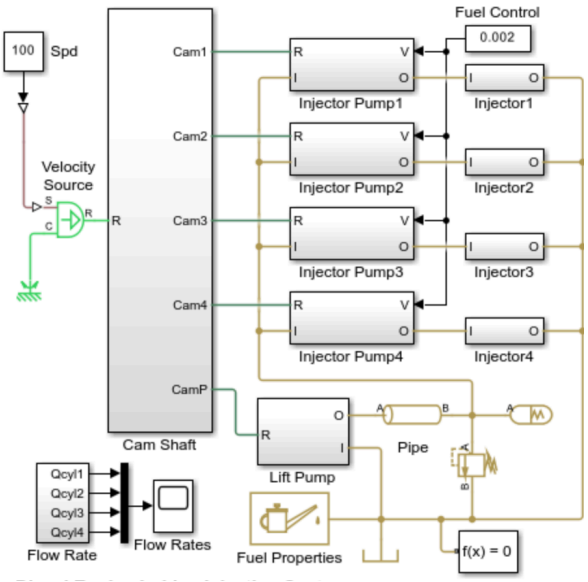
Diesel Inline Injection System

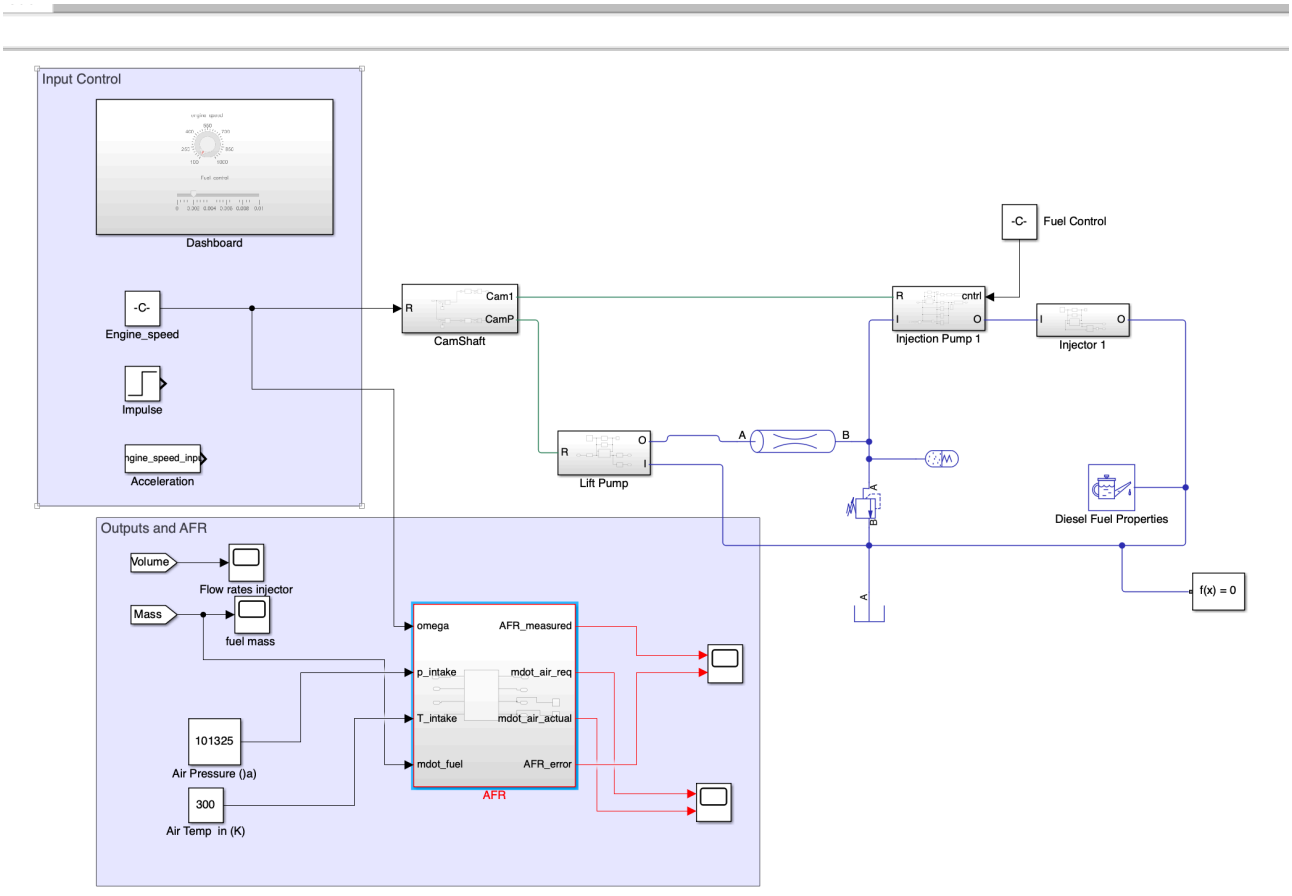
Research:

