

**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: April 1, 2013 to May 10, 2013
Date Submitted: May 10, 2013

Section I. Accomplishments

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

Task 5: Transient Emissions Tuning and Testing

- Task 5 is 100% completed. Conducted multiple transient emissions Federal Test Procedures (FTP) test cycles for the baseline and the retrofitted system. The control parameters were tuned to achieve the project goal of 50% NO_x reduction without fuel penalty compared with baseline engine configuration. Near 50% (48.8%) NO_x emissions reduction over transient FTP cycles was achieved by dual loop exhaust gas recirculation (EGR) configuration with improved “Calibration 2” as indicated by
- Figure 1. With dual loop “Calibration 1” in which less low pressure EGR was applied, 40% NO_x reduction was achieved over the transient FTP test cycle compared with baseline configuration as shown in
- Figure 1.

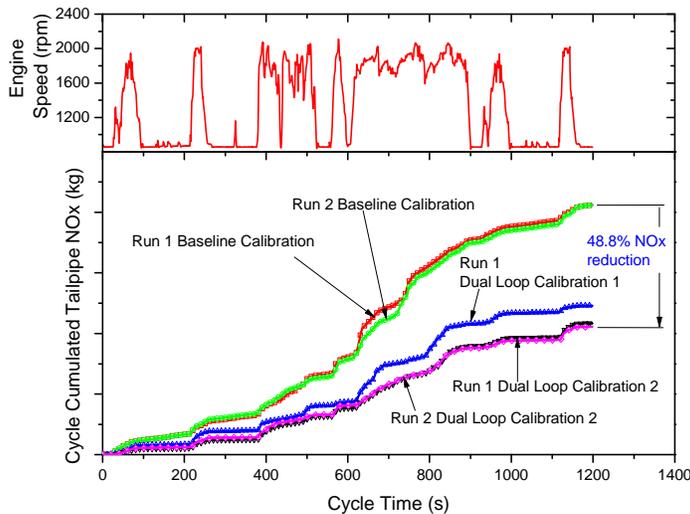


Figure 1. Results of NO_x emissions reduction from dual loop EGR engine compared with baseline engine configuration over transient FTP test cycle

Figure 2 shows the cycle cumulative fuel consumption over transient FTP test cycle where different engine configurations and calibrations were applied. As indicated by the results in

Figure 2, the fuel consumptions were the same for all test runs, which means the fuel economy was unchanged or no fuel economy impact by the dual loop EGR system and associated dual loop EGR calibration.

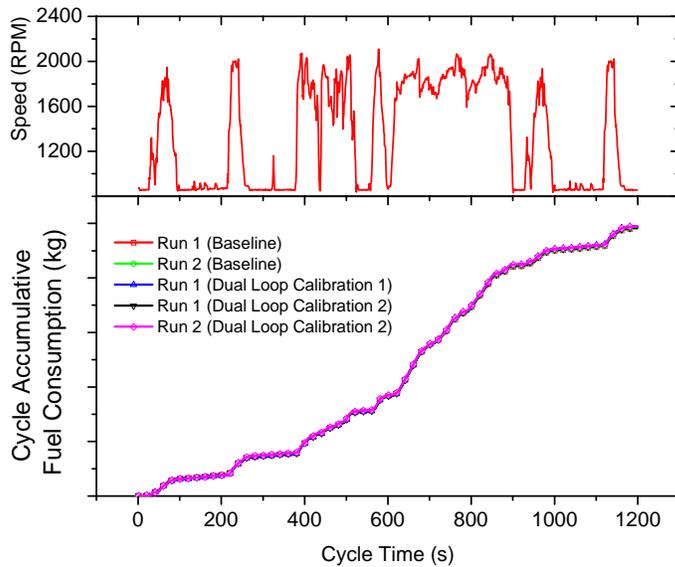


Figure 2. Cycle cumulative fuel consumption over transient FTP test cycles from different engine configurations and calibrations

Task 6: Vehicle installation of retrofit

- Task 6 is 35% complete. The prototype dual loop EGR system was removed from the test cell engine. The vehicle was examined to confirm the normal operation condition before retrofit starts. As shown in Figure 3, the test vehicle was retrofitted with a diesel oxidation catalyst (DOC), a diesel particulate filter (DPF), an exhaust back pressure valve and actuator, as well as fitted with sensor ports.



Figure 3. Test vehicle retrofitted with DOC, DPF, exhaust back pressure valve, and fitted with sensor ports

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

- The authorized tasks are related to:

“Task 5: Transient Emissions Tuning and Testing

2.5.2 Task Statement: The PERFORMING PARTY will finalize the engine control parameters to achieve targeted emissions goal and emissions test the retrofitted engine.

2.5.3 Transient Emissions Testing

2.5.2.1. The PERFORMING PARTY will emissions test the dual loop EGR retrofitted engine on an engine dynamometer at the Houston Advanced Research Center’s engine lab over the EPA Heavy-duty FTP test cycle.”

and

“Task 6: Vehicle installation of retrofit

2.6. Task Statement: The PERFORMING PARTY will retrofit the target vehicle with the dual loop EGR system for functionality test and initial usage accumulation.

2.6.1. The PERFORMING PARTY will uninstall the prototype retrofit dual loop EGR from the test engine and install it on the target vehicle.

2.6.2. The PERFORMING PARTY will complete a preliminary vehicle functionality test and begin the durability demonstration and usage accumulation.”

Section II: Problems/Solutions

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

- a) Task 5 needs be completed on time according to the revised schedule.

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

- a) Increase time and effort for Task 5.

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

- a) Task 5 was completed on time according to the revised schedule.

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.

- Finish Task 6 for vehicle retrofit.

Date: 5/10/2013

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.*