2.2.1 4TNE94 (Direct injection) Engine Specifications

Engine model	4TNE94					
Combustion system	Direct injection, No turbocharger					
No. of cylinders-Bore X Stroke mm	4—94×100					
Displacement ℓ	2.775					
Engine specifications	VM				CL	
Revolution rpm	2000	2200	2400	2500	1500	1800
Cont. rating output kW{hp}	—	—	—	—	26.1 {35.0}	31.3 {42.0}
Max. rating output kW{hp}	35.3 {47.3}	38.2 {51.2}	41.6 {55.7}	43.0 {57.6}	29.1 {39.0}	34.6 {46.4}
No load Maximum speed rpm						

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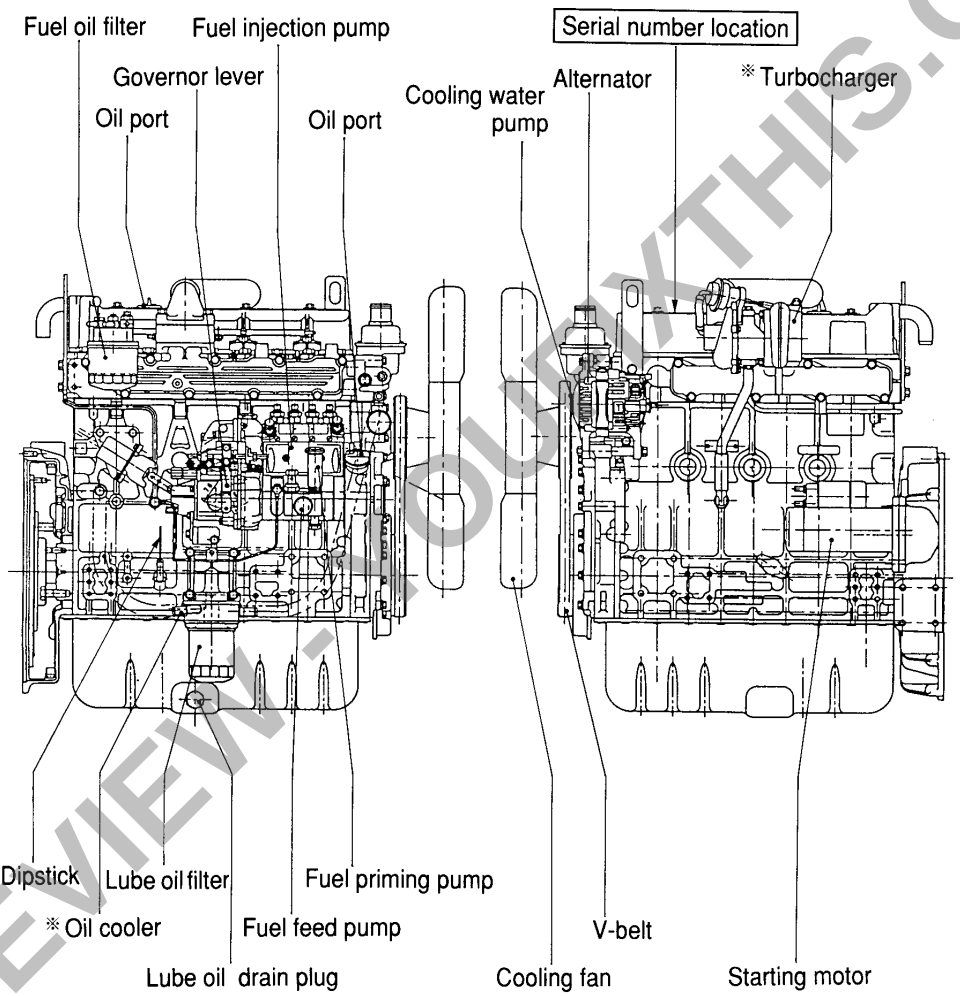
2.3 NAMES OF PARTS

●Operation Side

(Right side as viewed from the flywheel side)

Contains the main parts necessary for operation

●Non-Operation Side



[NOTE]

The 4TNE106T engine (with turbocharger) is used as the example for the above diagram.

※An asterisk indicates parts found in engines with turbochargers.

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2.5 Control Equipment

Control equipment includes alarm devices and operation equipment (Starting, Acceleration, Stopping).

2.5.1 Instruments and Alarm Devices

The following instruments and alarm devices are located on the auxiliary machinery side of the engine.

