

## Overall Information

*Table1- Overall Information*

|                          |  |
|--------------------------|--|
| Vehicle plate number     | 33592 (32441)                                |
| CPK data logger number   | LN: 001506, DN: 1927                         |
| Bus line                 | Number 2 (west to east bus line)             |
| Bus Terminals            | Khavaran Bus Terminal - Western Bus Terminal |
| Total path distance      | 19 km  |
| DPF producer company     | Tehag_02 (Catalyzed DPF)                     |
| Installation date        | 25/Jan/2016                                  |
| Report period            | 01/Feb/2016- 15/Feb/2016 (fifteen days)      |
| K value - DPF upstream   | 1.62 [1/m]                                   |
| K value – DPF downstream | 0.02 [1/m]                                   |

*Table 2- DPF Maintenance History*

|                         |   |
|-------------------------|---|
| Filter maintenance date | Filter have been working from installation date without any cleaning. |
| Dosing status           | This system doesn't use additive.                                     |

*Table 3- Fuel and Additive Consumption Information*

|   |            |
|---|------------|
| Bus mileage (from DPF installation date)            | 2025 km    |
| Bus mileage over the period                         | 1690 km    |
| Working days over the period                        | 12 days    |
| Stop days   | 3 days     |
| Data logger working days                            | 7 days     |
| Working hours over the period                       | -          |
| Average working hours per day (including stop days) | -          |
| Bus average speed                                   | -          |
| idle speed time to all working time ration          | 65.58 %    |
| Total Bus fuel consumption over the period          | 1014 lit   |
| Fuel consumption per hour                           | -          |
| Average fuel consumption                            | 0.6 lit/km |

Notice: Data logger had problem during this period and was fixed on Feb 6<sup>th</sup>. So working hours and their relative parameters were left blank.

