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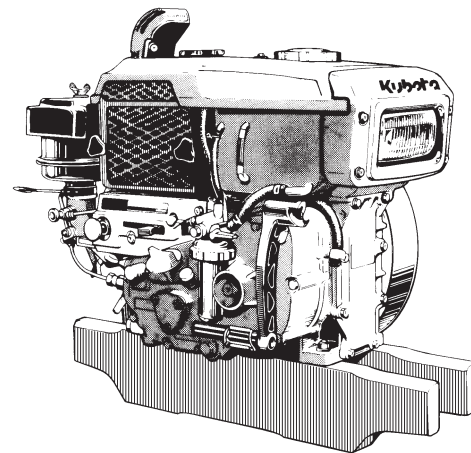
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OPERATOR'S MANUAL

KUBOTA DIESEL ENGINE



MODELS

EP84(-ND)

EA300(-N)(-NB)

E75(-NB3)

EP84·EA300·E75

FOREWORD

KUBOTA Corporation wishes to express its deep appreciation to you for your purchase of the KUBOTA Diesel Engine which has been designed and manufactured through many years of research and development. We also wish to express our deep appreciation for your patronage of KUBOTA products.

We are confident that the machine will give you the results you desire, but in order to get “Higher efficiency”, “Greater economy” and “Longer service”, it is recommended that this “Operator’s Manual” be read very thoroughly and the engine handled and maintained in the most proper manner.

If the engine is handled and maintained in the proper way, you will find in the long run, that you have made a good investment.

California Proposition 65

WARNING

Engine exhaust, some of its constituents, certain vehicle components and fluids, contain or emit chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

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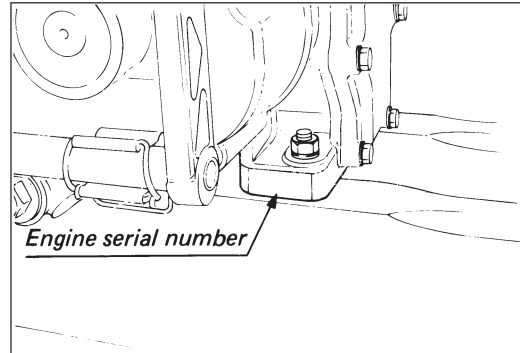
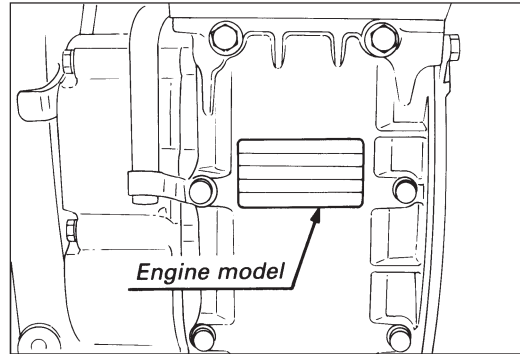
▲ SAFE OPERATION

1. Before operation, wear a proper cap and work clothes to prevent clothing, hair, towels and such from getting caught in the engine.
2. Before operation, check all set bolts and nuts for looseness and tighten if necessary.
3. Avoid placing inflammable materials close to the engine during operation.
4. As exhaust gases are harmful:
 - (1) Avoid operating the engine in an ill-ventilated place or where exhaust gases accumulate easily.
 - (2) Take special care during operation to prevent exhaust gases from affecting yourself, or people or animals around you.
5. When using an belt, install a cover, fence or similar device to prevent the risk of injury. Be sure to stop the engine before installing or removing the belt.
6. If the engine is to be lent to somebody, explain the handling procedures and point out that the Operator's Manual must be read carefully before use.
7. Keep children away from the engine during operation.
8. Do not touch the muffler, exhaust pipe or other hot parts during or immediately after operation.
9. Always stop the engine in the following cases:
 - (1) When checking, adjusting or cleaning each part.
 - (2) When discharging, pouring or injecting oil from or into each part.
 - (3) When cleaning off dust or other foreign matter accumulated on the muffler.
10. Do not use or charge the battery if its fluid level stands below the LOWER mark. Otherwise, the component parts may deteriorate earlier than expected, which may shorten the service life or cause an explosion. Immediately, add distilled water until the fluid level is between the UPPER and LOWER levels.

