Diesel Particle Filter

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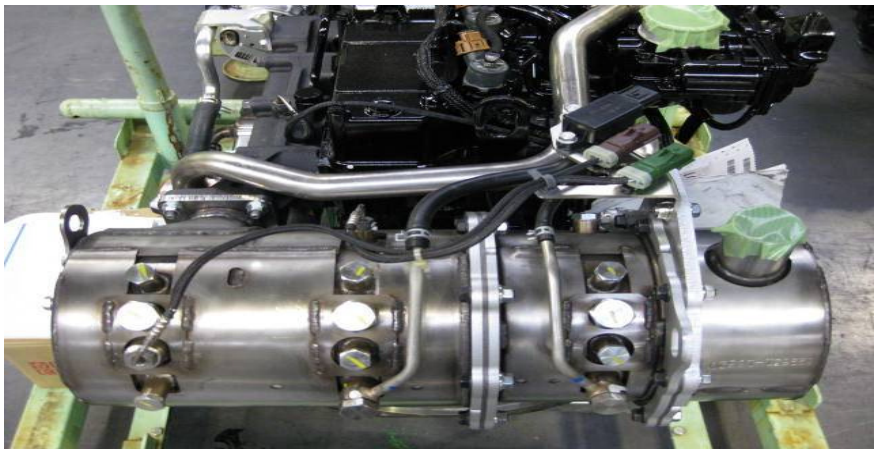


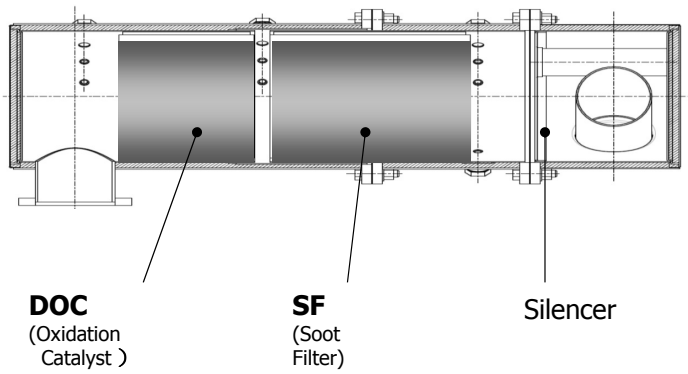
General out line

General outline

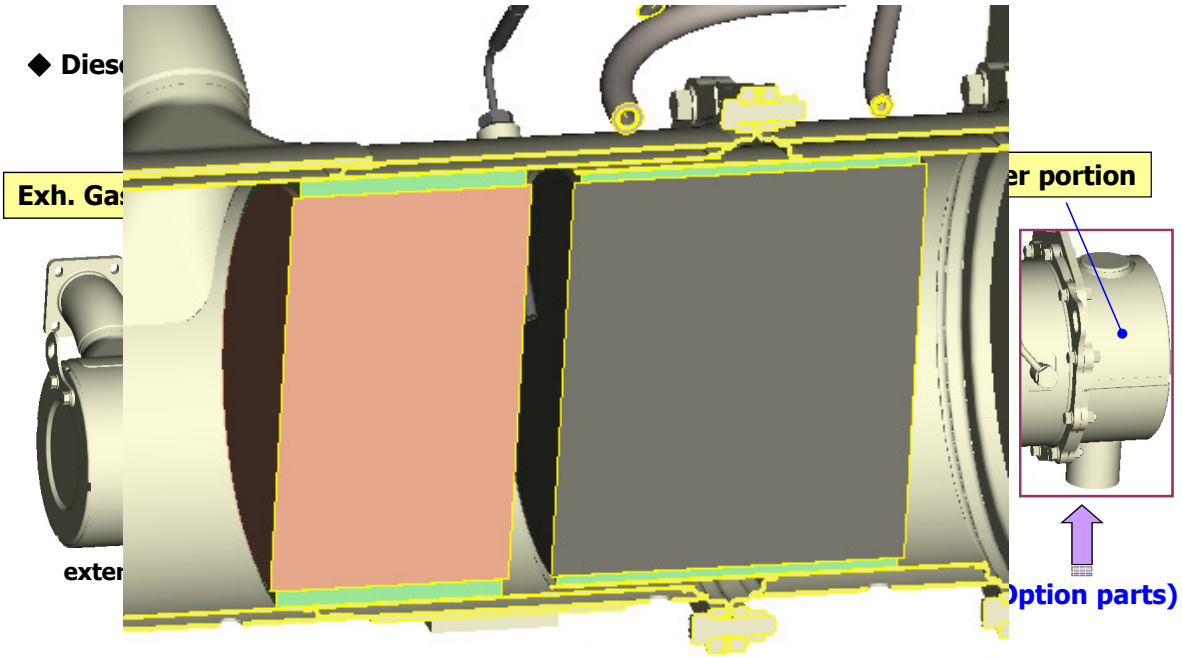
Diesel Particulate Filter (DPF)
The DPF Consists of 2 parts – The DOC and SF.

- DOC (Diesel Oxidation Catalyst)
- SF (Soot Filter)

Diesel Particulate Filter(DPF)



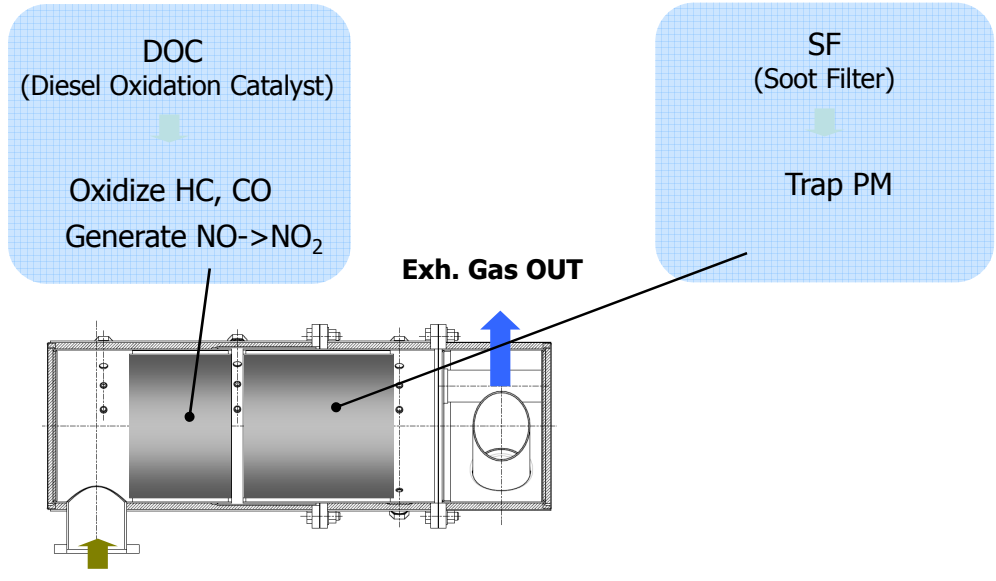
General outline



General outline

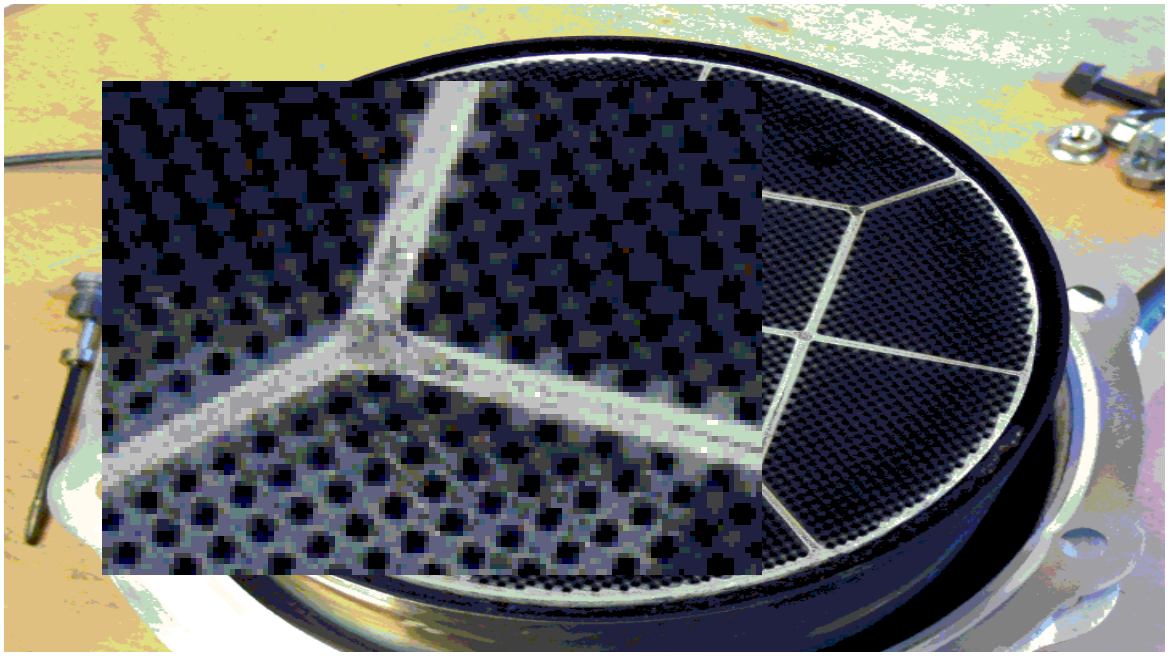
Diesel Particle Filter

-Exhaust gasses after treatment.

