

Product: 2006 Kubota WSM GL7000-CAN, GL11000-CAN Diesel Generator Service Repair Workshop Manual
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WSM

WORKSHOP MANUAL DIESEL GENERATOR

GL7000-CAN, GL11000-CAN

Kubota

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TO THE READER

This Workshop Manual has been prepared to provide servicing personnel with information on the mechanism, service and maintenance of KUBOTA Generator GL 7000-CAN / GL11000-CAN. It is divided into three parts, "General", "Mechanism" and "Servicing".

■ **General**

Information on the general precautions, check and maintenance and special tools.

■ **Mechanism**

Information on the construction and function are included. This part should be understood before proceeding with troubleshooting, disassembling and servicing.

■ **Servicing**

There are troubleshooting, servicing specification lists, checking and adjusting, disassembling and assembling, and servicing which cover procedures, precautions, factory specifications and allowable limits.

All information illustrations and specifications contained in this manual are based on the latest product information available at the time of publication.

The right is reserved to make changes in all information at any time without notice.

January 2006

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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.



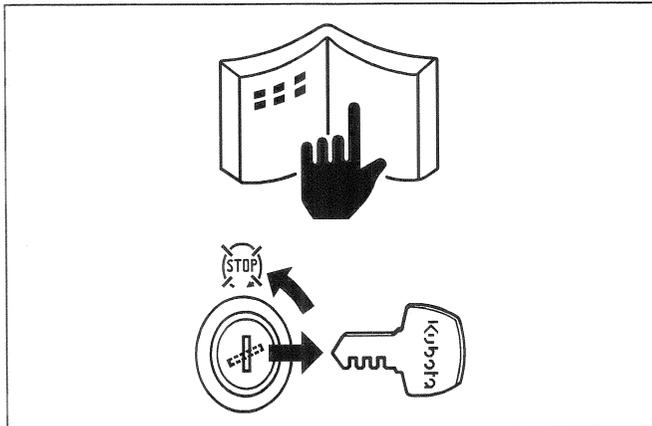
IMPORTANT

: 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 generator 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.

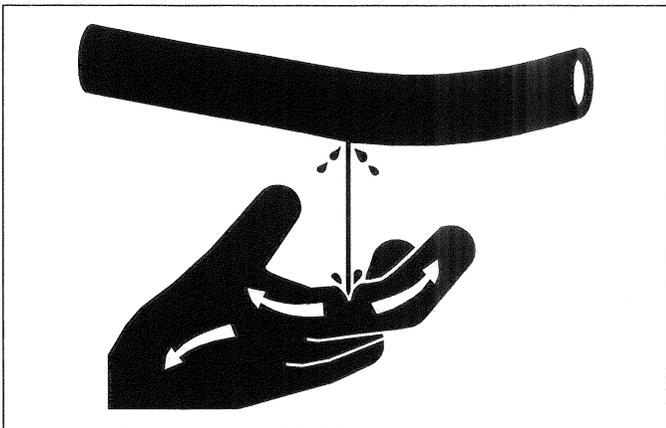
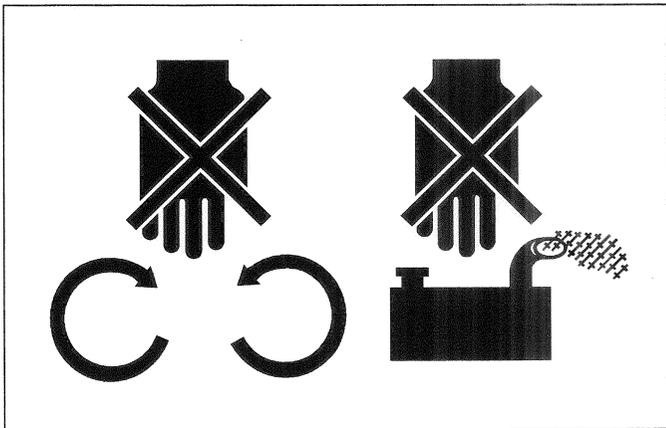
SAFETY STARTING

- 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.



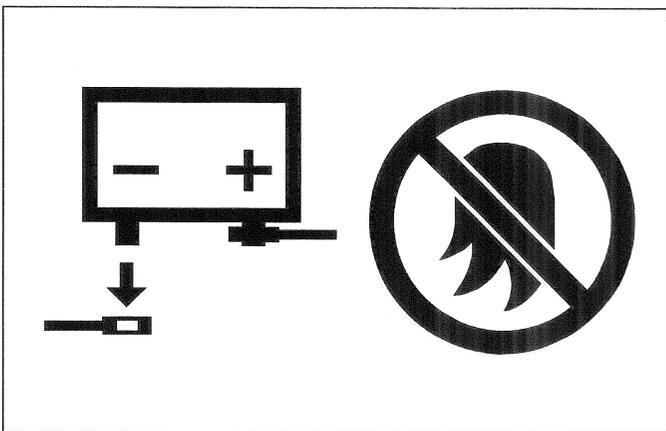
SAFETY WORKING

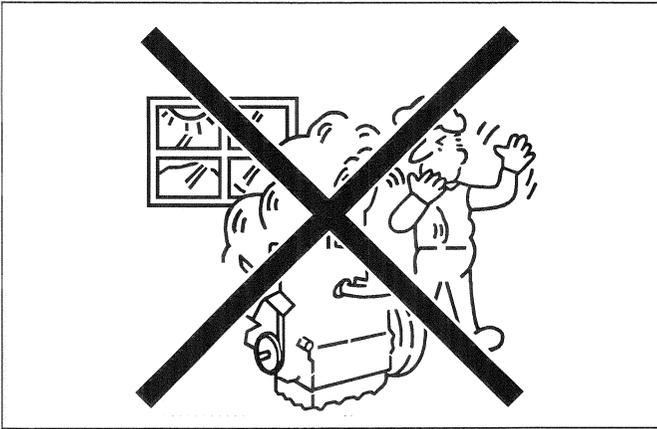
- Do not work on the generator while under the influence of alcohol, medication, or other substances or while fatigued.
- Wear close fitting clothing and safety equipment appropriate to the job.
- Use tools appropriate to the work. Makeshift tools, parts, and procedures are not recommended.
- When servicing is performed 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.



AVOID FIRES

- Fuel is extremely flammable and explosive under certain conditions. Do not smoke or allow flames or sparks in your working area.
- To avoid sparks from an accidental short circuit, always disconnect the battery negative cable first and connect it last.
- Battery gas can explode. Keep sparks and open flame away from the top of battery, especially when charging the battery.
- Make sure that no fuel has been spilled on the engine.





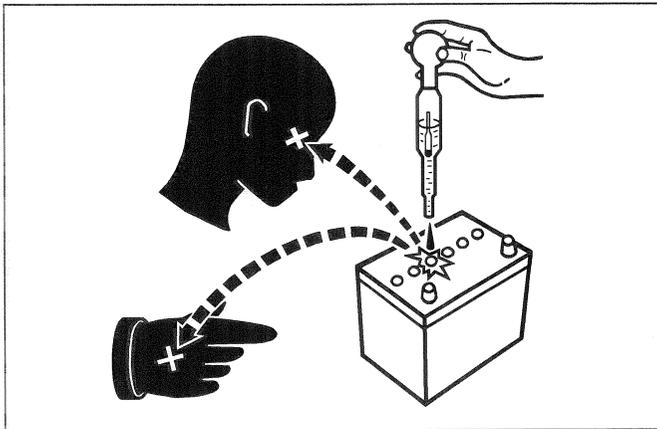
VENTILATE WORK AREA

- If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in a closed area. The exhaust gas contains poisonous carbon monoxide.



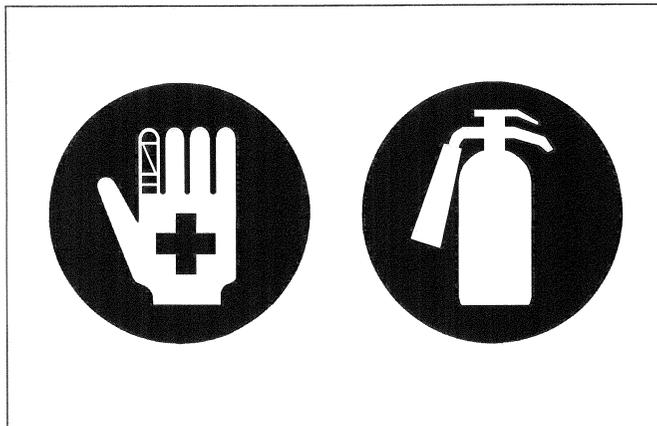
DISPOSE OF FLUIDS PROPERLY

- Do not pour fluids into the ground, down a drain, or into a stream, pond, or lake. Observe relevant environmental protection regulations when disposing of oil, fuel, coolant, electrolyte and other harmful waste.



PREVENT ACID BURNS

- Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, clothing and cause blindness if splashed into eyes. Keep electrolyte away from eyes, hands and clothing. If you spill electrolyte on yourself, flush with water, and get medical attention immediately.



PREPARE FOR EMERGENCIES

- Keep a first aid kit and fire extinguisher handy at all times.
- Keep emergency numbers for doctors, ambulance service, hospital and fire department near your telephone.

SAFETY DECALS

The following safety decals are installed on the machine.
 If a decal becomes damaged, illegible or is not on the machine, replace it. The decal part number is listed in the parts list.
 [Receptacle Type]

1AEAQAFAP0870

<p>⚠ DANGER</p> <p>TO AVOID SERIOUS INJURY OR DEATH: - HAZARDOUS VOLTAGE WILL SHOCK, BURN OR CAUSE DEATH. - CONNECT OR DISCONNECT THE AC RECEPTACLES OR TERMINALS ONLY WHEN THE ENGINE IS STOPPED. - DO NOT OPERATE THE MACHINE WITH THIS COVER REMOVED OR OPEN.</p>	<p>⚠ DANGER</p> <p>TO AVOID SERIOUS INJURY OR DEATH: - POUR ÉVITER D'ÊTRE GRAVEMENT BLESSÉ OU LA MORT, NE RACCORDEZ OU DÉBRANCHEZ LES BORNES OU LES PRISES DE COURANT SEULEMENT LORSQUE LE MOTEUR EST ARRÊTÉ. - NE PAS FAIRE FONCTIONNER LA MACHINE AVEC CE COUVERCLE RETIRÉ OU OUVERT.</p>
<p>DO NOT CONNECT THIS GENERATOR TO ANY BUILDING'S ELECTRICAL SYSTEM UNLESS AN ISOLATION SWITCH HAS BEEN INSTALLED BY A LICENSED ELECTRICIAN. - REFER TO THE OPERATOR'S MANUAL FOR DETAILS.</p>	<p>POUR ÉVITER D'ÊTRE GRAVEMENT BLESSÉ OU LA MORT, NE PAS RACCORDER CETTE GÉNÉRATRICE À UN IMPLANT QU'EL SYSTEME ÉLECTRIQUE D'UN BÂTIMENT À MOINS QU'UN COMMUTEUR D'ISOLEMENT AIT ÉTÉ INSTALLÉ PAR UN ÉLECTRICIEN AGRÉÉ. - SE RÉFÉRER AU MANUEL DE L'OPÉRATEUR POUR LES DÉTAILS.</p>

Part No. G3106-8831-0

1AEAQAFAP0910

<p>⚠ WARNING</p> <p>TO AVOID PERSONAL INJURY CONNECT GROUND WIRE BEFORE USING.</p>	<p>⚠ AVERTISSEMENT</p> <p>POUR ÉVITER DES BLESSURES CORPORELLES BRANCHER LA MISE À TERRE AVANT L'UTILISATION.</p>
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Part No. G3106-8895-0

1AEAQAFAP0860

<p>⚠ CAUTION</p> <p>TO AVOID PERSONAL INJURY: - MAY RESULT IF FINGERS OR CLOTHING ARE CAUGHT IN ROTATING PARTS. - DO NOT OPERATE THE MACHINE WITH THE SIDE COVERS OR ACCESS DOORS REMOVED OR OPEN.</p>	<p>⚠ ATTENTION</p> <p>POUR ÉVITER D'ÊTRE BLESSÉ: - ON RISQUE D'ÊTRE BLESSÉ SI LES DOIGTS OU UNE PARTIE DES VÊTEMENTS SONT PRIS DANS LES ORGANES EN TRAIN DE TOURNER. - NE PAS FAIRE FONCTIONNER LA MACHINE AVEC LES COUVERCLES LATÉRAUX OU LA PORTE D'ACCÈS RETIRÉS OU OUVERTS.</p>
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Part No. G3106-8830-0

1AEAQAFAP0820

<p>⚠ CAUTION</p> <p>SHIELD EYES AVOID SPARKS / FLAME. SULFURIC ACID.</p>	<p>⚠ ATTENTION</p> <p>PORTÉZ DES LUNETTES DE SÉCURITÉ. ÉVITEZ LES ÉTINCELLES / FLAMME. ACIDE SULFURIQUE.</p>
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Part No. K3511-4719-0

RECYCLABLE

1AEAQAFAP0810

<p>⚠ DANGER</p> <p>TO AVOID SERIOUS INJURY OR DEATH: - HAZARDOUS VOLTAGE WILL SHOCK, BURN OR CAUSE DEATH. - CONNECT OR DISCONNECT THE AC RECEPTACLES OR TERMINALS ONLY WHEN THE ENGINE IS STOPPED. - DO NOT OPERATE THE MACHINE WITH THIS COVER REMOVED OR OPEN.</p>	<p>⚠ DANGER</p> <p>POUR ÉVITER D'ÊTRE GRAVEMENT BLESSÉ OU LA MORT, NE RACCORDEZ OU DÉBRANCHEZ LES BORNES OU LES PRISES DE COURANT SEULEMENT LORSQUE LE MOTEUR EST ARRÊTÉ. - NE PAS FAIRE FONCTIONNER LA MACHINE AVEC CE COUVERCLE RETIRÉ OU OUVERT.</p>
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Part No. G3106-8831-0

Part No. G3106-8841-0

FUEL TANK CAPACITY 28L (7.4 U.S.gal)		CAPACITÉ DU RÉSERVOIR DE CARBURANT	
WARNING		AVERTISSEMENT	
<ul style="list-style-type: none"> DO NOT REFUEL WHEN ENGINE IS RUNNING OR HOT. WHEN REFUELING, KEEP ALL FLAMES, SPARKS AND CIGARETTES AWAY FROM GENERATOR. DO NOT OVERFILL FUEL SYSTEM. IF ANY FUEL OVERFLOWS, WIPE IT UP COMPLETELY BEFORE STARTING OPERATION. 		<ul style="list-style-type: none"> NE PAS FAIRE LE PLEIN LORSQUE LE MOTEUR EST EN TRAIN DE TOURNER OU LORSQU'IL EST CHAUD. LORS DU PLEIN DE CARBURANT, ÉLOIGNER TOUTES FLAMMES, ÉTINCELLES ET CIGARETTES DE LA GÉNÉRATRICE. NE PAS TROP REMPLIR LE CIRCUIT D'ALIMENTATION EN CARBURANT. SI DU CARBURANT DÉBORDE, L'ESSUYER COMPLÈTEMENT AVANT DE METTRE EN MARCHE LES OPÉRATIONS. 	

1AEACAFAP0900

Part No. G3106-8806-0

	CAUTION	ATTENTION
	HOT SURFACES DO NOT TOUCH	SURFACES CHAUDES NE PAS TOUCHER

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Part No. G1132-8806-0

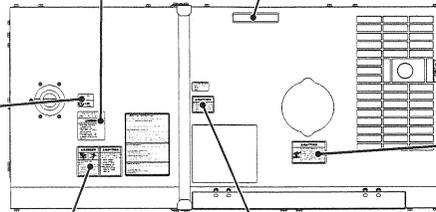
	CAUTION	ATTENTION
	HOT EXHAUST	ÉCHAPPEMENT CHAUD

1AEACAFAP0810

Part No. 18974-5090-0

Diesel fuel No.2 Carburant pour diesel No. 2	
	FLAMMABLE INFLAMMABLE

1AEACAFAP0800



Part No. G3106-8832-0

	WARNING
TO AVOID PERSONAL INJURY: • DO NOT REMOVE RADIATOR CAP WHILE COOLANT IS HOT. • WHEN COOL, ROTATE CAP SLOWLY TO THE FIRST STOP TO ALLOW EXCESS PRESSURE TO ESCAPE. • THEN REMOVE CAP COMPLETELY.	
	AVERTISSEMENT
POUR ÉVITER DES BLESSURES CORPORELLES: • NE PAS ENLEVER LE CAPUCHON DU RADIATEUR LORSQUE LE RÉFRIGÉRANT EST CHAUD. • LORSQUE LE RÉFRIGÉRANT EST REFROIDI, TOURNER LE CAPUCHON LENTEMENT JUSQU'À LA PREMIÈRE BUTÉE POUR PERMETTRE À LA PRESSION DE S'ÉCHAPPER.	

1AEACAFAP0880

Part No. G3106-8836-0

CAUTION	ATTENTION
TO AVOID PERSONAL INJURY: 1. DO NOT SWING WHILE LIFTING. 2. NEVER USE THE HOOK WHEN THE BONNET IS REMOVED OR WHEN ANY BOLTS ARE LOOSE.	POUR ÉVITER DES BLESSURES CORPORELLES: 1. NE PAS FAIRE PIVOTER LORS DU LEVAGE. 2. NE PAS UTILISER LE CROCHET LORSQUE LE CAPOT EST ENLEVÉ OU LORSQUE LES BOULONS SONT DESERRÉS.

1AEACAFAP0890

Part No. G3106-8824-0

DANGER	CAUTION	DANGER	ATTENTION
 TO AVOID SERIOUS INJURY OR DEATH: • DO NOT OPERATE OR IDLE IN NONVENTILATED AREAS. CARBON MONOXIDE GAS IS COLORLESS, ODORLESS AND DEADLY. • DO NOT OPERATE IN WET OR DAMP CONDITIONS.	TO AVOID PERSONAL INJURY OR EQUIPMENT DAMAGE BEFORE STARTING ENGINE: (1) TURN OFF GENERATOR CIRCUIT BREAKER. (2) TURN OFF ALL SWITCHES ON ELECTRICAL LOAD. (3) MAKE CERTAIN LOAD CONNECTIONS AND POWER CABLES ARE IN GOOD CONDITION.	 POUR ÉVITER DES BLESSURES GRAVES OU LA MORT: • NE PAS UTILISER OU FAIRE FONCTIONNER DANS UN ENDROIT MAL VENTILÉ. LE GAZ MONOXYDE DE CARBONE EST INCOLORE, INODORE ET MORTEL. • NE PAS UTILISER DANS DES CONDITIONS HUMIDES OU MOUILLÉES.	AVANT DE DÉMARRER LE MOTEUR, POUR ÉVITER DES BLESSURES CORPORELLES OU DES DOMMAGES À L'ÉQUIPEMENT. (1) DÉCONNECTER LE DISJONCTEUR DE LA GÉNÉRATRICE. (2) DÉCONNECTER TOUS LES INTERRUPTEURS SUR LA CHARGE ÉLECTRIQUE. (3) ASSURER QUE LES CONNEXIONS ET LES CÂBLES ÉLECTRIQUES SONT EN BONNE CONDITION.

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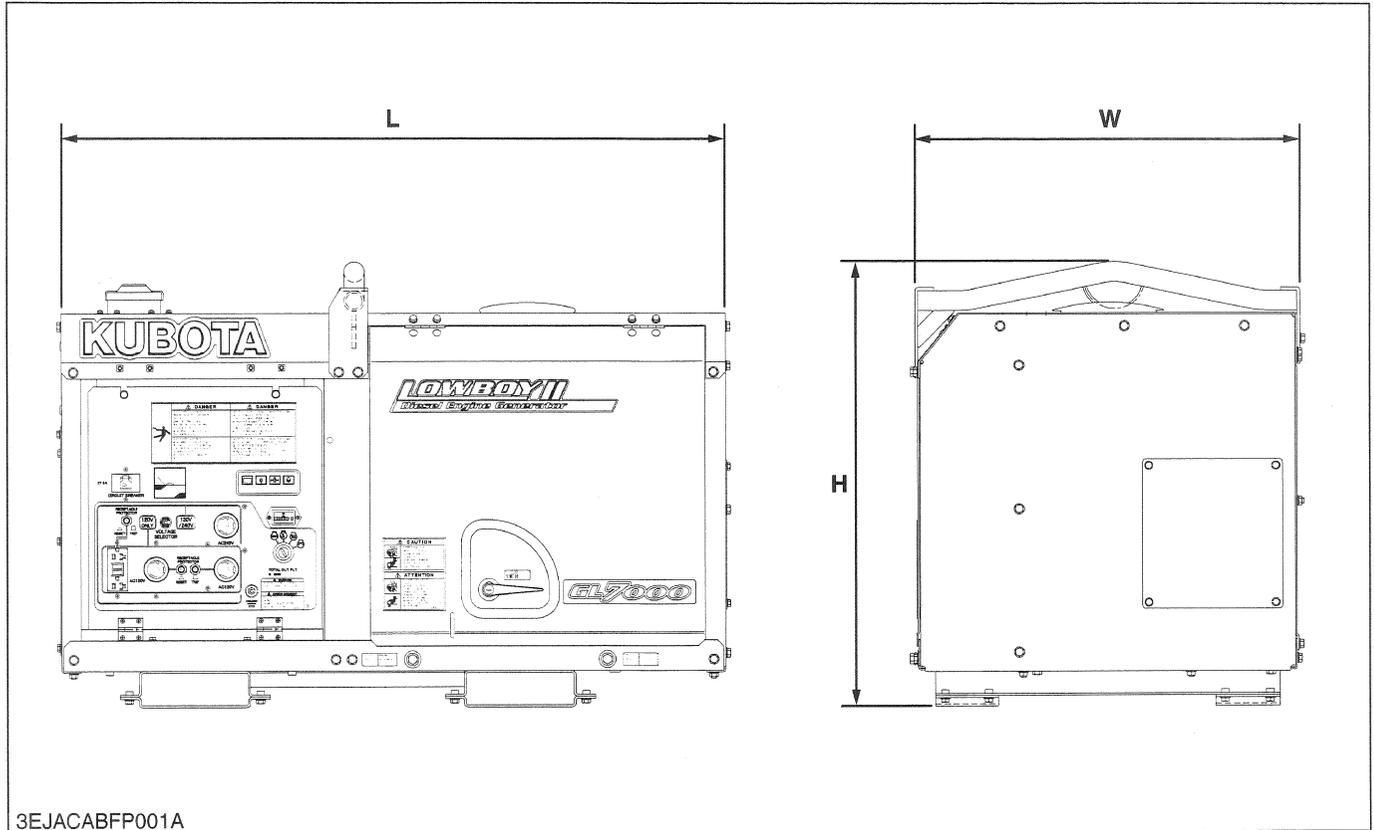
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SPECIFICATIONS

Model		GL7000-CAN	GL11000-CAN
Frequency (Hz)	60		
Rated output (kW)	6.5	10.0	
Maximum output (kW)	7.0	11.0	
Rated voltage (V)	120 / 240		
Rated current (A)	54.2 / 27.1	83.3 / 41.7	
Phrase and wire	1 - 4	1 - 3	
Number of poles	2		
Power Factor	1		
Insulation	Stator coil: B Rotor coil: F		
Design	Vertical, liquid cooled, 4 cycle, diesel		
Model name	Z482-E2B-SEC-3	D722-E2B-SEC-3	
Rated output (kW)	8.1	12.2	
Speed (rpm)	3600		
Number of cylinder - Bore x Stroke (mm (in.))	2 - ϕ 67 x 68 (2 - ϕ 2.52 x 2.68)	3 - ϕ 67 x 68 (3 - ϕ 2.52 x 2.68)	
Displacement (L (cu.in.))	0.479 (29.23)	0.719 (48.89)	
Fuel tank capacity (L (U.S.qts.))	28 (7.4)		
Crankcase oil capacity	2.2 (2.3)	3.4 (3.6)	
Starting system	Electric type 12 V / 0.8 kW	Electric type 12 V / 1.0 kW	
Battery	38B20R 12 V x 28 Ah / 5 Hr	55B24R 12 V x 36 Ah / 5 Hr	
Continuous operating hours (at rated load) (hrs)	7		
Net weight kg (lbs)	262 kg (577 lbs)	318 kg (700 lbs)	
Output	L6 - 30R L5 - 30R 5 - 20RA (GFCI)	14 - 50R (50 A) 120 / 240 V L6 - 30R (240 V) L5 - 30R (120 V) 5 - 20RA (GFCI) (120 V)	

W1028103

DIMENSIONS



Unit : mm (in.)

	GL7000-CAN	GL11000-CAN
L	1066 (42.0)	1281 (50.4)
W	616 (24.3)	616 (24.3)
H	698 (27.5)	698 (27.5)

W1038971

GENERAL

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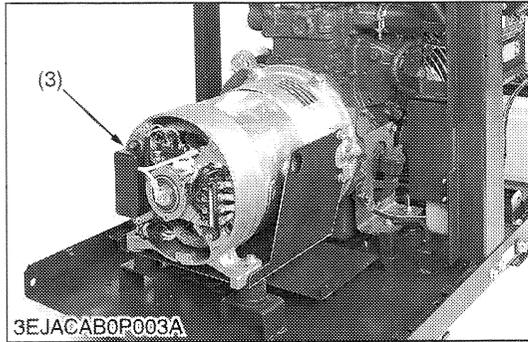
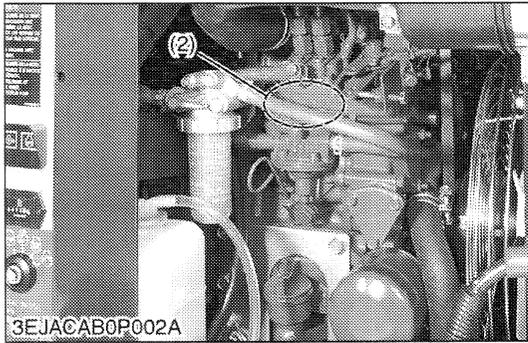
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1. IDENTIFICATION

When contacting your local KUBOTA distributor, always specify the model name and serial numbers of both engine and generator.

- (1) Model Name and Serial Number
- (2) Engine Model Name and Serial Number
- (3) Generator Model Name and Serial Number

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2. PRECAUTION

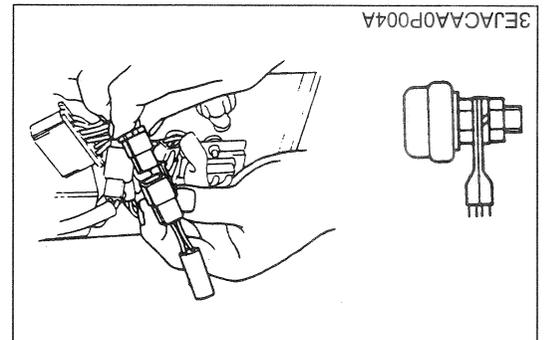
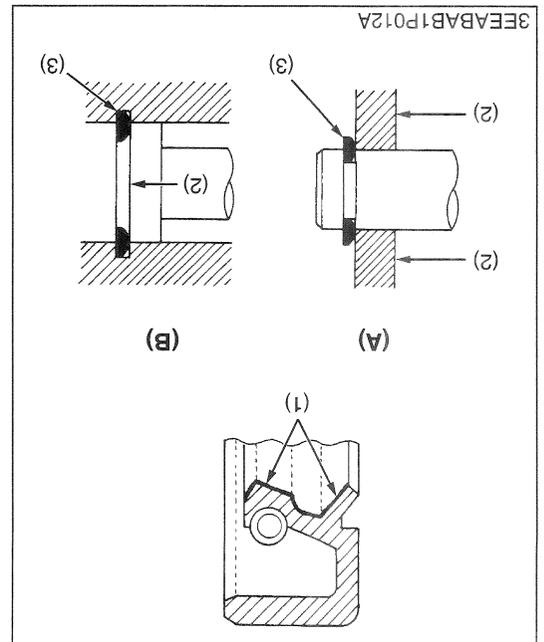
- During disassembly, carefully arrange removed parts in a clean area to prevent confusion later. Screws, bolts and nuts should be replaced in their original position to prevent reassembly errors.
- When special tools are required, use KUBOTA genuine special tools. Special tools which are not frequently 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

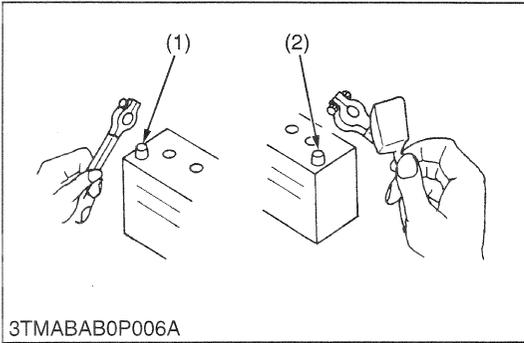
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- Before checking any generator or engine electrical component, be sure to check that all terminals and connectors are tight.
- After the individual component inspection, also inspect the wire leads for continuity; that might be the cause of the problem.
- The rotor and stator must be protected when disassembling and reassembling.
- If they are damaged, no power can be generated.
- To maintain the generator's performance and ensure safety, use only KUBOTA genuine parts for replacement.
- Use extreme caution when working on electrical components. Electrical shocks cause injury or death.

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3. HANDLING PRECAUTIONS FOR ELECTRICAL PARTS AND WIRING



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To ensure safety and prevent damage to the machine and surrounding equipment, heed the following precautions in handling electrical parts and wiring.

■ **IMPORTANT**

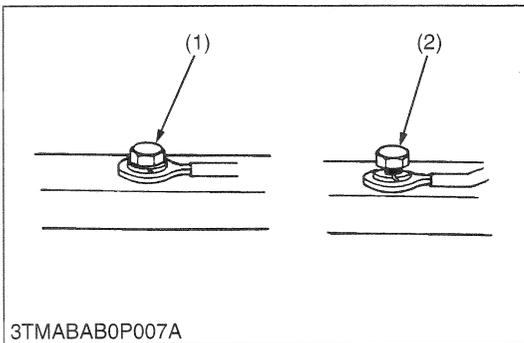
- Check electrical wiring for damage and loosened connection every year. To this end, educate the customer to do his or her own check and at the same time recommend the dealer to perform periodic check for a fee.
- Do not attempt to modify or remodel any electrical parts and wiring.
- When removing the battery cables, disconnect the negative cable first. When installing the battery cables, connect the positive cable first.

(1) Negative Terminal

(2) Positive Terminal

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[1] WIRING



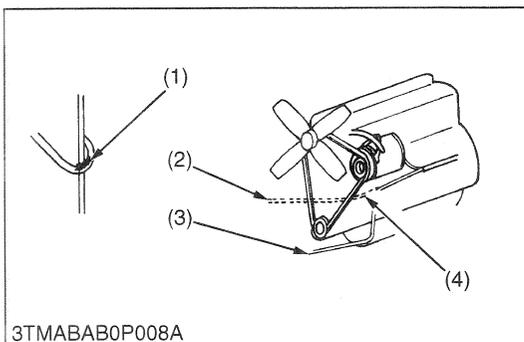
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- Securely tighten wiring terminals.

(1) Correct
(Securely Tighten)

(2) Incorrect
(Loosening Leads to Faulty Contact)

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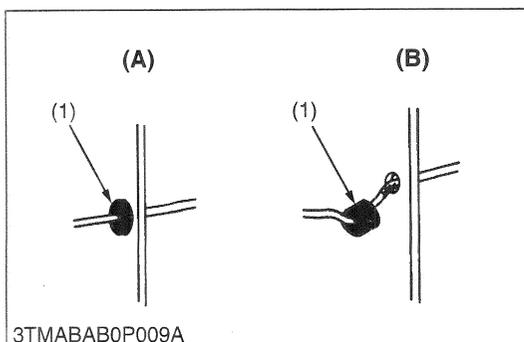
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- Do not let wiring contact dangerous part.

(1) Dangerous Part
(2) Wiring (Incorrect)

(3) Wiring (Correct)
(4) Dangerous Part

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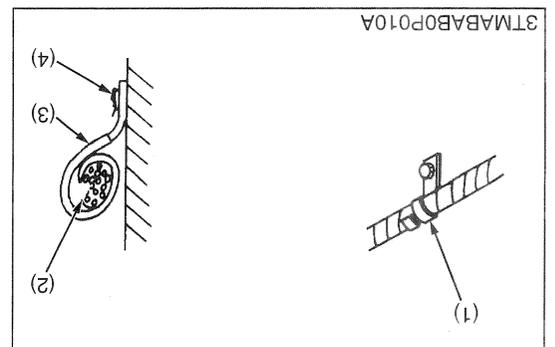
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- Securely insert grommet.

(1) Grommet

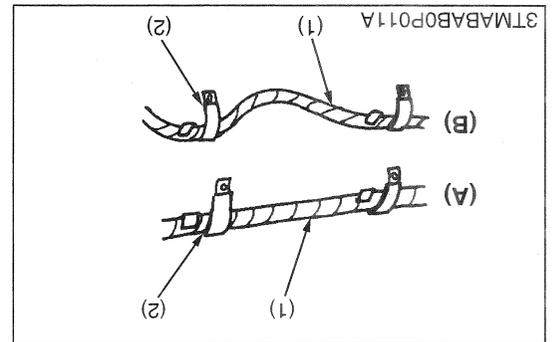
(A) Correct
(B) Incorrect

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- Securely clamp, being careful not to damage wiring.
 - (1) Clamp
 - (2) Wire Harness
 - (3) Clamp
 - (4) Welding Dent

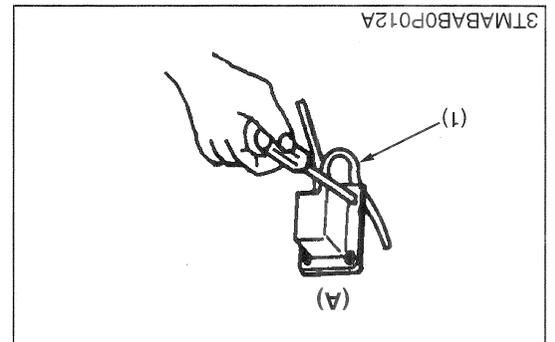
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- Clamp wiring so that there is no twist, unnecessary sag, or excessive tension, except for movable part, where sag be required.
 - (1) Wiring
 - (2) Clamp

(A) Correct
(B) Incorrect

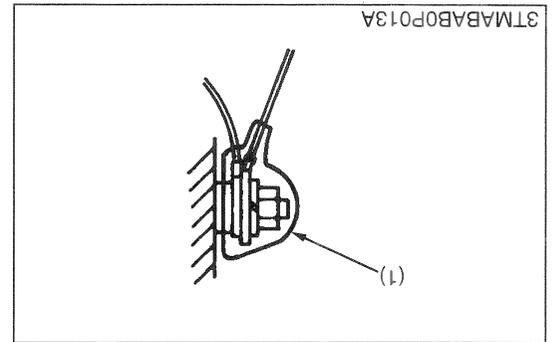
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- In installing a part, take care not to get wiring caught by it.
 - (1) Wiring

(A) Incorrect

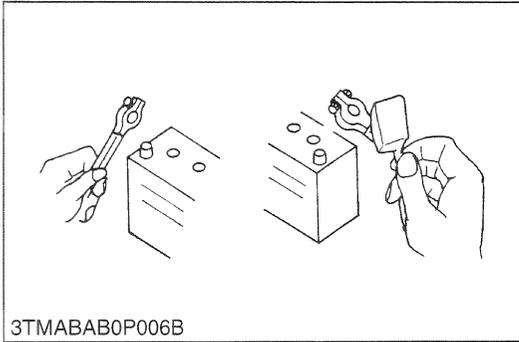
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- After installing wiring, check protection of terminals and clamped condition of wiring, only connect battery.
 - (1) Cover
- Securely Install Cover

W10117350

[2] BATTERY



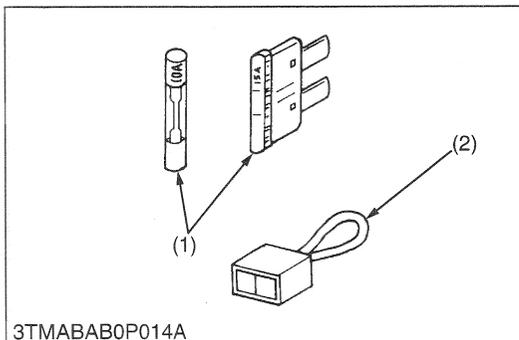
- Take care not to confuse positive and negative terminal posts.
- When removing battery cables, disconnect negative cable first. When installing battery cables, check for polarity and connect positive cable first.
- Do not install any battery with capacity other than is specified (Ah).
- After connecting cables to battery terminal posts, apply high temperature grease to them and securely install terminal covers on them.
- Do not allow dirt and dust to collect on battery.

⚠ CAUTION

- Take care not to let battery liquid spill on your skin and clothes. If contaminated, wash it off with water immediately.
- Before recharging the battery, remove it from the machine.
- Before recharging, remove cell caps.
- Do recharging in a well-ventilated place where there is no open flame nearby, as hydrogen gas and oxygen are formed.

W10118160

[3] FUSE



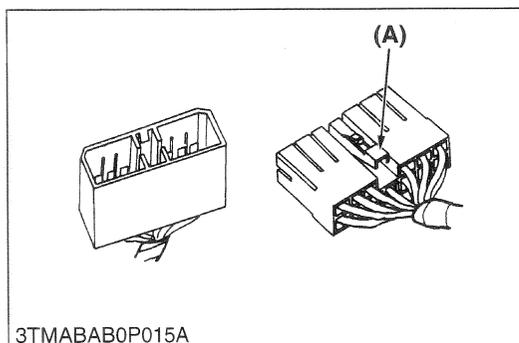
- Use fuses with specified capacity. Neither too large or small capacity fuse is acceptable.
- Never use steel or copper wire in place of fuse.
- Do not install working light, radio set, etc. on machine which is not provided with reserve power supply.
- Do not install accessories if fuse capacity of reserve power supply is exceeded.

(1) Fuse

(2) Slow Blow Fuse

W10120920

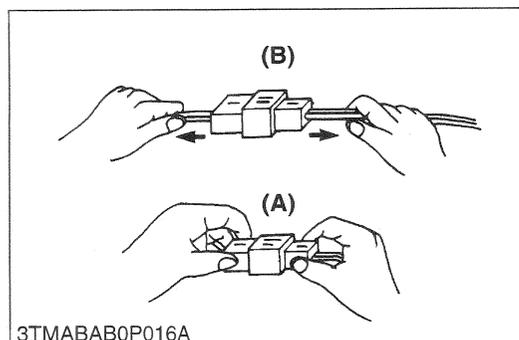
[4] CONNECTOR



- For connector with lock, push lock to separate.

(A) Push

W10122110

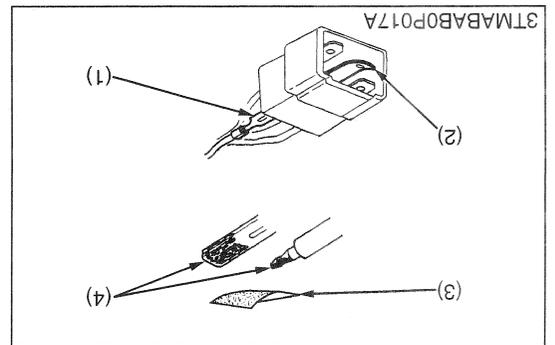


- In separating connectors, do not pull wire harnesses.
- Hold connector bodies to separate.

(A) Correct

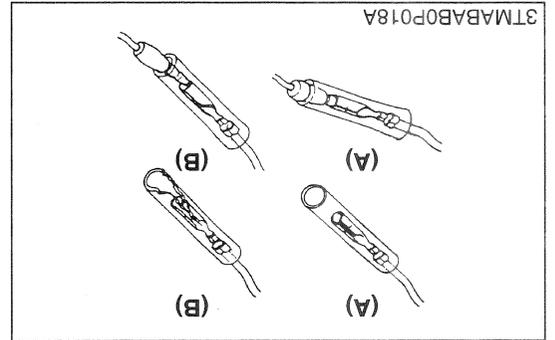
(B) Incorrect

W10122720



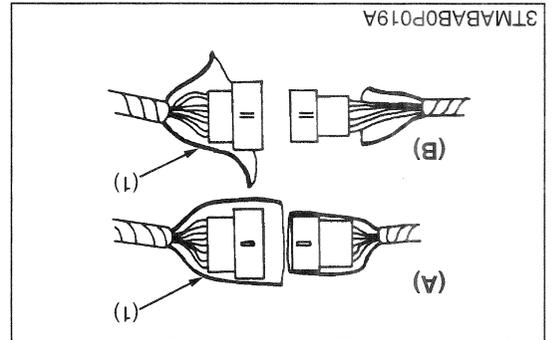
- Use sandpaper to remove rust from terminals.
- Repair deformed terminal. Make certain there is no terminal being exposed or displaced.
- (1) Exposed Terminal
- (2) Deformed Terminal
- (3) Sandpaper
- (4) Rust

W10123460



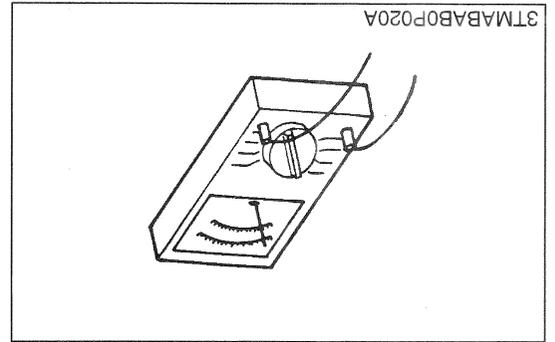
- Make certain that there is no female connector being too open.
- (A) Correct
- (B) Incorrect

W10124300



- Make certain plastic cover is large enough to cover whole connector.
- (1) Cover
- (A) Correct
- (B) Incorrect

W10125190



- Use tester correctly following manual provided with tester.
- Check for polarity and range.

W10126840

[5] HANDLING OF CIRCUIT TESTER

4. E2B ENGINE

The emission controls that have been put into effect in various countries to prevent air pollution will be stepped up. The time to enforce the regulations differs depending on the engine output classifications.

Kubota has been supplying the diesel engines conforming to the emission regulations in respective countries. Exhaust emissions regulations shift to the second stage. Kubota executed the improvement of the engine according to this regulation.

In order to discriminate the engines conforming to Tier 1 / Phase 1 requirements and those conforming to Tier 2 / Phase 2 requirements, we have adopted E2B as a new model name for the engines conforming Tier 2 / Phase 2 regulations.

In the after-sale services for E2B engines, only use the dedicated parts for E2B models and carry out the maintenance services accordingly.

5. LUBRICANTS, FUEL AND COOLANT

No.	Place	Capacity		Lubricants, fuel and coolant
		GL7000-CAN	GL11000-CAN	
1	Engine oil	2.2 L 2.3 U.S.qts. 1.9 Imp.qts.	3.4 L 3.6 U.S.qts. 3.0 Imp.qts.	Higher than CD class (API) Above 25 °C (77 °F) : SAE10W-30, SAE10W-30, SAE30 0 to 25 °C (32 to 77 °F) : SAE10W-30, SAE10W-40, SAE20 Below 0 °C (32 °F) : SAE10W-30, SAE10W-40, SAE10
2	Fuel	28 L 7.4 U.S.gals. 6.2 Imp.gals.		Diesel fuel No.2-D [No.1-D diesel fuel, if temperature is below -10 °C (14 °F)]
3	Coolant	3.7 L 3.9 U.S.qts. 3.3 Imp.qts.	4.1 L 4.3 U.S.qts. 3.6 Imp.qts.	Clean water (Soft water) Use antitfreeze 50 / 50

6. TIGHTENING TORQUES

[1] GENERAL USE SCREWS, BOLT AND NUTS

Screws, bolt and nuts whose tightening torque are not specified in this Workshop Manual should be tightened according to the table below.

Indication on top of bolt	 No-grade or 4T						 7T					
Material of bolt	SS400, S20C						S43C, S48C					
Material of opponet part	Ordinariness			Aluminum			Ordinariness			Aluminum		
Unit	N-m	kgf-m	ft-lbs	N-m	kgf-m	ft-lbs	N-m	kgf-m	ft-lbs	N-m	kgf-m	ft-lbs
Diameter												
M4 (4 mm, 0.16 in.)	1.00 to 2.90	0.10 to 0.30	0.70 to 2.10	-	-	-	-	-	-	-	-	-
M5 (5 mm, 0.20 in.)	1.90 to 3.60	0.20 to 0.40	1.40 to 2.70	-	-	-	-	-	-	-	-	-
M6 (6 mm, 0.24 in.)	7.85 to 9.31	0.80 to 0.95	5.79 to 6.87	7.85 to 8.82	0.80 to 0.90	5.79 to 6.50	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31	7.85 to 8.82	0.80 to 0.90	5.79 to 6.50
M8 (8 mm, 0.31 in.)	17.7 to 20.5	1.8 to 2.1	13.1 to 15.1	16.7 to 19.6	1.7 to 2.0	12.3 to 14.4	23.6 to 27.4	2.4 to 2.8	17.4 to 20.2	17.7 to 20.5	1.8 to 2.1	13.1 to 15.1
M10 (10 mm, 0.39 in.)	39.3 to 45.1	4.0 to 4.6	29.0 to 33.2	31.4 to 34.3	3.2 to 3.5	23.2 to 25.3	48.1 to 55.8	4.9 to 5.7	35.5 to 41.2	39.3 to 44.1	4.0 to 4.5	29.0 to 32.5
M12 (12 mm, 0.47 in.)	62.8 to 72.5	6.4 to 7.4	46.3 to 53.5	-	-	-	77.5 to 90.2	7.9 to 9.2	57.2 to 66.5	62.8 to 72.5	6.4 to 7.4	46.3 to 53.5
M14 (14 mm, 0.55 in.)	108 to 125	11.0 to 12.8	79.6 to 92.5	-	-	-	124 to 147	12.6 to 15.0	91.2 to 108	-	-	-

W1034542

[2] STUD BOLTS

Material of opponet part	Ordinariness			Aluminum		
Unit	N-m	kgf-m	ft-lbs	N-m	kgf-m	ft-lbs
Diameter						
M8 (8 mm, 0.31 in.)	11.8 to 15.6	1.2 to 1.6	8.68 to 11.5	8.82 to 11.8	0.90 to 1.2	6.51 to 8.67
M10 (10 mm, 0.39 in.)	24.6 to 31.3	2.5 to 3.2	18.1 to 23.1	19.7 to 25.4	2.0 to 2.6	14.5 to 18.8

W1048139

7. MAINTENANCE CHECK LIST

Observe the following for service and maintenance:

The lubricating oil change intervals listed in the table below are for classes CG, CE and CD lubricating oil of API classification with a low-sulfur fuel in use. If the CF-4 of CG-4 lubricating oil is used with a high-sulfur fuel, change the lubricating oil at shorter intervals than recommended in the table below depending on the operating condition.



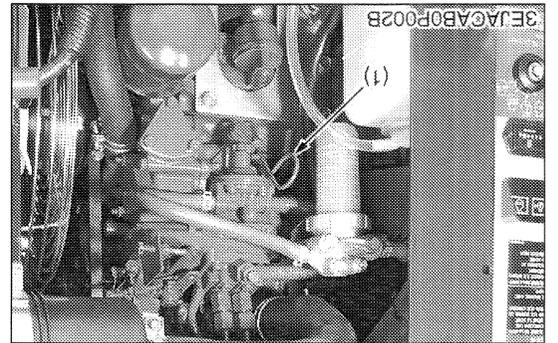
- When checking and servicing the generator, be sure to level and stop the engine.

No.	Item	Period									
		Daily	Initial 50 hours	Every 50 hours	Every 100 hours	Every 200 hours	Every 300 hours	Every 400 hours	Every 500 hours	Reference page	
1	Engine oil	Change	☆		☆						G-12, 14
		Check	☆				☆				G-12
2	Radiator coolant (L.L.C.)	Change									G-22
		Clean			☆						G-15
3	Air cleaner element	Change									G-22
		Check				☆					G-15
4	Fan belt	Change									G-21
		Check				☆					G-15
5	(Fuel hose and clamp bands)	Change									G-23
		Check		☆							G-14
6	Battery	Change									G-23
		Check							☆		G-13, 15
7	Radiator hose and clamp bands	Change									G-23
		Check				☆					G-16
8	Oil filter cartridge	Change									G-13, 16
		Clean									G-16
9	Fuel filter element	Change									G-17
		Clean									G-16
10	Valve clearance	Check									G-20
11	Water Jacket (Radiator interior)	Clean									G-18
		Check									G-17
12	Generator's brush ware	Check							☆		G-17
13	Generator's slip-ring	Check							☆		G-17
14	Generator's ball bearing	Check									G-21
15	Damage in electric wiring and loose connections	Check									G-22
16	Fuel injection pressure	Check									G-21
17	Nozzle spraying condition	Check									G-21
18	Nozzle valve seat tightness	Check									G-21

No.	Item	Period	Every	Every	Every	Every	Every	Reference page
			800 hours	1000 hours	1500 hours	1 year	2 year	
1	Engine oil	Check						G-12
		Change						G-13, 14
2	Radiator coolant (L.L.C.)	Check						G-12
		Change					☆	G-22
3	Air cleaner element	Clean						G-15
		Change				☆		G-22
4	Fan belt	Check						G-15
		Change	☆					G-21
5	Fuel line (Fuel line and clamps)	Check						G-14
		Change					☆	G-23
6	Battery	Check						G-13, 15
		Change					☆	G-23
7	Radiator hose and clamps	Check						G-16
		Change					☆	G-23
8	Oil filter cartridge	Change						G-13, 16
9	Fuel filter element	Clean						G-16
		Change						G-17
10	Valve clearance	Check	☆					G-20
11	Water jacket (Radiator interior)	Clean						G-18
12	Generator's brush ware	Check						G-17
13	Generator's slip-ring	Check						G-17
14	Generator's ball bearing	Check		☆				G-21
15	Damage in electric wiring and loose connections	Check						G-22
16	Fuel injection pressure	Check			☆			G-21
17	Nozzle spraying condition	Check			☆			G-21
18	Nozzle valve seat tightness	Check			☆			G-21

