

## Overall Information

**Table 1- Overall Information**

Vehicle plate number	78514
CPK data logger number	LN: 001496, DN: 1914, Sim +989218786219
Bus line	Number 4 (south to north Bus line)
Bus Terminals	Tehran South Bus Terminal - Park Way Bus Terminal
Total path distance	22.8 km
DPF producer company	HJS_01 (Passive system with FBC)
Installation date	10/Sep/2014
Report period	16/May/2015 – 31/May/2015 (sixteen days)
K value - DPF upstream	1.24 [ $m^{-1}$ ]
K value - DPF downstream	0.06 [ $m^{-1}$ ]

**Table 2- Maintenance Table**

Filter maintenance date	DPF has been working from installation until now without any cleaning.
Dosing status	Dosing value has been kept constant from installation date until now.

**Table 3- Fuel and Additive Consumption Information**

Bus mileage ( from DPF installation date)	37232 km
Bus mileage over the period	2579 km
Working days over the period	15 days
Stop days	1 day
Data logger working days	12 days
Working hours over the period	$159.23+3*13.27=199.04$ hours
Average working hours per day (including stop days)	12.44 hours
Bus average speed	12.95 km/hr
idle speed time to all working time ration	33%
Total Bus fuel consumption over the period	1903 lit
fuel consumption per hour	9.56 lit/hr
Average fuel consumption	0.74 lit/km
Total Bus additive consumption over the period	0.80 lit
Average additive consumption	0.310 cc/km
additive consumption to fuel ration	420 cc per 1000 lit (Batch Dosing with Tank Level)

Notice: As depicted in Figure 12, data logger hade problem for three days. So we add average working hours to calculated working hours from the data logger.