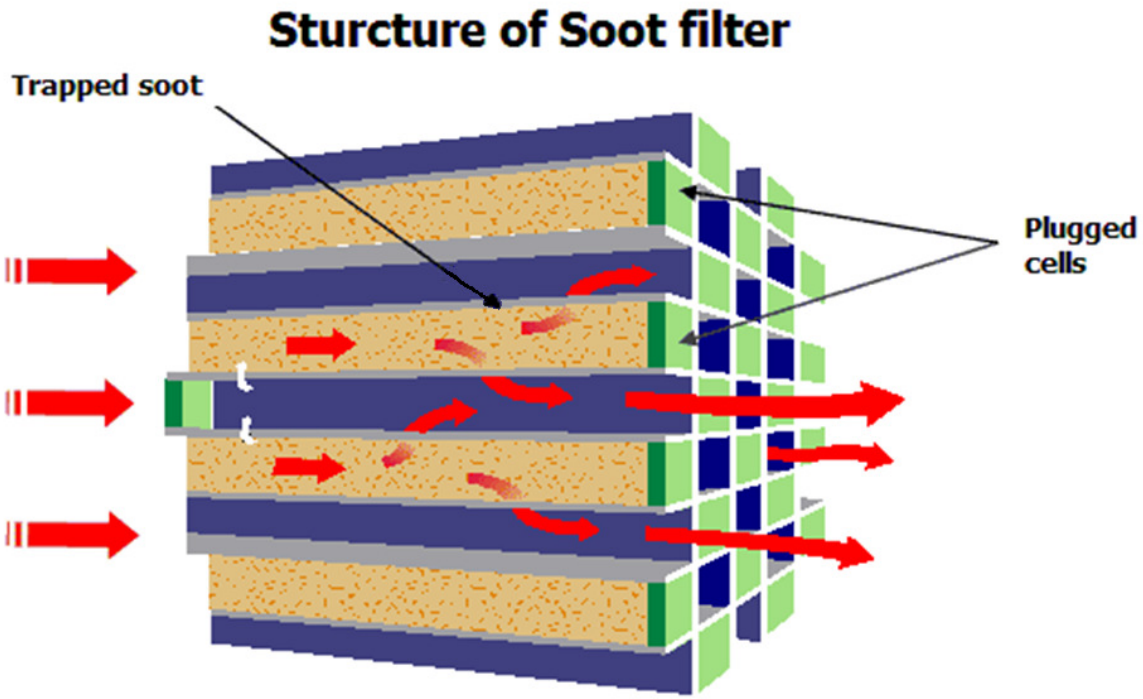


General outline

Soot filter (trap soot)

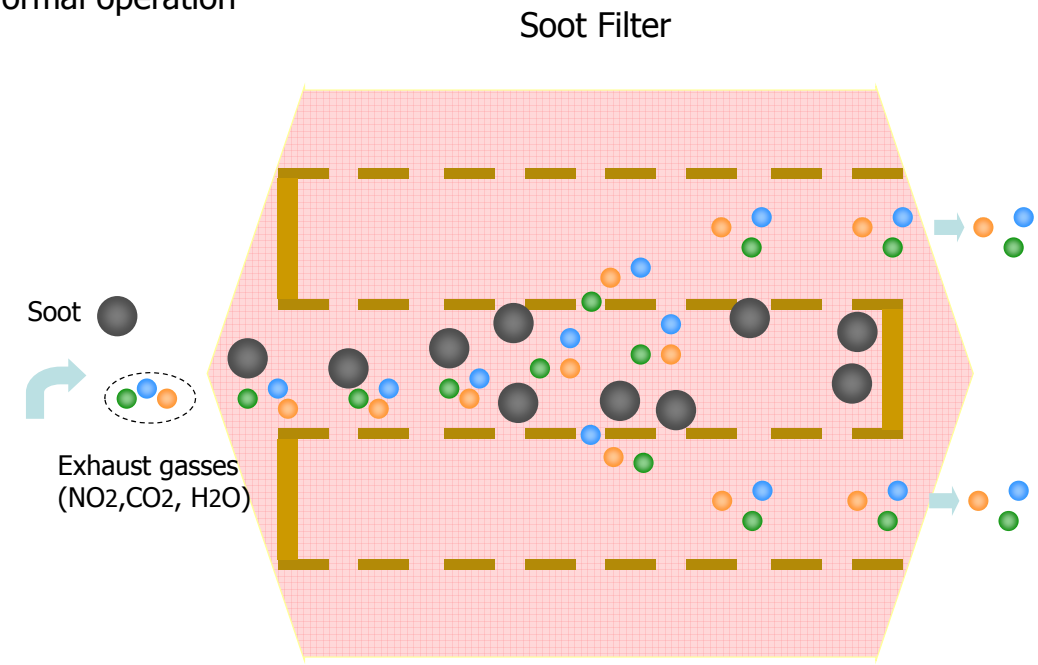


General outline



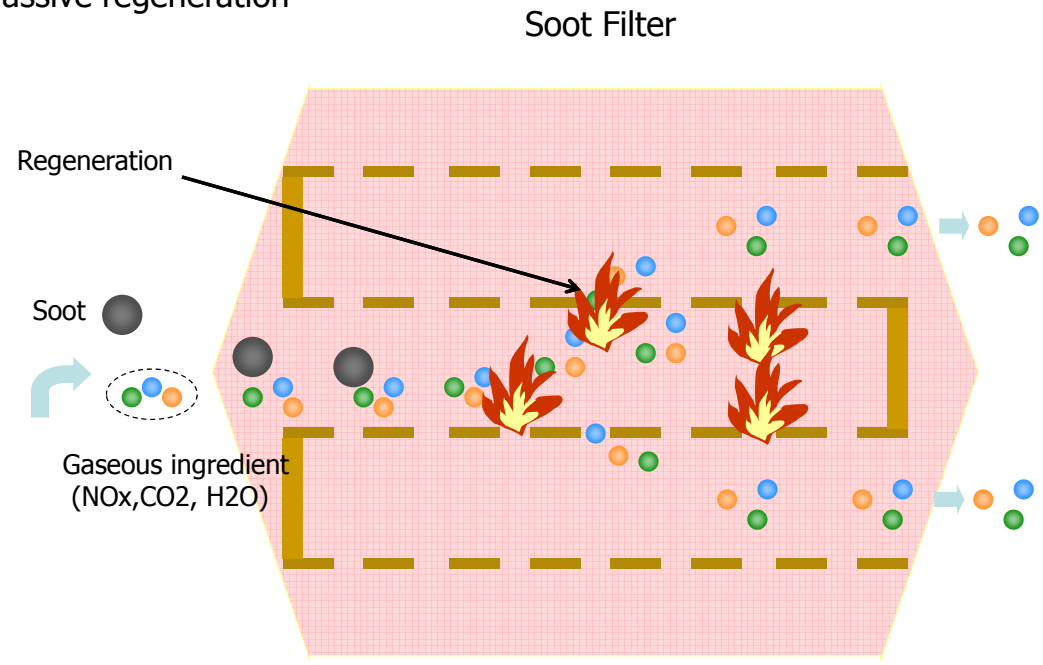
General outline

Normal operation



General outline

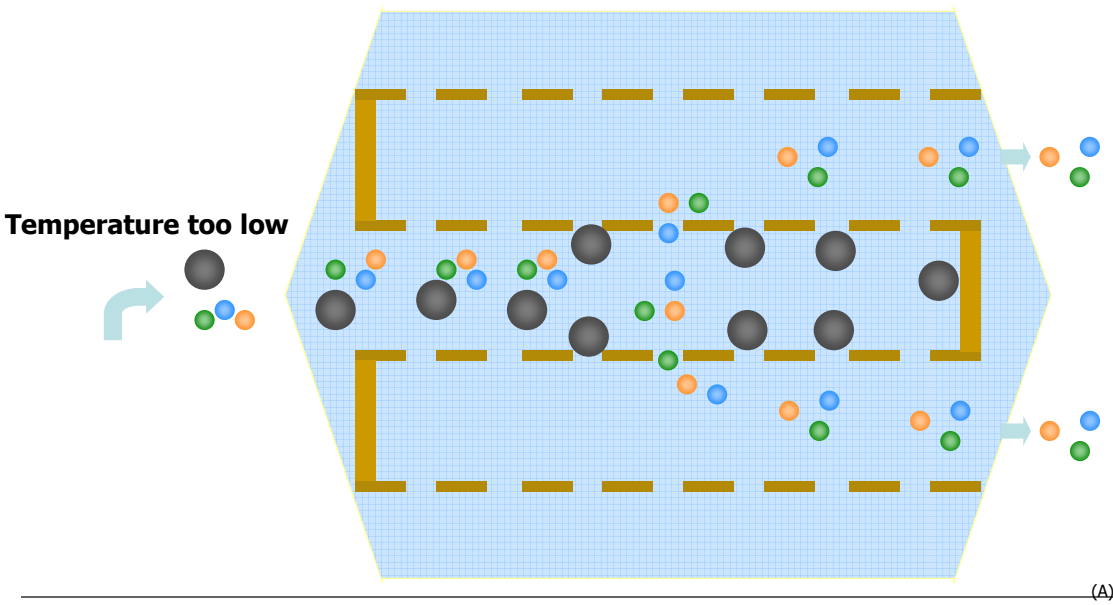
Passive regeneration



General outline

Mechanism of Regeneration

Soot Filter

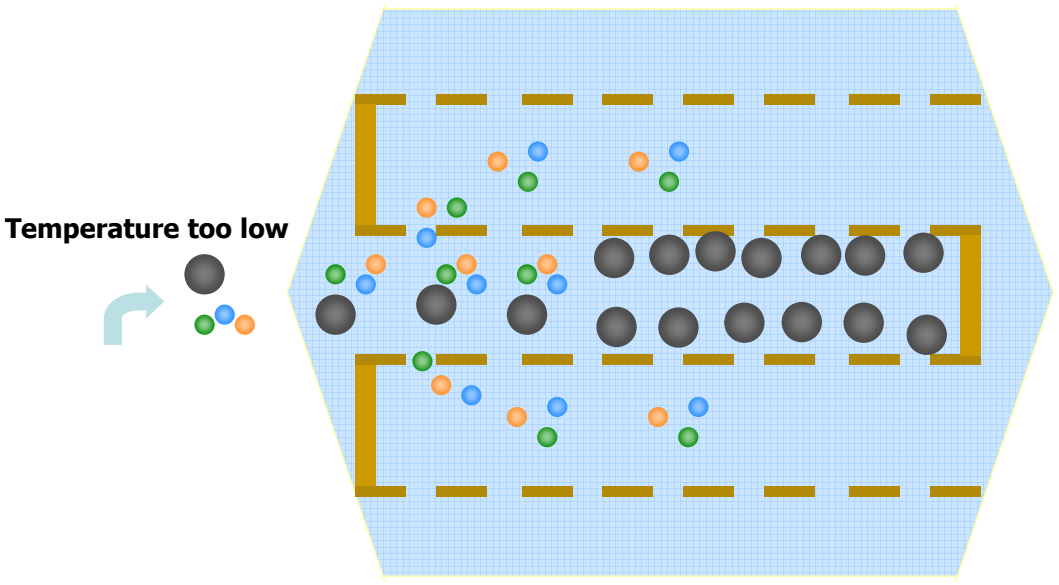


(A)

