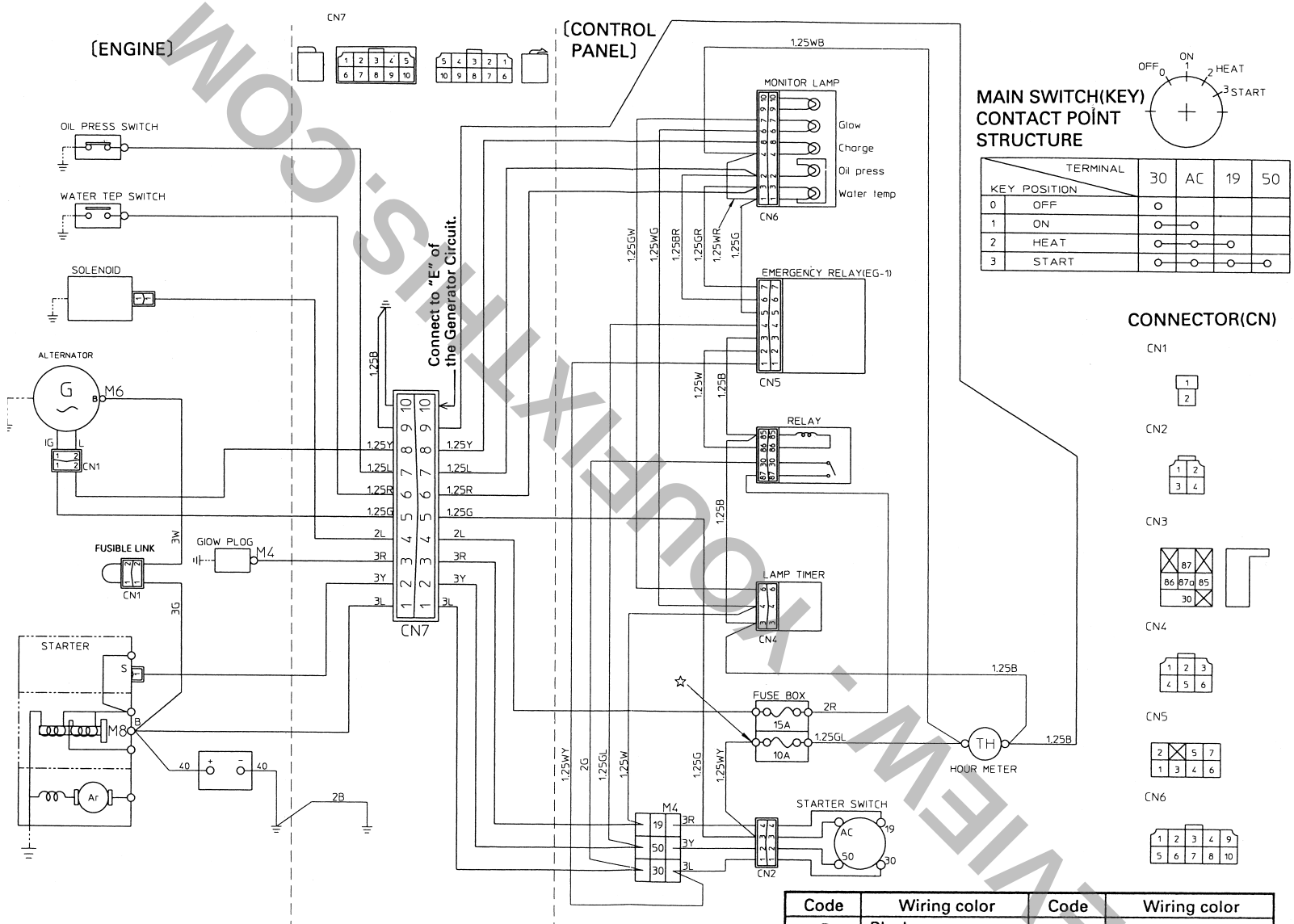
■ Engine Circuit Diagram for D1703, V2203



MAIN SWITCH(KEY) CONTACT POINT STRUCTURE

KEY POSITION \ TERMINAL	30	AC	19	50
0 OFF	○			
1 ON	○	○		
2 HEAT	○	○	○	
3 START	○	○	○	○

CONNECTOR(CN)

