OPERATION MANUAL

4TNE92
4TNE94L
4TNE98

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SAFETY

SAFETY STATEMENTS

Yanmar is concerned for your safety and your machine's condition. Safety statements are one of the primary ways to call your attention to the potential hazards associated with Yanmar TNE engine operation. Follow the precautions listed throughout the manual before operation, during operation and during periodic maintenance procedures for your safety, the safety of others and to protect the performance of your engine. Keep the labels from becoming dirty or torn and replace them if they are lost or damaged. Also, if you need to replace a part that has a label attached to it, make sure you order the new part and label at the same time.



This safety alert symbol appears with most safety statements. It means attention, become alert, your safety is involved! Please read and abide by the message that follows the safety alert symbol.

DANGER

Danger (the word "DANGER" is in white letters with a red rectangle behind it) – indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. Danger is limited to the most extreme situations.

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WARNING

Warning (the word "WARNING" is in black letters with an orange rectangle behind it) – indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

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CAUTION

Caution (the word "CAUTION" is in black letters with a yellow rectangle behind it) – indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

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CAUTION

Caution *without the safety alert symbol* indicates a potentially hazardous situation that can cause damage to the machine, personal property and / or the environment or cause the machine to operate improperly.

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COMPONENT IDENTIFICATION

Figure 1 shows where major engine components are located.

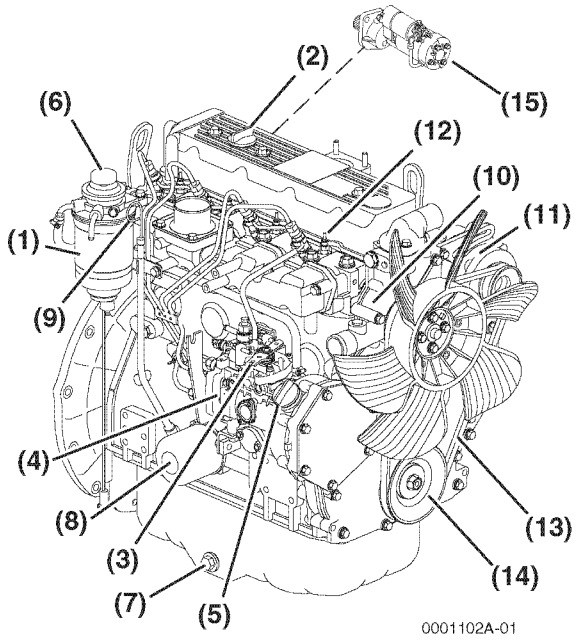


Figure 1

1. Fuel Filter / Water Separator
2. Top Filler Port (Engine Oil)
3. Governor Lever
4. Fuel Injection Pump
5. Side Filler Port (Engine Oil)
6. Fuel Priming Pump
7. Drain Plug (Engine Oil)
8. Engine Oil Filter
9. Dipstick (Engine Oil)
10. Engine Coolant Pump
11. Alternator
12. Glow Plug
13. V-Belt
14. Crankshaft V-Pulley
15. Starter Motor

LOCATION OF LABELS

Figure 2 shows the location of regulatory and safety labels on Yanmar TNE series engines.

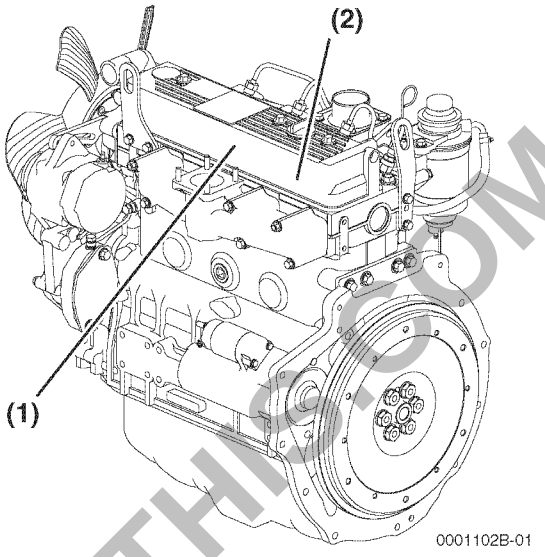
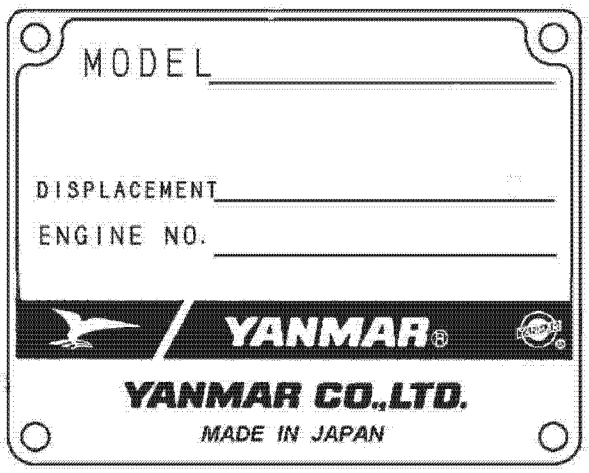


Figure 2

The emission control information label is typically affixed to the exhaust side of the rocker arm cover **(Figure 2, (1))**.

Typical location of the engine nameplate is shown. **(Figure 2, (2))**.

Engine Nameplate (Typical)



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Applicable Engine Oil Filter Part No. (Figure 5-11, (1))	
4TNE92 4TNE94L 4TNE98	129150-35153

4. Add new engine oil to the engine as specified in *Adding Engine Oil on page 31*.

Check and Adjust the Governor Lever and Engine Speed Control

The governor lever and engine speed control (accelerator lever, pedal, etc.) of the machine are connected together by an accelerator cable or rod. If the cable becomes stretched, or the connections loosen, the governor lever may not respond to change of engine speed control position. This may make operation of the machine unsafe. Check the cable periodically and adjust if necessary. Consult your authorized Yanmar industrial engine dealer or distributor for the adjustment procedure.

NEVER force the accelerator cable or pedal to move. This may deform the governor lever or stretch the cable and cause irregular operation of the engine speed control.

Checking and adjusting the governor lever:

1. Check that the governor lever **(Figure 5-12, (1))** makes uniform contact with the low idle **(Figure 5-12, (2))** and high idle **(Figure 5-12, (3))** speed limit screws when the engine speed control is in the high idle speed or low idle speed position.
2. If the governor lever does not make contact with the high idle or low idle speed limit screw, adjust the accelerator cable.
3. In some engine speed control applications, loosen the accelerator cable locknut and adjust the cable so the governor lever makes proper contact with the high / low idle speed limit screw.

CAUTION

NEVER attempt to adjust the low or high idle speed limit screw. This may impair the safety and performance of the machine and shorten its life. If the idle speed limit screws require adjustment, see your authorized Yanmar industrial engine dealer or distributor.

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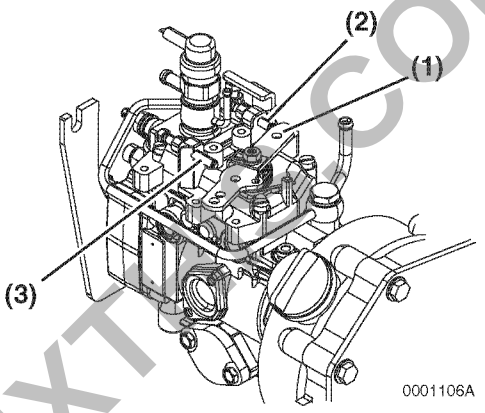


Figure 5-12

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Every 250 Hours of Operation

Perform the following maintenance every 250 hours of operation.

- **Check and Clean Radiator Fins**
- **Check and Adjust Cooling Fan V-Belt**
- **Check Battery**
- **Clean Air Cleaner Element**

Check and Clean Radiator Fins

⚠ CAUTION



FLYING OBJECT HAZARD!

- **ALWAYS wear eye protection when servicing engine and when using compressed air or high-pressure water. Dust, flying debris, compressed air, pressurized water or steam may injure your eyes.**
- **Failure to comply may result in minor or moderate injury.**

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Dirt and dust adhering to the radiator fins reduce the cooling performance, causing overheating. Make it a rule to check the radiator fins daily and clean as needed.

Note that a typical radiator is shown in **Figure 5-2** for illustrative purposes only.

- Blow off dirt and dust from fins and radiator with 28 psi (0.19MPa, 2kgf/cm^2) or less of compressed air **(Figure 5-2, (1))**. Be careful not to damage the fins with the compressed air.
- If there is a large amount of contamination on the fins, apply detergent, thoroughly clean and rinse with tap water.

CAUTION

NEVER use high pressure water or compressed air at greater than 28 psi or a wire brush to clean the radiator fins. Radiator fins damage easily.

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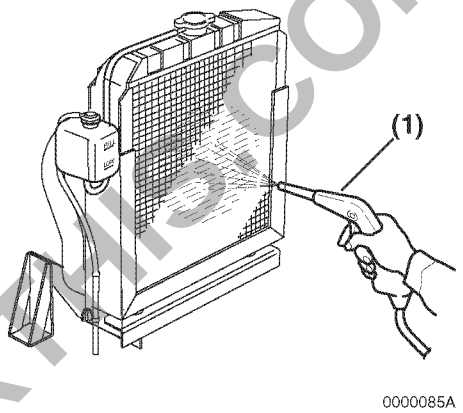


Figure 5-2

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PRINCIPAL ENGINE SPECIFICATIONS

4TNE92 EPA Tier2 & Tier3

Engine Model	4TNE92 EPA Tier2 & Tier3	
Version	VM	
Type	Vertical Inline Diesel Engine	
Combustion System	Indirect Injection, No Turbocharger	
Aspiration	Natural	
No. of Cylinders	4	
Bore × Stroke	3.62 x 3.94 in (92 × 100 mm)	
Displacement	162.3 cu in (2.659 L)	
** Max. Rated Output (Gross)	rpm (min^{-1})	2450
	hp SAE	46.5
	kW	34.7
	PS	47.2
High Idle Speed (Bare Engine)	2725 ± 25 rpm	
Low Idle Speed (Bare Engine)	850 ± 25 rpm	
Engine Weight (Dry)*	496 lb (225 kg)	
PTO Position	Flywheel Side	
Direction of Rotation	Counterclockwise Viewed From Flywheel Side	
Cooling System	Liquid-Cooled With Radiator	
Lubricating System	Forced Lubrication With Trochoid Pump At normal operating speeds, oil pressure is: 42 - 57 psi (0.29 - 0.39 MPa; 3.0 - 4.0 kgf/cm^2) At idle, oil pressure is: No less than 18.5 psi (0.13 MPa; 1.3 kgf/cm^2)	
Starting System	Electric Starting - Starter Motor: DC12V, 3.1 hp (2.3 kW)	
	Alternator: DC12V, 40A	
	Recommended Battery Capacity: 12V, 622 CCA (Cold Cranking Amps)	
Dimensions (L × W × H)*	28.0 x 20.3 x 29.8 in (710 x 516 x 758 mm)	
Engine Oil Pan Capacity	9.7 / 7.6 qt (9.2 / 7.2 L) (Dipstick Upper Limit / Lower Limit)	
Engine Coolant Capacity	1.11 gal (4.2 L) Engine Only	

* Engine specifications do not include height of lifting eyes nor dimensions or specifications for the Radiator, Muffler, and Air Cleaner.

** The Intake and Exhaust condition of Max. Rated output are
Air Intake Restriction : 250mmAq
Exhaust Gas Restriction : 1000mmAq

*** The detail specifications are refer to the Specification document which is agreed between both engineering.

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○: Check ◇: Replace ●: Contact your authorized Yanmar industrial engine dealer or distributor

System	Check Item	Check During Operation	Daily	Periodic Maintenance Interval				
				Every 250 hours	Every 500 hours	Every 1000 hours	Every 2000 hours	Every 4000 hours
Cooling System	Check & Re-fill Engine Coolant		○					
	Check Engine Coolant Temperature Indicator	○						
	Check & Clean Radiator Fins [1]			○ or every 6 weeks				
	Check & Adjust Cooling Fan V-belt	First Check after 50 hours		○ or every 6 weeks				
	Drain, Flush, and Re-fill Cooling System with New Coolant							◇ or every 2 yr. which-ever comes first
Cylinder Head	Adjust Intake / Exhaust Valve Clearance					● or every 6 months		
Electrical Equipment	Check Battery			○ or every 6 weeks				
	Check Battery Indicator	○						
Emission Control Warranty	Inspect, Clean & Test Fuel Injectors						● or every 1 year	
Engine Oil	Check Engine Oil Level		○					
	Check Engine Oil Pressure Indicator	○						
	Drain & Fill Engine Oil				● or every 3 months			
	Replace Engine Oil Filter				● or every 3 months			
Engine Speed Control	Check & Adjust Governor Lever & Engine Speed Control				○ or every 3 months			
Fuel	Check & Re-fill Fuel Tank Level		○					
	Check Fuel Filter Indicator	○						
	Drain Fuel Filter / Water Separator		○					
	Check Fuel Filter / Water Separator		○					
	Clean Fuel Filter / Water Separator [1]					○ or every 6 months		
	Replace Fuel Filter [1]					◇ or every 6 months		
Hoses	Inspect or Replace Fuel System & Cooling System Hoses		○					○ or every 2 years
Intake & Exhaust	Clean or Replace Air Cleaner Element [1 2]			○ or every 6 weeks			◇ or every 1 year	

1 Very dirty conditions will require daily check and cleaning.
2 In dirty or dusty environments, replace at 1000 hours or as needed.

Note: These procedures are considered normal maintenance and are performed at the owner's expense.

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