## Temperature, Pressure and Engine Speed Overview

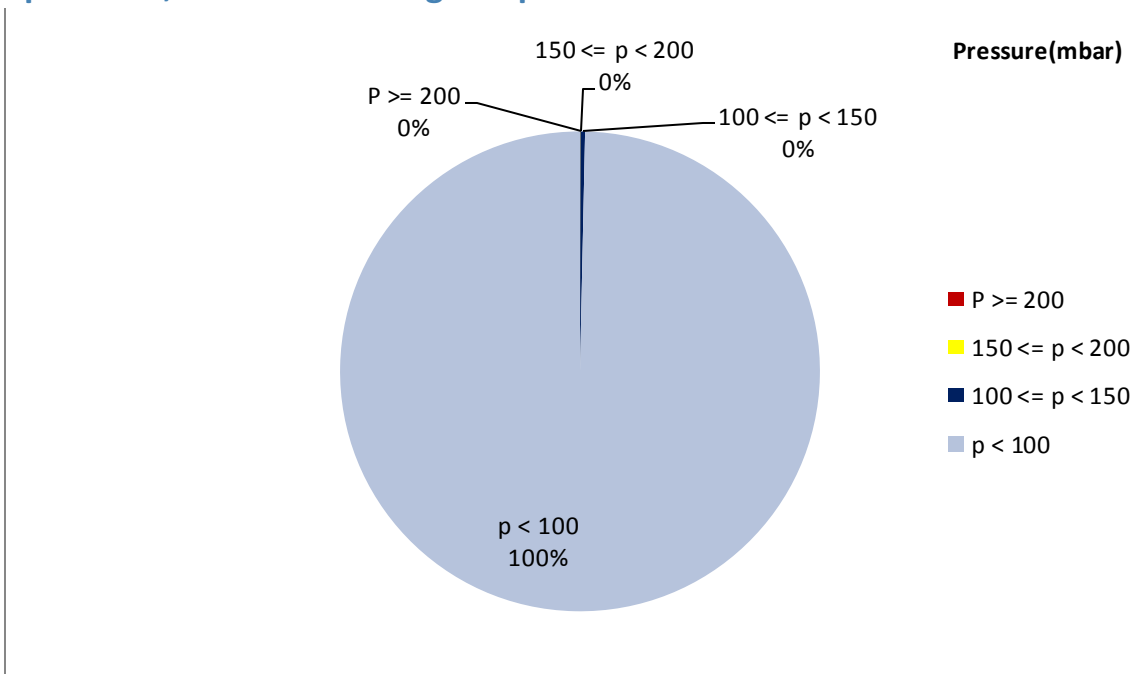


Figure 1- Pressure distribution over the working hours

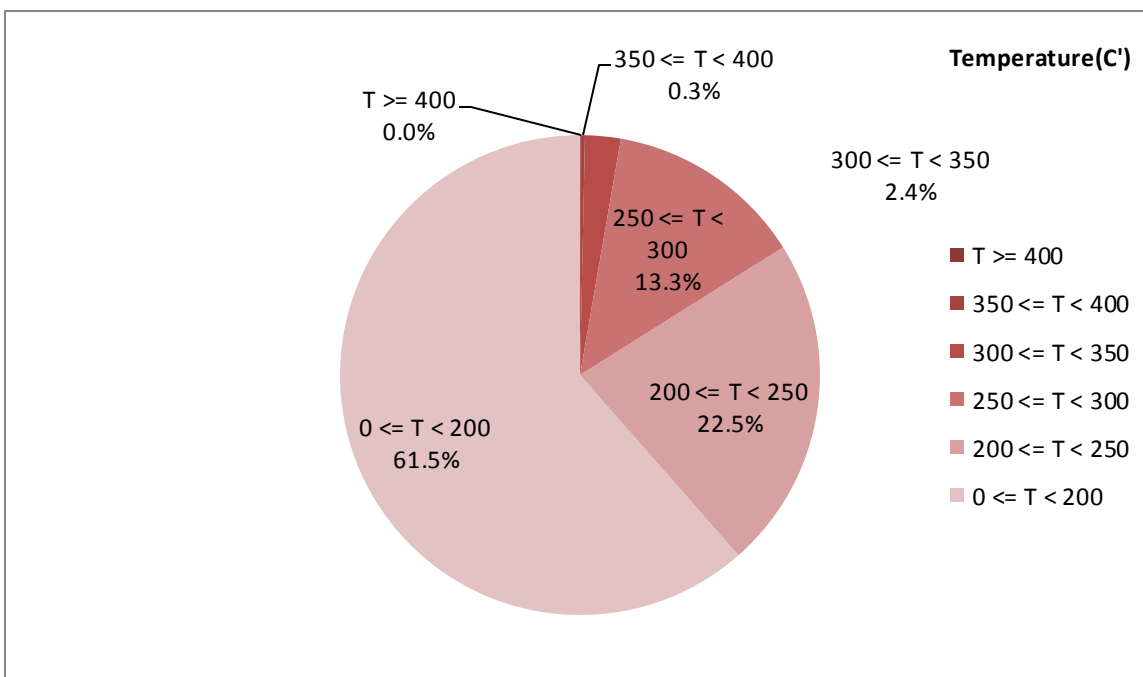


Figure 2-Temperature distribution over the working hours

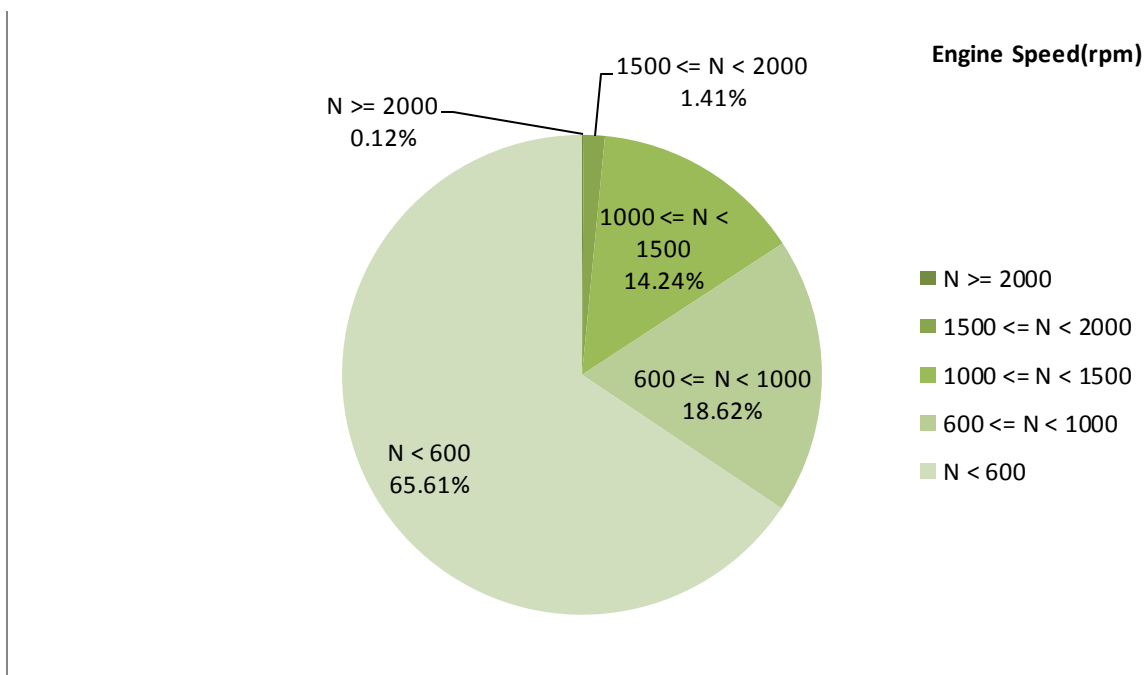


Figure 3- Engine speed distribution over the working hours

Table 4- Mean values

| Mean temperature (C) | Mean pressure(mbar) | Mean engine speed(rpm) |
|----------------------|---------------------|------------------------|
| 176.73               | -                   | 688                    |

