Overall Information

Table1- Overall Information

Vehicle plate number	78524
CPK data logger number	LN: 001443, DN: 1930,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	PURItech (Passive system with FBC)
Installation date	28/Jan/2015
Report period	16/Sep/2015 – 30/Sep/2015 (fifteen days)
K value – DPF upstream	1.90 [1/m]
K value – DPF downstream	0.02 [1/m]

Table 2- DPF Maintenance History

Filter maintenance date	DPF core was removed on Jul 22nd and was cleaned on Aug 12th for the first time. Considering system relatively high backpressure, filter isolation defect and air filter's deformation, DPF core was removed on Sep 16th and will be installed on system after cleaning and improving isolation system.
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)	35728 km
Bus mileage over the period	1808 km
Working days over the period	10 days
Stop days	5 days
Data logger working days	8 days
Working hours over the period	138 hours 53 minutes
Average working hours per day (including stop days)	9 hours 15 minutes
Bus average speed	13.00 km/hr
idle speed time to all working time ration	-
Total Bus fuel consumption over the period	1110 lit
Fuel consumption per hour	7.99 lit/hr
Average fuel consumption	0.61 lit/km
Total Bus additive consumption over the period	- lit
Average additive consumption	- cc/km
Additive consumption to fuel ration	- cc/1000lit

Notice: Due to some technical problem related to data logger, rpm data missed. So parameters like idling speed was left blank.
Notice: According to figure 12, data logger didn't sample on Sep 19th and 20th. So average two days working hours were added to total working hours.
Notice: DPF core was removed on Sep 16th and additive system was disconnected, so additive consumption during this period was insignificant.

