Cylinder Head Components

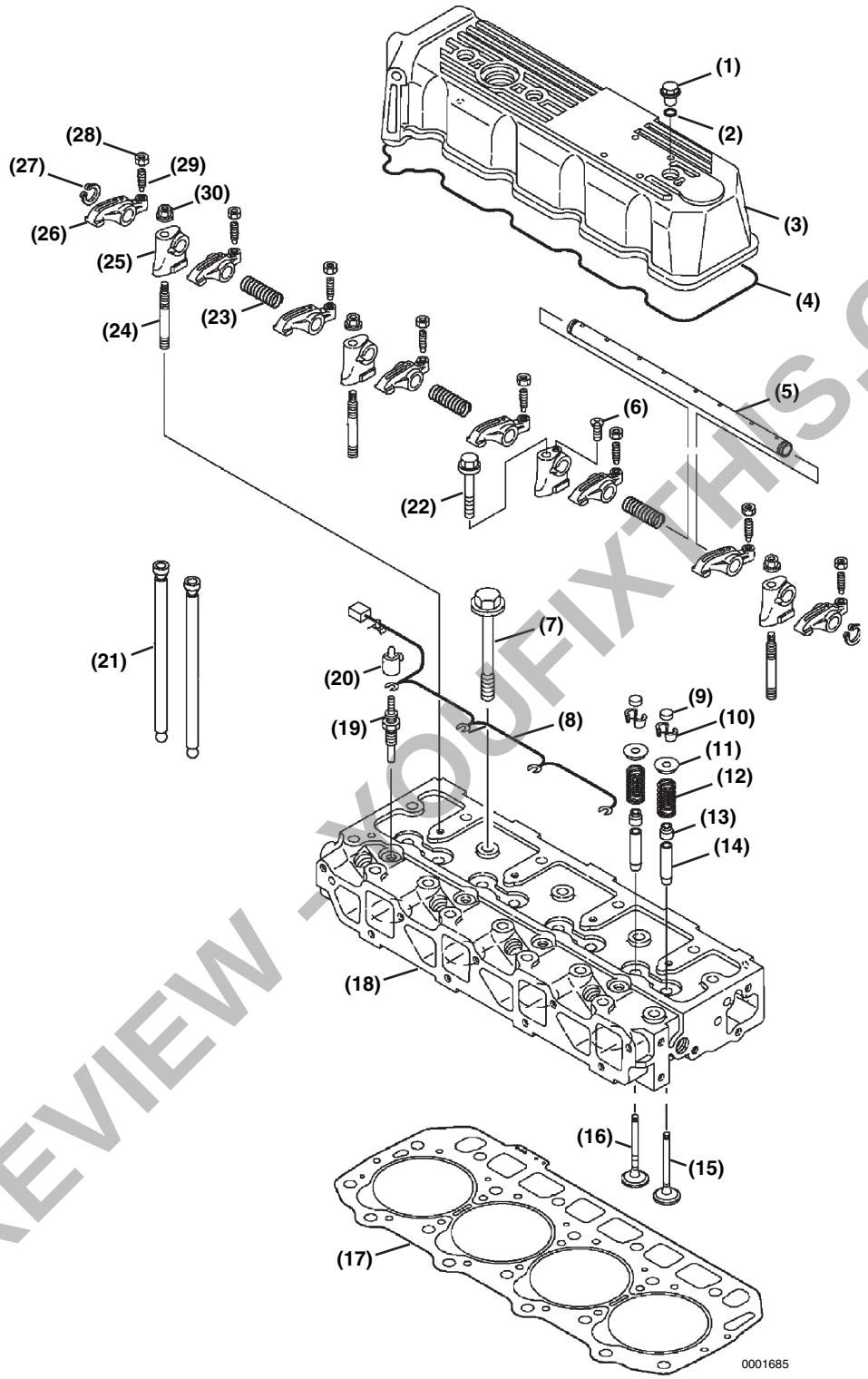


Figure 6-1

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STANDARD TORQUE CHART

Thread size × Pitch mm		M6×1.0	M8×1.25	M10×1.5	M12×1.75	M14×1.5	M16×1.5
Tightening Torque	in lbs	96.0 ± 9.0	-	-	-	-	-
	ft lbs	-	19.0 ± 2.0	36.0 ± 4.0	65.0 ± 7.0	101.0 ± 7.0	167.0 ± 7.0
	N·m	10.8 ± 1.0	25.5 ± 2.9	49.0 ± 4.9	88.3 ± 9.8	137 ± 9.8	22.6 ± 9.8
	kgf·m	1.1 ± 0.1	2.6 ± 0.3	5.0 ± 0.5	9.0 ± 1.0	14.0 ± 1.5	23.0 ± 2.0

