WSM

WORKSHOP MANUAL
DIESEL GENERATOR

GL SERIES

Kubota

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

CONTENTS

SPECIFICATIONS ——— 1
DIMENSIONS AND WEIGHT ——— 3

M. MECHANISM

F. FEATURES ——— M-1
1 GENERATOR UNITS ——— M-2
[1] AVR ····· M-3
[2] ELECTRONIC CONTROL COMPONENT PARTS ····· M-4
[3] WIRING DIAGRAM ····· M-5
[4] ELECTRONIC CONTROLLER SYSTEM DIAGRAM ····· M-7
2. ENGINE ——— M-8
[1] COOLING SYSTEM ····· M-8

S. DISASSEMBLING AND SERVICING

G. GENERAL ——— S-1
[1] GENERATOR SET IDENTIFICATION ····· S-1
[2] GENERAL SAFETY ····· S-1
[3] GENERAL PRECAUTION ····· S-3
[4] FUNDAMENTALS OF ELECTRICAL LOADS ····· S-4
[5] LUBRICANTS FUEL AND COOLING WATER ····· S-5
[6] TROUBLESHOOTING ····· S-6
(1) EMERGENCY UNIT ····· S-6
(2) GENERATOR ····· S-7
(3) ENGINE ····· S-8
[7] SERVICING SPECIFICATIONS ····· S-11
(1)-1 GENERATOR GL- SERIES (2 POLES) ··· S-11
(1)-2 GENERATOR GL- SERIES (4 POLES) ··· S-11
(2) ENGINE ····· S-12
[8] TIGHTENING TORQUES ····· S-14
(1) TIGHTENING TORQUES FOR SPECIAL USE SCREWS, STUDS AND NUTS ····· S-14
(2) TIGHTENING TORQUE FOR GENERAL USE SCREWS,BOLTS AND NUTS ····· S-15
[9] MAINTENANCE CHECK LIST ····· S-16
[10] CHECKING AND MAINTENANCE ····· S-17
GENERATOR ····· S-17
(1) CHECK POINTS OF EVERY 200 HOURS ····· S-17
(2) CHECK POINTS OF EVERY 1000 HOURS ····· S-17
ENGINE ····· S-18
(1) DAILY CHECK POINTS ····· S-18
(2) CHECK POINTS OF EVERY 75 HOURS ····· S-19
(3) CHECK POINTS OF EVERY 150 HOURS ····· S-20
(4) CHECK POINTS OF EVERY 200 HOURS ····· S-21
(5) CHECK POINTS OF EVERY 300 HOURS ····· S-21
(6) CHECK POINTS OF EVERY 1000 HOURS ····· S-22
(7) CHECK POINTS OF EVERY THREE MONTHS ····· S-23
[11] SPECIAL TOOLS ····· S-23
1. GENERATOR ——— S-29
DISASSEMBLY AND REASSEMBLY ····· S-29
[1] PREPARATION FOR DISASSEMBLY ····· S-29
[2] HANDLING OF PARTS ····· S-29
[3] ENCLOSURE ····· S-30
[4] GENERATOR ····· S-31
SERVICING ····· S-33
[1] BODY COMPONENTS ····· S-33
(1) RADIATOR CAP ····· S-33
(2) RADIATOR ····· S-33
(3) OIL PRESSURE ····· S-33
(4) SOLENOID ····· S-34
(5) AC OUTPUT/PANEL (120/240V) PARTS ····· S-34
(6) CHARGE INDICATOR UNIT CIRCUIT CONTINUITY ····· S-35
(7) SAFETY RELAY ····· S-35
(8) REGULALTOR COMPONENT ····· S-36
(9) SELECT SWITCH ····· S-37
(10) EASY CHECKER ····· S-37
(11) AC SENSOR ····· S-37
(12) IDLE CONTROL SWITCH ····· S-37
(13) EMERGENCY UNIT CIRCUIT CONTINUITY CHECK ····· S-38
2. ENGINE ——— S-40
DISASSEMBLING ····· S-40
[1] CYLINDER HEAD ····· S-40
[2] INJECTION PUMP, OIL PUMP, TIMING GEAR, CAMSHAFT ····· S-42
[3] PISTON, CRANKSHAFT ····· S-44
SERVICING ····· S-47
[1] COMPRESSION PRESSURE ····· S-47
[2] TOP CLEARANCE ····· S-48
[3] GEAR BACKLASH ····· S-48
[4] INJECTION TIMING ····· S-49
[5] OIL PUMP ····· S-50
ADJUSTING ····· S-51
[1] MAXIMUM SPEED ····· S-51
[2] GENERATOR DRIVE BELT ····· S-52
[3] LINK BELT ····· S-53

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

B&W INSERT

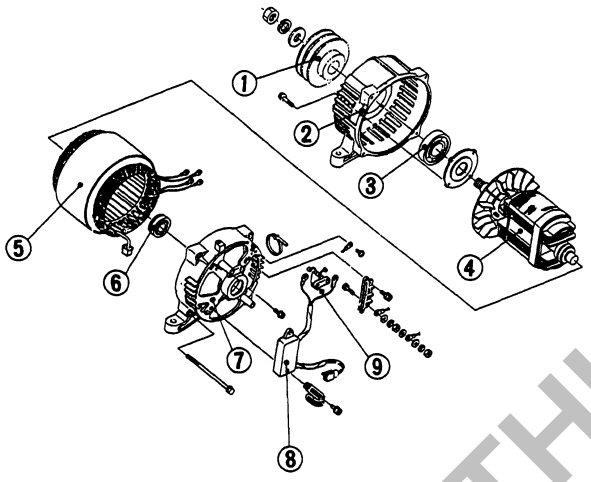
M-5

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

1 GENERATOR UNITS

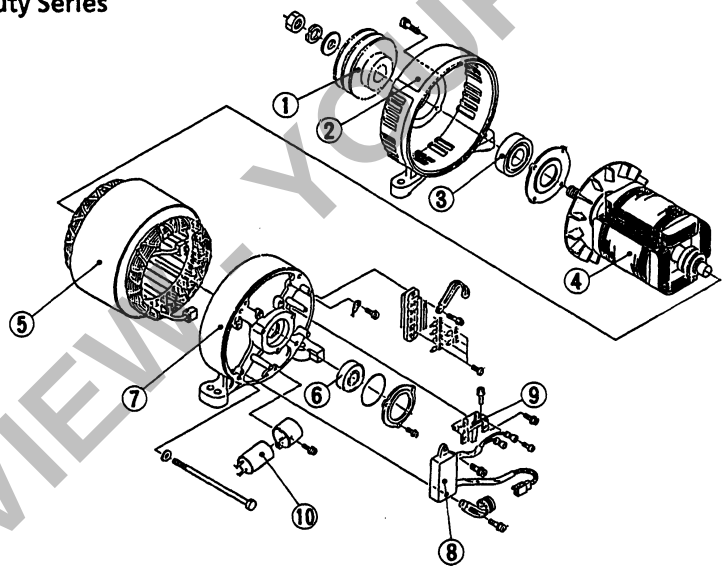
Quiet Type Series



0198F002

(1) V-pulley
(2) Front Bracket
(3) Bearing
(4) Rotor Assy
(5) Stator Assy
(6) Bearing
(7) Rear Bracket
(8) A.V.R.
(9) Brush Holder
(10) Capacitor

Heavy Duty Series



0198F003

There are two kinds of Rotor Assy. One is the 2pole type, the other is 4pole. Heavy Duty type is equipped with the 4pole type. Quiet type is equipped with the 2pole type.

- Stator assembly
  The main coil and sub coil and battery coil generation are wound in the slots provided on the core. The main coil generates the AC out put and takes AC out put for cooling Fan Motor. The subcoil working as an excitation coil magnetizes the rotor. The battery charge coils give a charge of electricity to a battery.
- Rotor assembly
  Permanent magnets used for initial excitation are placed at the top of the two or four salient poles. The coils are wound to magnetize the entire core.
- AVR
  The AVR maintains the AC output voltage at a constant level.

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

[8] TIGHTENING TORQUES

- Screws, bolts and nuts must be tightened to the specified torque with a torque wrench.
- Several screws and nuts such as used on the cylinder head must be tightened in prop sequence and to the proper torque.

(1) Tightening Torques for Special Use Screws, Studs and Nuts

Item		Size x Pitch	N·m	kgf·m	ft-lbs
"o" Cylinder, Head Bolt	ZB400-GL(S)	M8 x 1.25	39.2 to 44.1	4.0 to 4.5	28.8 to 32.5
	ZB500-GL(S)	M9 x 1.25	42.1 to 47.0	4.3 to 4.8	31.1 to 34.7
	ZB600-GL(S)	M9 x 1.25	56.8 to 61.7	5.8 to 6.3	41.9 to 45.3
"o" Connecting Rod Bolt	ZB400-GL(S)	M6 x 0.75	14.7 to 18.6	1.5 to 1.9	10.8 to 13.7
	ZB500.600-GL(S)	M7 x 0.75	26.5 to 30.4	2.7 to 3.1	19.5 to 22.4
"o" Bearing Case Bolt 1	ZB400-GL(S)	M6 x 1.0	11.8 to 14.7	1.2 to 1.5	8.68 to 10.8
	ZB500.600-GL(S)	M7 x 1.0	26.5 to 30.4	2.7 to 3.1	19.5 to 22.4
"o" Bearing Case Bolt 2	ZB400-GL(S)	M7 x 1.0	19.6 to 23.5	2.0 to 2.4	14.5 to 17.4
	ZB500.600-GL(S)	M8 x 1.25	29.4 to 34.3	3.0 to 3.5	21.7 to 25.3
"*" Flywheel Nut	ZB400-GL(S)	M20 x 1.5	196 to 215.6	20 to 22	144.1 to 159
	ZB500.600-GL(S)	M30 x 2.0	294 to 343	30 to 35	216.9 to 253.1
"o" Rocker Arm Bracket Retaining Nuts	ZB400-GL(S)	M6 x 1.0	9.8 to 11.3	1.00 to 1.15	7.23 to 8.32
	ZB500.600-GL(S)	M7 x 1.0	16.7 to 20.6	1.7 to 2.1	12.3 to 15.2
Head Cover Cap Nuts	ZB400-GL(S)	M6 x 1.0	3.92 to 5.88	0.4 to 0.6	2.89 to 4.34
	ZB500.600-GL(S)			1.0 to 1.1	
Gear Case Bolt	ZB400-GL(S)	M6 x 1.0	9.8 to 11.3	1.00 to 1.15	7.23 to 8.32
	ZB500.600-GL(S)				
Cylinder Block Cover Bolt	ZB400-GL(S)	M6 x 1.0	9.8 to 11.3	1.00 to 1.15	7.23 to 8.32
	ZB500.600-GL(S)				
Bearing Case Cover Bolt	ZB400-GL(S)	M6 x 1.0	9.8 to 11.3	1.00 to 1.15	7.23 to 8.32
	ZB500.600-GL(S)				
Crow Plug	ZB400-GL(S)	M10 x 1.25	19.6 to 24.5	2.0 to 2.5	14.5 to 18.1
	ZB500.600-GL(S)				
Nozzle Holders	ZB400-GL(S)	M24 x 2.0	34.3 to 49.0	3.5 to 5.0	25.3 to 36.2
	ZB500.600-GL(S)			6.0 to 7.0	
Engine Pulley Nuts	ZB400-GL(S)	M8 x 1.25	27.4 to 31.4	2.8 to 3.2	20.23 to 23.12
	ZB500.600-GL(S)	M10 x 1.50	51.9 to 59.8	5.3 to 6.1	38.29 to 44.07
Injection Pump Eye Joint Bolt	ZB400-GL(S)	M6 x 1.0	24.5 to 29.4	2.5 to 3.0	18.1 to 21.68
	ZB500.600-GL(S)				

■ NOTE

- **For "*" marked nuts on the table, apply engine oil to their threads and molybdenum disulfide to their seats before tightening.**
- **For "o" marked screws, bolts and studs on the table, apply engine oil to their threads and seats before tihghtening**

PREVIEW, YOUFIXTHIS.COM

Download full manual at youfixthis.com

(3) Engine

Symptom	Probable Cause	Solution	Reference Page
Engine Does Not Start	● No fuel	Replenish fuel	
	● Air in the fuel system	Vent air	
	● Water in the fuel system	Replace fuel and repair or replace fuel system	
	● Fuel pipe clogged	Clean	
	● Fuel filter clogged	Clean	S-20
	● Excessively high viscosity of fuel or engine oil at low temperature	Use the specified fuel or engine oil	S-5
	● Fuel with low cetane number	Use the specified fuel	S-5
	● Fuel leak due to loose injection pipe retaining nut	Tighten nut	S-19
	● Incorrect injection timing	Adjust	
	● Fuel camshft worn	Replace	
	● Injection nozzle clogged	Clean	S-22
	● Injection pump malfunctioning	Repair or replace	
	● Seizure of crankshaft, piston, cylinder liner or bearing	Repair or replace	S-46
	● Compression leak	Replace head gasket, tighten cylinder head screw, glow plug, nozzle holder and correct valve seat	S-47
	● Deficient compression	Check top clearance and correct valve recessing	S-47, 48
	● Improper valve seat alignment, valve spring broken, valve siezed	Repair or replace	
	● Improper valve timing	Correct or replace timing gear	S-43
	● Piston ring and liner worn	Replace	S-45, 47
	● Excessive valve clearance	Adjust	S-22
Starter Does Not Run	● Battery discharged	Charge	
	● Starter malfuctioning	Repair or replace	
	● Starter switch malfunctioning	Replace	
	● Wiring disconnected	Connect	
Engine Revolution Is Not Smoothly	● Fuel filter clogged or dirt	Clean or replace	S-20, 21
	● Air cleaner clogged	Clean or replace	S-19
	● Fuel leak due to loose injection pipe retaining nut	Tighten nut	S-40
	● Injection pump malfunctioning	Repair or replace	
	● Incorrect nozzle opening pressure	Adjust	
	● Injection nozzle stuck or clogged	Repair or replace	
	● Fuel over flow pipe clogged	Clean	
	● Governor malfunctioning	Repair or replace	

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

SPECIFICATIONS

MODEL		GL4500-S	GL5500-S	GL6500-S
GENERATOR	Type	Rotating Field Single-Phase AC Generator		
	Frequency Hz	60		
	Maximum Output kW	4.5	5.5	6.5
	Rated Output kW	4	5	6
	Rated Voltage V	120/240 Dual Voltage		
	Rated Current A	33.3/16.7	41.7/20.9	50/25
	Phase	Single		
	No. of Poles	2		
	Power Factor %	100		
	Generator Rotation Speed	3600 rpm		
	Generator Driving System	V-Belt		
MODEL		**ZB400-GL-S**	**ZB500-GL-S**	**ZB600-GL-S**
ENGINE	Type	4-cycle, 2 cylinder water-cooled diesel engine		
	Bore x Stroke mm (in.)	64 x 62.2 (2.52 x 2.45)	68 x 70 (2.68 x 2.76)	72 x 70 (2.83 x 2.76)
	Displacement cm^3 (cu.in.)	400 (24.41)	508 (31.00)	570 (34.78)
	Rated Output HP	8	10	12
	Revolution rpm	3000	3000	3000
	FuelTank Capacity ℓ (U.S. gals.)	11.5 (3.0)	19.0 (5.0)	19.0 (5.0)
	Cooling System	Radiator Cooling System		
	Starting System	Battery Assisted Electric Starter		
Dry Weight kg (lbs)		175 (385)	230 (506)	235 (517)
Battery		36B20R(S)	46B24R(S)	46B24R(S)
Capacity 20 HR V-AH		12V-35AH	12V-45AH	12V-45AH
AC Receptacle		3	4	
Voltage Regulator		A.V.R.		

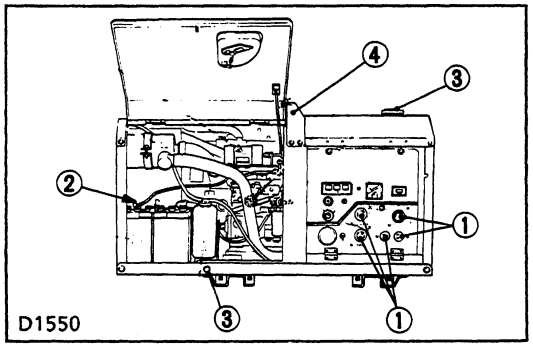
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

1 GENERATOR

DISASSEMBLY AND REASSEMBLY

[1] PREPARATION FOR DISASSEMBLY



1. Disconnect output wire of load terminal.
2. Disconnect the wire of battery negative terminal.
3. Drain water and oil as necessary.
4. Select a level place for the generator unit, and always hoist by a proper metal tool.

[2] HANDLING OF PARTS

Follow the instructions listed below.

1. Tag all parts properly so as to avoid the confusion when reassembling. Be careful particularly of the bolts and nuts.
2. Torque bolts and nuts by using specified values.
3. O-ring and oil seal:
   (1) Do not apply adhesive
   (2) Apply grease during assembly.
   (3) Clean by washing with oil quickly, and wipe off the oil using a rag after cleaning.
4. Detach electrical parts after disconnecting the negative battery terminals. When assembling connect the negative terminals last.
5. Should be excersized such for foreign material and dirt when assembling the fuel related parts as injection pump, pipes, and nozzle holder.
6. Removed parts should be free of damage.
7. Use KUBOTA standard parts when replacing.

⚠ CAUTION

- **Perform insulation test without fail after assembly of the generator unit.**

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW ONLY

You're viewing 8 of 80 pages

The full manual includes:

- All 80 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

Kubota GL3500, GL4500, GL4500-S, GL5500, GL5500-S, GL6500-S Workshop Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual