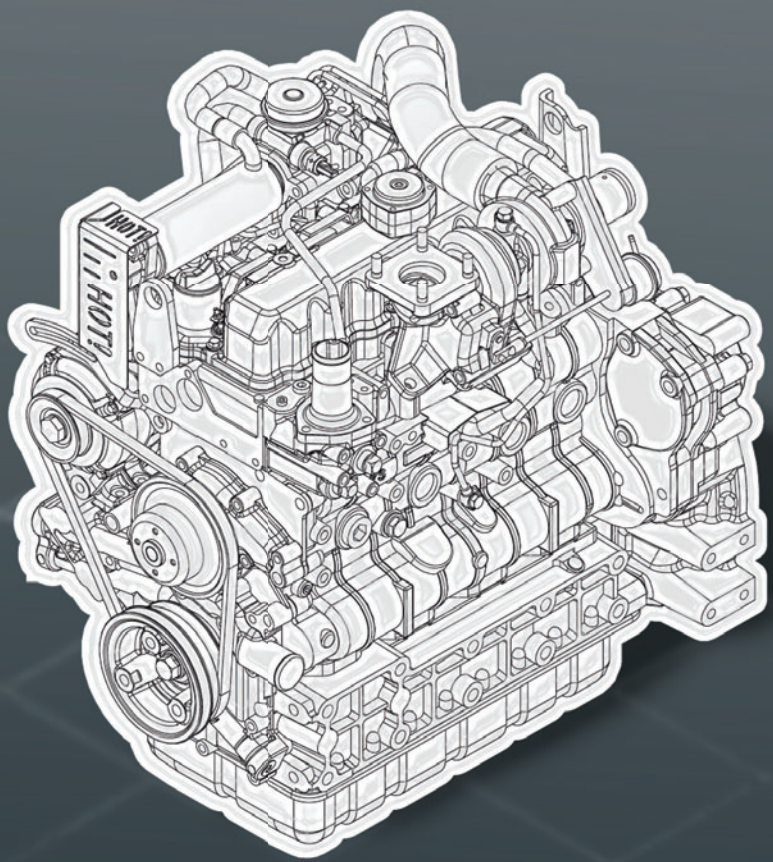
647044EN (10/04/2014)

ENGINE V3307
EURO 3

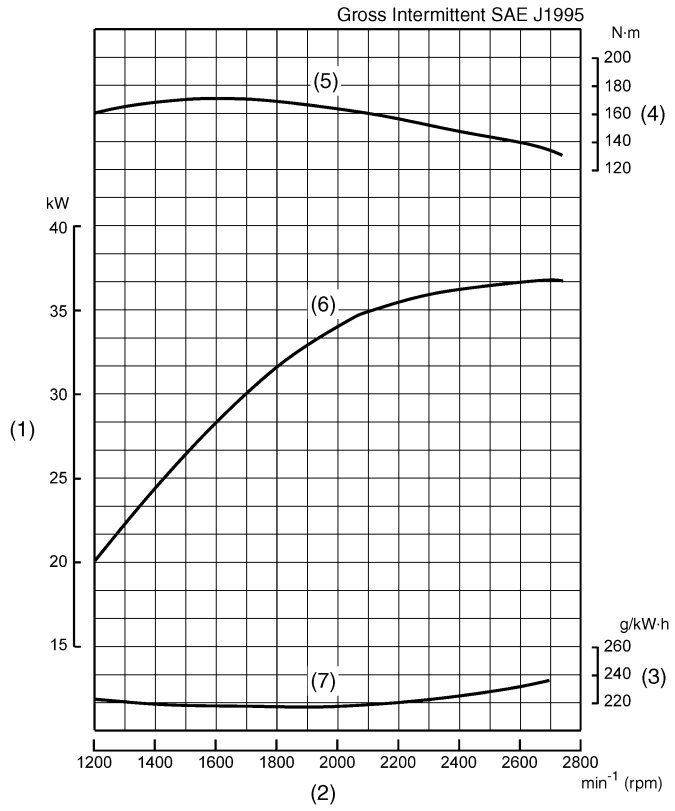
Repair Manual



MANITOU BF
B.P 10249 - 44158 ANCENIS Cedex Tél. 33 (0) 2 40 09 10 11
Fax commercial France : 02 40 09 10 96 // Export : 33 2 40 09 10 97
www.manitou.com

PERFORMANCE CURVES

■ V2607-DI-E3B

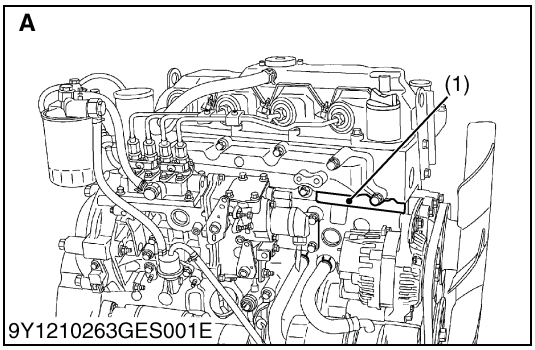


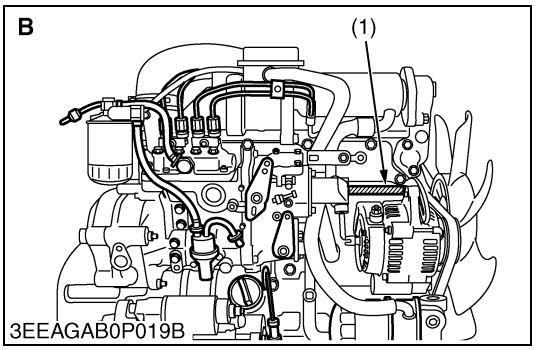
9Y1210263IEI001A

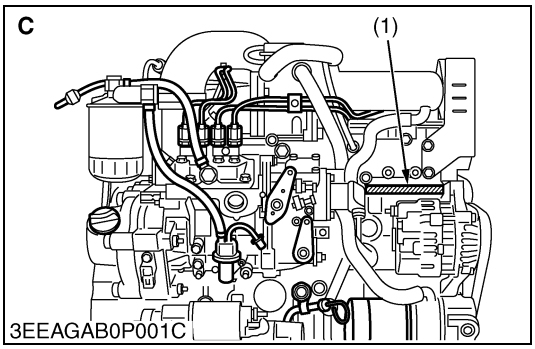
(1) Brake Horsepower
(2) Engine Speed
(3) B.S.F.C.
(4) Torque
(5) Gross Intermittent Torque
(6) Gross Intermittent B.H.P.
(7) Gross Intermittent B.S.F.C.

1. ENGINE IDENTIFICATION

[1] MODEL NAME AND ENGINE SERIAL NUMBER







You must identify the engine model name and serial number before you start a job. When you get in touch with the manufacturer, always tell your engine model name and serial number.

■ **Engine Serial Number**

The engine serial number is an identified number for the engine. It appears after the engine model name.
It shows the month and year of manufacture as below.

(1) Engine Model Name and Serial Number

- **Year of manufacture**

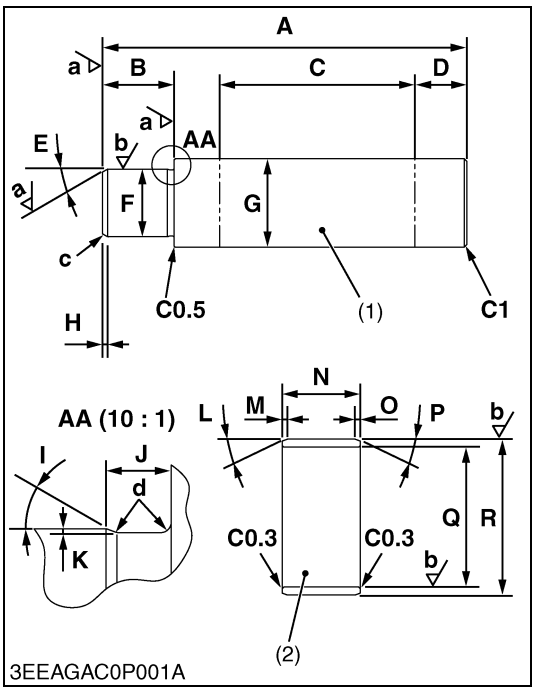
Alphabet or Number	Year	Alphabet or Number	Year
1	2001	F	2015
2	2002	G	2016
3	2003	H	2017
4	2004	J	2018
5	2005	K	2019
6	2006	L	2020
7	2007	M	2021
8	2008	N	2022
9	2009	P	2023
A	2010	R	2024
B	2011	S	2025
C	2012	T	2026
D	2013	V	2027
E	2014		

(1) Engine Model Name and Serial Number

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

W1010477

(To be continued)



Small End Bushing Replacing Tool (for V2607-DI-E3B / V2607-DI-T-E3B)

Application: Use to press fit the small end bushing.