General outline

Mechanism of Regeneration

Soot Filter



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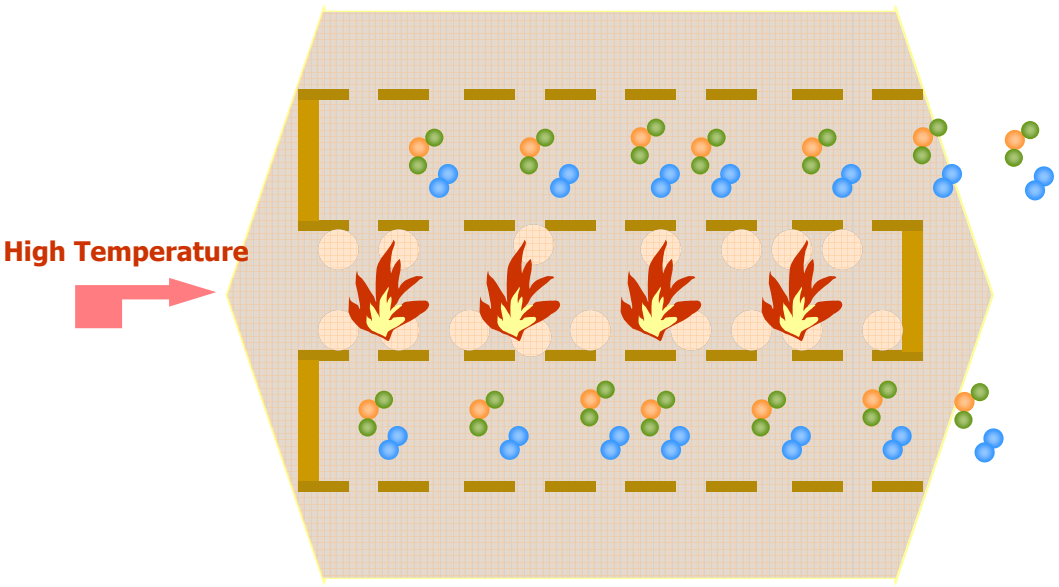
General outline

Mechanism of Regeneration

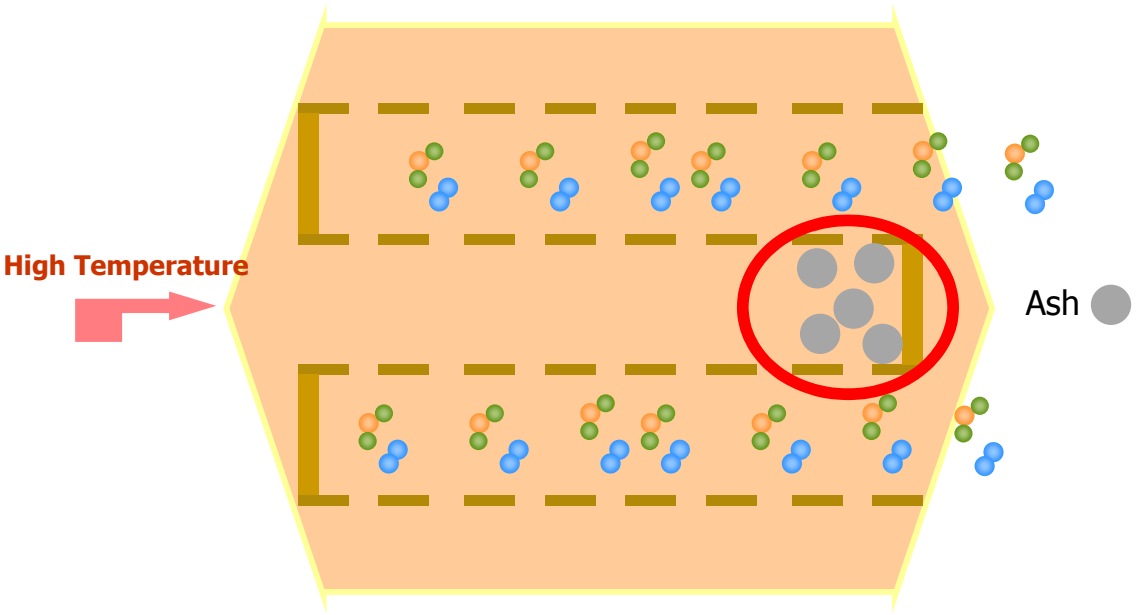
Soot Filter



General outline

Mechanism of Regeneration

Soot Filter



Service & DPF cleaning

Service

Service for DPF

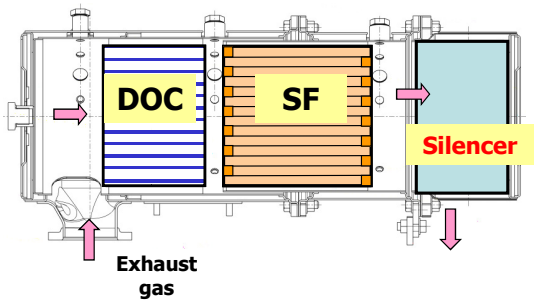
The Exhaust separated in 3 parts DOC, SF and the silencer.
Part replacement will be available.
The DPF is registered as emissions-related parts and periodic maintenance of the DPF is required.
If the SF is replaced, it is necessary to update the ECU.

DPF Cleaning

To remove Ash in the SF it's necessary to perform a periodic SF cleaning.
If the SF is cleaned, it is also necessary to update the ECU due to the management of the history.

Service

DOC : Maintenance-free part;
Replacement every 9000hrs of operation.
SF : Maintenance is required;
Perform cleaning every 3000hrs of operation



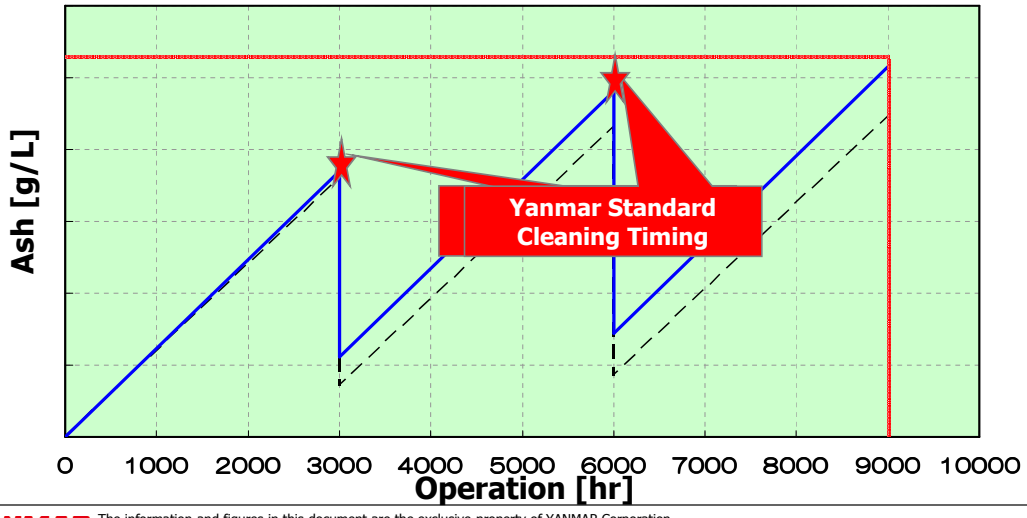
Item	Engine Type	Periodic Maintenance Interval	
		Replacement	Clean
DOC	19-37kW	Every 9000hrs of operation	Not necessary
	≧37kW		
SF	19-37kW	Every 9000hrs of operation	Every 3000hrs of operation
	≧37kW		

Service

【 Service Interval 】

Under following conditions
Lub. Oil Ash Concentration : 1%
Ash Filtration Efficiency : 56%
Ash Cleaning Efficiency : 70%

Time Base
Every 3,000hr



Service

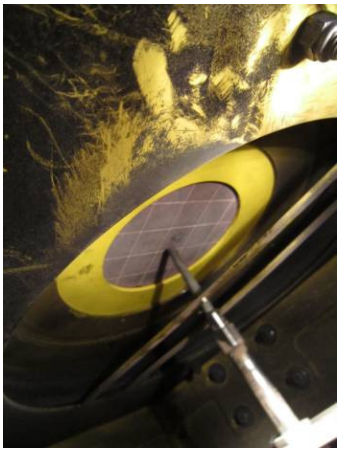
Example : FSX Cleaning Equipment

Test Procedure

Initial cleaning
Cleaning DPF by blast air from both top side and bottom side.

