



YANMAR

DIESEL ENGINE

TNV

Common Rail Series

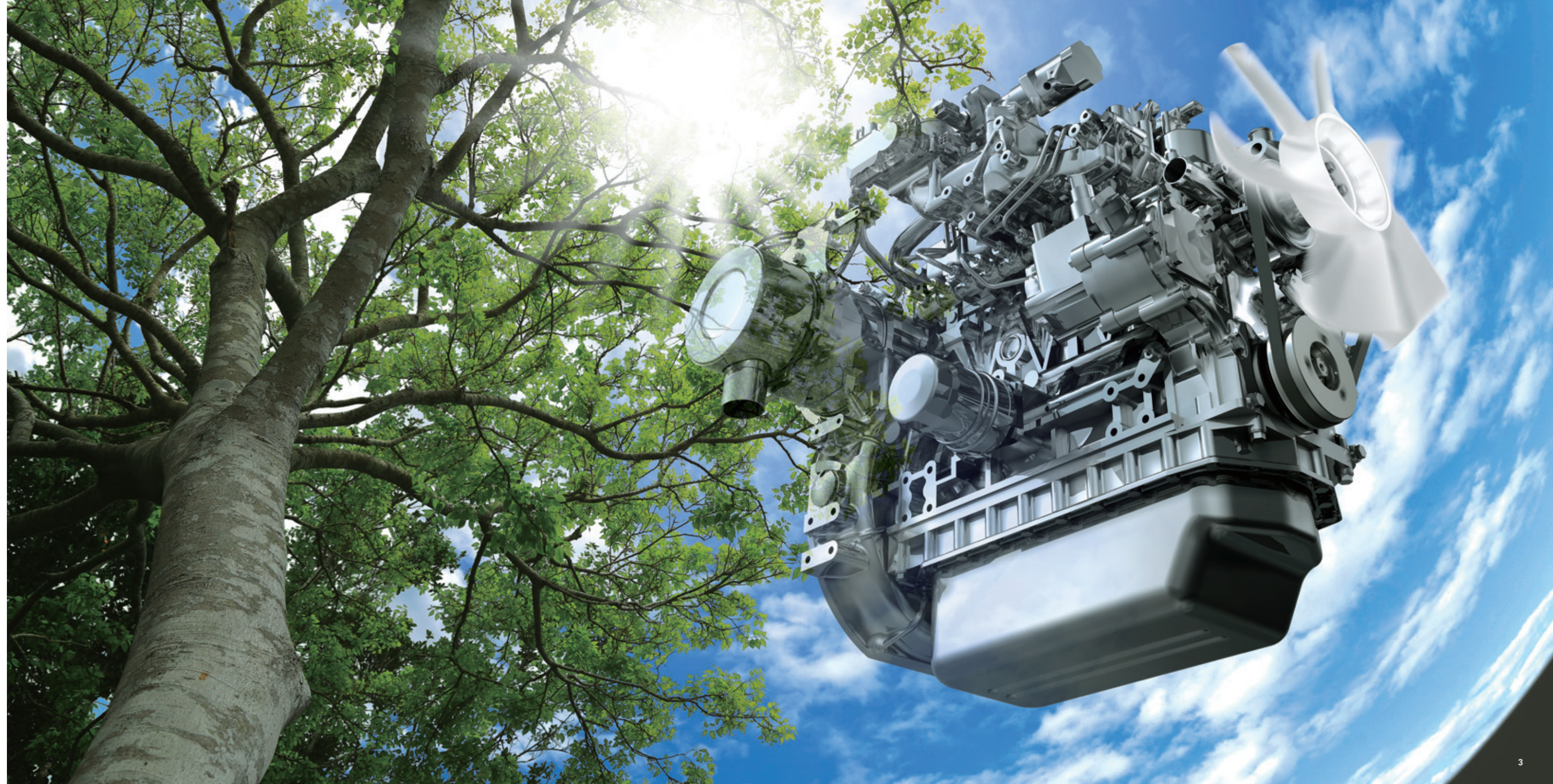
<div>EPA Tier 4 <small>(19-56kW)</small></div>	<div>EU Stage IIIB <small>(37-56kW)</small></div>	<div> Certified by FOEN <small>(18-56kW)</small></div>	<div>KOREA Tier 4 <small>(18-56kW)</small></div>	<div>JAPAN 2013 <small>(18-56kW)</small></div>
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A SUSTAINABLE FUTURE

YANMAR is engaged in the relentless pursuit of high efficiency,
low emission diesel engines.