Temperature, Pressure and Engine Speed Overview

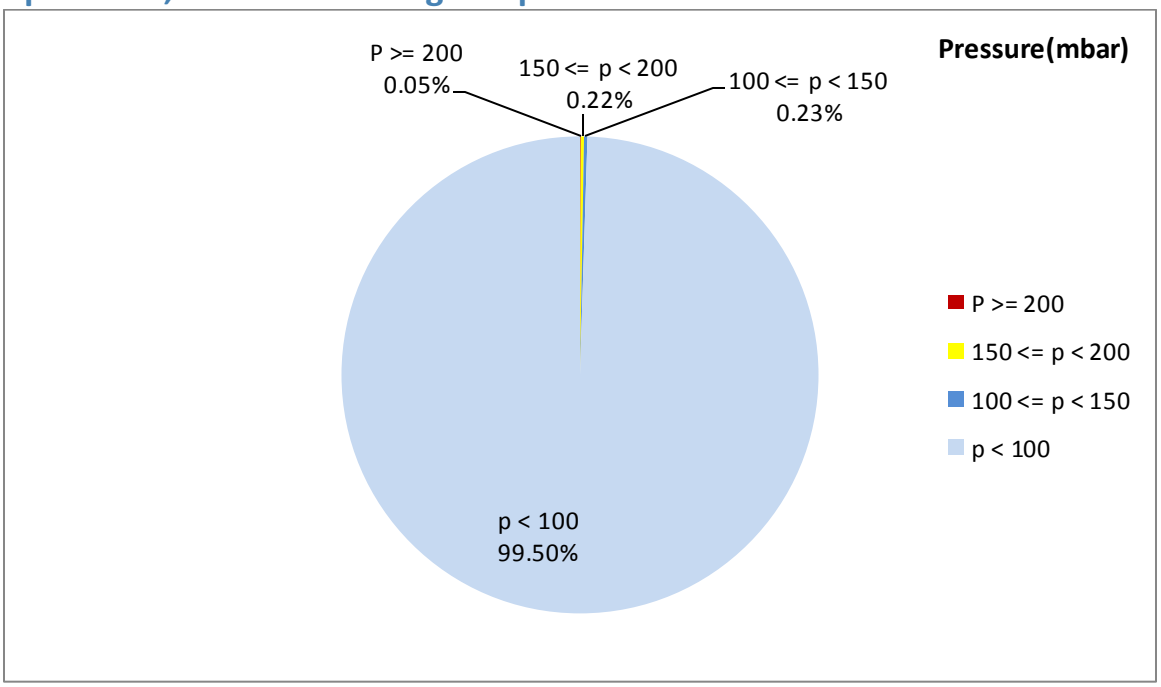

Figure 1- Pressure distribution over the working hours

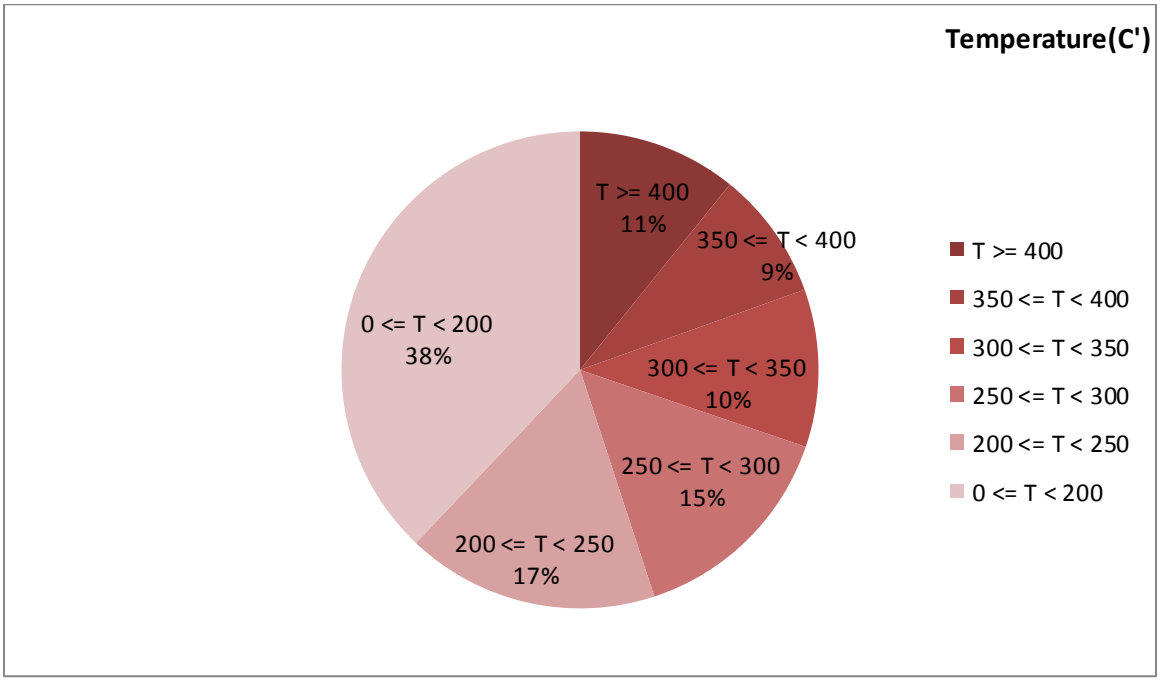

Figure 2-Temperature distribution over the working hours

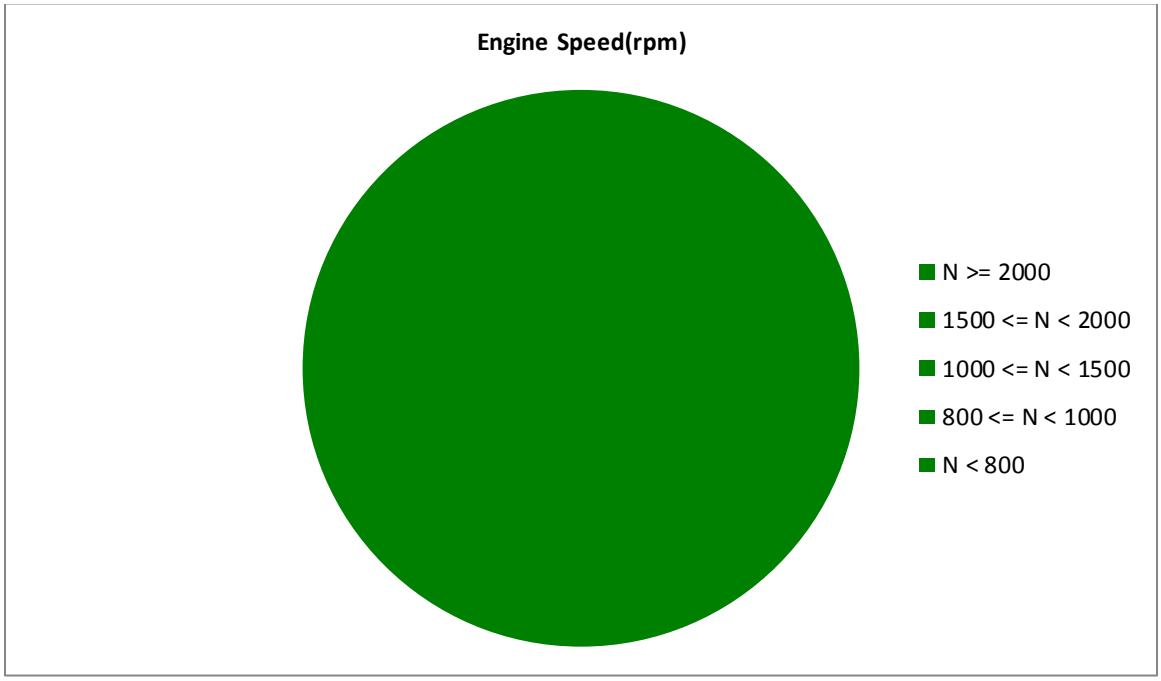

Figure 3- Engine speed distribution over the working hours

Table 4- Mean values

Mean temperature (C)	Mean pressure(mbar)	Mean engine speed(rpm)
253.66	6.7	-

Table 5- Mean values without idling

Mean temperature (C)	Mean pressure(mbar)	Mean engine speed(rpm)
-	-	-

Table 6- Max-min values

Max-min temperature(C)	Max-min pressure(mbar)	Max-min engine speed(rpm)
586-50	222-0	-

Notice: Due to data logger technical problem, rpm sensor data missed. So engine speed's related parameters were left blank.

