

YANMAR

OPERATION MANUAL

MARINE PROPULSION ENGINE

**4CHE3
6CHE3
6CH-HTE3**

CONTENTS

FOR YOUR SAFETY	1
Safety Symbols	1
Safety Precautions	2
Warning labels	5
Precautions for Lifting the Engine	6
Engine nameplates	7
SPECIFICATIONS	8
Location of components	9
FUEL OIL, LUBRICATING OIL AND COOLANT	12
Fuel	12
Lubricating Oil (Engine and Marine gear)	13
Coolant	14
RUNNING-IN	15
Fuel	15
Lubricating oil (Engine and Marine gear)	17
Cooling system (seawater and coolant)	18
Cranking	21
Instruments check before starting	22
Rechecking after starting	24
OPERATION	25
Starting	25
Notice while running with load.....	27
Stopping	28
Long-term storage.....	29
PERIODICAL MAINTENANCE	30
Periodic maintenance schedule	30
Fuel system	32
Lubricating oil system	33
Cooling water system (seawater and coolant)	35
Turbocharger	38
Injection nozzle	39
Remote control cables	40
Electrical parts	41
TROUBLESHOOTING AND COUNTERMEASURES	42
Handling of emergency bolts for marine gear trouble	46
SYSTEM DIAGRAMS	48
WIRING DIAGRAMS	51

FOR YOURSAFETY

Following the precautions described in this manual will enable you to use this engine with complete satisfaction. Failure to observe any of the rules and precautions, however, may result in injury, burns, fires and engine damage. Read this manual carefully and be sure you fully understand it before beginning operation.

Safety Symbols

These are the warning signs used in this manual and on the product.



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 indicates a hazardous situation which, if not avoided, will result in death or serious injury.

 **WARNING**

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION**

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE indicates a situation which can cause damage to the machine, personal property and/or the environment or cause the equipment to operate improperly.

Safety Precautions

Safety precautions for operation

DANGER



Burns from steam

- Never remove the filler cap from the coolant tank while the engine is still hot. Steam and hot air will spurt out and seriously burn you. After engine stop, wait until the water temperature drops. Wrap a cloth around the filler cap and slowly loosen the cap.
- After inspection, tighten the filler cap firmly. If the cap is not secure, steam or hot air can spurt out during operation and seriously burn you.



Ventilation of the battery area

- Make sure that the area around the battery is well-ventilated and that no flammable materials are near.
- The battery emits hydrogen gas during operation and charging. The gas can catch fire.



Fires from oil ignition

- Be sure to use the correct type of fuel oil. Always double-check before fueling. The wrong fuel oils (e.g. gasoline) can cause a fire.
- Be sure to stop the engine before fueling. If you spill fuel oil, wipe the spillage carefully.
- Keep oil and other inflammable materials away from the engine. They can catch fire.

WARNING



Exhaust gas poisoning

- Never cover or block the windows, air vents, fans or other ventilation devices in the engine room. Always maintain good ventilation in the engine room during operation. Breathing exhaust gas is dangerous to your health.



Moving parts

- Keep your hands, other body parts and clothing away from moving parts (e.g. the front drive shaft, V-belt or propeller shaft). You will get caught and injured.
- Never operate the engine without the covers on the moving parts.
- Before engine start, check that you removed all tools and cloths from the area near the engine.



Alcohol and drugs

- Never operate the engine while you are under the influence of alcohol or drugs. Never operate the engine when you feel ill or unwell.

⚠ CAUTION



Burns

- Be careful of burns. The entire engine is very hot during and after operation.
- Keep your hands, other body parts and clothing away from the exhaust manifold, exhaust pipes, turbocharger, air cooler and engine body.

Safety precautions for maintenance

⚠ DANGER



Burns from steam

- Never remove the filler cap from the coolant tank while the engine is still hot. Steam and hot air will spurt out and seriously burn you. After engine stop, wait until the water temperature drops. Wrap a cloth around the filler cap and slowly loosen the cap.
- After inspection, tighten the filler cap firmly. If the cap is not secure, steam or hot air can spurt out during operation and seriously burn you.



Fires from oil ignition

- Be sure to use the correct type of fuel oil. Always double-check before fueling. The wrong fuel oils (e.g. gasoline) can cause a fire.
- Be sure to stop the engine before fueling. If you spill fuel oil, wipe the spillage carefully.
- Keep oil and other inflammable materials away from the engine. They can catch fire.