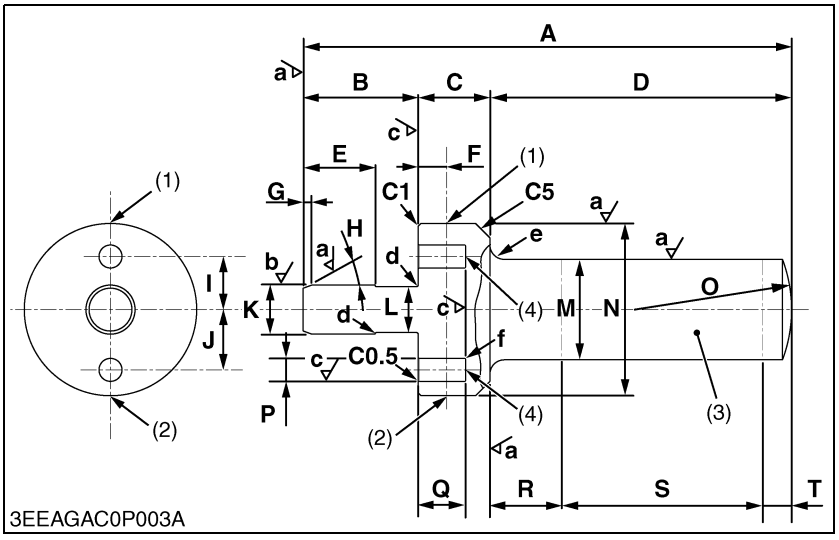
A	140 mm (5.51 in.)
B	27.2 to 27.5 mm (1.07 to 1.08 in.)
C	75.0 mm (2.95 in.) : Roulette
D	20.0 mm (0.787 in.)
E	0.52 rad (30 °)
F	25.967 to 25.980 mm dia. (1.0224 to 1.0228 in. dia.)
G	34.0 mm dia. (1.34 in. dia.)
H	2.0 mm (0.079 in.)
I	0.35 rad (20 °)
J	2.5 mm (0.098 in.)
K	0.15 to 0.25 mm (0.0059 to 0.0098 in.)
L	0.35 rad (20 °)
M	1.0 mm (0.039 in.)
N	14.5 mm (0.571 in.)
O	1.0 mm (0.039 in.)
P	0.35 rad (20 °)
Q	26.000 to 26.021 mm (1.0237 to 1.0244 in.)
R	28.900 to 28.950 mm (1.1378 to 1.1397 in.)
a	Ra = 3.2a
b	Ra = 1.6a
c	1.0 mm radius (0.039 in radius)
d	0.40 mm radius (0.016 in. radius)
C0.3	Chamfer 0.30 mm (0.012 in.)
C0.5	Chamfer 0.50 mm (0.020 in.)
C1	Chamfer 1.0 mm (0.039 in.)

(1) Shaft Material : SS400
(2) Guide Material : STKM12A

W1038743

Valve Bridge Shaft Replacing Tool (for V2607-DI-E3B / V2607-DI-T-E3B)

Application : Use to press fit the valve bridge shaft.



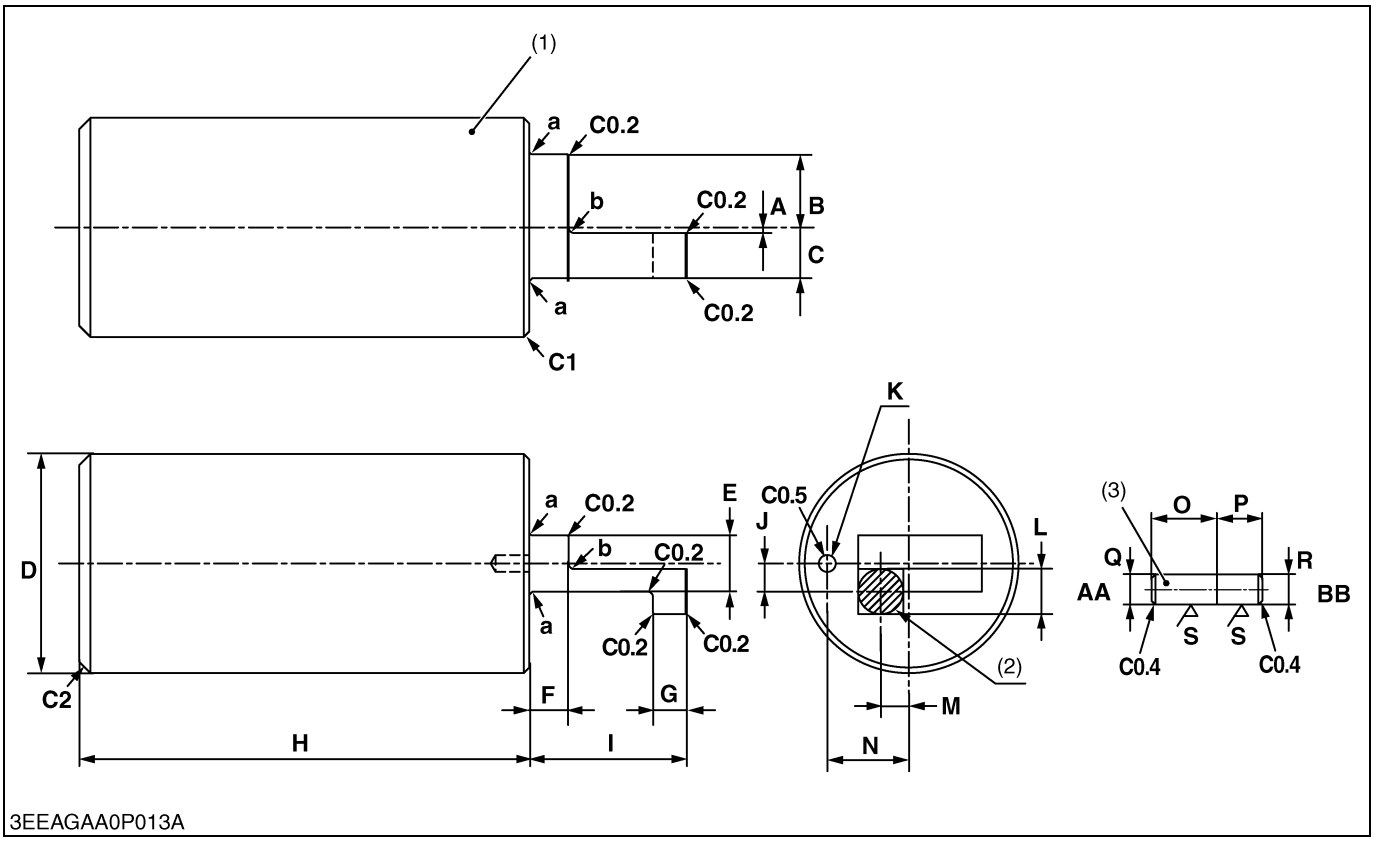
A	170 mm (6.69 in.)
B	40.0 mm (1.57 in.)
C	25.0 mm (0.984 in.)
D	105 mm (4.13 in.)
E	25.0 mm (0.984 in.)
F	10.0 mm (0.394 in.)
G	3.0 mm (0.12 in.)
H	0.35 rad (20 °)
I	18.45 to 18.55 mm (0.7264 to 0.7303 in.)
J	20.95 to 21.05 mm (0.8248 to 0.8287 in.)
K	17.057 to 17.084 mm dia. (0.67154 to 0.67259 in. dia.)
L	16.0 mm dia. (0.630 in. dia.)
M	35.0 mm dia. (1.38 in. dia.)
N	60.0 mm dia. (2.36 in. dia.)
O	SR 50.0 mm (1.97 in.)
P	8.10 to 8.15 mm dia. (0.319 to 0.320 in. dia.)
Q	16.4 to 16.6 mm (0.646 to 0.653 in.)
R	25.0 mm (0.984 in.)
S	70.0 mm (2.76 in.) : Roulette
T	10.0 mm (0.394 in.)
a	Ra = 6.3 a
b	Ra = 1.6 a
c	Ra = 3.2 a
d	0.50 mm radius (0.020 in. radius)
e	5.0 mm radius (0.20 in. radius)
f	under 0.30 mm radius (0.012 in. radius)
C0.5	Chamfer 0.50 mm (0.020 in.)
C1	Chamfer 1.0 mm (0.039 in.)
C5	Chamfer 5.0 mm (0.20 in.)

