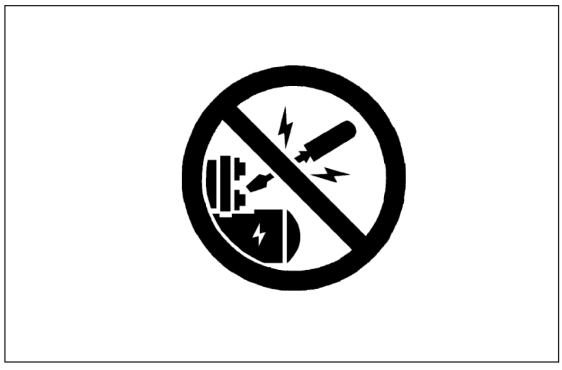
SERVICING

CONTENTS

1. TROUBLESHOOTING S-1
2. SERVICING SPECIFICATIONS S-5
3. TIGHTENING TORQUES S-14
   [1] TIGHTENING TORQUES FOR GENERAL USE SCREWS, BOLTS AND NUTS S-14
   [2] TIGHTENING TORQUES FOR SPECIAL USE SCREWS, BOLTS AND NUTS S-15
4. CHECKING, DISASSEMBLING AND SERVICING S-16
   [1] CHECKING AND ADJUSTING S-16
      (1) Engine Body S-16
      (2) Lubricating System S-18
      (3) Cooling System S-18
      (4) Fuel System S-21
      (5) Electrical System S-24
      (6) Turbocharger S-29
   [2] DISASSEMBLING AND ASSEMBLING S-30
      (1) Draining Oil and Coolant S-30
      (2) External Components S-30
      (3) Cylinder Head and Valve S-31
      (4) Gear Case and Timing Gears S-35
      (5) Piston and Connecting Rod S-40
      (6) Flywheel and Crankshaft S-43
      (7) Alternator S-46
      (8) Starter S-47
   [3] SERVICING S-49
      (1) Cylinder Head and Valves S-49
      (2) Timing Gears, Camshaft and Governor Gear S-55
      (3) Piston and Connecting Rod S-58
      (4) Crankshaft S-61
      (5) Cylinder S-67
      (6) Oil Pump S-68
      (7) Starter S-68
      (8) Alternator S-71

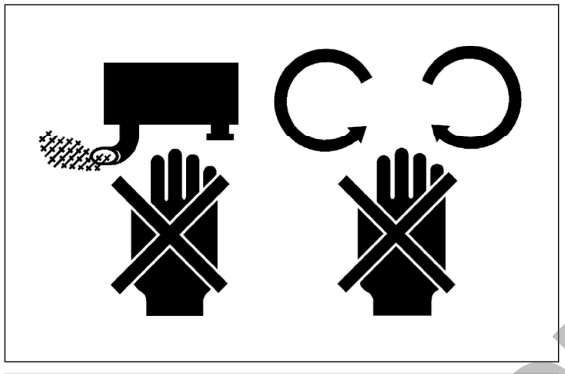
KiSC issued 10, 2007 A

PREVIEW ONLY
Download full manual at youfixthis.com



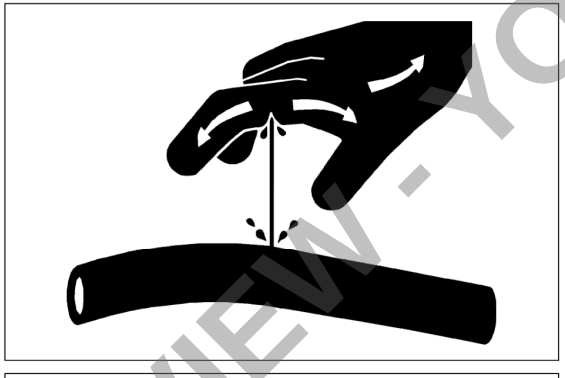
SAFETY STARTING

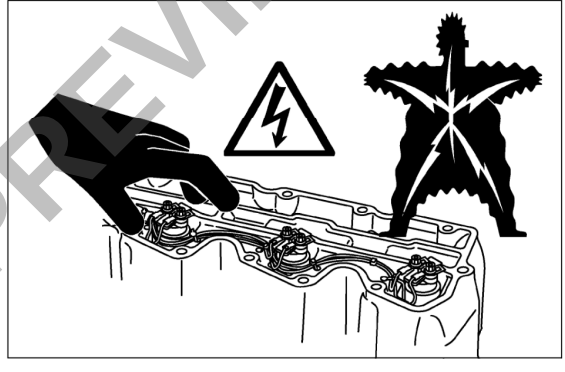
- Do not start the engine by shorting across starter terminals or bypassing the safety start switch.
- Unauthorized modifications to the engine may impair the function and / or safety and affect engine life.