⚠ WARNING



Fires from electric short-circuits

Always turn off the battery switch or detach the earth cable (-) before you inspect the electrical system. If you cause a short-circuit, a fire can occur.



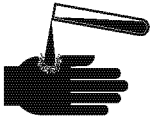
Moving parts

Stop the engine before you inspect it. If you have no choice but to inspect the engine while it operates, keep your hands, other body parts and clothing away from rotating parts. You will get caught and injured.



Exhaust gas poisoning

Never cover or block the windows, air vents, fans or other ventilation devices in the engine room. Always maintain good ventilation in the engine room during operation. Breathing exhaust gas is dangerous to your health.

⚠ CAUTION**Battery fluid**

Be very careful not to expose your skin or eyes to the battery electrolyte.

The electrolyte is a strong acid and can cause inflammations.

If you come in contact with the battery fluid, wash it off immediately with a lot of tap water.

**Burns**

• Be careful of burns. The entire engine is very hot during and after operation.

• Keep your hands, other body parts and clothing away from the exhaust manifold, exhaust pipes, turbocharger, air cooler and engine body.

NOTICE**No modification**

To keep the engine in good condition, the engine has been sealed to control the engine speed limit and the fuel injection quantity. If a seal is removed, the sliding and moving parts of the engine will suffer from increased wear. Engine performance will deteriorate and service life may shorten significantly. Removing a seal may also lead to increased lubricating oil and fuel consumption, seizure and breakage in all portions of the engine. Therefore, do not remove any seals. If the seal is removed, no warranty will be given even during the warranty period.

**Waste disposal**

- Never dispose of waste oil, such as lubricating oil, by dumping it into a sewer, river, lake or ocean waters.
- Do not spill waste oil into ocean waters. Use a container to collect waste oil from the engine.
- Comply with relevant laws and/or regulations for the disposal of hazardous materials such as lubricating oil, fuel, filters or batteries.