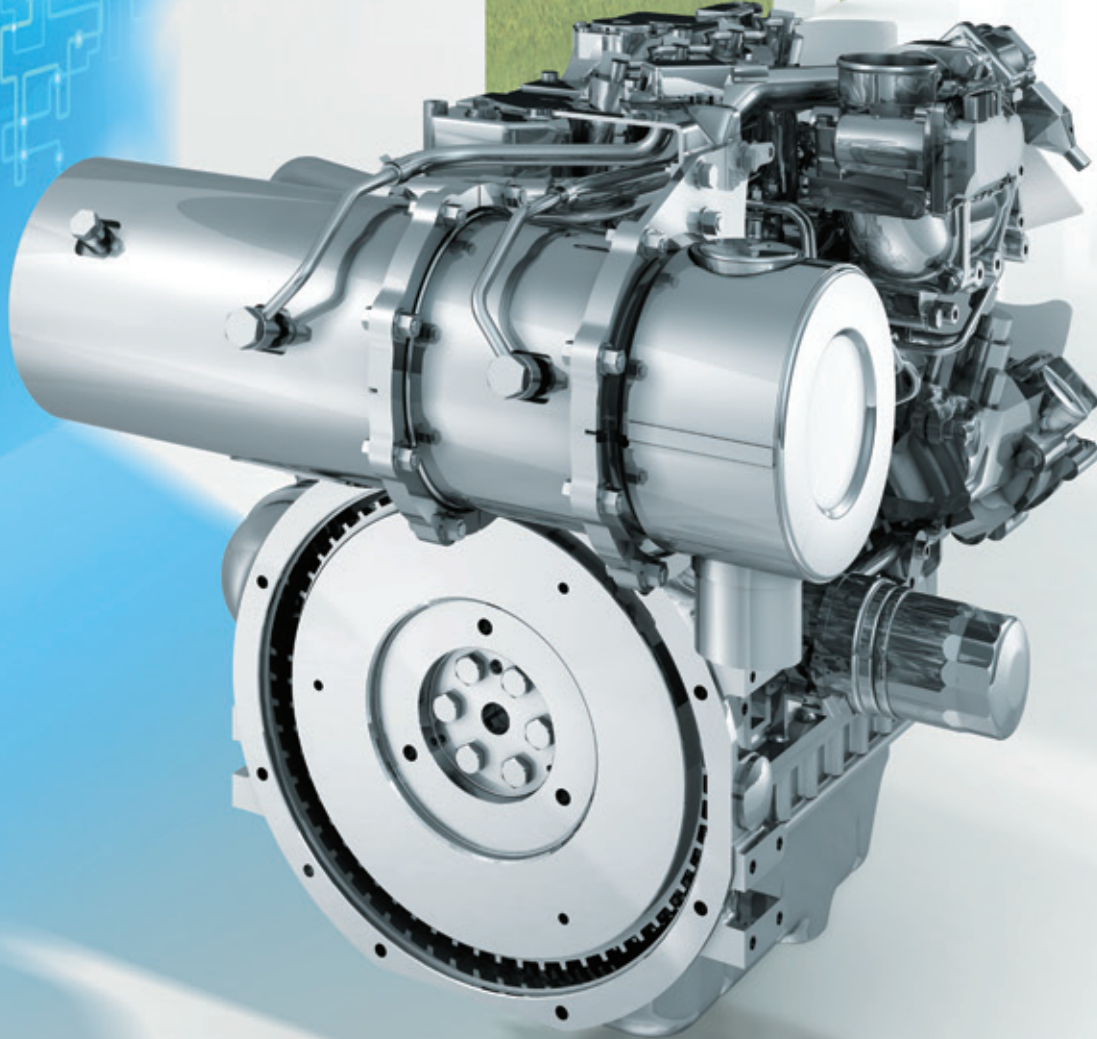
With technology that already meets the next generation
of environmental emissions standards,
YANMAR is providing sustainable solutions
towards a new era of prosperity.

DIESEL ENGINE
TNV
Common Rail Series

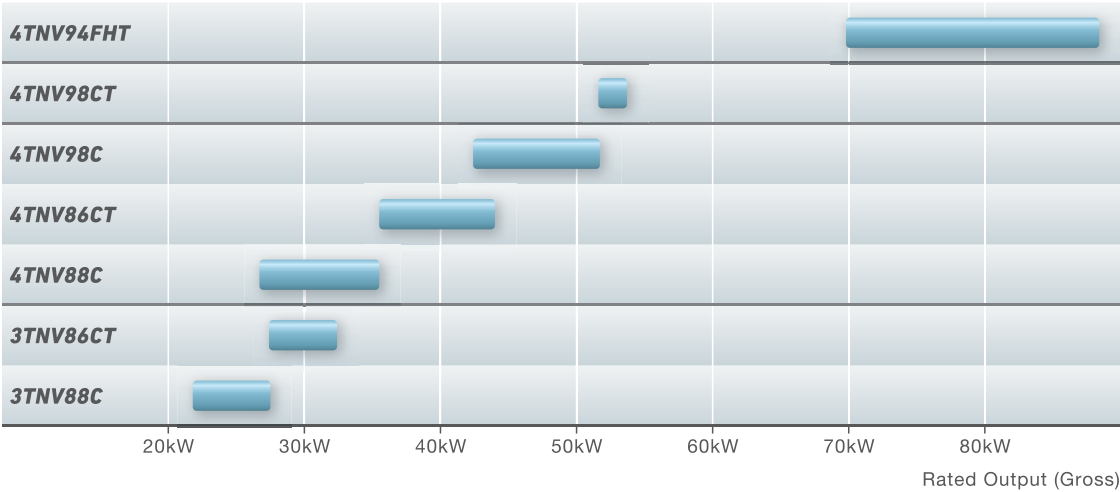


Perfect Technology for Clean Power

YANMAR smart diesel technology from a future where all devices operate under constant electronic control delivers unparalleled levels of efficient combustion. By monitoring a host of factors from the temperature and oxygen level of the surrounding air to the current engine loading, the engine itself can determine the optimum running conditions to deliver maximum combustion efficiency, in any environment. Through moment by moment feedback and control a powerful and cleanest engine in its category is born, the likes of which the world has never seen.



- **EU Stage5 Ready**
Cleanest engine in its category
- **No Scheduled Maintenance DPF* for 6,000 hours**
Seamless operation in the field
- **Tough and Reliable Power**
- **Best in Class Fuel Consumption**



* DPF is the filter device designed to remove particulate matter (PM) from exhaust gas.



■ COOLED EGR SYSTEM

The cooled Exhaust Gas Recirculation (EGR) system cools a portion of the emission gas, mixing it with intake air and circulating it in the cylinders, to lower the combustion temperature within the cylinders and reduce NOx. The EGR valve makes precise adjustments to the EGR circulation volume to match the air temperature and oxygen concentration depending on altitude of the intake air, enabling stable fuel combustion control in any operating conditions.



