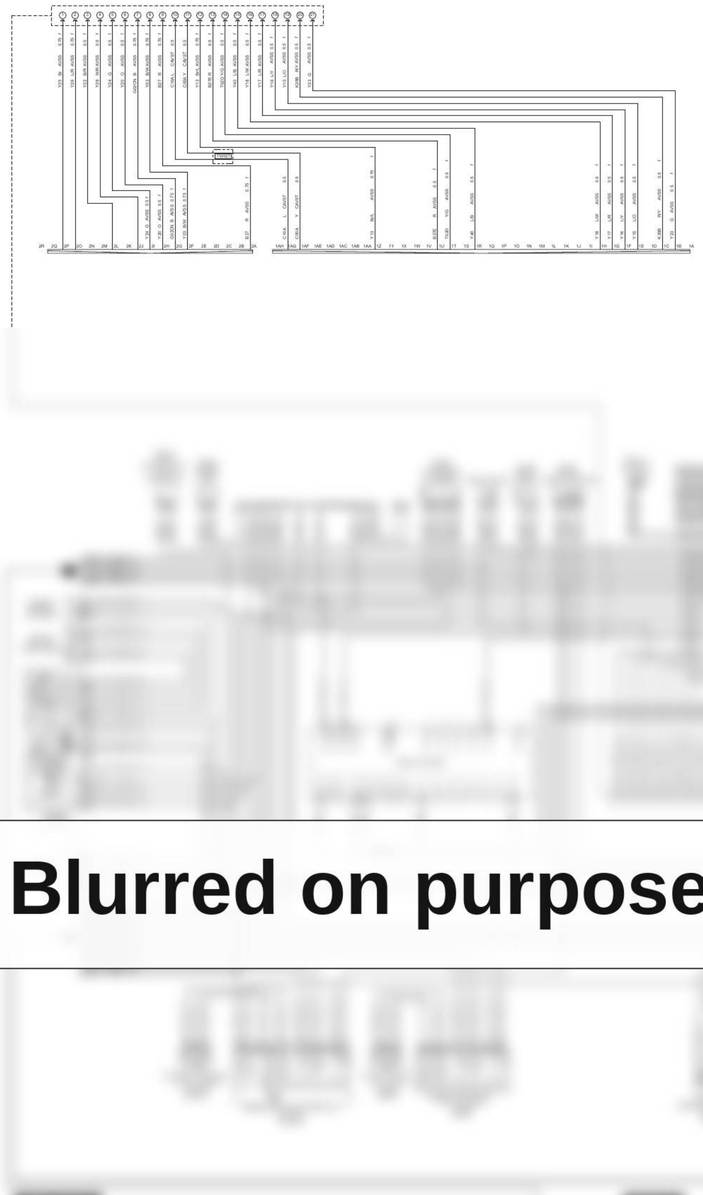
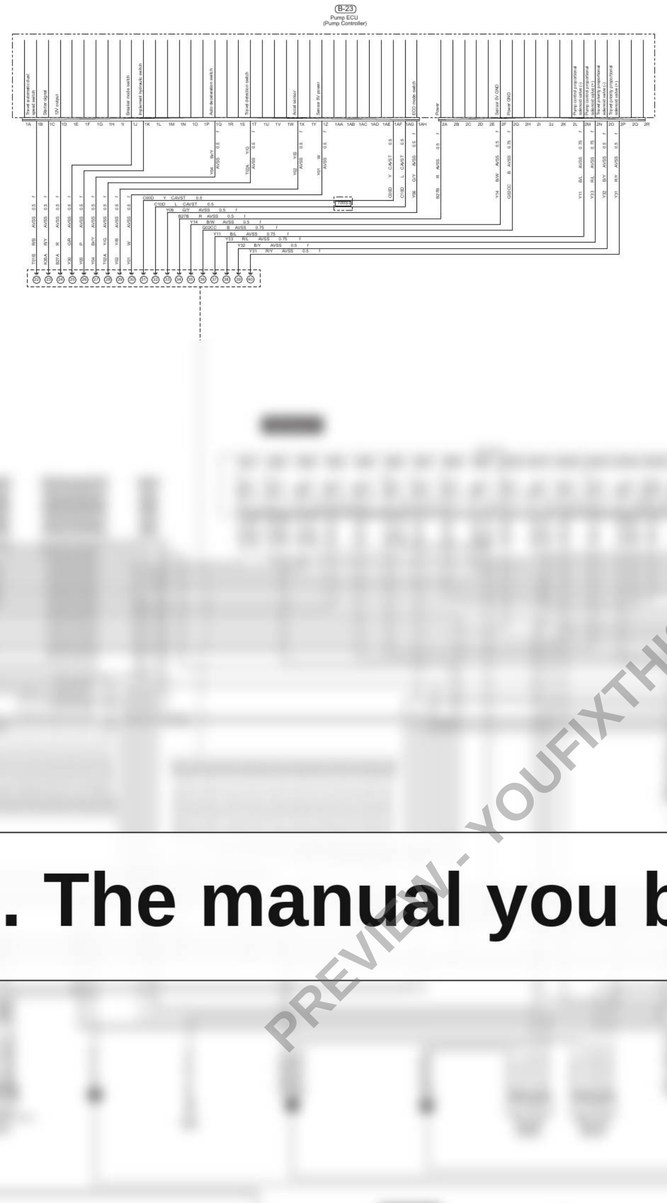
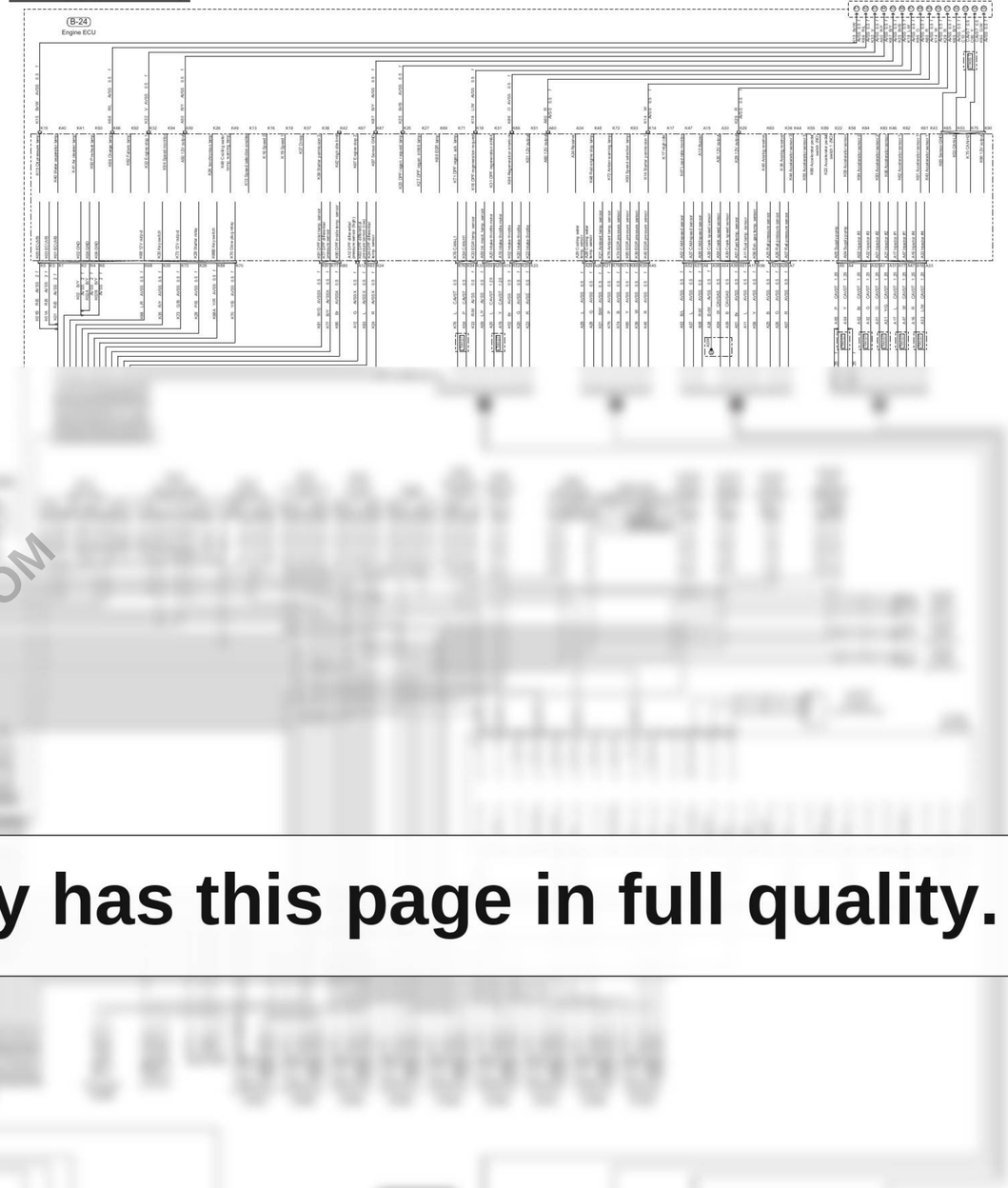
Controller (Pump) Detailed Drawing 1



Controller (Pump) Detailed Drawing 2



Controller (Engine) Detailed Drawing



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2. TECHNICAL DATA

2-8 Hydraulic Circuit Schematic



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4-2-4 Cylinder Head

Cylinder Head Components

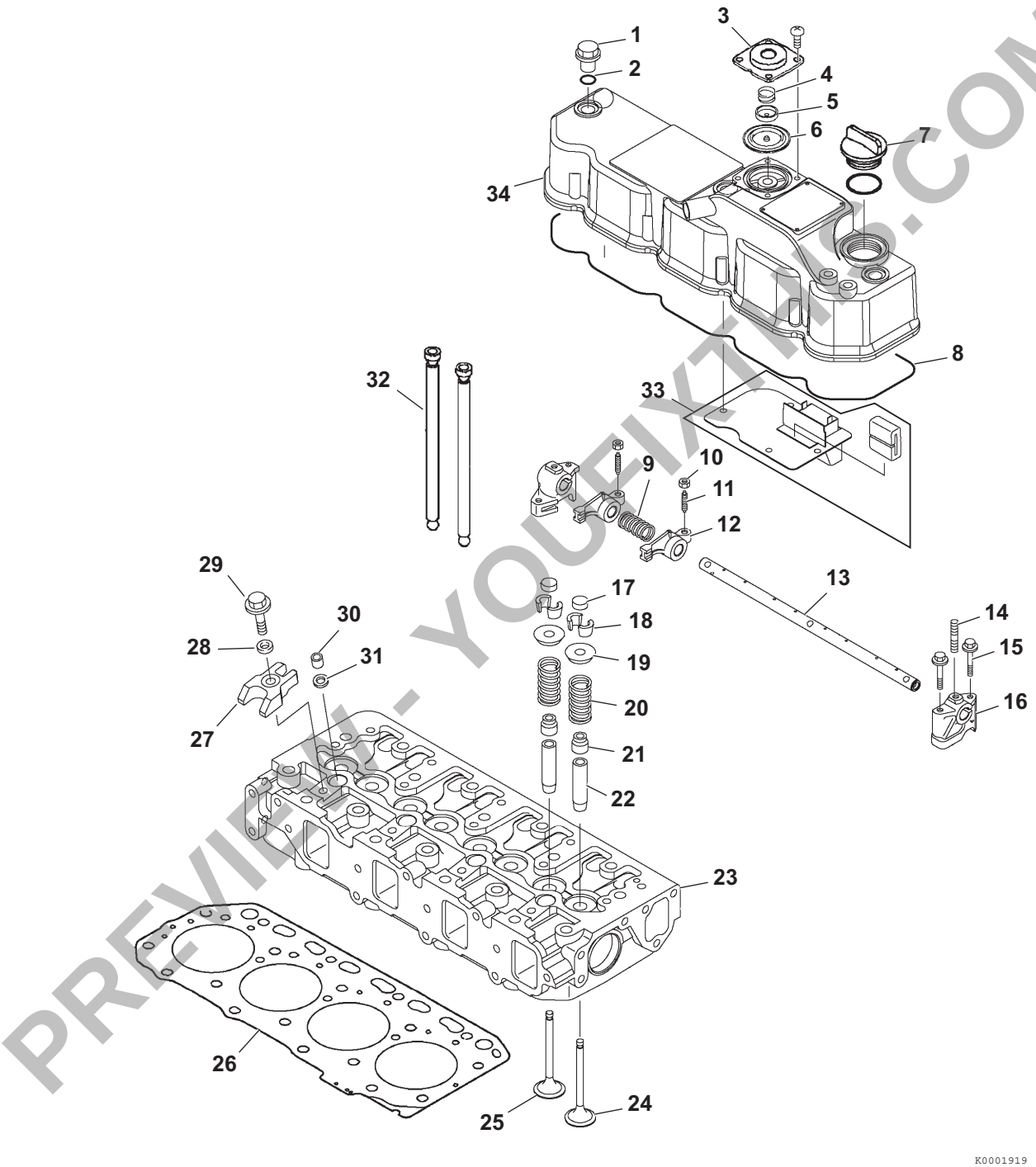


Figure 4-2-1

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3. SERVICE STANDARDS

3-7 List of Tightening Torque

3-7-1 Machine

Applicable model			ViO82		
Equipment			Thread size	Tightening torque ft•lbf (N•m)	Adhesive
	No	Tightening part			
Engine / Electrical equipment					

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Error Code List

Error code	Classification	Error description	Detection condition	Causes	Corrective measures
00 000051.03	Caution	Intake throttle position sensor malfunction: High voltage	The sensor voltage is higher than 4.8 V when the engine is not cranking.	1. Improper connector engagement, 2. Faulty wire harness, 3. Intake throttle position sensor failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, intake throttle position sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000051.04	Caution	Intake throttle position sensor malfunction: Low voltage	The sensor voltage is lower than 0.2 V when the engine is not cranking.	1. Improper connector engagement, 2. Faulty wire harness, 3. Intake throttle position sensor failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, intake throttle position sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000091.03	Caution	Accelerator sensor malfunction: High voltage	The sensor voltage is higher than 4.6 V.	1. Improper connector engagement, 2. Faulty wire harness, 3. Accelerator sensor failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, accelerator sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000091.04	Caution	Accelerator sensor malfunction: Low voltage	The sensor voltage is lower than 0.2 V.	1. Improper connector engagement, 2. Faulty wire harness (Sensor 5V disconnection or short to ground), 3. Accelerator sensor failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, accelerator sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000100.01	Warning	Low engine oil pressure alarm	After the engine starts, the engine oil pressure switch stays on for a specific period of time at an engine speed of 600 min^{-1} or more and at a battery voltage of 9V or more.	1. Low engine oil pressure, 2. Engine lubrication system failure, 3. Faulty wire harness (Engine oil pressure switch wire short to ground), 4. Engine oil pressure switch failure (Short to ground on a wire inside the engine oil pressure switch), 5. Engine ECU internal circuit failure	Check the amount of engine oil, engine lubrication system, wire harness, engine oil pressure switch and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000100.04	Warning	Engine oil pressure switch disconnection	Before the engine starts with the starter switch in the "ON" position, the engine oil pressure switch stays off for one second at a battery voltage of 9 V or more.	1. Improper connector engagement, 2. Faulty wire harness (Engine oil pressure switch wire disconnection or short to power), 3. Engine oil pressure switch failure (Wire disconnection or short to power on a wire inside the engine oil pressure switch), 4. Engine ECU internal circuit failure	Check the connector, wire harness, engine oil pressure switch and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000102.03	Warning	EGR low pressure-side sensor malfunction: High voltage	The sensor voltage is higher than 4.8 V when the engine is not cranking.	1. Improper connector engagement, 2. Faulty wire harness (Sensor signal wire short to ground), 3. EGR pressure sensor failure (Improper sensor output due to short to ground on a wire inside the EGR pressure sensor), 4. Engine ECU internal circuit failure	Check the connector, wire harness, EGR pressure sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000102.04	Warning	EGR low pressure-side sensor malfunction: Low voltage	The sensor voltage is lower than 0.2 V when the engine is not cranking.	1. Improper connector engagement, 2. Faulty wire harness, 3. EGR pressure sensor failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, EGR pressure sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000102.13	Warning	EGR low pressure-side sensor malfunction: Abnormal learning value	The final offset value for the intake manifold pressure is lower than the threshold value or higher than the threshold value.	1. Improper connector engagement, 2. Faulty wire harness, 3. EGR pressure sensor failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, EGR pressure sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000105.03	Warning	Intake manifold temperature sensor malfunction: High voltage	The sensor voltage is higher than 4.8 V when the engine is not cranking.	1. Improper connector engagement, 2. Faulty wire harness, 3. Intake manifold temperature sensor failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, intake manifold temperature sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000105.04	Warning	Intake manifold temperature sensor malfunction: Low voltage	The sensor voltage is lower than 0.2 V when the engine is not cranking.	1. Improper connector engagement, 2. Faulty wire harness, 3. Intake manifold temperature sensor failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, intake manifold temperature sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000108.03	Caution	Atmospheric pressure sensor malfunction: High voltage	The sensor voltage is higher than 4.8 V when the engine is not cranking.	1. Failure of atmospheric pressure sensor inside engine ECU, 2. Engine ECU internal circuit failure	Check the atmospheric pressure sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000108.04	Caution	Atmospheric pressure sensor malfunction: Low voltage	The sensor voltage is lower than 0.2 V when the engine is not cranking.	1. Failure of atmospheric pressure sensor inside engine ECU, 2. Engine ECU internal circuit failure	Check the atmospheric pressure sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000108.10	Caution	Abnormal atmospheric pressure sensor characteristics	The final offset values for both the intake manifold pressure and the exhaust manifold pressure remain at 5 kPa or higher for 600 ms.	1. Failure of atmospheric pressure sensor inside engine ECU, 2. Engine ECU internal circuit failure, 3. Abnormal characteristics of both EGR high pressure-side and low pressure-side sensors, 4. Obstruction due to foreign matter in the sensor area or frozen sensor	Check the atmospheric pressure sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000110.00	Warning	Abnormally-high coolant temperature (Overheating)	60 seconds after the engine starts, the coolant temperature remains at 110°C or higher for 20 seconds.	1. Engine overheating, 2. Insufficient engine coolant, 3. Engine cooling system failure, 4. Coolant temperature sensor system failure	Check the amount of engine coolant, engine cooling system and coolant temperature sensor system. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.

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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 the cylinder head.

1. Drain the coolant from the 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. Disconnect the electrical wire from the glow plug, injector, intake throttle, EGR valve and sensors **(Figure 4-2-3, (1))**.

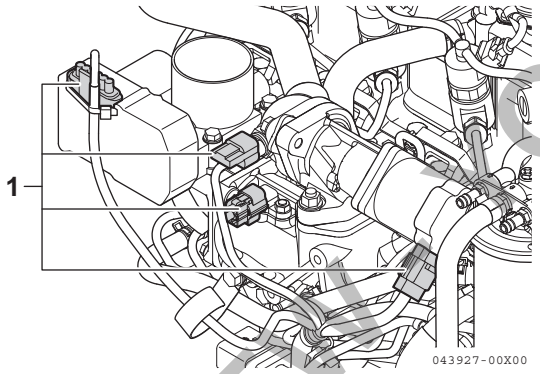


Figure 4-2-3

3. Disconnect the fuel pipes from the fuel filter, if the fuel filter is mounted on the intake manifold.
4. Remove the intake throttle, EGR valve and fuel filter on the intake manifold if required (discard the all gasket).
5. Remove the intake manifold bolts **(Figure 4-2-4, (1))**. Remove the intake manifold **(Figure 4-2-4, (2))**. Discard the intake manifold gasket **(Figure 4-2-4, (3))**.