Implementation of Diesel In line Injection system, source Mathworks,

Original Design proposed by Matlab :



Simulink Modified:

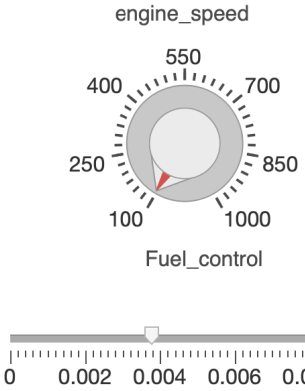


Work:

We have replaced this model, with newer blocks, and removed the redundant parts, like extra cam shafts
The integrated system was initialised and tested, and put under various responses or input and condition and observed results.

Testing:

The input to the system was tested by **Matlab** test codes.



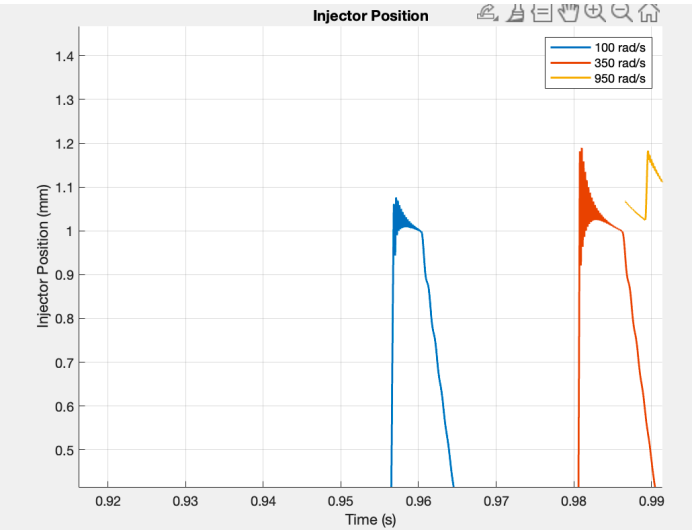
All the important parameters are extracted and given values, according to research paper, and made it easy to observe the results.

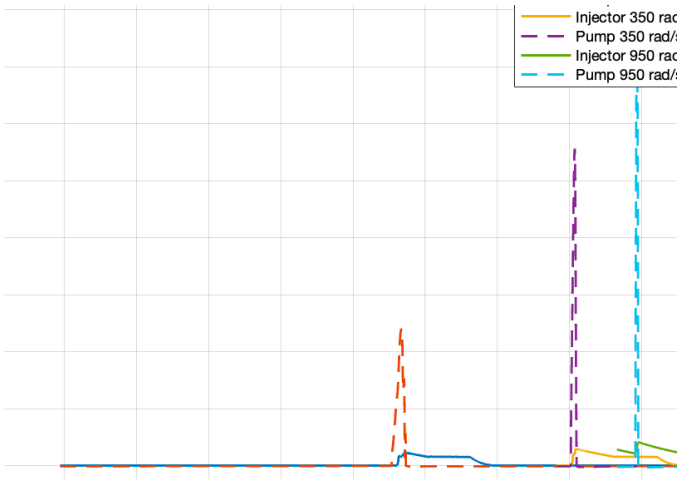
The main controllable params are preload pressure for the **lift pump, engine speed, fuel control, and diesel properties like temp and pressure at which fuel is kept.**

Made it easier to plot the graphs using Matlab by writing plot graphs by varying the input speed under various conditions, like comparing the flow at different input speeds, and acceleration plot.