(1) Meters

Ⓐ Tachometer (with hour meter) OPTION

The engine's rotation speed is indicated by the needle. The number of hours of operation is indicated, and can be used as a guide for periodic maintenance checks.

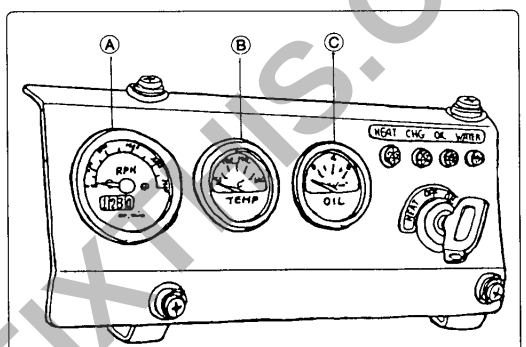
Ⓑ Cooling Water Temperature Gauge OPTION

The cooling water temperature is indicated by the needle. The normal temperature is 100° C or less.

Ⓒ Lube Oil Pressure Gauge OPTION

The engine oil pressure is indicated by the needle.

The normal pressure during operation is 4 kg/cm².



Instrument Panel OPTION

(2) Pilot Lamps OPTION

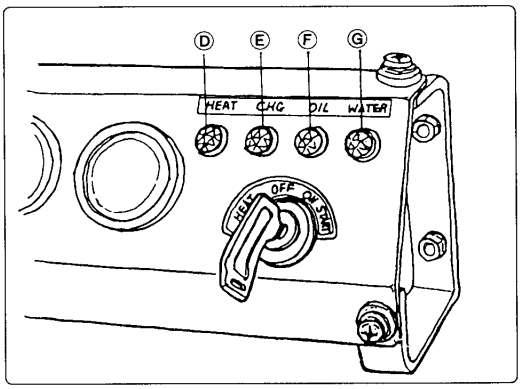
Ⓓ Heater Lamp (HEAT: Blue)

Indicates that the air heater is on.

When the starter switch is turned to the HEAT position, the lamp comes on and goes out approximately 15 seconds later.

When the lamp is extinguished, the engine may be started.

→See 2.5.2(2).



Ⓔ Charge Lamp (CHG: Red)

When the charge is normal the lamp will go out. When the charge is abnormal the lamp will come on.

Ⓕ Lube Oil Pressure Alarm Lamp (OIL: Red)

When the lube oil pressure falls below normal (0.5kg/cm² or lower) the oil pressure sensor will register this and the lamp will come on.

Ⓖ Cooling Water Temp. Alarm Lamp (WATER: Red)

When the cooling water temperature rises above normal (110℃ or higher) the water temperature switch will cause the lamp to come on.

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5.2 List of Periodic Inspections

Daily and periodic inspection are important to keep the engine in its best condition. The following is a summary of inspection and servicing items by inspection interval. Periodic inspection intervals vary depending on the uses, loads, fuels and lube oils used and handling conditions, and are hard to establish definitively. The following should be treated only as a general standard. [Section 5.3 Periodic Inspection Items] gives a detailed explanation of which parts must be inspected and the procedure for doing so for each interval.

[NOTICE]

Schedule your own periodic inspection plan according to the operational conditions of

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5.3 Periodic Inspection Items

5.3.1 Inspection After Initial 50Hrs. Operation

(1) Replacing the Engine Lube Oil and Lube Oil Filters (1st time)

During initial operation of the engine, the oil is quickly contaminated due to the initial wear of internal parts. The lube oil must therefore be replaced early. Replace the lube oil filter at the same time.

①Drain off the lube oil.

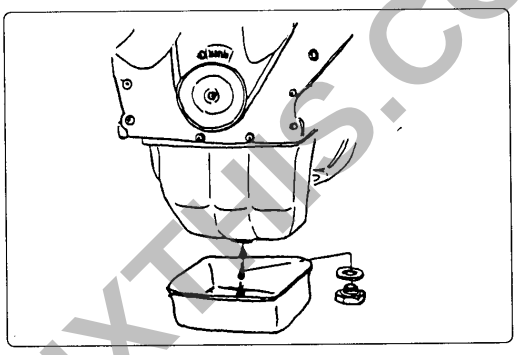
1) Put a container under the drain plug to catch the old oil.
2) Remove the oil plug at the bottom of the oil pan to drain off the oil.

It is easier and more effective to drain the engine lube oil while the engine is still warm after operation.

⚠ CAUTION

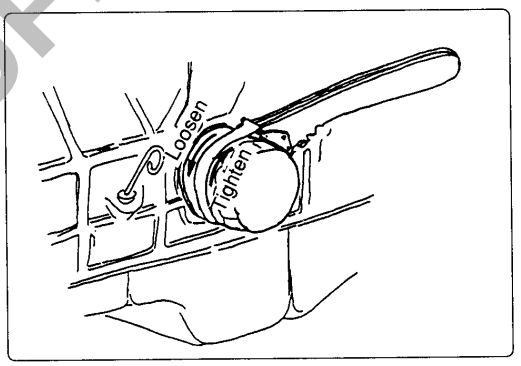


Be careful not to let hot oil splash on you and cause burns.



②Replace the lube oil filter.

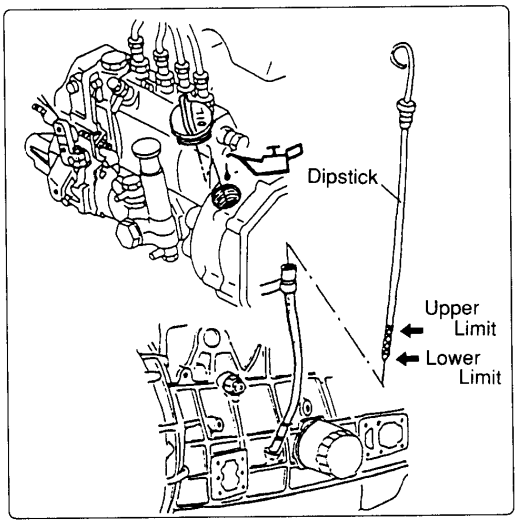
1) Turn the lube oil filter to the left with the filter wrench and remove.
2) Clean the filter installation face.
3) Put the new filter on the installation face, turn to the right by hand. Next, tighten an addition 3/4 of a turn with the filter wrench. (Tightening torque: 2.0 ~ 2.4kgf-m) Part Numbers: →See [5.4 Spare Parts]



③Fill with new lube oil.

1) Fill with the specified amount of oil. →See [2.2 Engine Items].
2) Run the engine for approximately 5 minutes and check to see if there is any oil leakage.
3) Approximately 10 minutes after stopping, check the oil level again with the oil dipstick and add more oil if necessary.

From the 2nd time on, replace the oil every 250 hours.



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6. TROUBLE AND TROUBLESHOOTING

If you should encounter some difficulty during operation, refer to the following table for countermeasures.

Trouble	Probable Cause	Measure	Reference
1. Alarm Lamps On During Operation (Trouble)	**[NOTICE] When the alarm lamp comes on, immediately cut off the load, bring the engine to a stop, and inspect.**		
●Oil Press. Alarm Lamp goes on.	Engine L.O. insufficient L.O. filter clogged	Supply engine oil. Replace L.O. filter and engine oil	3.3 5.3.1(1)
●C.W.Temp.Alarm Lamp goes on.	Insufficient radiator cooling water Dirty radiator fins Leaky radiator cooling water pipe V-belt is loose or broken. Cooling water pump is damaged. Inside of C.W. system is dirty.	Check cooling water and replenish. Clean radiator fins. Ask for repairs for water leakage. Adjust or replace V-belt Ask for repairs. Ask for repairs.	4.1(4) 5.3.3(3) 5.3.1(2)
●Charge Lamp	V-belt is loose or broken. Insufficient battery charge	Adjust or replace V-belt Check battery fluid and charge battery. Ask for repairs.	5.3.1(2) 5.3.2(4)
2. Faulty Warning Devices	**[NOTICE] Do not operate the engine if alarm devices are not repaired. Serious accidents may result if difficulties are not spotted due to faulty alarm lamps.**		
●When switch is turned on (OFF→ON) Alarm lamps do not go on.	Circuit broken or lamp burnt out.	Ask for repairs.	
●When the key returned (START→ON) One of the alarm lamps does not go out.	Sensor switches faulty.	Ask for repairs.	

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1.2 SAFETY PRECAUTIONS

(Observe these instructions for your own safety.)

■ Precautions for Operation

DANGER



Scalds Prevention

- Never remove the radiator cap while the engine is still hot. Steam and hot water will spurt out and seriously burn you. Wait until the water temperature has dropped, then wrap a cloth around the cap and loosen it slowly.
- After inspection, refasten the cap firmly. If the cap is not secure, steam or scald-

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