Detailed Pressure Analysis

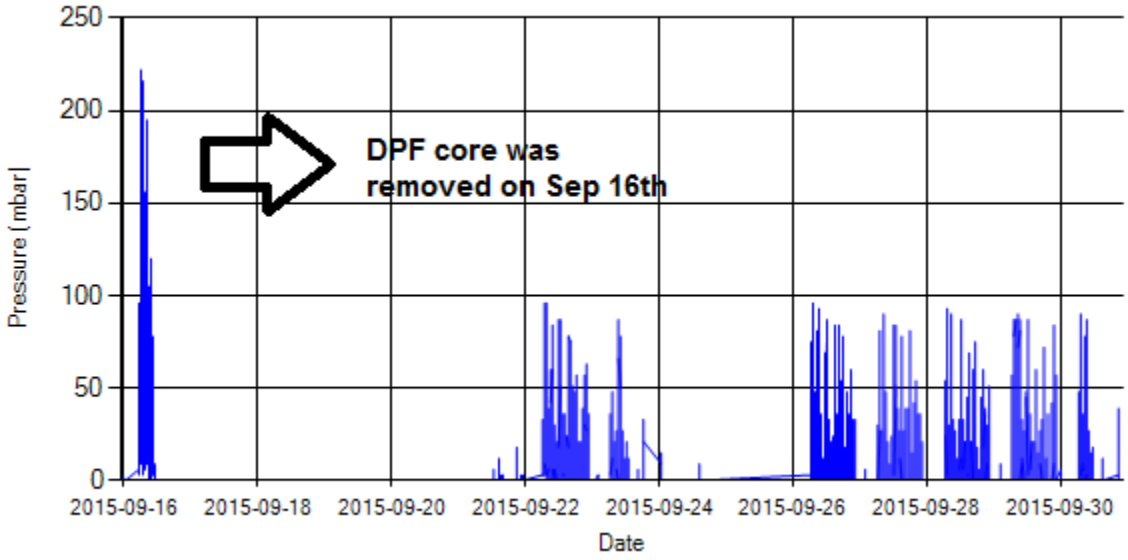

Figure 4- Pressure distribution over the period

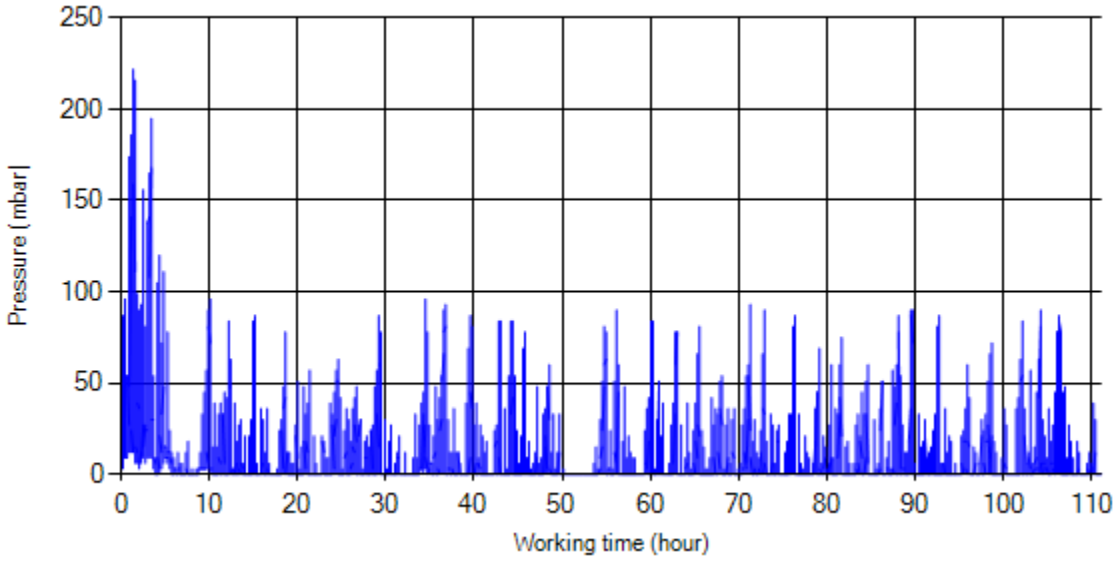

Figure 5- Pressure vs. working hours

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.

Detailed Temperature Analysis

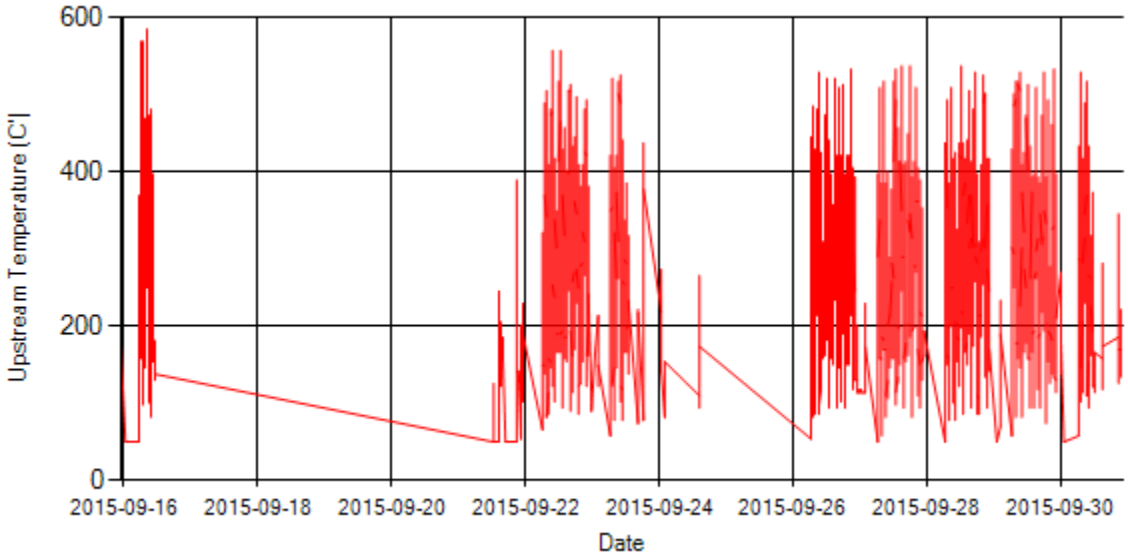

Figure 6- Temperature distribution over the period

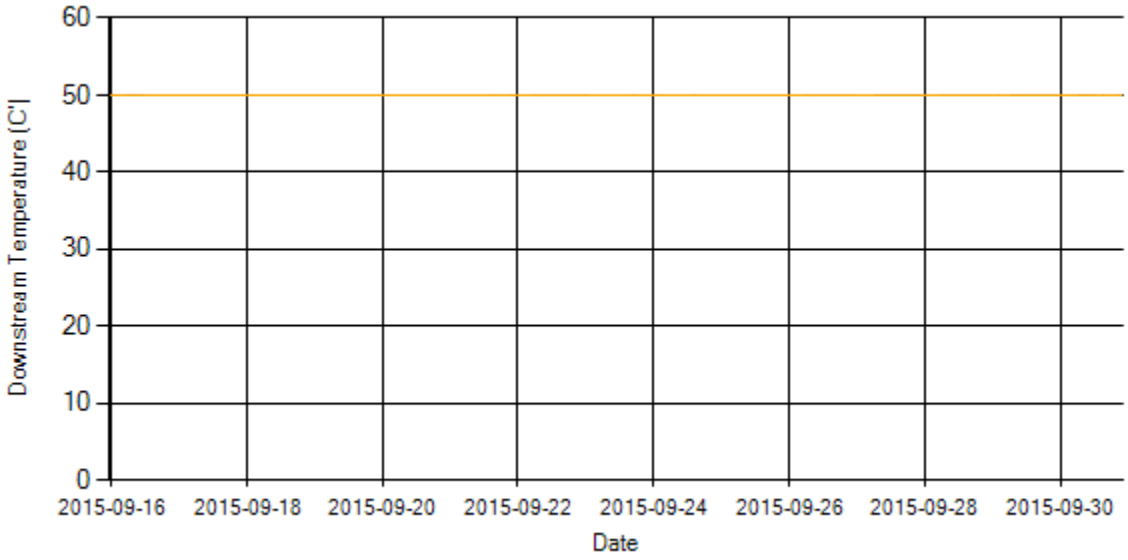

Figure 7- Temperature distribution over the period

Notice: Temperature 2 sensor was shoving constant value due to data logger problem.

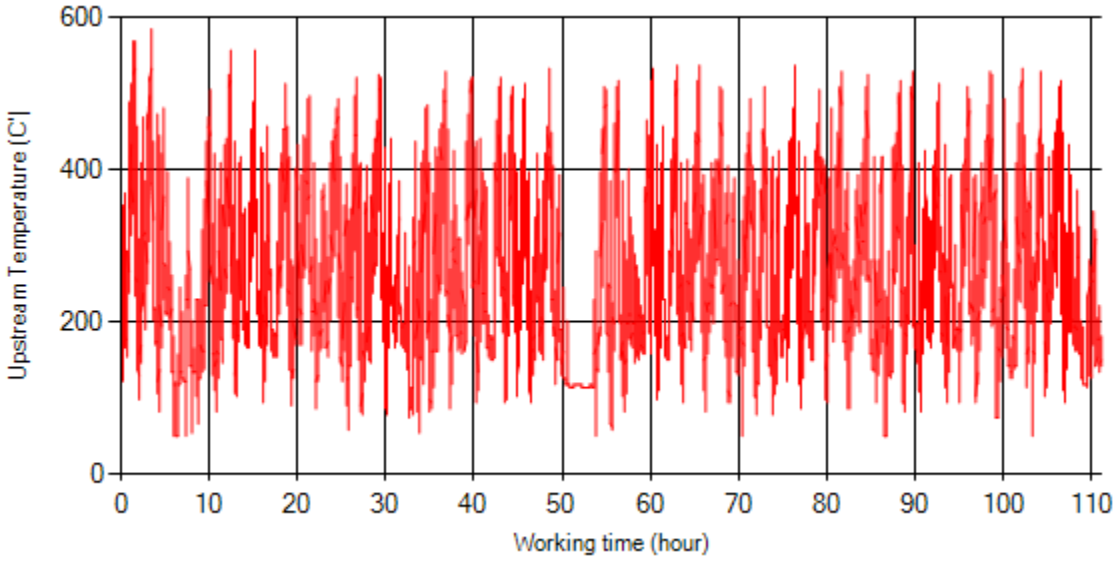

Figure 8- Temperature vs. working hours

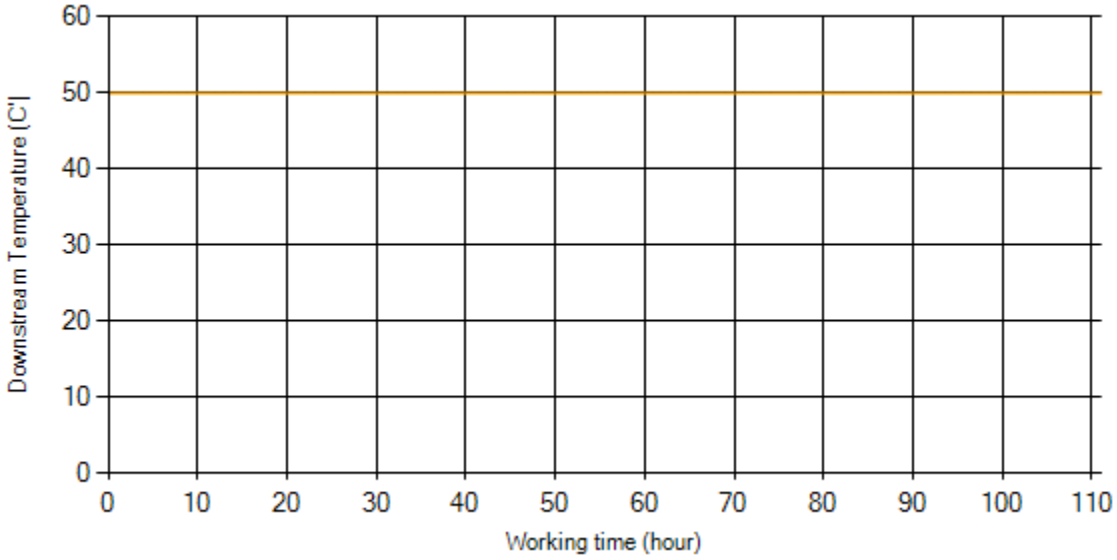

Figure 9- Temperature vs. working hours

Engine Speed Diagrams

Figure 10- Engine speed distribution over the period

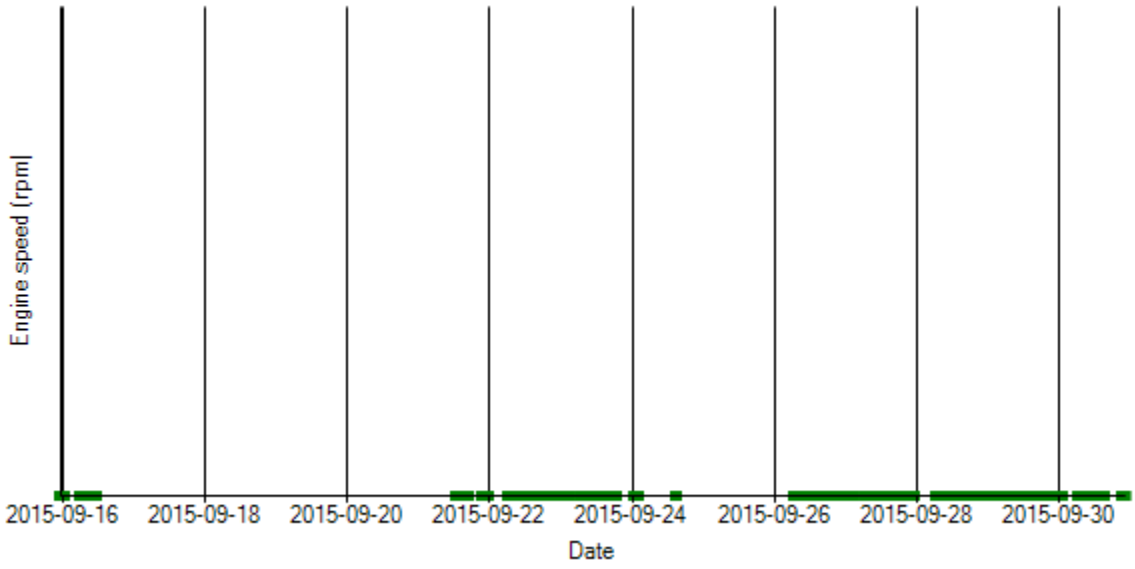

Figure 11- Engine speed diagram for calculating CPK's working days

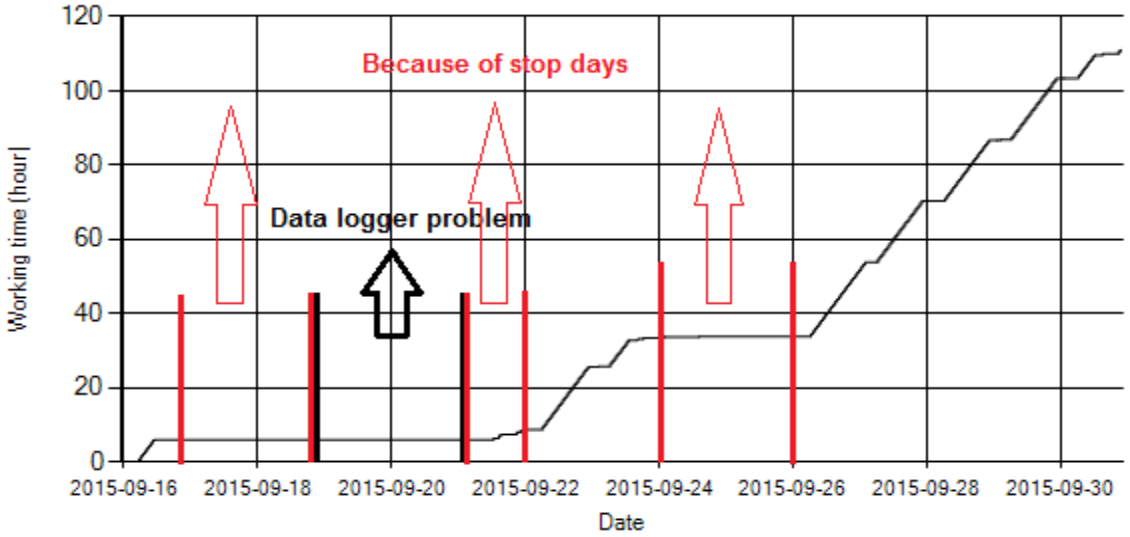

Figure 12- Time diagram for calculating CPK's working days

Notice: Data logger sampling time can be calculated from Figure 12. The lines parallel with Date axis show days without data logger data.

Pressure-Engine Speed diagrams

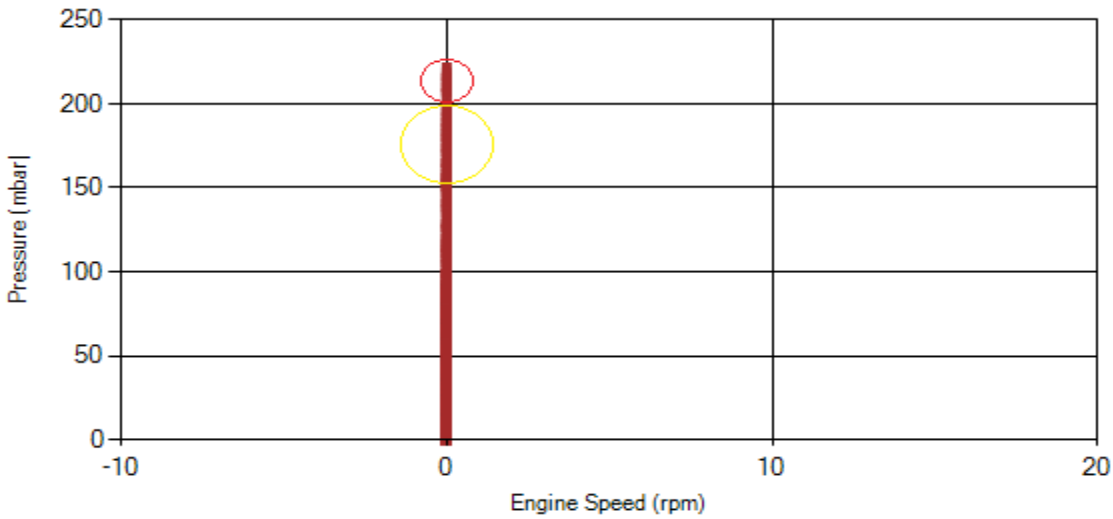

Figure 13- Pressure against engine speed

Notice: Red alarm (pressure>200 mbar) and yellow alarm (200>pressure>150) ranges were indicated in figure 13.

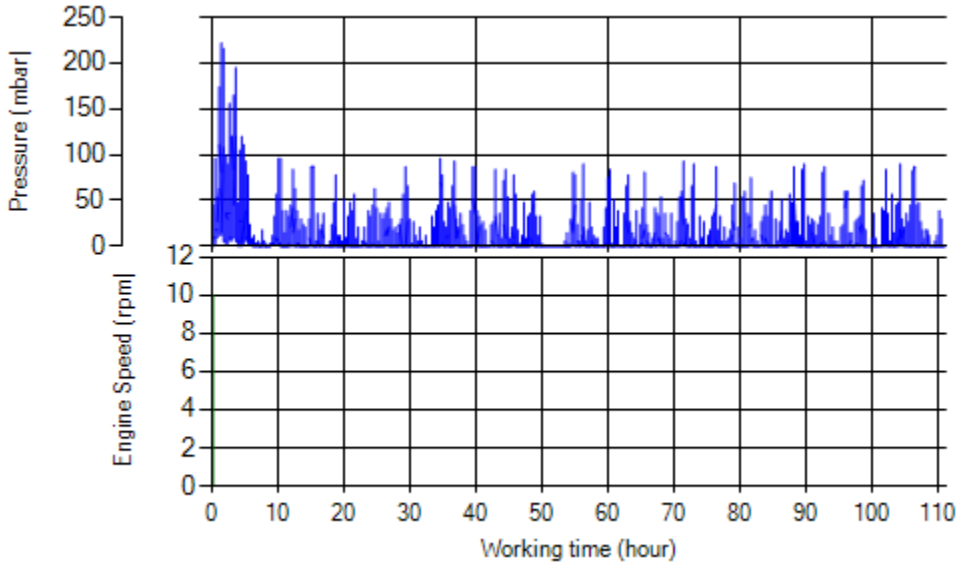

Figure 14- P, N distribution vs. working hours

Temperature-Engine Speed diagrams

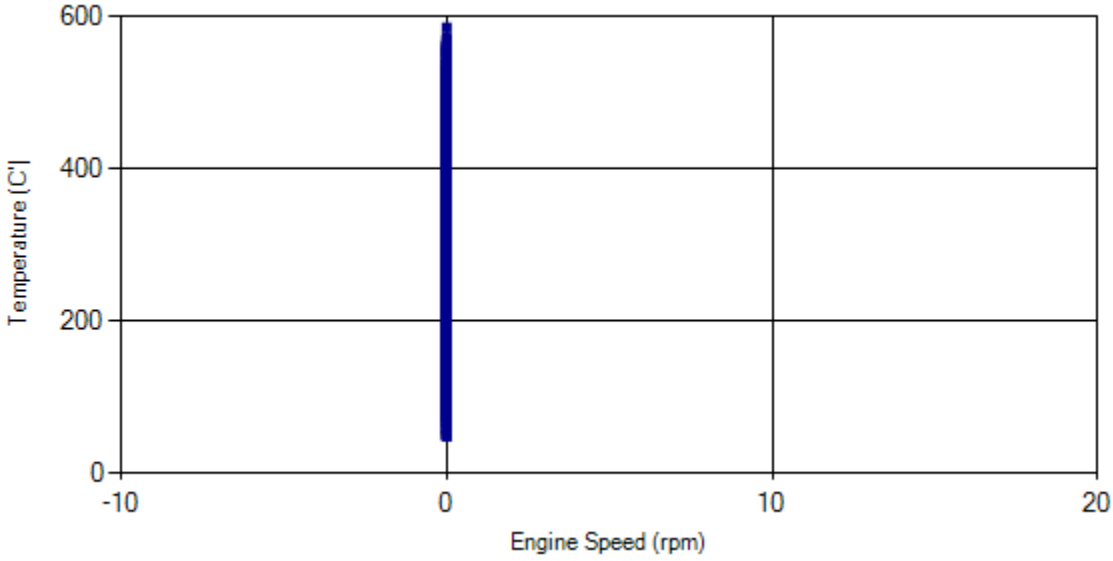

Figure 15- Temperature against engine speed

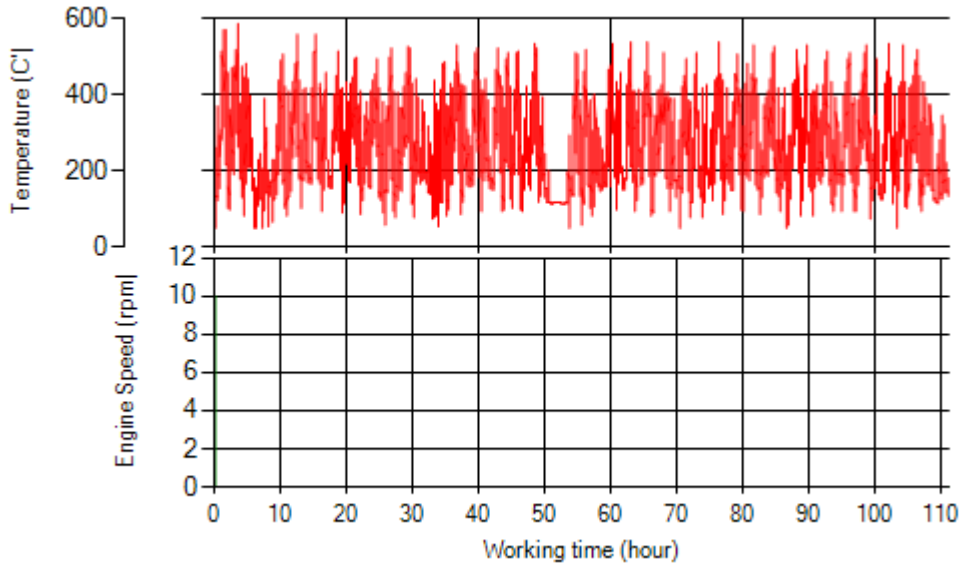

Figure 16- T, N distribution vs. working hours

Filter Operation Analysis

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

- It is worth-mentioning DPF isolation was not suitable and air filter melted because of very high temperature distribution.
- For decreasing destructive effect of increasing temperature, special heat shield was designed and DPF will be installed on system after cleaning with designed heat shield.

Appendix

Figure 1. Unsuitable filter isolation

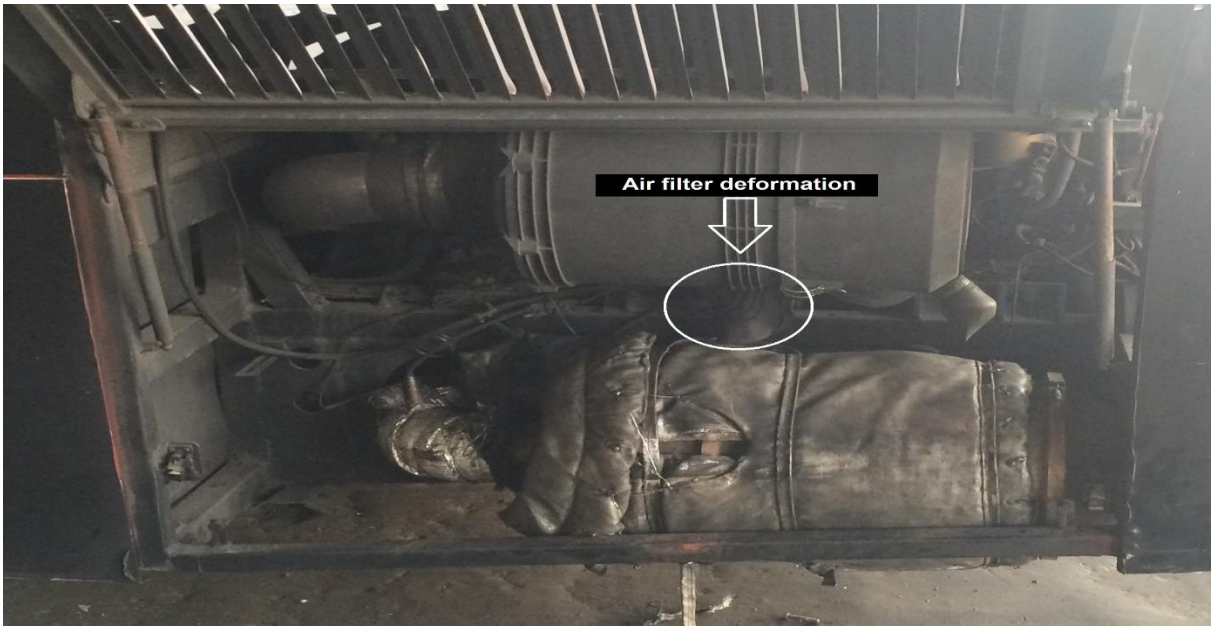

Figure 2. Air filter deformation, due to high temperature and filter unsuitable isolation