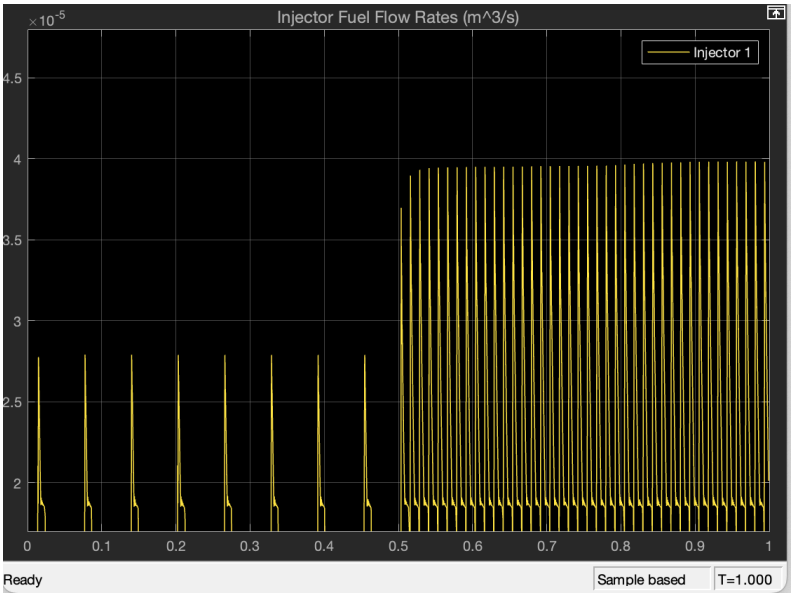
Added a simple dashboard to control the **engine speed and fuel control.**

INPUT RESPONSE:

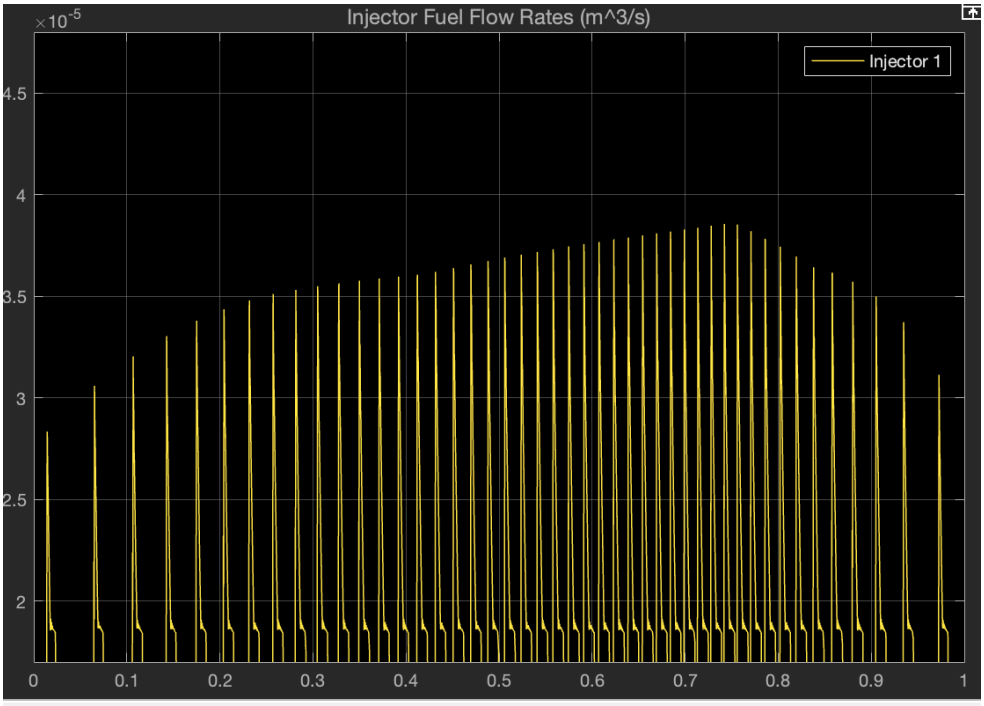




STEP INPUT RESPONSE:
Sudden jump at 0.5 from 100 to 500



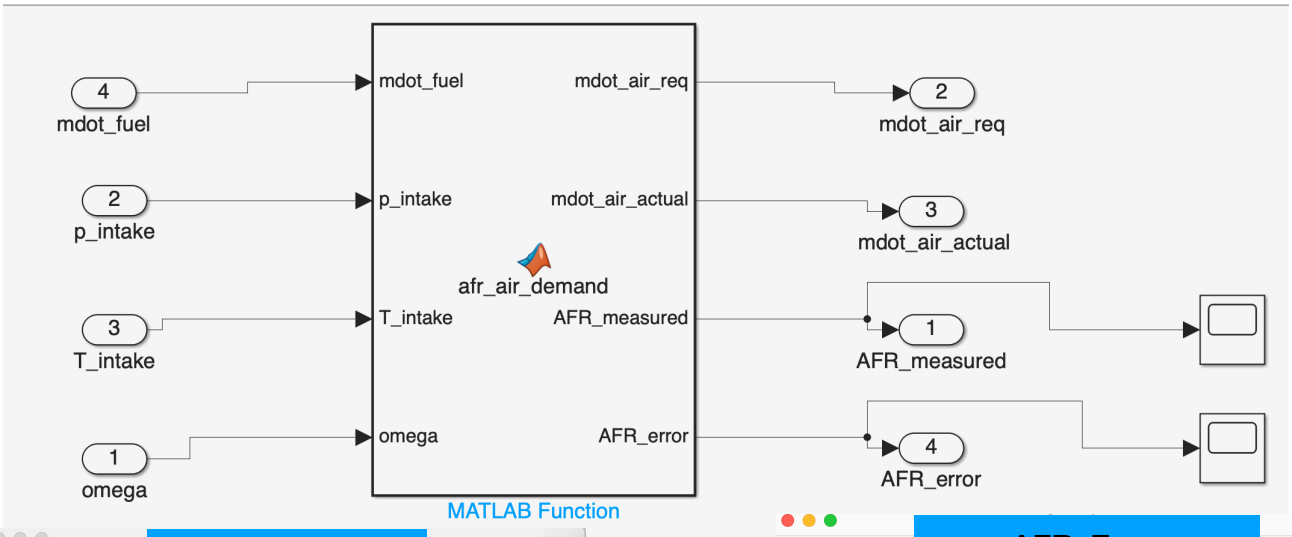
ACCELERATION RESPONSE :