Top side nozzle

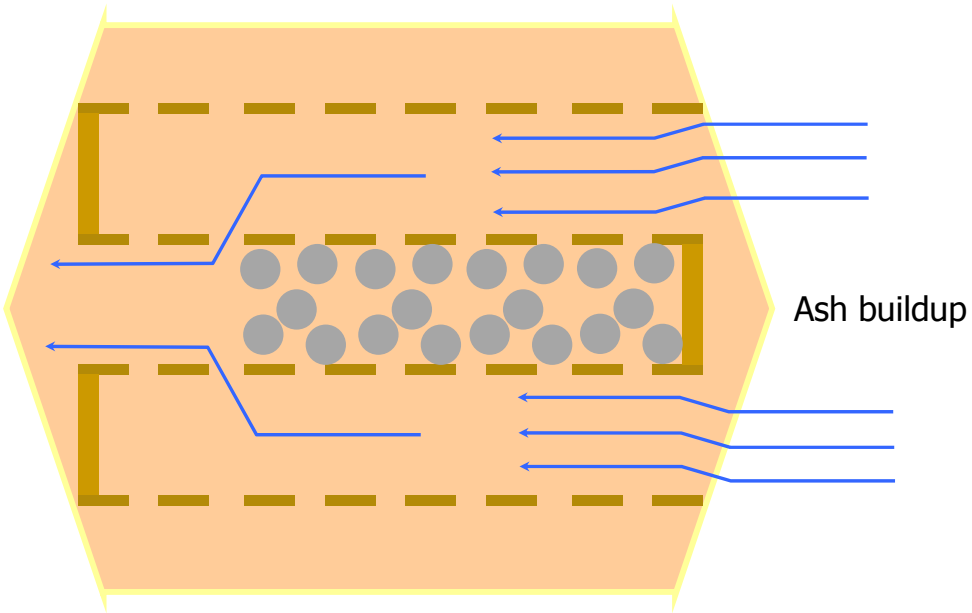
Bottom side nozzle



Service

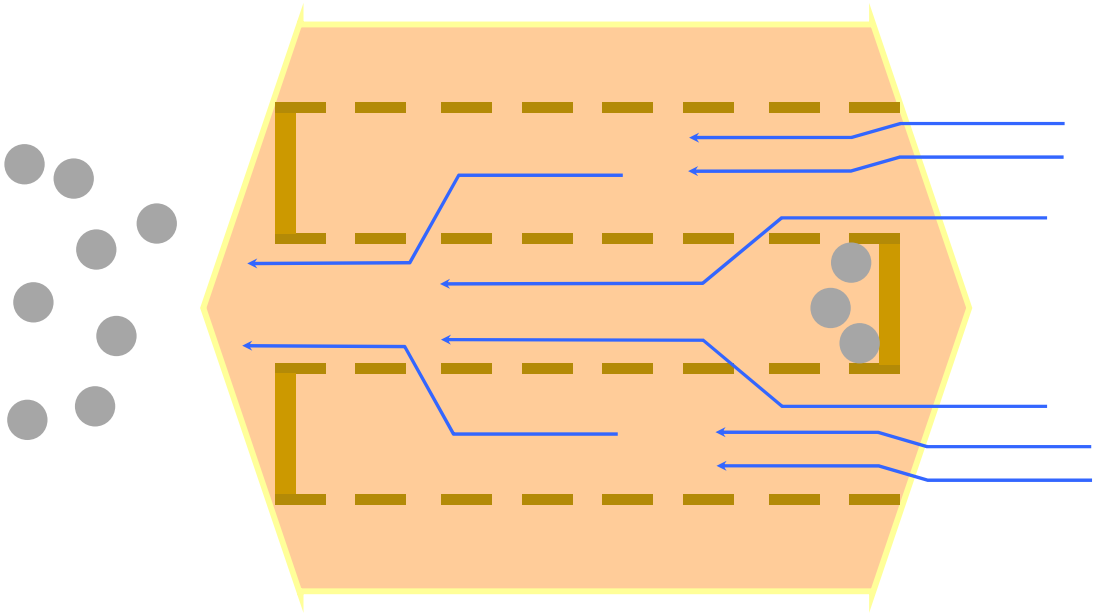
Soot filter cleaning (every 3000 hours)

Soot Filter



Soot filter cleaning (every 3000 hours)

Soot Filter

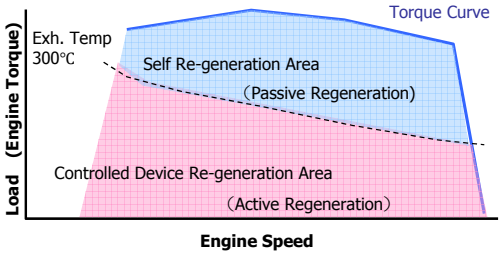


Regeneration of the DPF

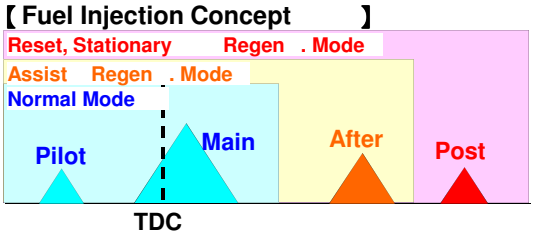
DPF Regeneration

Regeneration Method Overview

		Regen. Temp	Machine Operation	Assist Device			Remarks
				Intake Throttle	After Injection	Post Injection	
Passive		Low	Possible	×	×	×	Normal run mode
Active	Assist			○	○	×	Promote regeneration
	Reset	High		○	○	○	For burning all PM every 100 hours
	Stationary		Not possible	○	○	○	For Burning all PM if not burned during Reset Regeneration.

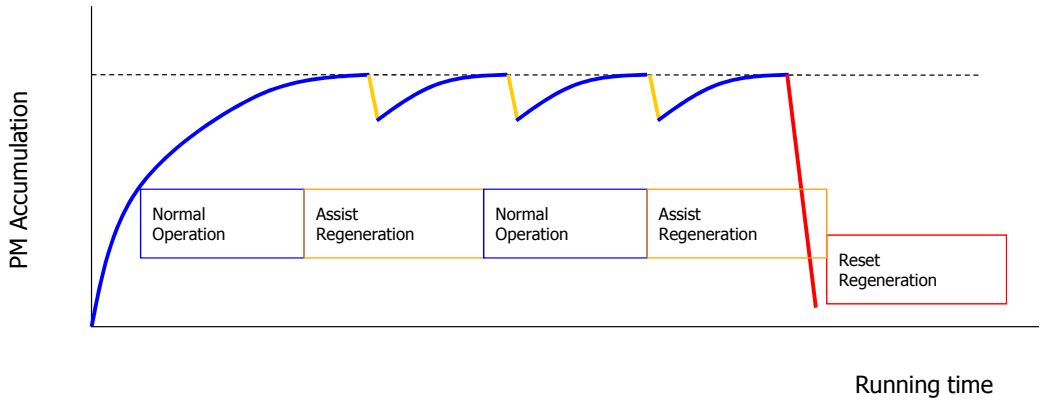


Fuel Injection Patern



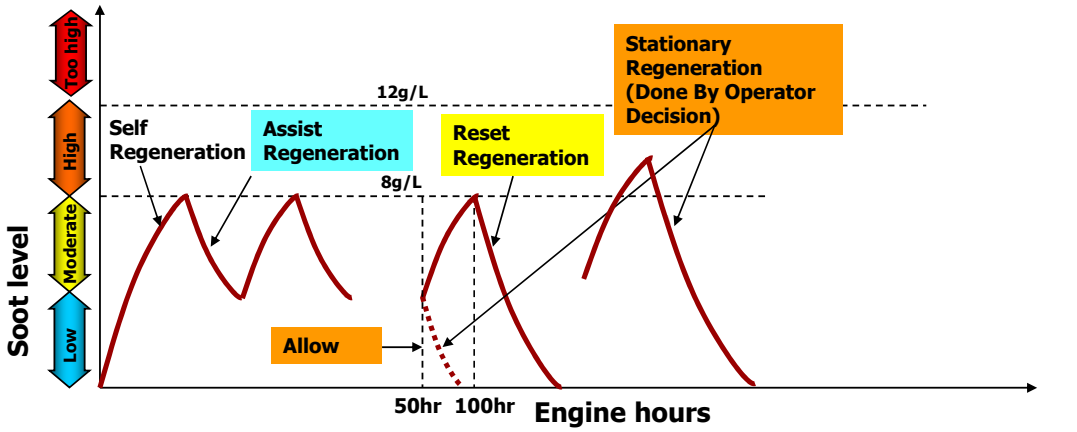
DPF Regeneration

ECU		Intake Throttle	After Injection	Post Injection	EGR Valve
Active Regen.	Assist	○	○	×	×
	Reset	○	○	○	×
	Stationary	○	○	○	×

