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 company producer	HJS_01 (Passive system with FBC)
Installation date	10/Sep/2014
Report period	1/May/2015 – 15/May/2015 (fifteen 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 date 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)	34653 km
Bus mileage over the period	2622 km
Working days over the period	15 days
Stop days	0 day
Data logger working days	12 days
Working hours over the period	148.70+3*12.39=185.88 hours
Average working hours per day (including stop days)	12.39 hours
Bus average speed	16.50 km/hr
idle speed time to all working time ration	47%
Total Bus fuel consumption over the period	1708 lit
fuel consumption per hour	9.19 lit/hr
Average fuel consumption	0.65 lit/km
Total Bus additive consumption over the period	0.73 lit
Average additive consumption	0.280 cc/km
additive consumption to fuel ration	430 cc per 1000 lit (Batch Dosing with Tank Level)

Notice: As depicted in Figure 12, data logger didn't sample for three days. So we add average working hours to calculated working hours from the data logger.

Temperature, Pressure and Engine Speed Overview

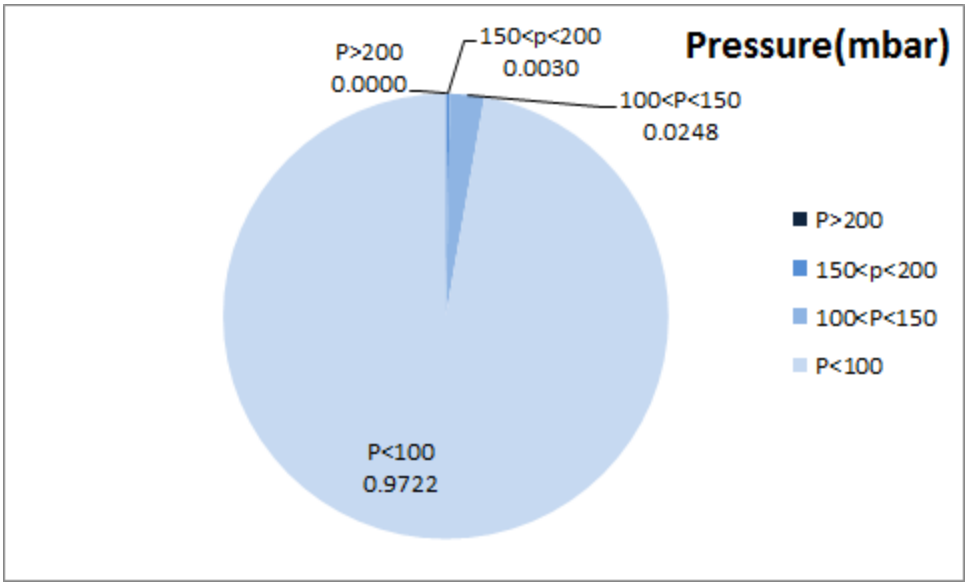

Figure 1- Pressure distribution over the working hours

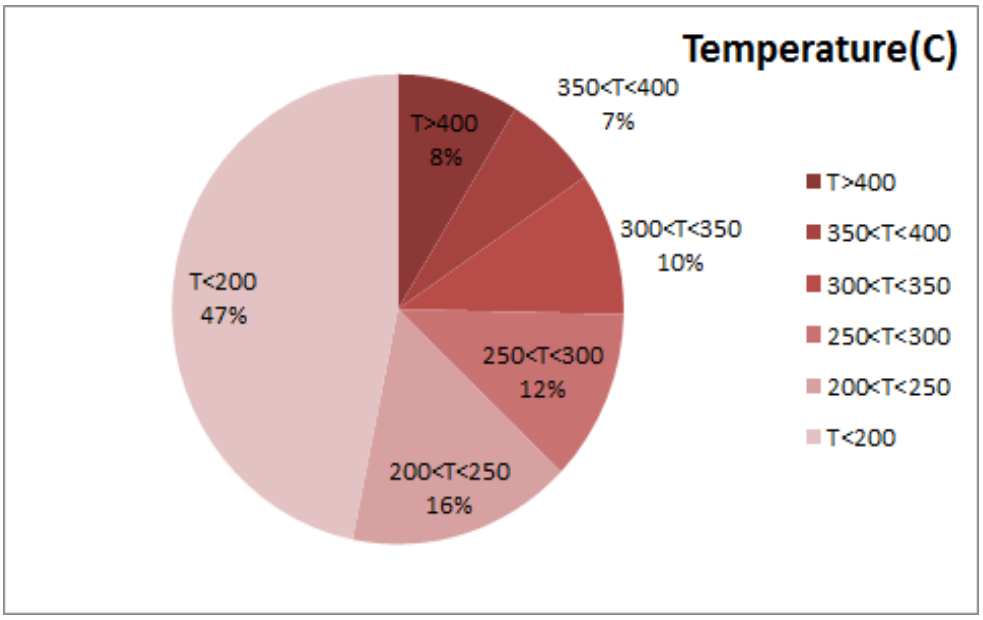

Figure 2-Temperature[1] distribution over the working hours

[1] - Exhaust temperature before the DPF

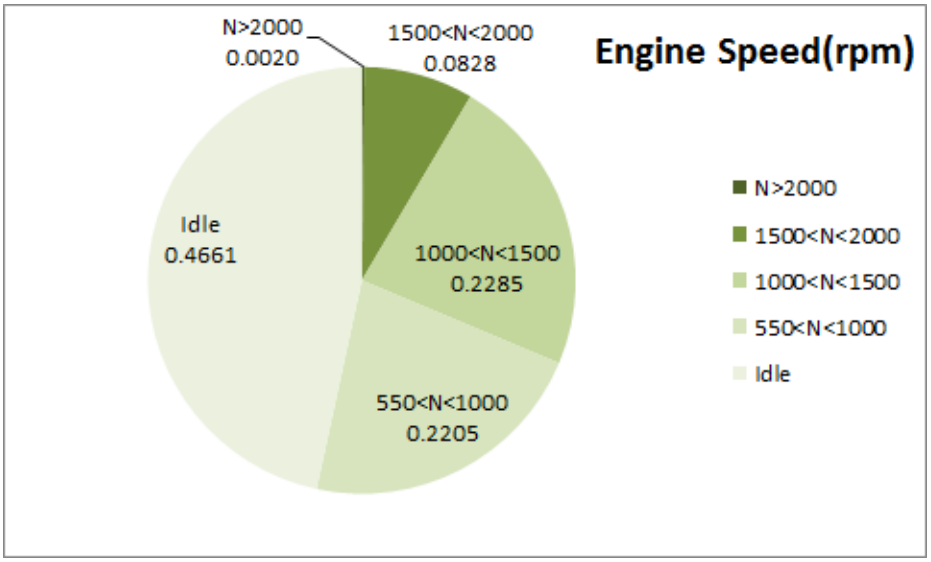

Figure 3- Engine speed distribution over the working hours

Table 4- Mean values

Mean temperature[2](C)	Mean pressure(mbar)	Mean engine speed(rpm)
235.63	18.26	843

Table 5- Mean values without idling

Mean temperature(C)	Mean pressure(mbar)	Mean engine speed(rpm)
290.36	30.90	1103

Table 6- Max-min values

Max-min temperature(C)	Max-min pressure(mbar)	Max-min engine speed(rpm)
670-50	189-0	2240-272