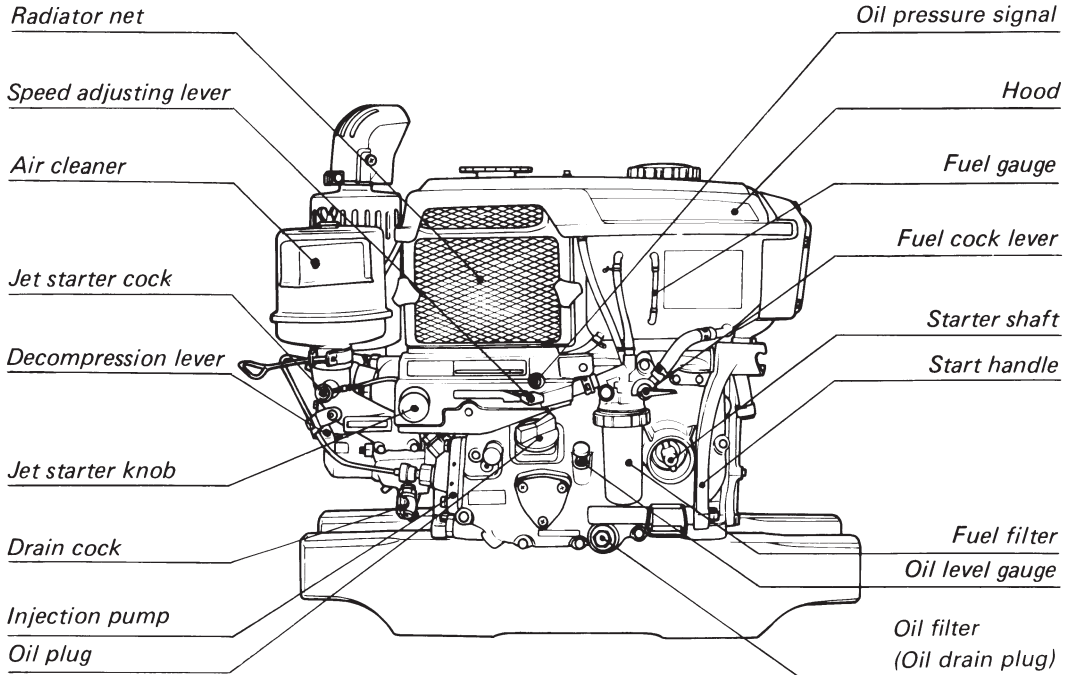
1. SERVICING

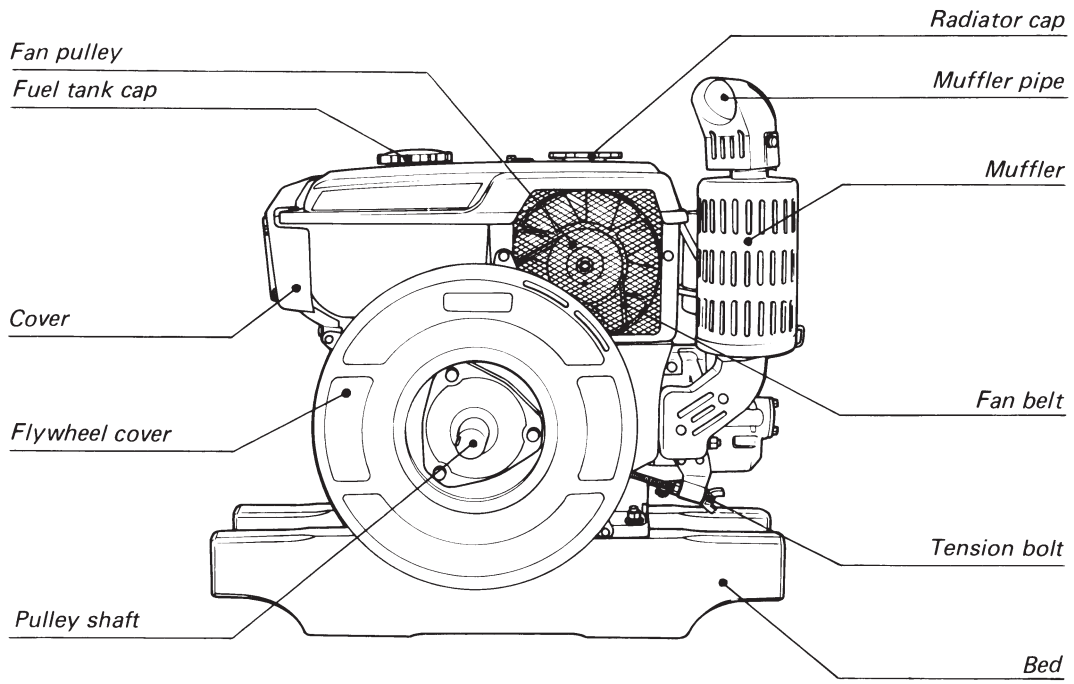
If you should have any questions or require servicing for your machine, contact a KUBOTA dealer with the following information:

- model name and serial number.



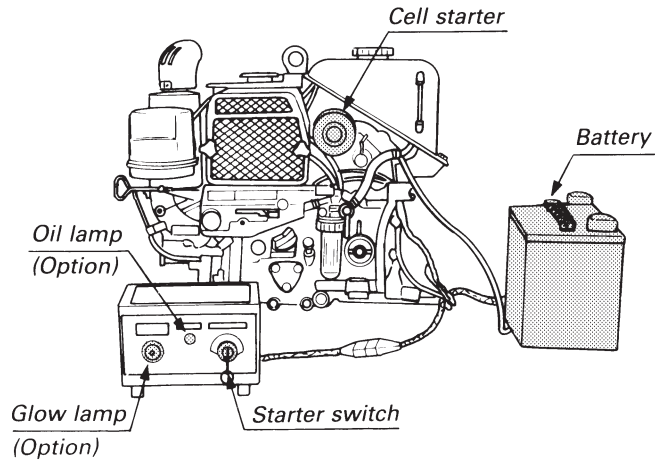
2. NAMES OF PARTS





ELECTRIC START MODELS

EA300-NB
E75-NB3

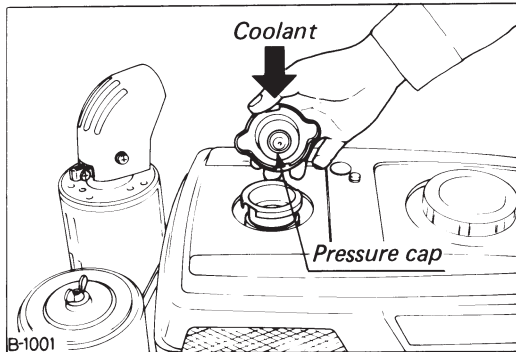


3. PRE-START CHECKS

Check the engine prior to starting as described below:

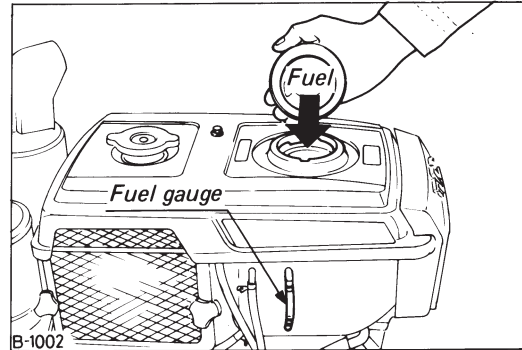
3.1. COOLANT

Fill the radiator with tap water. Secure the pressure cap.



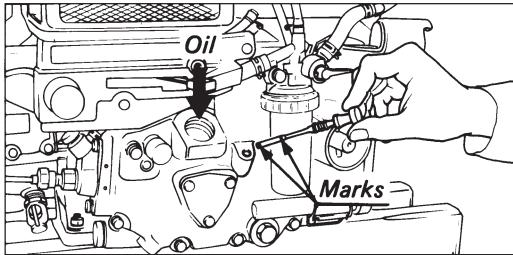
3.2. FUEL

Fill the fuel tank with diesel fuel. (SAE No.2-D)



3.3. CRANKCASE OIL

Keep the engine horizontal, and fill the crankcase with SAE 30 in summer (above 20°C), SAE 20 in spring or autumn (5°C through 20°C), and SAE 10W or 10W-30 in winter climates (below 5°C) to the top mark on the oil level gauge. The oil level gauge must be screwed in.



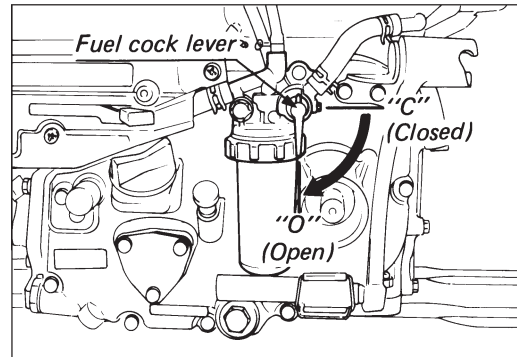
■ TANK CAPACITIES

Models Tank	EP84 EA300	E75-NB3
Fuel tank (ℓ)	4.5	4.8
Radiator (ℓ)	1.2	
Crankcase (ℓ)	1.3	

3.4. AIR VENTING

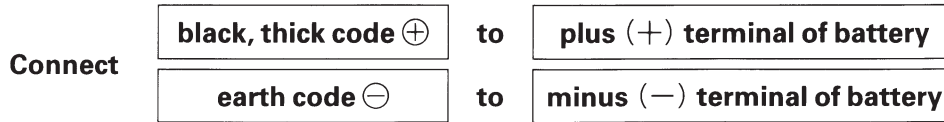
Vent air in the fuel in the following way.

- (1) Turn fuel cock lever from "C" (closed) to "O" (open) and wait about 20 seconds. This fuel filter is equipped with an automatic fuel venting device. When the cock is opened the air within the pipe and filter is automatically vented.
- (2) Do not move the lever but leave in the "O" (open) position when running the engine.

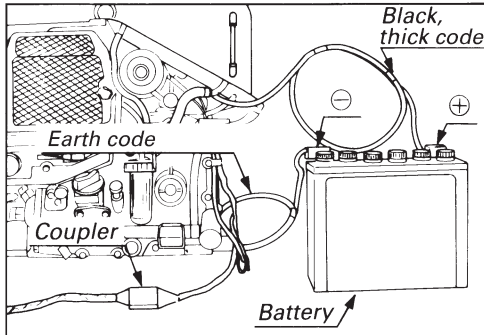


3.5. CONNECTION TO BATTERY [ELECTRIC START MODELS]

Properly connect the battery cord to the battery terminals.



EA300-NB



IMPORTANT:

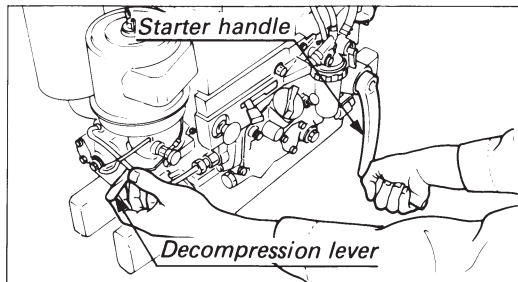
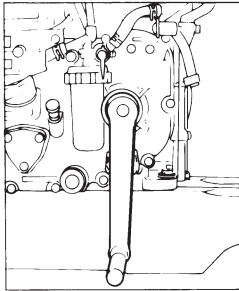
- Do not run the engine without connecting to battery because regulator may be damaged. In case the engine is to be run without connecting to the battery, disconnect the cable at the coupler between dynamo and regulator.

- Refer to page 26 for the battery.

4. STARTING

4.1. MANUAL STARTING

- (1) Set the speed adjusting lever to position "RUN".
- (2) Insert starting handle into starting shaft until the edge of starting handle is hooked to starting shaft.
- (3) While lifting the decompression lever with your left hand, turn the handle slowly with your right hand. A rumbling noise should be heard.



- (4) Once you hear the rumbling, turn the handle smartly. Then, release the decompression lever, and continue to turn the handle with more force. Once compression is overcome, the engine will catch.



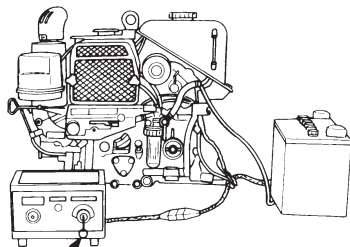
CAUTION

- **DO NOT** release the handle until the engine catches. Otherwise, the handle will turn together with the starter, and come off after the engine catches, which is very dangerous.
- The starting handle's turning speed is multiplied by 2.5 times and the compression position always changes.
- **DO NOT** ease or draw out the starting handle even when the compression position has been reached. Keep turning on the lever 2 or 3 times more with force.

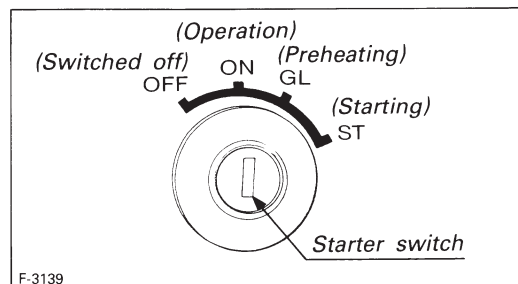
4.2. ELECTRIC STARTING [ELECTRIC START MODELS]

■ EA300-NB and E75-NB3 models

- (1) Set the speed adjusting lever to position "RUN".
- (2) Insert the key into the starter switch, turn it 「GL」 (Preheating) and keep it at 「GL」 for several seconds.