Code	Wiring color	Code	Wiring color
B	Black	R	Red
BR	Red on black	W	White
G	Green	WB	Black on white
GL	Blue on green	WG	Green on white
GW	White on green	WR	Red on white
GR	Red on green	WY	Yellow on white
L	Blue	Y	Yellow

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EVERY 100 HOURS

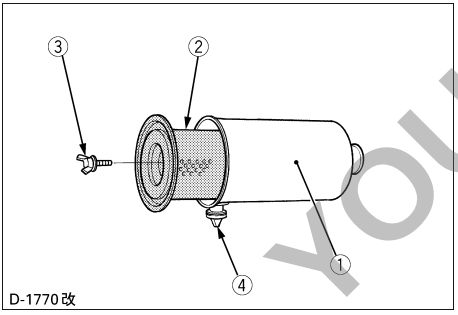
■ Cleaning Air Cleaner Element

Since the air cleaner employed on this engine is a dry type, never apply oil to it.

1. Open the evacuator valve once a week under ordinary conditions - or daily when used in severe or dusty conditions. This will get rid of large particles of dust and dirt.
2. Wipe the inside air cleaner clean with cloth if it is dirty or wet.
3. Avoid touching the element except when cleaning.
4. When dry dust adheres to the element, blow compressed air from the inside turning the element. Pressure of compressed air must be under 205 kPa (2.1 kgf/cm^2, 30 psi).

【Engine model : D1703-EBG, V2203-EBG】

5. Replace the element every year or every 6 cleanings.



D-1770改

(1) Air cleaner body
(2) Element
(3) Wing bolt
(4) Evacuator valve

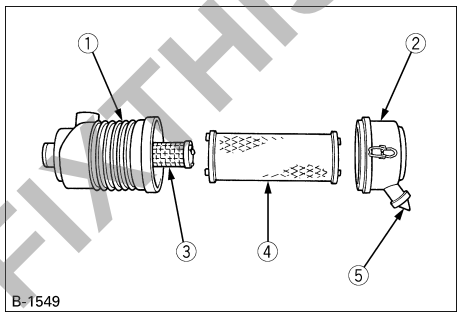
IMPORTANT:

- Make sure the wing bolt for the element is tight enough. If it is loose, dust and dirt may be sucked into the engine, causing premature wearing down the cylinder liner and piston ring earlier, and thereby resulting in poor power output and need for engine repair.

【Engine model : V3300-EBG】

If the air cleaner is equipped with the secondary element, start it in the following manner :
Take steps (1) through (4) foregoing.

5. Replace the primary element every year or every 6 cleanings. If the primary element is heavily stained, replace it sooner. At this time, also replace the secondary element.
6. The secondary element should be removed only if it is to be replaced.
7. To protect the engine, do not remove the secondary element in normal servicing of the primary element.



B-1549

(1) Air cleaner body
(2) Cover
(3) Secondary element
(4) Primary element
(5) Evacuator valve

IMPORTANT:

- Make sure hooking clip is tight enough. If it is loose, dust and dirt may be sucked into the engine, causing excessive wear or premature engine failure and need for engine repair.

■ Cleaning Primary Air Filter Element

To clean the element, use clean dry compressed air on the inside of the element.
Air pressure at the nozzle must not exceed 205 kPa (2.1 kgf/cm^2, 30 psi).
Maintain reasonable distance between the nozzle and filter.

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TROUBLESHOOTING

CAUTION:
To avoid personal injury:
- **Always perform all checks with engine stopped and cool to the touch except for those checks in which operation is required.**
- **DO NOT touch the charging section during operation.**
- **Avoid any contact with rotating fan during operation.**

If the engine does not function properly, use the following chart to identify and correct the cause.

■ Generator Troubleshooting

Trouble	Possible causes	Correction
Unusual noise or vibration	Single-phase load applied beyond allowable level (on three phase models).	*Lower the load to acceptable level.
	Bearing deteriorated.	*Replace the bearing.
	Coupling damaged.	*Replace the coupling.
Frame overheated.	Cooling fan inlet or outlet blocked.	*Unblock the inlet or outlet.
	Voltage too high.	*Readjust the voltage.
	Overloaded.	*Reduce the load.
Voltage failure to rise.	Voltage maladjusted.	*Readjust using the voltage control.
	AVR excitation output cable broken.	*Repair the cable.
	AVR itself in trouble.	*Replace the AVR.
	Exciter's winding short-circuited or broken.	*Replace the generator.
	AVR excitation input cable broken.	*Repair the cable.
	Generator's winding broken.	*Replace the generator.
	AVR excitation output fuse blown out.	*Replace the fuse.
Voltage too high.	Voltage maladjusted.	*Readjust using the voltage control.
	AVR voltage detection cable broken.	*Repair the cable.
	AVR itself in trouble.	*Replace the AVR.
	Mercury arc lamp or such conductive load connected.	*Disconnect such load.
Voltage hunting	Inverter or such switching load connected.	*Disconnect such load.
	AVR itself in trouble.	*Replace the AVR.
Circuit breaker turned OFF.	Connected cable or load short-circuited.	*Contact a qualified electrical engineer for inspection.
	Overloaded.	*Reduce the load.
Pilot lamp failure to light up	Lamp bulb broken.	*Replace the bulb.
	Generator voltage too low.	*See "Voltage failure to rise" above.

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SPECIFICATIONS

General Type (50Hz)

Model	Unit	KJ-S130VX	KJ-T130DX	KJ-T180VX	KJ-T300
Generator					
Generator type		PX-316KU1	PX-312KU3	PX-316KU3	PX-322KE3
Type		Revolving field, self-excited brushless AC generator			
Rated output	kVA	12.5	12.5	18.0	30.0
	kW	12.5	10.0	14.4	24.0
No. of phase		1 Phase 4 wires	3 Phases 12 wires		
Power factor	%	100	80		
Rating		Continuous			
Rated voltage	V	110/220	380 415	380 415	380
Current	A	56.8	19.0 17.4	27.3 25.0	45.6
Rated frequency	Hz	50			
Insulation class		H			
Excitation		Self-excitation			
No. of poles		4			
Drive		Direct drive			
Engine speed	rpm	1500			
Ambient temperature range	℃	–15 to 40			
Length x Width x Height	mm	1488 x 650 x 971	1393 x 650 x 971	1488 x 650 x 971	1717 x 824 x 1046
Mass	kg	505	450	505	710
Engine					
Model		V2203	D1703	V2203	V3300
Type		Vertical water cooled 4 cycle diesel			
Cylinders – Bore x Stroke	mm	4 – 87 x 92.4	3 – 87 x 92.4	4 – 87 x 92.4	4 – 98 x 110
Displacement	mL	2197	1647	2197	3318
Rated output	kW (PS)	16.9 (23.0)	12.7 (17.2)	16.9 (23.0)	26.8 (36.4)
Fuel		Diesel fuel No. 2-D (ASTM D975)			
Fuel consumption	L/h	5.3	4.0	5.3	7.7
Fuel tank capacity	L	37			60
Engine oil grade		API service class CD or higher			
Engine oil capacity	L	7.6	5.6	7.6	13.2
Coolant capacity ※	L	9.0	8.0	9.0	9.5
Battery capacity	(V x AH/5Hr)	95D31R (12 x 64)			130E41R (12 x 92)
Emergency stop system		In case of abnormal Oil Pressure or water temperature			

※ Including the reserve tank

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SERVICE INTERVALS

Observe the following for service and maintenance.
The lubricating oil change intervals listed in the table below are for Classes CF, CE and CD lubricating oils of API classification with a low-sulfur fuel in use. If the CF-4 or 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.

No.	Check point	Interval										Ref. page		
		First 50 hours	Every day	Every 100 hours	Every 250 hours	Every 500 hours	Every 1000 hours	Every 1500 hours	Every 3000 hours	Every 1 year	Every 2 years			
1	Check of fuel pipes and clamp bands			○								–		@
2	Change of engine oil	◎	Level check		○							29		
3	Cleaning of air cleaner element			○								27	*1	@
4	Check of battery electrolyte level			○								29		
5	Check of fan belt tightness	◎			○							30		
6	Check of radiator hoses and clamp bands				○							30		
7	Check of intake air line				○							–		@
8	Replacement of oil filter cartridge	◎										31		
9	Replacement of fuel filter cartridge					○						31		@
10	Cleaning of sedimenter (water separator)				○							32		
11	Cleaning of water jacket (radiator interior)						○					–		
12	Replacement of fan belt						○					–		
13	Check of valve clearance						○					–		
14	Replacement of air cleaner element									○		27	*2	@
15	Check of damage in electric wiring and loose connections				○							–		
16	Check of fuel injection nozzle injection pressure							○				–	*3	@
17	Check of injection pump								○			–	*3	@
18	Replacement of fuel pipes, fuel gauge and clamp bands										○	–	*3	@
19	Replacement of radiator hoses and clamp bands										○	30		
20	Replacement of battery										○	33		
21	Change of radiator coolant (L.L.C.)		Level check								○	8		
22	Replacement of intake air line										○	–	*4	@

IMPORTANT

- The jobs indicated by ◎ must be done after the first 50 hours of operation.

*1 Air cleaner should be cleaned more often in dusty conditions than in normal conditions.
*2 After 6 times of cleaning.
*3 Consult your local KUBOTA Dealer for this service.
*4 Replace earlier if necessary.

- The items listed above (@ marked) are registered as emission related critical parts by KUBOTA in the U.S. EPA non-road 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 Warranty Statement in detail.
- When the battery is used for less than 100 hours in a year, check its electrolyte yearly. (for refillable battery's only)

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OPERATING THE ENGINE

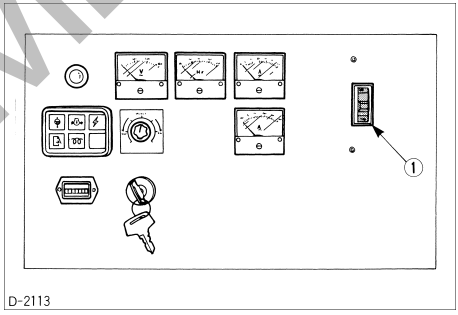
CAUTION:
To avoid personal injury:
- **Read "Safe Operation" in the front of this manual.**
- **Read the danger, warning and caution labels located on the generator.**
- **To avoid the danger of exhaust fume poisoning, do not operate the engine in a closed building without proper ventilation.**
- **Always turn OFF the circuit breaker before starting the generator.**
- **Turn OFF all switches on the electrical devices.**
- **Check the wiring and connections of the electrical devices before starting the machine.**
- **DO NOT touch the charging section during operation.**

IMPORTANT:
- Do not use ether or any starting fluid for starting the engine, or a severe damage will occur.
- To protect the battery and the starter, make sure that the starter is not continuously turned for more than 10 seconds.

STARTING THE ENGINE

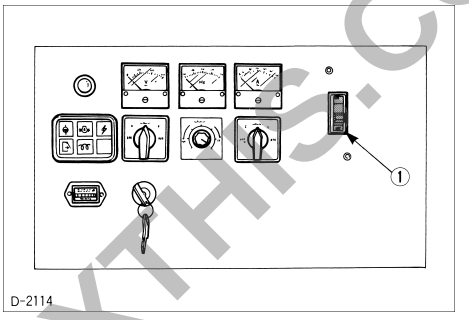
1. Turn OFF the circuit breaker on the control panel.

[KJ-S130VX, KJ-S150VX]



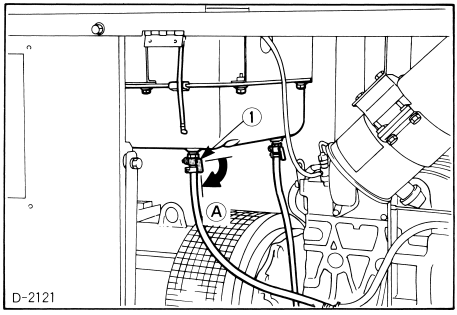
(1) Circuit breaker

[KJ-T130DX, KJ-T180VX, KJ-T300, KJ-T160DX, KJ-T210VX]



(1) Circuit breaker

2. Turn OFF all switches for the electrical devices.
3. Turn the fuel tank tap to the "OPEN" position.



(1) Fuel tank tap (A) "OPEN"

CAUTION:
To avoid personal injury:
- **Never open the door or generator side cover while the engine is running.**

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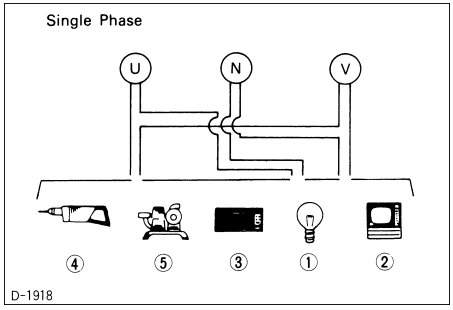
◆ Single phase 3 terminal type

i) KJ-S130VX

50Hz 110V	Use Ⓤ-Ⓝ
	Ⓥ-Ⓝ
50Hz 220V	Use Ⓤ-Ⓥ

ii) KJ-S150VX

60Hz 110V	Use Ⓤ-Ⓝ
	Ⓥ-Ⓝ
60Hz 220V, 240V	Use Ⓤ-Ⓥ



(1) Light *(4) Electric Drill*
(2) Television *(5) Motor Pump*
(3) Air conditioner

◆ 3 phase and single phase 4 terminals type

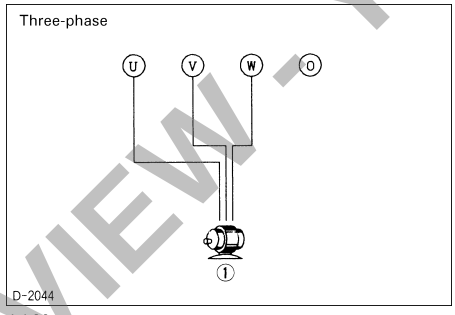
● For 3 phase power source

i) KJ-T130DX, KJ-T180VX, KJ-T300

50Hz,380,415V	Use Ⓦ-Ⓥ-Ⓤ

ii) KJ-T160DX, KJ-T210VX

60Hz 220,380V	Use Ⓦ-Ⓥ-Ⓤ



(1) Motor

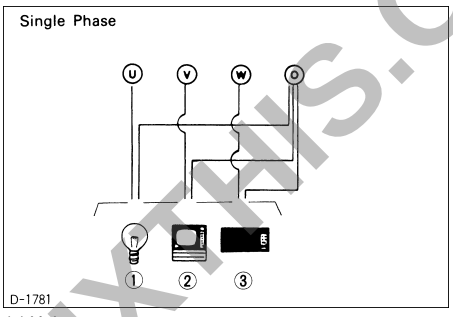
● For single phase Power Source:

i) KJ-T130DX, KJ-T180VX, KJ-T300

50Hz 220,240V	Use Ⓞ-Ⓤ
	Ⓞ-Ⓥ
	Ⓞ-Ⓦ

ii) KJ-T160DX, KJ-T210VX

60Hz 127,220V	Use Ⓞ-Ⓤ
	Ⓞ-Ⓥ
	Ⓞ-Ⓦ



(1) Light
(2) Television
(3) Air conditioner

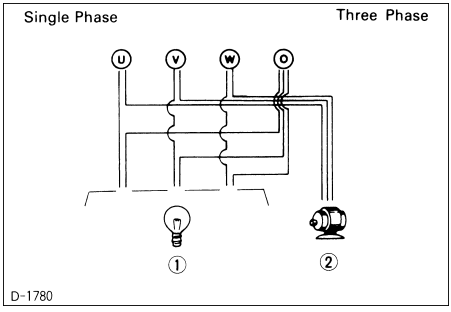
● Connecting 3 phase Power Source to Single Phase Load.

i) KJ-T130DX, KJ-T180VX, KJ-T300

50Hz 220,240V single phase	Use Ⓤ-Ⓞ
	Ⓥ-Ⓞ
	Ⓦ-Ⓞ
50Hz 220,380,415V 3 phase	Use Ⓤ-Ⓥ-Ⓦ

ii) KJ-T160DX, KJ-T210VX

60Hz 127,220V single phase	Use Ⓤ-Ⓞ
	Ⓥ-Ⓞ
	Ⓦ-Ⓞ
60Hz 220,380V 3 phase	Use Ⓤ-Ⓥ-Ⓦ



(1) Light
(2) Motor

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