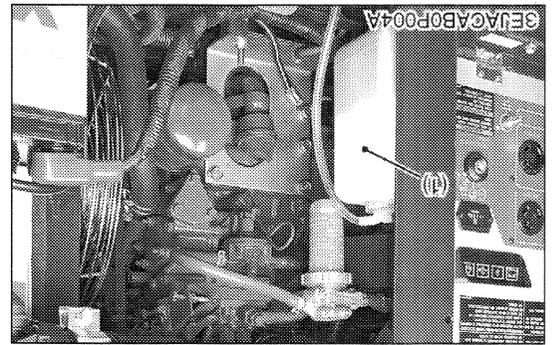
W1036740

8. CHECK AND MAINTENANCE [1] DAILY CHECK



- CAUTION**
- Be sure to stop the engine before checking the engine oil level.
- Level the engine and check the oil level on the gauge (1).
 - If the level below the lower mark, add new engine oil to the upper mark.
- IMPORTANT**
- When using an oil of different maker or viscosity from the previous one, drain an old oil.
 - Never mix two different types of oil.
 - Use the proper SAE Engine oil according to ambient temperatures.
- Refer to "5. LUBRICANTS, FUEL AND COOLANT".
- (1) Gauge

Checking Engine Oil Level

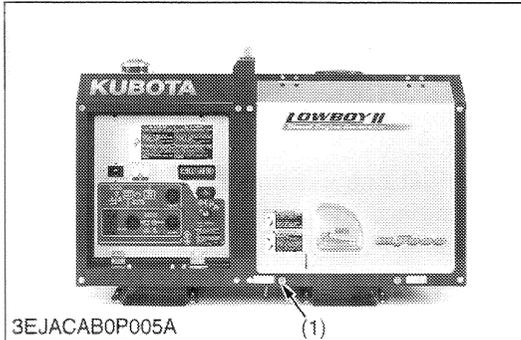


- CAUTION**
- Do not remove the radiator cap while operating or immediately after stopping. Otherwise, hot water will spout out from the radiator. Wait for more than ten minutes to cool the radiator, before opening the cap.
- Remove the radiator cap and check to see that the coolant level is just below the port.
 - If low, add coolant to the radiator.
 - Check the reserve tank (1) and keep the coolant level between the "FULL" and "LOW" marks.
 - If low, add coolant to the reserve tank (1).
- (1) Reserve Tank

Checking Coolant Level

W1040218

[2] CHECK POINTS OF INITIAL 50 HOURS



Changing Engine Oil

! CAUTION

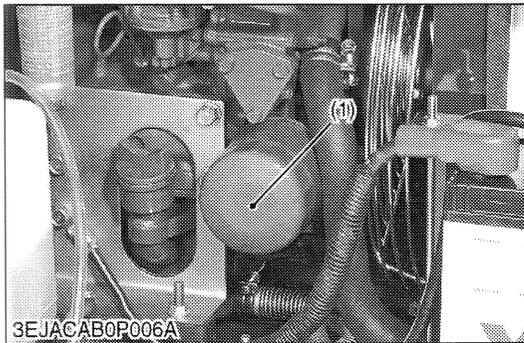
- **Be sure to stop engine before changing engine oil.**
1. After warming up, stop the engine.
 2. Place an oil pan underneath the engine.
 3. Remove the oil drain plug (1) to drain the dirty engine oil completely.
 4. Inspect the drain plug gasket. Replace it damaged.
 5. Reinstall the drain plug.
 6. Fill the new engine oil up to the upper mark on the gauge

■ IMPORTANT

- **When using an oil of different maker or viscosity from the previous one, drain an old oil.**
 - **Never mix two different type's of oil.**
 - **Use the proper SAE Engine oil according to ambient temperatures.**
- Refer to "5. LUBRICANTS, FUEL AND COOLANT".**

(1) Oil Drain Plug

W1016604



Changing Engine Oil Filter Cartridge

! CAUTION

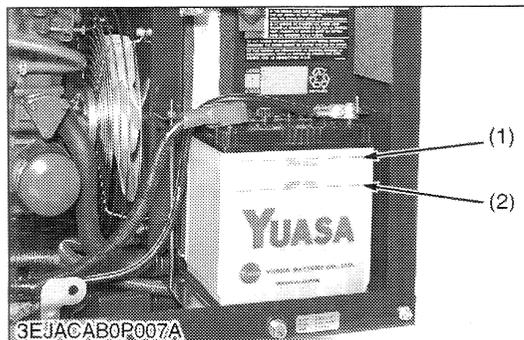
- **Be sure to stop the engine before changing the engine oil filter cartridge.**
1. Remove the engine oil filter cartridge (1) with the filter wrench.
 2. Apply engine oil slightly to the rubber gasket of new cartridge.
 3. Install the new cartridge, screwing it in by hand.
Over-tightening may cause deformation of the rubber gasket.
 4. After the cartridge has been changed, the engine oil level normally lowers a little. Add engine oil to proper 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

W1017137



Checking Battery Electrolyte Level

1. Check the battery electrolyte level.
2. If the level is below than lower level line (2), add the distilled water to pour level of each cell.
3. If the battery can not be charged even though the electrolyte level is correct, replace the battery.

(1) Upper Level Line

(2) Lower Level Line

W1041720

[3] CHECK POINT OF EVERY 50 HOURS

Checking Fuel Hose and Clamp Bands



Stop the engine when attempting the check and change prescribed below.

Remember to check the fuel line periodically. The fuel line is subject to wear and aging, fuel may leak out onto the running engine, causing a fire.

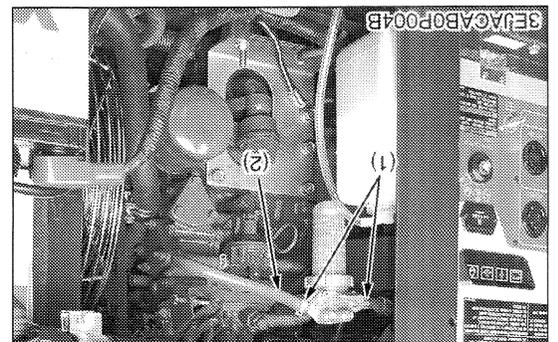
1. Check to see that all fuel lines (2) and hose clamps (1) are tight and not damaged.
2. If fuel lines (2) and hose clamps (1) are found worn or damaged, replace or repair them at once.
3. The fuel line (2) is made of rubber and ages regardless of period of service. Replace the fuel line (2) together with the hose clamp (1) every two years and securely tighten.
4. However if the fuel lines (2) and hose clamps (1) are found damaged or deteriorated earlier than two years, then change or remedy.

IMPORTANT

When the fuel line is disconnected for change, close both ends of the fuel line with a piece of clean cloth or paper to prevent dust and dirt from entering. Entrance of dust and dirt causes malfunction of the fuel injection pump. In addition, particular care must be taken not to admit dust and dirt into the fuel pump.

- (1) Hose Clamp
- (2) Fuel Line

W1035921



[4] CHECK POINT OF EVERY 100 HOURS

Changing Engine Oil



Be sure to stop engine before changing engine oil.

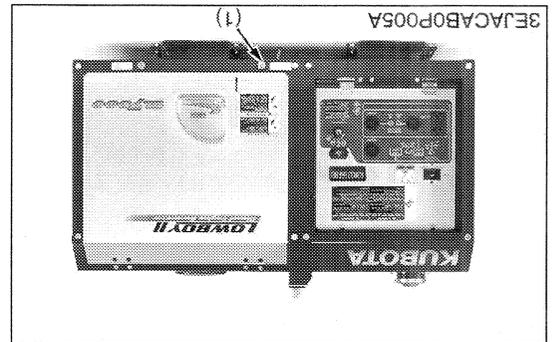
1. After warming up, stop the engine.
2. Place an oil pan underneath the engine.
3. Remove the oil drain plug (1) to drain the dirty engine oil completely.
4. Inspect the drain plug gasket. Replace it damaged.
5. Reinstall the drain plug.
6. Fill the new engine oil up to the upper mark on the gauge.

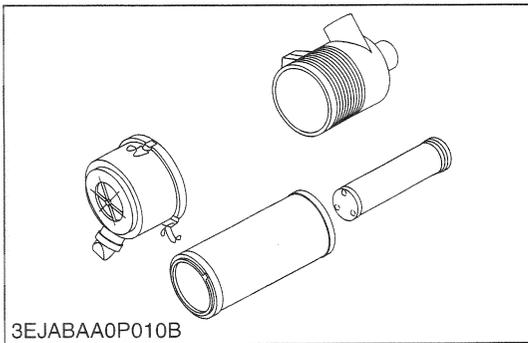
IMPORTANT

When using an oil of different maker or viscosity from the previous one, drain an old oil.
 Never mix two different types of oil.
 Use the proper SAE Engine oil according to ambient temperatures.
 Refer to "5. LUBRICANTS, FUEL AND COOLANT".

- (1) Oil Drain Plug

W1014131





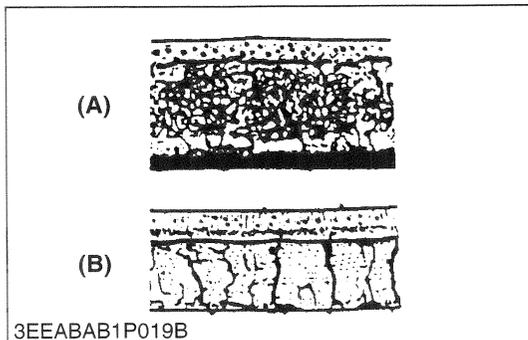
Checking Air Cleaner Element

1. Remove the air cleaner element.
2. Use clean dry compressed air on the inside of the element. Pressure of compressed air must be under 205 kPa (2.1 kgf/cm², 30 psi). Maintain reasonable distance between the nozzle and the filter.

NOTE

- The air cleaner uses a dry element. Never apply oil to it
- Be sure to refit the dust cup with arrow ↑ (on the rear) upright. If the dust cup is improperly fitted, dust passes by the dust cup and directly adheres to the element.
- Do not run the engine with filter element removed.
- Change the element once a year or every 6th cleaning

W1043003



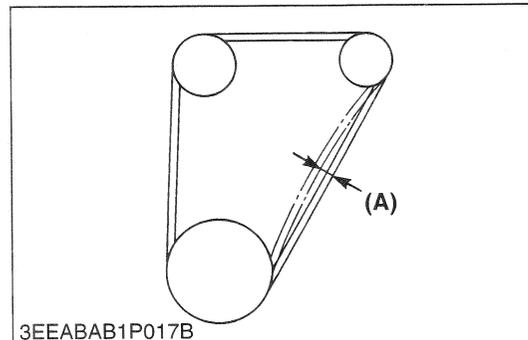
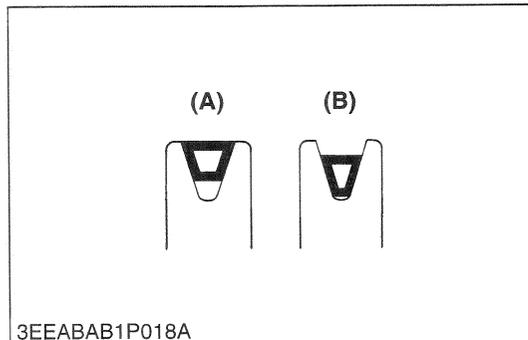
Fan Belt Damage and Wear

1. Check the fan belt for damage.
2. If the fan belt is damaged, replace it.
3. Check if the fan belt is worn and sunk in the pulley groove.
4. If the fan belt is nearly worn out and deeply sunk in the pulley groove, replace it.

(A) Good

(B) Bad

W1209480



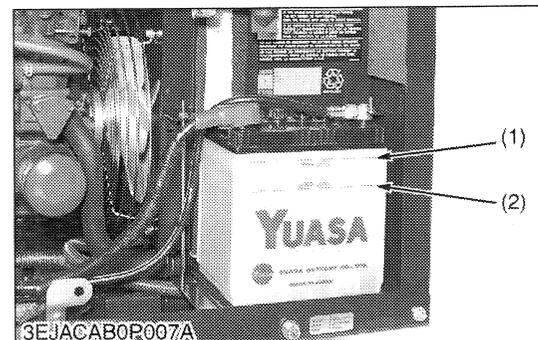
Fan Belt Tension

1. Measure the deflection (A), depressing the belt halfway between the fan drive pulley and alternator pulley at specified force 98 N (10 kgf, 22 lbs).
2. If the measurement is not within the factory specifications, loosen the alternator mounting screws and relocate the alternator to adjust.

Deflection (A)	Factory spec.	7.0 to 9.0 mm 0.28 to 0.35 in.
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(A) Deflection

W1208957



Checking Battery Electrolyte Level

1. Check the battery electrolyte level.
2. If the level is below than lower level line (2), add the distilled water to pour level of each cell.
3. If the battery can not be charged even though the electrolyte level is correct, replace the battery.

(1) Upper Level Line

(2) Lower Level Line

W1045746

W1015117

(1) Engine Oil Filter Cartridge

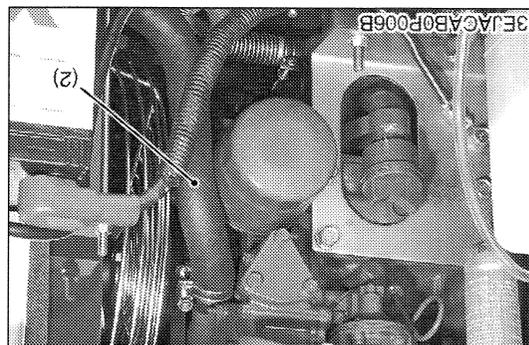
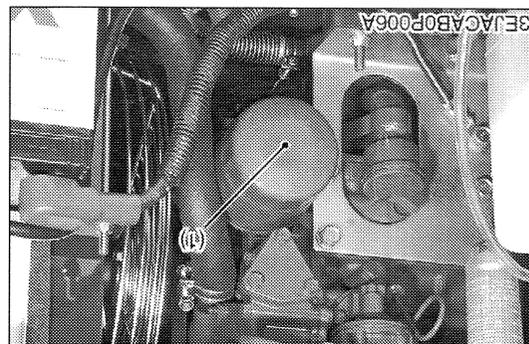
- To prevent serious damage to the engine, replacement oil filter cartridge must be highly efficient. Use only a genuine KUBOTA filter cartridge or its equivalent.

IMPORTANT

- Be sure to stop the engine before changing the engine oil filter cartridge.
1. Remove the engine oil filter cartridge (1) with the filter wrench.
 2. Apply engine oil slightly to the rubber gasket of new cartridge.
 3. Install the new cartridge, screwing it in by hand.
 4. Over-tightening may cause deformation of the rubber gasket. After the cartridge has been changed, the engine oil level normally lowers a little. Add engine oil to proper level.

CAUTION

Changing Engine Oil Filter Cartridge

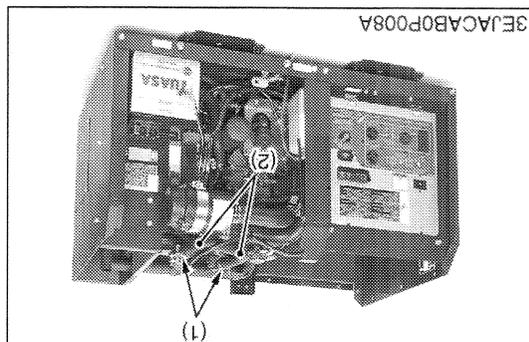


W1014590

(1) Clamp Band (2) Radiator Hose

1. Check to see if the radiator hoses (2) are properly fixed every 200 hours of operation or every six months, whichever comes first.
2. If clamp bands (1) are loose or water leaks, tighten bands securely. Replace hoses and tighten clamp bands securely, if radiator hoses are swollen, hardened or cracked.
3. Replace hoses and clamp bands every 2 years or earlier if checked and found that hoses are swollen, hardened or cracked.

Checking Radiator Hose and Clamp Bands



[5] CHECK POINT OF EVERY 200 HOURS

W1046058

(1) Fuel Cock (2) Fuel Filter Element

- Check for fuel leak after checking it.
- NOTE**
1. Close the fuel cock (1).
 2. Remove the fuel filter element (2).
 3. After cleaning the fuel filter element (2), screwing it in by hand.

Checking Fuel Filter Element