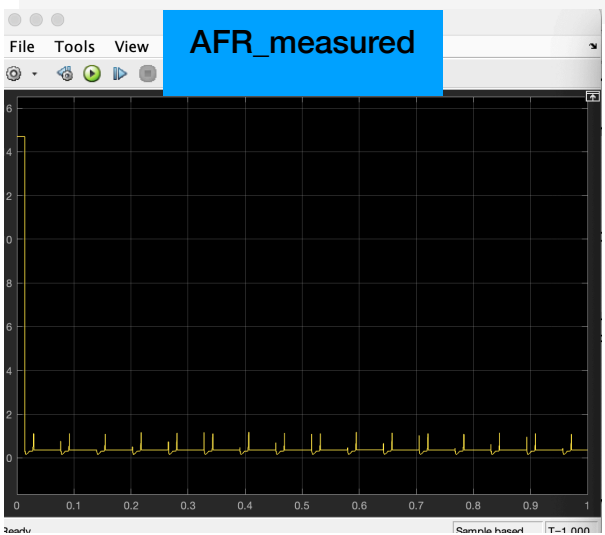


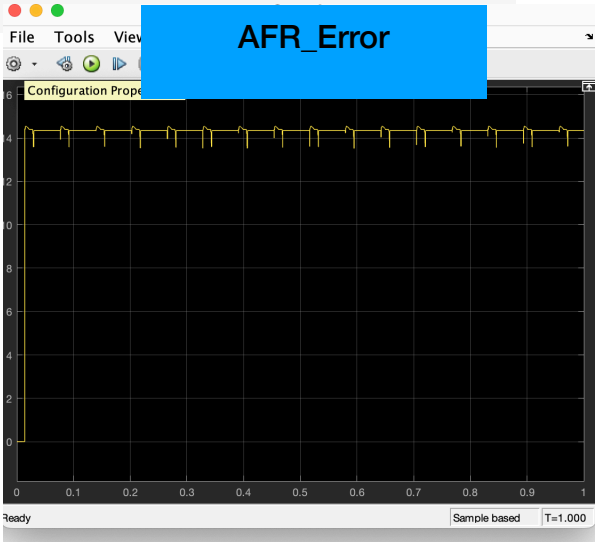
Design of parts: for omega = 100rad/s

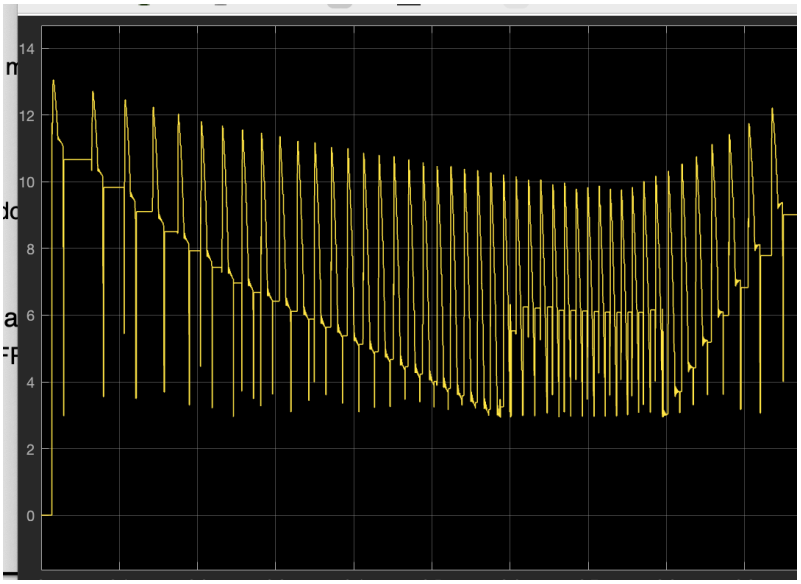
Air Fuel Ratio:

By receiving our fuel from the design, we tried the design to maintain a 14.2 to 14.4 air fuel ratio





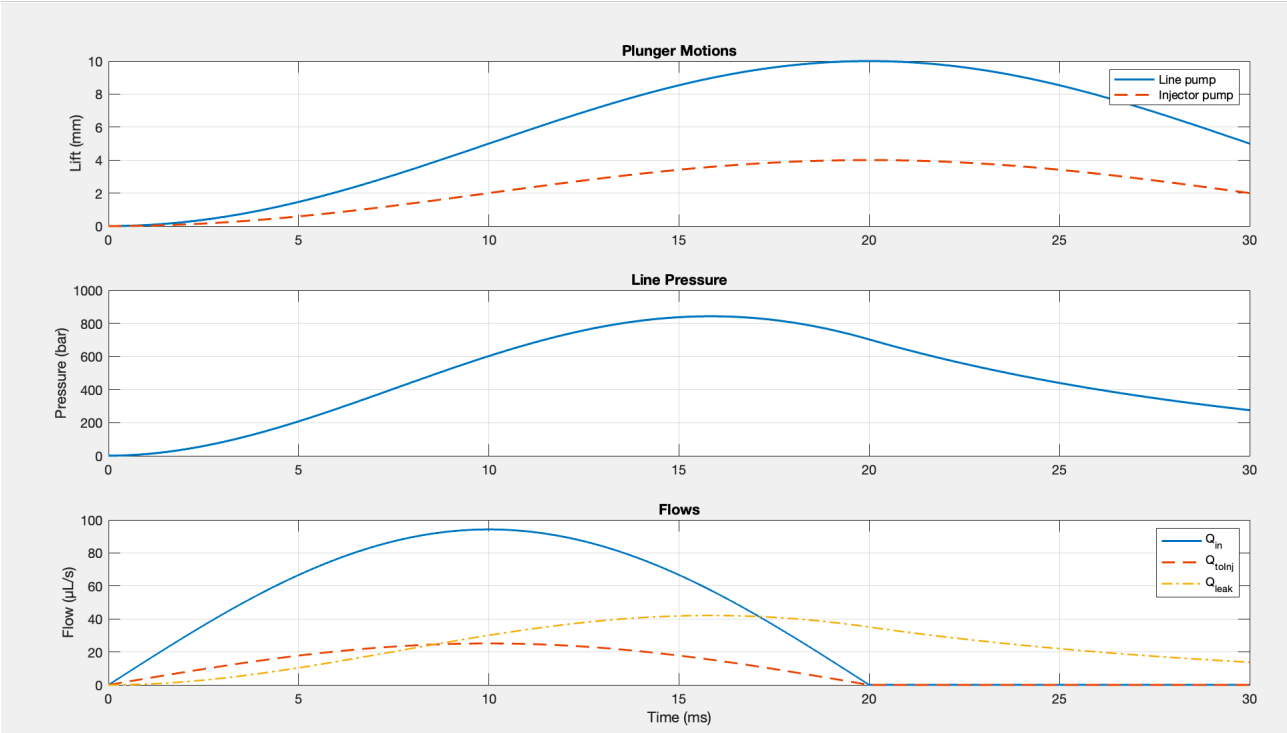




For an chasing omega.

Line Pump Design:

I have designed the Inline pump design, which is crucial parameter for injecting the fuel into the injector pump, which in thus increases the fuel pressure and sends to injector.
The mathematical Formulation are available on the github.
SourceCode



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