

CHAPTER 1

INTRODUCTION

1.1 PROJECT BACKGROUND

Diesel engines are a compression ignition type of internal combustion engine. It is well known technology in achieving major improvement in fuel economy and heavy duty task presently. Diesel engines are commonly used in heavy duty application vehicle such as constructional vehicles, trucks and lorries. But now it is widely implemented in light vehicle such as cars and vans. Diesel engines can double the fuel economy than spark ignition engines in light vehicles.

Diesel engines use fuel injection system. The fuel injection system is a system used to supply fuel into internal combustion engine which replaced carburetor function to supply the fuel into the engine. Fuel injector atomizes the fuel by forcibly pumping it through a small injection nozzle under high pressure. It is because diesel engine ignites the fuel by the high temperature created by the compression of air and fuel mixture.

Diesel engines have many advantages such as high fuel efficiency, reliability and durability. The performance of diesel engines depends on many parameters. One of the important parameters which influence the performance of diesel engines is fuel injection pressure. Fuel injection pressure plays an important aspect of power performance of the engine to obtain combustion treatment.

1.1.1 Fuel Injection System

Fuel injection is a technology that is being used in most of cars and other automotive transportation these days. The technology is used to eliminate the need for carburetors. The technology helps the engine to supply fuel directly to the cylinder in the intake manifold, eliminating the use of carburetor to much extent. Overall, the fuel injection is required to supply fuel directly to the engine.

The system works by the fuel is directly supplied to the cylinder in the intake chamber. Sensors located in such engines will regulate the flow of fuel injected and maintains it to appropriate levels. As long as the sensors which are usually electronic are working properly, the possibilities of breakdown and choke are immensely reduced.

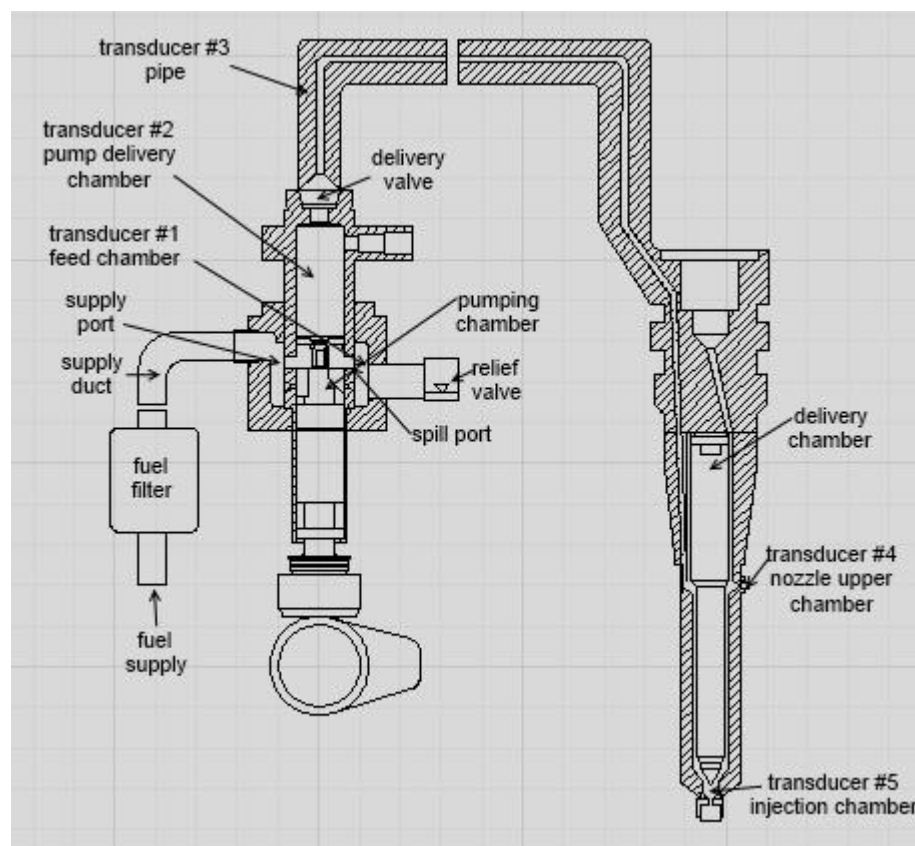


Figure 1.1 : Fuel injection system

1.2 PROBLEM STATEMENT

Engine performance depends on many factors. There are fuel injection pressure, engine speed, air fuel ratio, air flow rate, boost pressure, turbocharger speed, combustion efficiency, exhaust temperature and other factors. The fuel injection pressure need to be experimented to know how the varied injection pressure will affect the engine performance. In this study, the effects of fuel injection pressure on performance of diesel engines are investigated.

1.3 PROJECT OBJECTIVES

This project objective is to study the effects of fuel injection pressure on performance for diesel engine with simulation.

1.4 PROJECT SCOPES

In order to achieve the objective stated for this project successfully, this work is guided by several scopes. A flowchart for this project was made to show the clear of the progress of this project and make sure the project running under its scopes. The flowchart of the project is as shown in Figure 1.1.