## Temperature, Pressure and Engine Speed Overview

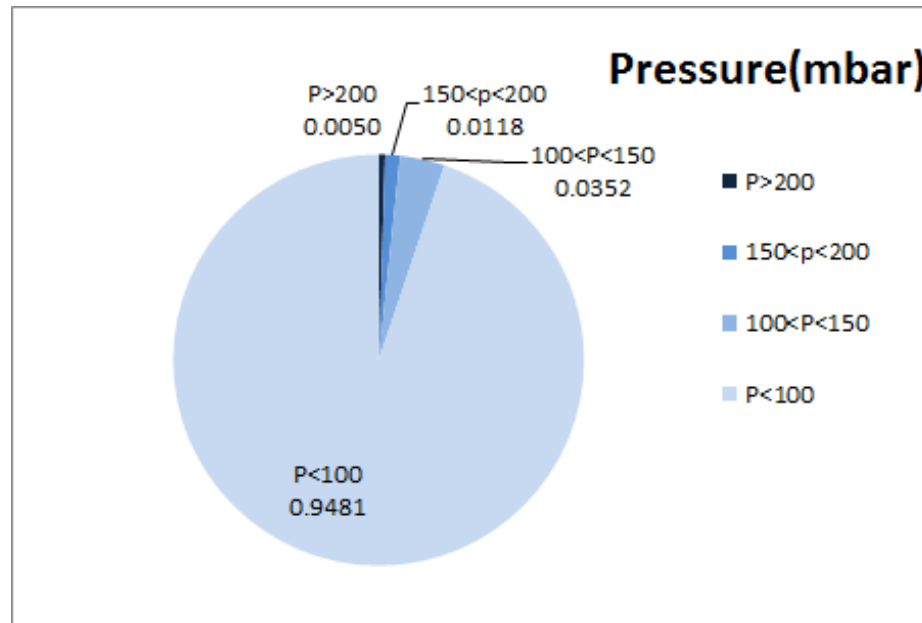


Figure 1- Pressure distribution over the working hours

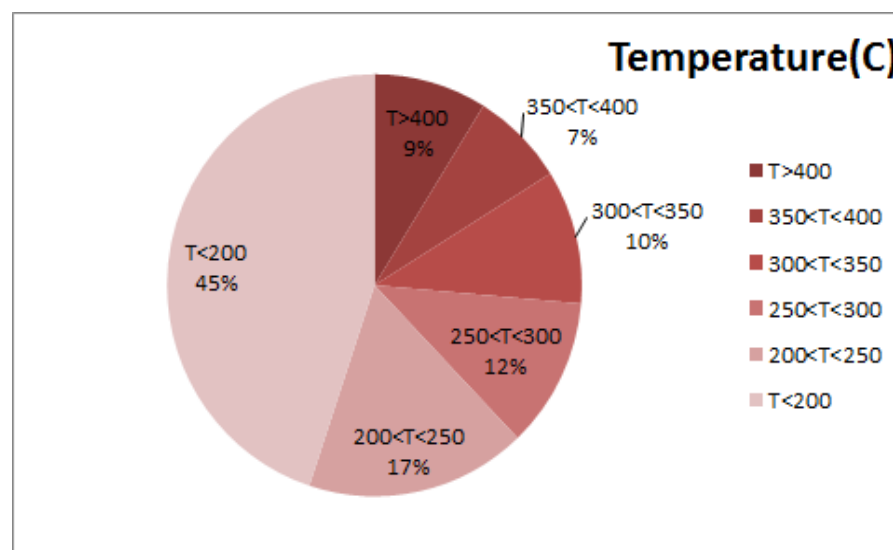


Figure 2-Temperature<sup>1</sup> distribution over the working hours

<sup>1</sup> - Exhaust temperature before the DPF

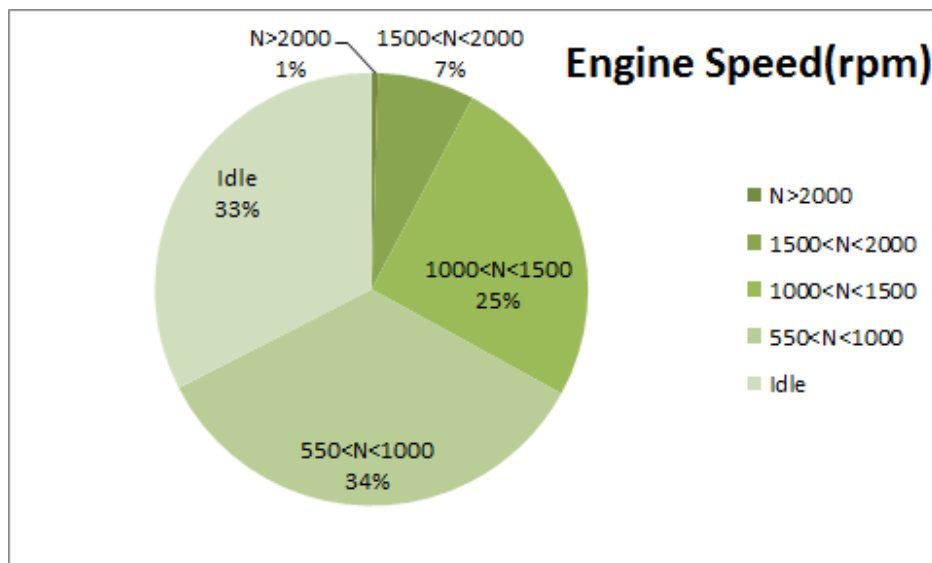


Figure 3- Engine speed distribution over the working hours

Table 4- Mean values

Mean temperature <sup>2</sup> (C)	Mean pressure(mbar)	Mean engine speed(rpm)
256	26.9	882

Table 5- Mean values without idling

Mean temperature(C)	Mean pressure(mbar)	Mean engine speed(rpm)
288	36.6	1045

Table 6- Max-min values

Max-min temperature(C)	Max-min pressure(mbar)	Max-min engine speed(rpm)
578-50	297-0	2432-256

