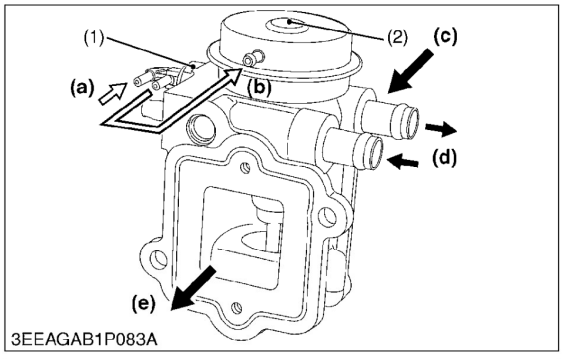
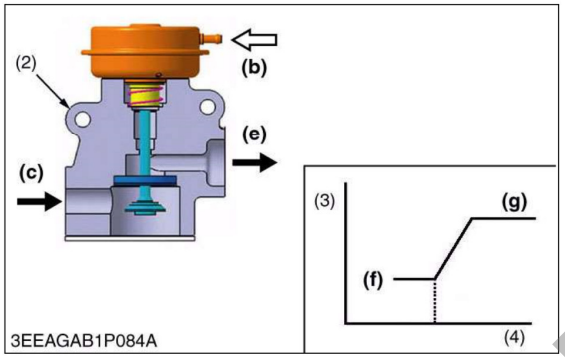
(3) Mechanical EGR Valve



3EEAGAB1P083A



3EEAGAB1P084A

Mechanical EGR valve (2) controls the flow of cooled EGR gas **(c)** to the intake manifold.

If the boost pressure **(b)** is low, EGR valve (2) is closed, so cooled EGR gas **(c)** does not flow to the intake manifold **(e)**.

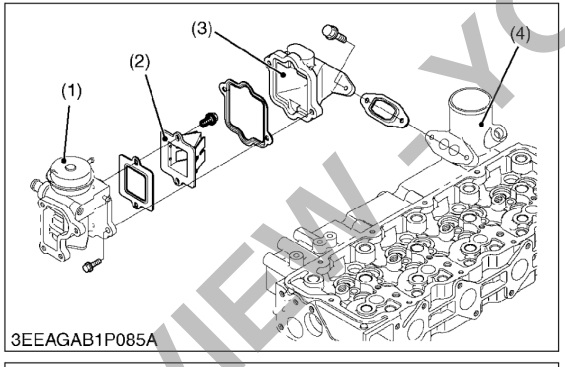
If the boost pressure **(b)** is getting higher, EGR valve (2) is opening and cooled EGR gas **(c)** is flowing to the intake manifold **(e)**.

(1) Thermo Valve
(2) Mechanical EGR Valve
(3) EGR Valve Lift
(4) Boost Pressure

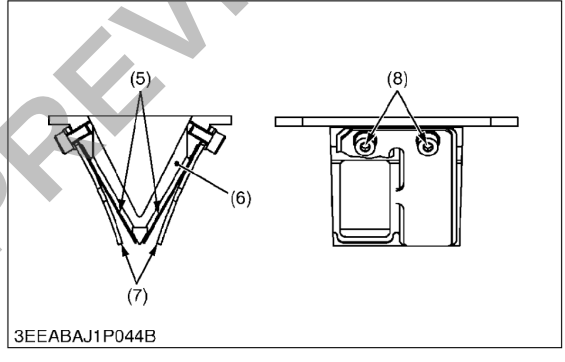
(a) Boost Pressure from Inlet Manifold
(b) Boost Pressure from Thermo Valve
(c) Cooled EGR Gas
(d) Coolant
(e) Cooled EGR Gas To The Intake Manifold
(f) Close
(g) Open

W1176088

(4) Reed Valve



3EEAGAB1P085A



3EEABAJ1P044B

The reed valve (2) is provided at the confluence of exhaust gas after passing the EGR valve (1), and intake air. It operates by the pressure difference between inside of the crankcase and the atmosphere, and prevents back-flow of the mixture of exhaust gas and intake air generated by the piston and valves. It is used as the secondary air introduction device for the countermeasure against exhaust gas of four-cycle engines.

(1) Mechanical EGR Valve
(2) Reed Valve
(3) Reed Valve Housing
(4) Intake Manifold
(5) Valve
(6) Case
(7) Stopper
(8) Screw

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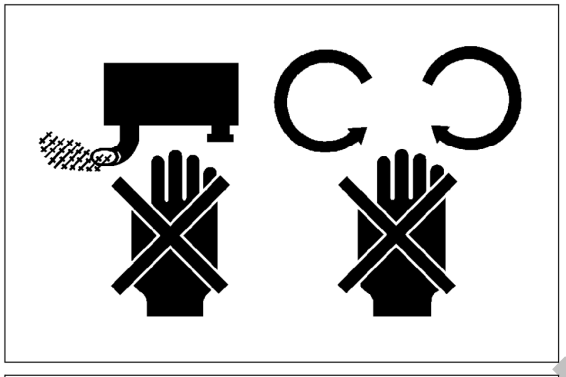
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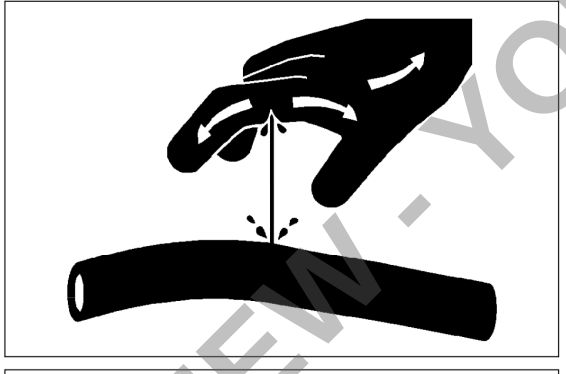
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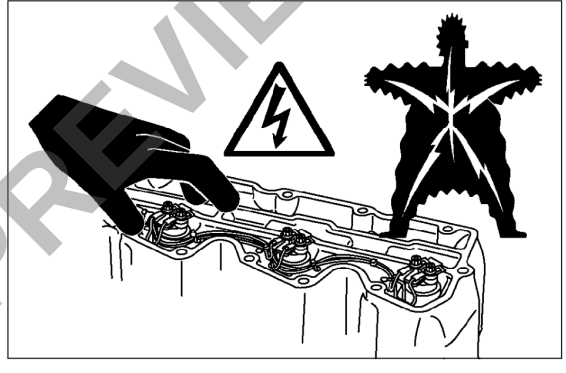


SAFETY STARTING

- Do not start the engine by shorting across starter terminals or bypassing the safety start switch.
- Unauthorized modifications to the engine may impair the function and / or safety and affect engine life.







SAFETY WORKING

- Do not work on the machine while under the influence of alcohol, medication, or other substances or while fatigued.
- Wear close fitting clothing and safety equipment appropriate to the job.
- Use tools appropriate to the work. Makeshift tools, parts, and procedures are not recommended.
- When servicing is performed together by two or more persons, take care to perform all work safely.
- Do not touch the rotating or hot parts while the engine is operating.
- Never remove the radiator cap while the engine is operating, or immediately after stopping. Otherwise, hot water will spout out from radiator. Only remove radiator cap when cool enough to touch with bare hands. Slowly loosen the cap to first stop to relieve pressure before removing completely.
- Escaping fluid (fuel or hydraulic oil) under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic or fuel lines. Tighten all connections before applying pressure.
- Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.
- Do not open high-pressure fuel system.
  High-pressure fluid remaining in fuel lines can cause serious injury. Do not disconnect or attempt to repair fuel lines, sensors, or any other components between the high-pressure fuel pump and injectors on engines with high pressure common rail fuel system.
- High voltage exceeding 100 V is generated in the ECU, and is applied to the injector.
  Pay sufficient caution to electric shock when performing work activities.

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SPECIFICATIONS

Model	V2607-DI-E3B	V2607-DI-T-E3B
Number of Cylinder	4	
Type	Vertical, water-cooled, 4-cycle DI diesel engine	
Bore × Stroke	87.0 × 110 mm (3.43 × 4.33 in.)	
Total Displacement	2615 cm^3 (159.6 cu.in.)	
ISO Net Continuous	30.4 kW / 2700 min^{-1} (rpm) (40.8 HP / 2700 min^{-1} (rpm))	41.3 kW / 2700 min^{-1} (rpm) (55.4 HP / 2700 min^{-1} (rpm))
ISO / SAE Net Intermittent	35.0 kW / 2700 min^{-1} (rpm) (46.9 HP / 2700 min^{-1} (rpm))	47.5 kW / 2700 min^{-1} (rpm) (63.7 HP / 2700 min^{-1} (rpm))
SAE Gross Intermittent	36.5 kW / 2700 min^{-1} (rpm) (48.9 HP / 2700 min^{-1} (rpm))	49.2 kW / 2700 min^{-1} (rpm) (66.0 HP / 2700 min^{-1} (rpm))
Maximum Bare Speed	2920 min^{-1} (rpm)	
Minimum Bare Idling Speed	825 to 875 min^{-1} (rpm)	
Combustion Chamber	Reentrant Type, Center Direct Injection Type (E-CDIS)	
Fuel Injection Pump	Bosch PFR4KZ Type Mini Pump	
Governor	All speed mechanical governor	
Direction of Rotation	Counter-clockwise (Viewed from flywheel side)	
Injection Nozzle	Bosch P Type	
Injection Timing	0.0393 rad (2.25 °) before T.D.C.	[Serial No. : 8G0001 to 8V9999] 0.0044 rad (0.25 °) after T.D.C. [Serial No. : 8W0001 and above] 0.0044 rad (0.25 °) before T.D.C.
Firing Order	1-3-4-2	
Injection Pressure	1st stage 18.63 MPa (190.0 kgf/cm^2, 2702 psi), 2nd stage 21.57 MPa (220.0 kgf/cm^2, 3129 psi),	
Compression Ratio	20.0	19.0
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, 2.5 kW	
Starting Support Device	By Glow Plug in Combustion Chamber	
EGR	None	External EGR (EGR Cooler + Mechanical water-cooled EGR Valve + Reed Valve)
Battery	12 V, 92 AH equivalent	
Charging Alternator	12 V, 540 W	
Fuel	Recommended fuels vary depending on the contents of the emission control regulations, the ambient temperature, and the fuel specifications. Therefore, please refer to the detailed description on page G-6.	
Lubricating Oil	Class CF lubricating oil as per API classification is recommended. For details on recommended lubricating oils, see page G-6 and page G-9.	
Lubricating Oil Capacity	10.2 L (2.69 U.S.gals)	
Weight (Dry)	225 kg (496 lbs)	235 kg (518 lbs)

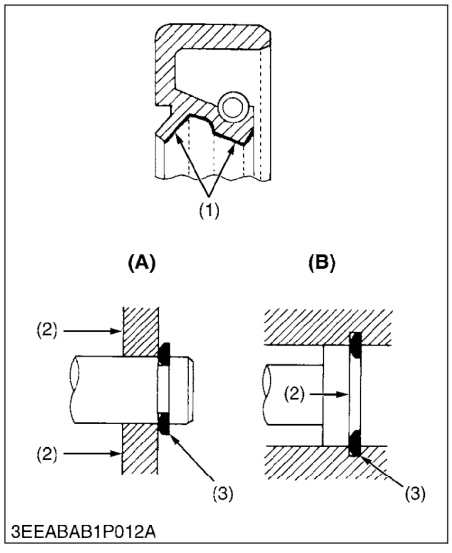
* The specification described above is of the standard engine of each model.
* Conversion Formula : HP = 0.746 kW, PS = 0.7355 kW