Table 5- Mean values without idling

| Mean temperature (C) | Mean pressure(mbar) | Mean engine speed(rpm) |
|----------------------|---------------------|------------------------|
| 242.62               | -                   | 989                    |

Table 6- Max-min values

| Max-min temperature(C) | Max-min pressure(mbar) | Max-min engine speed(rpm) |
|------------------------|------------------------|---------------------------|
| 418-50                 | 222-0                  | 2096-256                  |

Notice: pressure sensor had problem during this period and was fixed on Feb 9<sup>th</sup>. So pressure data was unreliable.

## Detailed Pressure Analysis

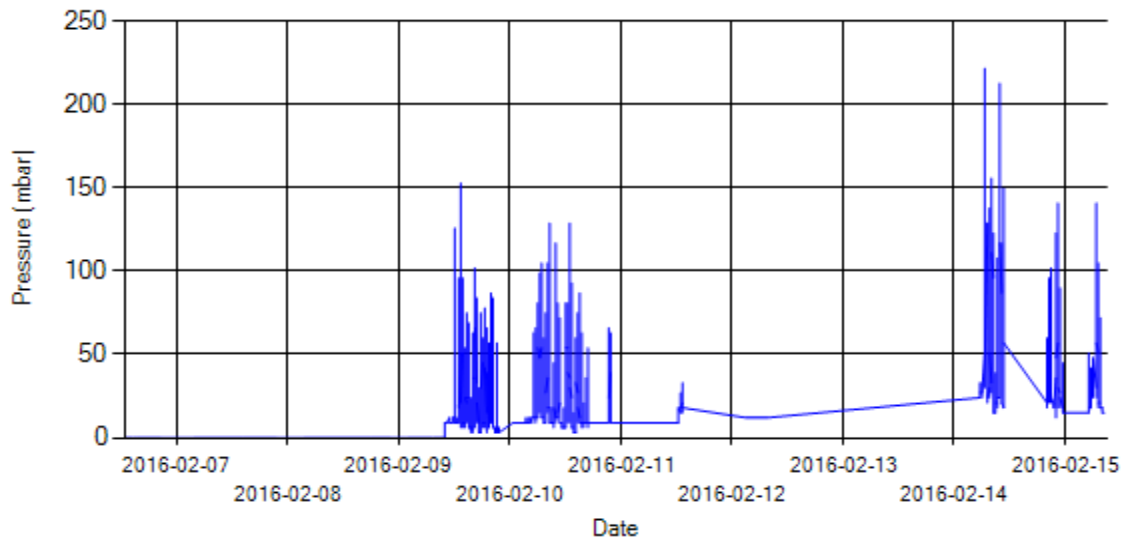


Figure 4- Pressure distribution over the period

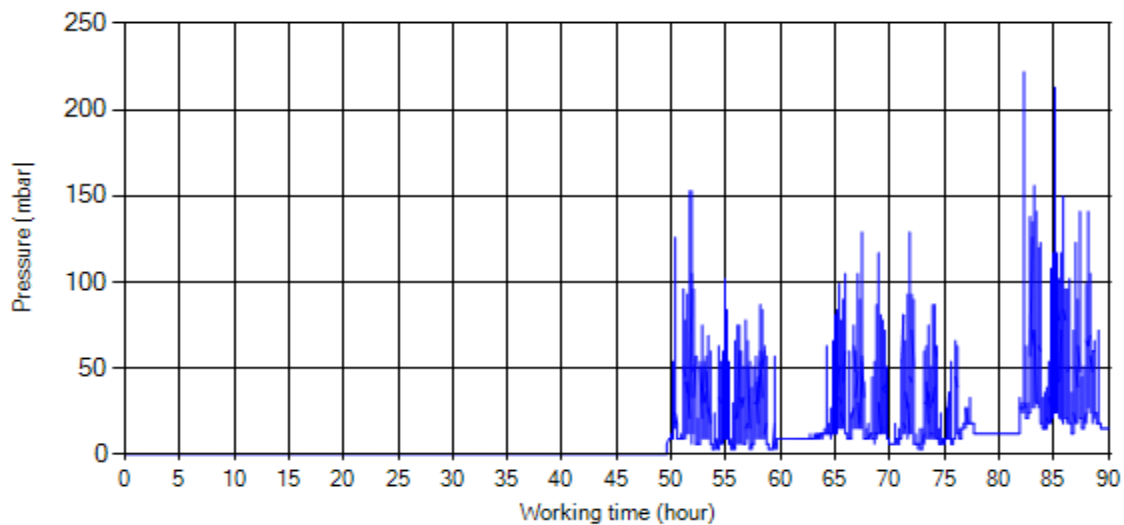


Figure 5- Pressure vs. working hours

Notice: backpressure distribution was shown into two diagrams. As obvious in figure 5, stop-working periods were eliminated and pressure was displayed along working hours.