[2] - Temperature of before the DPF

Detailed Pressure Analysis

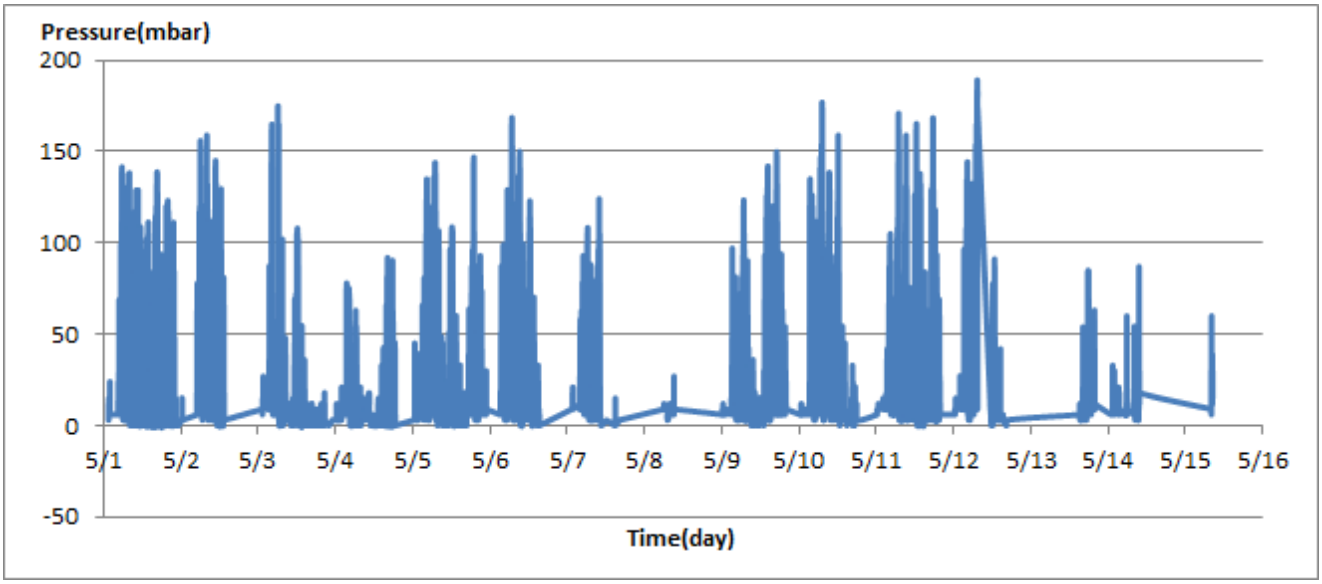

Figure 4- Pressure distribution over fifteen days

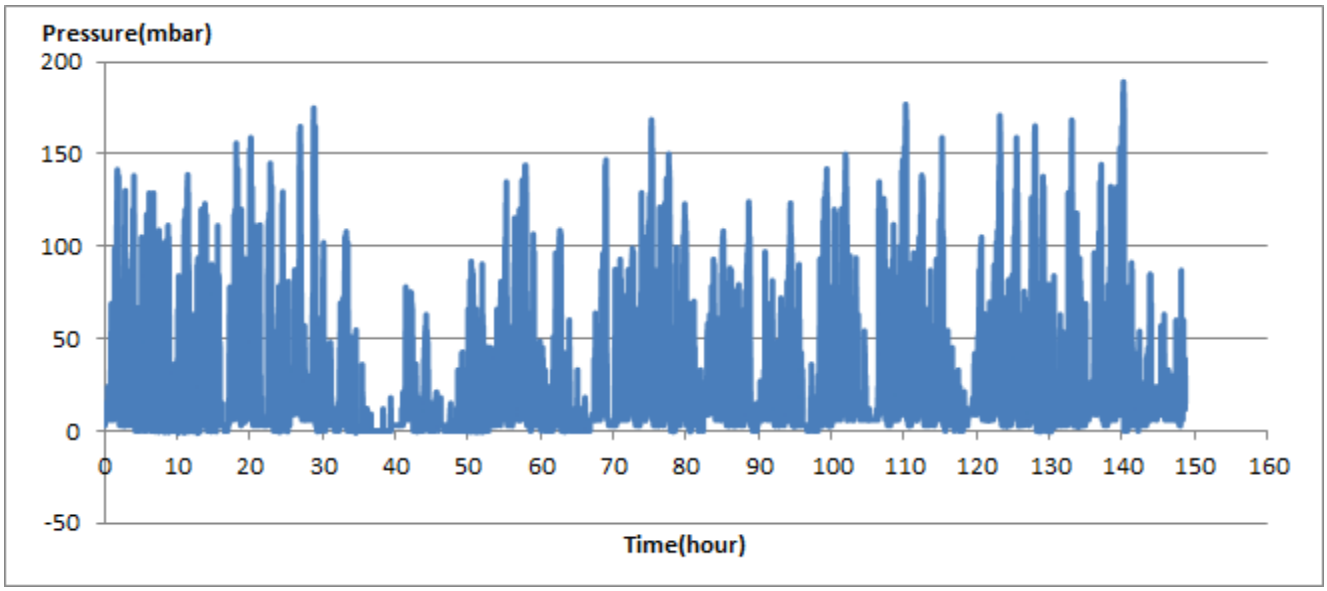

Figure 5- Pressure vs. working hours

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