(1) “IN” side
(2) “EX” side
(3) Material : S43C-D
(4) Bottom flat

W1042739

Jig for Governor Connecting Rod (for V2607 / V3007 / V3307)

Application: Use for connecting the governor connecting rod to the rack pin of the fuel injection pump assembly.



3EEAGAA0P013A

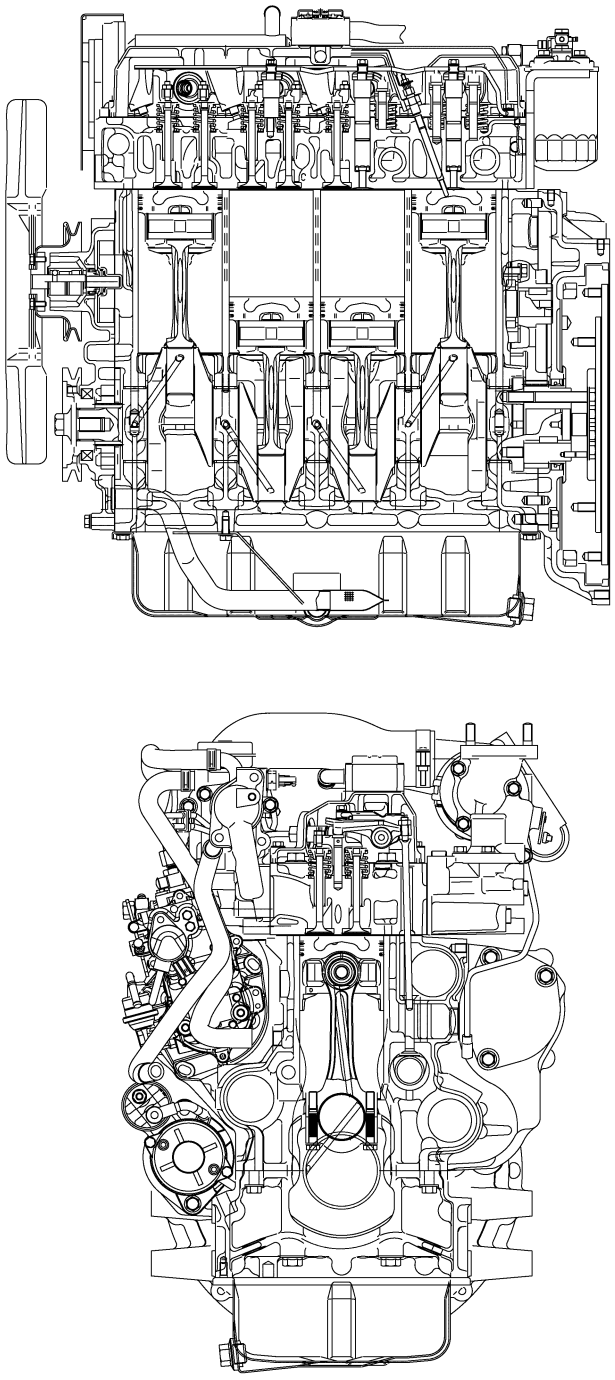
A	0.50 mm (0.020 in.)	**O**	5.0 mm (0.20 in.)
B	12.7 to 13.0 mm (0.500 to 0.511 in.)	**P**	4.0 mm (0.16 in.)
C	8.70 to 9.00 mm (0.343 to 0.354 in.)	**Q**	2.955 to 2.965 mm dia. (0.1164 to 0.1167 in. dia.)
D	39.0 mm (1.54 in.)	**R**	3.020 to 3.030 mm dia. (0.1189 to 0.1192 in. dia.)
E	10.0 mm (0.394 in.)	**S**	Ra = 1.6 a
F	7.0 mm (0.28 in.)	**AA**	Governor housing side
G	6.0 mm (0.24 in.)	**BB**	Press in side
H	80.0 mm (3.15 in.)	**a**	0.60 mm radius (0.024 in. radius)
I	27.95 to 28.05 mm (1.101 to 1.104 in.)	**b**	1.0 mm radius (0.039 in. radius)
J	5.0 mm (0.20 in.)	**C0.2**	Chamfer 0.20 mm (0.0079 in.)
K	3.000 to 3.010 mm dia., 6.0 mm depth (0.1182 to 0.1185 in. dia., 0.24 in. depth)	**C0.4**	Chamfer 0.40 mm (0.016 in.)
L	9.0 mm (0.35 in.)	**C0.5**	Chamfer 0.50 mm (0.020 in.)
M	5.0 mm (0.20 in.)	**C1**	Chamfer 1.0 mm (0.039 in.)
N	14.45 to 14.55 mm (0.5689 to 0.5728 in.)	**C2**	Chamfer 2.0 mm (0.079 in.)

(1) Material : S43C-D

(2) Permanent Magnet :
8.0 mm dia. (0.31 in. dia.)
Thickness : 3.0 mm (0.12 in.)

(3) Pin Material : SUM22

1. FEATURE



3EEAGAB1P086A

The 07 series DI engine are the vertical type 4-cycle diesel engine featuring the advanced performances shown below.

■ **New Concept**

- The Kubota 07 Series is a totally new concept in engine design developed with various requirements necessary for a wide range of industrial applications.
- Kubota's unique cylinder block design was developed using Kubota's original casting technology allowing for a larger displacement within the current 2.4 L compact engine package.
- The improved cooling system with a main water gallery and water passages between cylinder bores as a countermeasure against heat load provides high power density, superior endurance and a reliable Kubota 07 Series.
- The Kubota 07 Series completes Kubota's seamless range up to 100 hp.

■ **Emissions**

- The NEW Kubota 07 Series engines have been designed to comply with EPA Interim Tier 4 (Option 1) emissions regulations, which are the most stringent in this size range. The Kubota 07 Series engines also comply with EU Stage IIIA requirements. The Kubota 07 Series engines offer the benefit of one year longer validity than Tier 3. Therefore, these engines are good through the end of 2012 in both the North American and European markets, which would save engineering resources for the future Tier levels.
- Meeting emission regulations with minimal additional required devices : NOx is reduced only by mechanical means such as a compactly designed cooled exhaust gas recirculation (EGR) system.

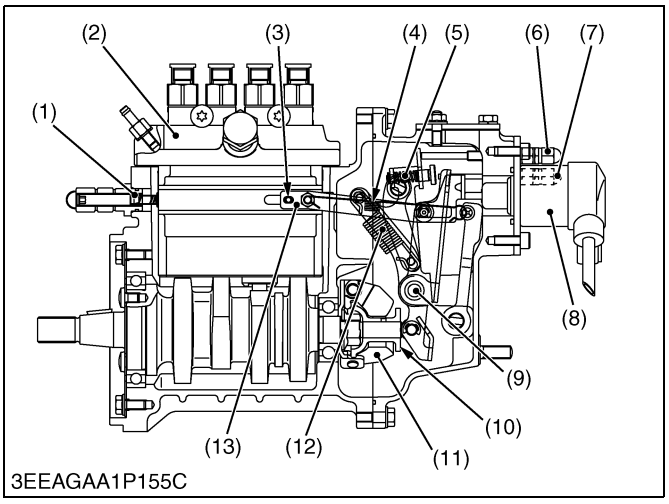
■ **Clean and Quiet Power**

- Kubota's original E-CDIS (Center Direct Injection System) combustion system, renowned for clean combustion in the Kubota V3 (DI) Series, has been renovated. The fuel injection pressure was increased and the combustion chamber was redesigned to achieve a 25 % lower particulate matter (PM) level, resulting in a better condition when compared to engines that only meet EPA Tier 3 regulations in this class.
- These new engines have been designed to reduce transmitted vibrations and radiated sound, resulting in lower noise levels. Operator and environmentally friendly, the Kubota 07 Series begins a new era of Kubota's engine design.