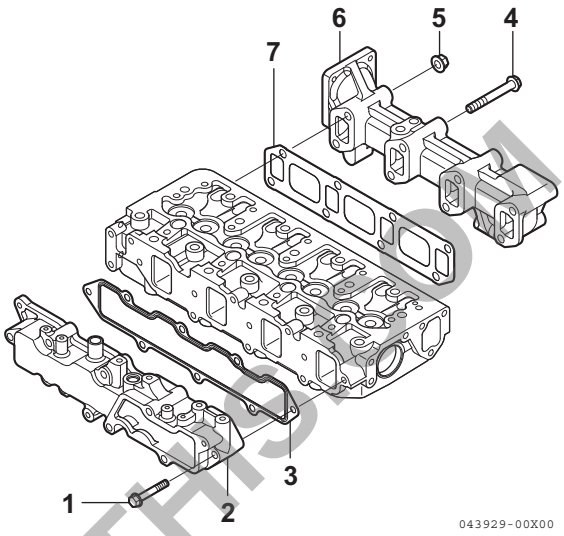


Figure 4-2-4

6. Disconnect the electrical wire from the diesel particulate filter if mounted.
7. Remove the diesel particulate filter from the engine (discard the all gasket).
8. Remove the exhaust manifold bolts **(Figure 4-2-4, (4))** and nuts **(Figure 4-2-4, (5))**. Remove the exhaust manifold **(Figure 4-2-4, (6))** and the exhaust manifold gasket **(Figure 4-2-4, (7))**.
9. Remove the coolant pump. *See Disassembly of Engine Coolant Pump on page 4-4-6.*
10. Remove the high-pressure lines and fuel injectors from the cylinder head. *See Removal of Injector on page 4-3-8.*

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2. TECHNICAL DATA

2. Technical Data

2-1 Specifications

2-1-1 Standard arm type

Item	Unit	ViO82	
		With quick coupler	Without quick coupler

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8-2 Quick Reference Table for Troubleshooting

The following table summarizes the general trouble symptoms and their causes.
If any trouble symptom occurs, take corrective action before it becomes a serious problem.

Trouble symptoms are shown in columns and their causes are shown in rows.

Whether boxes where the column and rows intersect are marked with a circle should be checked.

Example: When the bucket does not move at all

Trouble symptom: Implement does not move at all. (Bucket)

Items relevant to causes whose corresponding boxes are marked with a circle must be inspected and repaired.

Cause \ Symptoms and conditions of failures		Implement does not move at all										Implement's force			
		All implements	Boom	Arm	Bucket	Boom swing	Swing	Blade	Travel R	Travel L	P.T.O.	Boom	Arm	Bucket	Boom swing
1. Hydraulic pump	Hydraulic pump ASSY	○													
	Piston pump P1			○		○				○	○		○		○
	Piston pump P2		○		○				○			○		○	
	Gear pump P3						○	○							
	Pilot pump P4		○	○	○	○	○		○	○	○	○	○	○	○
	Cut-off valve	○	○	○	○	○	○		○	○	○	○	○	○	○
	Travel speed switch valve														
2. Control valve	Sections related to P1 flow														
	Sections related to P2 flow														
	Sections related to P3 flow														
	Boom section		○									○			
	Arm section			○									○		
	Bucket section				○									○	
	Boom swing section					○									○
	Blade section							○							
	Swing section						○								
	Travel R section								○						

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2. TECHNICAL DATA

2-7 Fuel, Lube Oil and Grease Recommended

Components	Fluid	Temperatures °C								Quantity prescribed (L)	
		-	-20	-10	0	10	20	30	+		
Thermal engine	Engine oil		SAE 10W CJ-4							10,5	–
			SAE 10W-30 CJ-4								
				SAE 15W-40 CJ-4							

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2-6 Periodic Inspection and Servicing

○: Verification and adjustment ●: Replacement □: Cleaning ■: Greasing

Parts & Operations		Daily	Every 50h	Every 500h	Every 1000h / Every year	Every 2000h / Every two years
General	Missing or broken parts	○				
	Tightening of nuts and bolts	○				
	Engine and battery in good condition	○				
	Machine	□				
Transmissions	Travel gears		● 1st time	○	●	
	Rotation reducer		● 1st time	○	●	
Hydraulic circuit	Hydraulic oil	○			●	
	Aspiration filter				□	
	Hydraulic oil return filter		● 1st time	●		
	Operation of the accumulator	○				
Greasing	Greasing points	■				
	Rotation pin and crown		■			
Chassis	Bearing rollers and bearings, idler wheels	○			■	
	Track tension	○				
Electrical equipment	Headlights, horn, travel alarm	○				
	Dashboard and indicators	○				
	System state	○				
Engine	Water separator	○				
	GO filter			●		
	Air filter (dusty atmosphere every 250 h)			●		
	Engine oil	○	● 1st time	●*		
	Oil filter		● 1st time	●*		
	Cooling fluid	○				●
	Belt	○			●	
	Radiator vents	○		□		
	Fuel hose, coolant hose					●
	Intake and exhaust valves				○	
	Injectors and injection pressure					○
	EGR valve				□	
Air conditioning					○	

*. Every 500h / Every year

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4. Engine

4-1 Safety

4-1-1 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 TNV 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 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.

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3. SERVICE STANDARDS

3-2 Engine

1) Nominal and Allowable Values

Applicable model		4TNV98C-WBV1	
Item	Unit	Standard	Allowable limit
Cylinder head			
Adjustment of valve clearance	in. (mm)	0.006 to 0.010	

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4-2-5 Measuring and Adjusting Valve Clearance

Measure and adjust while the engine is cold.

Note:

- *The No. 1 piston position is on the flywheel end of the engine, opposite the radiator. The firing order is 1-3-4-2 for 4-cylinder engines.*
- *4-cylinder engines fire every 180° of crankshaft rotation.*
- *Valve clearance of both the intake and exhaust valves can be checked with the piston for that cylinder at top dead center (TDC) of the compression stroke. When a piston is at TDC of the compression stroke, both rocker arms will be loose and the cylinder TDC mark on the flywheel will be visible in the timing port of the flywheel housing.*
- *If there is no valve clearance, and the cylinder is at TDC of the compression stroke, extreme wear, or damage to the cylinder head or valves may be possible.*
- *If adjusting each cylinder individually, the cylinder to be adjusted first does not have to be the No. 1 cylinder. Select and adjust the cylinder where the piston is nearest to the top dead center after turning. Make adjustment for the remaining cylinders in the order of firing by turning the crankshaft each time.*
- *To decrease the number of rotations required to check all cylinders, other cylinders can also be checked as indicated in the chart below.*

Example: On a 4-cylinder engine, with the No. 1 piston at TDC on the compression stroke (both valves closed), the valves indicated on the top line of the chart can be adjusted without rotating the crankshaft. To adjust the remaining four valves, rotate the crankshaft until the No. 1 piston is at TDC on the exhaust stroke (exhaust valve only open).

■ 4-cylinder engines

Cylinder No.	1		2		3		4	
Valve	Intake	Exhaust	Intake	Exhaust	Intake	Exhaust	Intake	Exhaust
No. 1 cylinder at TDC compression	•	•	•			•		
No. 4 cylinder at TDC compression				•	•		•	•

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Disassembly of Oil Pump

NOTICE

If the oil pump must be replaced, replace it as an assembly only. Do not replace individual components.

Remove the engine cooling fan guard (if equipped), engine cooling fan **(Figure 4-5-4, (3))**, spacer **(Figure 4-5-4, (2))**, engine coolant pump V-pulley **(Figure 4-5-4, (1))** and V-belt.

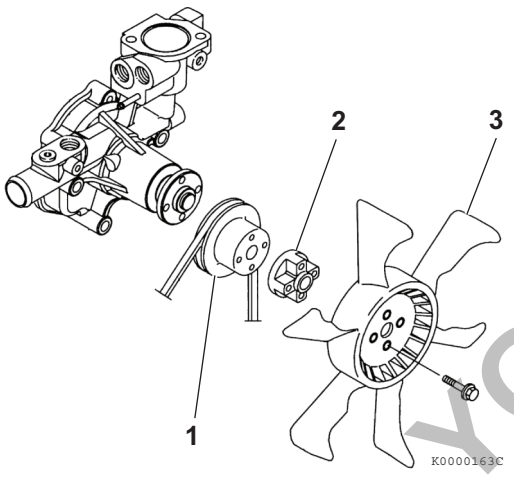


Figure 4-5-4

1. Remove the crankshaft pulley and the gear case cover. *See Removal of timing gear case cover on page 4-2-26.*
2. Remove the oil pump assembly bolts. Remove the oil pump assembly **(Figure 4-5-5, (1))** from the gear case housing **(Figure 4-5-5, (2))**.

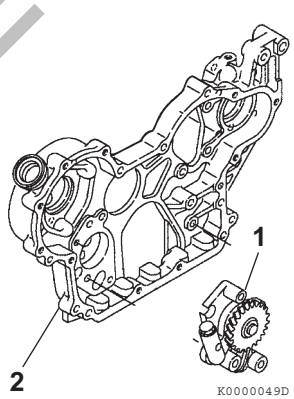


Figure 4-5-5

Cleaning and Inspection

Wash the oil pump, oil pressure regulator and oil pump cavity. Inspect for wear or damage. Replace as necessary.

NOTICE

If any oil pump component clearance exceeds its limit, the oil pump must be replaced as an assembly.

■ Check outer rotor outside clearance

Determine the outside clearance of the outer rotor. Insert a feeler gauge between the outer rotor **(Figure 4-5-6, (1))** and gear case oil pump cavity **(Figure 4-5-6, (2))**.

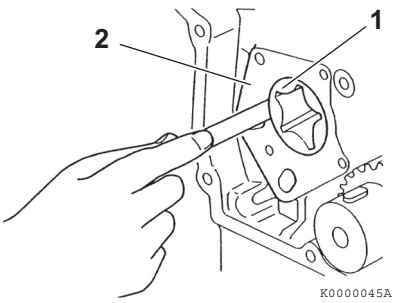


Figure 4-5-6

Record the measurement(s) and see "3-2 Engine" section for the service limit.

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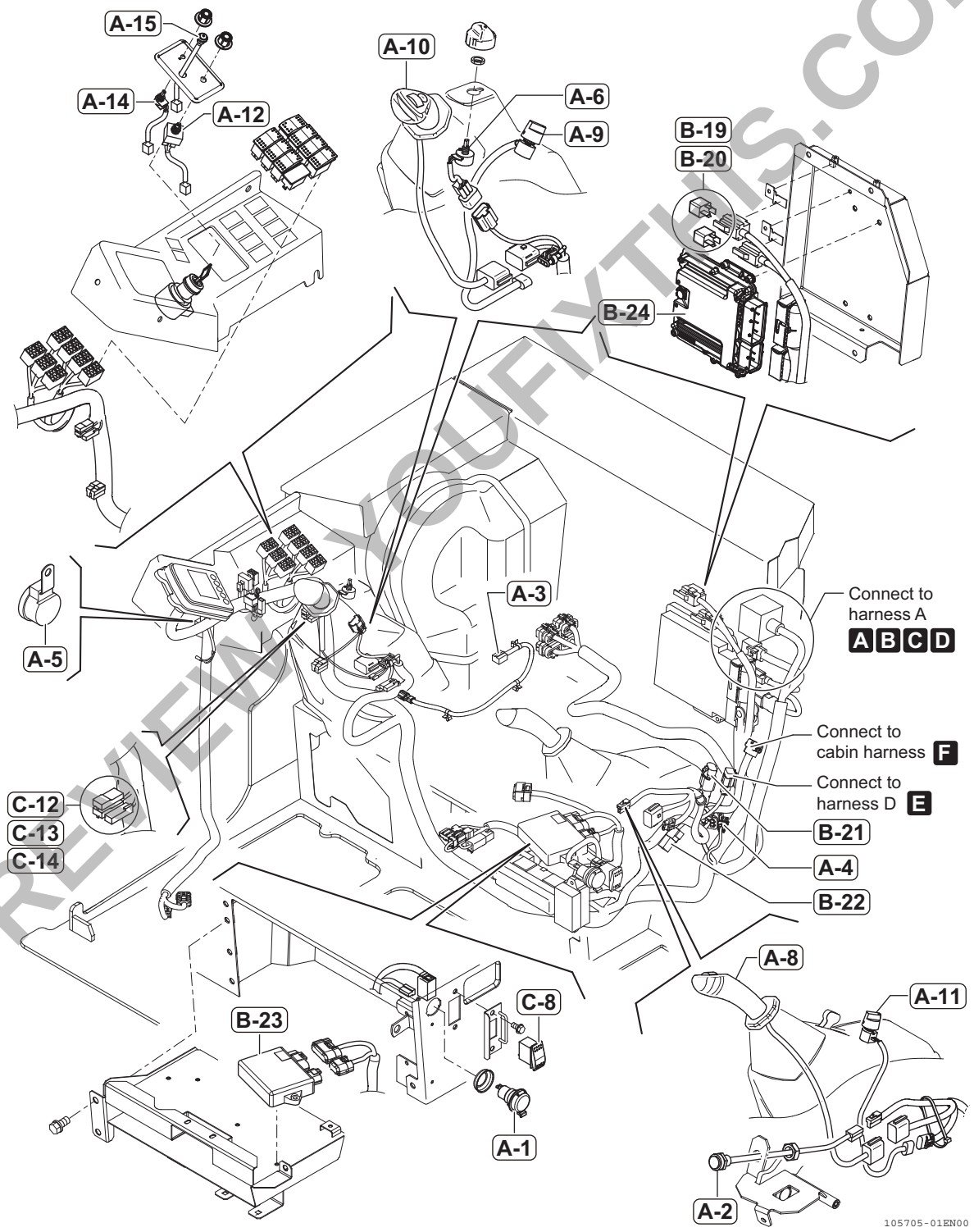
5. Electric System

5-1 Electric Equipment of Machine

5-1-1 Parts Layout of Electrical Equipment

1) Harness B

1/3



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Error code	Classification	Error description	Detection condition	Causes	Corrective measures
2E 000091.04	Caution	Accelerator sensor malfunction: Low voltage	Accelerator sensor voltage is lower than 0.2 V.	Inability to detect accelerator setting due to accelerator sensor failure, disconnection or continuous short circuit to GND	Check if the connectors, terminals and harnesses of the accelerator sensor are correctly connected. Also, check the installation condition.
2E 000108.12	Caution	Engine controller malfunction	Pump controller receives error signal from engine ECU.	Failure of atmospheric pressure sensor or internal circuit inside engine ECU	Check the engine ECU condition.
2E 024832.03	Warning	Abnormal sensor 5V power supply	Sensor power-supply voltage is lower than 4.5 V.	Abnormal sensor operation due to power supply voltage drop	Check the installation condition of each sensor and the harnesses connecting condition (short circuit).
2E 025088.02	Caution	Pump controller malfunction (EEPROM memory read error)	EEPROM error in pump controller	Provisional values are used because data is broken or faulty.	Restart the pump controller (by turning the starter switch to the “OFF” position and then the “ON” position.) If the error is still not resolved, replace the pump controller.
2E 025088.12	Caution	Pump controller malfunction (EEPROM memory writing error)	EEPROM error in pump controller	Provisional values are used because data is broken or faulty.	Restart the pump controller (by turning the starter switch to the “OFF” position and then the “ON” position.) If the error is still not resolved, replace the pump controller.
2E 025600.09	Caution	CAN communication error (Engine ECU)	Pump controller cannot receive data from engine ECU.	Engine data cannot be obtained due to disconnection of CAN communication line or defective engine ECU.	Check that the connectors, terminals and harnesses for CAN communication are correctly connected. Also, check the engine ECU for blown fuse.
2E 025856.09	Caution	CAN communication error (LCD monitor)	Pump controller cannot receive data from LCD monitor. (Pump controller is operating normally.)	• Disconnection or short circuit of CAN communication line between LCD monitor and pump controller • Blown fuse of LCD monitor • Pump controller failure or LCD monitor failure (Inability to send and receive data)	Check that the connectors, terminals and harnesses for CAN communication are correctly connected. Also, check the LCD monitor for blown fuse.
2E 026112.12	Caution	Pump controller malfunction	Malfunction of pump controller arbitration port or defective internal memory	• Arbitration port failure • Defective ROM • Broken RAM • Initialization failure	Check that pump controller is correctly mounted and that the connectors, terminals and harnesses for arbitration port are correctly connected. Also, rewrite the pump controller software. If the error is still not resolved, replace the pump controller.
2E 026368.12	Caution	Engine controller malfunction	Pump controller receives error signal from engine ECU.	Due to defective rotation sensor, engine rotation cannot be detected or any other engine trouble occurs.	Check the engine ECU condition.
2E 026880.09	Caution	CAN communication error (Work controller)	Pump controller cannot receive data from work controller. (Pump controller is operating normally.)	• Disconnection or short circuit of CAN communication line between work controller and pump controller • Pump controller failure or work controller failure (Inability to send and receive data)	Check that the connectors, terminals and harnesses for CAN communication are correctly connected. Also, check the controllers for blown fuse.
2E 030464.05	Caution	Abnormal output of pump control proportional solenoid valve (Too small feedback current)	Driving current for pump control proportional solenoid valve is smaller than command value of pump ECU.	Proportional solenoid valve cannot be activated due to disconnection or other fault or defect.	Check that the connectors, terminals and harnesses of the pump control proportional solenoid valve are correctly connected.
2E 030464.06	Caution	Abnormal output of pump control proportional solenoid valve (Too large feedback current)	Driving current for pump control proportional solenoid valve is larger than command value of pump ECU.	Proportional solenoid valve is moved exceeding the target due to short circuit to power supply or other fault or defect.	Check that the connectors, terminals and harnesses of the pump control proportional solenoid valve are correctly connected.
2E 032000.05	Caution	Abnormal output of travel priority proportional solenoid valve (Too small feedback current)	Driving current for travel priority proportional solenoid valve is smaller than command value of pump ECU.	Proportional solenoid valve cannot be activated due to disconnection or other fault or defect.	Check that the connectors, terminals and harnesses of the travel priority proportional solenoid valve are correctly connected.
2E 032000.06	Caution	Abnormal output of travel priority proportional solenoid valve (Too large feedback current)	Driving current for travel priority proportional solenoid valve is larger than command value of pump ECU.	Proportional solenoid valve is moved exceeding the target due to short circuit to power supply or other fault or defect.	Check that the connectors, terminals and harnesses of the travel priority proportional solenoid valve are correctly connected.
2E 033024.00	Caution	Abnormal power supply voltage of pump controller (Above the upper limit)	Pump controller power supply voltage is higher than 16.0 V.	Abnormal voltage causes breakage of pump ECU.	Check the connecting conditions of the alternator and battery.
2E 033024.01	Caution	Abnormal power supply voltage of pump controller (Voltage reduction)	Pump controller power supply voltage is higher than 10.0 V.	Warning against power supply voltage reduction (Operable)	Check the connecting conditions of the alternator and battery. Also, check the battery charging condition.
2E 033024.11	Caution	Abnormal power supply voltage of pump controller (Below the lower limit)	Pump controller power supply voltage is higher than 8.0 V.	Pump controller does not operate normally due to power supply voltage reduction	Check the connecting conditions of the alternator and battery. Also, check the battery charging condition.
2E 033792.02	Caution	Pump controller malfunction (Option setting defect)	Pump controller option settings are not correct.	A malfunction has occurred is the pump controller option settings.	Perform the initial settings of the pump ECU following the specified procedure. Restart the pump ECU (turn the starter switch to the “OFF” position and then to the “ON” position) to reflect the initial settings.
2E 034048.02	Caution	Pump controller malfunction (Option mismatch)	Option data mismatch between LCD monitor and pump controller	Option data stored on LCD monitor and pump controller are not matched.	Check if correct pump controller and/or LCD monitor are installed. If so, perform the initial settings of the pump ECU following the specified procedure. Restart the pump ECU (turn the starter switch to the “OFF” position and then to the “ON” position) to reflect the initial settings.

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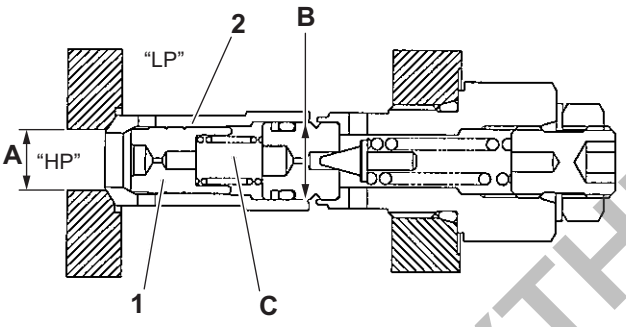
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2. Actuation of the relief valve

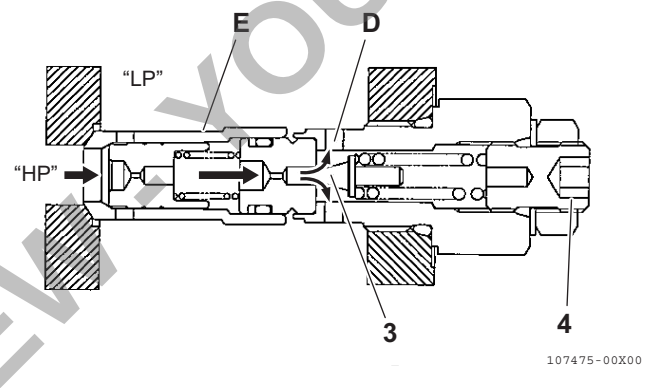
■ Actuation of system relief valve and surge cut valve

This relief valve is installed in between the high-pressure passage “HP” and the low-pressure passage “LP”. Oil passes through the orifice in main poppet **1**, and fills internal chamber **C**.