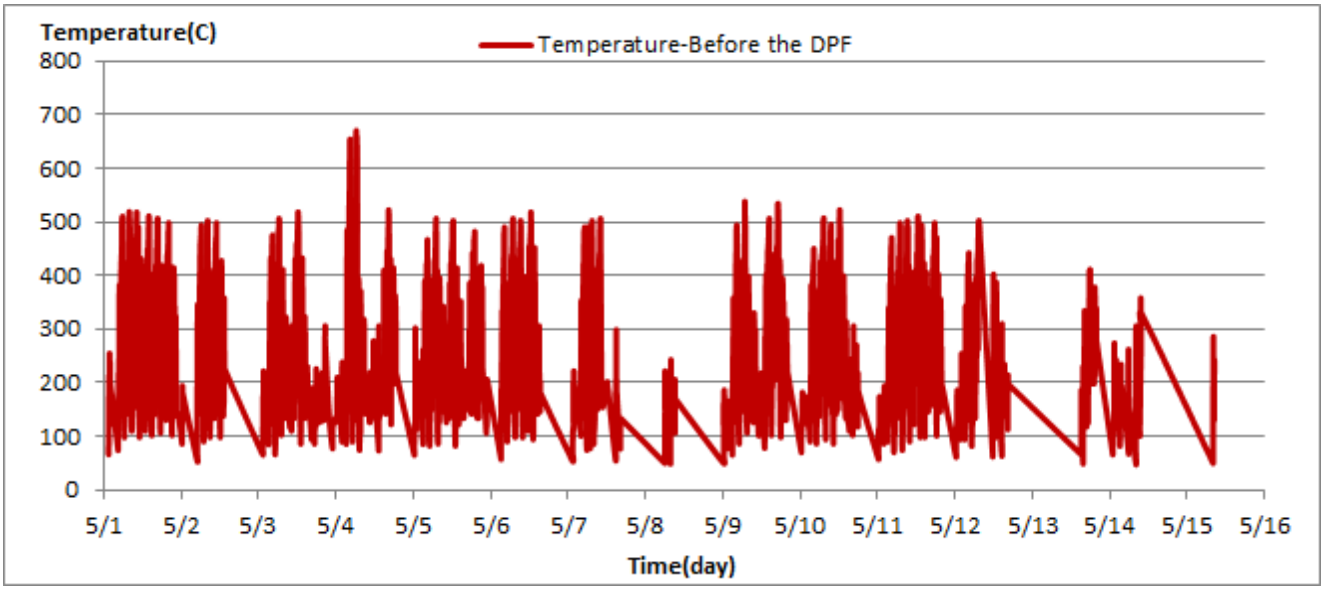

Figure 6- Temperature distribution over fifteen days

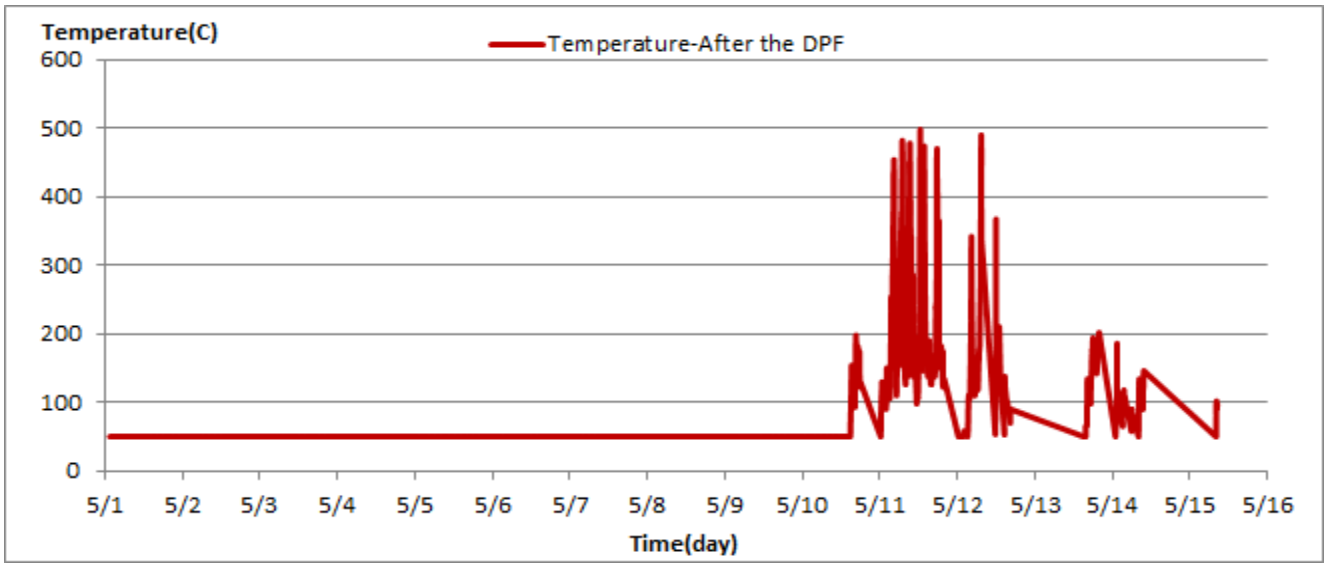

Figure 7- Temperature distribution over fifteen days

Notice: Temperature sensor for after the DPF installed on May 10th, so before this date CPK's showed 50°C.

