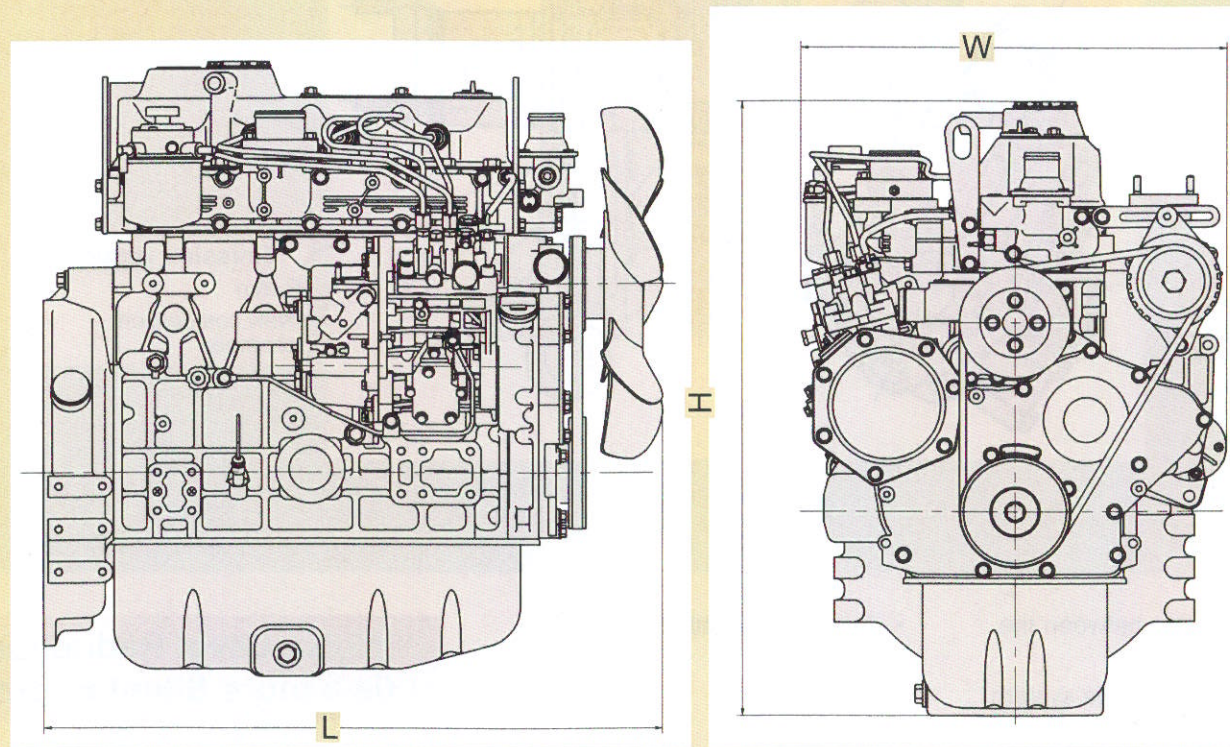


SPECIFICATIONS

Model	4TNV98		4TNV98T	
	-NSA	-GGE	-NSA	-GGE
Specification				
Type	Vertical Cylinder, Inline, 4-cycle, Water-Cooled Diesel Engine			
Combustion	DI		DI	
Aspiration	NA		Turbo	
No. of cylinders	4		4	
Cyl. bore x stroke	mm 98 x 110		98 x 110	
Displacement	L 3.318		3.318	
Rated output	hp/rpm 67.7/2500	54.7/1800	83.5/2500	67.2/1800
Cooling system	Radiator		Radiator	
Starting system	Electric		Electric	

DIMENSIONS



Model	4TNV98			4TNV98T		
	SA	SA2	GGE	SA	SA2	GGE
L (in.)	31.14"	28.15"	30.3"	31.14"	29.44"	30.4"
W (in.)	20.31"	20.31"	20.94"	21.26"	21.26"	21.26"
H (in.)	29.76"	29.76"	29.13"	33.62"	33.62"	32.99"
Dry wt. (lbs)	581	535	584	603	557	606

Note: All data subject to alteration without notice.

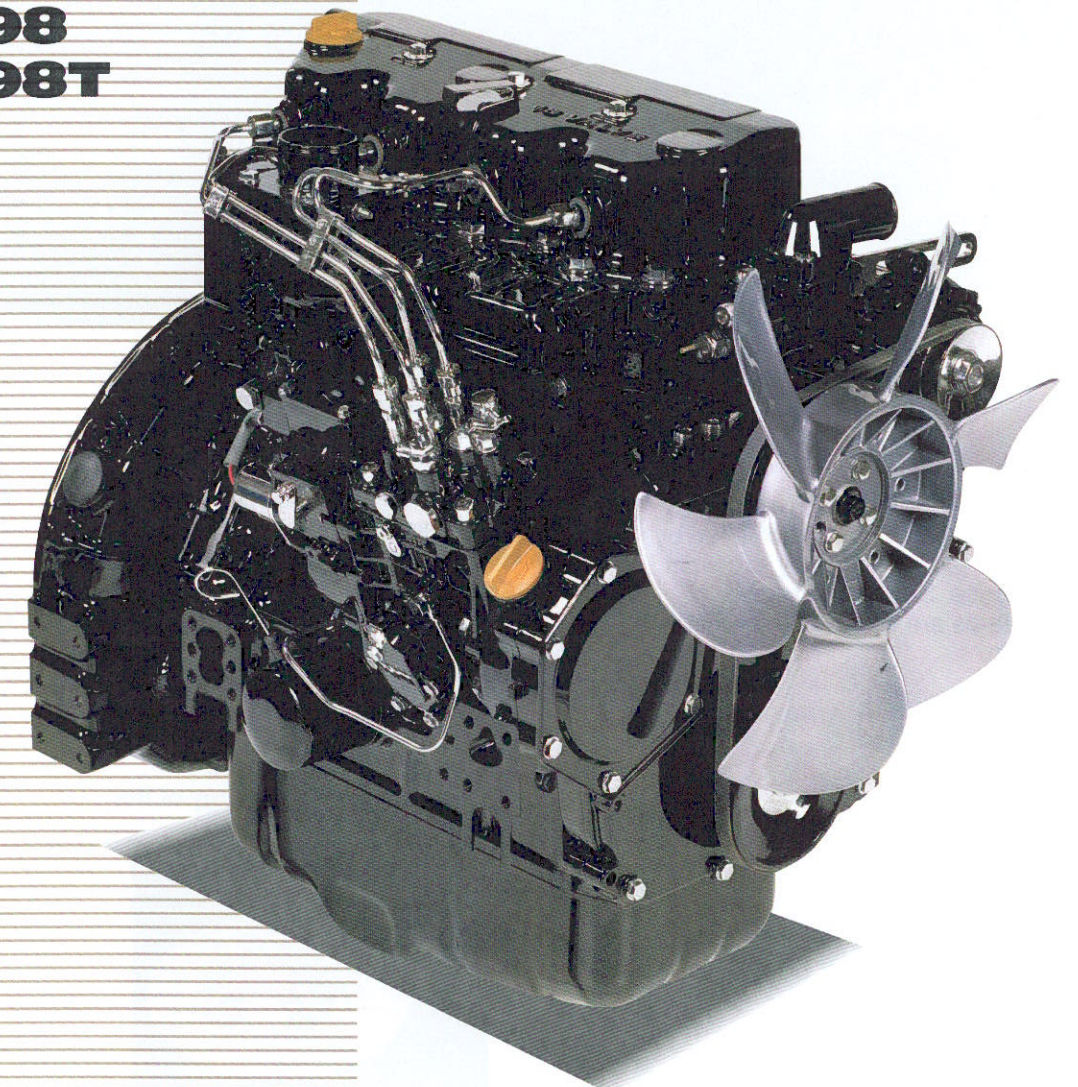
YANMAR®

DIESEL ENGINES

TNV series -3

54.7~83.5 hp

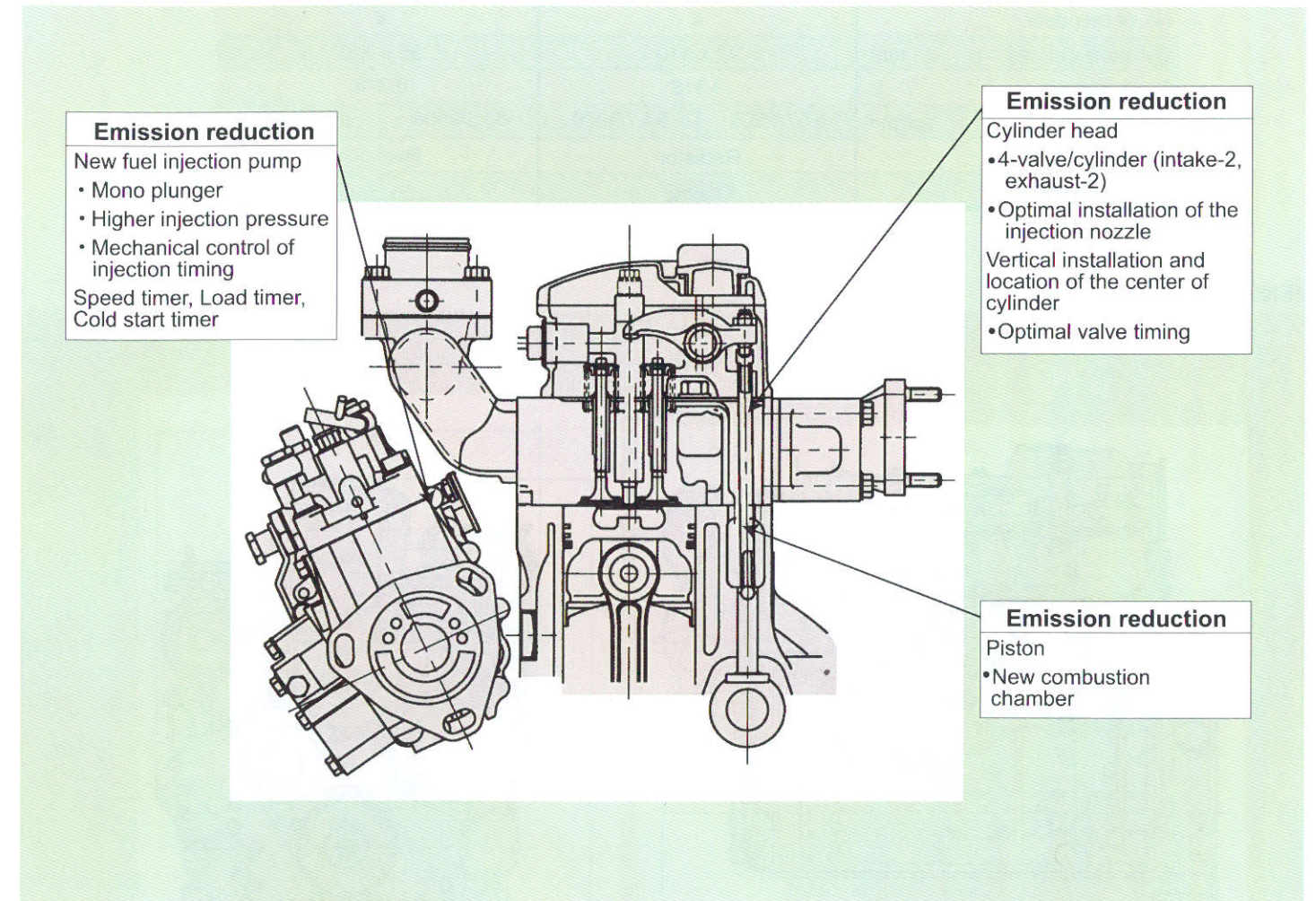
4TNV98
4TNV98T



Photograph may show optional equipment.

The TNV series adds a whole range of “goodies” that make this engine a mechanical “Work of art”

The much acclaimed “Clean and Silent” TNE series has just become even better. Its called the TNV, and it stands for Total New Value. Lets take a look.....

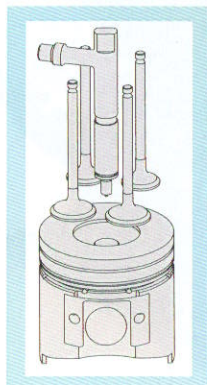


Emission Reduction (ie a Cleaner Engine)

Cleaner engines with even lower exhaust emissions are achieved by improving on the already excellent TNE base. Stricter emission standards are cleared by a wide margin.

Four valves with centrally located fuel injector.

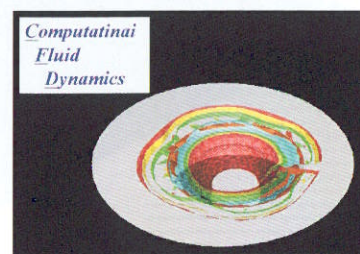
By using 2 inlet and 2 exhaust valves, air intake and expulsion is markedly improved. injector pump and timing system further increase the precision of fuel delivery.



Vertically mounted injector nozzle minimizes imbalance of spray pattern. Swirl ratios are excellent giving even atomization and uniform mixing. Valve sizes closely matched to flow needs, and state of the art combustion chamber design are added, substantial improvement is achieved in combustion efficiency, stability and exhaust emissions.

Lets examine some of these areas in more detail.....

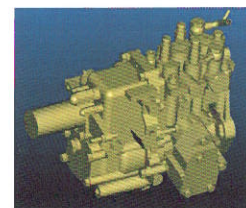
1. Combustion Chamber
 It increases the fluid energy of the



air and fuel charge. The swirl effect produced in the chamber continues while combustion occurs, aiding mixing and results in lower exhaust emissions compared to conventional chambers.

2. Fuel Injection Equipment NMP Pump

A new MP pump has been developed especially for the TNV engine series. Our aim was to make improvements over a wide range of areas to even further reduce emissions. Features are:

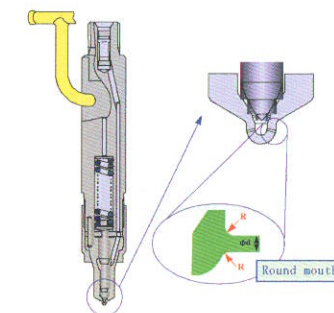


- High injection pressure
- Use of a mono plunger reduces

uneven injection between the cylinders.

- Timing Control Device system optimizes injection to take into account speeds, loads and the startup phase.
- New mechanical governor helps to maintain cleaner exhausts.
- Minimal variation from chosen revs at low speed using constant pressure valve.
- Fuel Injection Nozzle
- Multiple numbers of very small holes are used to achieve uniform atomization.
- Holes are not simply drilled, their inside edges are carefully rounded to promote even flow and direction of spray, also to reduce resistance.
- Low sack nozzle profile improves combustion. Double corn shape

- Fuel filter installed at inlet of injector.



Noise Level Reduction (ie a more Silent Engine)

1. Cylinder Block Noise Reduction

Yanmar's original CAE techniques have optimized the stiffness, minimized transformation, and reduced radiant noise.