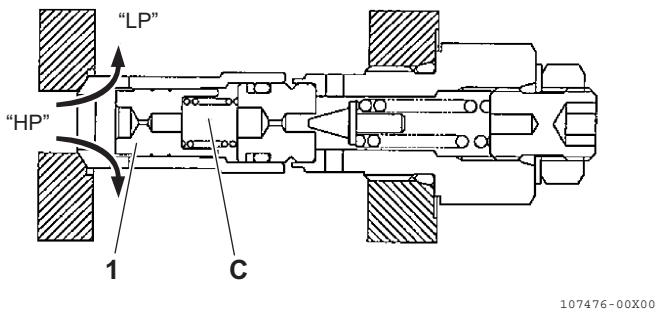
Further, sleeve **2** and main poppet **1** are properly seated due to the difference in surface area between **A** and **B**.



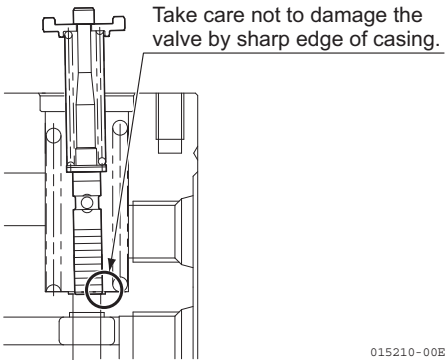
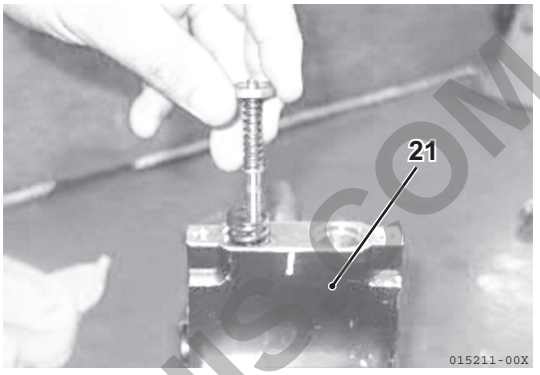
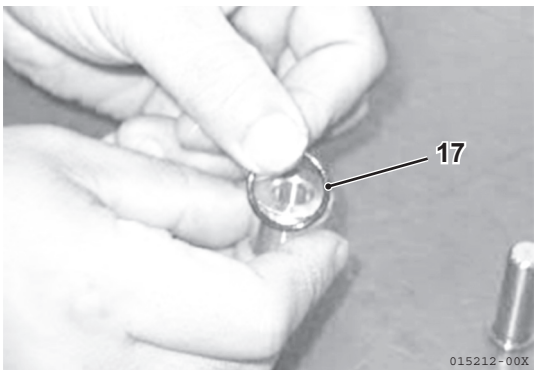
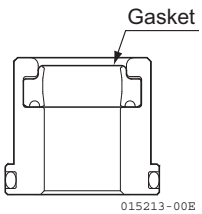
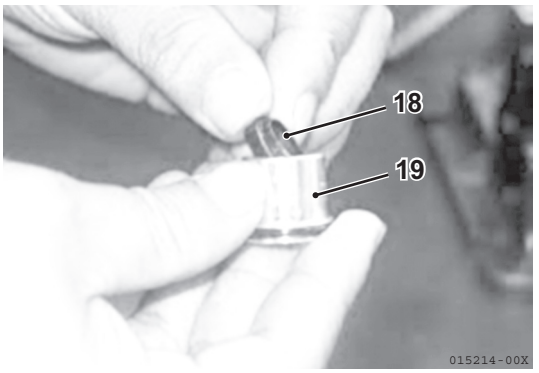
When the pressure in the high-pressure passage “HP” reaches the pilot spring force set by adjustment plug **4**, pilot poppet **3** opens. The oil flows around pilot poppet **3**, and is led to the low-pressure passage “LP” from holes **D**.



When the pilot poppet opens, the pressure decreases in internal chamber **C**, main poppet **1** opens, and the oil in the high-pressure passage “HP” flows directly to the low-pressure passage “LP”.



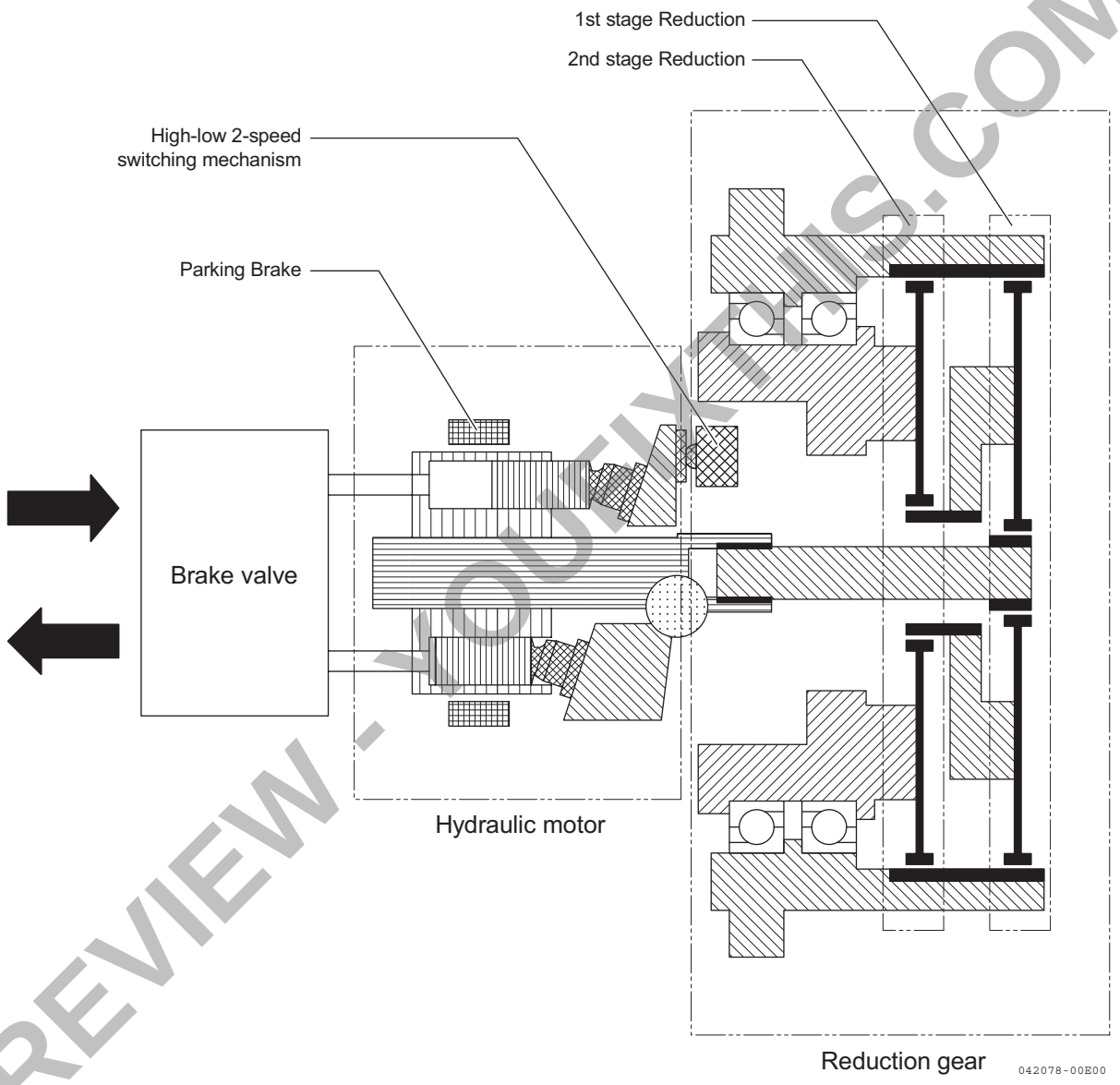
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Procedure	
(4) Install pressure reducing valve sub-assembled at the steps (1) and (2) in casing **21**. ***Notes :*** • *Reinstall the part to the original position before disassembling.* • *When installing pressure reducing valve, be careful not to excessively press the bottom of spool **11** to sharp edge of casing **21**.*  	
(5) Install O-ring **17** on plug **19**.	
(6) Install gasket **18** on plug **19**. ***Notes :*** • *Take care of installation direction of gasket **18**.* • *Coat grease on gasket **18** before installing.*  	

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6-6-3 Basic Configuration and Drawing

1. Motor Basic Configuration



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Procedure	
12. Carrier assy assembly (1) Insert the sun gear (2) **6** in the carrier **3**, and insert the retaining ring **50** into the retaining ring groove of the sun gear (2) **6**.	

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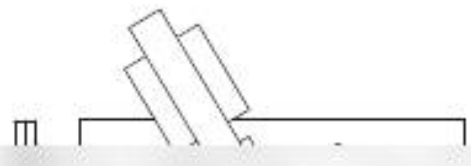
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7. ADJUSTMENT AND REPAIR

Removal and reinstallation of DOC (diesel oxidation catalyst)

1) Removal

Procedure	
(1) Remove the cabin. Refer to Section "7-7-1 Cabin" for the removal procedure of the cabin. (2) Swing superstructure so that drain plug 1 of hydraulic oil	

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7. ADJUSTMENT AND REPAIR

7-5-15 Removal and Reinstallation of Swivel Joint

1) Removal

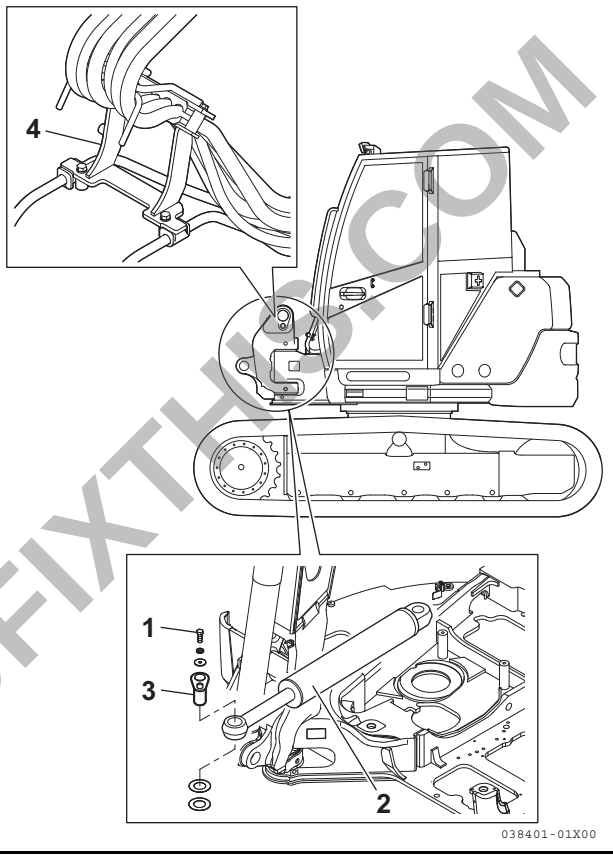
Procedure	
(1) Operate the implement and the blade to raise the machine, and put blocks under it. (2) Turn the implement to the left, lower the bucket to the	

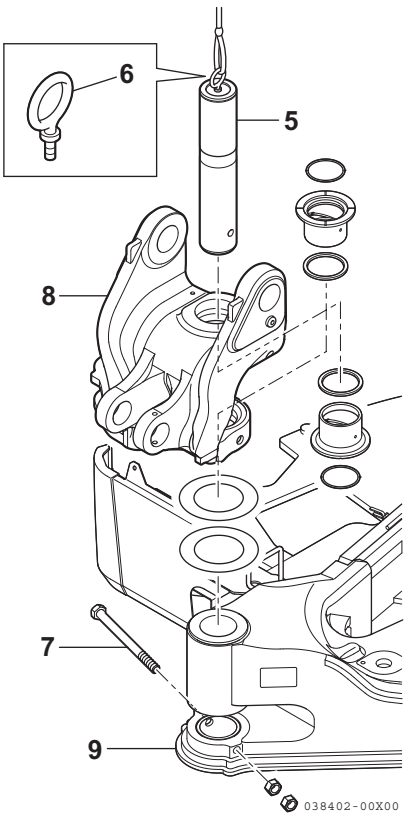
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[Removal of boom bracket]

Procedure	
(1) Remove the bucket. Refer to "Removal of Bucket" in Section 7-6-1. (2) Remove the arm. Refer to "Removal of Arm" in Section 7-6-1. (3) Remove the boom. Refer to "Removal of Boom" in Section 7-6-1. (4) Remove bolt (M14) **1** to pull out pin **3** from the rod side of boom swing cylinder **2**. (5) Remove hose clamp **4**.	

(6) Install eye bolt **6** into the tapped hole (M12) in pin **5** and put rope through eye bolt **6**. (7) Remove bolt (M18) **7** and lift up pin **5** to remove it from boom bracket **8**. (8) Lift up boom bracket **8** with rope to remove it from turning frame **9**.	

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