W1012645

5. FUEL SYSTEM

[1] GOVERNOR



3EEAGAA1P155C

The engine employs the separated fuel injection pump in combination with Kubota's own small multi-function mechanical governor, which enables more dependability.

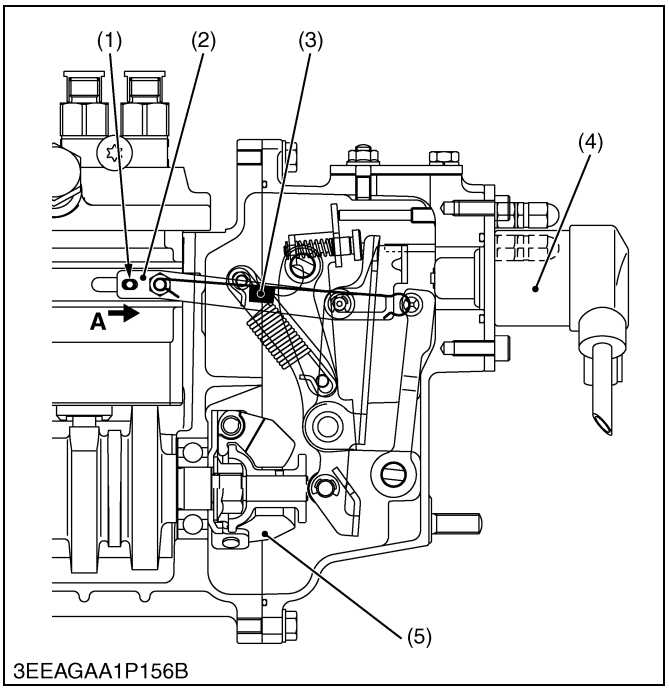
It also employs the torque limiting mechanism to control the maximum peak torque so that it complies with the regulations of exhaust gas.

This mechanism maintains engine speed at a constant level even under fluctuating loads, provides stable idling and regulates maximum engine speed by controlling the fuel injection rate.

This engine uses a mechanical governor that controls the fuel injection rate at all speed ranges (from idling to maximum speed) by utilizing the balance between the flyweight's centrifugal force and spring tension.

(1) Idle Limit Spring
(2) Injection Pump
(3) Control Rack
(4) Start Spring
(5) Torque Spring
(6) Output Limiting Bolt
(7) Torque Limiting Bolt
(8) Stop Solenoid
(9) Fork Lever 1, 2
(10) Governor Sleeve
(11) Flyweight
(12) Governor Spring
(13) Governor Connecting Rod

W1013830



3EEAGAA1P156B

■ At Start

The stop solenoid (4) (energized-to-run type) is powered to release the governor connecting rod (2).

As no centrifugal force is applied to flyweight (5), low tension of start spring (3) permits control rack (1) to move the starting position **A** as showing the arrow, supplying the amount of fuel required to start the engine.

(1) Control Rack
(2) Governor Connecting Rod
(3) Start Spring
(4) Stop Solenoid
(5) Flyweight

A : To Start Position

W1013967

SERVICING

CONTENTS

ENGINE BODY (Continued)

Item		Factory Specification	Allowable Limit
Idle Gear Shaft to Idle Gear Bushing **[V2607-DI-E3B / V2607-DI-T-E3B]**	Oil Clearance	0.025 to 0.096 mm 0.00099 to 0.0037 in.	0.10 mm 0.0039 in.
Idle Gear Shaft	O.D.	34.959 to 34.975 mm 1.3764 to 1.3769 in.	–
Idle Gear Bushing	I.D.	35.000 to 35.055 mm 1.3780 to 1.3801 in.	–
[V3007-DI-T-E3B / V3307-DI-T-E3B]	Oil Clearance	0.050 to 0.091 mm 0.0020 to 0.0036 in.	0.10 mm 0.0039 in.
Idle Gear Shaft	O.D.	34.959 to 34.975 mm 1.3764 to 1.3769 in.	–
Idle Gear Bushing	I.D.	35.025 to 35.050 mm 1.3790 to 1.3799 in.	–
Camshaft	Side Clearance	–	0.10 mm 0.0039 in.
Camshaft	Alignment	–	0.01 mm 0.0004 in.
Cam Height **[V2607-DI-E3B]**	Intake	32.70 mm 1.287 in.	32.20 mm 1.268 in.
	Exhaust	33.20 mm 1.307 in.	32.70 mm 1.287 in.
[V2607-DI-T-E3B]	Intake	32.60 mm 1.283 in.	32.10 mm 1.264 in.
	Exhaust	33.00 mm 1.299 in.	32.50 mm 1.280 in.
[V3007-DI-T-E3B / V3307-DI-T-E3B]	Intake	37.50 mm 1.476 in.	37.00 mm 1.457 in.
	Exhaust	37.90 mm 1.492 in.	37.40 mm 1.472 in.

W1042752

[2] TIGHTENING TORQUES OF THE SCREWS, BOLTS AND NUTS FOR SPECIAL USE

■ **NOTE**

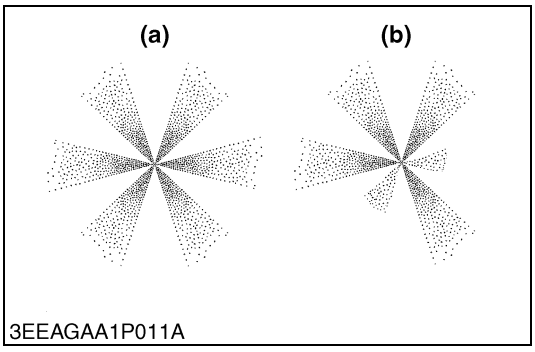
- **For the screws, bolts and nuts with the mark "*", apply engine oil to their threads and seats before you tighten.**
- **The alphabet "M" in Dimension x Pitch shows that the screw, bolt or nut dimensions are in the metric system. The dimension is the nominal external diameter in mm of the threads. The pitch is the nominal distance in mm between 2 threads.**

Item	Dimension x Pitch	N·m	kgf·m	lbf·ft
Glow lead mounting nut	M4 x 0.7	0.98 to 1.7	0.10 to 0.18	0.73 to 1.3
Glow plug	M8 x 1.0	7.7 to 9.3	0.78 to 0.95	5.7 to 6.8
Cylinder head cover screw	M6 x 1.0	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31
Injection pipe retaining nut	M12 x 1.5	23 to 36	2.3 to 3.7	17 to 26
Oil switch taper screw	R 1/8	15 to 19	1.5 to 2.0	11 to 14
Injection pump unit mounting nut	M8 x 1.25	18 to 20	1.8 to 2.1	13 to 15
Drain plug	M22 x 1.5	45 to 53	4.5 to 5.5	33 to 39
Oil pipe 1 mounting screw	M10 x 1.25	16 to 19	1.6 to 2.0	12 to 14
Thermo valve	R 3/8	30 to 39	3.0 to 4.0	22 to 28
Nozzle holder clamp screw	M8 x 1.25	24 to 27	2.4 to 2.8	18 to 20
Overflow pipe assembly retaining screw	M6 x 1.0	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31
*Lubricating oil pipe mounting screw	M10 x 1.25	16 to 19	1.6 to 2.0	12 to 14
Governor housing mounting screw	M6 x 1.0	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31
Lock nut	M5 x 0.8	2.9 to 4.0	0.29 to 0.41	2.1 to 2.9
Injection pump assembly mounting screw	M8 x 1.25	24 to 27	2.4 to 2.8	18 to 20
Injection pump assembly mounting nut	M8 x 1.25	18 to 20	1.8 to 2.1	13 to 15
Governor weight mounting nut	M12 x 1.25	63 to 72	6.4 to 7.4	47 to 53
Fuel camshaft stopper mounting screw	M6 x 1.0	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31
Fuel camshaft bearing stopper mounting screw	M6 x 1.0	3.9 to 4.2	0.39 to 0.43	2.9 to 3.1
*Crankshaft screw	M16 x 1.5	255 to 274	26.0 to 28.0	188 to 202
Relief valve retaining screw	M22 x 1.5	69 to 78	7.0 to 8.0	51 to 57
*Flywheel screw	M12 x 1.25	98.1 to 107	10.0 to 11.0	72.4 to 79.5
Camshaft set screw	M8 x 1.25	24 to 27	2.4 to 2.8	18 to 20
Balancer shaft set screw	M8 x 1.25	24 to 27	2.4 to 2.8	18 to 20
Starter's terminal **B** mounting nut	M8 x 1.25	9.8 to 11	1.0 to 1.2	7.3 to 8.6
Alternator pulley nut	M24	58.4 to 78.9	5.95 to 8.05	43.1 to 58.2
Oil pump cover screw	M6	7.9 to 9.3	0.80 to 0.95	5.8 to 6.8