Notice: System was stationary from 1<sup>st</sup> to 5<sup>th</sup> of the Feb. Also pressure sensor had problem during this period and was fixed on Feb 9<sup>th</sup>.

## Detailed Temperature Analysis

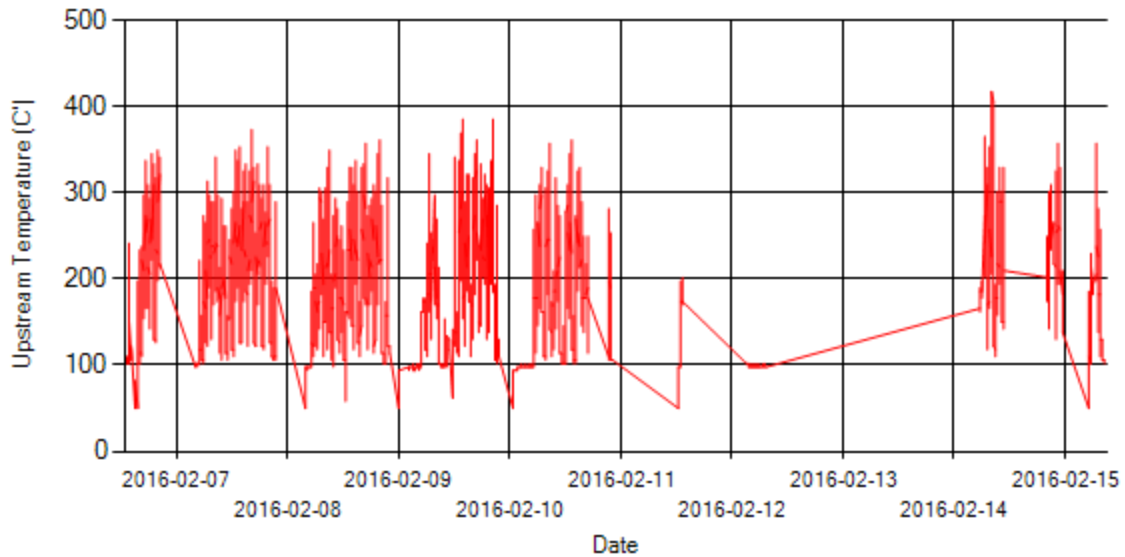


Figure 6- Temperature distribution over the period