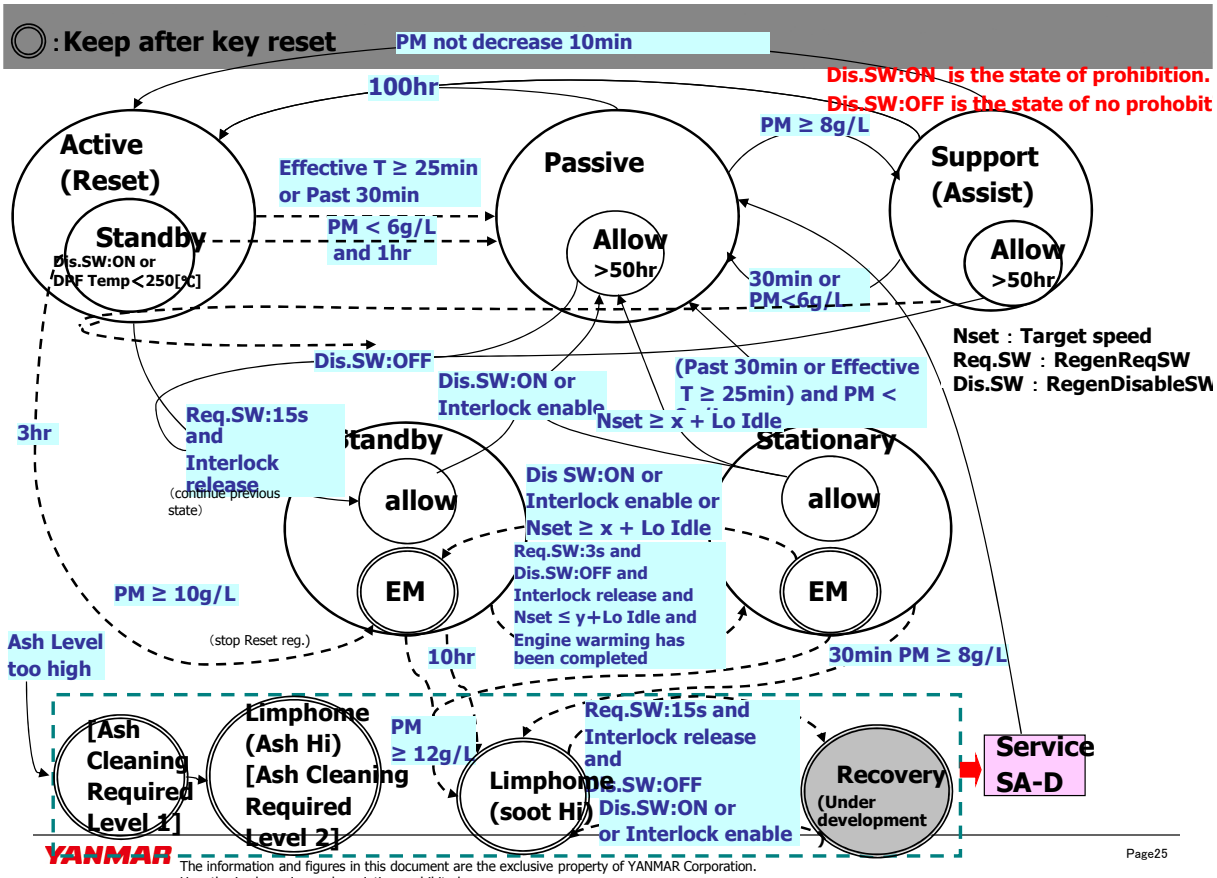


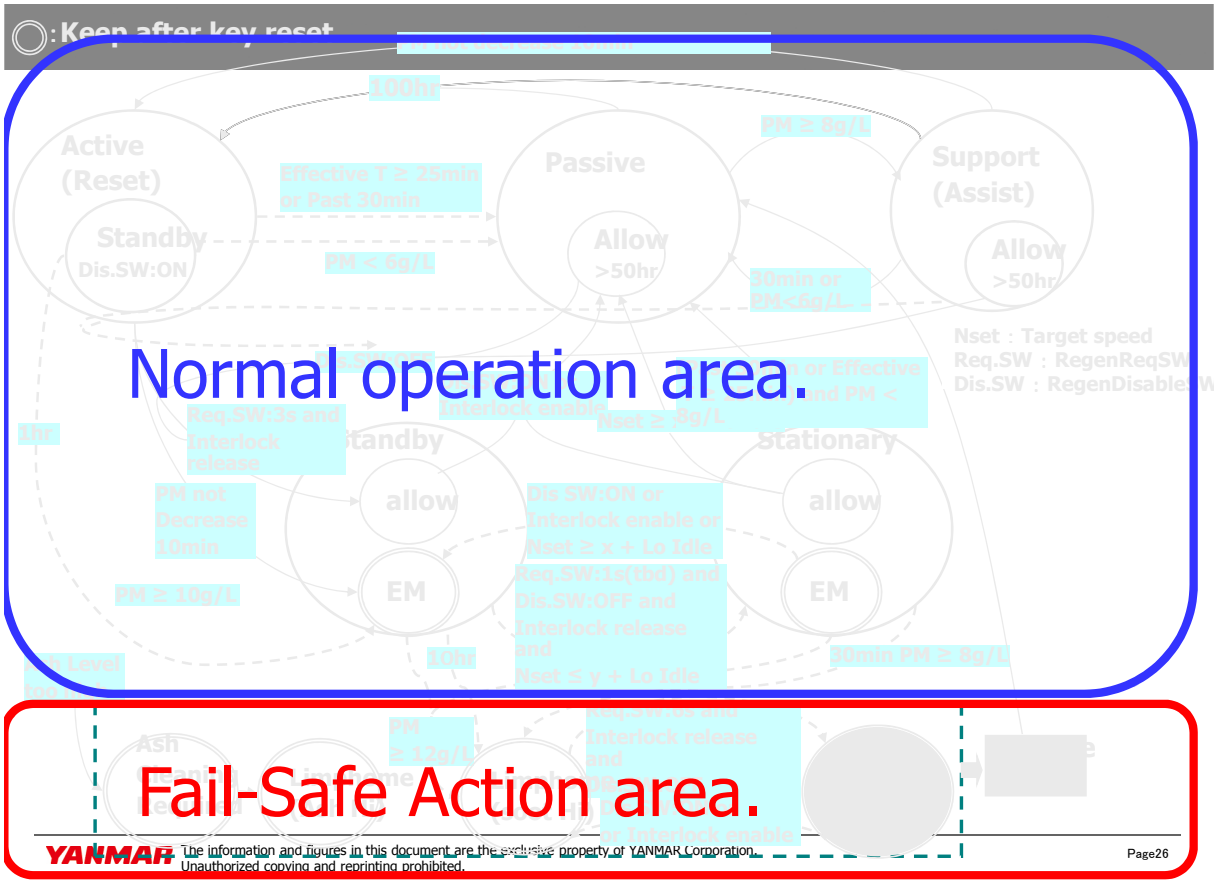
DPF Regeneration

DPF Regeneration Mode	Explanation	
Passive Regeneration	It doesn't need assistance device.	Regenerations are able to continue during the machine operation.
Assist Regeneration	It uses assistance device.	
Reset Regeneration	It uses post injection and above assistance device.	
Stationary Regeneration	It uses post injection, above assistance device and engine speed become 2200[rpm].	
Recovery Regeneration	It is requested when Stationary Regeneration is failed (using the SA-D).	
Ash Cleaning Required	ECU warning is occurred in case of ash accumulation.	

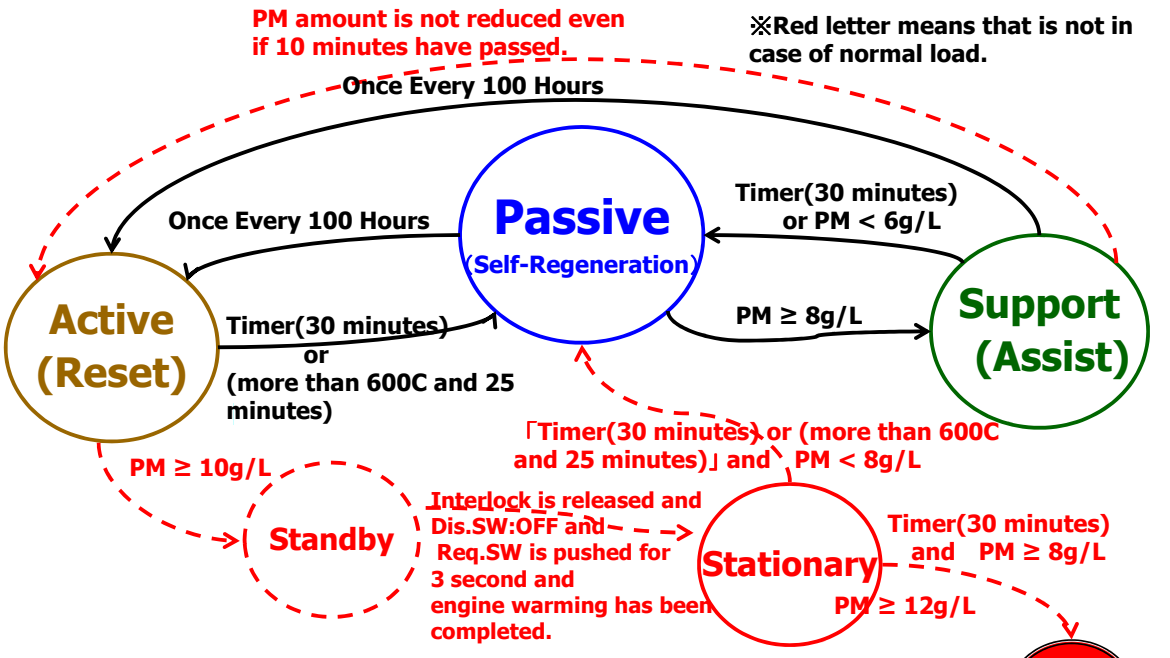


◎ : Keep after key reset





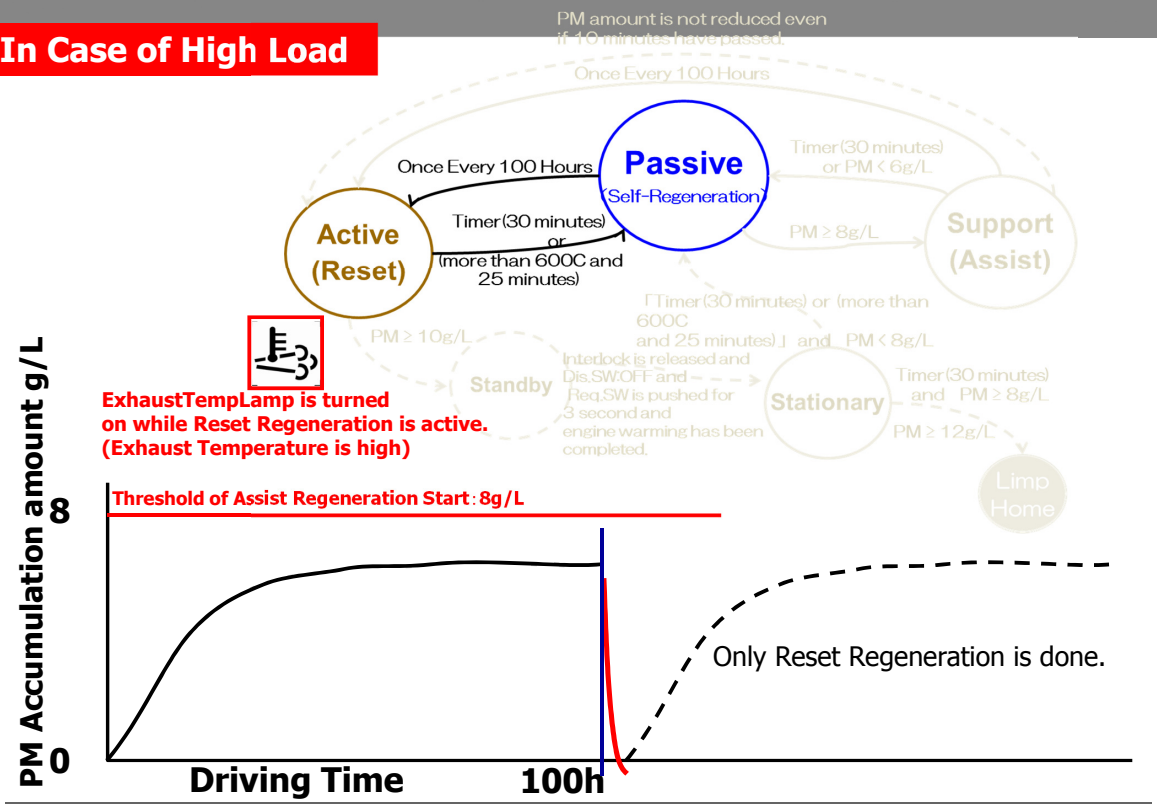
DPF Regeneration



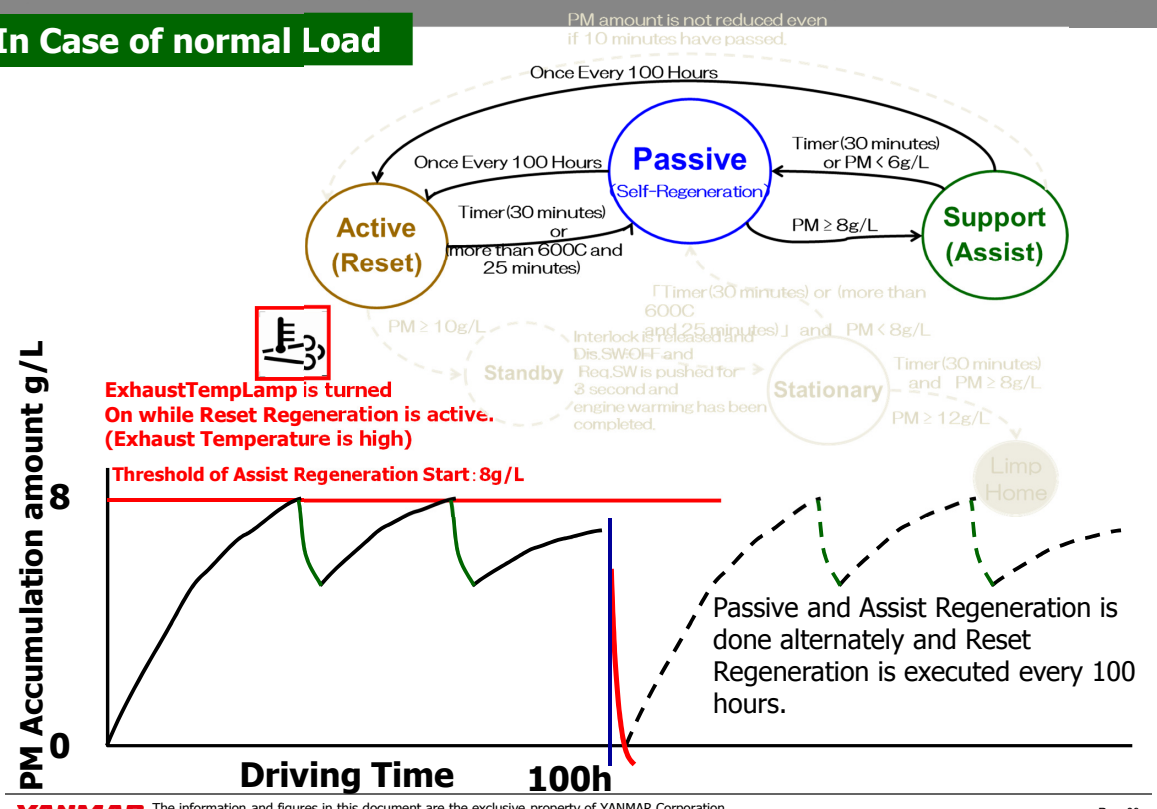
Basic Action

- **Less Than 100 Hours ：Assist Regeneration is done repeatedly if PM amount is more than 8g/L.**
- **Once Every 100 Hours：Reset Regeneration is done to burn PM.**

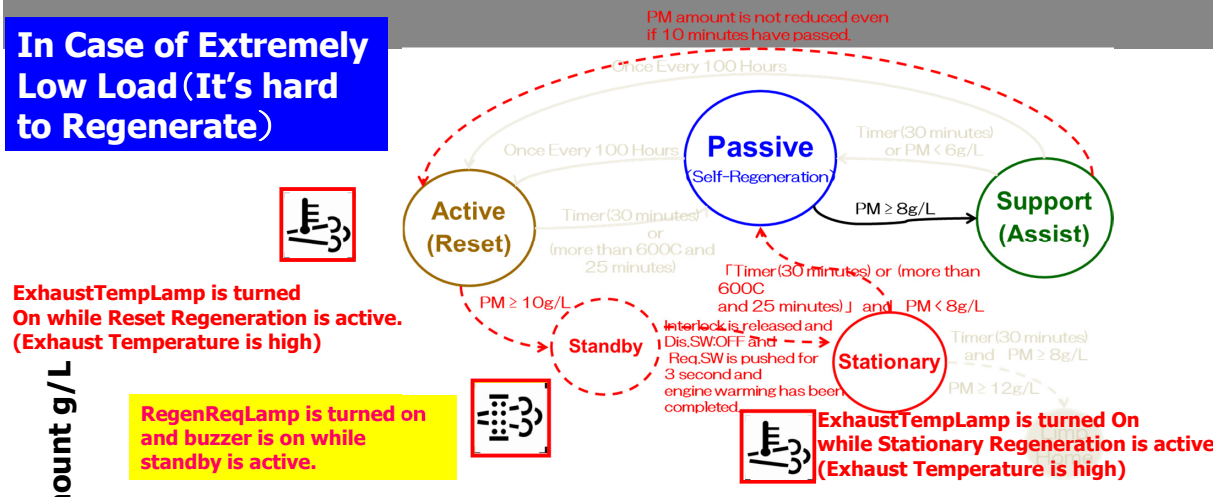
In Case of High Load



In Case of normal Load



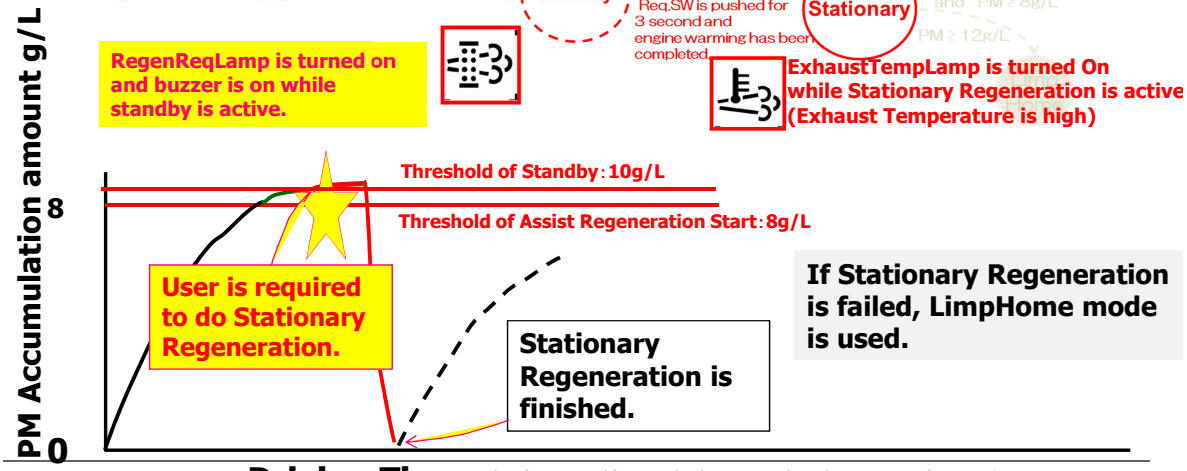
In Case of Extremely Low Load (It's hard to Regenerate)



ExhaustTempLamp is turned On while Reset Regeneration is active. (Exhaust Temperature is high)

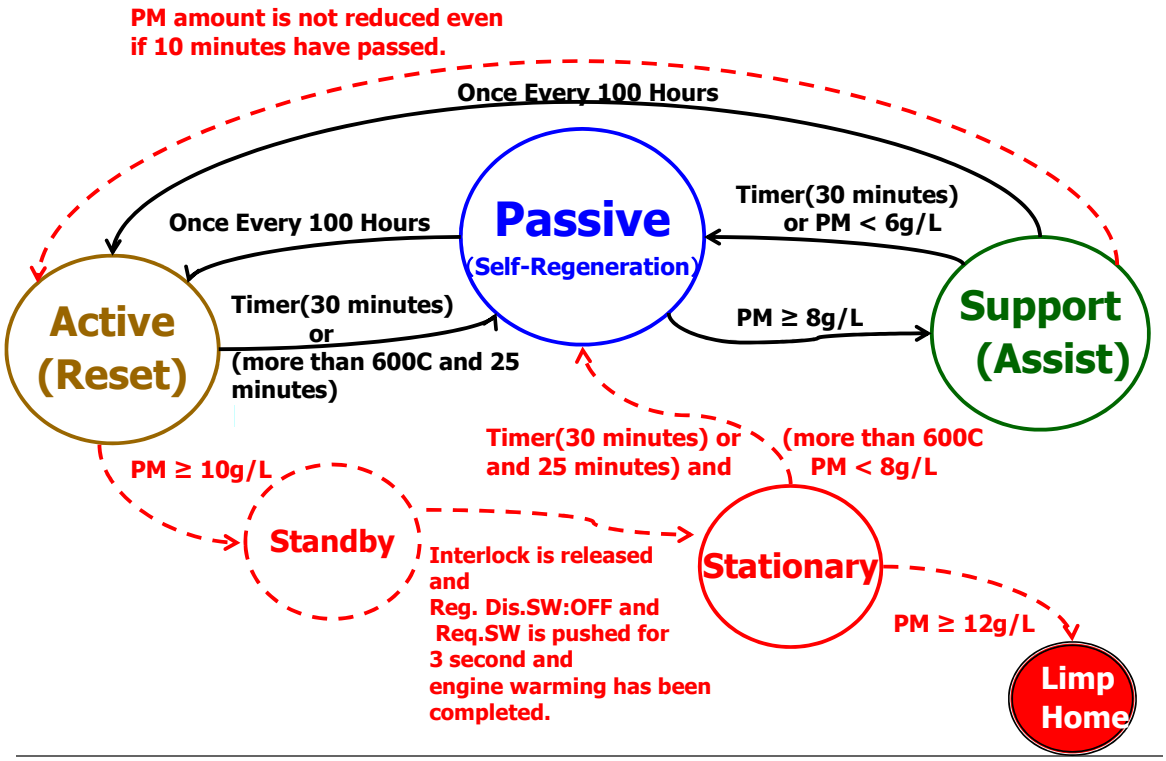
RegenReqLamp is turned on and buzzer is on while standby is active.

ExhaustTempLamp is turned On while Stationary Regeneration is active (Exhaust Temperature is high)



If Stationary Regeneration is failed, LimpHome mode is used.

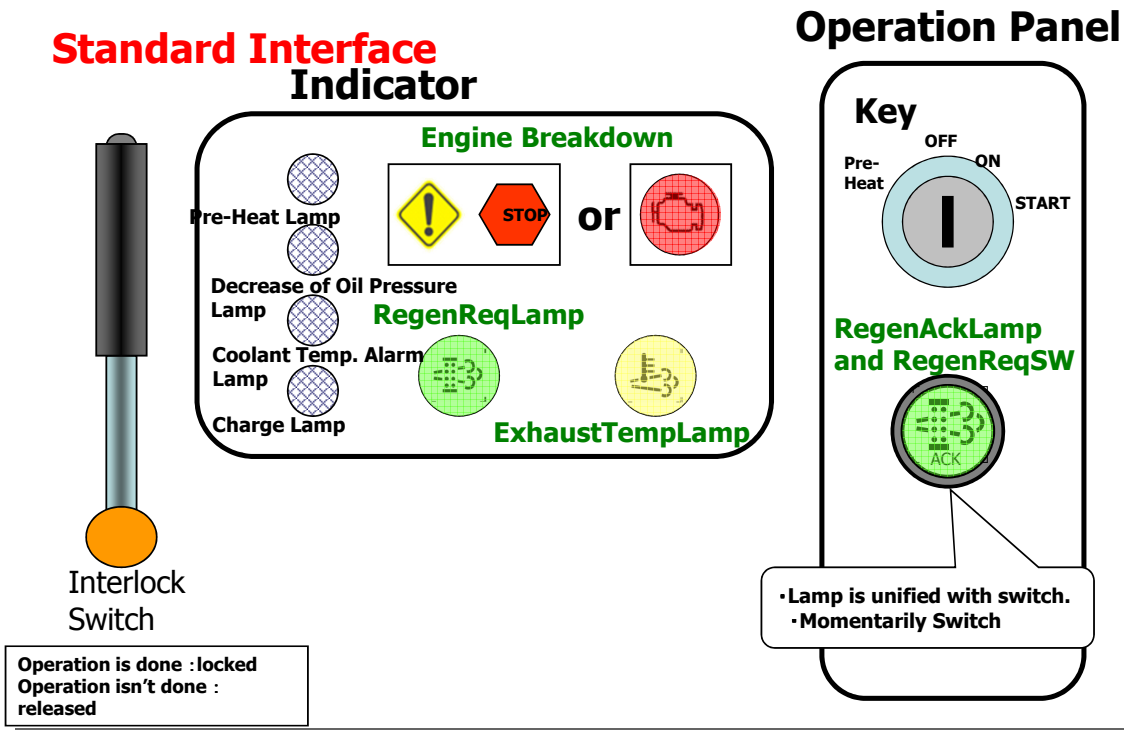
DPF Regeneration



DPF Regeneration

Interface	Operator Action	Switch・Lamp
Standard (normal switch)	• Reset Regeneration is done automatically. • Stationary Regeneration is done by operator's action.	• Fail Lamp(A or B) • RegenReqLamp • ExhaustTempLamp • RegenAckLamp • RegenReqSW
Standard (Special Locker Switch)	• You can choose below. (a) Reset Regeneration is done automatically. (b) Reset Regeneration is done by operator's action. • Stationary Regeneration is done by operator's action. • It is possible to execute Allow Mode of Stationary Regeneration.	• **Fail Lamp**(A or B) • **RegenReqLamp** • **ExhaustTempLamp** • **Locker Switch with Lamp**
Option: (CAN Communication)	• **Reset Regeneration is done automatically.** • **Stationary Regeneration is done by operator's action.**	• **Fail Lamp(A or B)** • **RegenReqLamp** • **ExhaustTempLamp** • **RegenAckLamp** • **RegenReqSW**

DPF Regeneration

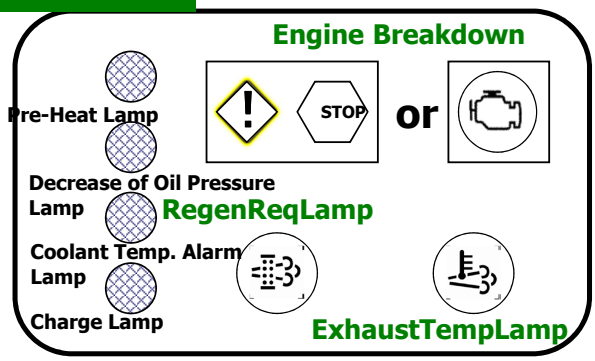


DPF Regeneration

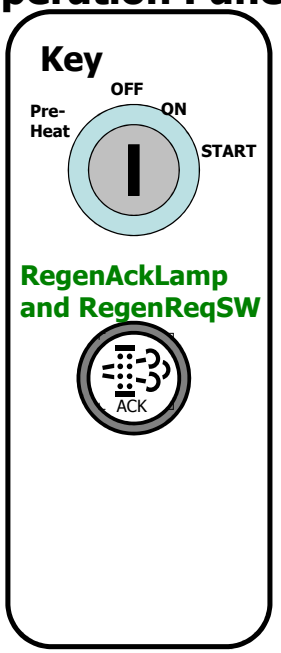
Self Regeneration and Assist Regeneration

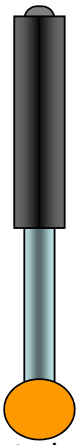
All Lamp is Turned Off

Indicator

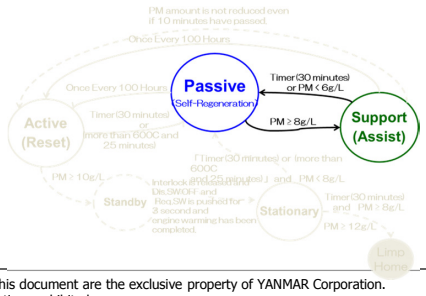


Operation Panel





Interlock Switch

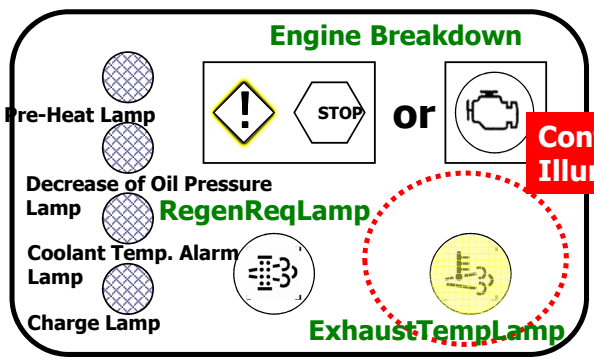


Operation is done :locked
Operation isn't done :released

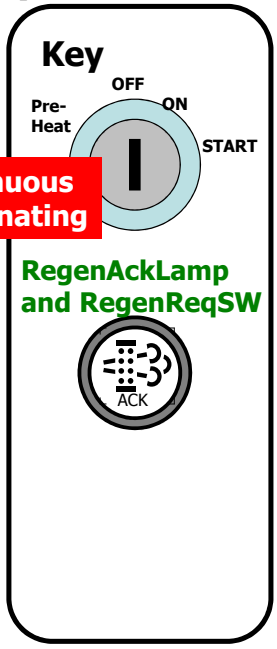
DPF Regeneration

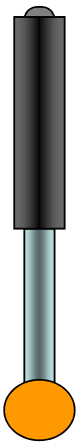
Reset Regeneration

Indicator

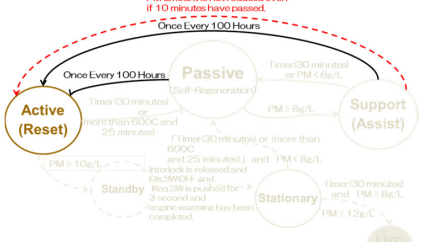


Operation Panel





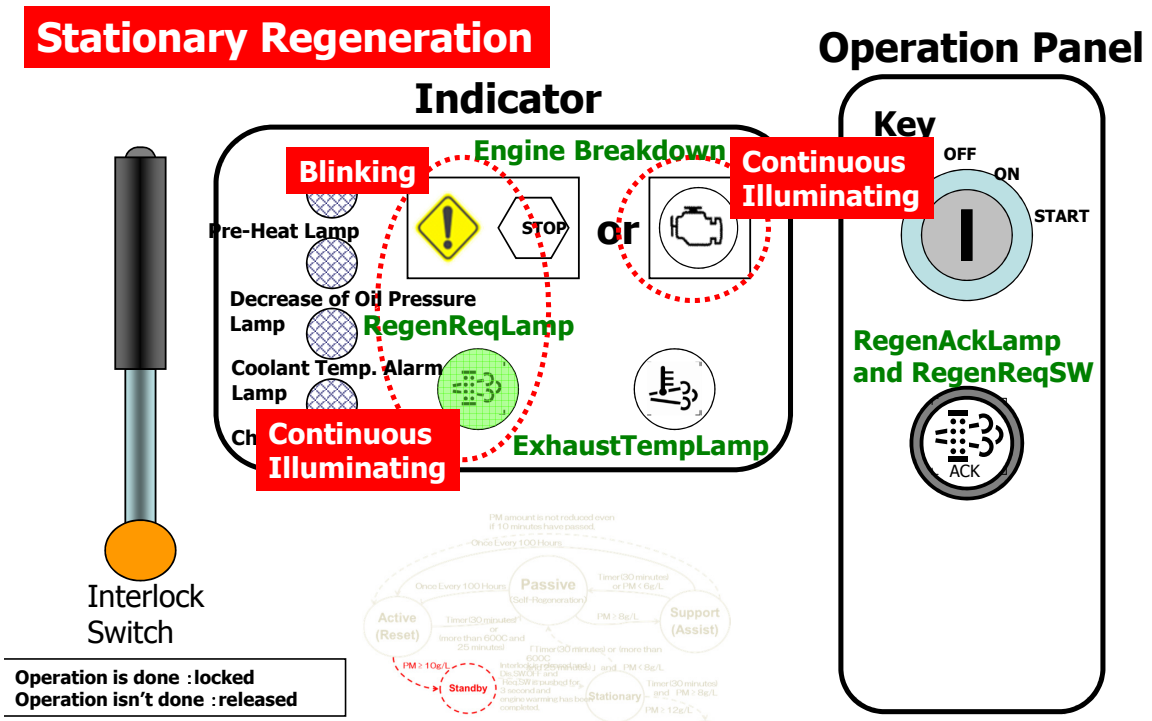
Interlock Switch



Operation is done :locked
Operation isn't done :released

DPF Regeneration

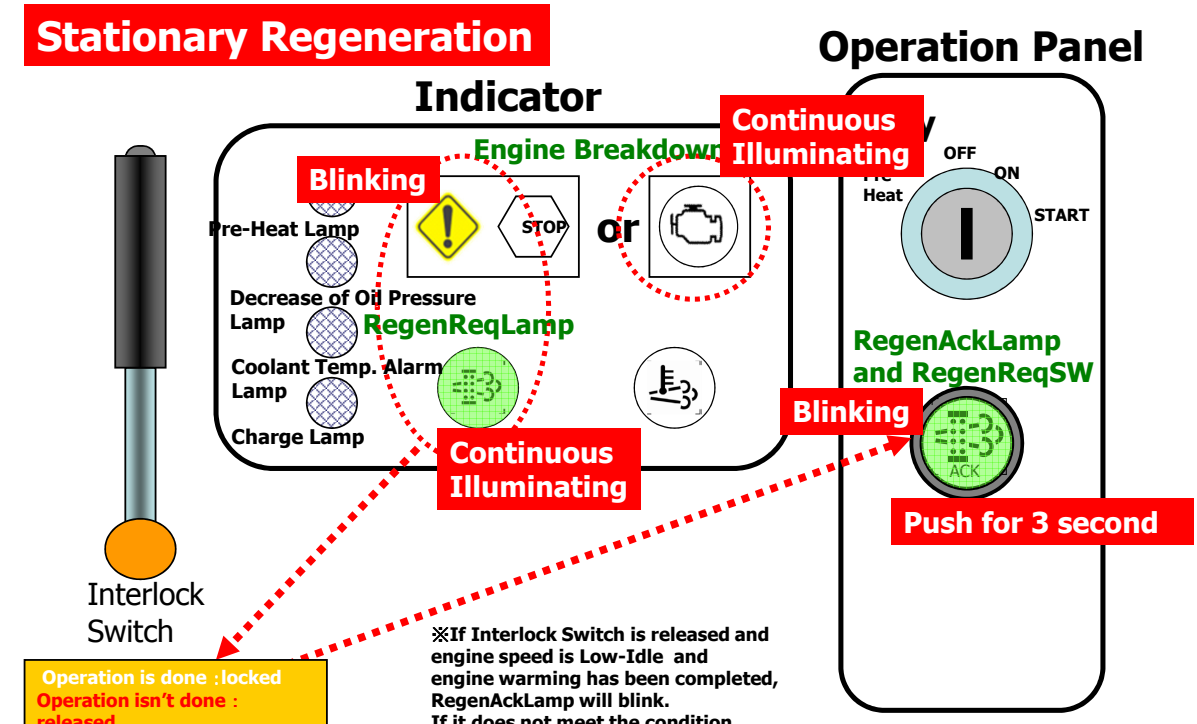
Stationary Regeneration



Operation is done :locked
Operation isn't done :released

DPF Regeneration

Stationary Regeneration

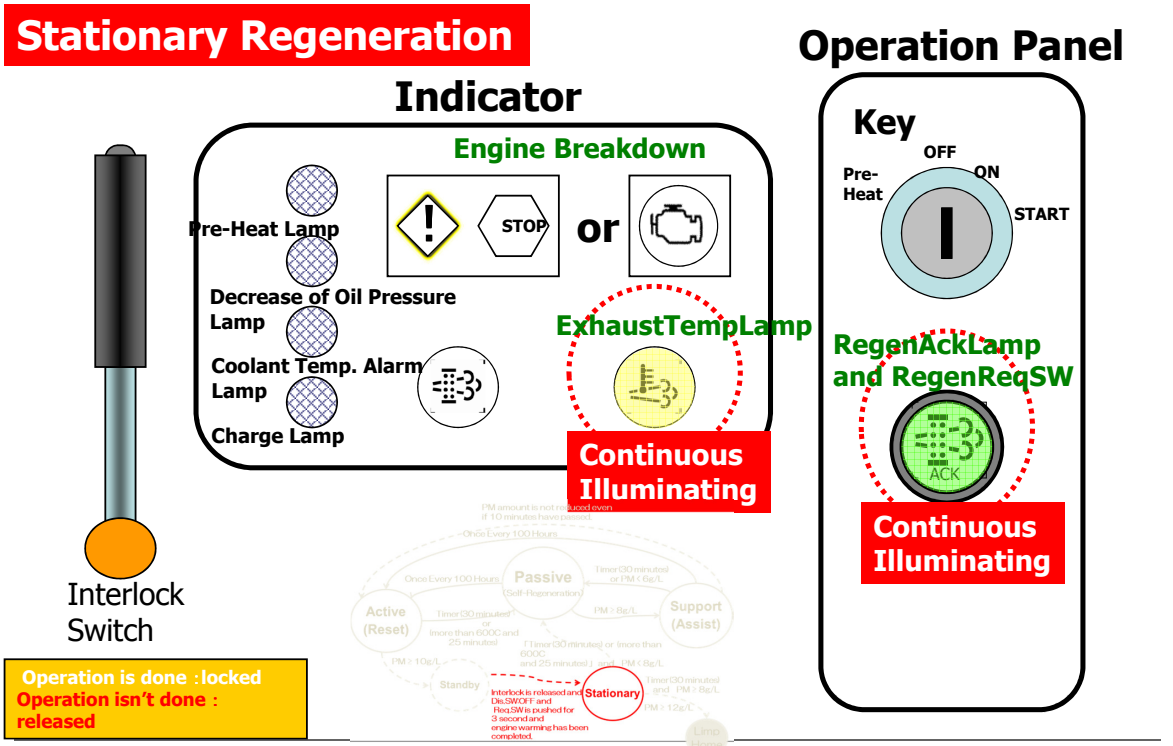


Operation is done :locked
Operation isn't done : released

※If Interlock Switch is released and engine speed is Low-Idle and engine warming has been completed, RegenAckLamp will blink.
If it does not meet the condition, RegenAckLamp will not blink.

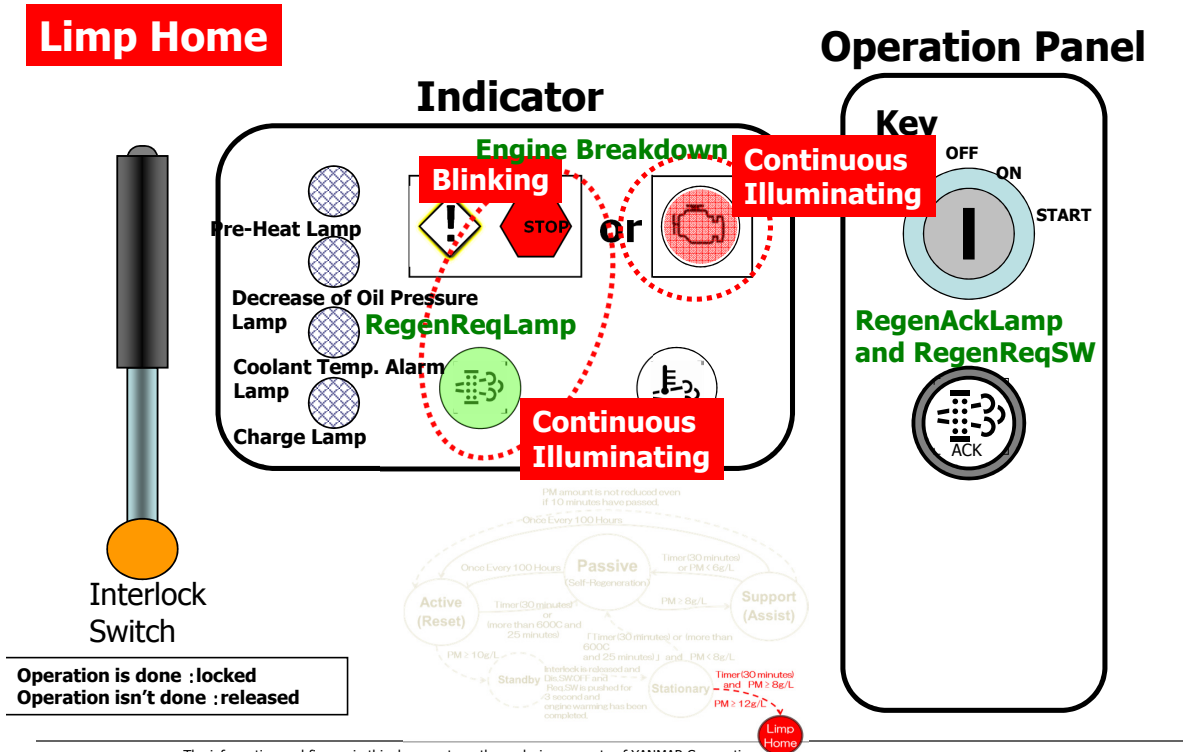
DPF Regeneration

Stationary Regeneration



DPF Regeneration

Limp Home



THANK YOU FOR YOUR ATTENTION.

YANMAR