**ME3475: IC Engine Lab**

**Experiment 2**

**ME21BTECH11001**

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**Aim**:

Performance Study of Common Rail Direct Injection (CRDI) engine.

**Procedure:**

1. Start the engine.

2. Set the dynamometer load to 1 N, 12 N, and 24 N for additional experiments.

3. After adjusting the dynamometer load to the desired level, manipulate the fuel consumption rate by using the knob to regulate the throttle valve.

4. Ensure the RPM of the engine remains constant at 2000 RPM for each load by adjusting the throttle valve.

5. Measure the fuel consumption rate from 20-cc tube using a stopwatch.

6. Organize the collected data into a table and compute Fuel consumption rate, Brake power, specific fuel consumption, brake thermal efficiency, and volumetric efficiency.

**Formulas used:**

1. ***Brake Power (BP):***
2. *:*
3. **:**

**Tabulation:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| S No. | Load (Nm) | Air Flow Rate (kg/hr) | Speed (N) | Time for rise of  fuel (s) | FC  (Kg/hr) | BP (KW) | SFC (Kg/ KW hr) | 𝜂𝐵𝑃 | 𝜂𝑉𝑜𝑙 |
| 1 | 1 | 42.18 | 2000 | 121 | 0.488 | 0.21 | 2.33 | 3.432% | 63.133% |
| 2 | 12 | 43.8 | 2000 | 95 | 0.621 | 2.512 | 0.2474 | 32.336% | 65.56% |
| 3 | 24 | 46.44 | 2000 | 51 | 1.158 | 5.024 | 0.231 | 34.719% | 69.51% |

**Calculation:**

**Graph:**

A graph with a line going up

AI-generated content may be incorrect.

A graph with a line going up

AI-generated content may be incorrect.

**Conclusion:**

1. The data analysis shows that the fuel consumption rate increases as the load increases. This is due to the higher fuel requirement to maintain the desired RPM at greater loads.
2. Based on the calculations and graphical analysis, it is evident that both thermal efficiency and volumetric efficiency improve as the load increases.