<sup>2</sup> - Temperature of before the DPF

## Detailed Pressure Analysis

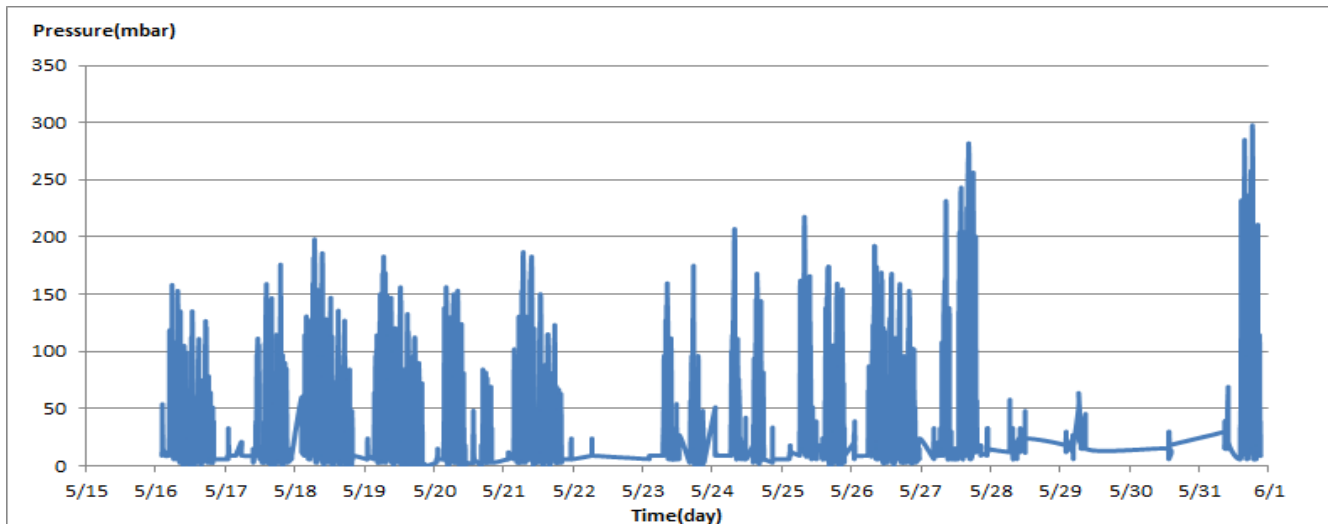


Figure 4- Pressure distribution over sixteen days

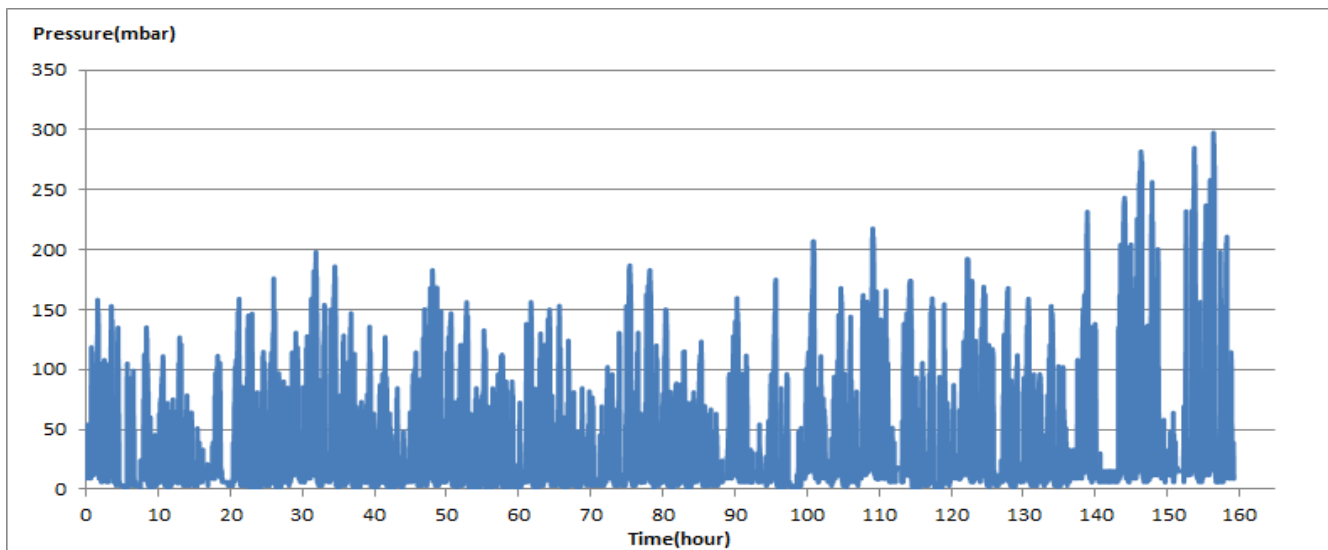


Figure 5- Pressure vs. working hours

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

## Detailed Temperature Analysis

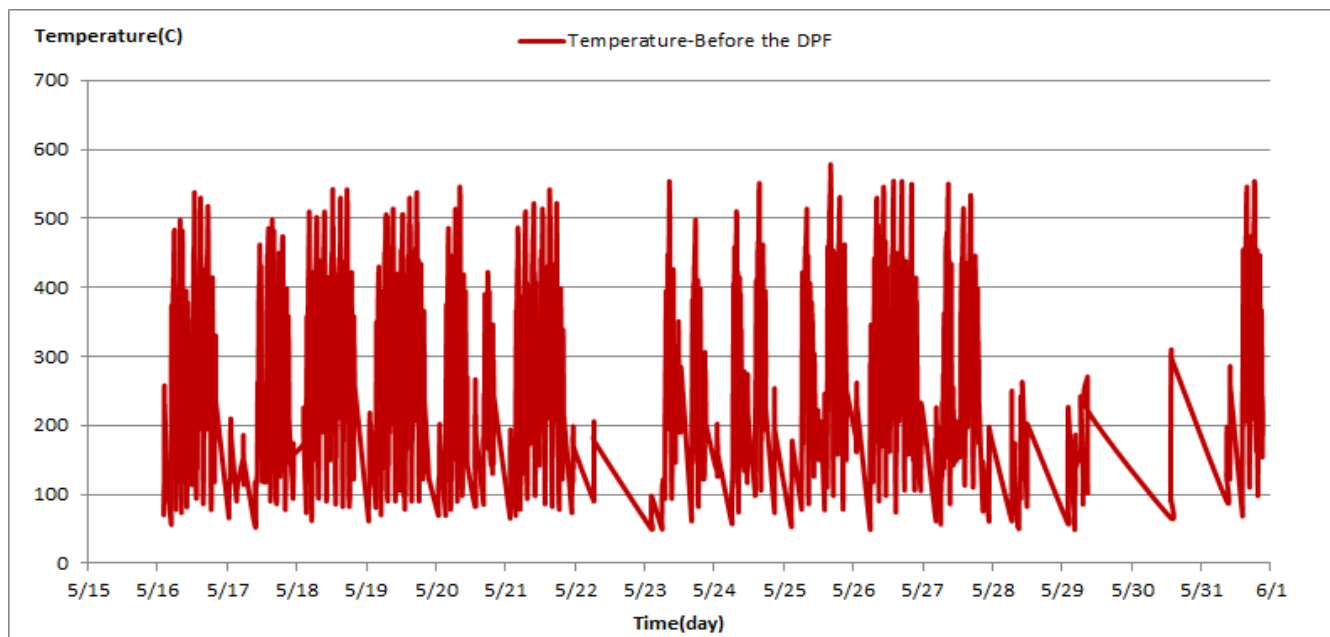


Figure 6- Temperature distribution over sixteen days

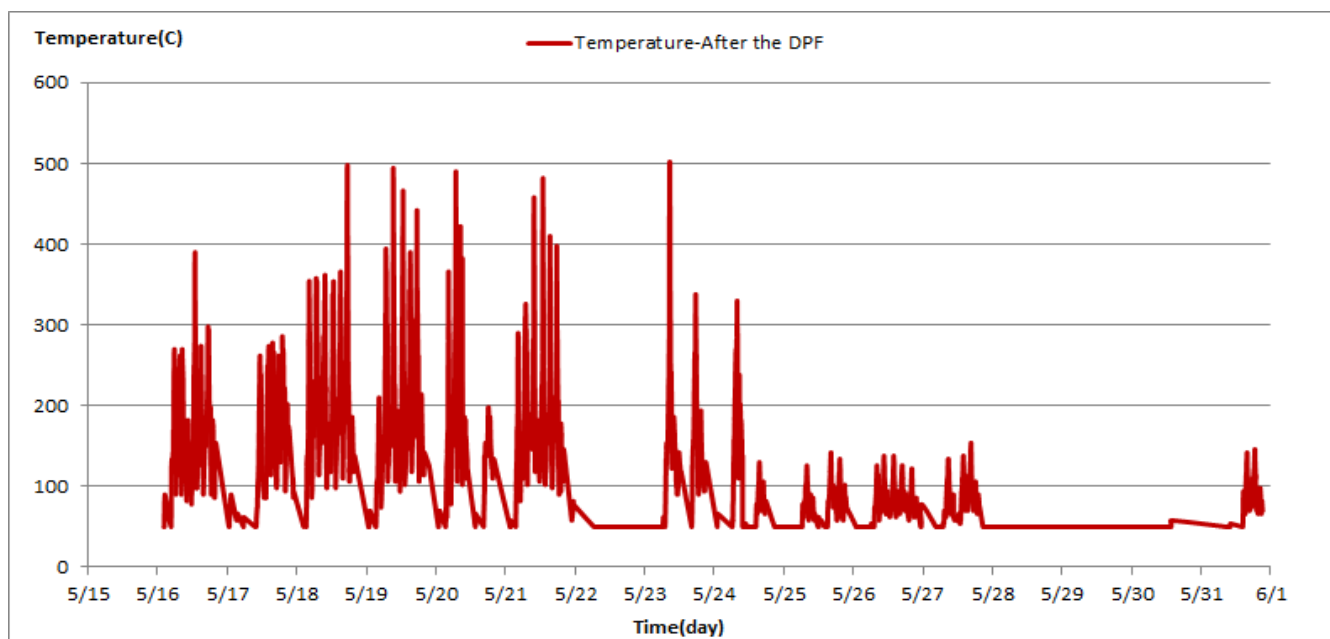


Figure 7- Temperature distribution over sixteen days

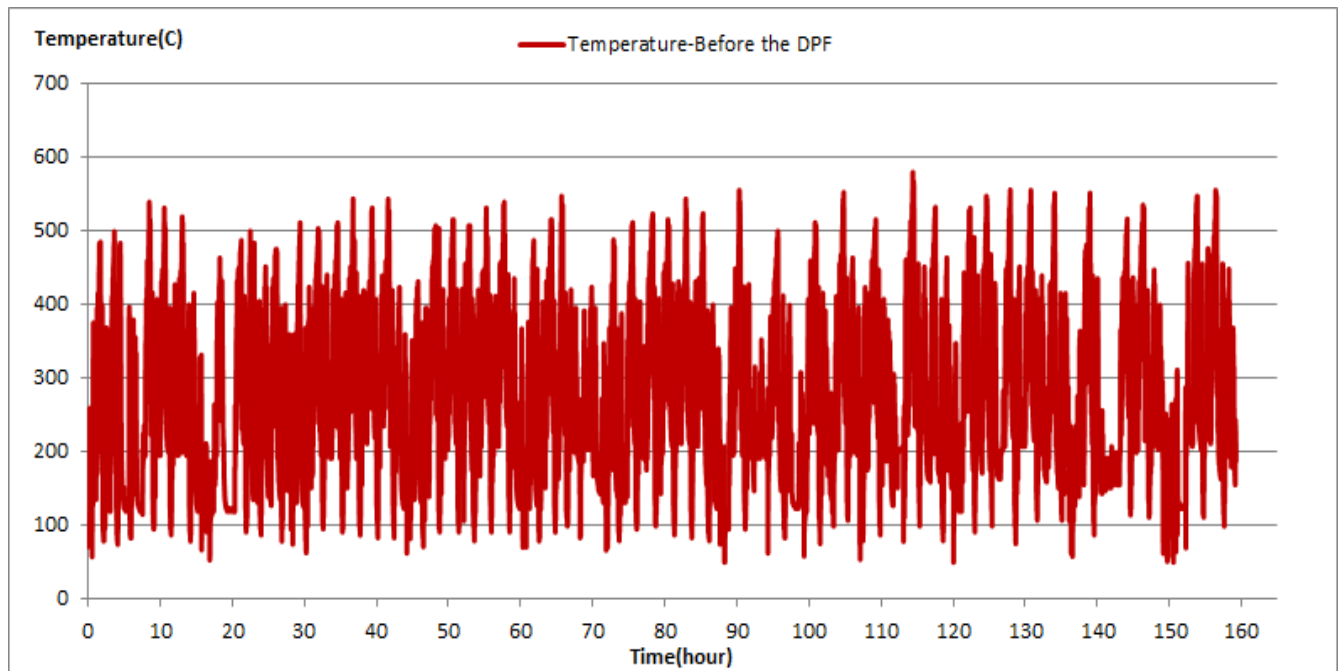


Figure 8- Before DPF temperature vs. working hours

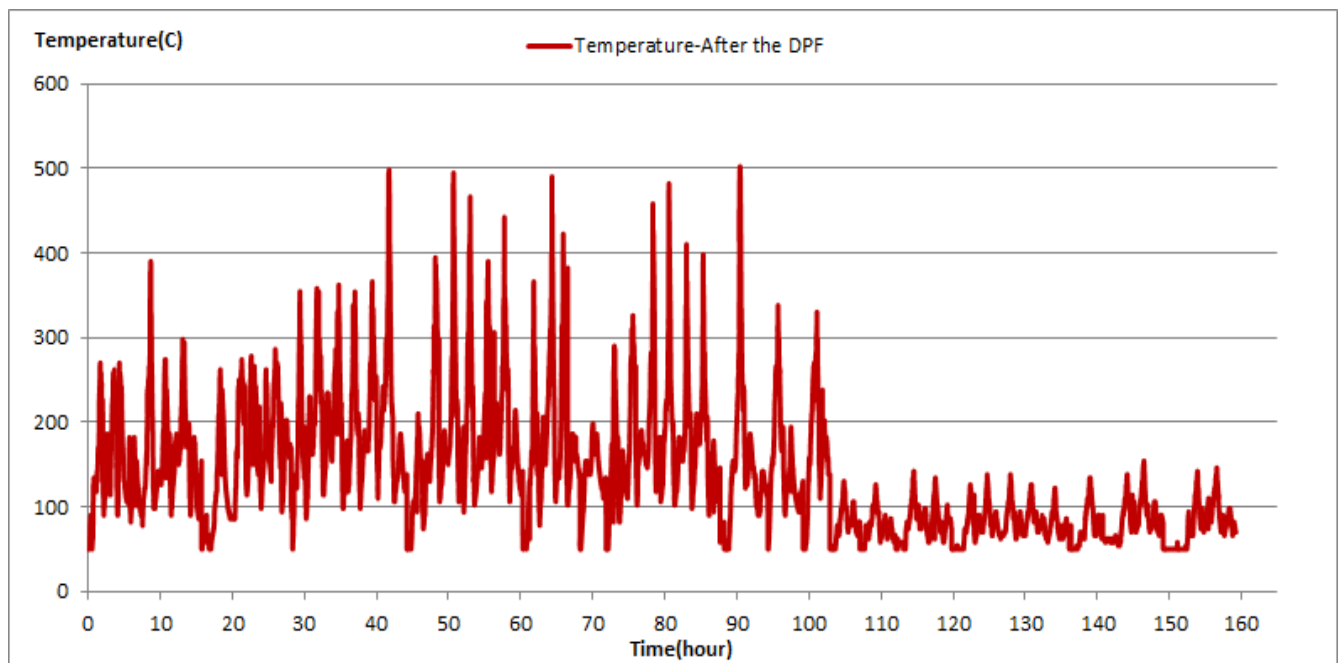


Figure 9- After DPF temperature vs. working hours

## Engine Speed Diagrams

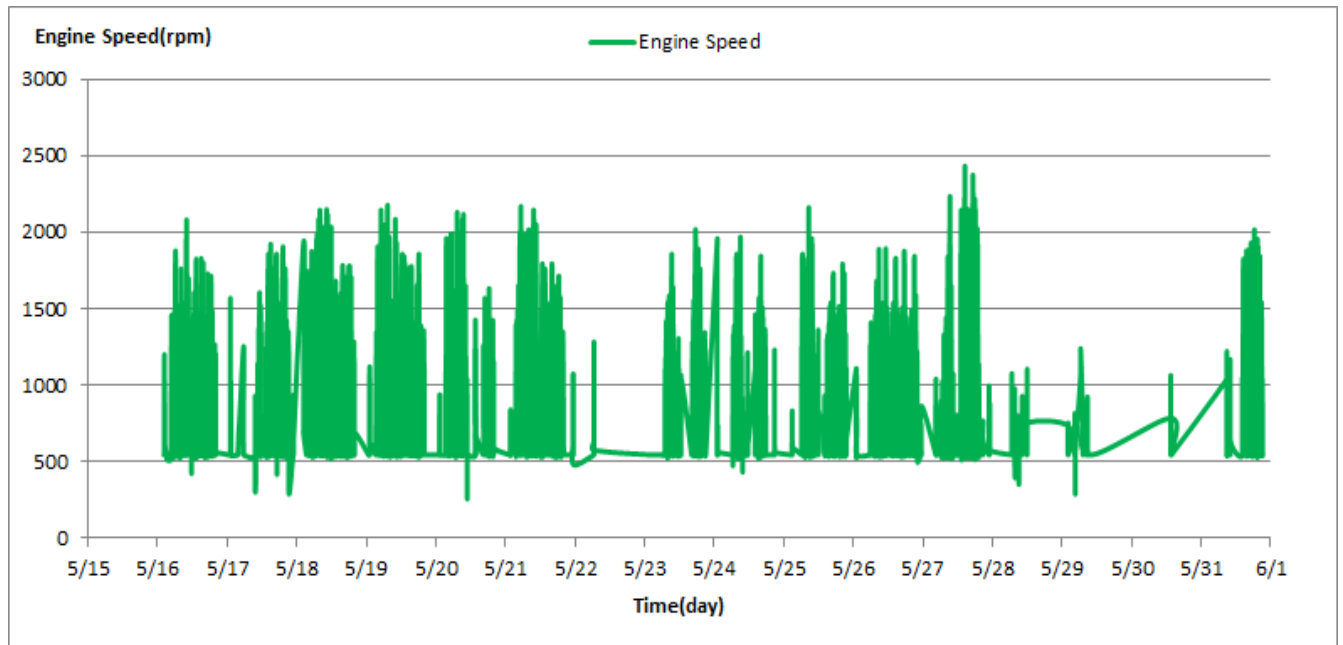


Figure 10- Engine speed distribution over sixteen days

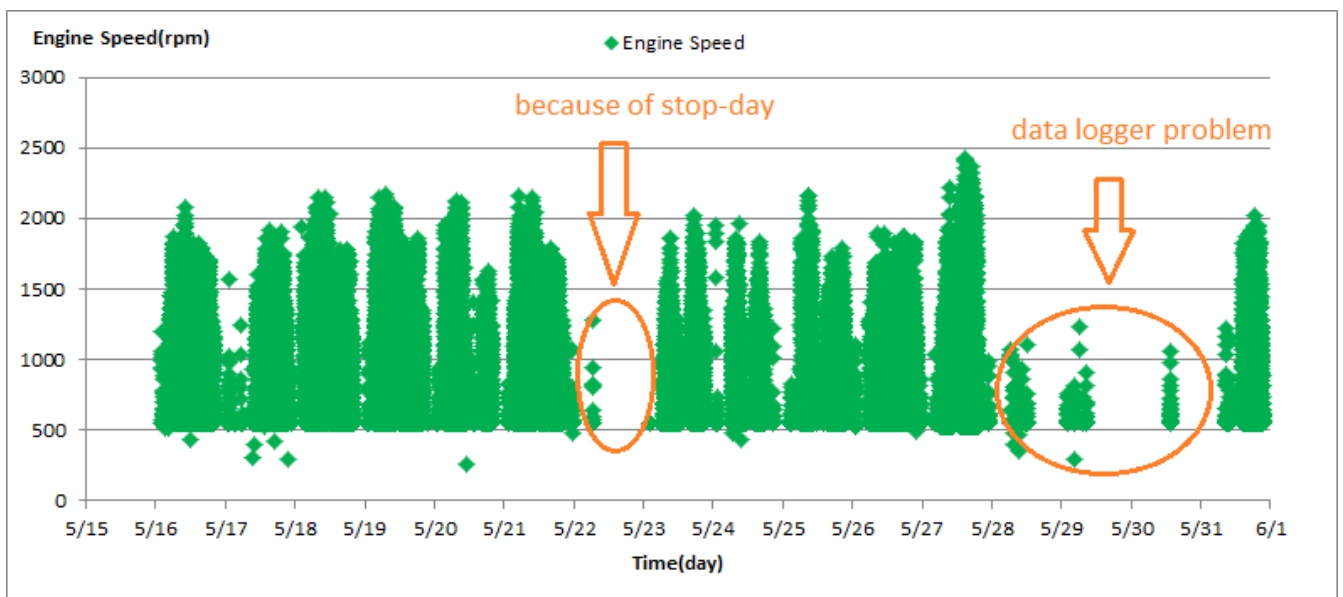


Figure 11- Engine speed diagram for calculating CPK's working days



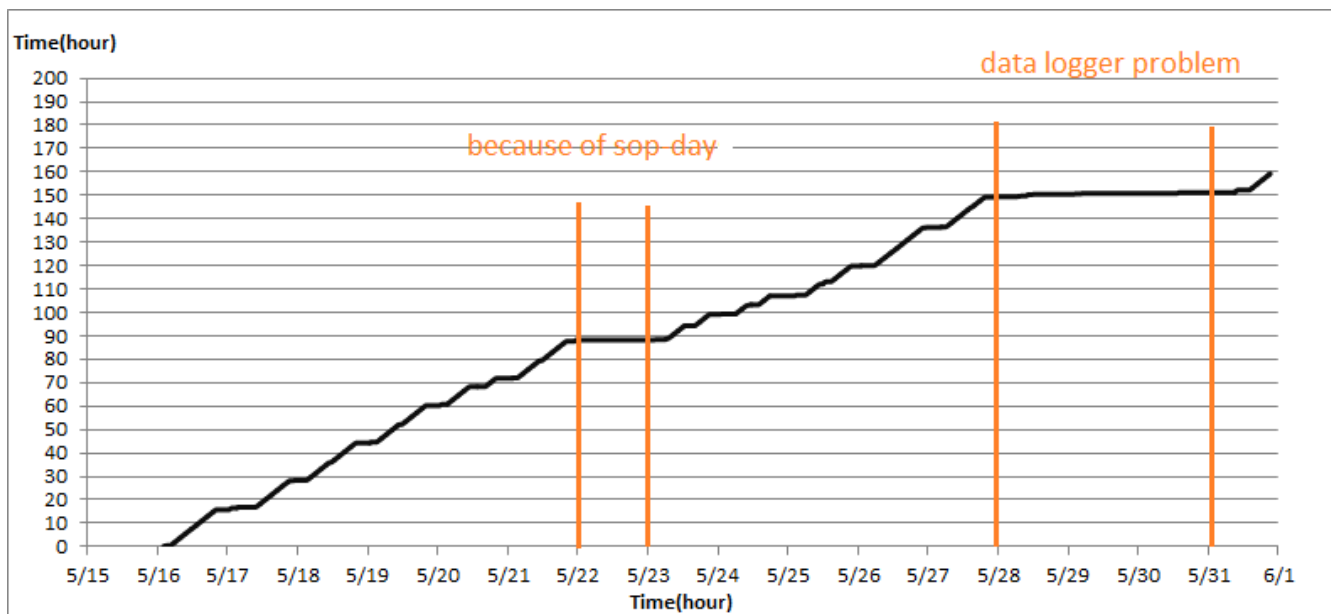


Figure 12- Time diagram for calculating CPK's working days

Notice: Data logger sampling time can be calculated from Figure 12. The lines parallel with time (day) axis show days without data logger data. As depicted in Figure 12, data logger didn't sample four days.

## Pressure-Engine Speed diagrams

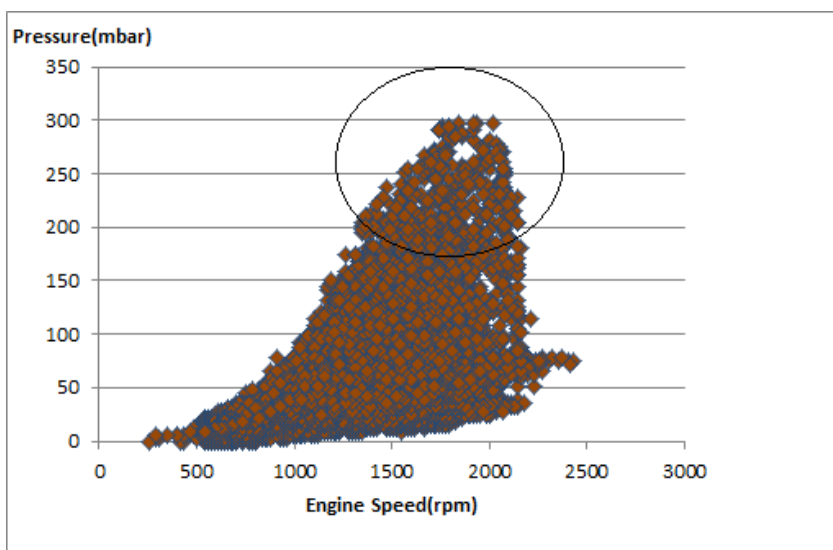


Figure 13- Pressure against speed

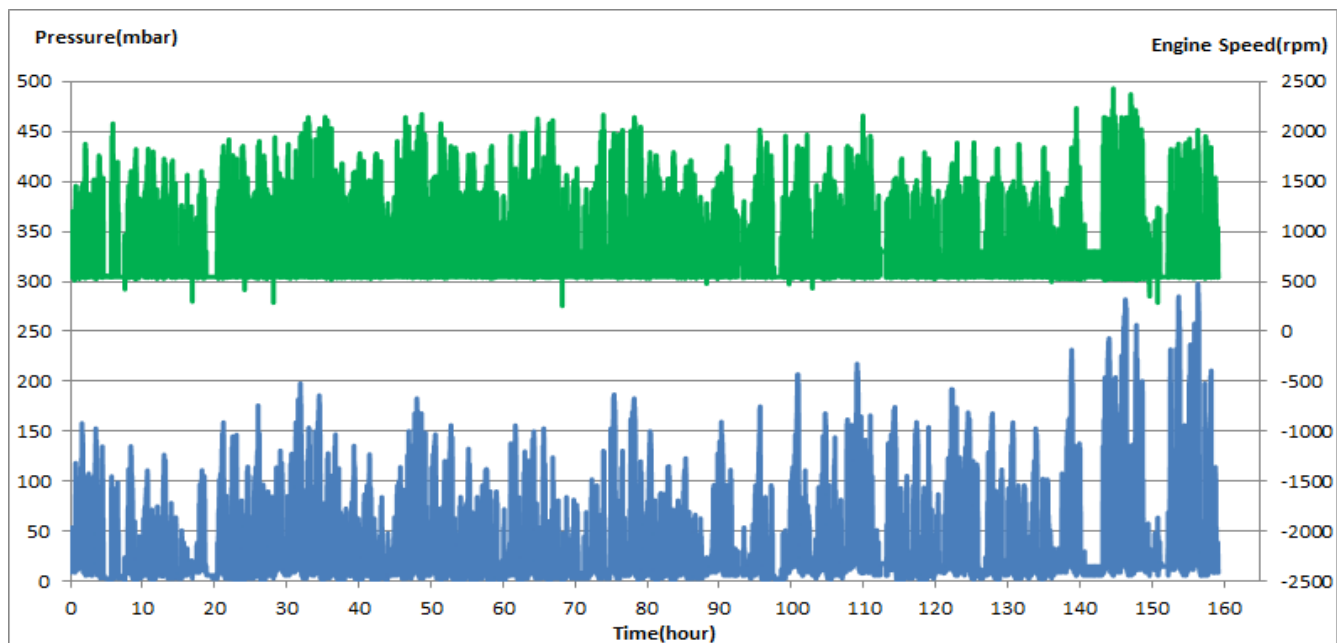


Figure 14- P, N distribution vs. working hours

## Temperature- Engine Speed Diagram

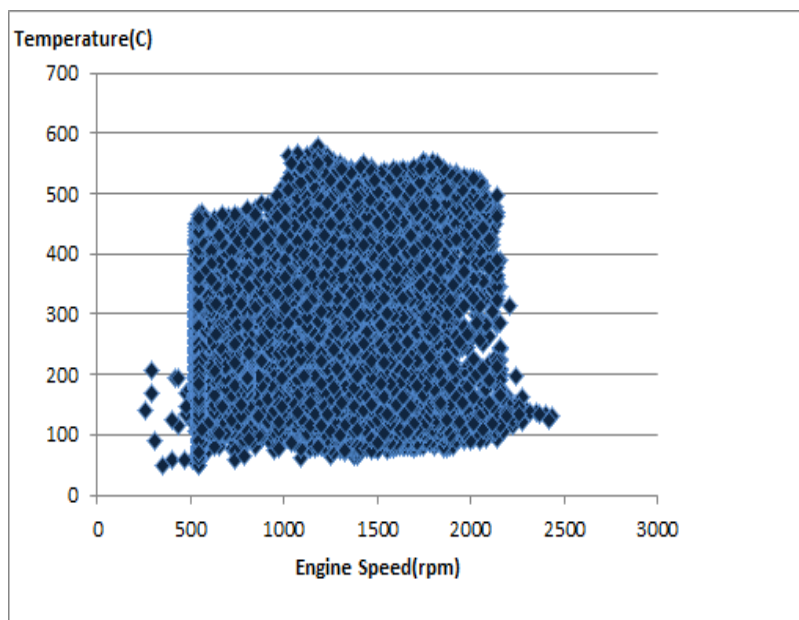


Figure 15- Temperature against speed

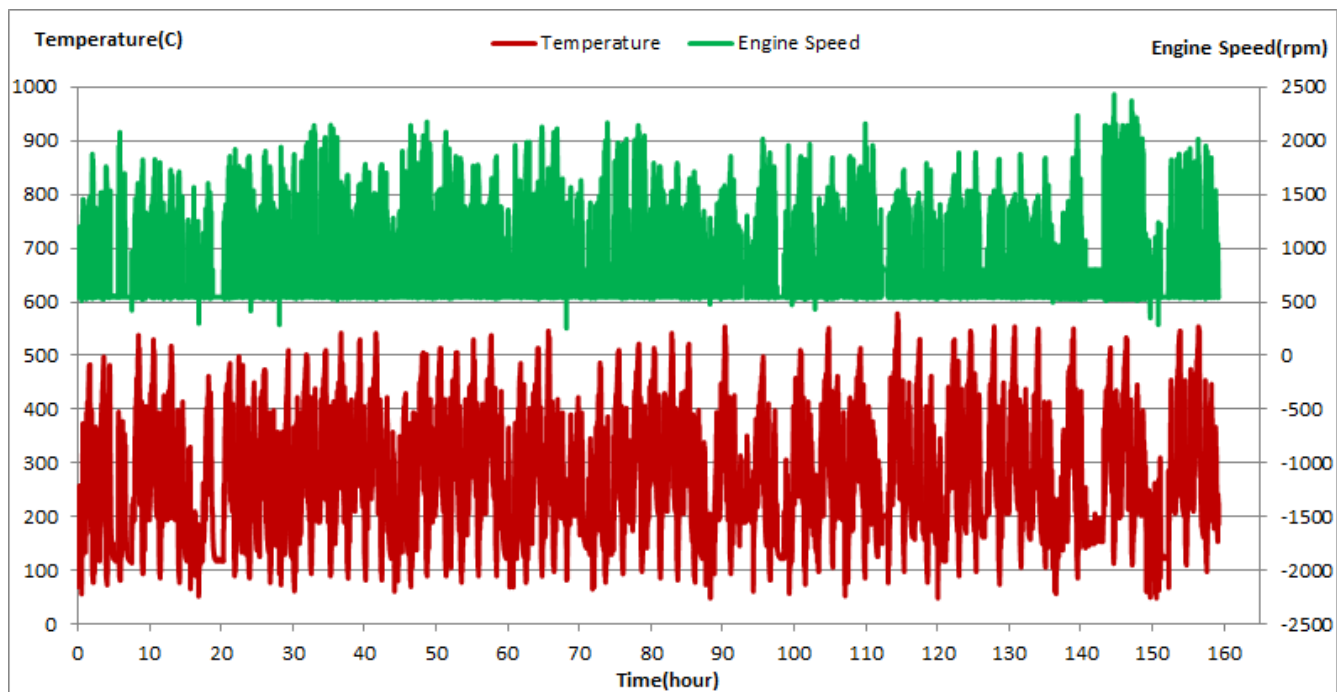


Figure 16- T, N distribution vs. working hours

## Filter Operation Analysis

- As depicted in Figure 1, 0.5% of total working-time pressure is above 200 mbar and 1.68% above 150mbar.
- Figure 2 displays flow temperature before the DPF. It can be obviously observed that 9% of total working-time temperature is above 400 °C and 16% above 350°C. This high temperature distribution is cause of acceptable operation of this filter over the period. .
- This vehicle operates in line 4 and for its path characteristic, engine operates in high engine speed.

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