

Tier 4 overview

Date 2 April 2013

Vico de Bres
Customer Service Department
Yanmar Europe B.V.

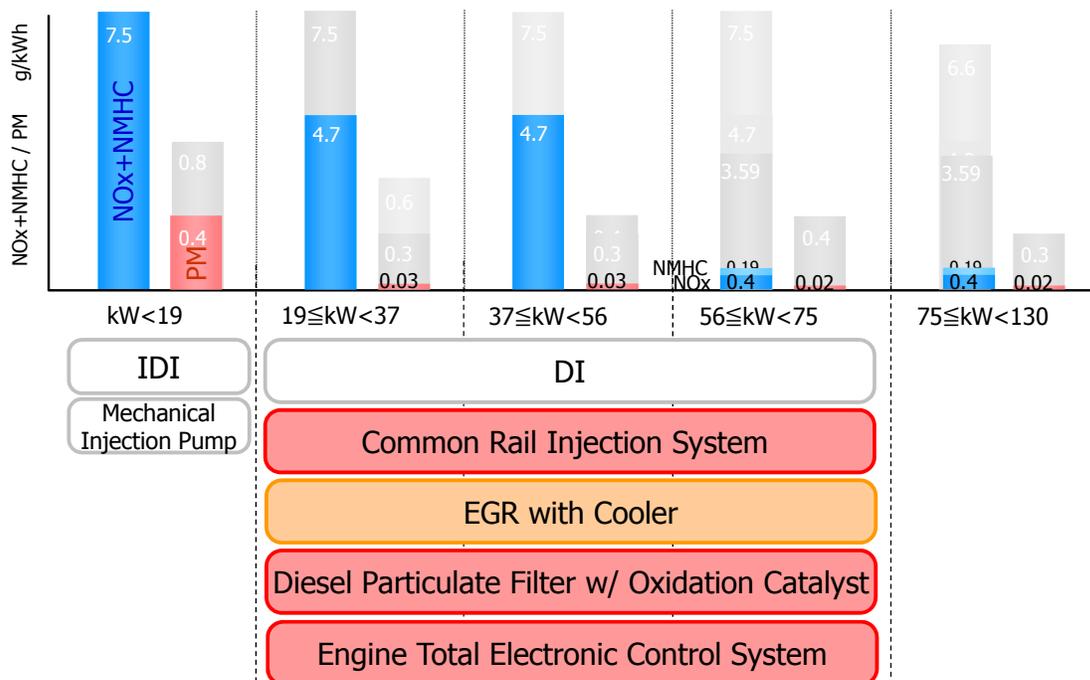
YANMAR

Content

1. Emission regulations
2. Product overview
3. Engine layout

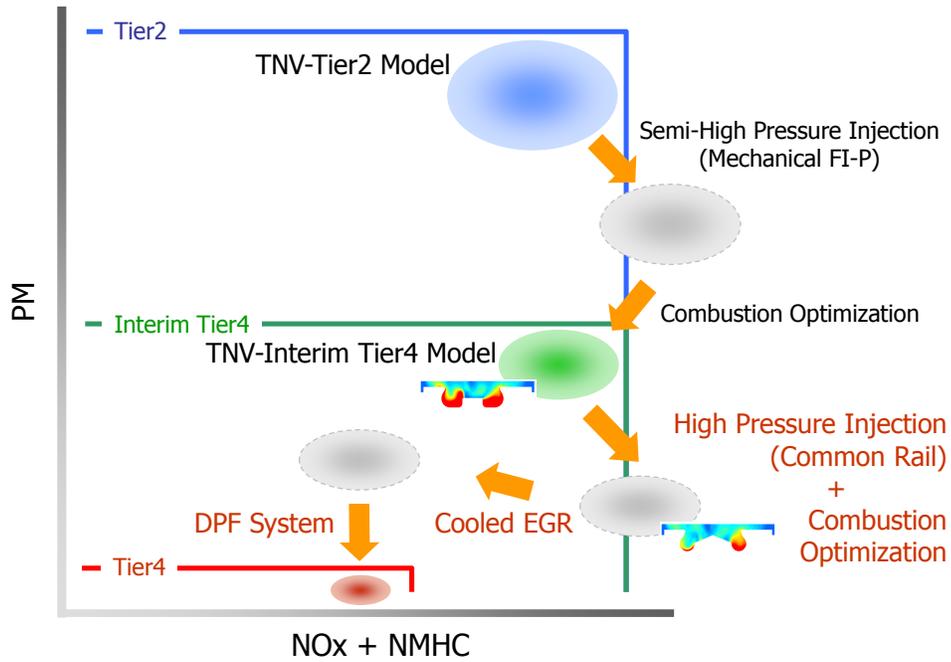
Emission regulations Tier 4

USA EPA-Tier 4 emission regulation

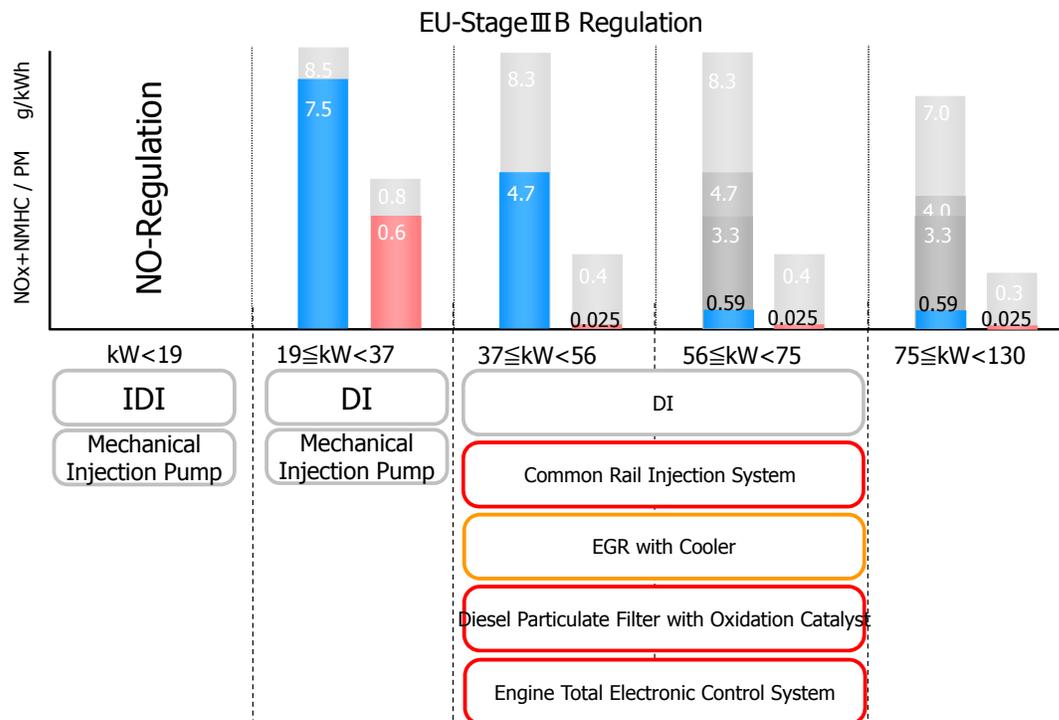


Detail technology

Emission Reduction Road Map



European Stage IIIB emission regulation



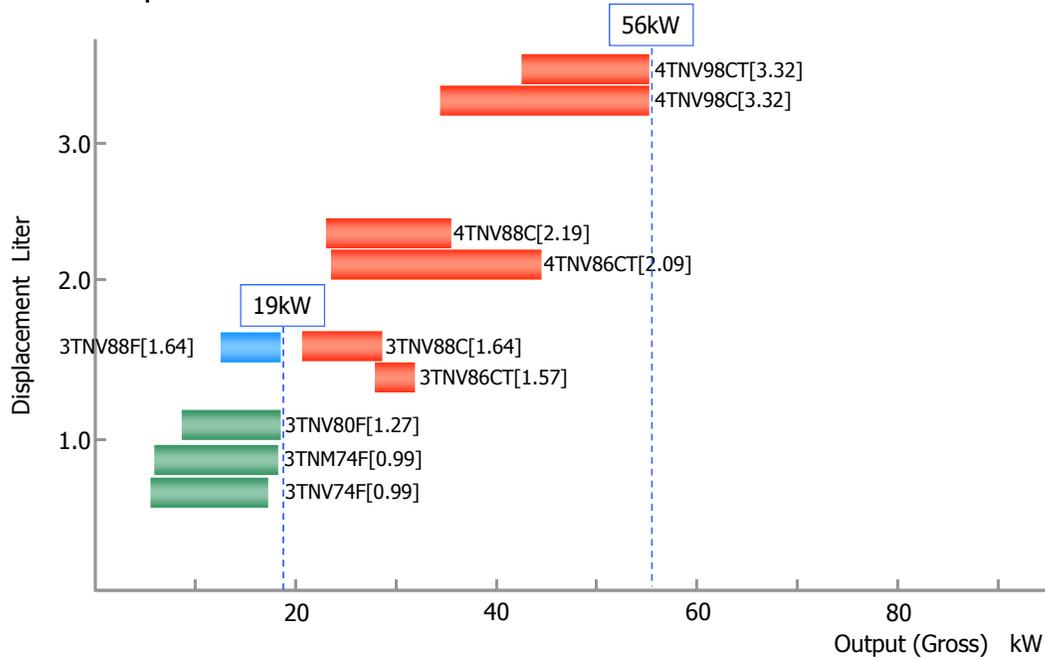
Product overview

Product overview Tier 4

	1.0L	1.5L	2.0L	3.0L	4.0L	
						
						
	<div style="background-color: #cccccc; padding: 5px; text-align: center;">NV1</div>		<div style="background-color: #cccccc; padding: 5px; text-align: center;">NV2</div>		<div style="background-color: #cccccc; padding: 5px; text-align: center;">NV3</div>	