W1013236

CAUTION

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



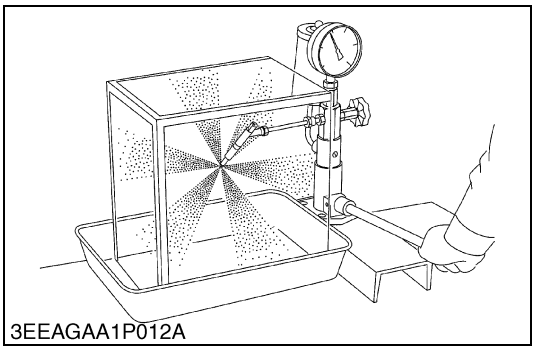
3EEAGAA1P011A

Nozzle Spraying Condition

1. Attach the injection nozzle to the nozzle tester, and check the nozzle spraying condition.
2. If the spraying condition is defective, replace the injection nozzle assembly or repair at Kubota-authorized nozzle service shop.

(a) Good **(b) Bad**

W10371670


3EEAGAA1P012A

Checking Nozzle Injection Pressure

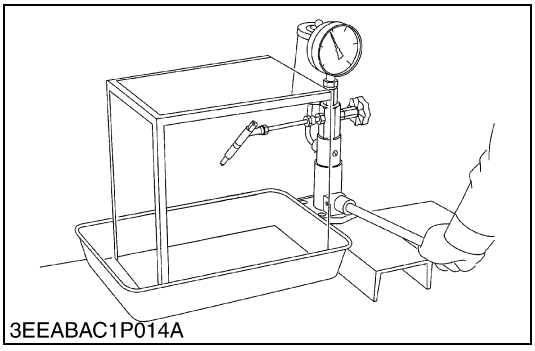
1. Attach the injection nozzle to the nozzle tester.
2. Slowly move the tester handle to measure the pressure at which fuel begins jetting out from the nozzle.
3. If the measurement is not within the factory specifications, replace the injection nozzle assembly or repair at Kubota-authorized nozzle service shop.

■ **NOTE**

- **Injection nozzle gasket must be replaced when the injection nozzle is removed for checking.**

Injection pressure (1st stage)	Factory spec.	V2607-DI-E3B V2607-DI-T-E3B	18.64 to 20.10 MPa 190.0 to 205.0 kgf/cm^2 2703 to 2915 psi
		V3007-DI-T-E3B V3307-DI-T-E3B	18.64 to 19.61 MPa 190.0 to 200.0 kgf/cm^2 2703 to 2844 psi

W1037280


3EEABAC1P014A

Valve Seat Tightness

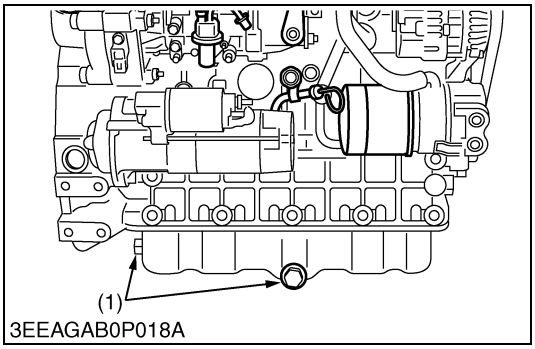
1. Attach the injection nozzle to the nozzle tester.
2. Raise the fuel pressure, and keep at 16.67 MPa (170.0 kgf/cm^2, 2418 psi) for 10 seconds.
3. If any fuel leak is found, replace the injection nozzle assembly or repair at Kubota-authorized nozzle service shop.

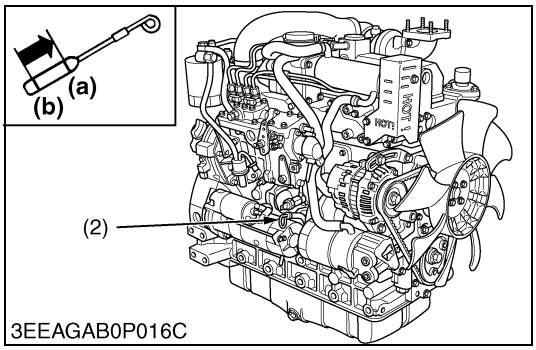
Valve seat tightness	Factory spec.	No fuel leak at 16.67 MPa 170.0 kgf/cm^2 2418 psi

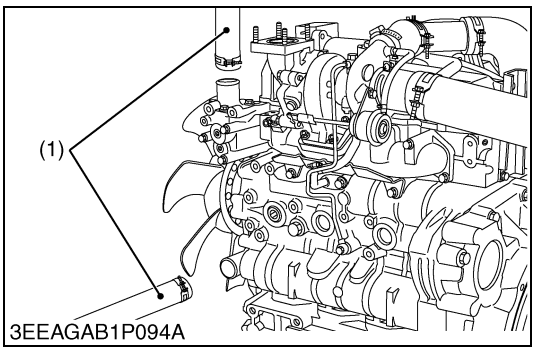
W10374150

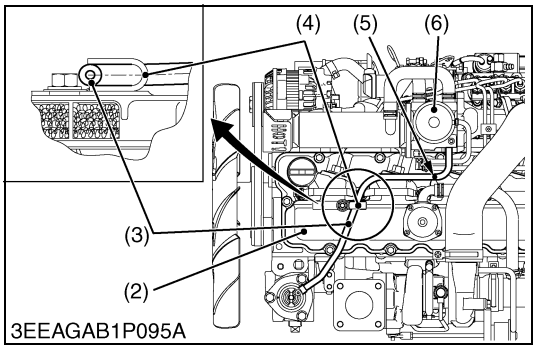
[2] DISASSEMBLING AND ASSEMBLING

(1) Draining Oil and Coolant









Draining Engine Oil

1. Start and warm up the engine for approx. 5 minutes.
2. Place an oil pan underneath the engine.
3. Remove the drain plug (1) to drain oil.
4. After draining, screw in the drain plug (1).

(When refilling)

- Fill the engine oil up to the upper line on the dipstick (2).

■ **IMPORTANT**

- **Never mix two different types of oil.**
- **Use the proper SAE Engine Oil according to ambient temperature.**

Tightening torque	Drain plug	45 to 53 N·m 4.5 to 5.5 kgf·m 33 to 39 lbf·ft

(1) Drain Plug
(2) Dipstick
(a) Upper Line
(b) Lower Line

W1023464

Draining Coolant

CAUTION

- **Never remove radiator cap while operating or immediately after stopping. Otherwise, hot water will spout out from the radiator. Wait for more than ten minutes to cool the radiator, before opening the cap.**

1. Open the radiator drain plug and remove the radiator cap.
2. Remove the radiator hose (1) from engine body.

[If air vent hose equipped]

3. Remove the air vent hose (3).

(When refilling)

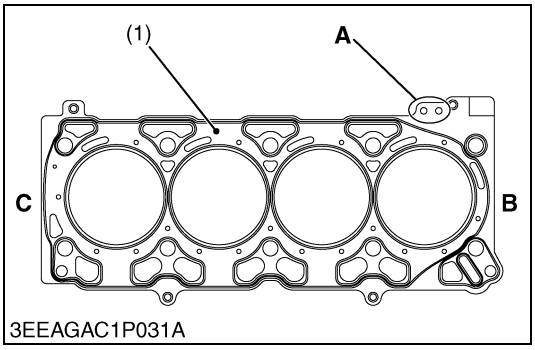
- Adjust the mark (5) of the air vent hose (3) to upward side near the EGR valve (6).
- Fix the air vent hose (3) to the cylinder head cover (2) by using clamp belt (4).

