2. TECHNICAL DATA

2. Technical Data

2-1 Specifications

Item	Unit	V8
Main specifications of machine		
Dimensions		
Standard bucket capacity	m^3	0,8

PREVIEW - YOUFIXTHIS.COM

Blurred on purpose. The manual you buy has this page in full quality.

Download full manual at youfixthis.com

4-2-4 Cylinder Head

Cylinder Head Components

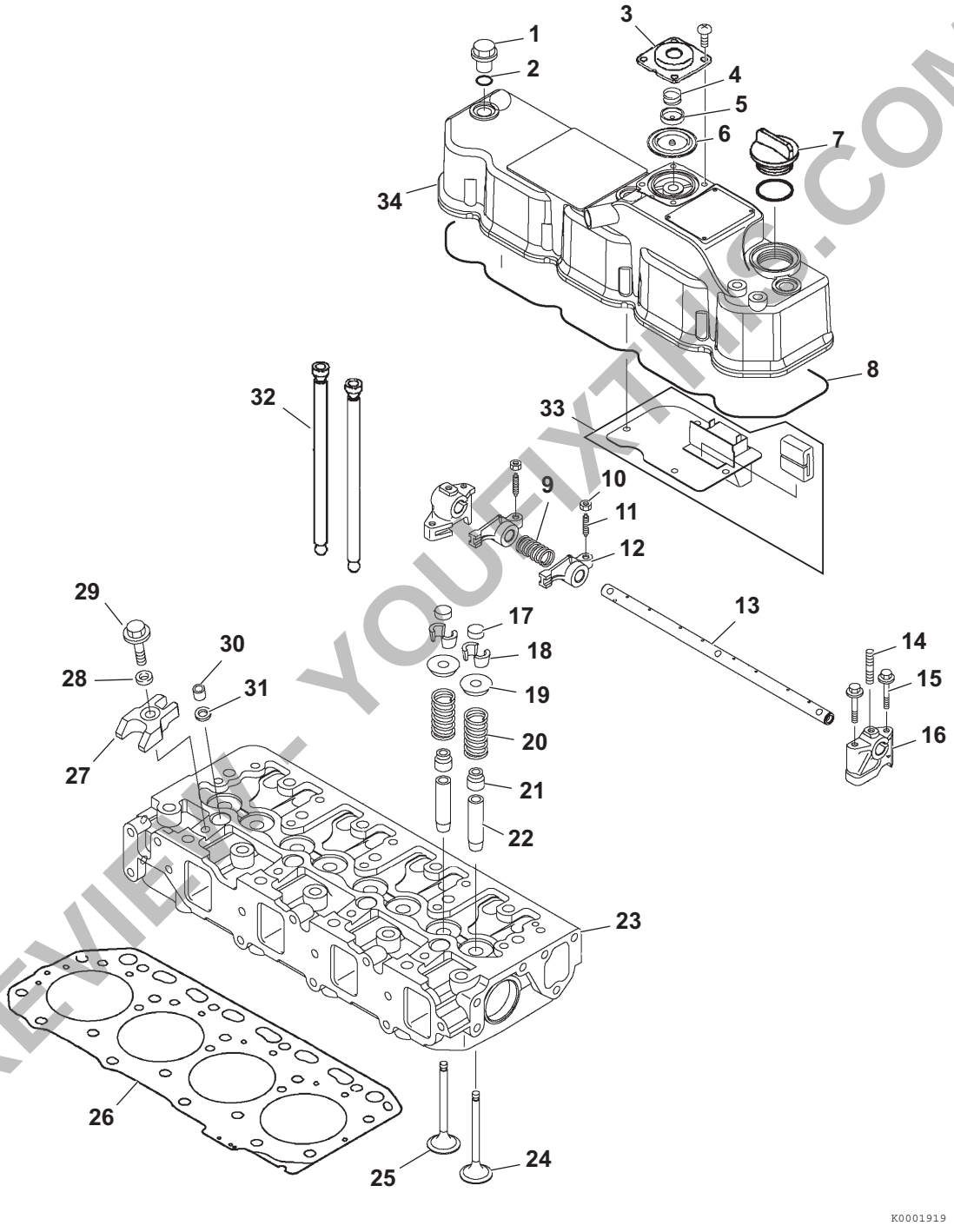


Figure 4-2-1

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

1 – Valve cover nut
2 – Valve cover nut O-ring
3 – Crankcase breather cover
4 – Diaphragm spring
5 – Diaphragm plate
6 – Crankcase breather diaphragm (non-turbocharged engines only)
7 – Oil fill cap
8 – Valve cover gasket
9 – Rocker arm shaft spring
10 – Valve adjusting screw lock nut
11 – Valve adjusting screw
12 – Rocker arm
13 – Rocker arm shaft
14 – Rocker arm shaft aligning stud
15 – Support bolt
16 – Rocker arm shaft support
17 – Valve cap
18 – Valve keepers
19 – Spring retainer
20 – Valve spring
21 – Valve stem seal
22 – Valve guide
23 – Cylinder head
24 – Intake valve
25 – Exhaust valve
26 – Cylinder head gasket
27 – Fuel injector retainer
28 – Washer
29 – Fuel injector retainer bolt
30 – Fuel injector nozzle protector
31 – Fuel injector nozzle seat
32 – Push rod
33 – Crankcase breather components
34 – Valve cover

Disassembly of Cylinder Head

Prepare a clean, flat working surface on a workbench large enough to accommodate the cylinder head assembly. Discard all gaskets, O-rings and seals. Use new gaskets, O-rings and seals on reassembly of cylinder head.

IMPORTANT

Mark all valve train components so they can be installed in their original locations.

Note: Record all measurements taken during disassembly.

1. Drain coolant from engine into a suitable container.

NOTICE

Identify all parts and their location using an appropriate method. It is important that all parts are returned to the same position during the reassembly process.

---

2. Remove the coolant pump. *See Disassembly of Engine Coolant Pump on page 4-4-4.*
3. Remove the high-pressure fuel lines and fuel injectors from the cylinder head. *See Removal of Fuel Injectors on page 4-3-18.*

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

5-2 Electric diagram

5-2-1 Steering column

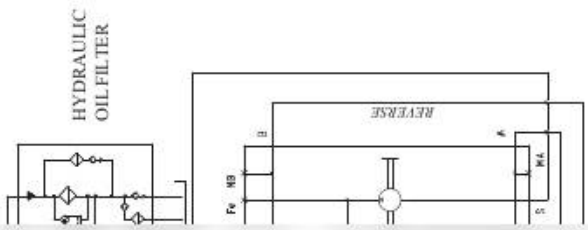


Blurred on purpose. The manual you buy has this page in full quality.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

2-6 Hydraulic Circuit Schematic



Blurred on purpose. The manual you buy has this page in full quality.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Failure Diagnostic List

Symptoms and conditions of failures / Cause	Defective start					Engine stall after start			Defective rotation control						Insufficient engine output			Noise/vibration				Lubricant				Cooling water		Intake		Exhaust				Fuel			Electrics/electronics						Action	Referenced page number
	Starter not rotate		Starter rotates			Exhaust fume				Without load			At work		Exhaust color															At work														
	ECU indicator lamp not on just after key-on	ECU indicator lamp on just after key-on (2 seconds)	Engine not start (not even initial combustion)	Engine not start (stall after serial combustion)	Engine starts later then ever	None	Little	Much	Speed change by accelerator not available (constant speed)	Specified speed setting not available	Poor acceleration	Return to low speed not smooth	Hunting	Hunting	Normal	White		Knocking noise at combustion too high	Combustion noise uneven	Noise other than combustion from engine	Engine vibration too big	Lubricant consumption too much	Lubricant diluted with fuel	Lubricant mixed with water	Oil pressure too low (oil pressure lamp on)	Overheated (water temperature lamp on)	Water temperature too low	Pressure down (air cleaner lamp on)	Pressure up		Blow-by too much	Exhaust temperature up	Fuel consumption too much	Fuel mixed with water (oil-water separator lamp on)	Fuel filter contaminated too early	Battery charge defect (charge lamp on)	ECU indicator lamp flashing	ECU indicator lamp not on just after key-on (2 seconds)	Prescribed ECU control function not operate	Fuse meltdown, disconnection (repeated)		
Engine system																																											
Intake/exhaust valve clearance incorrect			○			○									○					○									○				○										Valve clearance adjustment	*See Measuring and Adjusting Valve Clearance on page 4-2-20.*
Compression failure at valve seat			○												○		○			○									○		○	○	○	○									Valve seat facing	*See Valve face and valve seat on page 4-2-14.*
Intake/exhaust valve seizure			○					○						○	○		○			○	○		○						○		○	○										Correction or replacement of intake/exhaust valve	*See Removal of intake/exhaust valves on page 4-2-10.*
Cylinder head gasket blow-out															○									○		○																Gasket replacement	*See Removal of cylinder Head on page 4-2-9.*
Piston ring sticking or breakage			○					○					○			○				○	○	○			○				○		○	○										Piston ring replacement	*See Reassembly of pistons on page 4-2-40.*
Wear of piston ring, piston or cylinder			○					○								○					○	○							○		○										Horning work and usage of over-sized parts	*See Honing and Boring on page 4-2-39.*
Seizure of crank pin metal or bearing parts			○			○							○	○						○	○										○											Repair or replacement	*See Inspection of crankshaft on page 4-2-37.*
Closed gap position fault of piston ring						○										○						○										○										Correction of closed gap position	*See Reassembly of pistons on page 4-2-40.*
Reverse assembling of piston ring																○						○								○		○										Correction of assembling	*See Reassembly of pistons on page 4-2-40.*
Wear of crank pin metal and journal metal													○	○	○					○	○				○																	Measurement and replacement	*See Inspection of crankshaft on page 4-2-37.*
Connecting rod bolt loose																				○	○				○																	Tightening at specified torque	*See Torque for Bolts and Nuts on page 6-21.*
Foreign material entered into combustion chamber			○																	○		○									○											Disassembling and repair	*See Disassembly of Engine on page 4-2-23.*
Gear backlash too big																				○																						Gear mesh adjustment	*See Checking timing gear backlash on page 4-2-25.*
Wear of intake/exhaust valve guide																○						○										○										Measurement and replacement	*See Inspection of valve guides on page 4-2-12.*
Governor misalignment			○			○						○	○	○							○																					Adjustment	
Open/close timing failure of intake/exhaust valve			○													○	○			○										○	○											Valve clearance adjustment	*See Measuring and Adjusting Valve Clearance on page 4-2-20.*
Engine vibration isolating support loose, damage													○	○						○	○																						Repair or replacement of faulty parts	
Cooling water system																																											
Radiator super cooled																											○				○											Thermostat replacement	*See Disassembly of Engine Coolant Pump on page 4-4-5.*
Insufficient radiator cooling																○									○						○											Thermostat replacement or check for fan belt loose	*See Disassembly of Engine Coolant Pump on page 4-4-5.*
Insufficient cooling water quantity																○									○						○											Water leak inspection of cooling water system	*See Engine Coolant System Check on page 4-4-4.*
Water jacket cracks																								○	○	○																Repair or replacement	*See Disassembly of Engine Coolant Pump on page 4-4-4.*
Fan belt elongation																○									○						○											Adjustment of belt tension	
Thermostat fault																○									○	○					○											Inspection or replacement	*See Disassembly of Engine Coolant Pump on page 4-4-4.*

PREVIEW OF YOUFIXTHIS.COM

Download full manual at youfixthis.com

CONTENTS

CHAPTER 1
GENERAL CAUTIONS FOR MAINTENANCE WORK

1-1 Correct Work 1-1
1-2 Safety Precautions 1-1
1-3 Preparations 1-1
1-4 Cautions for Disassembly and Reassembly 1-1
1-5 Cautions for Removal and Installation of Hydraulic Equipment 1-2
1-6 Cautions for Removal and Installation of Hydraulic Piping 1-2
1-7 Cautions for Handling Seals 1-3
1-8 Correct Installation of Hydraulic Hose 1-3
1-9 Specifications of Hydraulic Hose 1-6
1-10 Air Release of Hydraulic Equipment 1-8

CHAPTER 2
TECHNICAL DATA

2-1 Specifications 2-1-1
2-2 Outline Drawing and Working Area 2-2-1
2-3 Lifting Capacity List 2-3-1
2-4 Periodic Inspection and Servicing 2-4-1
2-5 Fuel, Lube Oil and Grease Recommended 2-5-1
2-6 Hydraulic Circuit Schematic 2-6-1
2-7 Electrical Diagram 2-7-1

CHAPTER 3
SERVICE STANDARDS

3-1 Machine Performance 3-1-1

CHAPTER 4
ENGINE

4-1 Safety 4-1-1
4-1-1 Safety Statements 4-1-1
4-1-2 Safety Precautions 4-1-2
4-2 Engine 4-2-1
4-2-1 Before You Begin Servicing 4-2-1
4-2-2 Special Service Tools 4-2-2
4-2-3 Measuring Instruments 4-2-4
4-2-4 Cylinder Head 4-2-6
4-2-5 Measuring and Adjusting Valve Clearance 4-2-20
4-2-6 Crankshaft and Camshaft Components 4-2-23
4-3 Fuel System 4-3-1
4-3-1 Before You Begin Servicing 4-3-1
4-3-2 Introduction 4-3-2
4-3-3 Special Service Tools 4-3-7

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

4-3-4 Measuring Instruments 4-3-7
4-3-5 Fuel System Diagram 4-3-8
4-3-6 Fuel System Components 4-3-9
4-3-7 Fuel Injection Pump 4-3-11
4-3-8 Checking and Adjusting Fuel Injection Timing 4-3-22
4-3-9 Fuel Injectors 4-3-27
4-4 Cooling System 4-4-1
4-4-1 Before You Begin Servicing 4-4-1
4-4-2 Introduction 4-4-2
4-4-3 Cooling System Diagram 4-4-2
4-4-4 Engine Coolant Pump Components 4-4-3
4-4-5 Engine Coolant System Check 4-4-4
4-4-6 Engine Coolant Pump 4-4-4
4-5 Lubrication System 4-5-1
4-5-1 Before You Begin Servicing 4-5-1
4-5-2 Introduction 4-5-2
4-5-3 Lubrication System Diagram 4-5-4
4-5-4 Checking Engine Oil Pressure 4-5-5
4-5-5 Trochoid Oil Pump 4-5-5
4-6 Starter Motor 4-6-1
4-6-1 Before You Begin Servicing 4-6-1
4-6-2 Introduction 4-6-2
4-6-3 Starter Motor Information 4-6-2
4-6-4 Starter Motor Troubleshooting 4-6-3
4-6-5 Starter Motor Components 4-6-4
4-7 Alternator 4-7-1
4-7-1 Before You Begin Servicing 4-7-1
4-7-2 Introduction 4-7-2
4-7-3 Alternator Specifications 4-7-2
4-7-4 Alternator Troubleshooting 4-7-3
4-7-5 Alternator Components 4-7-4
4-7-6 Alternator Wiring Diagram 4-7-5
4-7-7 Alternator Standard Output 4-7-6
4-7-8 Alternator 4-7-7
4-8 Electric Wiring 4-8-1
4-8-1 Electric Wiring Precautions 4-8-1
4-9 Troubleshooting 4-9-1
4-9-1 Special Service Tools 4-9-1
4-9-2 Troubleshooting By Measuring Compression Pressure 4-9-2
4-9-3 Quick Reference Table For Troubleshooting 4-9-4

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

NOTICE

- Only use the engine coolant specified. Other engine coolants may affect warranty coverage, cause an internal buildup of rust and scale and / or shorten engine life.
- Prevent dirt and debris from contaminating the engine coolant. Carefully clean the radiator cap and the surrounding area before you remove the cap.
- NEVER mix different types of engine coolants. This may adversely affect the properties of the engine coolant.

NOTICE

- NEVER overfill the engine with engine oil.
- ALWAYS keep the oil level between the upper and lower lines on the oil cap / dipstick.

NOTICE

For maximum engine life, Yanmar recommends that when shutting the engine down, you allow the engine to idle, without load, for five minutes. This will allow the engine components that operate at high temperatures, such as the turbocharger (if equipped) and exhaust system, to cool slightly before the engine itself is shut down.

NOTICE

NEVER use an engine starting aid such as ether. Engine damage will result.

NOTICE



- ALWAYS be environmentally responsible.
- Follow the guidelines of the EPA or other governmental agencies for the proper disposal of hazardous materials such as engine oil, diesel fuel and engine coolant. Consult the local authorities or reclamation facility.
- NEVER dispose of hazardous materials irresponsibly by dumping them into a sewer, on the ground, or into ground water or waterways.
- Failure to follow these procedures may seriously harm the environment.

NOTICE

NEVER engage the starter motor while the engine is running. This may damage the starter motor pinion and / or ring gear.

NOTICE

New Engine Break-in:

- On the initial engine start-up, allow the engine to idle for approximately 15 minutes while you check for proper engine oil pressure, diesel fuel leaks, engine oil leaks, coolant leaks, and for proper operation of the indicators and / or gauges.
- During the first hour of operation, vary the engine speed and the load on the engine. Short periods of maximum engine speed and load are desirable. Avoid prolonged operation at minimum or maximum engine speeds and loads for the next four to five hours.
- During the break-in period, carefully observe the engine oil pressure and engine temperature.
- During the break-in period, check the engine oil and coolant levels frequently.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Inspection of Tappets

1. Inspect the tappet contact surfaces for abnormal wear **(Figure 4-2-73, (1))**. Normal wear will be even as shown in **(Figure 4-2-72, (2)).** Slight surface defects can be corrected using an oilstone.

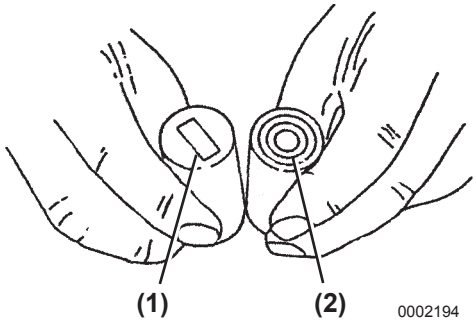


Figure 4-2-73

2. Measure the outside diameter of the tappet stem **(Figure 4-2-74, (1))**. Record the measurements. *See "3-2 Engine Service Standard" section for the service limit.*

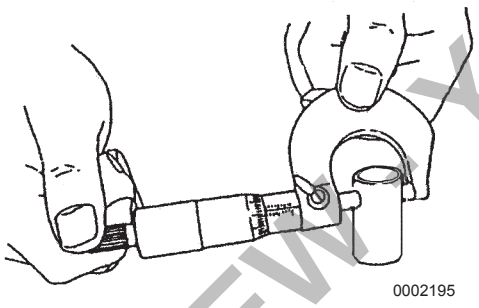


Figure 4-2-74

3. Measure the tappet bores in the cylinder block. Record the measurements. *See "3-2 Engine Service Standard" section for the service limit.*

Inspection of Crankshaft

1. Put the crankshaft end journals **(Figure 4-2-75, (4))** on V-blocks.
2. Place a dial indicator **(Figure 4-2-75, (3))** on a center main bearing surface.