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Trouble Symptom		Starting Problem				Insufficient Engine Output			Poor Exhaust Color		High Knocking Sound During Combustion	Abnormal Engine Sound	Uneven Combustion Sound	Engine Surging		Excessive Engine Vibration	Difficulty in Returning to Low Speed	Excessive Fuel Consumption	Engine Oil					Excessive Blow-by Gas	Engine Coolant		Air Intake		Exhaust Temperature Rise	Corrective Action
		Engine Does Not Start.	Engine Starts But Stops Soon.			Ordinary	Exhaust Color		During Work					During Idling	During Work Operation				Excessive Oil Consumption	Dilution by Diesel Fuel	Oil with Water	Low Oil Pressure		Overheat	Low Water Temperature	Pressure Drop	Pressure Rise		
			None	Exhaust Smoke			White	Black	White	Black																				
				Little	Much																								
Engine System	Cause																												
	Improper Intake/Exhaust Valve Clearance	○	○			○		○		○		○														○			○	Adjust the Valve Clearance. *(See page 6-32)*
	Compression Leakage from Valve Seat					○		○		○		○						○								○			○	Lap the Valve Seat. *(See page 6-27)*
	Intake/Exhaust Valve Seizure	○			○	○		○		○					○	○				○						○				Correct or Replace Intake/Exhaust Valve. *(See page 6-29 and 6-26)*
	Cylinder Head Gasket Blowout					○															○			○						Replace the Gasket. *(See page 6-30)*
	Seized or Broken Piston Ring	○			○		○		○			○		○		○			○	○				○					Replace the Piston Ring. *(See page 6-49)*
	Worn Piston Ring, Piston or Cylinder	○			○		○		○										○	○				○					Perform Honing and Use Oversize Parts. *(See page 6-48)*
	Seized Crankpin Metal or Bearing	○	○									○		○	○	○			○					○					Repair or Replace. *(See page 6-50)*
	Improper Arrangement of Piston Ring Joints		○				○												○					○					Correct the Ring Joint Positions. *(See page 6-49)*
	Reverse Assembly of Piston Rings						○		○										○					○					Reassemble Correctly. *(See page 6-49)*
	Worn Crankpin and Journal Bearing					○						○		○	○	○						○							Measure and Replace. *(See page 6-45)*
	Loose Connecting Rod Bolt											○				○						○							Tighten to the Specified Torque. *(See page 6-12)*
	Foreign Matter Trapped in Combustion Chamber	○										○							○					○					Disassemble and Repair. *(See page 6-21)*
	Excessive Gear Backlash											○																	Adjust Gear Meshing. *(See page 6-8)*
	Worn Intake/Exhaust Valve Guide						○												○					○					Measure and Replace. *(See page 6-26 and 6-28)*
	Governor Adjusted Incorrectly		○											○	○	○													Make Adjustment. *(See page 5-28)*
	Improper Open/Close Timing of Intake/Exhaust Valves	○				○	○	○	○	○		○																	Adjust the Valve Clearance. *(See page 5-29)*

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PERIODIC MAINTENANCE

○: 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				

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PRINCIPAL ENGINE SPECIFICATIONS

4TNE92-NMH

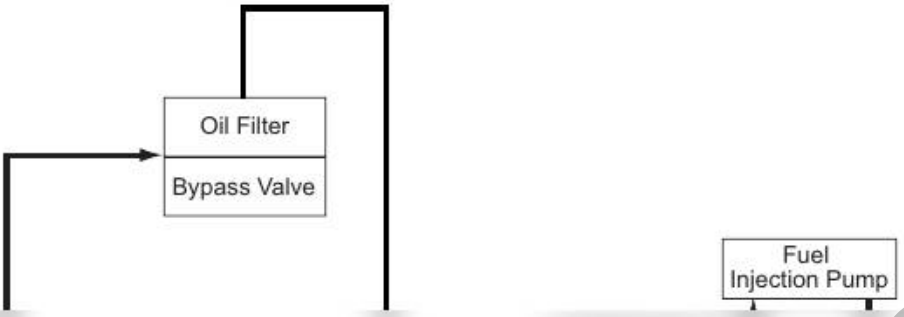
Engine Model	4TNE92-NMH
Version	VM
Type	Vertical Inline Diesel Engine
Combustion System	Indirect Injection
Aspiration	Natural
No. of Cylinders	4

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LUBRICATION SYSTEM DIAGRAM

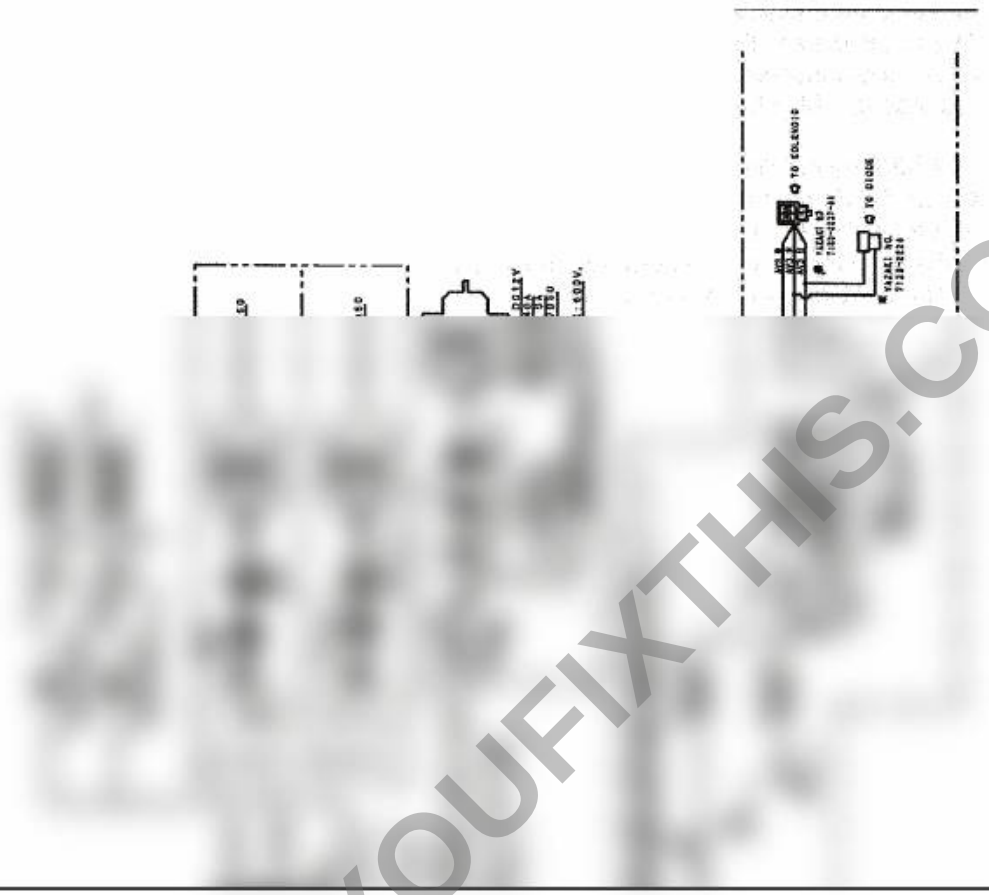


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ELECTRIC WIRING DIAGRAM



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TABLE OF CONTENTS

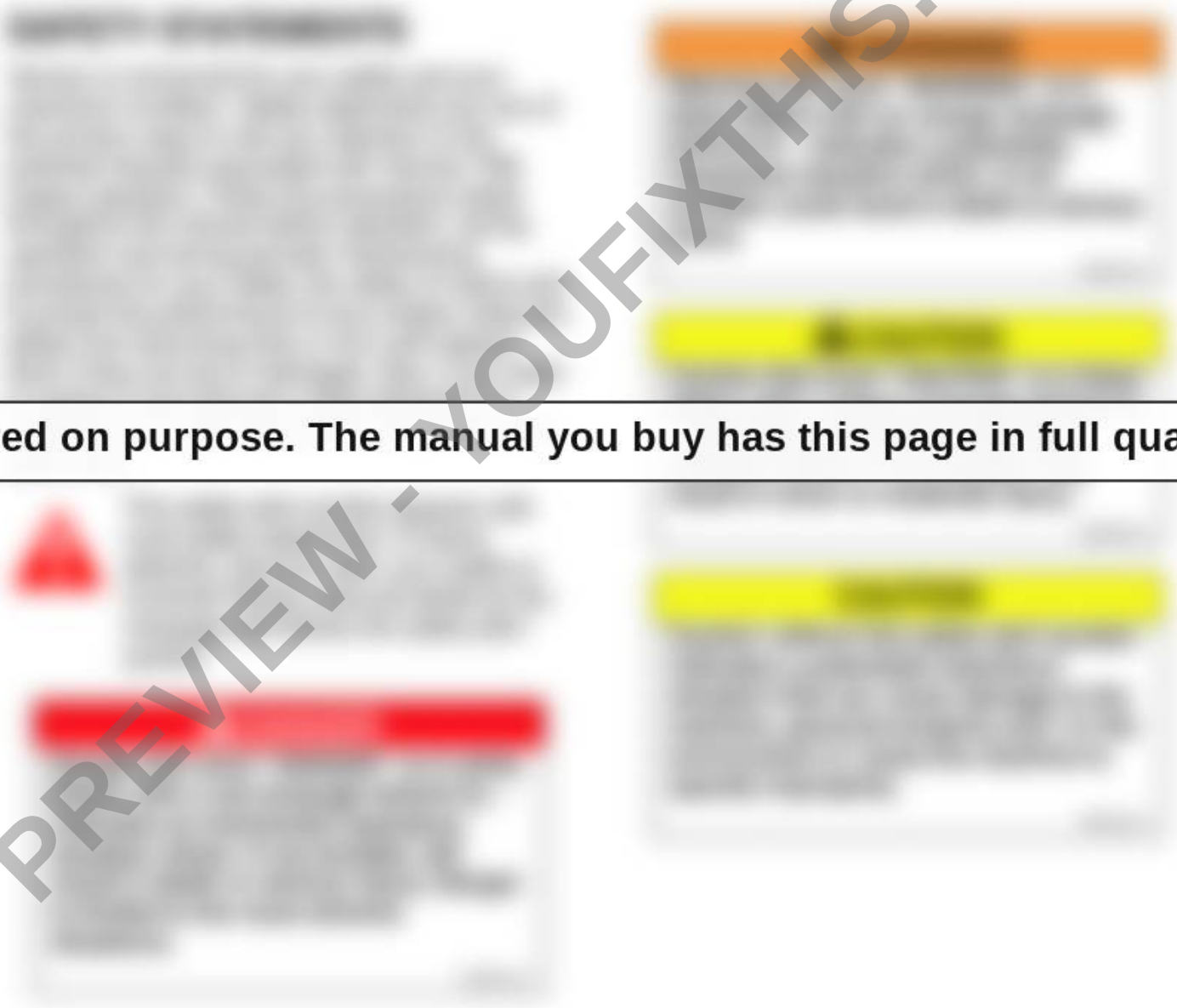
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Section 3

SAFETY



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This section of the *Service Manual* describes the servicing of the engine.

⚠ WARNING

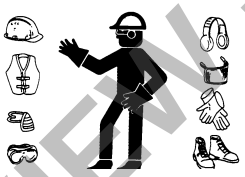


SEVER HAZARD!

- **Stop the engine before you begin to service it.**
- **NEVER leave the key in the key switch when you are servicing the engine. Someone may accidentally start the engine and not realize you are servicing it. This could result in a serious injury.**
- **If you must service the engine while it is operating, remove all jewelry, tie back long hair, and keep your hands, other body parts and clothing away from moving / rotating parts.**
- **Failure to comply could result in death or serious injury.**

0000010en

⚠ WARNING



EXPOSURE HAZARD!

- **Always read and follow safety related precautions found on containers of hazardous substances like parts cleaners, primers, sealants, and sealant removers.**
- **Failure to comply could result in death or serious injury.**

0000014en

⚠ 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.**

0000003en

CAUTION

- **Only use the engine oil specified. Other engine oils may affect warranty coverage, cause internal engine components to seize, or shorten engine life.**
- **Prevent dirt and debris from contaminating engine oil. Carefully clean the oil cap / dipstick and the surrounding area before you remove the cap.**
- **NEVER mix different types of engine oil. This may adversely affect the lubricating properties of the engine oil.**
- **NEVER overfill. Overfilling may result in white exhaust smoke, engine overspeed or internal damage.**

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