■ **NOTE**

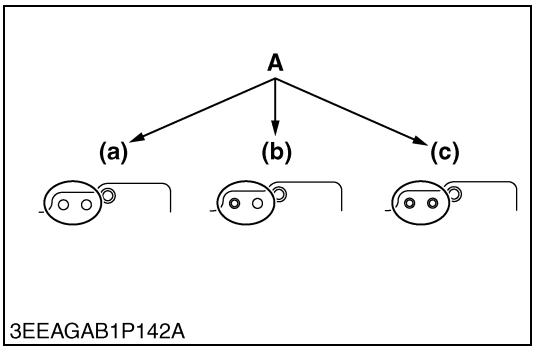
- **Clamp the air vent hose (3) so as not to crush.**
- **Securely tighten clamp belts (4). If the clamp belt (4) is loose or improperly fitted, coolant may leak out and the engine could overheat.**

(1) Radiator Hose
(2) Cylinder Head Cover
(3) Air Vent Hose
(4) Clamp Belt
(5) Mark
(6) EGR Valve

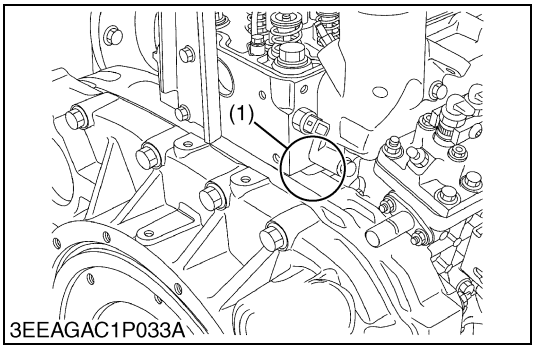
W1023496



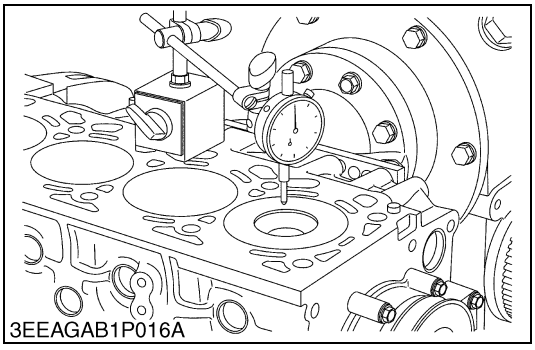
3EEAGAC1P031A

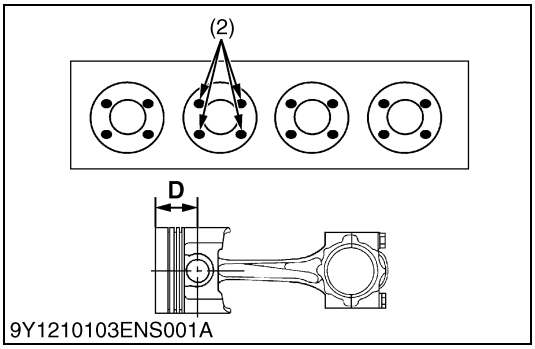


3EEAGAB1P142A



3EEAGAC1P033A


3EEAGAB1P016A



9Y1210103ENS001A

Selecting Cylinder Head Gasket (for V2607-DI-E3B / V2607-DI-T-E3B)

■ Replacing the Cylinder Head Gasket

1. Make sure to note the hole **(a)**, **(b)** or **(c)** of cylinder head gasket (1) in advance.
2. Replace the same hole **(a)**, **(b)** or **(c)** as the original cylinder head gasket (1).

■ Selecting the Cylinder Head Gasket

- Select the cylinder head gasket (1) thickness to meet with the top clearance when replacing the piston, piston pin bush, connecting rod or crankpin bearing.

1. Measure the piston head's protrusion or recessing from the crankcase cylinder face (4 spots per each piston and average of four pistons) using the dial gauge as shown in figure.
2. Select the suitable cylinder head gasket (1) refer to the table below.

Hole of Cylinder Head Gasket	Thickness of cylinder head gasket		Part Code	Piston Head's protrusion or recessing from the level of crankcase cylinder face. (average of 4 pistons)
	Before tightening	After tightening		
Without hole **(a)**	1.10 mm 0.0433 in.	1.00 mm 0.0394 in.	1J700-03310	0.250 to 0.350 mm 0.00985 to 0.0137 in.
1 hole **(b)**	1.20 mm 0.0472 in.	1.10 mm 0.0433 in.	1J700-03320	0.350 to 0.450 mm 0.0138 to 0.0177 in.
2 holes **(c)**	1.30 mm 0.0512 in.	1.20 mm 0.0472 in.	1J700-03330	0.450 to 0.550 mm 0.0178 to 0.0216 in.

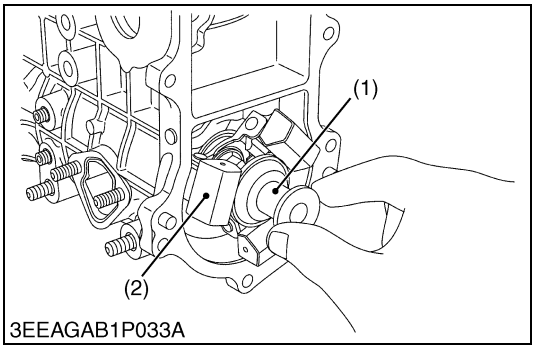
■ NOTE

- **Select the H05 piston first when you replace the piston. Select the H00 or H10 piston when the H05 piston does not cover the range in the table.**

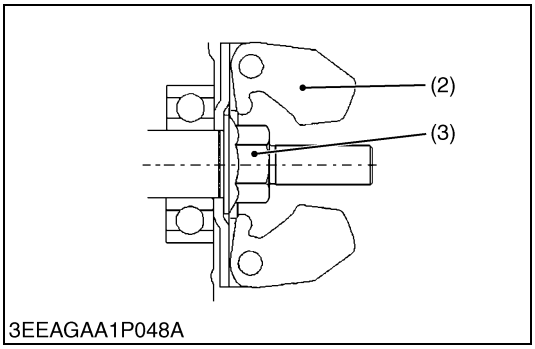
Piston	Piston Height (H)
H05	39.10 to 39.15 mm 1.540 to 1.541 in.
H00	39.05 to 39.10 mm 1.538 to 1.539 in.
H10	39.15 to 39.20 mm 1.542 to 1.543 in.

(1) Cylinder Head Gasket
(2) Measuring Point
A : Hole of Cylinder Head Gasket
B : Flywheel Housing Side
C : Front Cover Side
D : Piston Height (H)
(a) Without Hole (0 Through Hole)
(b) 1 Hole (1 Through Hole)
(c) 2 Holes (2 Through Holes)

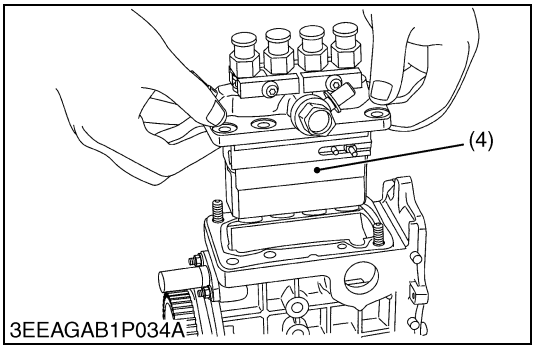
W1214547



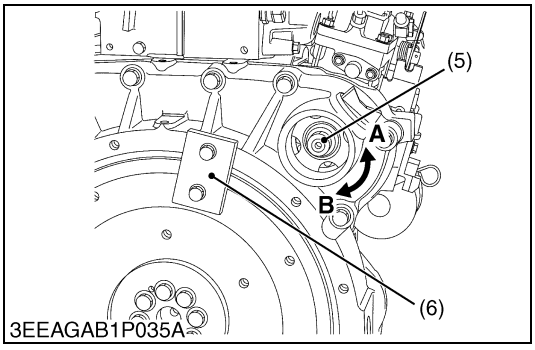
3EEAGAB1P033A



3EEAGAA1P048A



3EEAGAB1P034A



3EEAGAB1P035A

Fuel Camshaft and Governor Weight

1. Separate the governor housing assembly from the injection pump unit. (See the “Injection Pump Unit”.)
2. Remove the governor sleeve (1).
3. Remove the injection pump assembly (4).
4. Remove the fuel camshaft lock screws.
5. Install the injection pump unit to the crankcase 1 again and temporarily tighten unit.
6. Fix the flywheel with the flywheel stopper (6) and loosen the injection pump gear mounting nut (5).
7. Remove the governor weight mounting nut (3) and the governor weight (2).
8. Separate the injection pump unit from the crankcase 1.

■ **NOTE**

- **Do not use the fuel camshaft lock screws, when removing the governor weight mounting nut (3). Otherwise, the lock screws or injection pump housing might get damage.**

■ **IMPORTANT**

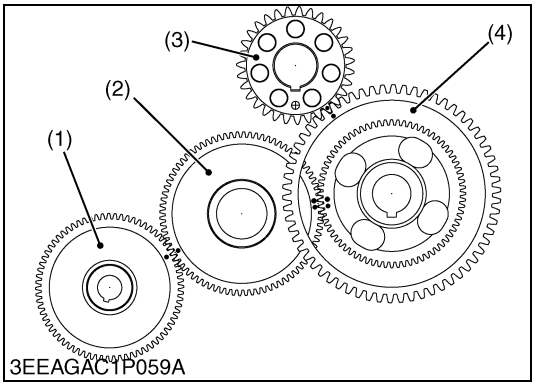
- **This injection pump gear mounting nut (5) has left-handed screw. To loose this nut, rotate clockwise (viewed from flywheel side).**

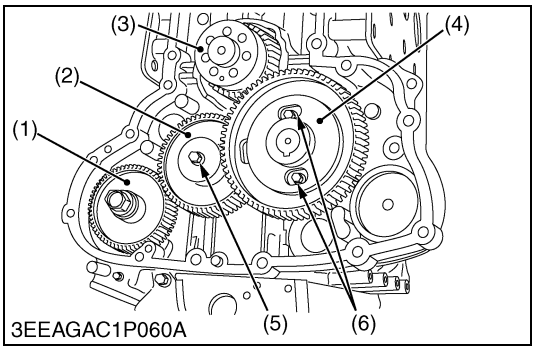
Tightening torque	Injection pump assembly mounting screw		24 to 27 N·m 2.4 to 2.8 kgf·m 18 to 20 lbf·ft
	Injection pump assembly mounting nut		18 to 20 N·m 1.8 to 2.1 kgf·m 13 to 15 lbf·ft
	Injection pump gear mounting nut (left-handed screw)	V2607-DI-E3B V2607-DI-T-E3B	93.2 to 102 N·m 9.50 to 10.5 kgf·m 68.8 to 75.9 lbf·ft
		V3007-DI-T-E3B V3307-DI-T-E3B	138 to 156 N·m 14.0 to 16.0 kgf·m 102 to 115 lbf·ft
	Governor weight mounting nut		63 to 72 N·m 6.4 to 7.4 kgf·m 47 to 53 lbf·ft

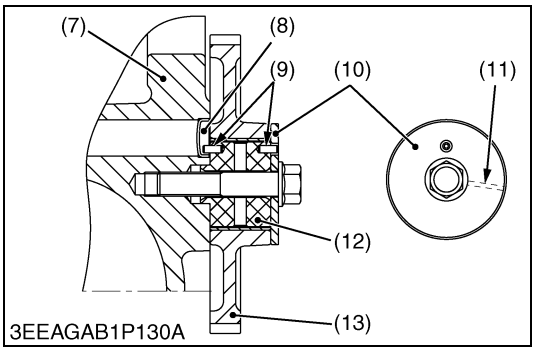
(1) Governor Sleeve
(2) Governor Weight
(3) Governor Weight Mounting Nut
(4) Injection Pump Assembly
(5) Injection Pump Gear Mounting Nut
(6) Flywheel Stopper

A : To Tighten
B : To Loosen

(To be continued)
W1144178







Camshaft and Idle Gear (for V2607-DI-E3B / V2607-DI-T-E3B)

1. Rotate the cylinder head side of the engine crankcase to the lower side.
2. Remove the camshaft set screws (6) and draw out the cam gear (4).
3. Remove the idle gear mounting screws (5) and draw out the idle gear (2).

■ **NOTE**

- **If the cylinder head side of the engine crankcase does not become lower side, the tappets drop and become the trouble to the camshaft. The camshaft will not be able to be drawn out.**

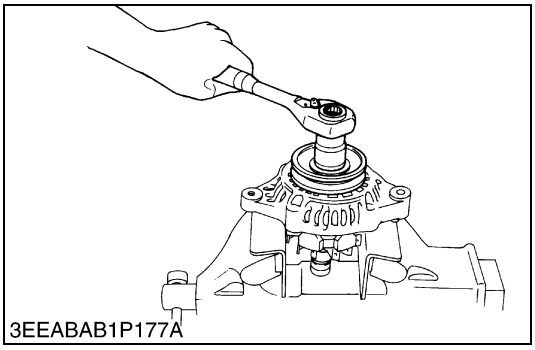
(When reassembling)

- When installing the idle gear (2) and cam gear (4), be sure to place the 4th cylinder piston at the top dead center in compression then, align all mating marks on each gear to assemble the timing gears, set the cam gear last.
- Mount the injection pump gear (1) after installing the flywheel housing.
- Make sure the idle gear shaft (12) is clean.
- Apply oil to the idle gear shaft (12) and set the crankcase 1 (7).
- Set the idle gear (13) and the collar (10) with the oil groove (11) facing crankcase 1 side.

Tightening torque	Camshaft set screw	24 to 27 N·m 2.4 to 2.8 kgf·m 18 to 20 lbf·ft
	Idle gear mounting screw	49 to 55 N·m 5.0 to 5.7 kgf·m 37 to 41 lbf·ft

(1) Injection Pump Gear
(2) Idle Gear
(3) Crank Gear
(4) Cam Gear
(5) Idle Gear Mounting Screw
(6) Camshaft Set Screw
(7) Crankcase 1
(8) Plug
(9) Spring Pin
(10) Collar
(11) Oil Groove
(12) Idle Gear Shaft
(13) Idle Gear

W1294222

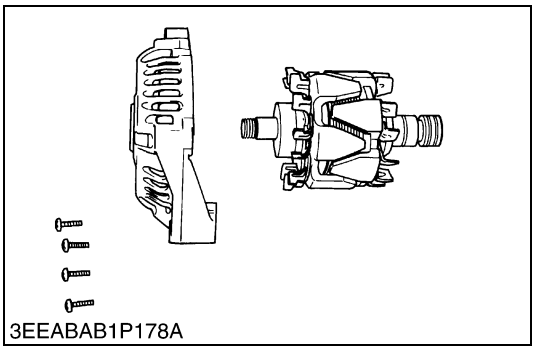

3EEABAB1P177A

Pulley

1. Hold the rotor (base of the claw) in a vise. Loosen the lock nut using a M24 box wrench.

Tightening torque	Alternator pulley nut	58.4 to 78.9 N·m 5.95 to 8.05 kgf·m 43.1 to 58.2 lbf·ft

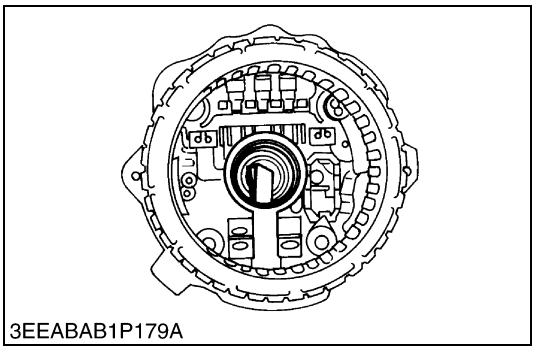
W1074849


3EEABAB1P178A

Rotor

1. Remove the 4 screws and detach the bearing retainer.
2. Temporarily install the nut on the pulley screw, and detach the rotor.

W1074920

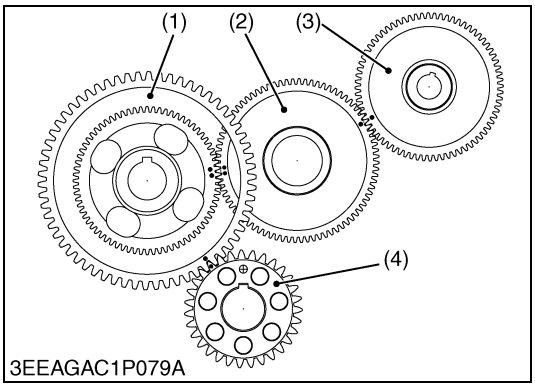

3EEABAB1P179A

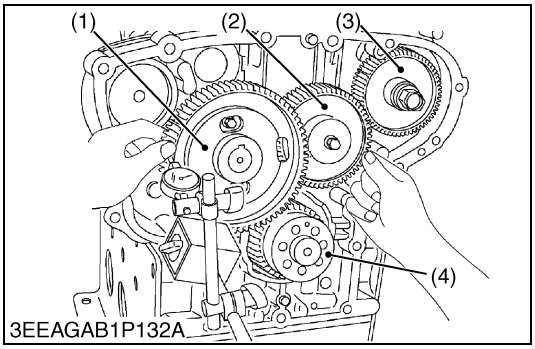
Brush

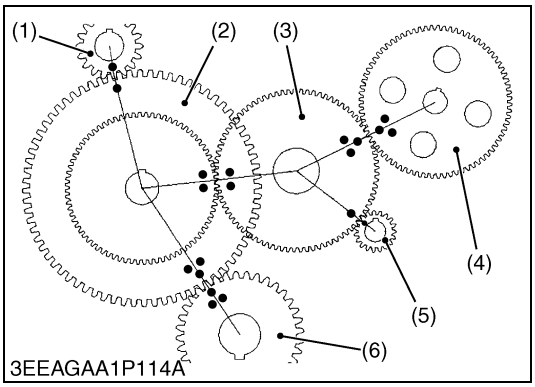
1. When the rotor is detached, the 2 brushes are found to stretch out of the shaft hole.

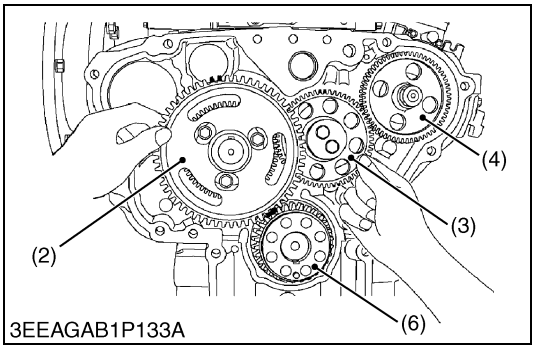
W1075045

(2) Timing Gears









Timing Gear Backlash (for V2607-DI-E3B / V2607-DI-T-E3B)

1. Set a dial indicator (lever type) with its tip on the gear tooth.
2. Move the gear to measure the backlash, holding its mating gear.
3. If the backlash exceeds the allowable limit, check the oil clearance of the shafts and the gear.
4. If the oil clearance is proper, replace the gear.

Backlash between crank gear and cam gear	Factory spec.	0.0400 to 0.137 mm 0.00158 to 0.00539 in.
	Allowable limit	0.22 mm 0.0087 in.
Backlash between cam gear and idle gear	Factory spec.	0.0460 to 0.136 mm 0.00182 to 0.00535 in.
	Allowable limit	0.22 mm 0.0087 in.
Backlash between idle gear and injection pump gear	Factory spec.	0.0460 to 0.136 mm 0.00182 to 0.00535 in.
	Allowable limit	0.22 mm 0.0087 in.

(1) Cam Gear
(2) Idle Gear
(3) Injection Pump Gear
(4) Crank Gear

W1249019

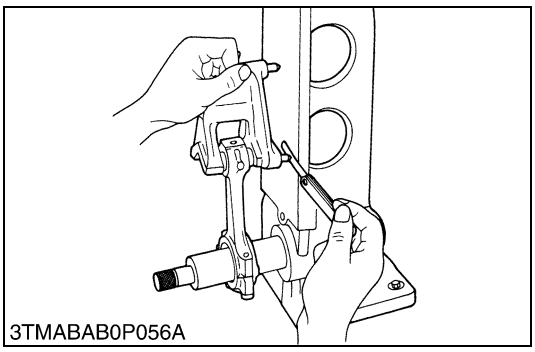
Timing Gear Backlash (for V3007-DI-T-E3B / V3307-DI-T-E3B)

1. Set a dial indicator (lever type) with its tip on the gear tooth.
2. Move the gear to measure the backlash, holding its mating gear.
3. If the backlash exceeds the allowable limit, check the oil clearance of the shafts and the gear.
4. If the oil clearance is proper, replace the gear.

Backlash between crank gear and cam gear	Factory spec.	0.0410 to 0.139 mm 0.00162 to 0.00547 in.
	Allowable limit	0.22 mm 0.0087 in.
Backlash between cam gear and idle gear	Factory spec.	0.0410 to 0.134 mm 0.00162 to 0.00527 in.
	Allowable limit	0.22 mm 0.0087 in.
Backlash between idle gear and injection pump gear	Factory spec.	0.0410 to 0.134 mm 0.00162 to 0.00527 in.
	Allowable limit	0.22 mm 0.0087 in.
(for balancer model) Backlash between cam gear and balancer 1 gear	Factory spec.	0.0410 to 0.134 mm 0.00162 to 0.00527 in.
	Allowable limit	0.22 mm 0.0087 in.
(for balancer model) Backlash between idle gear and balancer 2 gear	Factory spec.	0.0410 to 0.129 mm 0.00162 to 0.00507 in.
	Allowable limit	0.22 mm 0.0087 in.

(1) Balancer 1 Gear (Option)
(2) Cam Gear
(3) Idle Gear
(4) Injection Pump Gear
(5) Balancer 2 Gear (Option)
(6) Crank Gear

W1064048


3TMABAB0P056A

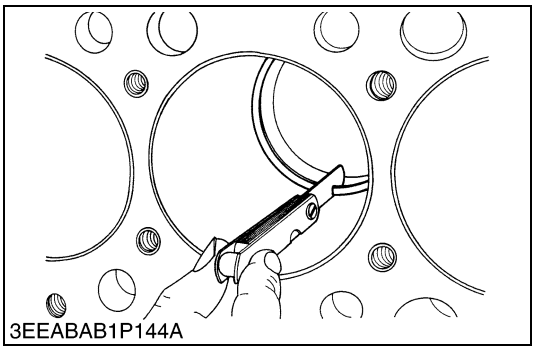
Connecting Rod Alignment

■ **NOTE**
- **Since the I.D. of the connecting rod small end bushing is the basis of this check, check the bushing for wear beforehand.**

1. Remove the piston pin from the piston.
2. Install the piston pin in the connecting rod.
3. Install the connecting rod on the connecting rod alignment tool.
4. Put a gauge over the piston pin, and move it against the face plate.
5. If the gauge does not fit squarely against the face plate, measure the space between the pin of the gauge and the face plate.
6. If the measurement exceeds the allowable limit, replace the connecting rod.

Connecting rod alignment	Allowable limit	0.05 mm 0.002 in.

W1066581


3EEABAB1P144A

Piston Ring Gap

1. Insert the piston ring into the lower part of the liner (the least worn part) with the piston.
2. Measure the ring gap with a feeler gauge.
3. If the gap exceeds the allowable limit, replace the piston ring.

Top ring	V2607-DI-E3B V2607-DI-T-E3B	Factory spec.	0.20 to 0.35 mm 0.0079 to 0.013 in.
		Allowable limit	1.25 mm 0.0492 in.
	V3007-DI-T-E3B V3307-DI-T-E3B	Factory spec.	0.25 to 0.40 mm 0.0099 to 0.015 in.
		Allowable limit	1.25 mm 0.0492 in.

Second ring	Factory spec.	0.30 to 0.45 mm 0.012 to 0.017 in.
	Allowable limit	1.25 mm 0.0492 in.

Oil ring	Factory spec.	0.25 to 0.45 mm 0.0099 to 0.017 in.
	Allowable limit	1.25 mm 0.0492 in.

W1066430