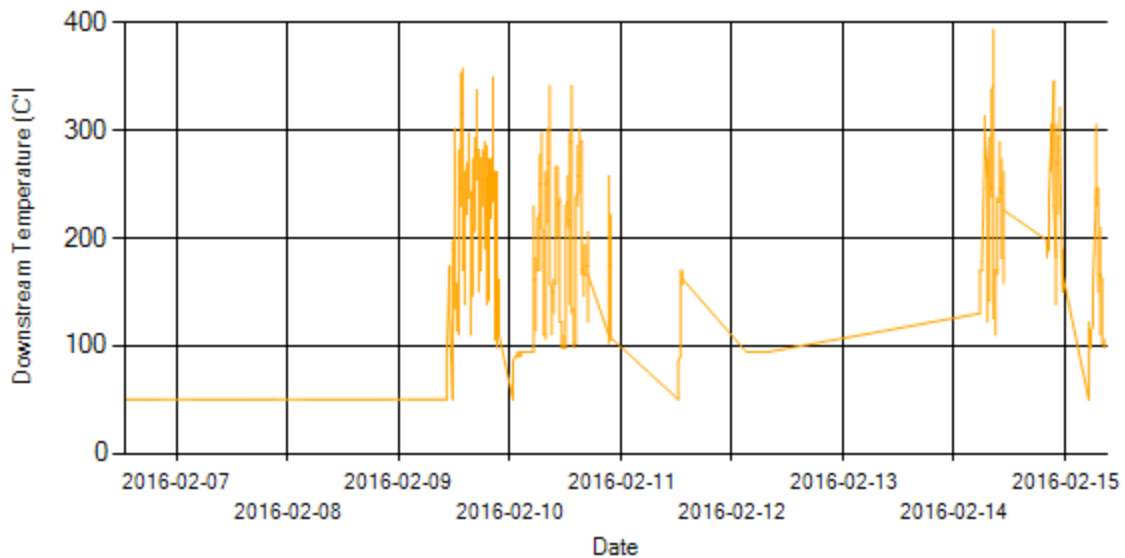
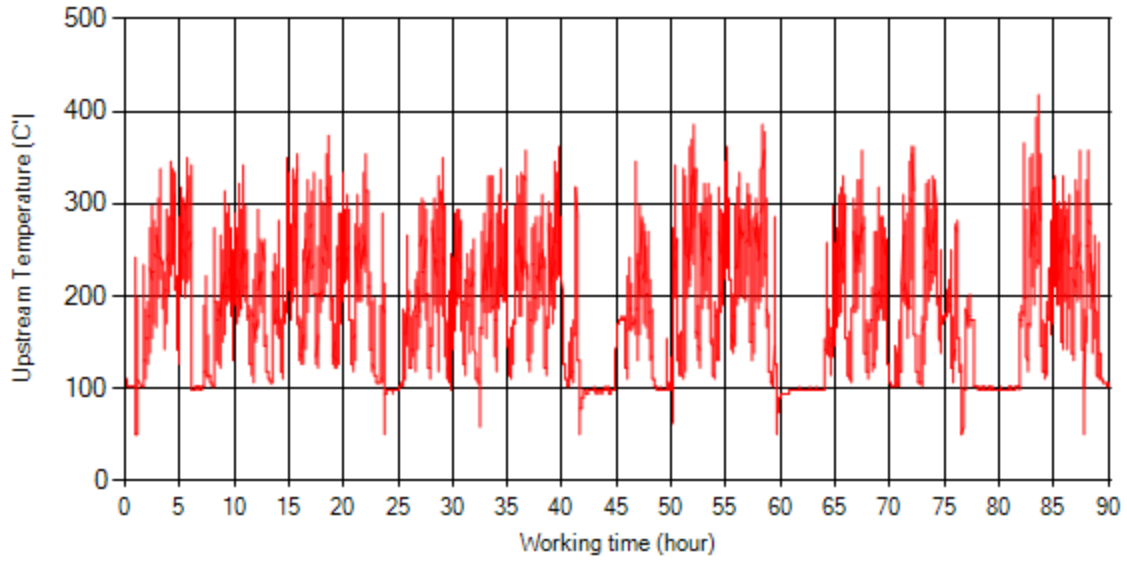
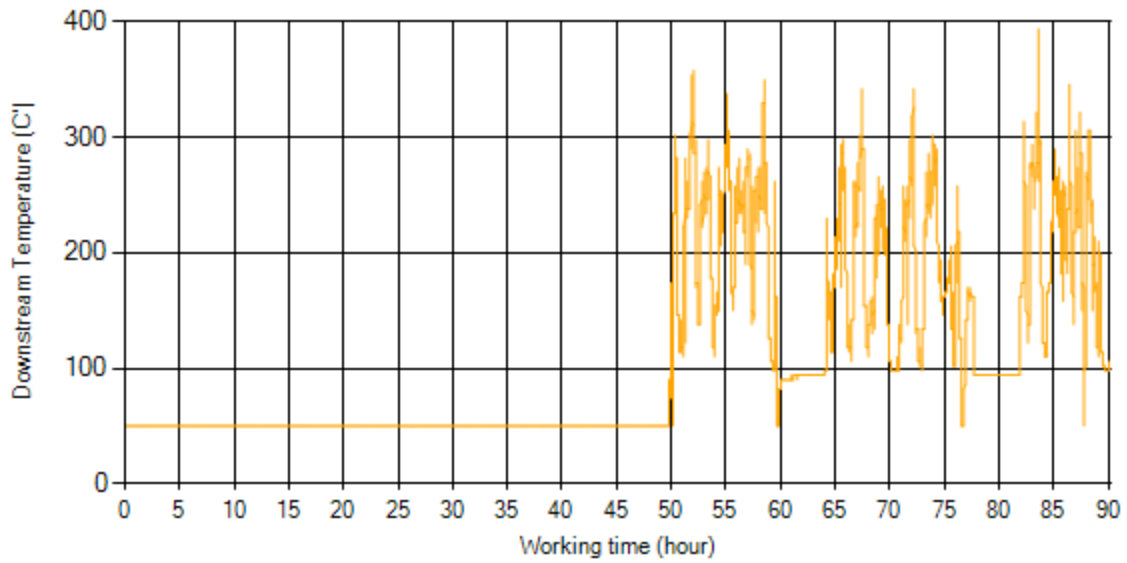


Figure 7- Temperature distribution over the period

Notice: Downstream temperature sensor had problem during this period and was fixed on Feb 9<sup>th</sup>.



