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Verbrauchsoptimierung

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FUEL CONSUMPATION OPTIMIZATION BY APPROXIMATION OF IMPULATIONS IN PARTICLE FILTER FOR SPARK IGNITION ENGINE CONCEPTS

Technical task:
The task of the technical innovation is to realize a reduction in consumption with simultaneous efficient particle filtration.

Initial situation:
The optimal operating parameters of an internal combustion engine in terms of consumption are usually not compatible with the optimal parameters for emissions.
In the future, special attention will be paid to particle emissions.

Without the use of an OPF, the main focus is on the internal engine optimization of particulate emissions. This is accompanied by a deterioration of fuel consumption, since the engine is not operated in its thermodynamically best efficiency.

Solution:
With the use of the particulate filter, this conflict of objectives can be partially resolved.
Depending on the operating strategy of the particulate filter and its loading state, the operating parameter selection (injection parameters, camshaft timing, rail pressure, etc.) of the engine can be unrestricted in the direction of optimum consumption. The figure illustrates this emission / particle tradeoff schematically.
In the previous design is based on particle optimum, in the future, a particle disadvantage can be accepted, as long as no critical level of the particulate filter is reached.

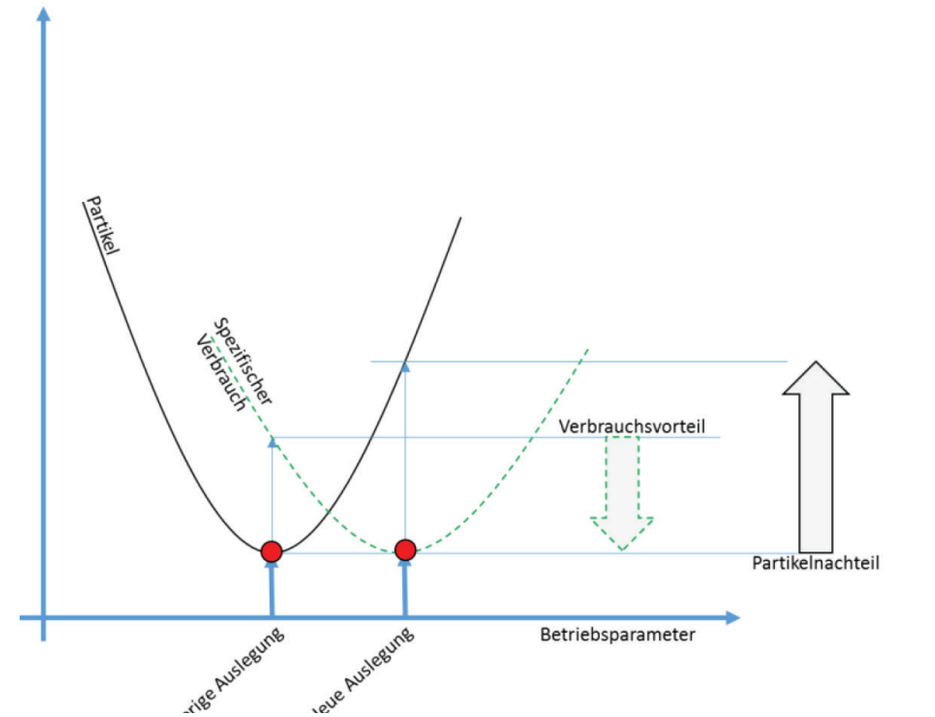
The soot loading of the particulate filter is continuously calculated and monitored during engine operation. At low load levels, engine operation can be optimized for optimal fuel consumption and can be tolerated by increasing particulate emissions. The ottomotor combustion is characterized among other things by high exhaust gas temperatures. As a result, it is generally ensured that the soot retained in the filter is also discharged again while driving. As a rule, it can be ruled out that total emissions will rise.

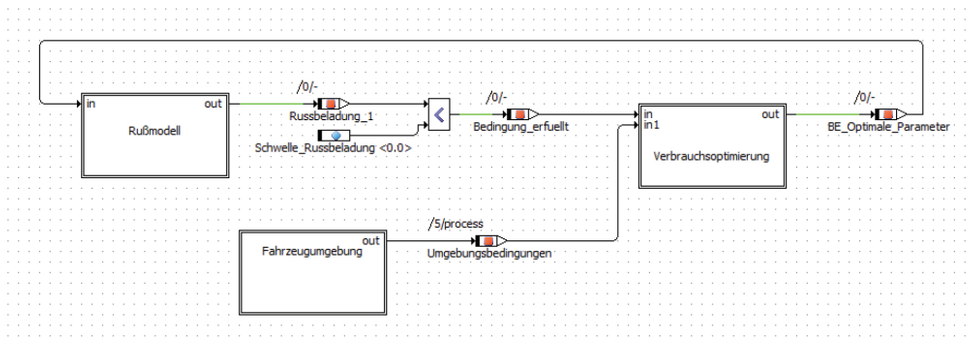
Key idea: The soot model states that consumption-optimized engine operation is permitted (low-threshold loading). When vehicle environment parameters meet required environmental conditions, customer consumption is optimized.
The soot model takes into account this increase in soot emissions due to the changed process parameters. The following sketch shows the idea schematically.

Advantages:
- Consumption and emissions are reduced.

Possible application:
- All direct injection gasoline engines.

Technische Neuerung





Sofern der Einfluss der verstellen Brennverfahrensparameter (BE_Optimale_Parameter) noch nicht im Rußmodell berücksichtig wird, muss das geschehen.