	<div style="background-color: #cccccc; padding: 5px;">Use Mechanical Governor + altitude compensation device</div>		<div style="background-color: #cccccc; padding: 5px;">Common rail system Cooled EGR Electronic controlled</div>		<div style="background-color: #cccccc; padding: 5px;">Common rail system Cooled EGR Electronic controlled</div>	
			<div style="background-color: #cccccc; padding: 5px;">Not required for Stage IIIB !</div>			

Products line-up

Tier4 Compliance Models



Products line-up

Specification (over 19kW)

Engine Model		NV2-CR series			
		3TNV88-CR	3TNV86T-CR	4TNV88-CR	4TNV86T-CR
Type		Vertical, 4-cycle Water-Cooled Diesel			
Combustion System		Direct Injection (DI)			
Cylinder No. – Bore x Stroke	mm	3 – 88 x 90	3 – 86 x 90	4 – 88 x 90	4 – 86 x 90
Displacement	L	1.642	1.568	2.189	2.090
Output Range	kW	20.0-27.5	27.4-31.0	21.8-35.5	27.7-44.0
Fuel Injection System		Common Rail Injection System			
Aspiration		Natural Aspiration	Turbo Charged	Natural Aspiration	Turbo Charged
Engine Size (LxHxW)		Depend on DPF Layout			
Emission Compliance		US EPA Tier4 , EU NRMM Stage IIIB, JPN Off-Road Tier3			

Products line-up

Specification (over 19kW)

Engine Model		NV3-CR series	
		4TNV98C	4TNV98CT
Type		Vertical, 4-cycle Water-Cooled Diesel	
Combustion System		Direct Injection (DI)	
Cylinder No. – Bore x Stroke	mm	4 – 98 x 110	
Displacement	L	3.319	
Output Range	kW	41.5-51.7	51.0-53.7
Fuel Injection System		Common Rail Injection System	
Aspiration		Natural Aspiration	Turbo Charged
Engine Size (LxHxW)		Depend on DPF Layout	
Emission Compliance		US EPA Tier4 (≥56kW : Interim Tier4), EU NRMM Stage IIIB, JPN Off-Road Tier3	