Starter switch



F-3139

- If the ambient temperature is (too) low, increase the preheating time. The relationship between the ambient temperature and preheating time is as follows.
- (3) When the key is turned to position 「ST」 (Starting) , the starter is actuated to start the engine.
 - Take your hand off the switch upon confirmation of starting.

Ambient temperature	Preheating time
above -5°C	5 sec.
-5°C to -20°C	10 sec.

IMPORTANT:

- Do not try to manipulate the starter switch when the engine is in operation.

4.3. COLD STARTING

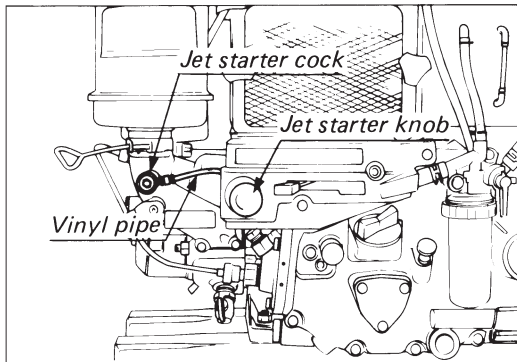
■ JET STARTER

- Some model are not equipped with a JET STARTER.

When starting the engine is difficult because of the cold, use the jet starter.

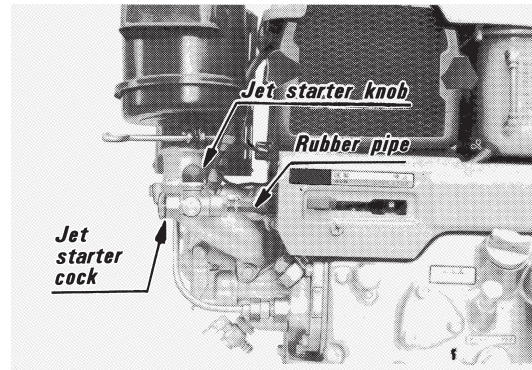
- (1) Turn the cock counterclockwise to open.
- (2) Pull and push the starter knob the number of times shown in the table below. About 1cc (TYPE 2 : 1.5cc) of fuel is injected into the air cleaner flange by one pull-and-push.
- (3) After injecting fuel, close the cock completely.

TYPE 1



- (4) Set the speed adjusting lever to "RUN".
Without using the decompression lever, slowly turn the starter handle to the point of resistance. Move the starter back and forth to this point about 10 times. This will cause the temperature of the air in the cylinder to rise due to compression heat and oil film to form on the inside wall of the cylinder, both of which will facilitate engine starting.
Now, lift the decompression lever, and turn the handle smartly. When the handle turns

TYPE 2



with force, release the lever. Keep turning the handle with even more force to overcome compression.

● **Table of the number of times needed pull-and-push jet starter**

Times	TYPE 1	4 to 5
	TYPE 2	2

Increase or decrease the number of times as needed, depending on the ambient temperature.

NOTE:

- (1) Starting fuel is sucked into the jet starter through the outlet of the fuel tank and rubber pipe. If dirt and water collect on the bottom of the fuel tank, fuel cannot be drawn in well.
- (2) Observing the vinyl pipe that connects the cock with the pump, can show how much fuel is being absorbed into jet starter. (TYPE 1)
- (3) Pouring hot water over the radiator eases starting.

- (4) It is extremely important, when starting the engine in cold weather, to use the proper oil for the crankcase. Be sure to use SAE 10W-30 which has low viscosity (soft). It will allow the starter handle to turn much more easily.

IMPORTANT:

- Make sure that the jet starter cock is closed during operation. Otherwise, fuel is sucked in.

■ **DECOMPRESSION LEVER**

[ELECTRIC START MODELS]

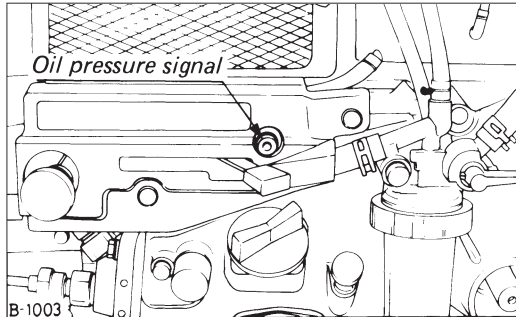
Pull the decompression lever, turn on the starter switch, then set the lever free after the engine rotates. The engine will start easily.

NOTE:

- Use decompression lever for starting engine when the engine is coupled with such equipment that has greater resistance to rotation, like compressors, etc.

4.4. OIL PRESSURE SIGNAL

The signal stays red when the engine is not in use. When it is started, the signal turns to blue, indicating that the hydraulic pump is functioning normally.



IMPORTANT:

- If the engine is used with the oil pressure signal red, the engine may be burned up. Immediately stop the engine and in such cases it would be preferable to have a specialist check and necessary repairs because he would be able to make repairs much quicker than inexperienced persons.

4.5. OIL PRESSURE WARNING LAMP (RED)-OPTION [ELECTRIC START MODELS only]

Read the following when the engine is equipped with oil pressure warning lamp.

This shows whether the oil pressure in the engine is proper.

- (1) The light goes on when the key switch is turned on. It goes off when the engine starts and the engine oil starts to circulate normally.
- (2) If the light stays on even after the engine starts, immediately stop the engine and check the cause of the trouble.

If the light goes on while operating, immediately stop the engine and check the cause.

4.6. WARMING-UP

After the engine has caught, it is necessary to allow time for the oil to penetrate all the engine parts. Warm up the engine for several minutes at no load.

■ BREAKING-IN

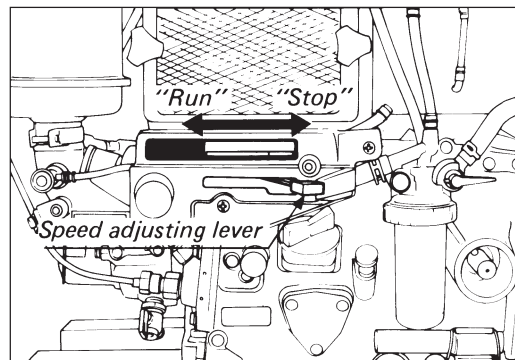
Especially when the engine is new, do not overload it for the first week or for the first 40 to 50 hours of operation.

5. STOPPING

Set the speed adjusting lever to "Stop", and the engine stops.

IMPORTANT:

- Do not touch the decompression lever, or the valve system may be damaged.



6. REVERSED ENGINE REVOLUTION AND REMEDIES



CAUTION

To avoid personal injury:

- **Reversed engine operation can make the machine reverse and run it backwards. It may lead to serious trouble.**
- **Reversed engine operation may make exhaust gas gush out into the intake side and ignite the air cleaner; It could catch fire.**

Reversed engine revolution must be stopped immediately since engine oil circulation is cut quickly, leading to serious trouble.

■ How to tell when the engine starts running backwards

- (1) Lubricating oil pressure drops sharply. Oil pressure warning light, if used, will light.
- (2) Since the intake and exhaust sides are reversed, the sound of the engine changes, and exhaust gas will come out of the air cleaner.

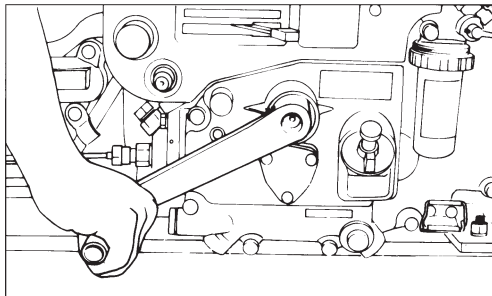
- (3) A louder knocking sound will be heard when the engine starts running backwards.

■ Remedies

- (1) Immediately set the engine stop lever to the "STOP" position to stop the engine.
- (2) After stopping the engine, check the air cleaner, and other parts and replace parts as needed.

7. STORAGE

- (1) Close the fuel cock to stop fuel supply.
Drain coolant completely. Change engine oil. Clean all the parts (See P.20 and 22).
- (2) Put a cover on the engine . Store it where there is little moisture and dust. Cover the engine after it has completely cooled off.
- (3) Clean the air cleaner element completely so that no dust sticks to it (See P.23).
- (4) If moisture enters the cylinder, starting the engine again will be difficult. Put the piston into the compression position.



CAUTION

- **When storing the engine in a small space, completely cool off the engine to prevent fire.**

NOTE:

- If there is no possibility of freezing or if anti-freeze is added, it is not necessary to drain coolant before storage.

8. INSPECTION SERVICING

8.1. TABLE OF INSPECTION INTERVALS

For items with (* *) marks, consult your KUBOTA dealer. ▲ Check-up ● Replenishing ■ Cleaning ○ Changing

No.	Interval Location	Interval											
		Daily	Every 50 h.	Every 100 h.	Every 300 h.	Every 500 h.	Every 800 h.	Every 1500 h.	Every 3000 h.	Every 1 year	Every 2 years.		
1	Radiator coolant	▲●										○	
2	Crankcase oil	▲	(First) ■○	■○									
3	Fuel feed piping		▲									○	
4	Air cleaner element	As needed	▲	■							○		@
5	Fuel filter			■		○							
6	Fuel tank	▲●			■								
7	Valve clearance (* *)						▲						
8	Nozzle (* *)							▲■					@
9	Injection pump (* *)									▲			@
10	Fan belt (* *)					○							
11	Battery			▲									

- When the battery is used for less than 100 hours in a year, check its electrolyte yearly. (for refillable battery's only)
- 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 Warranty Statement in detail.

8.2. TABLE OF INSPECTION

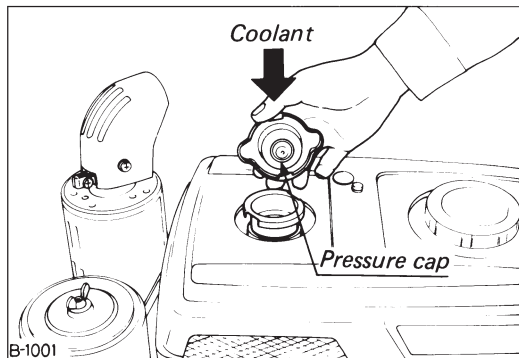
No.	Location	Interval	Method	Reference
1	Radiator coolant	Daily	Check the coolant level, and add water if necessary.	See P.6 / P.20
		Every 2 years	Change.	
2	Crankcase and oil filter	Daily	Check the oil level with the gauge and add oil if necessary.	See P.7
		Every 100 hours (after first 50 hours of operation)	Change oil and clean oil filter.	See P.22
3	Fuel feed piping	Every 50 hours	Check the nuts for tightness; tighten if necessary.	
		Every 2 years	Change.	
4	Air cleaner element	Every 50 hours	Blow it from inside with compressed air.	See P.23
		Every 100 hours	Clean of element and dust cup.	
		Appropriately	When used in a dusty place, check and clean. Replace elements if defective.	
		Every 1 years	Change.	
5	Fuel filter	Every 100 hours	Detach the filter, and remove impurities. Clean the filter and filter paper with light oil. Replace if defective.	See P.21
		Every 500 hours	Change.	

No.	Location	Interval	Method	Reference
6	Fuel tank	Daily	Check the fuel level and add fuel if necessary.	
		Every 300 hours	Clean the inside of the tank.	
7	Valve clearance	Every 800 hours	Check. Consult your KUBOTA dealer.	Dealer
8	Nozzle	Every 1500 hours	Check and clean. Consult your KUBOTA dealer.	Dealer
9	Injection pump	Every 3000 hours	Check. Consult your KUBOTA dealer.	Dealer
10	Fan belt	Every 500 hours	Change. Consult your KUBOTA dealer.	Dealer
11	Battery	Every 100 hours	Check the electrolyte level.	

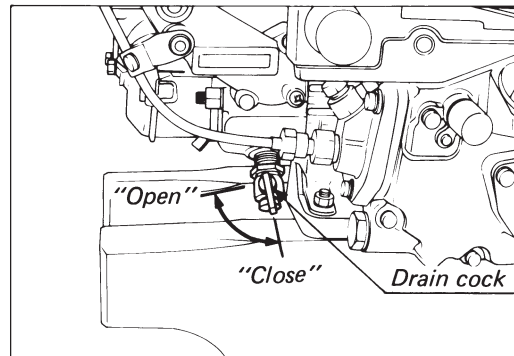
9. MAINTENANCE, CLEANING AND ADJUSTMENT

9.1. RADIATOR

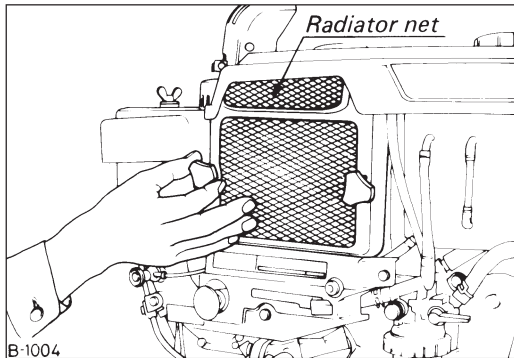
- (1) Fill the radiator with tap or fresh water. Dirt or dust in the water will hinder water flow, impairing cooling efficiency. If the engine is used within normal loads, radiator coolant should last more than one week. Check the coolant level before each use.



- (2) When draining coolant, open both the drain cock and the pressure cap. Water will drain even more completely if the engine is shaken several times.



- (3) When there is a chance of freezing and no anti-freeze is added to the coolant, drain it after each use.
- (4) Periodically remove the radiator net and check to see if the radiator fin is clogged with dust or dirt. A clogged fin may greatly lower cooling efficiency. Clean it carefully using compressed air or pressurized water do not use anything hard like a screwdriver or a spatula which may scratch the fin.



CAUTION

- **During operation or immediately after operation, the coolant in the radiator is extremely hot. If the pressure cap is removed, hot water may gush out, causing scalding. Open the pressure cap after the engine has cooled off.**

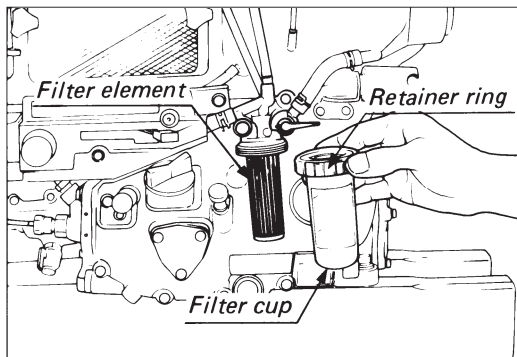
9.2. FUEL

Be sure to use diesel fuel (SAE No.2-D diesel fuel)

9.3. FUEL FILTER

- (1) The fuel filter element consists of high quality filter paper which can catch dust particles as fine as 5/1000mm in diameter. Dust are collected in the bottom of the dust cup or on the filter paper. Every 100 hours of operation, loosen the retainer ring on the cup, take out the cup, and clean out any dust or water collected in the bottom of it. The element can be detached by pulling downward gently.

Immerse it in new fuel and swish gently to wash. Handle it very carefully.



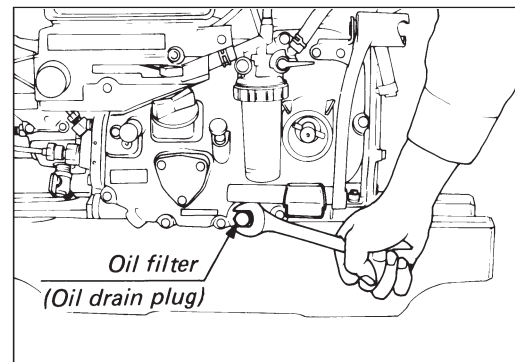
NOTE:

- If the element is damaged, replace it. Otherwise, dust may enter the injection pump and the nozzle, shortening their service life.

9.4. CRANKCASE AND OIL FILTER

Clean the crankcase and oil filter after the first 50 hours of operation, and every 100 hours thereafter, in the following manner:

- (1) Remove the oil filter and drain all oil from the crankcase.
- (2) Clean the inside of the oil filter and the crankcase with light oil.



■ OIL

Use oil which is equivalent to or better than API Service above CF, CD or CE grade oil. Use the oil suitable for the ambient temperature as in the table below:

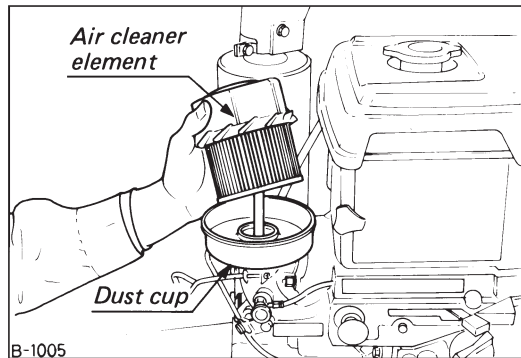
Summer	Above 20°C	SAE30
Spring and autumn	5°C to 20°C	SAE20
Winter	Below 5°C	SAE 10W or 10W-30

9.5. AIR CLEANER

Clean the air cleaner every 100 hours of operation. When used in a dusty place, check the cleaner every day, and clean if necessary.

Clean it as follows:

- (1) Remove dust from the dust cup, and clean the cup.
- (2) Lightly tap the element or blow it from inside with compressed air. If the element contains carbon or is oily, contact your KUBOTA dealer for the recommended element cleaner, if necessary.



NOTE:

- (1) Replace elements every year or after cleaning six times.
- (2) If the element has a hole, replace it. Otherwise, the engine's service life may be shortened.

9.6. ANTI-FREEZE

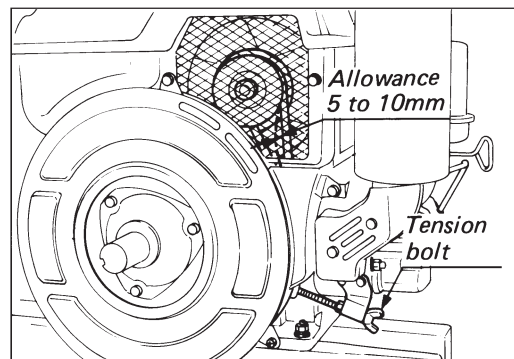
In cold weather, coolant in the radiator may freeze, breaking it. To prevent this, add an anti-freeze to the coolant. Decide the mixing ratio according to the direction of the anti-freeze manufacturer. When not using an anti-freeze, and there is a chance of freezing, be sure to drain coolant after each use.

9.7 FAN BELT TENSION ADJUSTMENT

Tighten the fan belt so that it has an allowance of 5 to 10mm when the center of the belt is pressed.

To tighten the fan belt:

First loosen the nut and turn the tension bolt clockwise to stretch the belt, and tighten the nut again.



IMPORTANT:

- (1) If the engine is used with a loose belt, the belt may slip, impairing the radiator's functioning and shortening the engine service life.
- (2) If the fan belt is torn, steam will come out of the radiator. Should this happen, immediately stop the engine.



CAUTION

- **Check and adjust the fan belt with the engine stopped.**

9.8. BATTERY [ELECTRIC START MODELS]



DANGER

The battery comes in two types:
Refillable, Non-refillable.

- For using the refillable type battery, follow the instructions below.

Do not use or charge the battery if its fluid level stands below the LOWER (lower limit level) mark. Otherwise, the battery component parts may deteriorate earlier than expected, which may shorten the battery's service life or cause an explosion.

Immediately, add distilled water until the battery's fluid level is between the UPPER and LOWER levels.

Battery is not equipped with the engine. Please buy one usually sold in shop.

Recommended capacity of battery...

(5hr Ratio)

EA300-NB1	28 to 32 AH 12V
EA300-NB2 E75-NB3	36 AH 12V

Mishandling may shorten the life of the battery, which could cause additional expenditure for you. Therefore handle the battery properly to obtain its best performance.



CAUTION

- Do not spoil clothes and skin with battery electrolyte.

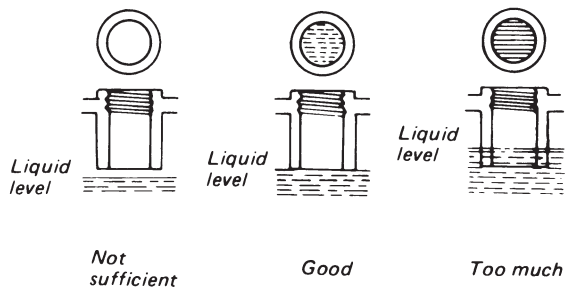
As the battery electrolyte is dilute sulfuric acid, it will damage the clothes. Wash away when battery electrolyte sticks to the clothes.

- (1) Engine does not start when the battery is discharged.

To prevent this, check and maintain the battery properly and charge the battery before discharged.

- (2) Battery electrolyte evaporates and therefore the volume decreases. Insufficient electrolyte may damage battery and overflow of electrolyte may damage the bed. Use distilled water when refilling battery.

Liquid Level of Battery



IMPORTANT:

- (1) When connecting cord to battery, do not misconnect plus (+) to minus (-). Wrong connection may damage the battery and the electrical system.
- (2) When disconnecting, disconnect minus (-) cord first from the battery. When connecting, connect plus (+) cord first, otherwise tools coming into contact will cause short circuits.

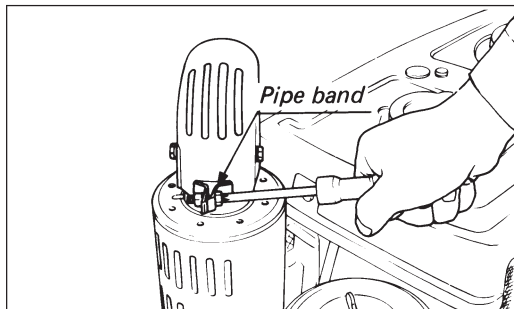
Notice during storage

- (1) When storing the engine for a long period, disconnect the battery from engine, charge the battery, check the electrolyte and then store the battery in a dry shady place.
- (2) As the battery discharges during storage, charge the battery every month in summer and every two months in winter season.

10. OTHERS

10.1. CHANGING THE DIRECTION OF MUFFLER

By loosening the nut for the muffler pipe band, the muffler can be turned in any direction.



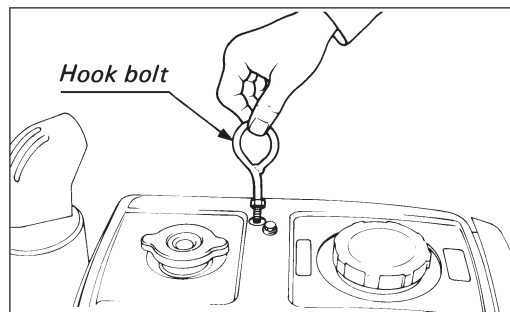
10.2. LIFTING THE ENGINE

Attach the provided engine hook bolt in the manner shown in the figure. When lifting is completed, remove the bolt, and replace the cap.



CAUTION

- Engine hook should be used only for lifting up the engine itself. Do not lift the engine if it is attached with any equipment.



10.3. PULLEYS

The size of the pulleys must be carefully chosen according to the type of the machine the engine is to be attached to, because it will greatly affect working efficiency.

- **Calculate the size of the pulleys in the following manner:**

(Size of engine pulley)

$$= (\text{Diameter of machine pulley}) \times \frac{\text{Machine revolution (RPM)}}{\text{Engine revolution (RPM)}}$$

(Size of machine pulley)

$$= (\text{Diameter of engine pulley}) \times \frac{\text{Engine revolution (RPM)}}{\text{Machine revolution (RPM)}}$$

NOTE:

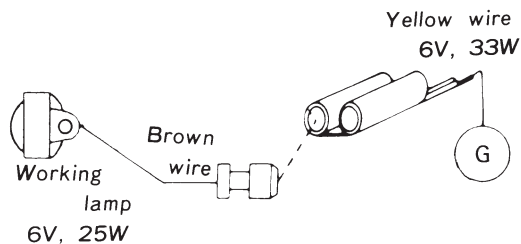
The wrong pulleys may cause engine knock, black exhaust or insufficient output. They may also shorten the life of the engine.

10.4. WORKING LAMP [NOT INSTALLED ON "-N", "-ND" AND "-NB" MODELS]

While the engine is running and power is being generated, the working lamp can be used for night work. Colored lead wires make connection easy.

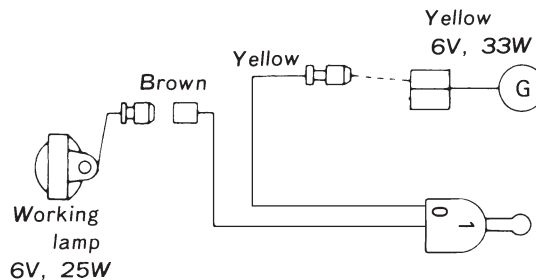
● Simple connection

Connect one of the two lead wires from the working lamp (brown) to the yellow wire from the generator. When the brown one is connected, the lamp illuminates forward.



● Wiring to allow switching on the tiller

Connect the lead wire to the switch provided on the tiller in the manner shown below. When the switch is set on "0", the working lamp is off; when set on "1", it illuminates forward; Buy a "T19 type 6V 25/25W" working lamp bulb.



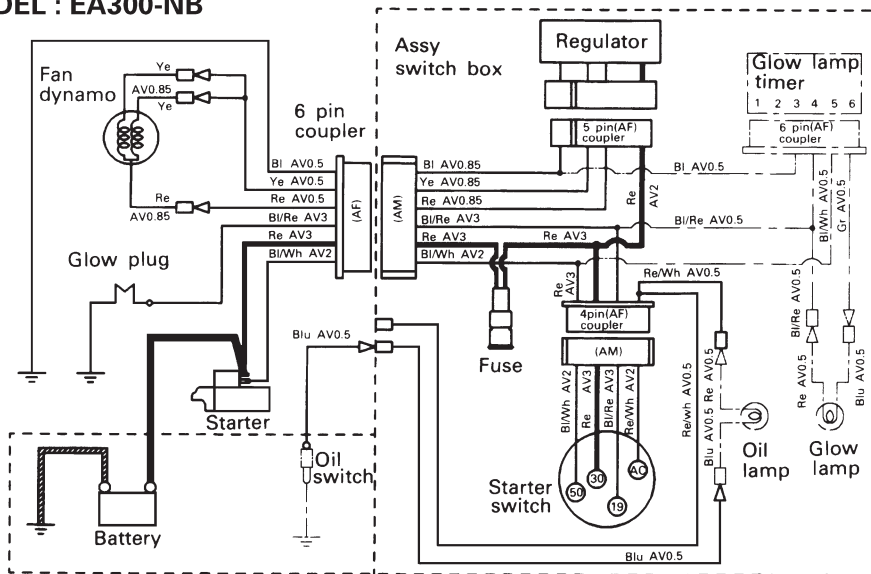
11. SPECIFICATIONS

Model		EP84	EA300-N	EA300-NB	E75-NB3
Specifications					
Type		Horizontal, water-cooled, 4-cycle diesel engine			
Number of cylinders		1			
Bore × Stroke (mm)		75 × 70			77 × 70
Displacement (L)		0.309			0.325
Broke Horsepower	SAE Intermittent kW (HP) / rpm	5.2 (7) / 3000			4.6 (6.2) / 2500
	SAE Cont. kW (HP) / rpm	4.5 (6) / 3000			4.0 (5.4) / 2500
Dimensions	Length (mm)	569	535	565.5	571
	Width (mm)	300	312		
	Height (mm)	402	457		459
Dry Weight (kg)		50		54	57
Cooling system		Radiator			
Combustion system		Spherical type (TVCS)			
Fuel		SAE No.2-D Light Diesel Oil			
Lubricating oil		Quality better than API service CC class			
Lubricating system		Forced Lubrication with Trochoid Pump			
Rotational direction		Counterclockwise Facing Flywheel			
Cooling Water Capacity (L)		1.2			
Fuel Tank Capacity (L)		4.5		4.8	
Engine Oil Capacity (L)		1.3			
Starting system		Manual Start	Electric Start + Manual Start		
Starter		—		12V1.1kW	12V1.4kW

● Specifications are subject to change for improvement without prior notice.

12. WIRING DIAGRAM [ELECTRIC START MODELS]

MODEL : EA300-NB



Ye	Yellow	Blu	Blue
Re	Red	Wh	White
Bl	Black	Gr	Green

- The parts framed with broken lines are optional.
- The thick line **—** indicates a circuit normally live with 12V.

MODEL : E75-NB3

