

## DPF Troubleshooting - Diagnosis and Remedy

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### To prevent malfunction:

- Select the appropriate DPF
- Mount the DPF technically correctly
- React to alarms
- Maintain DPF well
- Maintain engine to prevent excessive lubricant usage
- Use the correct fuel
- Select or adapt filter regeneration method to deployment operation profile

Malfunction	Cause	Remedy	
Back-pressure surprisingly prolonged low	Connection or pipes are blocked, iced or leaking	Clean pipes and connections; rectify leaks	1
		Fit the pipe to sensor sloping down; fit condensate trap	
	Pressure sensor defective	Test sensor with compressed and reducing valve at 500 mbar	
Back-pressure high; does not show zero when inoperative	Connection or pipes are blocked	Clean pipes and connections; rectify leaks	2
		Fit the pipe to sensor sloping down; fit condensate trap	
	Pressure sensor defective	Test with compressed air with reducing valve at 500 mbar	
	Filter soot load is extreme	Regenerate filter by running full load	3



Visible smoke emission and back-pressure high	Regeneration ineffective	Adapt regeneration procedure to actual deployment operation temperatures	
		Clean filter (external burn-off; clean by pulse air (ceramic) or wash (metal))	
Visible smoke emission and back-pressure low	Filter element damaged	Replace filter	4
	Canning bypass	Replace filter	
Noise noticeable	Ignition frequency	Repair flange leakage or cracked inflow pipe	5
	Whistling	Repair leakage or cracked inflow pipe	
	Rattling, more when idling	Repair loose filter element	
	Low frequency droning noise	Improve filter vibration isolation from engine; insert bellows	
Continuous increase in back-pressure: no regeneration	Temperature too low	Modify deployment conditions	6
		Inspect thermal insulation	
		Verify injection timing	
Rapid pressure increase	Regeneration fails Engine soot or oil emission high Turbocharger fails	Regenerate filter; check regeneration system Check engine-out emission	7
Back-pressure stays high despite active re- generation	Burner temperature is too low	Burner maintenance	8
	Oxygen insufficient	Turbocharger maintenance Intake air filter maintenance	
	Regeneration too short	Consult manufacturer	



	Soot has formed graphite	Raise regeneration temperature; use fuel additive	
Back-pressure base-line rises despite re-generation	Ash deposits from lubricant	Use low ash lubricant; Engine maintenance	9
	Gypsum formation	Use low sulfur diesel fuel and lubricants <del>/s</del>	
	Ash deposits from fuel additive	Decrease additive dosage	
	Mineral dust deposits	Use finer pored air intake filter. Fit pre-filter, cyclone.	
		Do not let air filter eject ahead of DPF	
	Muffler fibers	Never fit muffler ahead of DPF	
Engine abrade	Repair engine immediately		
Regeneration interval continuously decreasing	Excessive ash deposits	Send filter for cleaning	10
	Raw emission very high	Inspect and maintain engine	
	Regeneration incomplete	Verify regeneration	
Back-pressure high despite cleaning	Coking in the filter pores	Burn-off filter deposits before cleaning	11
	Sticky deposits in the filter	Replace filter	
	Ash sintering in the filter	Replace filter	
Sparks in exhaust gas	Filter soot load is excessive	Replace filter element	12
	Deposits downstream of DPF	Verify back-pressure control	
		Verify filter efficiency	
	Extremely high regeneration temperature peaks	Improve regeneration	



If used near inflammable material or in forests		Install spark-arrester disc downstream DPF	
Flames in exhaust gas	Massive oil deposits downstream of DPF, due to overload or damage plus substantial unburned hydrocarbons	Replace filter element	13
		Verify regeneration	
		Verify engine emission; check nozzles and LDA (boost limiter)	
Temperature after DPF unusually high	Uncontrolled regeneration with excessive soot content	Verify back-pressure control	14
	Regeneration is too rapid	Verify engine raw emissions for hydrocarbons	
Materials near DPF discolored, charred, burned	Surface temperature DPF too high	Improve DPF insulation and/or install heat shield	15
		Increase distance to inflammable material	
Engine power deficit	DPF back-pressure	Verify back-pressure	16
		If back-pressure is OK, then the malfunction is not in the DPF	
Fuel consumption increased	DPF back-pressure	Verify back-pressure	17
		If back-pressure is OK, then the malfunction is not in the DPF	
Water temperature higher	DPF back-pressure	Verify back-pressure	18
		If back-pressure is OK, then the malfunction is not in the DPF	
White smoke prolonged	Water vapor from condensation in cold DPF	Preheat DPF when equipped with burners or electrical heating	19
		Install water spill upstream DPF at lowest point	



		If mounted vertically never use open stack but install free moving rain flap	
		Else harmless	
Blue smoke	High lubricant consumption in engine or turbocharger	Inspect engine	20
Soot deposits in tail pipe	Filter damage	Replace filter element	21
Smoke only when accelerating	Too much fuel injected	Inspect and recalibrate injection pump	22
	Turbocharger response lag	Inspect boost limiter (LDA)	
	Filter damage	Replace filter element	
NO <sub>x</sub> too high or too low	Fuel injection timing wrong	Adjust timing of fuel injection	23
NO <sub>2</sub> high	Catalytic deposits	Clean out filter element	24
HC high	Nozzle drips; ring damage	Inspect injection nozzles	25
CO high	Turbocharger /	Verify boost pressure and	26
	Full load injection limiter	Injection pump	
O <sub>2</sub> low	Turbocharger /	Verify boost pressure	27
	Injection pump	Inspect injection pump	
High smoke emission engine-out upstream DPF	Turbocharger	Engine maintenance	28
	Injection pump		
	Intake air filter		