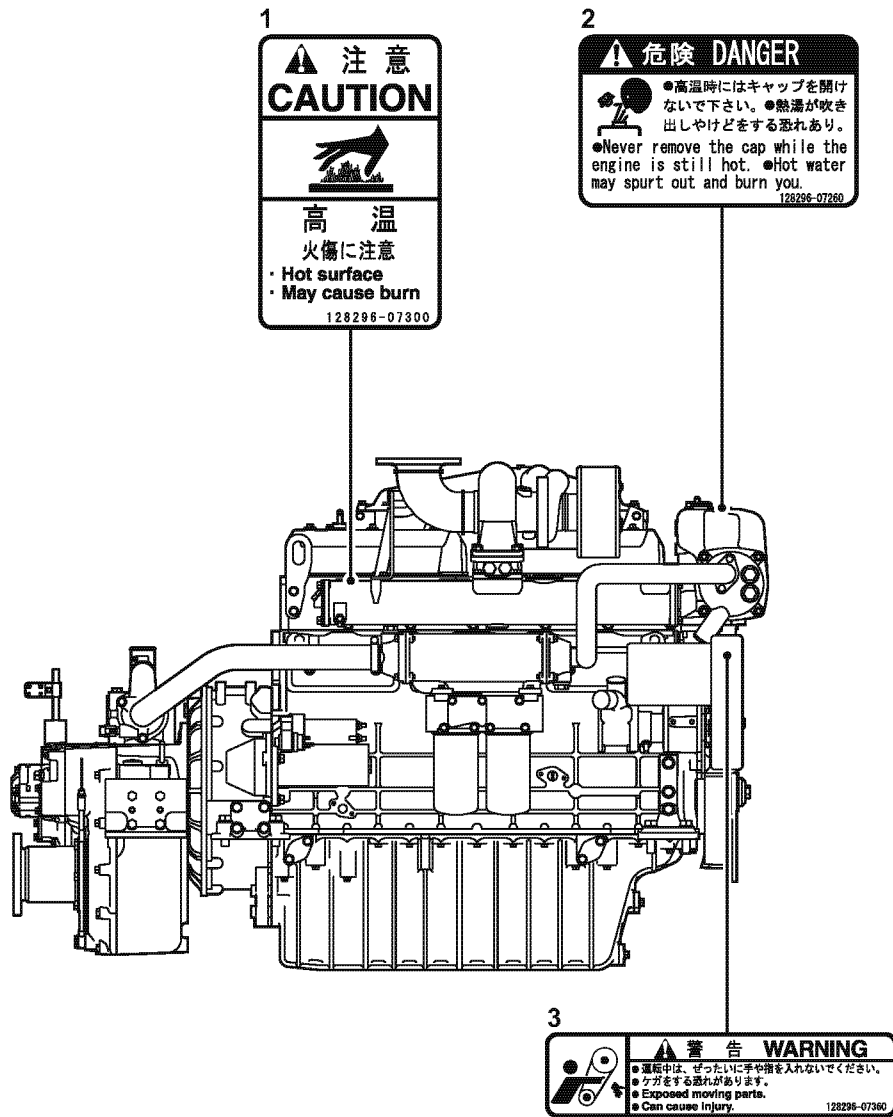
Warning labels

To ensure safe operation, the engine has warning labels attached at the locations described below.

Read the warning labels carefully to prevent accidents.

Also, if you need to replace a part that has a label attached to it, make sure that you order the new part together with the label.

If the warning label is damaged or has fallen off, order a new one from your YANMAR dealer or distributor.



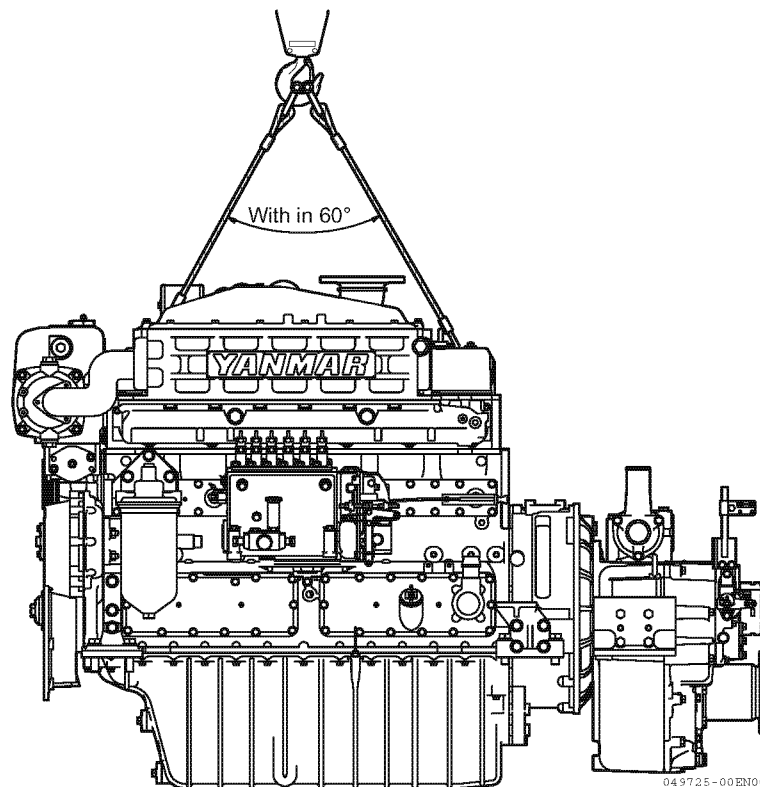
No.	Part No.
1	128296-07300
2	128296-07260
3	128296-07360

Precautions for Lifting the Engine

The engine can cause serious injury when it falls during lifting. Obey the below instructions to prevent accidents during lifting.

⚠ WARNING

- Make sure that the engine is lifted by qualified persons.
- Before lifting, make sure that the engine lifting bracket and mounting bolt have no damage and are in good shape. If you find a fault, stop immediately and contact your YANMAR dealer or distributor.
- Select lifting tools (e.g. wire rope and shackle) that are appropriate for heavy loads.
- Select the wire rope length so that the engine does not tilt during lifting.
- Before lifting, examine the lifting tools and make sure that they have no damage and are in good shape.
- Protect the parts of the engine or driven equipment that touch the wire rope with protective material.
- The tension of the wire rope changes depending on the lifting angle. Make sure that the angle is within 60°.
- If you use a marine gear that is not listed in this operation manual, separate the marine gear from the engine, and lift the marine gear and engine separately.
- During lifting and moving the engine, do not go under the engine or near the engine.



For the mass, refer to Specifications in the Operation Manual.