*Figure 8- Temperature vs. working hours*



*Figure 9- Temperature vs. working hours*

## Engine Speed Diagrams

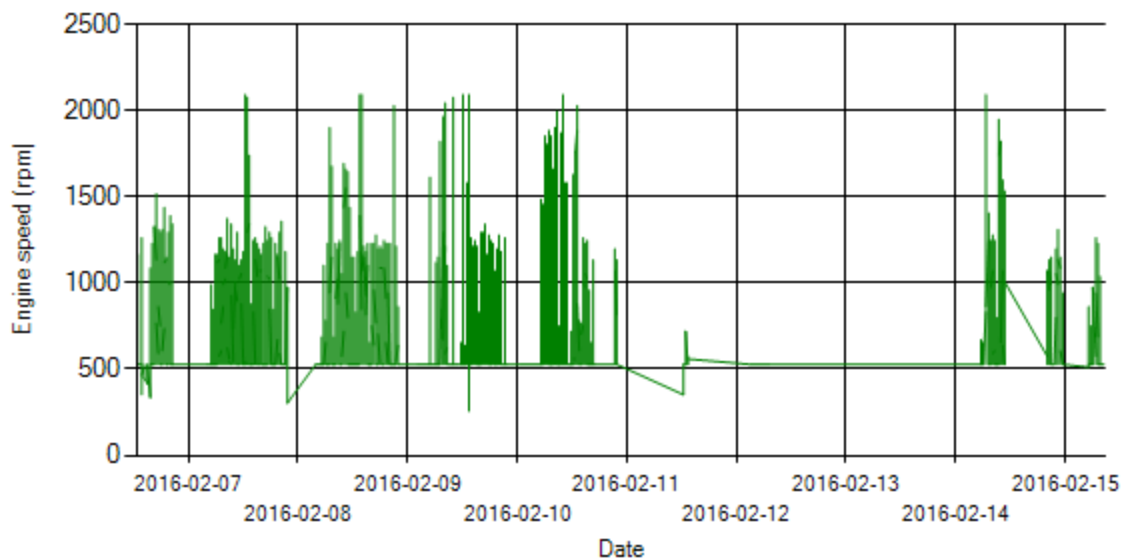


Figure 10- Engine speed distribution over the period

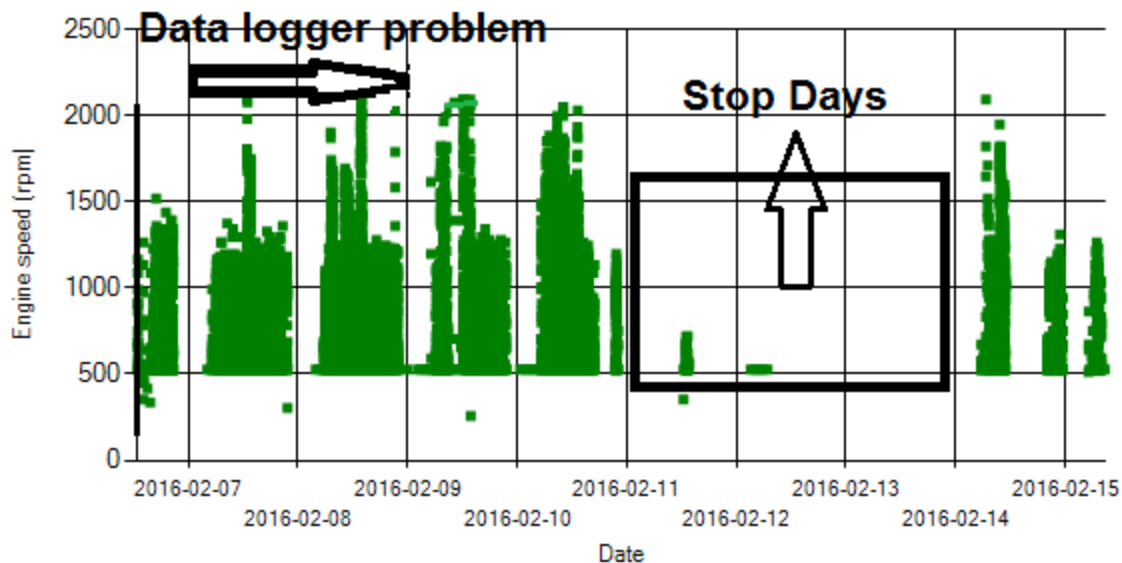


Figure 11- Engine speed diagram for calculating CPK's working days



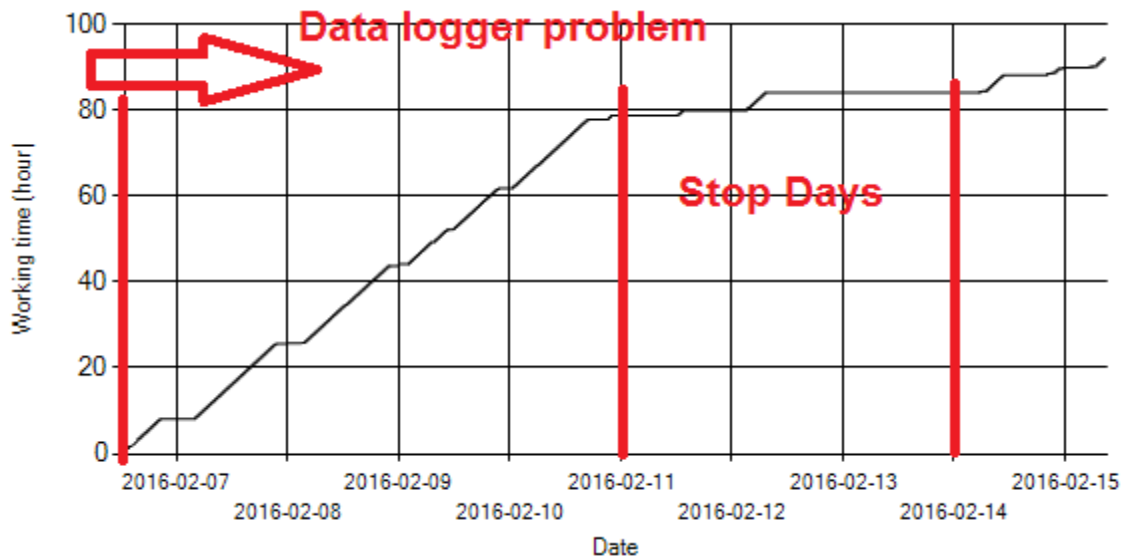


Figure 12- Time diagram for calculating CPK's working days

Notice: Data logger sampling time can be calculated from Figure 12. The lines parallel with Date axis show days without data logger data. As depicted in Figure 12, data logger only sampled data for 7 days.