■ COMMON RAIL SYSTEM

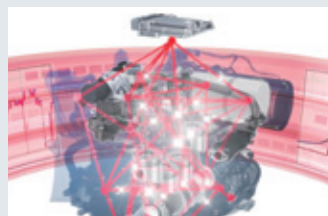
The Tier 4 engine uses a fully electronically controlled common rail and fuel injection system. At ignition, the system instantaneously collects and analyzes information such as the outside temperature and altitude (the air's oxygen concentration level), engine load conditions and DPF temperature for precise control of the fuel injection timing, fuel quantity and number of injection times for combustion control down to the millisecond that in turn reduces PM and NOx emissions.

YANMAR TNV CLEAN DIESEL TECHNOLOGIES



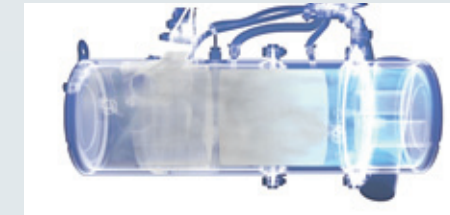
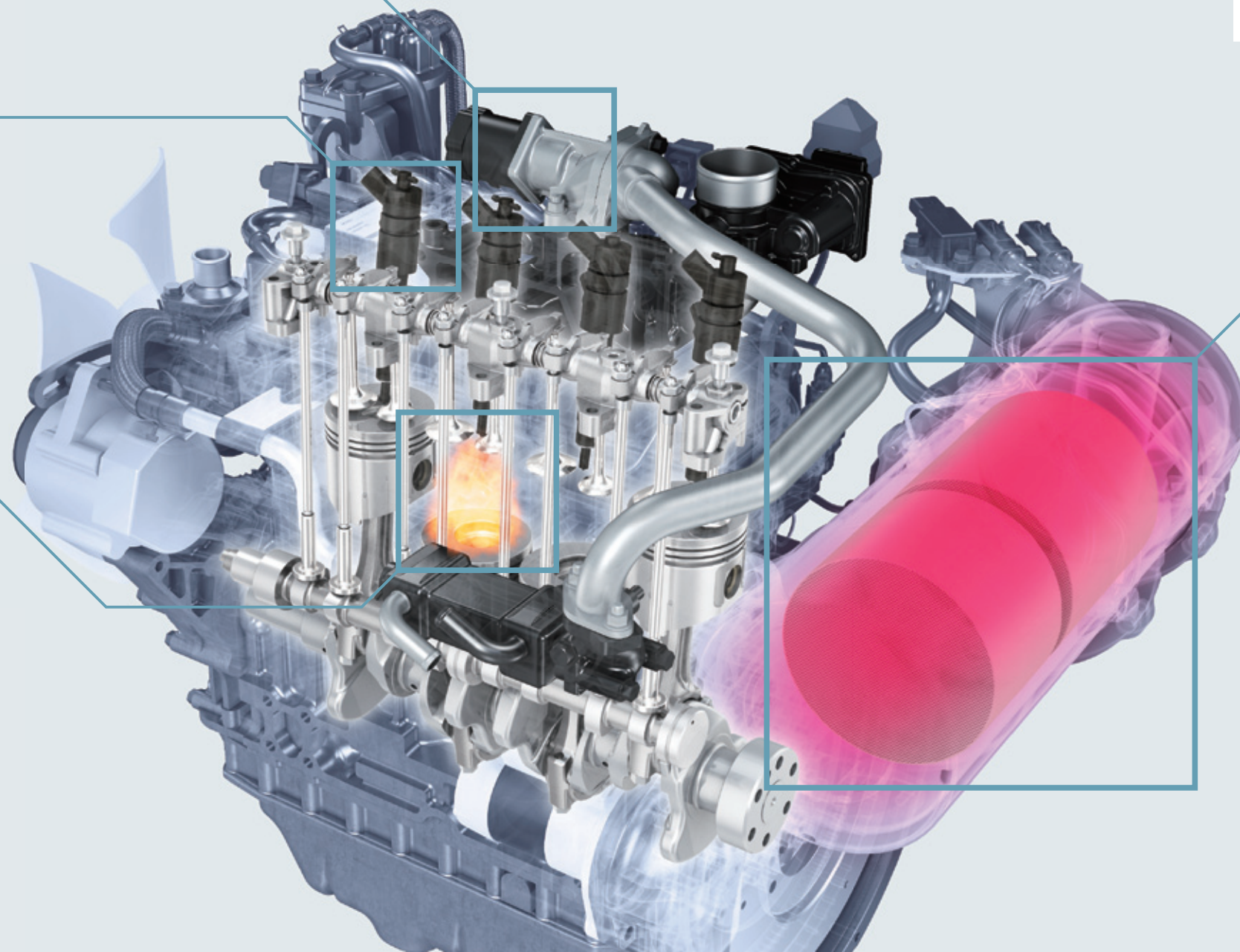
■ DIRECT INJECTION COMBUSTION

In 1980, YANMAR was one of the first companies to implement direct injection combustion into its small diesel engines. Since then, YANMAR has used its in-house FIE parts manufacturing process to further develop its unique direct injection combustion technology that boasts low emissions, increased fuel economy and high power output. Tier 4 takes this technology to its limit in pursuit of optimal fuel injection for minimal particulate matter (PM) in the exhaust gas.



■ ECU

The ECU, which provides integrated control of the engine, collects information about the work environment and load via engine sensors and electronic devices, and instantaneously feeds this information back for the reproduction of ideal operating conditions. Furthermore, using CAN communication, the machine also sends a wide variety of information to the ECU to achieve ideal control of the engine and entire machine. Should something happen unexpectedly, the ECU's service history can be extracted directly or via telecommunications using SMARTASSIST (YANMAR's diagnosis system) for faster servicing.



■ DIESEL PARTICULATE FILTER (DPF)

The minuscule amount of PM in the emissions gas, which has also been reduced to an absolute minimum, is finally captured by the Diesel Particulate Filter (DPF), preventing its escape into the atmosphere, resulting in unparalleled environmental performance. Moreover, the installation of the DPF allows for consistent power output and response even under rapidly changing loads and in low temperatures or high altitudes, factors which could inhibit good combustion, all without any added stress to the operator.