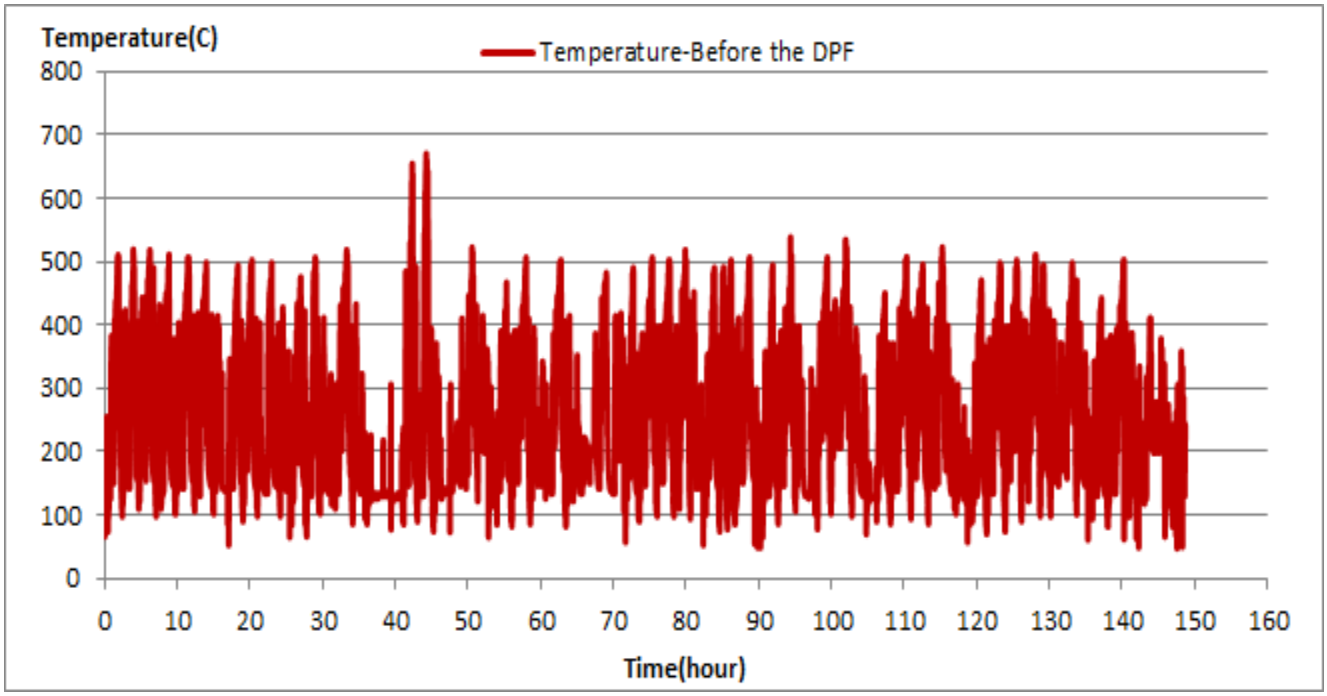

Figure 8- Before DPF temperature vs. working hours

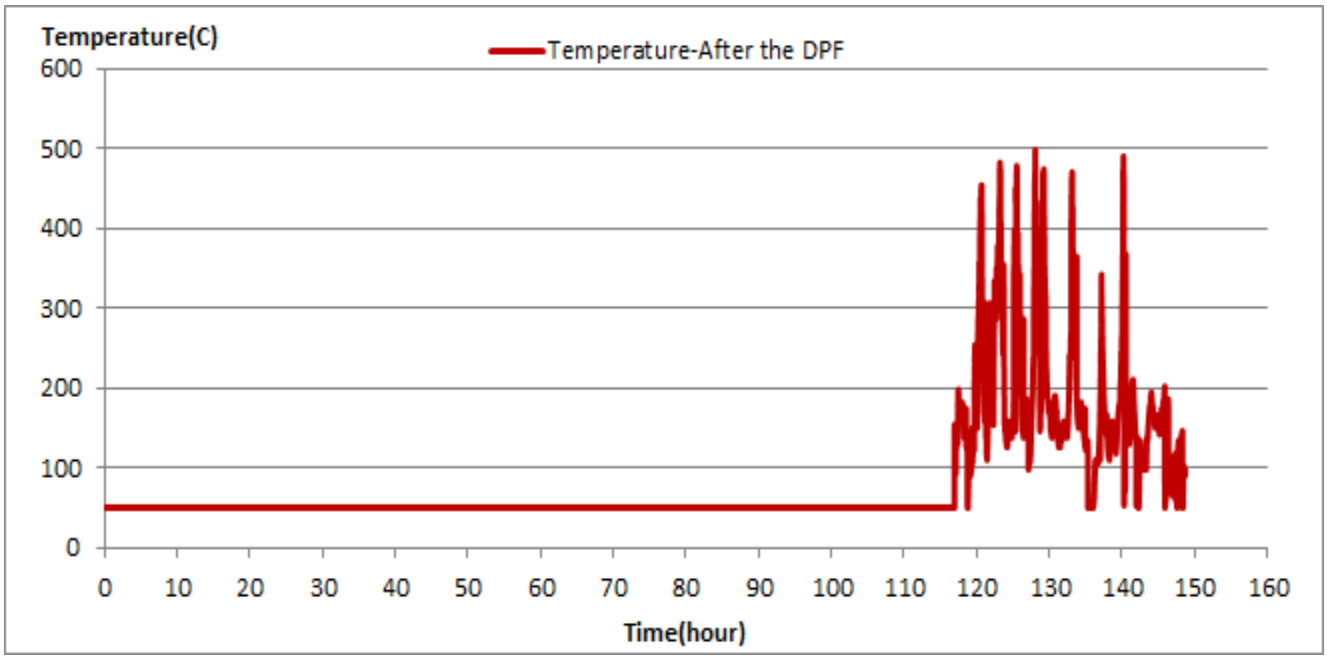

Figure 9- After DPF temperature vs. working hours

Engine Speed Diagrams

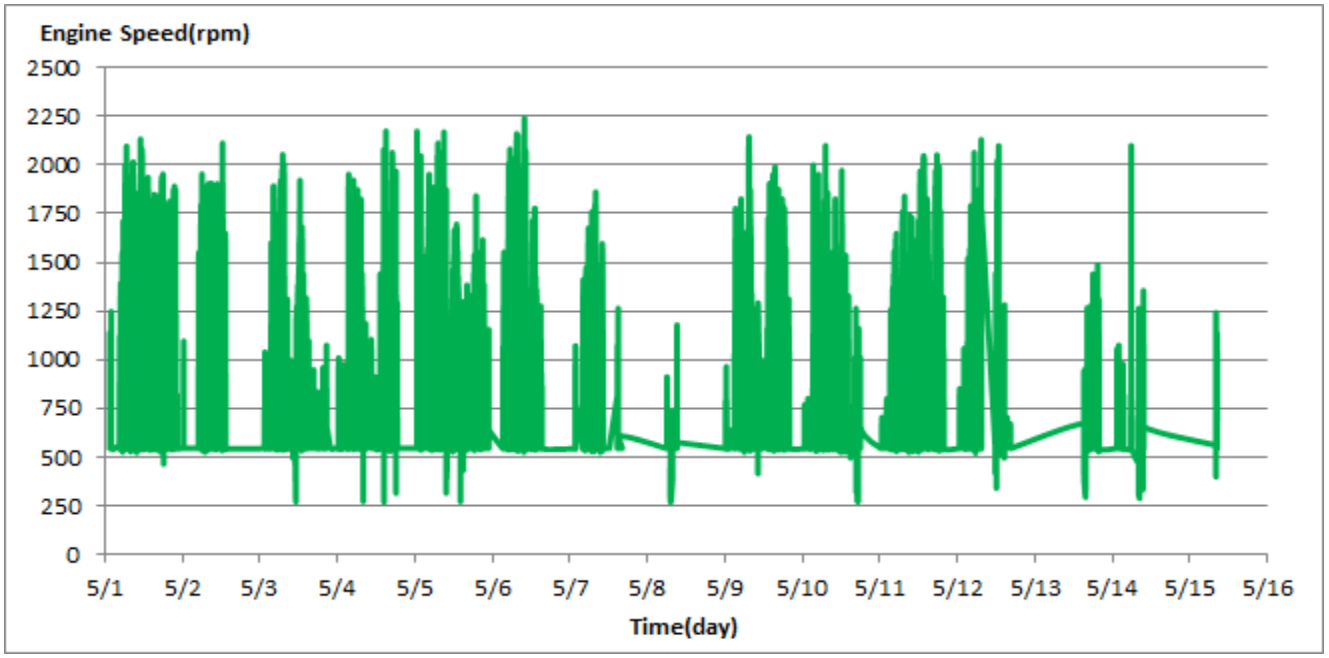

Figure 10- Engine speed distribution over fifteen days

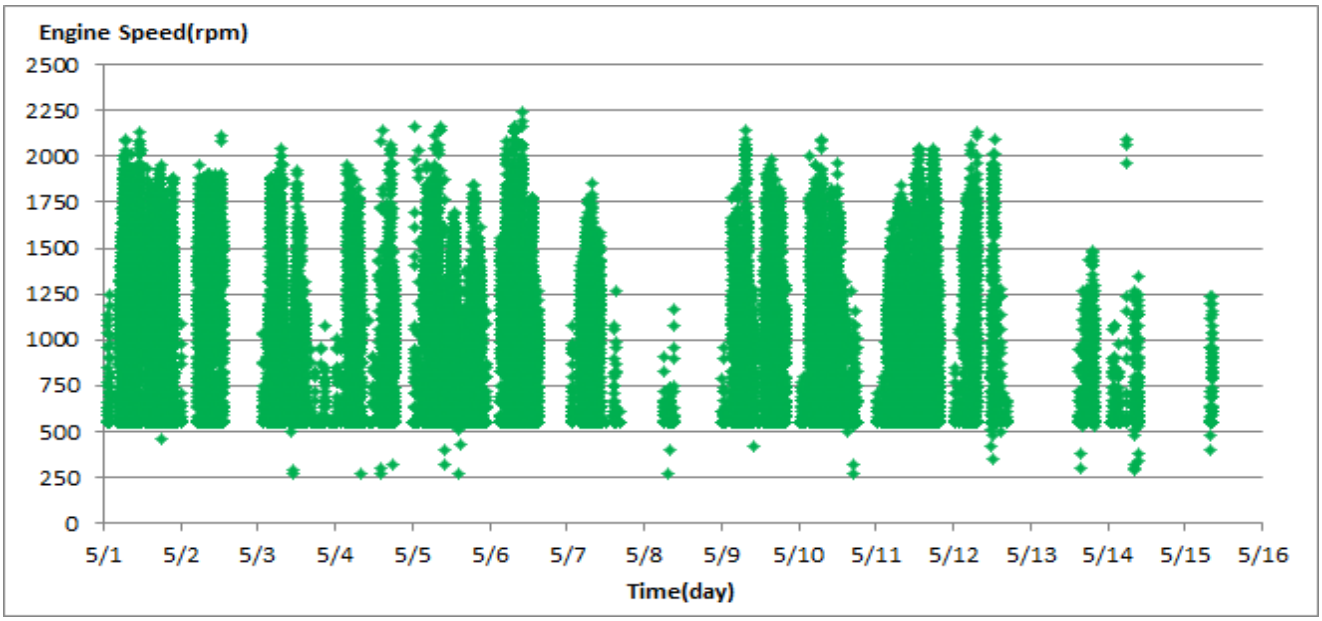

Figure 11- Engine speed diagram for calculating CPK's working days

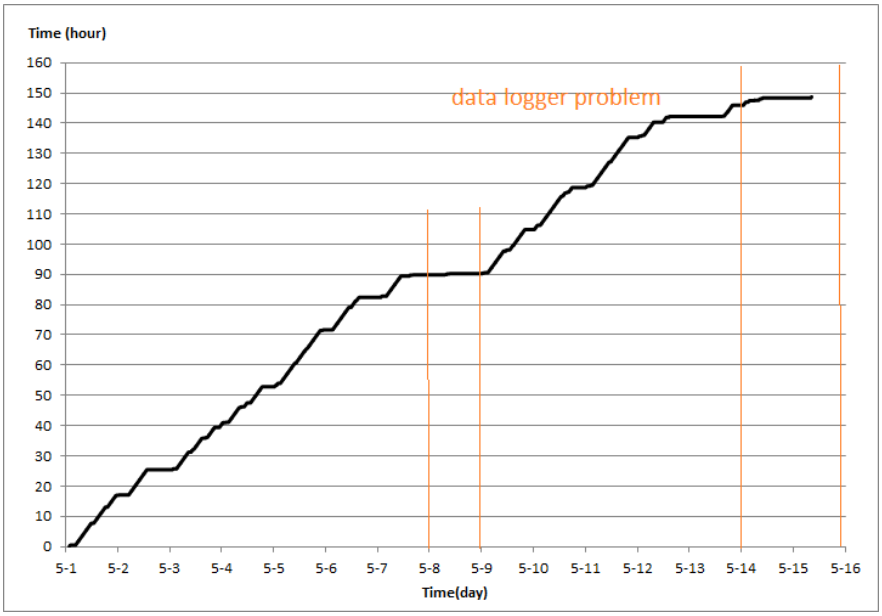

Figure 12- Time diagram for calculating CPK's working days

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 three days.

Pressure-Engine Speed diagrams

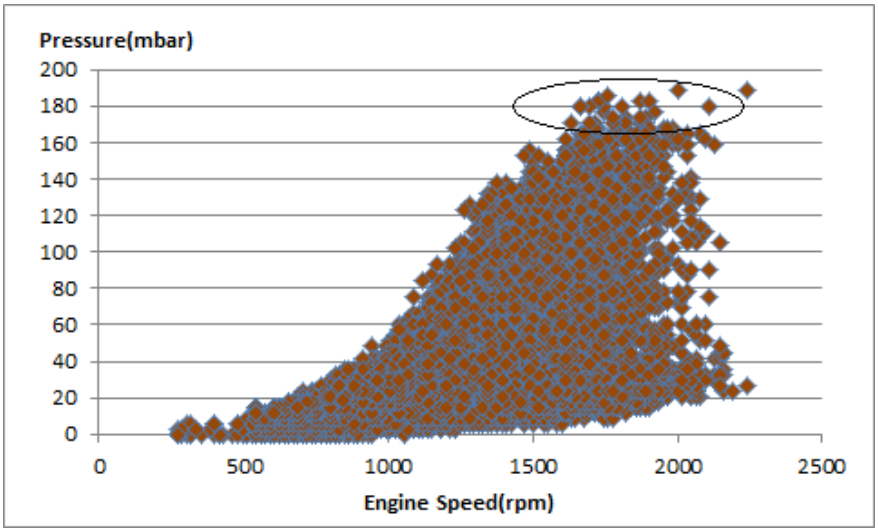

Figure 13- Pressure against speed

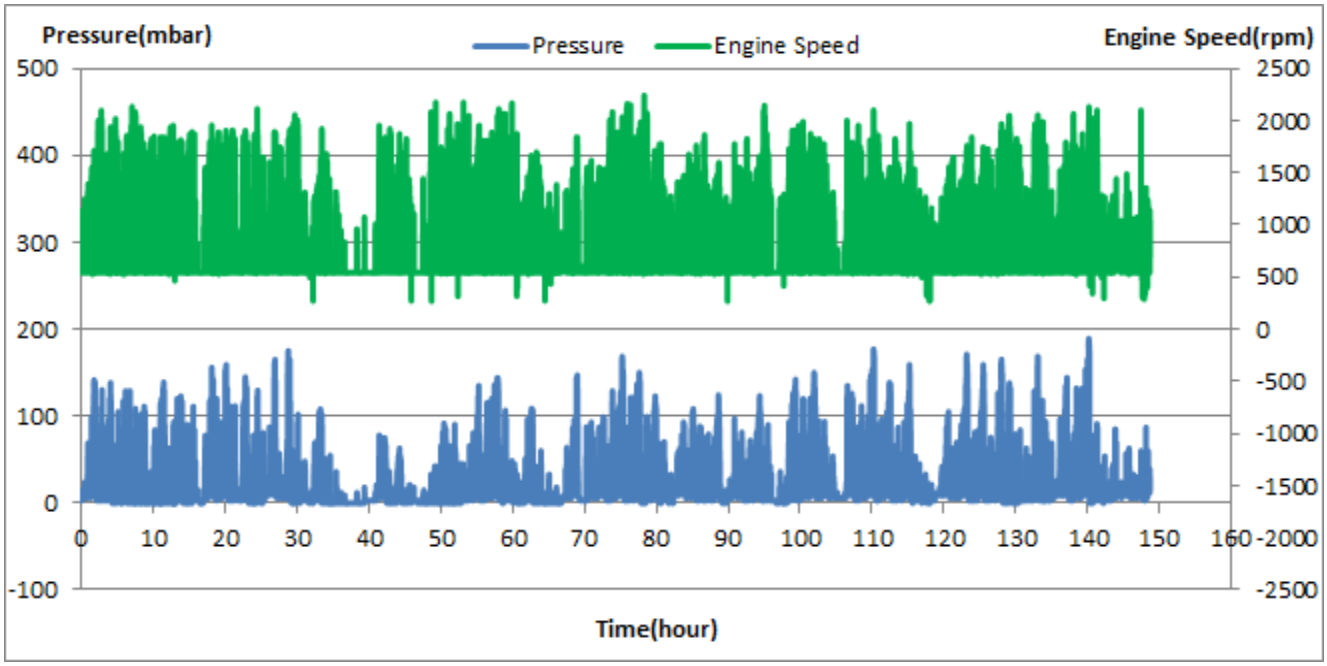

Figure 14- P, N distribution vs. working hours

Temperature- Engine Speed Diagram

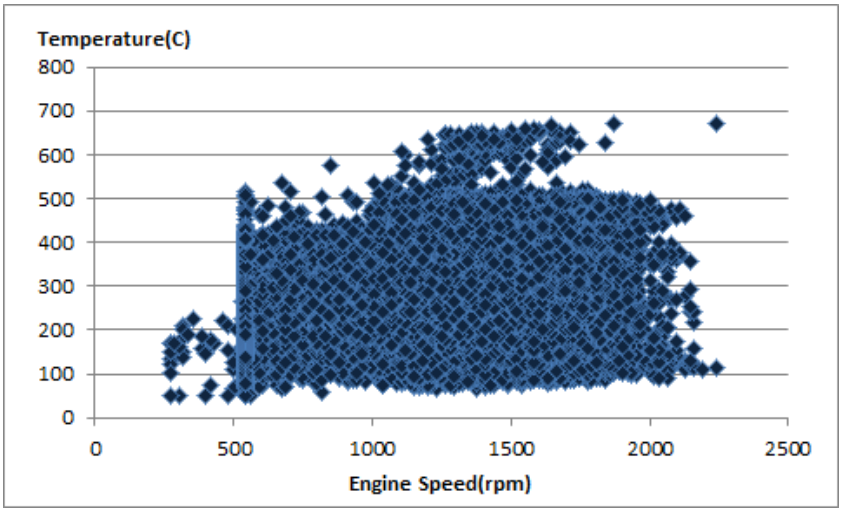

Figure 15- Temperature against speed

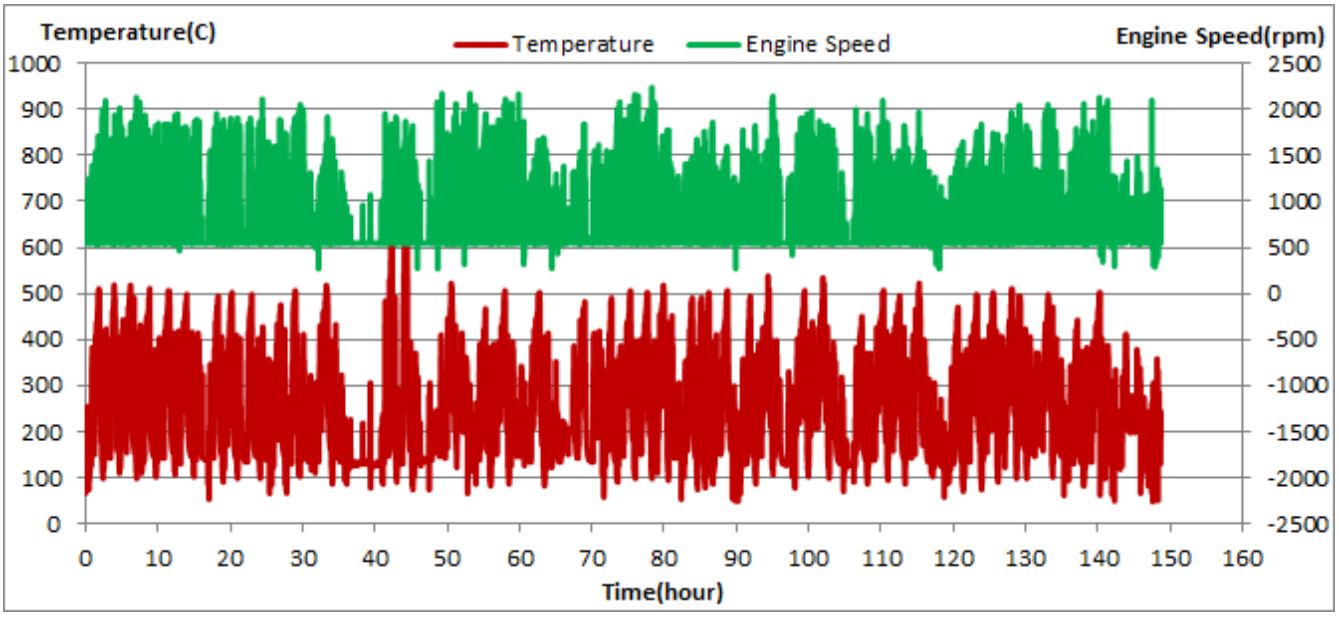

Figure 16- T, N distribution vs. working hours

Filter Operation Analysis

- As depicted in Figure 1, pressure above 200 mbar can't be obtained and only 0.3% of total working-time pressure is above 150 mbar.
- Figure 2 displays flow temperature before the DPF. It can be obviously observed that 8% 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 it's path characteristic, engine operates in high speed.

Filter operation status	Excellent ■	Good ☐
	Maintenance required ☐	Failed☐