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 running.
- Never remove the radiator cap while the engine is running, 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 repair or 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 injector.
  Pay sufficient caution to electric shock when performing work activities.





PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

3. MAINTENANCE CHECK LIST

To maintain long-lasting and safe engine performance, make it a rule to carry out regular inspections by following the table below.

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 (Oil pan depth : 110 mm (4.33 in.), 125 mm (4.92 in.), 130 mm (5.12 in.))											
* Cleaning air cleaner element (Replace the element after 6 times cleaning)											
Cleaning fuel filter element											
Check fan belt tension and damage											
Checking battery electrolyte level											
* Replacing oil filter cartridge (Oil pan depth : 110 mm (4.33 in.), 125 mm (4.92 in.), 130 mm (5.12 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 pressure											
* Checking turbocharger											
Checking injection pump											
Checking injection timing											
Changing radiator coolant (L.L.C.)											
Replacing radiator hoses and clamp bands											
* Replacing fuel hoses and clamps											
* Replacing intake air line											
Replacing battery											

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.
Please see the emission Warranty Statement in detail.

W1029462

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Engine Does Not Start	No fuel	Replenish fuel	G-11
	Air in the fuel system	Vent air	G-11
	Water in the fuel system	Change fuel and repair or replace fuel system	–
	Fuel pipe clogged	Clean or replace	G-11
	Fuel filter clogged	Replace	G-15, 16
	Excessively high viscosity of fuel or engine oil at low temperature	Use specified fuel or engine oil	5, 6, G-9
	Fuel with low cetane number	Use specified fuel	–
	Fuel leak due to loose injection pipe retaining nut	Tighten retaining nut	–
	Incorrect injection timing	Adjust	S-21
	Fuel camshaft worn	Replace	S-39
	Injection nozzle clogged	Clean or replace	S-23, 24
	Injection pump malfunctioning	Repair or replace	S-22, 38
	Seizure of crankshaft, camshaft, piston, cylinder or bearing	Repair or replace	S-61 to 67 S-39 to 42
	Compression leak from cylinder	Replace head gasket, tighten cylinder head screw, glow plug and nozzle holder	S-32, 33, 34
	Improper valve timing	Correct or replace timing gear	S-39
	Piston ring and cylinder worn	Replace	S-40, 41, 42
	Excessive valve clearance	Adjust	S-17
	Stop solenoid malfunctioning	Replace	S-37
Starter Does Not Run	Battery discharged	Charge	–
	Starter malfunctioning	Repair or replace	S-30, 68, 69, 70
	Key switch malfunctioning	Replace	–
	Wiring disconnected	Connect	–

W1014322

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

2. SERVICING SPECIFICATIONS

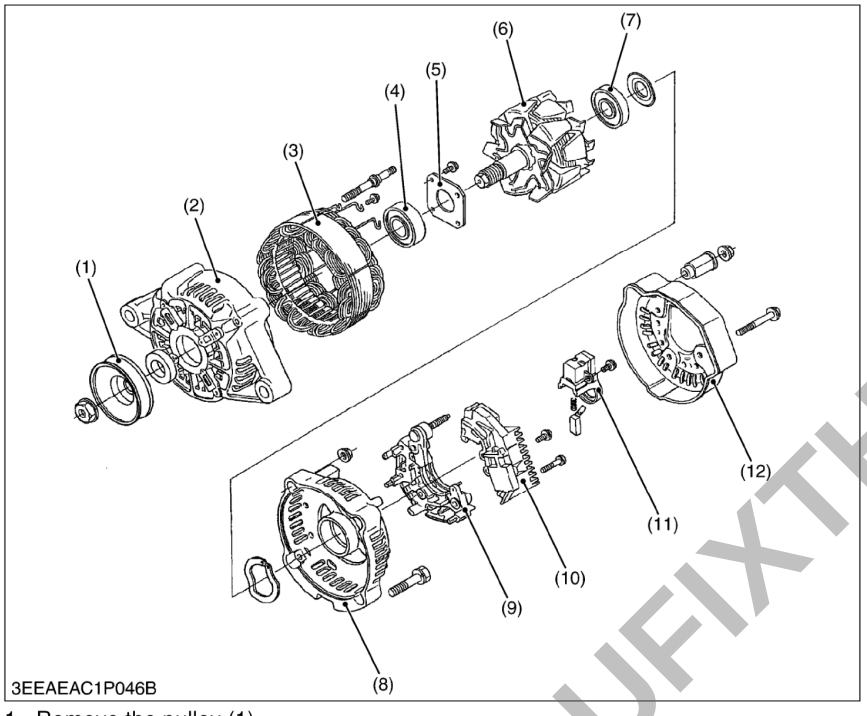
ENGINE BODY

Item		Factory Specification	Allowable Limit
Valve Clearance (Cold)		0.145 to 0.185 mm 0.00571 to 0.00728 in.	–
Compression Pressure	D1005-E3B D1105-E3B D1305-E3B V1505-E3B	3.73 to 4.11 MPa 38.0 to 42.0 kgf/cm^2 541 to 597 psi	2.26 MPa 23.0 kgf/cm^2 327 psi
	D1105-T-E3B V1505-T-E3B	3.14 to 3.53 MPa 32.0 to 36.0 kgf/cm^2 456 to 512 psi	2.26 MPa 23.0 kgf/cm^2 327 psi
Difference among Cylinders		–	10 % or less
Top Clearance	D1005-E3B D1105-E3B D1105-T-E3B V1505-E3B V1505-T-E3B	0.55 to 0.75 mm 0.022 to 0.029 in.	–
	D1305-E3B	0.80 to 1.0 mm 0.032 to 0.039 in.	–
Cylinder Head Surface	Flatness	–	0.05 mm 0.002 in.
Valve Recessing	Intake and Exhaust	–0.050 to 0.25 mm –0.0020 to 0.0098 in.	0.40 mm 0.016 in.
Valve Stem to Valve Guide	Clearance	0.035 to 0.065 mm 0.0014 to 0.0025 in.	0.10 mm 0.0039 in.
Valve Stem	O.D.	6.960 to 6.975 mm 0.2741 to 0.2746 in.	–
Valve Guide	I.D.	7.010 to 7.025 mm 0.2760 to 0.2765 in.	–
Valve Face	Angle (Intake)	1.0 rad 60 °	–
	Angle (Exhaust)	0.79 rad 45 °	–
Valve Seat	Angle (Intake)	1.0 rad 60 °	–
	Angle (Exhaust)	0.79 rad 45 °	–
	Width	2.12 mm 0.0835 in.	–

W10138740

PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com

(7) Alternator



(1) Pulley
(2) Drive End Frame
(3) Stator
(4) Bearing
(5) Retainer Plate
(6) Rotor
(7) Bearing
(8) Rear End Frame
(9) Rectifier
(10) IC Regulator
(11) Brush Holder
(12) Rear End Cover

W1224079

1. Remove the pulley (1).
2. Remove the rear end cover (12).
3. Remove the brush holder (11).
4. Remove the IC regulator (10).
5. Remove the four screws holding the stator lead wires.
6. Remove the rectifier (9).
7. Remove the rear end frame (8).
8. Press out the rotor (6) from drive end frame (2).
9. Remove the retainer plate (5).
10. Press out the bearing (4) from drive end frame (2) with a press and jig.
11. Lightly secure the rotor with a vise to prevent damage, and remove the bearing (7) with a puller.

(When reassembling)

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

W1224556

PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com

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

NOTE

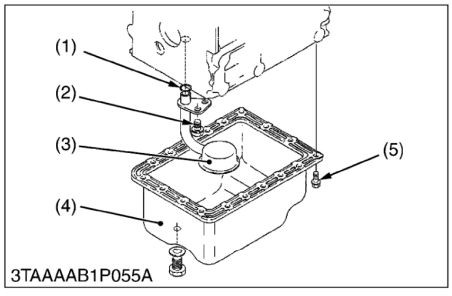
- **For " * " marked screws, bolts and nuts on the table, apply engine oil to their threads and seats before tightening.**
- **The letter "M" in Size x Pitch means that the screw, bolt or nut dimension stands for metric. The size is the nominal outside diameter in mm of the threads. The pitch is the nominal distance in mm between two threads.**

Item	Size x Pitch	N·m	kgf·m	lbf·ft
Cylinder head cover screw **[D1005-E3B, D1105-E3B, D1105-T-E3B, V1505-E3B, V1505-T-E3B]**	M7 x 1.0	7 to 8	0.7 to 0.9	5 to 6
Cylinder head cover screw **[D1305-E3B]**	M6 x 1.0	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31
*Cylinder head screw	M10 x 1.25	64 to 68	6.5 to 7.0	47 to 50
*Main bearing case screw 1	M8 x 1.25	30 to 34	3.0 to 3.5	22 to 25
*Main bearing case screw 2	M9 x 1.25	49 to 53	5.0 to 5.5	37 to 39
*Flywheel screw	M10 x 1.25	54 to 58	5.5 to 6.0	40 to 43
*Connecting rod screw	M8 x 1.0	42 to 46	4.2 to 4.7	31 to 33
*Rocker arm bracket nut **[D1005-E3B, D1105-E3B, D1105-T-E3B, V1505-E3B, V1505-T-E3B]**	M7 x 1.0	22 to 26	2.2 to 2.7	16 to 19
*Rocker arm bracket screw **[D1305-E3B]**	M7 x 1.0	22 to 26	2.2 to 2.7	16 to 19
*Idle gear shaft screw	M6 x 1.0	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31
*Fan drive pulley screw	M14 x 1.5	236 to 245	24.0 to 25.0	174 to 180
*Bearing case cover mounting screw	M6 x 1.0	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31
Glow plug	M8 x 1.0	7.9 to 14	0.80 to 1.5	5.8 to 10
Nozzle holder assembly	M20 x 1.5	49 to 68	5.0 to 7.0	37 to 50
Nozzle holder	–	35 to 39	3.5 to 4.0	26 to 28
Oil pressure switch	PT 1/8	15 to 19	1.5 to 2.0	11 to 14
Injection pipe retaining nut	M12 x 1.5	25 to 34	2.5 to 3.5	18 to 25
Overflow pipe retaining nut	M12 x 1.5	20 to 24	2.0 to 2.5	15 to 18
Starter's **B** terminal nut	M8	5.88 to 11.8	0.600 to 1.20	4.34 to 8.70
Alternator's pulley nut	–	58.4 to 78.9	5.95 to 8.05	43.1 to 58.2
Drain plug with copper gasket	M12 x 1.25	33 to 37	3.3 to 3.8	24 to 27
Drain plug with rubber coated gasket	M22 x 1.5	45 to 53	4.5 to 5.5	33 to 39

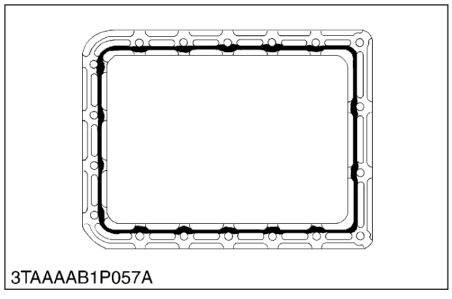
W1013236

PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com

(5) Piston and Connecting Rod



3TAAAAB1P055A


3TAAAAB1P057A

Oil Pan and Oil Strainer (for Standard Oil Pan)

1. Remove the oil pan mounting screws (5).
2. Remove the oil pan (4).
3. Remove the oil strainer (3).

(When reassembling)

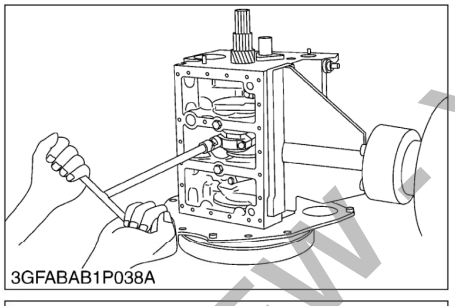
- After cleaning the oil strainer, check to see that the filter mesh in clean, and install it.
- Visually check the O-ring (1), apply engine oil, and install it.
- Securely fit the O-ring to the oil strainer.
- To avoid uneven tightening, tighten oil pan mounting screws in diagonal order form the center.

IMPORTANT

- **Scrape off the old adhesive completely. Wipe the sealing surface clean using waste cloth soaked with gasoline. Now apply new adhesive 3.0 to 5.0 mm (0.12 to 0.19 in.) thick all over the contact surface. Apply the adhesive also on the center of the flange as well as on the inner wall of each screw hole.**
- **Cut the nozzle of the "liquid gasket" container at its second notch. Apply "liquid gasket" about 5.0 mm (0.19 in.) thick. Within 20 minutes after the application of fluid sealant, reassemble the components. Wait then for about 30 minutes, and pour oil in the crankcase.**

(1) O-ring
(2) Screw
(3) Oil Strainer
(4) Oil Pan
(5) Oil Pan Mounting Screw

W10941340

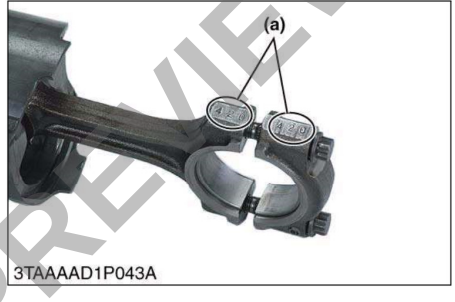

3GFABAB1P038A

Connecting Rod

1. Remove the connecting rod cap.

(When reassembling)

- Align the marks **(a)** with each other. (Face the marks toward the injection pump.)
- Apply engine oil to the connecting rod screws and lightly screw it in by hand, then tighten it to the specified torque.
  If the connecting rod screw won't be screwed in smoothly, clean the threads.
  If the connecting rod screw is still hard to screw in, replace it.



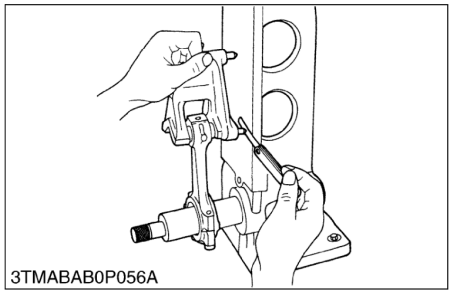
3TAAAAD1P043A

Tightening torque	Connecting rod screw	42 to 46 N·m 4.2 to 4.7 kgf·m 31 to 33 lbf·ft

(a) Mark

W10242740

PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com


3TMABAB0P056A

Connecting Rod Alignment

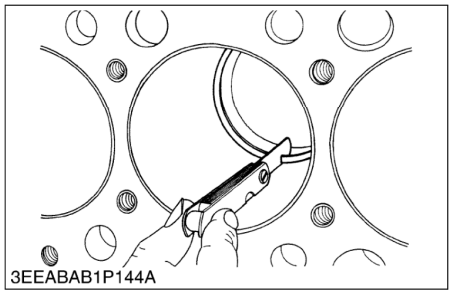
NOTE

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

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

Connecting rod alignment	Allowable limit	0.05 mm 0.002 in.

W10314620


3EEABAB1P144A

Piston Ring Gap

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

Piston ring gap **[D1005-E3B]** **[D1105-E3B]** **[D1305-E3B]** **[V1505-E3B]**	Top ring	Factory spec.	0.30 to 0.45 mm 0.012 to 0.017 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 0.40 mm 0.0099 to 0.015 in.
		Allowable limit	1.25 mm 0.0492 in.
Piston ring gap **[D1105-T-E3B]** **[V1505-T-E3B]**	Top ring	Factory spec.	0.20 to 0.35 mm 0.0079 to 0.014 in.
		Allowable limit	1.20 mm 0.0472 in.
	Second ring	Factory spec.	0.40 to 0.55 mm 0.016 to 0.021 in.
		Allowable limit	1.20 mm 0.0472 in.
	Oil ring	Factory spec.	0.30 to 0.55 mm 0.012 to 0.021 in.
		Allowable limit	1.25 mm 0.0492 in.

W10310120

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

SPECIFICATIONS

Model	D1005-E3B	D1105-E3B		D1105-T-E3B
Number of Cylinders	3			
Type	Vertical, Water-cooled, 4 cycle diesel engine			
Bore × Stroke mm (in.)	76.0 × 73.6 (2.99 × 2.90)	78.0 × 78.4(3.07 × 3.09)		
Total Displacement cm^3 (cu.in.)	1001 (61.08)	1123 (68.53)		
ISO Net Continuous kW/min^{-1} (rpm) (HP/min^{-1} (rpm))	14.5 / 3000 (19.5 / 3000)	15.5 / 3000 (20.7/ 3000)	18.0 / 3600 (24.1 / 3600)	20.4 / 3000 (27.4 / 3000)
ISO/SAE Net Intermittent kW/min^{-1} (rpm) (HP/min^{-1} (rpm))	16.8 / 3000 (22.5 / 3000)	17.8 / 3000 (23.9 / 3000)	20.7 / 3600 (27.7 / 3600)	23.5 / 3000 (31.5 / 3000)
SAE Gross Intermittent kW/min^{-1} (rpm) (HP/min^{-1} (rpm))	17.5 / 3000 (23.5 / 3000)	18.5 / 3000 (24.8 / 3000)	21.7 / 3600 (29.1 / 3600)	24.5 / 3000 (32.8 / 3000)
Maximum Bare Speed (min^{-1} (rpm))	3200		3800	3200
Minimum Bare Idling Speed (min^{-1} (rpm))	900			
Combustion Chamber	Spherical type (E-TVCS)			
Fuel Injection Pump	Bosch MD type mini pump			
Governor	All speed mechanical governor			
Direction of Rotation	Counter-clockwise (viewed from flywheel side)			
Injection Nozzle	Mini Nozzle (DNOPD)			
Injection Timing	0.31 rad (18 °) before T.D.C.	0.31 rad (18 °) before T.D.C.	0.35 rad (20 °) before T.D.C.	0.30 rad (17 °) before T.D.C.
Firing Order	1-2-3			
Injection Pressure	13.73 MPa (140.0 kgf/cm^2, 1991 psi)			
Compression Ratio	24 : 1		23 : 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, 1.2 kW			
Starting Support Device	By glow plug in combustion chamber			
EGR	None			
Battery	12 V, 65 AH, equivalent			
Charging Alternator	12 V, 480 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-6,9.			
Lubricating Oil Capacity	5.1 L (1.3 U.S.gals)			
Weight (Dry) kg (lbs)	93.0 (205.0)			97.0 (214)

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

W10441170

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

COOLING SYSTEM

Item		Factory Specification	Allowable Limit
Fan Belt	Tension	7.0 to 9.0 mm / 98 N 0.28 to 0.35 in. / 98 N (10 kgf, 22 lbf)	–
Thermostat **[D1005-E3B], [D1105-E3B], [D1105-T-E3B], [V1505-E3B], [V1505-T-E3B]**	Valve Opening Temperature (At Beginning) Valve Opening Temperature (Opened Completely)	69.5 to 72.5 °C 157.1 to 162.5 °F 85 °C 185 °F	– –
Thermostat **[D1305-E3B]**	Valve Opening Temperature (At Beginning) Valve Opening Temperature (Opened Completely)	80.5 to 83.5 °C 176.9 to 182.3 °F 95 °C 203 °F	– –
Radiator Cap	Pressure Falling Time	10 seconds or more 88 → 59 kPa 0.90 → 0.60 kgf/cm^2 13 → 8.5 psi	–
Radiator	Water Leakage Test Pressure	No leak at specified pressure	–

W10135990

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW ONLY

You're viewing 11 of 125 pages

The full manual includes:

- All 125 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

Kubota D1005-E3B, D1105-E3B, D1105-T-E3B, D1305-E3B, V1505-E3B, V1505-T-E3B Shop Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual