

**Texas Commission on Environmental Quality**  
**New Technology Research & Development (NTRD) Program**  
**Monthly Project Status Report**

**Contract Number:** 582-11-13469-2019

**Grantee:** QuantLogic Corporation

**Report for the  
Monthly period:** 9/1/2011 to 10/10/2011

**Date  
Submitted:** October 10, 2011

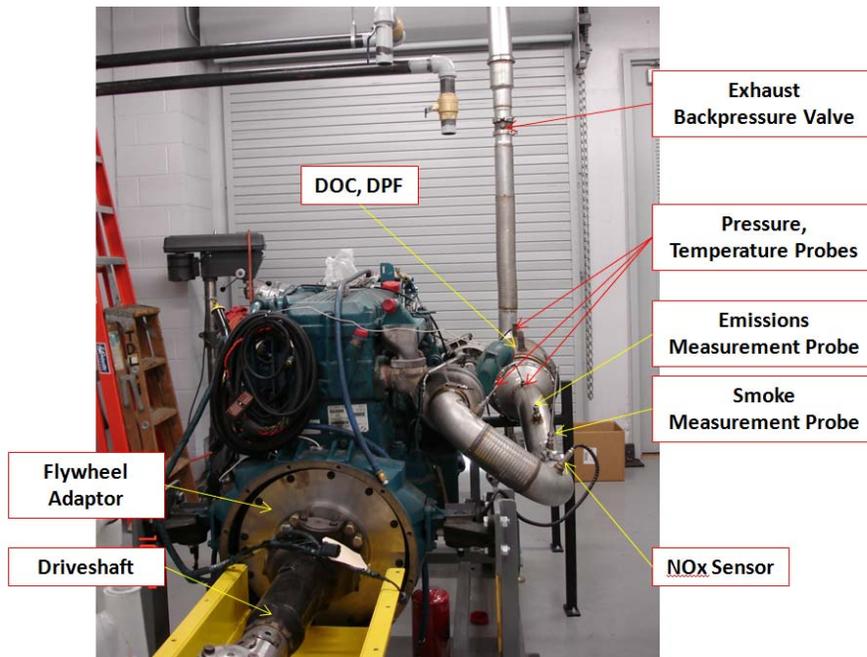
### **Section I. Accomplishments**

*Provide a bulleted list of project accomplishments as well as a description of their importance to the project.*

Task 1: Procure Components within 3 months: 90% completion of the task.

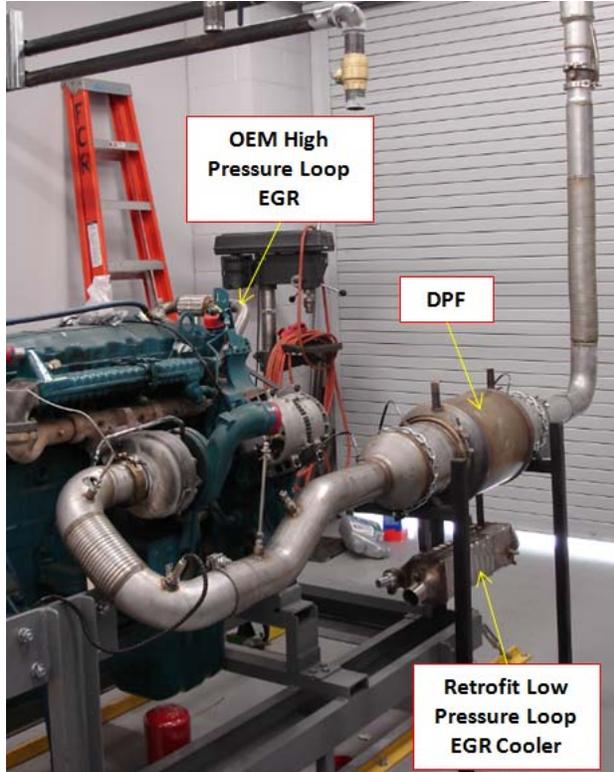
- All components for engine setup have been procured. The remaining 10% of the procurement refers to retrofits and will require more precise configuration such as dimensions for retrofit and results from the combustion and emission testing. It is more efficient to accomplish them at the stage after the emission reductions development and before the vehicle retrofit stage.
- Specifications for dual-loop exhaust gas recirculation (EGR) components have been finished.
- The major components for the combustion and emissions development for the retrofit kit were procured, including :
  - Driveshaft and flywheel adaptor for connecting dyno to the engine flywheel,
  - Rapid prototyping engine control system (openECU) and wireharness,
  - Crankshaft encoder, sensors and actuators,
  - Exhaust aftertreatment devices (diesel oxidation catalyst (DOC) and diesel particulate filter (DPF)), EGR cooler for low pressure loop EGR.

- **Error! Reference source not found.** shows the installation and setup of the test engine.



**Figure 1 Engine Setup and Components Installed**

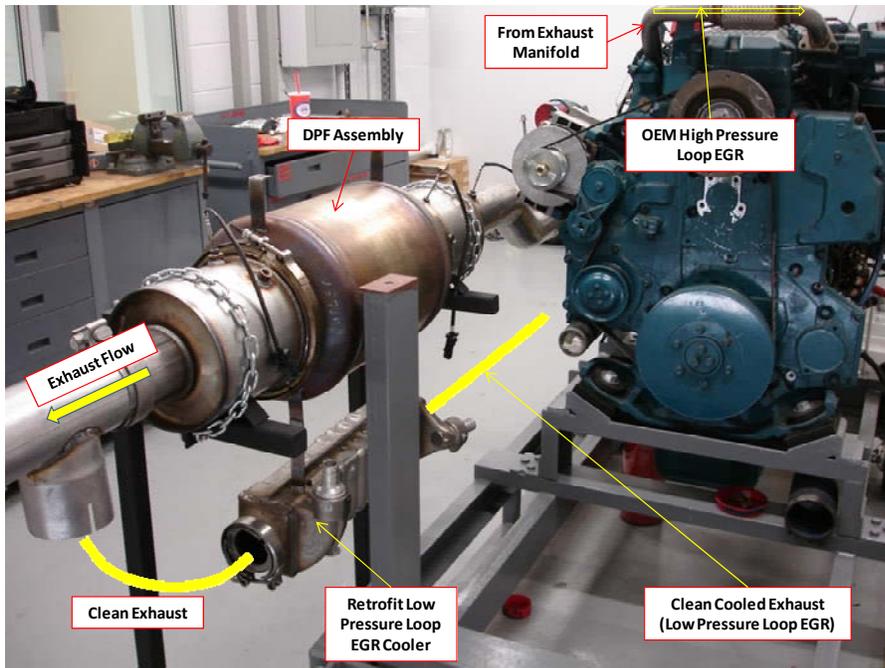
- The low pressure loop EGR cooler was also installed as shown in Figure 2. The low pressure loop EGR cooler will cool the exhaust after DOC and DPF (clean exhaust).



**Figure 2 Installation of Low Pressure Loop EGR Cooler next to (DOC and DPF) and OEM High Pressure Loop EGR**

Task 2: Set up engine retrofit and engine control systems within 6 months: 50% completion of the task.

- Continuation of the engine and exhaust aftertreatment, low pressure loop EGR system installation system as shown in **Error! Reference source not found.:**
  - Low pressure EGR cooler was mounted to the exhaust system,
  - Backpressure valve was mounted to the exhaust system,
  - Mounting adaptors of sensors ( $\text{NO}_x$ ,  $\text{O}_2$ , pressures and temperatures), as well as smoke and gaseous emissions measurement ports were fabricated and mounted in the exhaust.



**Figure 3 Illustration of Major Dual Loop EGR Components**

The remaining 50% of engine retrofit and engine control system setup will be the focus in the months of October and November.

*Indicate which part of the Grant Activities as defined in the grant agreement, the above accomplishments are related to:*

- Task 1: Procure Components within 3 months:
  - a. Finalize the specifications for and procure all test components needed for the completion of the project, and
  - b. Procure all test components needed to complete the project.
- Task 2: Set up engine retrofit and engine control systems within 6 months.
  - a. Set up the engine, dual loop EGR retrofit, and engine control systems in the laboratory in preparation for testing.
  - b. Install instrumentation for monitoring all major engine operation parameters
  - c. Set up the engine control system for fueling control, dual loop EGR control, and boost control.

## **Section II: Problems/Solutions**

*Problem(s) Identified: Report anticipated or unanticipated problem(s) encountered and its effect on the progress of the project*

a) None.

*Proposed Solution(s): Report any possible solution(s) to the problem(s) that were considered/encountered*

a) None.

*Action(s) Conducted and Results: Describe the action(s) taken to resolve the problem(s) and its effect*

a) None.

## **Section III. Goals and Issues for Succeeding Period:**

*Provide a brief description of the goal(s) you hope to realize in the coming period and identify any notable challenges that can be foreseen*

- Continue engine setup with control system and retrofit with dual loop EGR systems.
- Continue engine instrumentation setup.

*Date:* 10/10/2011

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*Authorized Project Representative's Signature*

**NOTE:** *Please attach any additional information that you feel should be a part of your report or that may be required to meet the deliverable requirements for tasks completed during this reporting period.*