### Pressure-Engine Speed diagrams

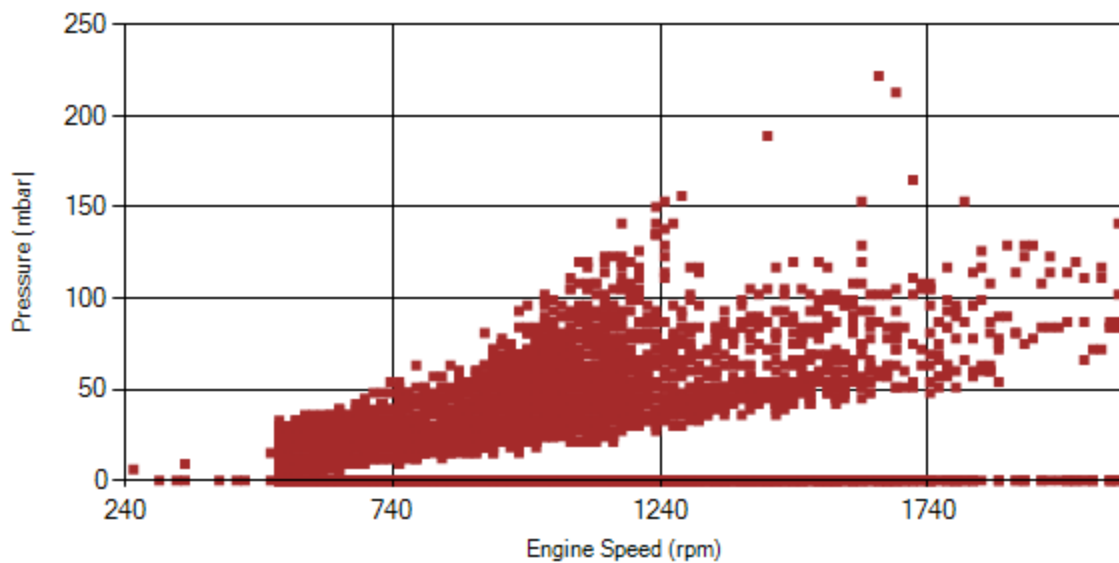


Figure 13- Pressure against engine speed

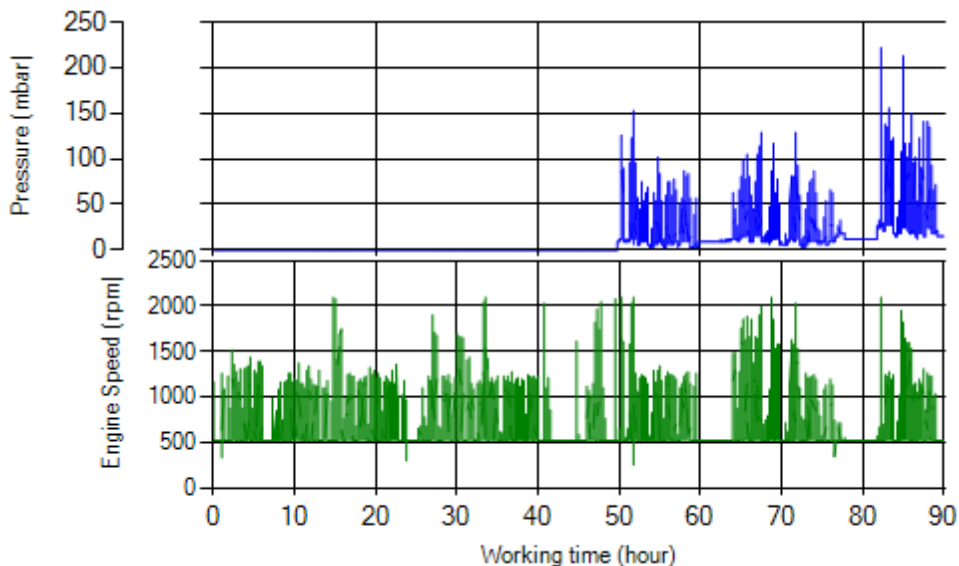


Figure 14- P, N distribution vs. working hours

### Temperature-Engine Speed diagrams

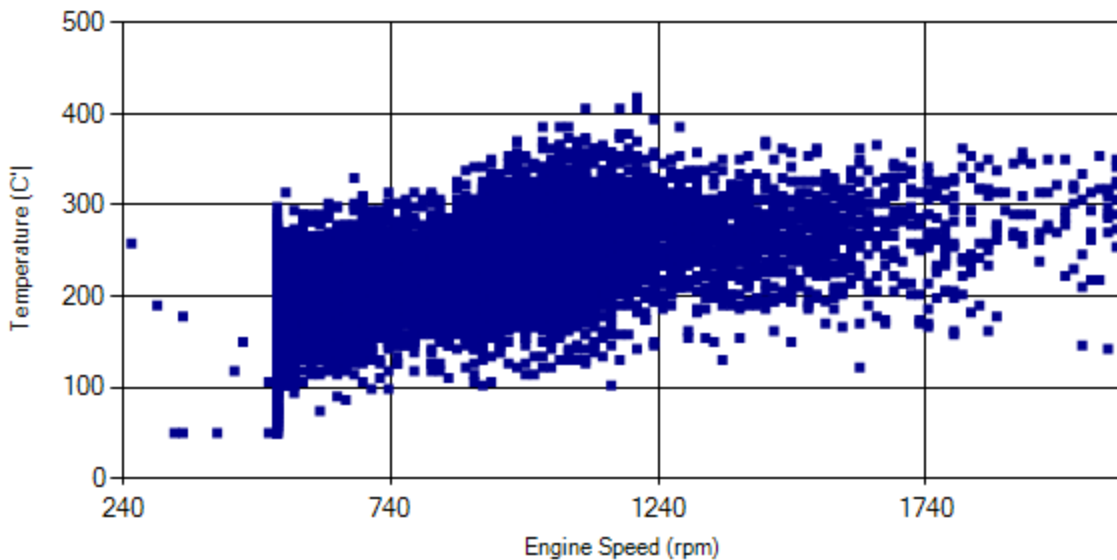


Figure 15- Temperature against engine speed

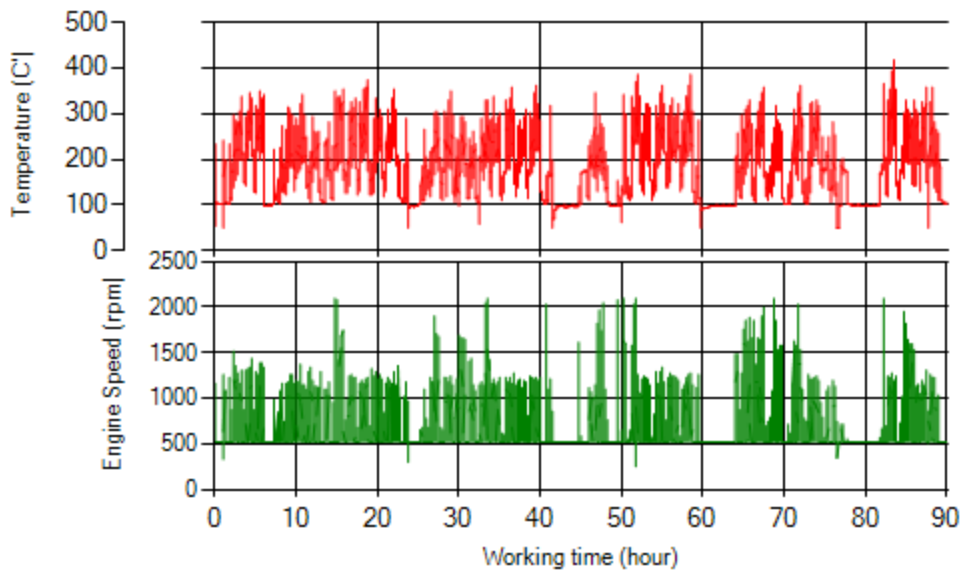


Figure 16- T, N distribution vs. working hours

### Filter Operation Analysis

Considering data logger and sensors problem, the system exact operation evaluation is not possible. But considering data logger working days and back-pressure distribution it can be guessed, DPF operation status was excellent during the period.

|                         |   |                                 |
|-------------------------|---|---------------------------------|
| Filter operation status | Excellent <input checked="" type="checkbox"/> | Good <input type="checkbox"/>   |
|                         | Maintenance required <input type="checkbox"/> | Failed <input type="checkbox"/> |