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2. GENERAL PRECAUTIONS



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- During disassembly, carefully arrange removed parts in a clean area to prevent confusion later. Screws, bolts and nuts should be replaced in their original position to prevent reassembly errors.
- When special tools are required, use KUBOTA genuine special tools. Special tools which are not frequently used should be made according to the drawings provided.
- Before disassembling or servicing live wires, make sure to always disconnect the grounding cable from the battery first.
- Remove oil and dirt from parts before measuring.
- Use only KUBOTA genuine parts for parts replacement to maintain engine performance and to ensure safety.
- Gaskets and O-rings must be replaced during reassembly. Apply grease to new O-rings or oil seals before assembling.
- When reassembling external or internal snap rings, position them so that the sharp edge faces against the direction from which force is applied.
- Be sure to perform run-in the serviced or reassembled engine. Do not attempt to give heavy load at once, or serious damage may result to the engine.

(1) Grease
(2) Force
(3) Place the Sharp Edge against the Direction of Force

(A) External Snap Ring
(B) Internal Snap Ring

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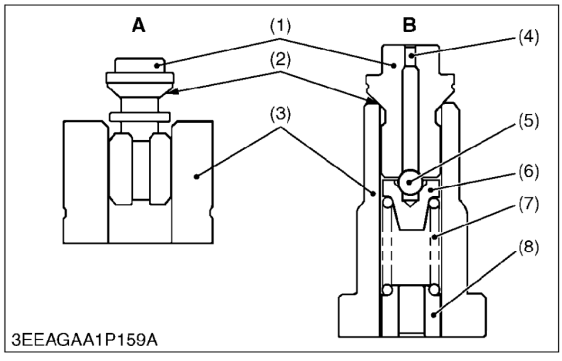
Symptom	Probable Cause	Solution	Reference Page
Engine Revolution Is Not Smooth	Fuel filter clogged or dirty	Replace	G-13, 15
	Air cleaner clogged	Clean or replace	G-12, 25
	Fuel leak due to loose injection pipe retaining nut	Tighten retaining nut	S-45
	Injection pump malfunctioning	Repair or replace	S-29, 62
	Incorrect nozzle opening pressure	Repair or replace	S-30, 46
	Injection nozzle stuck or clogged	Repair or replace	S-30, 46
	Governor malfunctioning	Repair	S-57, 58
	Turbocharger bearing worn out	Replace the turbocharger assembly	S-35, 41
	Turbocharger shaft bent	Replace the turbocharger assembly	S-35, 41
	Turbocharger fin or other part damaged due to foreign matters	Replace the turbocharger assembly	S-35, 41
Either White or Blue Exhaust Gas Is Observed	Excessive engine oil	Reduce to specified level	G-7, 9
	Piston ring and cylinder worn or stuck	Repair or replace	S-74, 75, 76, 101, 109
	Incorrect injection timing	Adjust	S-27
Oil Leak into Exhaust Pipe or Suction Pipe	Waste oil pipe clogged or deformed	Repair or replace	S-41
	Turbocharger's piston ring seal damaged	Replace the turbocharger assembly	S-41
Either Black or Dark Gray Exhaust Gas Is Observed	Overload	Reduce the load	–
	Low grade fuel used	Use specified fuel	G-6
	Fuel filter clogged	Replace	G-13, 15
	Air cleaner clogged	Clean or replace	G-12, 25
	Deficient nozzle injection	Repair or replace nozzle	S-30, 46

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(2) CPV Equipped Delivery Valve



The Constant Pressure Valve (CPV) is a mechanism that maintains uniform residual pressure in the high pressure pipe. It stabilizes overall delivery quantity characteristics and especially delivery quantity characteristics at low speeds.

■ **At high fuel pressure**

The delivery valve (1), the steel ball (5) and the snapper valve (6) are moved up together. The delivery valve seat surface (2) opens when the fuel pressure becomes more than the delivery valve set pressure.

■ **At after injection**

The delivery valve (1), the steel ball (5) and the snapper valve (6) are moved down and the delivery valve seat surface (2) closes. The steel ball still opens on the way and the fuel returns to the injection pump side. The steel ball (5) closes the delivery valve hole when the fuel pressure becomes less than the snapper valve set pressure.

(1) Delivery Valve
(2) Seat Surface
(3) Valve Seat
(4) Orifice
(5) Steel Ball
(6) Snapper Valve
(7) Snapper Valve Spring
(8) Snapper Valve Seat

A : Current Delivery Valve
B : CPV Equipped Delivery Valve

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3. TIGHTENING TORQUES

Use a torque wrench to tighten the screws, bolts and nuts to the specified torque. Tighten the screws, bolts and nuts used, such as on the cylinder head in the correct sequence and torque.

[1] TIGHTENING TORQUES OF SCREWS, BOLTS AND NUTS FOR GENERAL USE

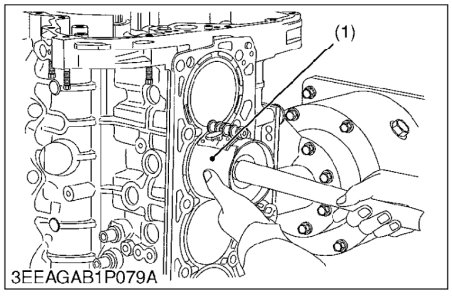
If the tightening torque is not specified, refer to the table below for the none specified torques values.

Indication on top of bolt	4 No-grade or 4T			7 7T		
Indication on top of nut	No-grade or 4T					
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M6	7.9 to 9.3	0.80 to 0.95	5.8 to 6.8	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31
M8	18 to 20	1.8 to 2.1	13 to 15	24 to 27	2.4 to 2.8	18 to 20
M10	40 to 45	4.0 to 4.6	29 to 33	49 to 55	5.0 to 5.7	37 to 41
M12	63 to72	6.4 to 7.4	47 to 53	78 to 90	7.9 to 9.2	58 to 66

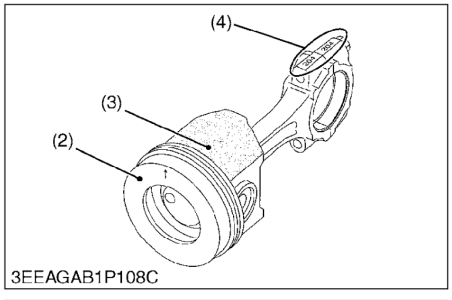
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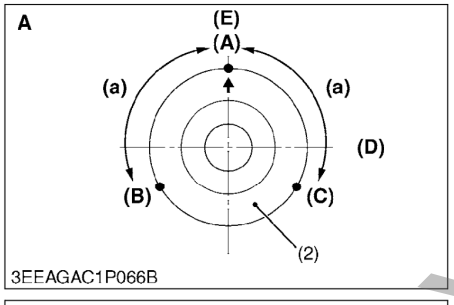
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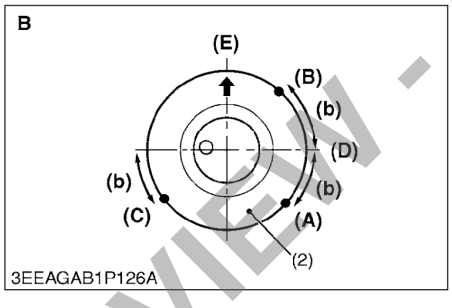
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3EEAGAB1P108C



3EEAGAC1P066B



3EEAGAB1P126A

Piston

1. Completely clean carbon in the cylinders.
2. Turn the flywheel and set a piston to the top dead center.
3. Pull out the piston upward by lightly tapping it from the bottom of the crankcase with the grip of a hammer.

(When reassembling)

- Before inserting the piston into the cylinder, apply enough engine oil to the cylinder.
- When inserting the piston into the cylinder, face the mark (4) on the connecting rod to the injection pump.

■ **IMPORTANT**

- **Do not change the combination of cylinder and piston. Make sure of the position of each piston by marking. For example, mark "1" on the No. 1 position.**
- **When inserting the piston into the cylinder, place the gap of each piston ring like the figure.**
- **Carefully insert the pistons using a piston ring compressor (1). Otherwise, their chrome-plated section of piston rings may be scratched, causing trouble inside the liner.**
- **When inserting the piston in place, be careful not to get the molybdenum disulfide coating (3) torn off its skirt. This coating is useful in minimizing the clearance with the cylinder liner. Just after the piston pin has been press-fitted, in particular, the piston is still hot and the coating is easy to peel off. Wait until the piston cools down.**

(1) Piston Ring Compressor
(2) Piston
(3) Molybdenum Disulfide Coating
(4) Mark

(A) Top Ring Gap
(B) Second Ring Gap
(C) Oil Ring Gap
(D) Piston Pin Hole
(E) Injection Pump Side

(a) 2.09 rad (120 °)
(b) 0.79 rad (45 °)

A : V2607-DI-E3B / V2607-DI-T-E3B
B : V3007-DI-T-E3B / V3307-DI-T-E3B

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ENGINE BODY (Continued)

Item		Factory Specification	Allowable Limit
Valve Face (Intake and Exhaust)	Angle	0.79 rad (45 °)	–
Valve Seat (Intake and Exhaust)	Angle	0.79 rad (45 °)	–
	Width	3.3 to 3.6 mm 0.13 to 0.14 in.	–
Intake Valve Timing **[V2607-DI-T-E3B]**	Open	0.21 rad (12 °) before T.D.C.	–
	Close	0.77 rad (44 °) after B.D.C.	–
[V2607-DI-E3B / V3007-DI-T-E3B / V3307-DI-T-E3B]	Open	0.24 rad (14 °) before T.D.C.	–
	Close	0.70 rad (40 °) after B.D.C.	–
Exhaust Valve Timing **[V2607-DI-T-E3B]**	Open	0.86 rad (49 °) before B.D.C.	–
	Close	0.30 rad (17 °) after T.D.C.	–
[V2607-DI-E3B / V3007-DI-T-E3B / V3307-DI-T-E3B]	Open	0.87 rad (50 °) before B.D.C.	–
	Close	0.24 rad (14 °) after T.D.C.	–
Valve Spring (Intake and Exhaust) **[V2607-DI-E3B / V2607-DI-T-E3B]**	Tilt	–	1.0 mm 0.039 in.
	Free Length	35.4 to 35.9 mm 1.40 to 1.41 in.	34.9 mm 1.37 in.
[V3007-DI-T-E3B / V3307-DI-T-E3B]	Tilt	–	1.0 mm 0.039 in.
	Free Length	35.1 to 35.6 mm 1.39 to 1.40 in.	34.6 mm 1.36 in.

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SAFETY FIRST

This symbol, the industry's "Safety Alert Symbol", is used throughout this manual and on labels on the machine itself to warn of the possibility of personal injury. Read these instructions carefully.

It is essential that you read the instructions and safety regulations before you attempt to repair or use this unit.

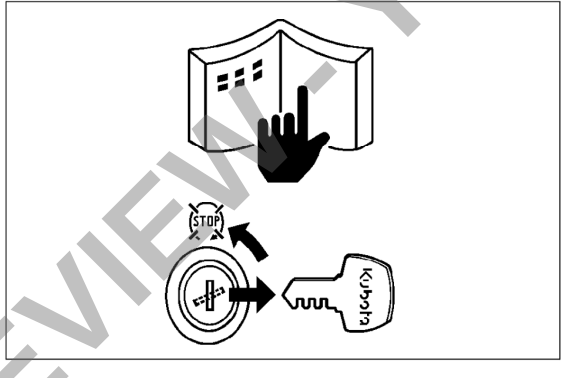
DANGER : Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

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

CAUTION : Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

■ IMPORTANT : Indicates that equipment or property damage could result if instructions are not followed.

■ NOTE : Gives helpful information.

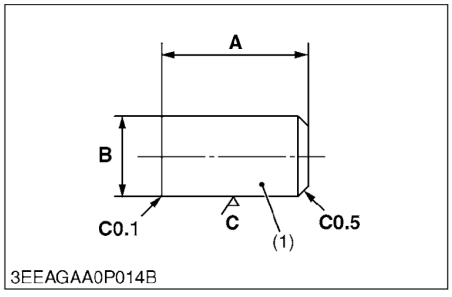


BEFORE SERVICING AND REPAIRING

- Read all instructions and safety instructions in this manual and on your engine safety decals.
- Clean the work area and engine.
- Park the machine on a firm and level ground.
- Allow the engine to cool before proceeding.
- Stop the engine, and remove the key.
- Disconnect the battery negative cable.
- Hang a "**DO NOT OPERATE**" tag in operator station.

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3EEAGAA0P014B

Pin for Balancer Shaft Bearing Replacing Tool (for V3007 / V3307 Balancer Model)

Application: Use to press fit the bearing.

A	7.20 to 7.40 mm (0.284 to 0.291 in.)
B	4.0 mm dia. (0.16 in. dia.)
C	Ra = 0.8 a
C0.1	Chamfer 0.10 mm (0.0039 in.)
C0.5	Chamfer 0.50 mm (0.020 in.)

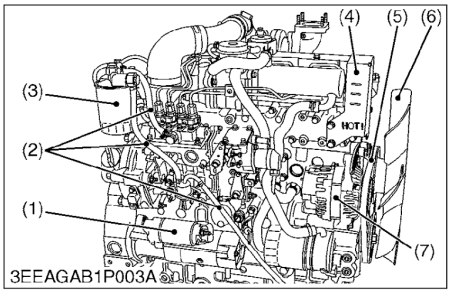
(1) Material : SUM22

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(2) External Components



Air Cleaner, Muffler and Others

1. Remove the air cleaner and muffler.
2. Remove the fan (6), fan belt (5), cover (4), fuel filter cartridge (3), fuel tubes (2), alternator (7) and starter (1).

(When reassembling)

- Check to see that there are no cracks on the belt surface.
- Mount the check valve with the ↓ mark toward the tank.

■ **IMPORTANT**

- **After reassembling the fan belt (5), be sure to adjust the fan belt tension.**
- **Do not confuse the direction of the fan (6). Attach the fan (6) with its marking facing frontward (toward the radiator).**

(1) Starter
(2) Fuel Tube
(3) Fuel Filter Cartridge
(4) Cover
(5) Fan Belt
(6) Fan
(7) Alternator

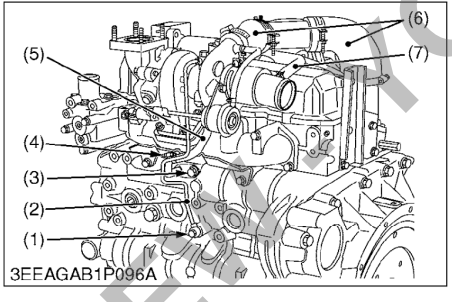
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CAUTION

- **While the engine is operating and or just after it stops, the turbocharger is hot, be careful not to touch the turbocharger.**

■ **NOTE**

- **When detaching and attaching the turbocharger assembly, be very careful not to allow dust, dirt and other foreign matter in the oil pipes.**
- **When the turbocharger assembly has been replace, pour fresh engine oil through the oil filler port of the turbocharger.**
- **Before starting the engine, make sure that air cleaner is in position.**



Oil Pipe and Intake Hose

1. Remove the joint bolt (1), bolt (3) and clamp band (4).
2. Disconnect the oil pipe 1 (2) and oil pipe 2 (5).
3. Remove the intake hose (6) and breather hose (7).

(When reassembling)

- Pour fresh engine oil through the oil filler port of the turbocharger.
- Replace the gasket with new one.
- Be careful not to allow dust, dirt and other foreign matters in the oil pipes (2) / (5).

■ **NOTE**

- **Tape or plug all openings to prevent foreign matters from damaging the oil cavities in the turbocharger.**

(1) Joint Bolt
(2) Oil Pipe 1
(3) Bolt
(4) Clamp Band
(5) Oil Pipe 2
(6) Intake Hose
(7) Breather Hose

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