Products line-up

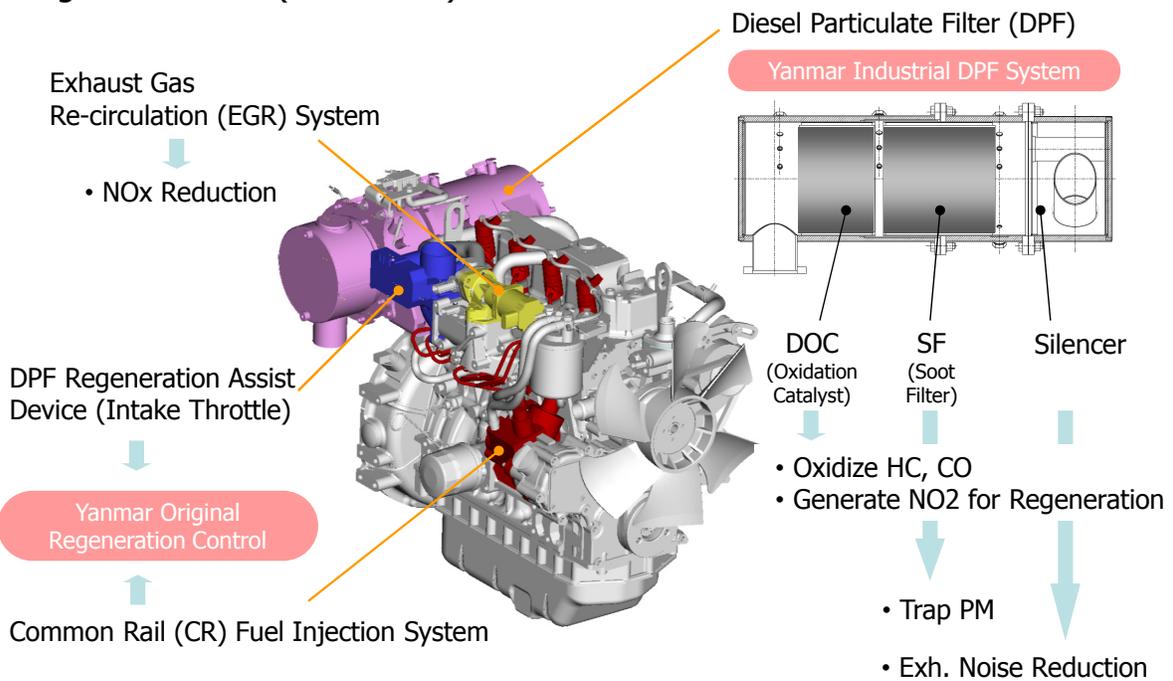
Rated Gross Power Line-Up

Model			GROSS Output (kW)																
			CL		VM										CH		VH		
Series	Name	Disp	1500	1800	2000	2100	2200	2300	2400	2500	2600	2700	2800	3000	3000	3600	3200	3400	3600
MINIMAX	3TNM74F	0.993	(7.4)	(8.8)											(15.2)	17.8	15.8	17.0	17.8
NV1	3TNV74F	0.993			(9.2)	(9.8)	(10.3)	(10.7)	11.2	(11.7)	(12.1)			(13.7)					
	3TNV80F	1.266	(9.2)	(11.1)	(12.1)		13.4	(14.0)	(14.6)	15.2	15.8		(17.0)	17.8					
NV2-MP	3TNV88F	1.642	13.7	15.5			18.2	18.2	18.2										
NV2-CR	3TNV88C	1.642							21.8	22.8	23.7		25.5	27.5					
	3TNV86CT	1.568								27.4	28.5		31.0	32.4					
	4TNV88C	2.189					26.7		29.1	30.5	31.7		34.3	35.5					
	4TNV86CT	2.091		27.7					35.5	36.6	37.9		41.1	44.0					
NV3-CR	4TNV98C	3.318		41.5	42.4	44.3	46.2	48.1	49.9	51.7									
	4TNV98CT	3.318		51.0	51.6	53.7	53.7		53.7	53.7									

Engine layout

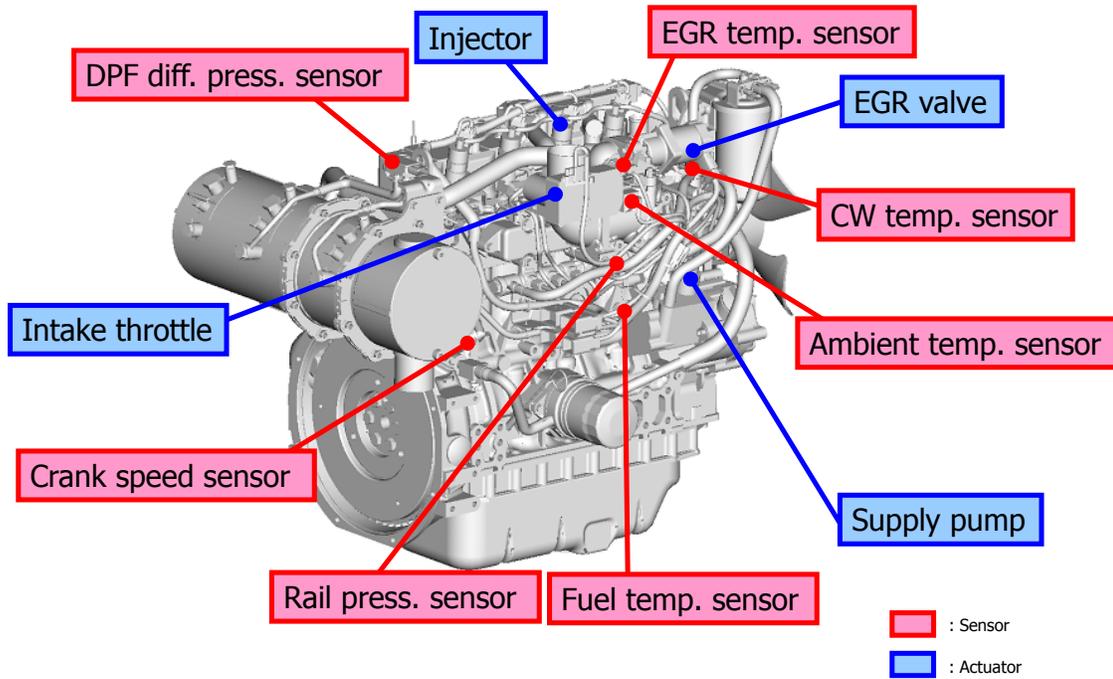
Engine layout

Engine Structure (over 19kW)



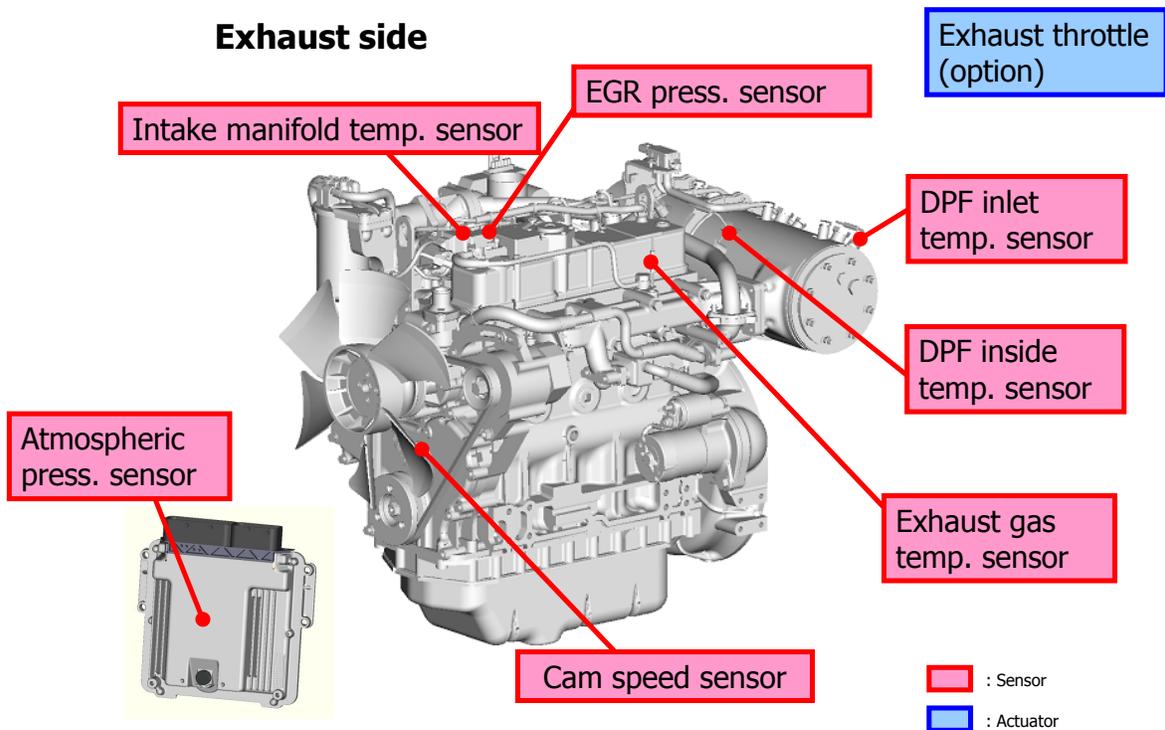
Engine layout

Intake side



Engine layout

Exhaust side



THANK YOU FOR YOUR ATTENTION.

YANMAR