

WSM

WORKSHOP MANUAL **DIESEL ENGINE**

**03-M-E3B SERIES,
03-M-DI-E3B SERIES,
03-M-E3BG SERIES**

Kubota

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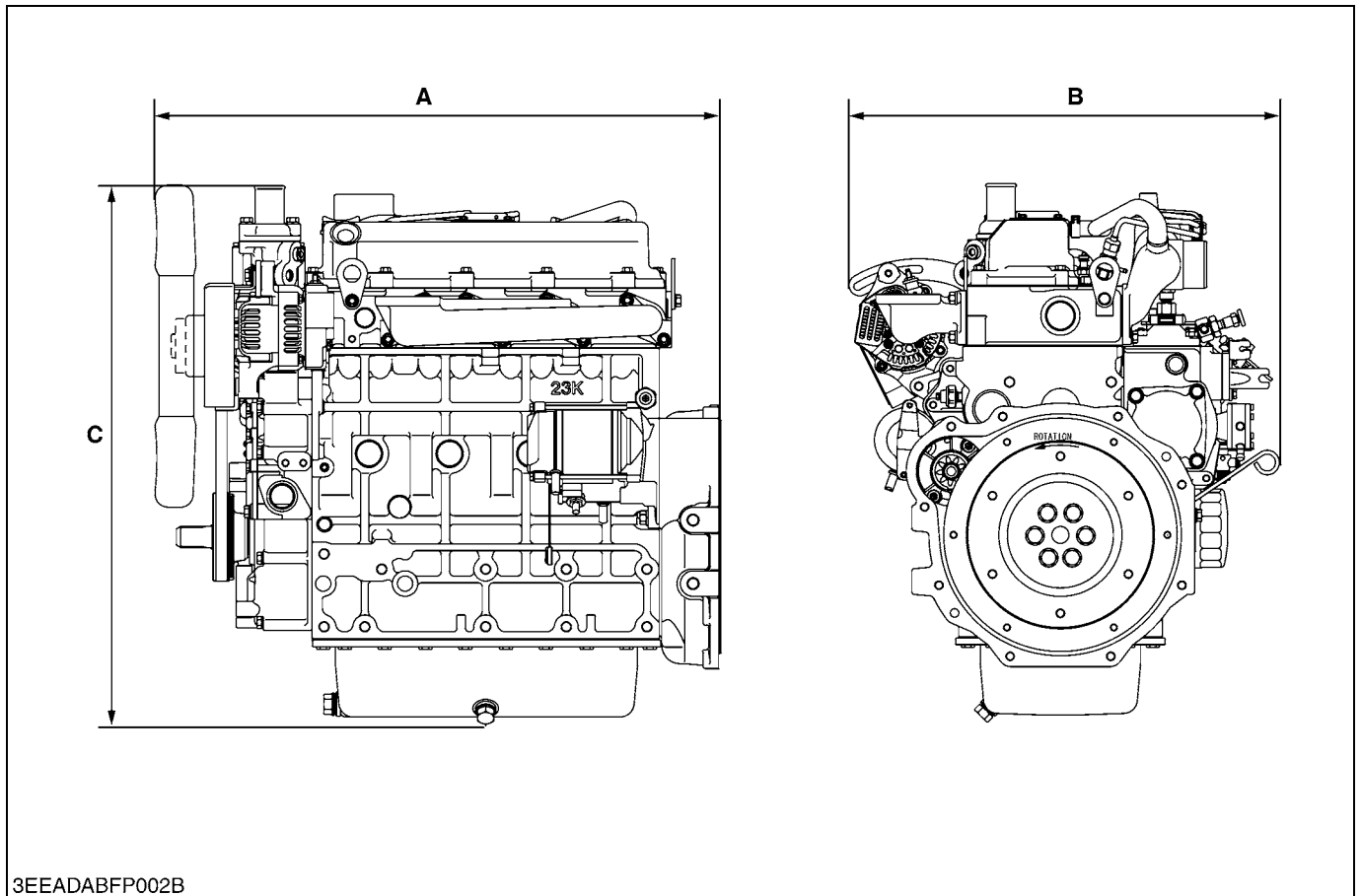
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Model		D1803-M-DI
Number of Cylinders		3
Type		Vertical, Water-cooled, 4 cycle diesel engine
Bore × Stroke		87.0 X 102.4 mm (3.43 X 4.031 in.)
Total Displacement		1826 cm ³ (111.4 cu.in.)
ISO Net Continuous		23.2 KW / 2700 min ⁻¹ (rpm) (31.1 HP / 2700 min ⁻¹ (rpm))
ISO/SAE Net Intermittent		26.7 KW / 2700 min ⁻¹ (rpm) (35.8 HP / 2700 min ⁻¹ (rpm))
SAE Gross Intermittent		27.9 KW / 2700 min ⁻¹ (rpm) (37.4 HP / 2700 min ⁻¹ (rpm))
Maximum Bare Speed		2920 min ⁻¹ (rpm)
Minimum Bare Idling Speed		850 to 950 min ⁻¹ (rpm)
Combustion Chamber		Reentrant Type (Direct Injection)
Fuel Injection Pump		Bosch "K" Type Mini Pump
Governor		Mechanical all speed governor
Direction of Rotation		Counter-clockwise (viewd from flywheel side)
Injection Nozzle		Bosch "P" Type Hole Nozzle
Injection Timing		0.087 rad (5.0 °) before T.D.C.
Firing Order		1-2-3
Injection Pressure	1st stage	18.63 MPa (190.0 kgf/cm ² , 2702 psi)
	2nd stage	22.56 MPa (230.0 kgf/cm ² , 3271 psi)
Compression Ratio		20.5 : 1
Lubricating System		Forced Lubrication by Trochoid Pump
Oil Pressure Indicating		Electrical type switch
Lubricating Filter		Full flow paper filter (cartridge type)
Cooling System		Pressurized radiator, forced circulation with water pump
Starting System		Electric Starting with Starter
Starting Motor		12 V, 1.4 kW
Starting Support Device		By glow plug in combustion chamber
EGR		NONE
Battery		12 V, 88 AH equivalent
Charging Alternator		12 V, 360 W
Fuel		Diesel Fuel No.2-D (ASTM D975)
Lubricating Oil		Class CF lubricating oil as per API classification is recommended. For details on recommended lubricating oils, see page G-7, 10
Lubricating Oil Capacity	Oil Pan Depth 90 mm (3.5 in.)	5.6 L (1.5 U.S.gals)
	Oil Pan Depth 124 mm (4.88 in.)	7.0 L (1.8 U.S.gals)
Weight (Dry)		151 kg (333 lbs)

* The specification described above is of the standard engine of each model.

* Conversion Formula : HP = 0.746 kW, PS = 0.7355 kW

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	V2403-M-DI	V2403-M-DI-T
A	655.0 mm (25.79 in.)	667.1 mm (26.26 in.)
B	492.0 mm (19.37 in.)	449.0 mm (17.68 in.)
C	636.0 mm (25.04 in.)	737.3 mm (29.03 in.)

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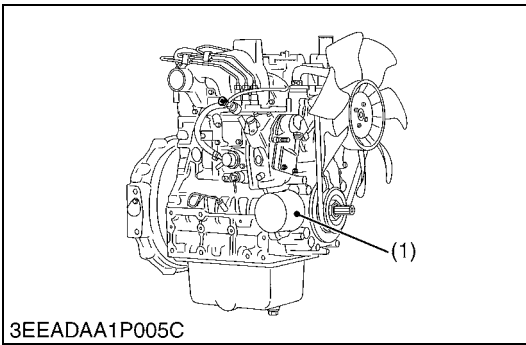
[D1803-M-DI, V2403-M-DI, V2403-M-DI-T]

Item	Service Interval											
	Every											
	50 hrs	100 hrs	200 hrs	400 hrs	500 hrs	1 or 2 months	1 year	800 hrs	1500 hrs	3000 hrs	2 years	
* Checking fuel hoses and clamp bands	☆											
Changing engine oil (depending on the oil pan)	(1) Oil pan depth (90 mm, 3.5 in.)	★		☆								
	(2) Oil pan depth (124 mm, 4.88 in.)	★			☆							
*Cleaning air cleaner element (replace the element after 6-times cleanings)		☆										
*Cleaning fuel filter (Element type)		☆										
Checking battery electrolyte level		☆										
Checking fan belt tension and damage		☆										
Replacing oil filter cartridge	(1) Oil pan depth (90 mm, 3.5 in.)	★		☆								
	(2) Oil pan depth (124 mm, 4.88 in.)	★			☆							
Checking radiator hoses and clamp bands			☆									
* Checking intake air line			☆									
Replacing fuel filter cartridge				☆								
Cleaning water jacket and radiator interior					☆							
Replacing fan belt					☆							
Recharging battery						☆						
* Replacing air cleaner element							☆					
Checking valve clearance								☆				
* Checking injection nozzle condition									☆			
* Checking turbocharger										☆		
* Checking injection pump										☆		
* Replacing intake air line												☆
Replacing battery												☆
Replacing radiator hoses and clamp bands												☆
* Replacing fuel hoses and clamps												☆
Changing radiator coolant (L.L.C.)												☆

★ Change engine oil and replace oil filter cartridge after the first 50 hours of operation.

* The items listed above (* marked) are registered as emission related critical parts by KUBOTA in the U.S. EPA nonroad emission regulation. As the engine owner, you are responsible for the performance of the required maintenance on the engine according to the above instruction.

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Replacing Oil Filter Cartridge (for 90 mm (3.5 in.) Depth Oil Pan)
[D1503-M, D1703-M, D1803-M, V2003-M, V2203-M, V2403-M]
[D1703-M-BG, V2003-M-BG, V2003-M-T-BG, V2203-M-BG,
V2403-M-BG]

⚠ CAUTION

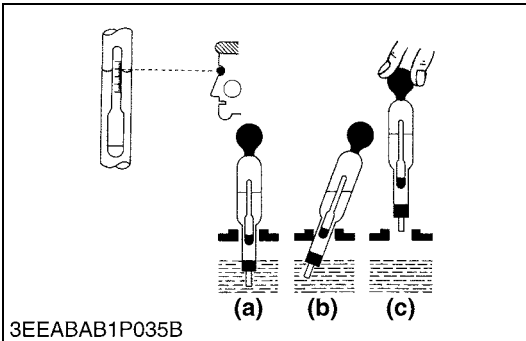
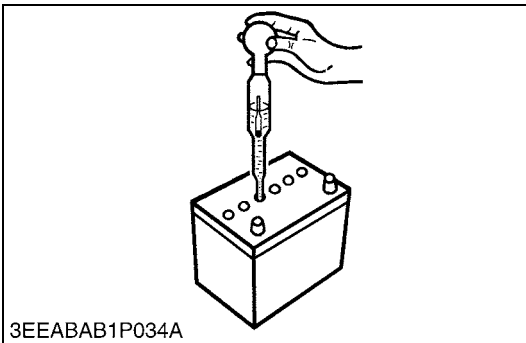
- **Be sure to stop the engine before replacing filter cartridge.**
1. Remove the oil filter cartridge (1) with the filter wrench.
 2. Apply a slight coat of oil onto the new cartridge gasket.
 3. To install the new cartridge, screw it in by hand. Over tightening may cause deformation of rubber gasket.
 4. After the new cartridge has been replaced, the engine oil normally decrease a little. Thus see that the engine oil does not leak through the seal and be sure to read the oil level on the dipstick. Then, replenish the engine oil up to the specified level.

