly, accumulator, and reservoir. After these components are attached to the vehicle chassis, they are connected together by hydraulic hoses. Figure 1 shows the pump/motor/transfer case assembly being lowered into the vehicle frame.

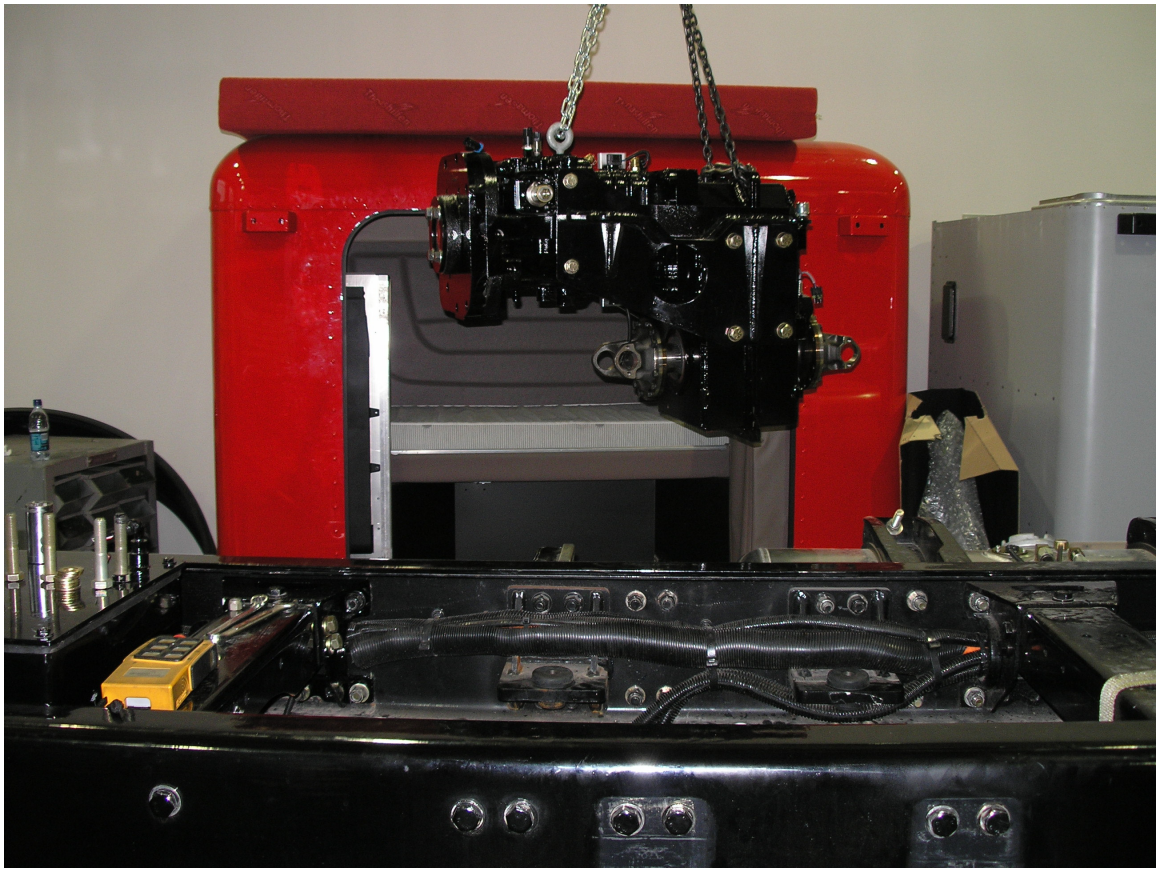

Figure 1

Figure 2 shows the HLA system in place between the vehicle's frame rails.

Figure 2

Another part of the HLA system is the Electronic Control Unit (ECU) and wire harness. These parts were installed in the vehicle and connected to the existing vehicle electrical supply and data bus. The HLA system has a user interface that consists of switches and a display. These parts were mounted in the dashboard for easy access to the operator. The user interface allows the vehicle operator the ability to select HLA operating modes and make some adjustments. The display communicates operating states and conditions. Figure 3 shows the truck dashboard.

Figure 3

After the HLA system was installed, a bed was put on the truck to carry weights. 22,000 lbs of concrete weights were added to enable the truck to be tested in a loaded condition. This amount of weight simulates a garbage truck that is half full. Figure 4 shows the truck with the bed and weights in place.

Figure 4

Optimization

After the HLA system was installed, it was filled with oil and turned on. Communication was established between the HLA system and the other truck subsystems necessary for vehicle control. The HLA system was tested by driving the truck in normal driving patterns and monitoring the performance. Some software changes were made to calibrate the system, and improve performance and feel. The result of the testing and tuning work was a smooth operating truck and HLA system. Several drivers operated the truck and expressed satisfaction with the system's performance. Figure 5 is a sample of data collected from the HLA system in the truck and used to improve the software calibration.

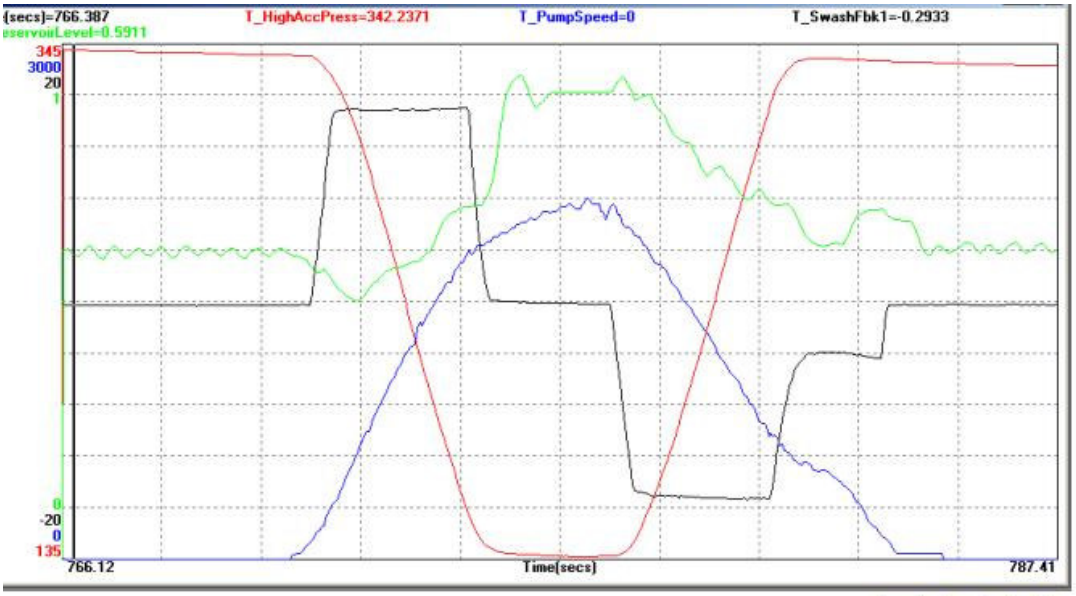

Figure 5

Conclusion

The updated HLA system was physically installed in the test truck and functionally integrated. All mechanical and electrical connections and data communications were verified to be correct and functional. The installation activities went well, due to the preparation and planning that had taken place.

The system performance was optimized by operating the HLA system in the truck and making adjustments to the system software. The effort was a success.