Automatic DPF regeneration operates without the operator ever noticing, so there is no need to stop operation. The DPF remains unclogged and no scheduled maintenance for 6,000 hours.

REGENERATION MODES



■ ASSIST REGENERATION

During low load and low temperature operation when it is difficult to obtain the temperature required for DPF regeneration, rather than using oxidation heat via the post fuel injection, YANMAR assist regeneration is able to elevate the DPF temperature via the intake throttle valve and combustion control. Therefore, DPF regeneration is possible without sacrificing high fuel economy.



■ RESET REGENERATION

The PM accumulated in the DPF is predicted and monitored based on the operating and working conditions of the engine. Assist regeneration is repeated until PM reaches a certain level, then it automatically switches to reset regeneration, completely regenerating and combusting the captured PM in the DPF without ceasing the engine's operation. Operating efficiency doesn't suffer as the operator continues working without ever noticing the reset regeneration process.

3TNV88C

Rated Output (Gross)

21.8-27.5kW

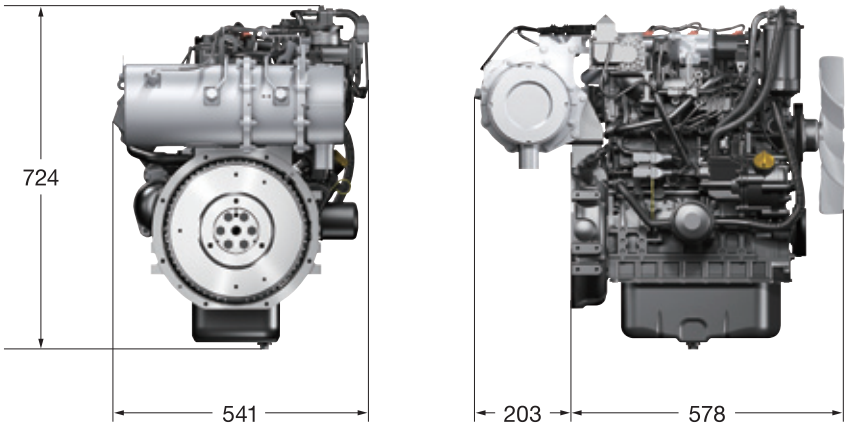


SPECIFICATION

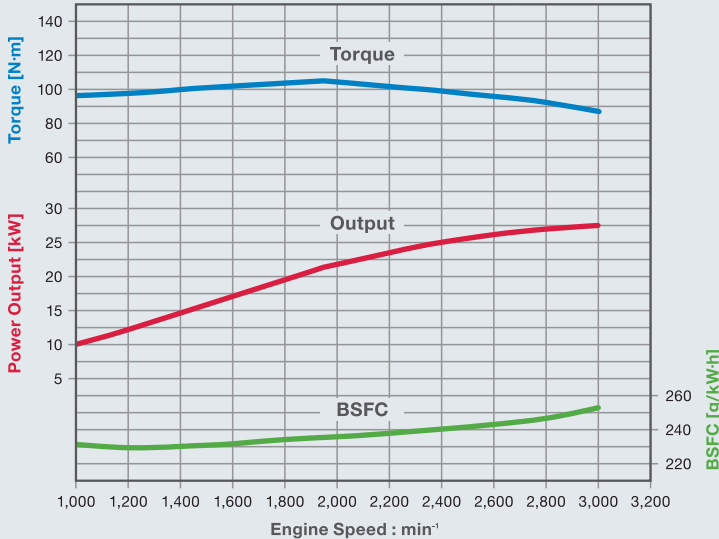
Engine Model		3TNV88C				
Emission Compliance		EPA Tier4 / EU StagellIA / Switzerland FOEN / Korea Tier4 / Japan 2013				
Fuel Injection		Direct Injection (DI)				
Aspiration		NA				
Fuel Injection System		Common Rail				
Intake Throttle Valve		Standard				
Cooled EGR		Standard				
Aftertreatment		DPF				
No. of Cylinders		3				
Bore × Stroke	mm	88 × 90				
Displacement	L	1,642				
Rated Output (Gross)	kW/min ⁻¹	21.8/2,400	22.8/2,500	23.7/2,600	25.5/2,800	27.5/3,000
	PS/min ⁻¹	29.6/2,400	31.0/2,500	32.2/2,600	34.7/2,800	37.4/3,000
Max.Torque (Gross)	N·m/min ⁻¹	105/1,560	105/1,625	105/1,690	105/1,820	105/1,950
Overall Length × Width × Height *	mm	781 × 541 × 724				
Weight (Dry) *	kg	170				

* : DPF Layout is on Flywheel Housing

DIMENSIONS (mm)



PERFORMANCE CURVES 3TNV88C 27.5kW at 3,000min⁻¹



3TNV86CT

Rated Output (Gross)

27.4-32.4kW

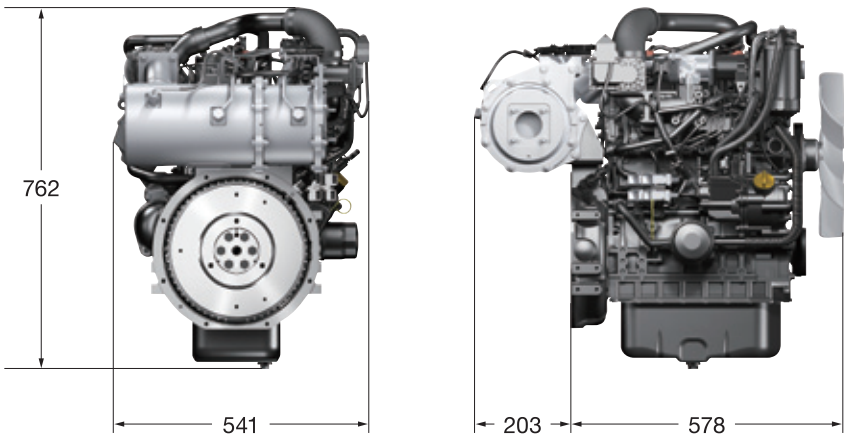


SPECIFICATION

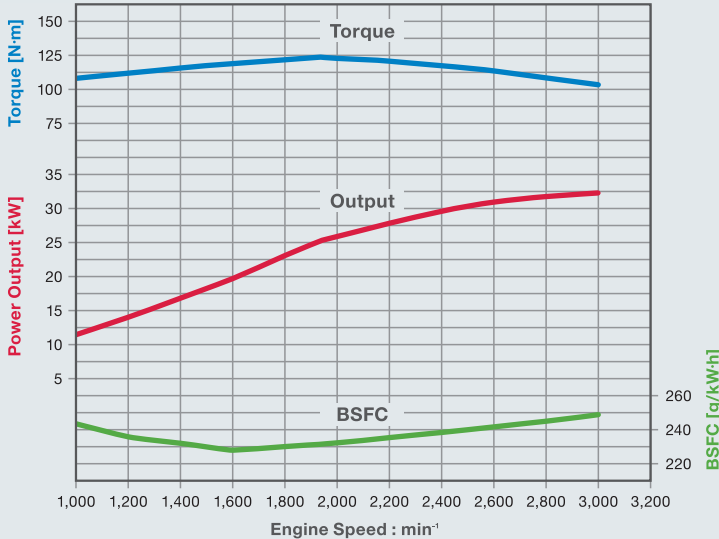
Engine Model		3TNV86CT			
Emission Compliance		EPA Tier4 / EU StagellIA / Switzerland FOEN / Korea Tier4 / Japan 2013			
Fuel Injection		Direct Injection (DI)			
Aspiration		T/C			
Fuel Injection System		Common Rail			
Intake Throttle Valve		Standard			
Cooled EGR		Standard			
Aftertreatment		DPF			
No. of Cylinders		3			
Bore × Stroke	mm	86 × 90			
Displacement	L	1,568			
Rated Output (Gross)	kW/min ⁻¹	27.4/2,500	28.5/2,600	31.0/2,800	32.4/3,000
	PS/min ⁻¹	37.3/2,500	38.7/2,600	42.1/2,800	44.1/3,000
Max.Torque (Gross)	N·m/min ⁻¹	127/1,625	127/1,690	127/1,820	124/1,950
Overall Length × Width × Height *	mm	781 × 541 × 762			
Weight (Dry) *	kg	175			

* : DPF Layout is on Flywheel Housing

DIMENSIONS (mm)



PERFORMANCE CURVES 3TNV86CT 32.4kW at 3,000min⁻¹



4TNV88C

Rated Output (Gross)

26.7-35.5kW

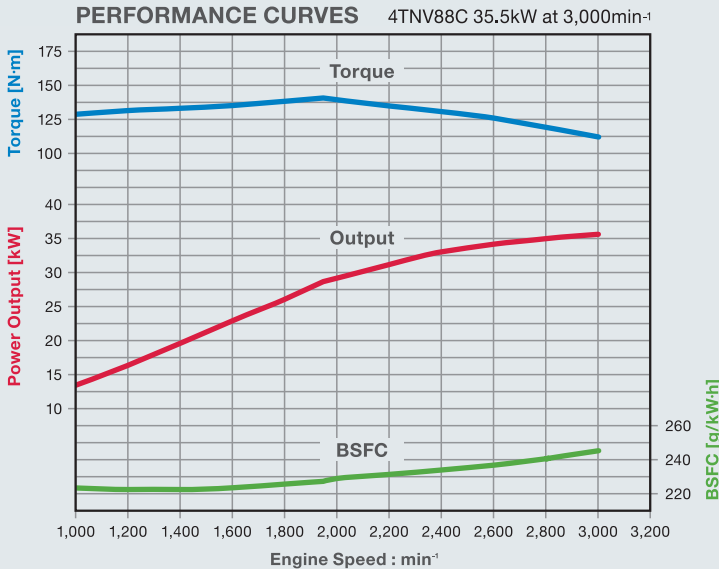
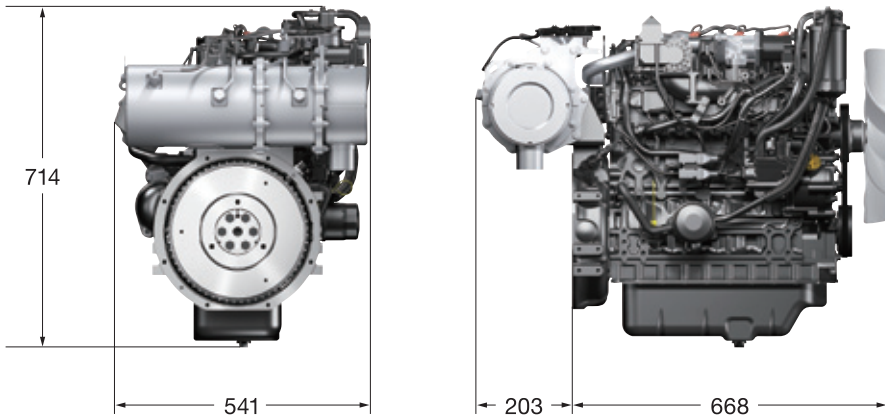


SPECIFICATION

Engine Model	4TNV88C						
Emission Compliance	EPA Tier4 / EU StagellIA / Switzerland FOEN / Korea Tier4 / Japan 2013						
Fuel Injection	Direct Injection (DI)						
Aspiration	NA						
Fuel Injection System	Common Rail						
Intake Throttle Valve	Standard						
Cooled EGR	Standard						
Aftertreatment	DPF						
No. of Cylinders	4						
Bore × Stroke	mm	88 × 90					
Displacement	L	2,190					
Rated Output (Gross)	kW/min ⁻¹	26.7/2,200	29.1/2,400	30.5/2,500	31.7/2,600	34.3/2,800	35.5/3,000
	PS/min ⁻¹	36.3/2,200	39.6/2,400	41.5/2,500	43.1/2,600	46.6/2,800	48.3/3,000
Max.Torque (Gross)	N·m/min ⁻¹	139/1,430	139/1,560	140/1,625	140/1,690	140/1,820	140/1,950
Overall Length × Width × Height *	mm	871 × 541 × 714					
Weight (Dry) *	kg	200		205			

* : DPF Layout is on Flywheel Housing

DIMENSIONS (mm)



4TNV86CT

Rated Output (Gross)

35.5-44.0kW

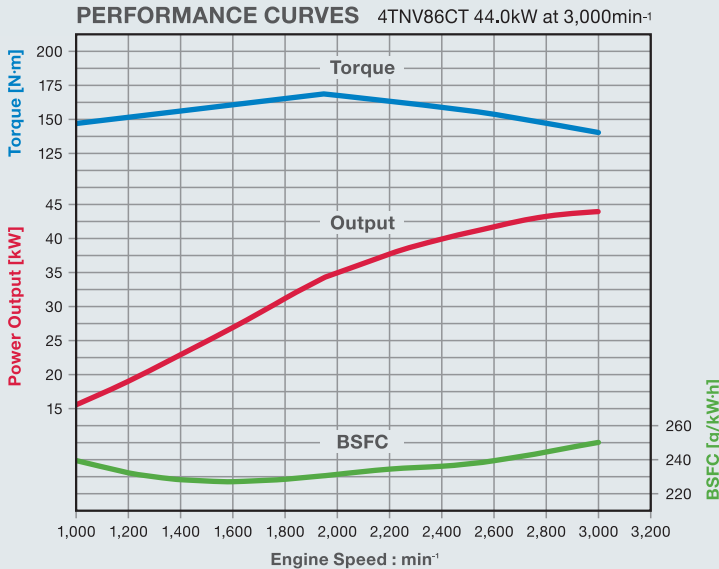
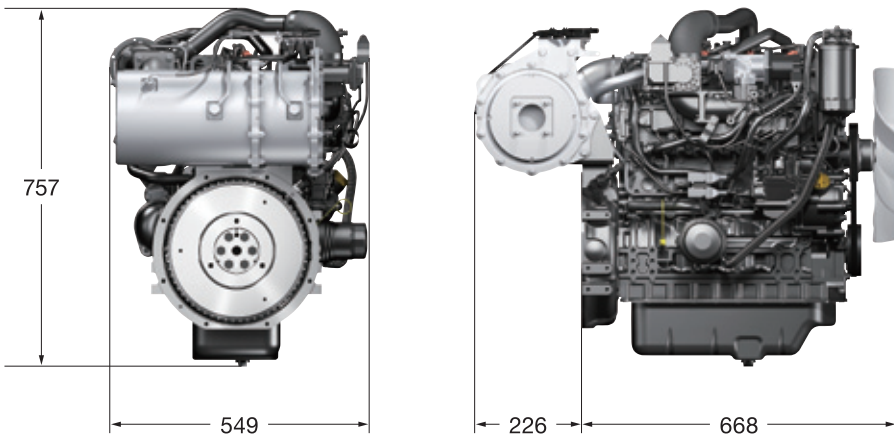


SPECIFICATION

Engine Model	4TNV86CT				
Emission Compliance	EPA Tier4 / EU StagellIB / Switzerland FOEN / Korea Tier4 / Japan 2013				
Fuel Injection	Direct Injection (DI)				
Aspiration	T/C				
Fuel Injection System	Common Rail				
Intake Throttle Valve	Standard				
Cooled EGR	Standard				
Aftertreatment	DPF				
No. of Cylinders	4				
Bore × Stroke	mm	86 × 90			
Displacement	L	2,091			
Rated Output (Gross)	kW/min ⁻¹	35.5/2,400	37.9/2,600	41.1/2,800	44.0/3,000
	PS/min ⁻¹	48.3/2,400	51.5/2,600	55.9/2,800	59.8/3,000
Max.Torque (Gross)	N·m/min ⁻¹	170/1,560	168/1,690	168/1,820	168/1,950
Overall Length × Width × Height *	mm	894 × 549 × 757			
Weight (Dry) *	kg	210			

* : DPF Layout is on Flywheel Housing

DIMENSIONS (mm)



4TNV98C

Rated Output (Gross)

42.4-51.7kW

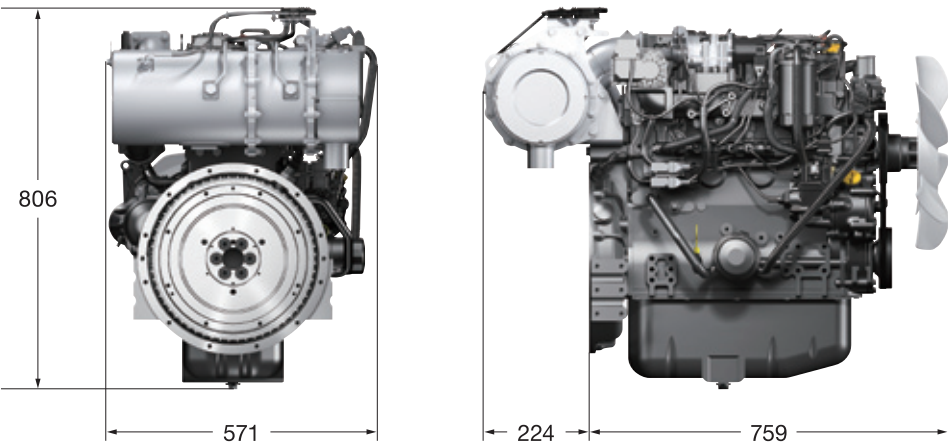


SPECIFICATION

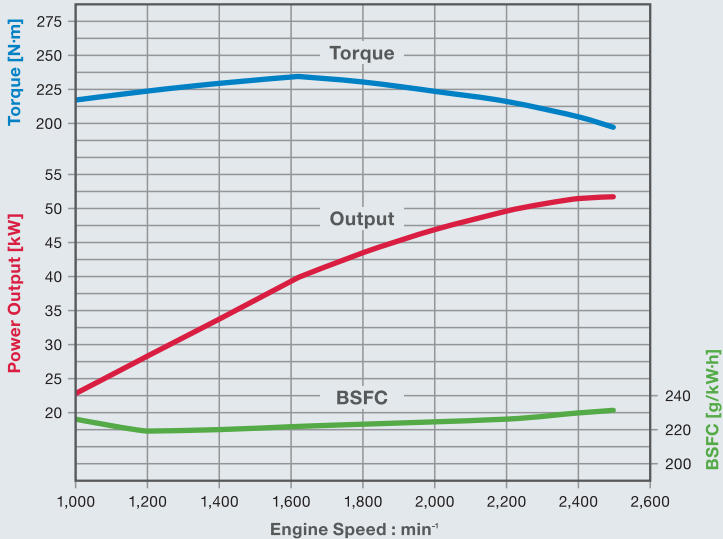
Engine Model	4TNV98C						
Emission Compliance	EPA Tier4 / EU StagellIB / Switzerland FOEN / Korea Tier4 / Japan 2013						
Fuel Injection	Direct Injection (DI)						
Aspiration	NA						
Fuel Injection System	Common Rail						
Intake Throttle Valve	Standard						
Cooled EGR	Standard						
Aftertreatment	DPF						
No. of Cylinders	4						
Bore × Stroke	mm	98 × 110					
Displacement	L	3,319					
Rated Output (Gross)	kW/min ⁻¹	42.4/2,000	44.3/2,100	46.2/2,200	48.1/2,300	49.9/2,400	51.7/2,500
	PS/min ⁻¹	57.6/2,000	60.2/2,100	62.8/2,200	65.4/2,300	67.8/2,400	70.3/2,500
Max.Torque (Gross)	N·m/min ⁻¹	235/1,300	235/1,365	235/1,430	235/1,495	235/1,560	235/1,625
Overall Length × Width × Height *	mm	983 × 571 × 806					
Weight (Dry) *	kg	270					

* : DPF Layout is on Flywheel Housing

DIMENSIONS (mm)



PERFORMANCE CURVES 4TNV98C 51.7kW at 2,500min⁻¹



4TNV98CT

Rated Output (Gross)

51.6-53.7kW

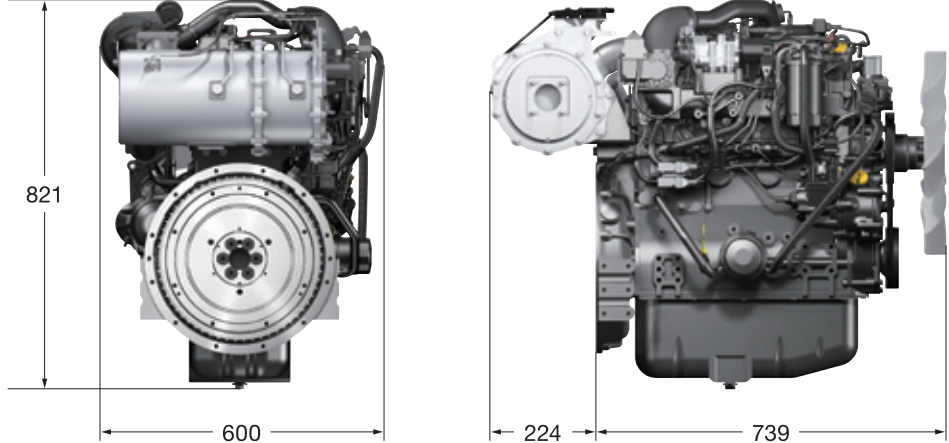


SPECIFICATION

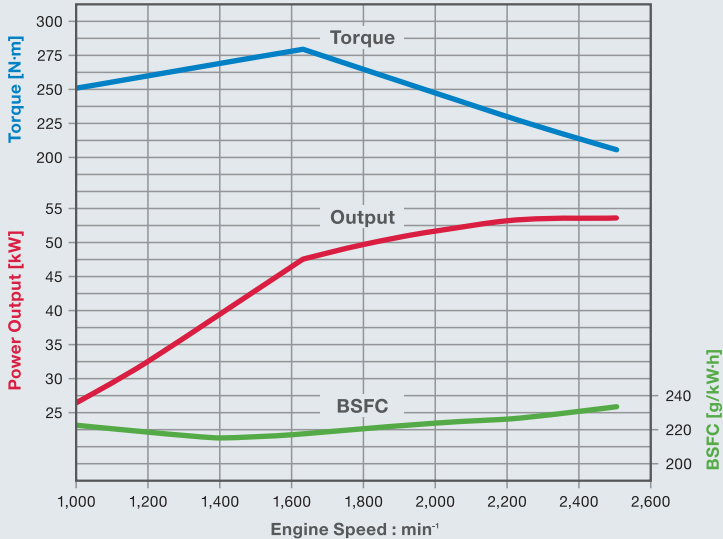
Engine Model	4TNV98CT			
Emission Compliance	EPA Tier4 / EU StagellIB / Switzerland FOEN / Korea Tier4 / Japan 2013			
Fuel Injection	Direct Injection (DI)			
Aspiration	T/C			
Fuel Injection System	Common Rail			
Intake Throttle Valve	Standard			
Cooled EGR	Standard			
Aftertreatment	DPF			
No. of Cylinders	4			
Bore × Stroke	mm	98 × 110		
Displacement	L	3,319		
Rated Output (Gross)	kW/min ⁻¹	51.6/2,000	53.7/2,100	53.7/2,400
	PS/min ⁻¹	70.2/2,000	73.0/2,100	73.0/2,400
Max.Torque (Gross)	N·m/min ⁻¹	296/1,300	296/1,365	280/1,560
Overall Length × Width × Height *	mm	963 × 600 × 821		
Weight (Dry) *	kg	275		

* : DPF Layout is on Flywheel Housing

DIMENSIONS (mm)



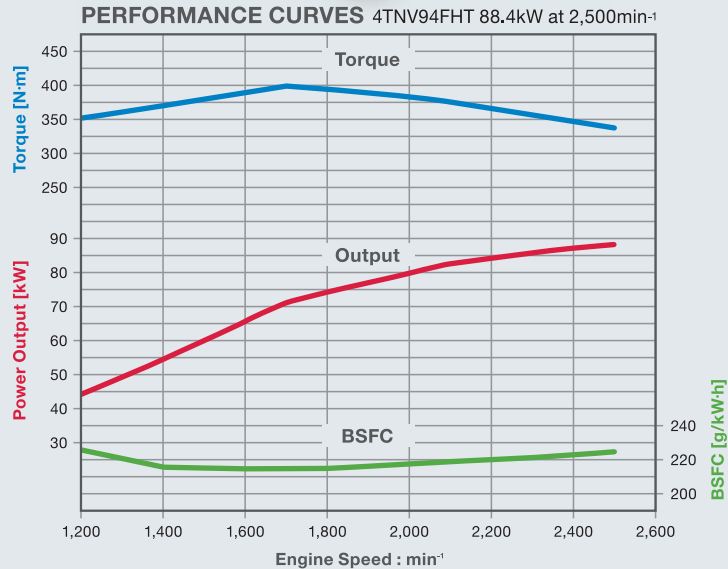
PERFORMANCE CURVES 4TNV98CT 53.7kW at 2,500min⁻¹



4TNV94FHT

Rated Output (Gross)

69.8-88.4kW

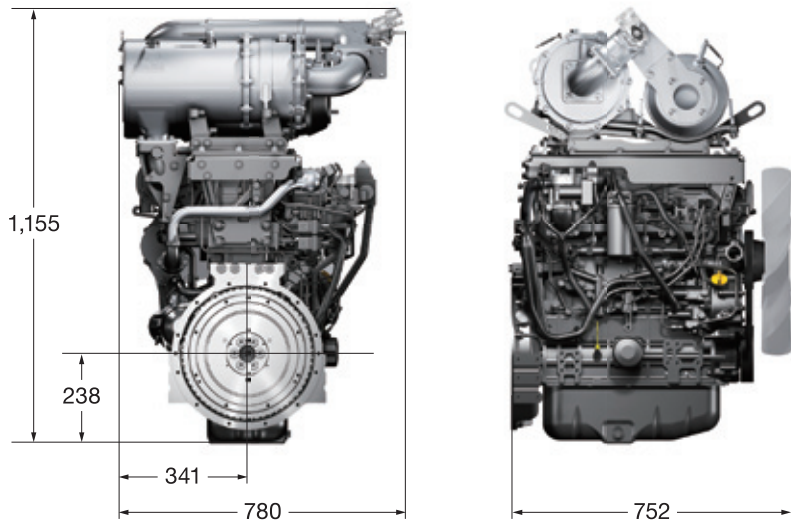


SPECIFICATION

Engine Model		4TNV94FHT		
Emission Compliance		EPA Final Tier4 / EU StageIV / Switzerland FOEN		
Fuel Injection		Direct Injection (DI)		
Aspiration		T/C with Intercooler		
Fuel Injection System		Common Rail		
Intake Throttle Valve		Standard		
Cooled EGR		Standard		
Aftertreatment		DPF+SCR		
No. of Cylinders		4		
Bore × Stroke	mm	94 × 110		
Displacement	L	3,054		
Rated Output (Gross)	kW/min ⁻¹	69.8/2,000	77.2/2,200	88.4/2,500
	PS/min ⁻¹	93.6/2,000	103.5/2,200	118.5/2,500
Max.Torque (Gross)	N·m/min ⁻¹	378~410/1,450	378~410/1,450	378~410/1,700
Voltage	V	12(24 Option)		
DPF / SCR Layout		Top of the engine		
Overall Length × Width × Height *	mm	752 × 780 × 1,155		
Weight (Dry) *	kg	370		

* : DPF&SCR Layout is on top of the engine

DIMENSIONS (mm)



Wide Range Application



Construction



Agriculture



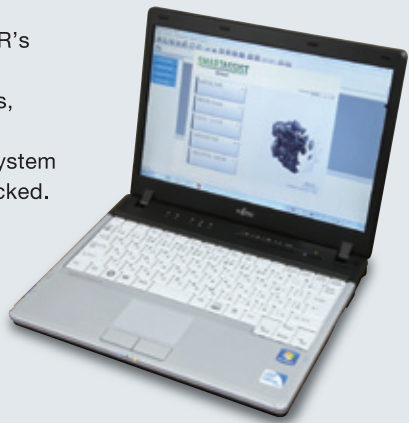
Material Handling



BIWA Plant

SMARTASSIST-Direct

SMARTASSIST-Direct is YANMAR's standard service tool for electronically-controlled products, and allows the engine operation history information and control system operation status to be easily checked.



Research & Development

YANMAR operates a diverse R&D program as we seek to create ever-more efficient and ever-more clean-burning diesel engines. Using our own unique technology as a starting-point, we add in the latest in advanced technology to comply with EPA Tier4 / EU Stage IIIB nonroad diesel engine emissions regulations.



Simulation Analysis

YANMAR - To conserve fuel is to serve mankind