■ IMPORTANT

- **To prevent serious damage to the engine, replacement element must be highly efficient. Use only a KUBOTA genuine filter or its equivalent.**

(1) Engine Oil Filter Cartridge

W1022423



Battery Specific Gravity

1. Check the specific gravity of the electrolyte in each cell with a hydrometer.
2. When the electrolyte temperature differs from that at which the hydrometer was calibrated, correct the specific gravity reading following the formula mentioned in **(Reference)**.
3. If the specific gravity is less than 1.215 (after it is corrected for temperature), charge or replace the battery.
4. If the specific gravity differs between any two cells by more than 0.05, replace the battery.

NOTE

- **Hold the hydrometer tube vertical without removing it from the electrolyte.**
- **Do not suck too much electrolyte into the tube.**
- **Allow the float to move freely and hold the hydrometer at eye level.**
- **The hydrometer reading must be taken at the highest electrolyte level.**

(Reference)

- Specific gravity slightly varies with temperature. To be exact, the specific gravity decreases by 0.0007 with an increase of 1 °C (0.0004 with an increase of 1 °F) in temperature, and increases by 0.0007 with a decreases of 1 °C (0.0004 with a decrease of 1 °F).

Therefore, using 20 °C (68 °F) as a reference, the specific gravity reading must be corrected by the following formula :

- Specific gravity at 20 °C = Measured value + 0.0007 × (electrolyte temperature : 20 °C)
- Specific gravity at 68 °F = Measured value + 0.0004 × (electrolyte temperature : 68 °F)

Specific Gravity	State of Charge
1.260 Sp. Gr.	100 % Charged
1.230 Sp. Gr.	75 % Charged
1.200 Sp. Gr.	50 % Charged
1.170 Sp. Gr.	25 % Charged
1.140 Sp. Gr.	Very Little Useful Capacity
1.110 Sp. Gr.	Discharged

At an electrolyte temperature of 20 °C (68 °F)

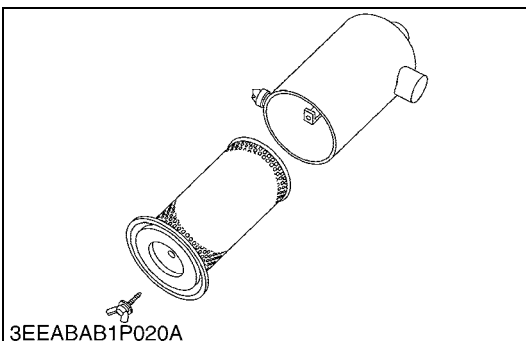
(a) Good

(b) Bad

(c) Bad

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[10] CHECK POINTS OF EVERY YEAR



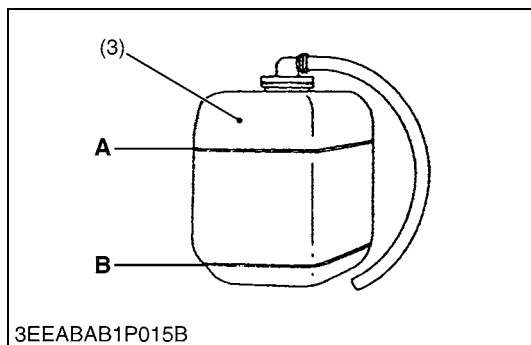
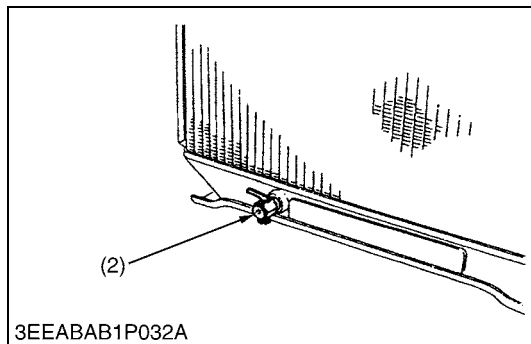
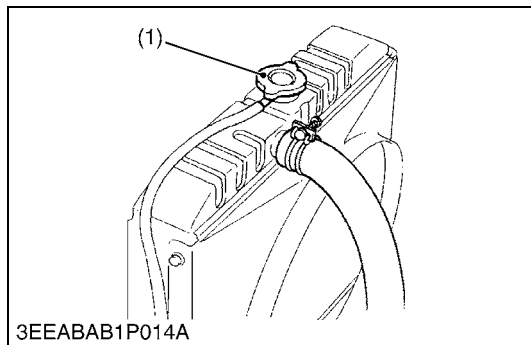
Replacing Air Cleaner Element

1. Remove used air cleaner element.
2. Replace new air cleaner element.

NOTE

- **The air cleaner uses a dry element. Never apply oil to it.**
- **Do not run the engine with filter element removed.**

W1020554



Changing Radiator Coolant (L.L.C.)

⚠ CAUTION

- **Do not remove the radiator cap when the engine is hot. Then loosen cap slightly to the stop to relieve any excess pressure before removing cap completely.**
1. Stop the engine and let cool down.
 2. To drain the coolant, open the radiator drain plug (2) and remove the radiator cap (1). Then radiator cap (1) must be removed to completely drain the coolant. And open the drain cock of engine body.
 3. After all coolant is drained, close the drain plug.
 4. Fill with clean water and cooling system cleaner.
 5. Follow directions of the cleaner instruction.
 6. After flushing, fill with clean water and anti-freeze until the coolant level is just below the port. Install the radiator cap (1) securely.
 7. Fill with coolant up to "FULL" (A) mark on the recovery tank (3).
 8. Start and operate the engine for few minutes.
 9. Stop the engine and let cool. Check coolant level of radiator and recovery tank (3) and add coolant if necessary.

■ IMPORTANT

- **Do not start engine without coolant.**
- **Use clean, fresh, soft water and anti-freeze to fill the radiator and recovery tank.**
- **When the anti-freeze is mixed with fresh, soft water, the anti-freeze mixing ratio must be less than 50 %.**
- **Securely tighten radiator cap. If the cap is loose or improperly fitted, water may leak out and the engine could overheat.**

- (1) Radiator Cap
 (2) Drain Plug
 (3) Recovery Tank

A : Full
 B : Low

W1024599

MECHANISM

CONTENTS

1. ENGINE BODY	M-1
[1] PISTON.....	M-1
[2] BUILT-IN DYNAMIC BALANCER (BALANCER MODEL ONLY).....	M-2
[3] HALF-FLOATING HEAD COVER.....	M-3
2. COOLING SYSTEM.....	M-4
[1] BOTTOM BYPASS SYSTEM.....	M-4
3. FUEL SYSTEM	M-5
[1] GOVERNOR	M-5
4. TURBOCHARGER SYSTEM.....	M-6
[1] BOOST COMPENSATOR	M-6

Symptom	Probable Cause	Solution	Reference Page
Deficient Output	Incorrect injection timing	Adjust	S-27, 28
	Engine's moving parts seem to be seizing	Repair or replace	–
	Injection pump malfunctioning	Repair or replace	S-29, 30, 31, 32, 54, 55
	Deficient nozzle injection	Repair or replace nozzle	S-33, 34, 35, 49
	Compression leak	Check the compression pressure and repair	S-21, 22
	Gas leak from exhaust system	Repair or replace	S-40, 47
	Air leak from compressor discharge side	Repair or replace	S-40, 47
	Air cleaner dirty or clogged	Clean or replace	G-13, 20, 26
	Turbocharger compressor wheel turning heavily	Replace the turbocharger assembly	S-47
Excessive Lubricant Oil Consumption	Piston ring's gap facing the same direction	Shift ring gap direction	S-64, 65
	Oil ring worn or stuck	Replace	S-66, 67, 88, 89
	Piston ring groove worn	Replace piston	S-66, 67, 89
	Valve stem and valve guide worn	Replace	S-53, 76
	Crankshaft bearing, and crank pin bearing worn	Replace	S-64, 65, 70, 91, 92, 93
	Oil leaking due to defective seals or packing	Replace	–
Fuel Mixed into Lubricant Oil	Injection pump's plunger worn	Repair or replace	S-29, 30, 31, 32, 54, 55
	Deficient nozzle injection	Repair or replace nozzle	S-33, 34, 35, 49
	Injection pump broken	Replace	S-54, 55
Water Mixed into Lubricant Oil	Head gasket defective	Replace	S-51, 52
	Cylinder block or cylinder head flawed	Replace	S-51, 74

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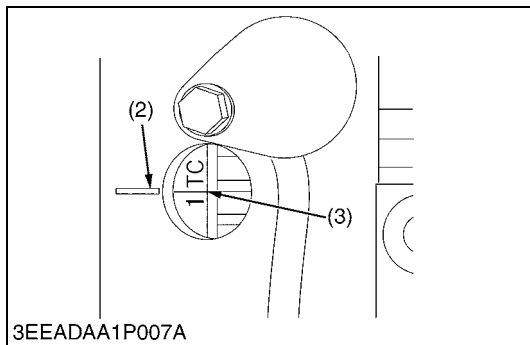
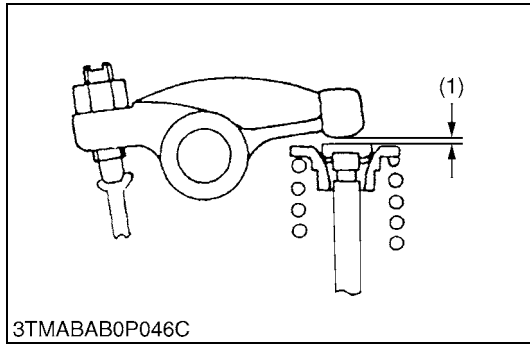
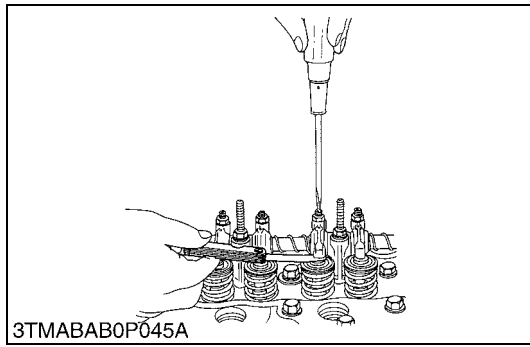
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ENGINE BODY (Continued)

Item		Factory Specification	Allowable Limit
Top Ring [D1503-M], [V2003-M], [V2403-M-T] [D1803-M-DI], [V2403-M-DI] [V2403-M-DI-T] [V2003-M-BG], [V2003-M-T-BG],	Ring Gap	0.20 to 0.35 mm 0.0079 to 0.013 in.	1.25 mm 0.0492 in.
Top Ring [D1703-M], [D1803-M] [V2203-M], [V2403-M] [D1703-M-BG], [V2203-M-BG] [V2403-M-BG]	Ring Gap	0.25 to 0.40 mm 0.0099 to 0.015 in.	1.25 mm 0.0492 in.
Second Ring [D1503-M], [D1703-M] [D1803-M], [V2203-M] [V2403-M] [D1803-M-DI], [V2403-M-DI] [D1703-M-BG], [V2003-M-BG] [V2203-M-BG], [V2403-M-BG]	Ring Gap	0.30 to 0.45 mm 0.012 to 0.017 in.	1.25 mm 0.0492 in.
Second Ring [V2003-M], [V2403-M-T], [V2403-M-DI-T] [V2003-M-T-BG]	Ring Gap	0.40 to 0.55 mm 0.016 to 0.021 in.	1.25 mm 0.0492 in.
Oil Ring [D1503-M], [D1703-M] [D1803-M], [V2003-M] [V2203-M], [V2403-M], [V2403-M-T] [V2403-M-DI-T] [D1703-M-BG], [V2003-M-BG] [V2003-M-T-BG], [V2203-M-BG] [V2403-M-BG]	Ring Gap	0.25 to 0.45 mm 0.0099 to 0.017 in.	1.25 mm 0.0492 in.
Oil Ring [D1803-M-DI], [V2403-M-DI]	Ring Gap	0.20 to 0.40 mm 0.0079 to 0.015 in.	1.25 mm 0.0492 in.
Connecting Rod	Alignment	–	0.05 mm 0.002 in.
Piston Pin to Small End Bushing	Oil Clearance	0.014 to 0.036 mm 0.00056 to 0.0014 in.	0.15 mm 0.0059 in.
Piston Pin	O.D.	25.004 to 25.011 mm 0.98441 to 0.98468 in.	–
Small End Bushing	I.D.	25.025 to 25.040 mm 0.98524 to 0.98582 in.	–
Crankshaft	Alignment	–	0.02 mm 0.0008 in.
Crankshaft Journal to Crankshaft Bearing 1	Oil Clearance	0.0400 to 0.118 mm 0.00158 to 0.00464 in.	0.20 mm 0.0079 in.
Crankshaft Journal	O.D.	59.921 to 59.940 mm 2.3591 to 2.3598 in.	–
Crankshaft Bearing 1	I.D.	59.980 to 60.039 mm 2.3615 to 2.3637 in.	–

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Valve Clearance

■ IMPORTANT

• Valve clearance must be checked and adjusted when engine is cold.

1. Remove the head cover.
2. Align the “1TC” mark line (3) on the flywheel and projection (2) on the housing so that the No.1 piston comes to the compression or overlap top dead center.
3. Check the following valve clearance (1) marked with “☆” using a feeler gauge.
4. If the clearance is not within the factory specifications, adjust with the adjusting screw.

Valve clearance	Factory spec.	0.18 to 0.22 mm 0.0071 to 0.0086 in.
-----------------	---------------	---

■ NOTE

- The “1TC” mark line on the flywheel is just for No. 1 cylinder. There is no “TC” marking for the other cylinders.
- No. 1 piston comes to the top dead center position when the “TC” marking is aligned with the projection (2) in the window on flywheel-housing. Turn the flywheel 0.26 rad (15 °) clockwise and counterclockwise to see if the piston is at the compression top dead center or the overlap position. Now referring to the table below, readjust the valve clearance (1). (The piston is at the top dead center when both the IN. and EX. valves do not move; it is at the overlap position when both the valves move.)
- Finally turn the flywheel 6.28 rad (360 °) and align the “1TC” mark line and the projection (2) perfectly. Adjust all the other valve clearance as required.
- After turning the flywheel counterclockwise twice or three times, recheck the valve clearance (1).
- After adjusting the valve clearance (1), firmly tighten the lock nut of the adjusting screw.

Valve arrangement		3 Cylinder		4 Cylinder	
		IN.	EX.	IN.	EX.
Adjustable cylinder location of piston	No. 1	☆	☆	☆	☆
	No. 2		☆	☆	
	No. 3	☆			☆
	No. 4	-	-		
When No. 1 piston is at compression top dead center	No. 1				
	No. 2	☆			☆
	No. 3		☆	☆	
	No. 4	-	-	☆	☆

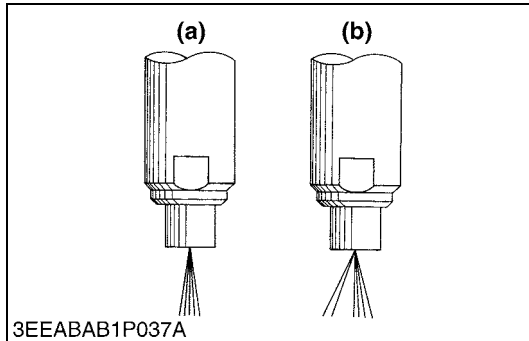
(1) Valve Clearance
(2) Projection

(3) 1TC Mark Line

W10379490

CAUTION

- Check the injection pressure and condition after confirming that there is nobody standing in the direction the fume goes.
- If the fume from the nozzle directly contacts the human body, cells may be destroyed and blood poisoning may be caused.



Nozzle Spraying Condition

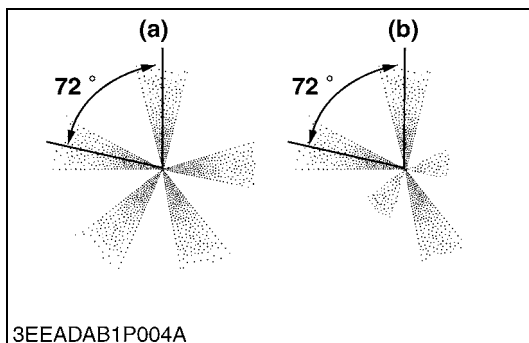
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[D1703-M-BG, V2003-M-BG, V2003-M-T-BG, V2203-M-BG, V2403-M-BG]

1. Set the injection nozzle to a nozzle tester, and check the nozzle spraying condition.
2. If the spraying condition is defective, replace the nozzle piece.

(a) Good

(b) Bad

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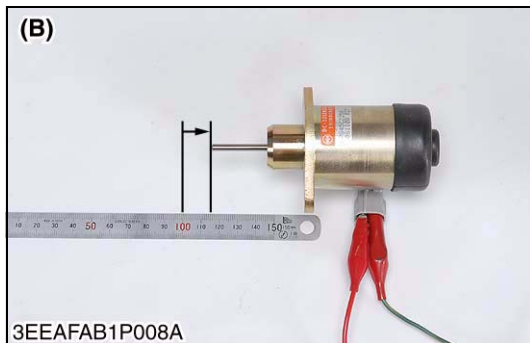
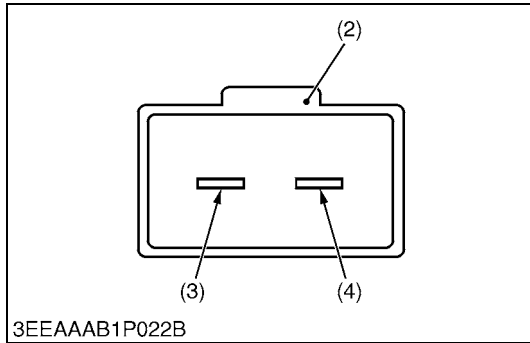
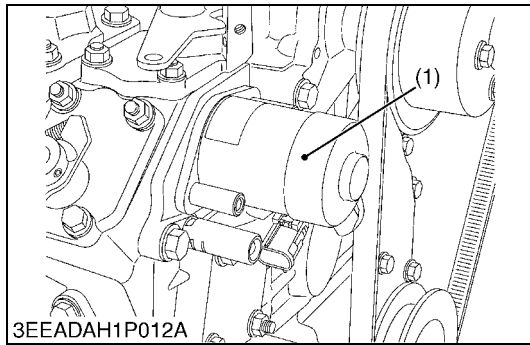
[D1803-M-DI, V2403-M-DI, V2403-M-DI-T]

1. Set the injection nozzle to a nozzle tester, and check the nozzle spraying condition.
2. If the spraying condition is defective, replace the injection nozzle assembly.

(a) Good

(b) Bad

W10226470



Solenoid

1. Disconnect the connector of solenoid (2) (2P).
2. Check the state of the harness and if it is abnormal, please replace it.
3. Turn the key switch to the ACC position.
4. Measure the voltage between the connector of solenoid (2) (harness side).
5. When the measurements are the below table value.
The ECU is normal. Check the solenoid (1) according to the procedure of confirming the solenoid's movement.
6. When the measurements are out of the below table value.
The ECU is failure, then please replace it.

Voltage	Terminal 1 - Terminal 2	12 V
---------	-------------------------	------

(Reference)

- The procedure of confirming the solenoid's movement
1. Measure the resistance between the connector of solenoid (2).
 2. When the measurements are the below table value.
The solenoid (1) is normal electrically. Check the solenoid's movement.
 3. When the measurements are out of the below table value.
The solenoid (1) is failure, then please replace it.
 4. Remove the solenoid (1) from the engine.
 5. Supply the voltage (12 V) to the solenoid (1).
 6. When the rod of the solenoid (1) moves smoothly.
The solenoid (1) is normal.
 7. When the rod of the solenoid (1) does not move smoothly.
The solenoid (1) is failure, then please replace it.

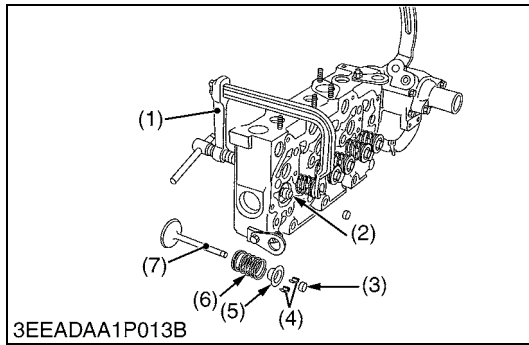
CAUTION

- Please note handling, the solenoid (1) becomes a high temperature.

Resistance	Terminal 1 - Terminal 2	2 to 4 Ω
------------	-------------------------	----------

- | | |
|---------------------------|-----------------------------|
| (1) Solenoid | (A) Key Switch OFF Position |
| (2) Connector of Solenoid | (B) Key Switch ON Position |
| (3) Terminal 2 (-) | |
| (4) Terminal 1 (+) | |

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Valves

1. Remove the valve caps (3).
2. Remove the valve spring collet (4), pushing the valve spring retainer (5) by valve spring replacer (1).
3. Remove the valve spring retainer (5), valve spring (6) and valve stem seal (2).
4. Remove the valve (7).

(When reassembling)

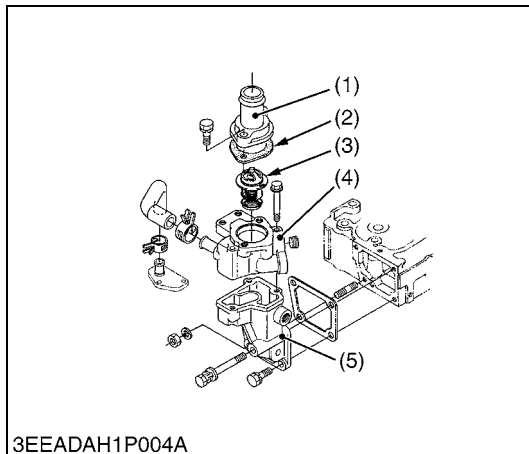
- Wash the valve stem and valve guide hole, and apply engine oil sufficiently.
- After installing the valve spring collets (4), lightly tap the stem to assure proper fit with a plastic hammer.

■ IMPORTANT

- **Do not change the combination of valve and valve guide.**

- | | |
|---------------------------|---------------------------|
| (1) Valve Spring Replacer | (5) Valve Spring Retainer |
| (2) Valve Stem Seal | (6) Valve Spring |
| (3) Valve Cap | (7) Valve |
| (4) Valve Spring Collet | |

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Thermostat Assembly

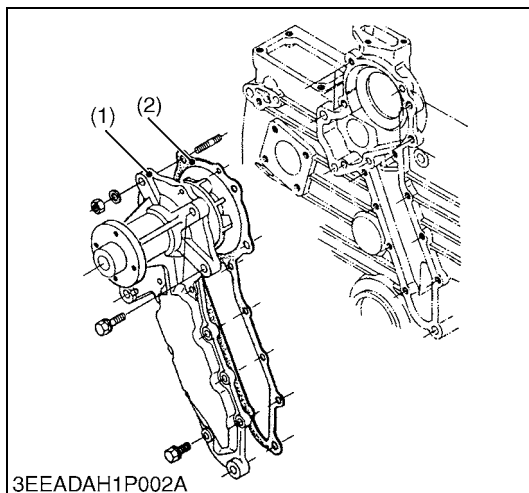
1. Remove the thermostat cover mounting screws, and remove the thermostat cover (1).
2. Remove the thermostat assembly (3).

(When reassembling)

- Replace the thermostat cover gasket (2) with new one.
- Apply a liquid gasket (Three Bond 1215 or equivalent) to the water flange 1 (4) and flange 2 (5)

- | | |
|-----------------------------|--------------------|
| (1) Thermostat Cover | (4) Water Flange 1 |
| (2) Thermostat Cover Gasket | (5) Water Flange 2 |
| (3) Thermostat Assembly | |

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Water Pump Assembly (If necessary)

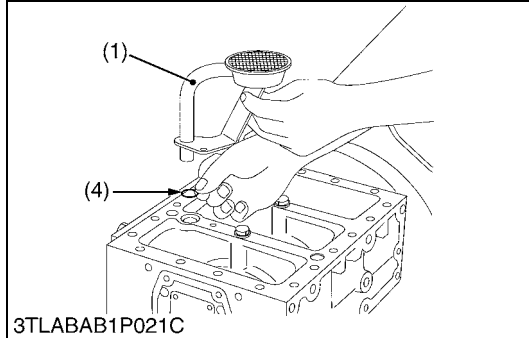
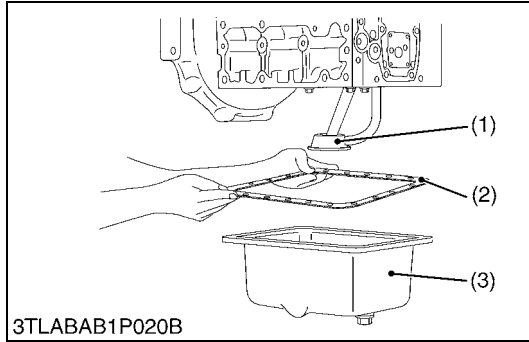
1. Remove the water pump assembly (1) from the gear case.

(When reassembling)

- Replace the gasket (2) with new one.

- | | |
|-------------------------|------------|
| (1) Water Pump Assembly | (2) Gasket |
|-------------------------|------------|

W1051957

(5) Piston and Connecting Rod**Oil Pan and Oil Strainer**

1. Remove the oil pan mounting screws.
2. Remove the oil pan (3) by lightly tapping the rim of the pan with a wooden hammer.
3. Remove the oil pan gasket (2).
4. Remove the oil strainer (1) and O-ring (4).

(When reassembling)

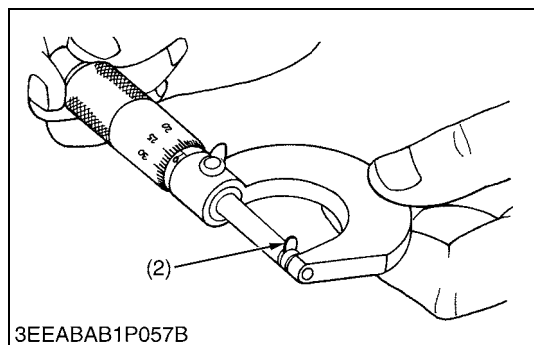
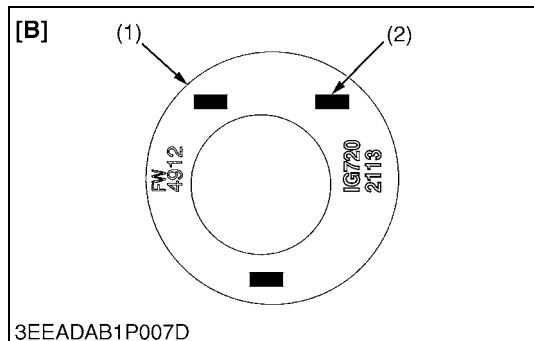
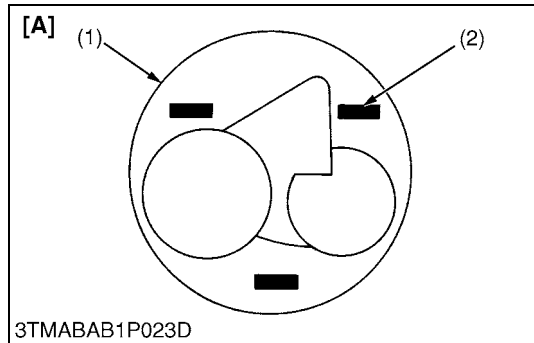
- After cleaning the oil strainer (1), check to see that the filter mesh is clean, and install it.
- Visually check the O-ring (4), apply engine oil, and install it.
- Securely fit the O-ring (4) to the oil strainer (1).
- Replace the oil pan gasket (2) with new one.
- To avoid uneven tightening, tighten oil pan mounting screws in diagonal order from the center.

- | | |
|--------------------|-------------|
| (1) Oil Strainer | (3) Oil Pan |
| (2) Oil Pan Gasket | (4) O-ring |

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[3] SERVICING

(1) Cylinder Head and Valves



Top Clearance

1. Remove the cylinder head.
2. Move the piston up and stick a strip of fuse on the piston head at three position with grease.
3. Lower the piston and install the cylinder head. (Use a new cylinder head gasket and tighten with a specified tightening torque.)
4. Turn the flywheel until the piston exceeds top dead center.
5. Remove the cylinder head and measure the thickness of the fuses.
6. If the measurement is not within the factory specifications, check the oil clearances between the crankpin and bearing and between the piston pin and bushing.

NOTE

- After checking the top clearance, be sure to assemble the cylinder head with a new cylinder head gasket.

Top clearance	Factory spec.	D1503-M D1703-M D1803-M V2003-M V2203-M V2403-M V2403-M-T D1703-M-BG V2003-M-BG V2003-M-T-BG V2203-M-BG V2403-M-BG	0.575 to 0.675 mm 0.0227 to 0.0265 in.
		D1803-M-DI V2403-M-DI V2403-M-DI-T	0.60 to 0.70 mm 0.024 to 0.027 in.

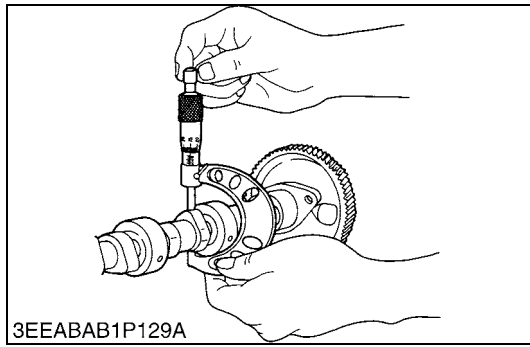
Tightening torque	Cylinder head screws	93.2 to 98.0 N·m 9.50 to 10.0 kgf·m 68.8 to 72.3 lbf·ft
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- (1) Piston
- (2) Fuse

[A] D1503-M, D1703-M, D1803-M
V2003-M, V2203-M, V2403-M
V2403-M-T
D1703-M-BG, V2003-M-BG
V2003-M-T-BG, V2203-M-BG
V2403-M-BG

[B] D1803-M-DI, V2403-M-DI
V2403-M-DI-T

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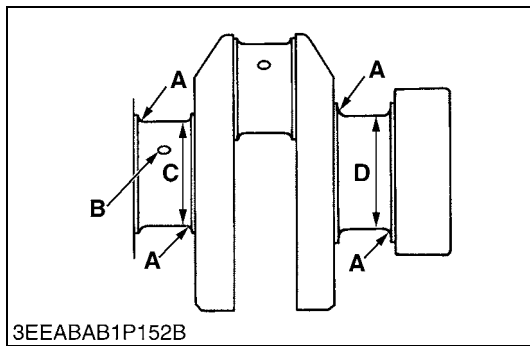
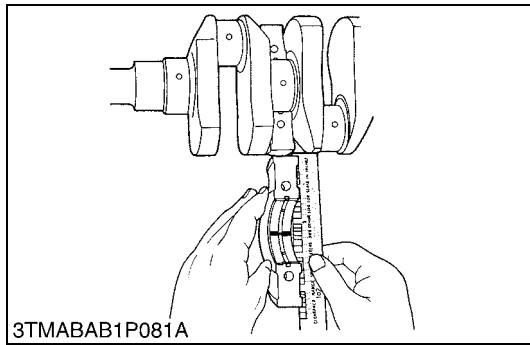


Cam Height

1. Measure the height of the cam at its highest point with an outside micrometer.
2. If the measurement is less than the allowable limit, replace the camshaft.

Cam height of intake	Factory spec.	D1503-M D1703-M-BG	33.27 mm 1.310 in.
		V2003-M V2403-M-DI-T V2003-M-BG V2203-M-BG	33.47 mm 1.318 in.
		D1703-M D1803-M V2203-M V2403-M V2403-M-T D1803-M-DI V2403-M-DI V2003-M-T-BG V2403-M-BG	33.90 mm 1.335 in.
	Allowable limit	D1503-M D1703-M-BG	33.22 mm 1.308 in.
		V2003-M V2403-M-DI-T V2003-M-BG V2203-M-BG	33.42 mm 1.316 in.
		D1703-M D1803-M V2203-M V2403-M V2403-M-T D1803-M-DI V2403-M-DI V2003-M-T-BG V2403-M-BG	33.85 mm 1.333 in.

W1031532



Oil Clearance between Crankshaft Journal and Crankshaft Bearing 2

1. Put a strip of plastigage on the center of the journal.
2. Install the bearing case and tighten the bearing case screws 1 to the specified torque, and remove the bearing case again.
3. Measure the amount of the flattening with the scale and get the oil clearance.
4. If the clearance exceeds the allowable limit, replace the crankshaft bearing 2.
5. If the same size bearing is useless because of the crankshaft journal wear, replace it with an undersize one referring to the table and figure.

NOTE

- Be sure not to move the crankshaft while the bearing case screws are tightened.

Oil clearance between crankshaft and crankshaft bearing 2	Factory spec.	0.0400 to 0.104 mm 0.00158 to 0.00409 in.
	Allowable limit	0.20 mm 0.0079 in.

Crankshaft journal O.D.	Factory spec.	59.921 to 59.940 mm 2.3591 to 2.3598 in.
Crankshaft bearing 2 I.D.	Factory spec.	59.980 to 60.025 mm 2.3615 to 2.3631 in.

(Reference)

- Undersize dimensions of crankshaft journal

Undersize	0.2 mm 0.008 in.	0.4 mm 0.02 in.
Dimension A	2.8 to 3.2 mm radius 0.11 to 0.12 in. radius	2.8 to 3.2 mm radius 0.11 to 0.12 in. radius
*Dimension B	1.0 to 1.5 mm relief 0.040 to 0.059 in. relief	1.0 to 1.5 mm relief 0.040 to 0.059 in. relief
Dimension C, D	59.721 to 59.740 mm dia. 2.3513 to 2.3519 in. dia.	59.521 to 59.540 mm dia. 2.3434 to 2.3440 in. dia.

(0.4S)
The crankshaft journal must be fine-finished to higher than ∇∇∇∇
*Holes to be de-burred and edges rounded with 1.0 to 1.5 mm (0.040 to 0.059 in.) relief.

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