Engine nameplates

Periodic inspection and maintenance are important to help you enjoy your engine.

Your serial number is required at the time of requesting an engine maintenance or ordering a part. Confirm it beforehand.

■ Location of engine nameplate:

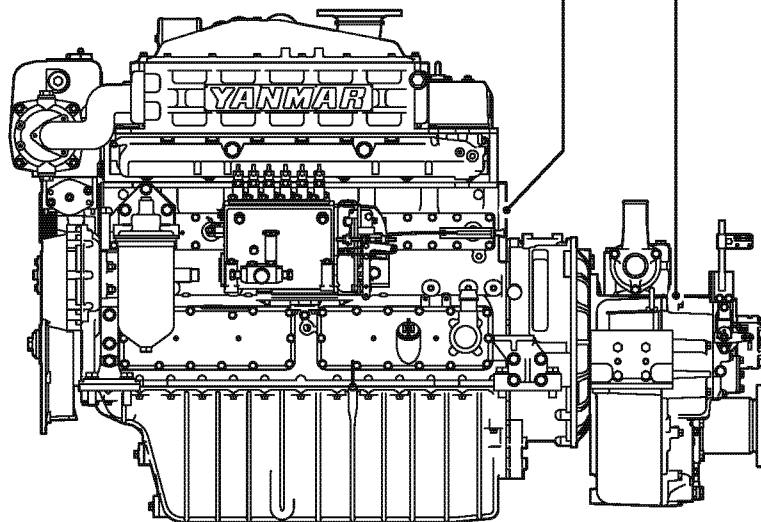
It is affixed the top part of the cylinder block on the marine gear side.

■ Location of marine gear nameplate:

It is affixed on the back side of the lubricating oil cooler mounted of the marine gear box.

Model	_____		
Gear Model	_____		
Continuous power kW	kW/	min ⁻¹	_____
Speed of prop.shaft	min ⁻¹	_____	_____
Fuel stop power kW	/	min ⁻¹	_____
ENG.No.	_____		
MFG.DATE	/ / _____		
YANMAR			
YANMAR CO.,LTD.			
<small>MADE IN JAPAN</small>			

MODEL	_____	
REDUCTION RATIO	_____	
AHEAD	_____	ASTERN _____
MFG.No.	_____	
YANMAR		
KANZAKI KOKYUKOKI MFG CO.,LTD.		
<small>MADE IN JAPAN</small>		



SPECIFICATIONS

Model		Unit	4CHE3	6CHE3	6CH-HTE3	
Type		-	Vertical, 4-cycle diesel engine			
Combustion system		-	Direct injection			
Number of cylinders		-	4	6		
Bore × stroke		mm	105 × 125			
Displacement		ℓ	4.33	6.494		
Continuous Power Output / Engine Speed		kW (hp metric) / min ⁻¹	57.4 (78) / 2550	84.6 (115) / 2550	125 (170) / 2550	
Fuel Stop Power Output / Engine Speed	Rating	M	57.4 (78) / 2550	84.6 (115) / 2550	125 (170) / 2550	
		L	62.5 (85) / 2600	95.6 (130) / 2600	140 (190) / 2600	
Direction of rotation		-	Counterclockwise (viewed from flywheel side)			
Cooling system		-	Constant temperature cooling system (with heat exchanger)			
Coolant capacity		ℓ	17	20	23	
Lubrication system		-	Forced lubrication with gear pump			
Lubricating oil capacity (Engine)		ℓ	15	18.5		
Charge air system		-	Natural aspirated		Exhaust gas turbocharger (with charge air cooler)	
Starting system		-	Electric starting DC12 V - 5 kW			
Alternator		-	24 V - 25 A			
Marine gear	Model	-	YX-20-1	YX-30-2	YX-50S	YX-71-4
	Reduction ratio (Ahead = Astern)	-	2.03, 2.55, 2.96, 3.48	2.03, 2.55, 2.96, 3.48	2.03, 2.48, 2.88	3.53
	Lubricating oil capacity	ℓ	3	3.2	5.5	5.5
Engine dry mass (with marine gear)		kg	568	700	795	895

Thank you so much for reading.
Please click the “Buy Now!”
button below to download the
complete manual.



After you pay.

You can download the most
perfect and complete manual in
the world immediately.

Our support email:

ebooklibonline@outlook.com