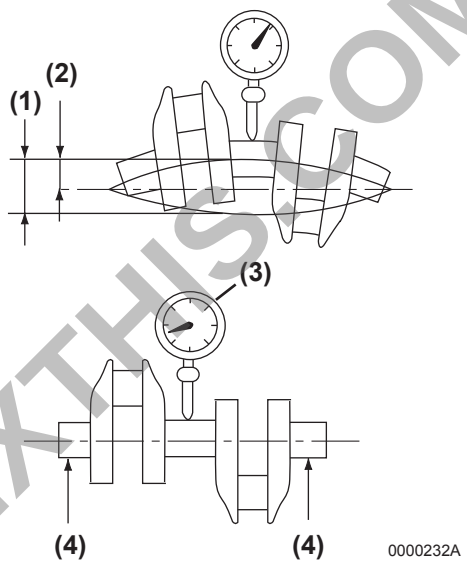


Figure 4-2-75

3. Rotate the crankshaft and observe runout. Record the measurements. *See "3-2 Engine Service Standard" section for the service limit.*
4. Use the color check method or MAGNAFLUX to inspect the crankshaft for cracks. Replace the crankshaft if evidence of fractures is found.
5. Measure the outside diameter of each crankpin **(Figure 4-2-76, (2))** and main bearing journal **(Figure 4-2-76, (1))**. *See "3-2 Engine Service Standard" section for the service limit.* Take measurements at several places around each bearing surface. If not within specification, grind the journals and install undersize bearings, or replace the crankshaft. Record the measurements.

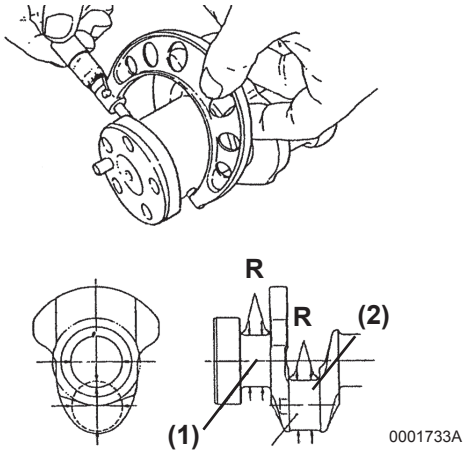


Figure 4-2-76

PREVIEW YOUFIXTHIS.COM
Download full manual at youfixthis.com

6. Inspect the sealing surfaces **(Figure 4-3-55, (2))** between the valve stop spacer and nozzle body for nicks or scratches. Check the contact area between the valve stop spacer and the nozzle valve **(Figure 4-3-55, (1))** for scoring, or pitting. Use a magnifier glass to inspect the area.

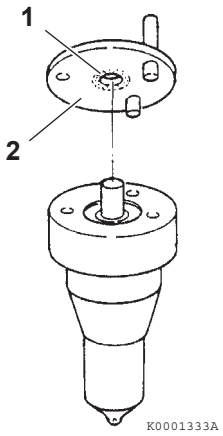


Figure 4-3-55

7. Perform a nozzle valve slide test:
   1- Wash nozzle body and valve in clean diesel fuel.
   2- While holding the nozzle body vertical, pull the nozzle valve about 2/3 of the way out **(Figure 4-3-56)**.
   3- Release the valve. It should fall smoothly to its seat by it's own weight.

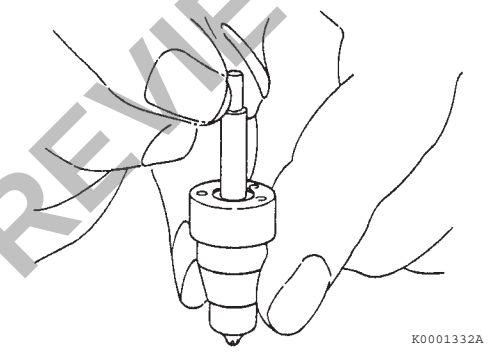
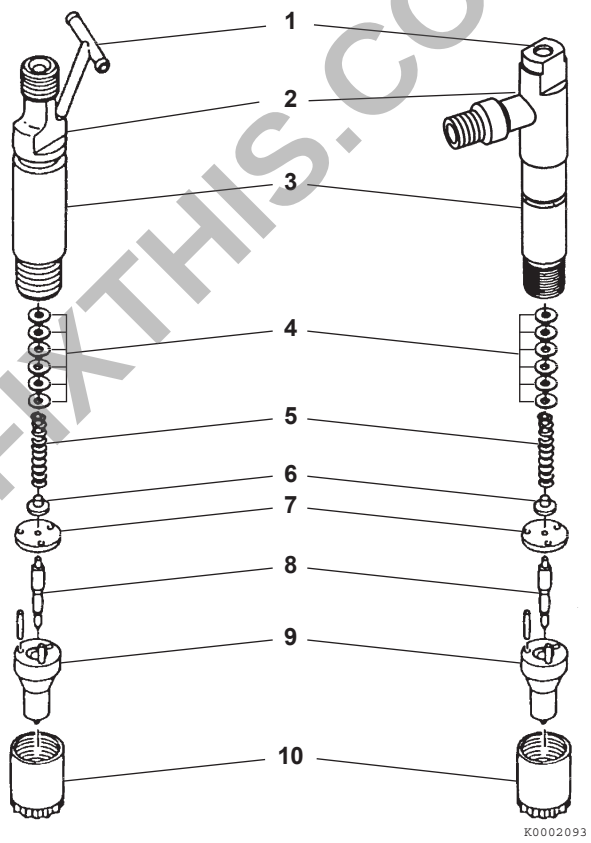


Figure 4-3-56

8. Replace the fuel injector assembly if it fails any inspection.

Adjusting Fuel Injector Pressure

The fuel injectors open when pressure reaches a predetermined pressure threshold. They close when the pressure is reduced below that threshold. The pressure threshold can be adjusted by adding or removing shims **(Figure 4-3-57, (3))**.



1 – Fuel return passage
2 – Injector ID location
3 – Injector body
4 – Pressure adjusting shims
5 – Spring
6 – Spring seat
7 – Valve stop spacer
8 – Nozzle valve
9 – Nozzle body
10 – Nozzle case nut

Figure 4-3-57

The injection pressure will change by approximately 1.9 MPa for every 0.1 mm in shim thickness.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

4-7-8 Alternator

⚠ WARNING

SHOCK HAZARD!



- **Turn off the battery switch (if equipped) or disconnect the negative battery cable before servicing the electrical system.**
- **Check the electrical harnesses for cracks, abrasions, and damaged or corroded connectors. ALWAYS keep the connectors and terminals clean.**
- **Failure to comply could result in death or serious injury.**

Removal of Alternator

1. Disconnect the electrical wires from the alternator.
2. Loosen the V-belt.

⚠ CAUTION

PINCH HAZARD!



Carefully rotate the alternator toward the cylinder block while loosening the V-belt. Failure to comply may result in minor or moderate injury.

3. Remove the V-belt adjuster from the alternator bolt **(Figure 4-7-4, (1))**.
4. Remove the nut **(Figure 4-7-4, (2))** from the gear case stud. Remove the alternator.

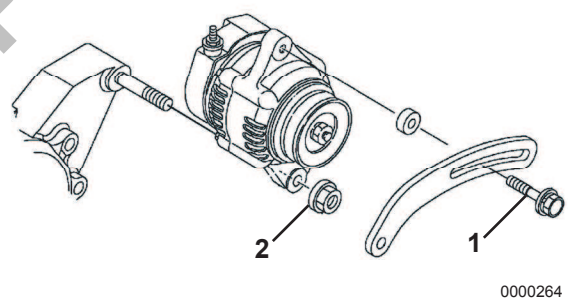


Figure 4-7-4

Disassembly of Alternator

1. Remove the nut **(Figure 4-7-5, (1))** from the shaft of the rotor assembly. Remove the pulley **(Figure 4-7-5, (2))**.

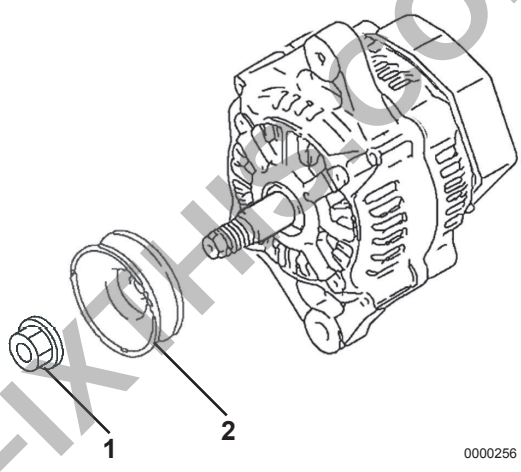


Figure 4-7-5

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW ONLY

You're viewing 12 of 213 pages

The full manual includes:

- All 213 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

Yanmar V7, V8 Service Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual