

KUBOTA
WATER-COOLED
DIESEL ENGINE

OPERATOR'S MANUAL

E75N
E75NB3

FOREWORD

KUBOTA Corporation wishes to express its deep appreciation to YOU for 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 result 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.

The important instructions or alert, which relates to the safety of you and the people around you are highlighted with the following safety symbols.

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SAFE OPERATION

SAFETY SYMBOL

These Safety Symbols represents the alert to the operator of the engine



FOR SAFE OPERATION

- For safe operation of the engine, please read through this manual very carefully.
- Keep the Warning decals on the engine clean and legible at all time.
- Learn how to operate the engine before attempting to operate it.
- Keep the engine in the normal working condition. DO NOT alter the setting or modify the engine, otherwise, the performance of the engine would be affected, and would cause premature wear and tear of the engine.
- Keep this manual handy with the engine.
- 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.



BEFORE OPERATION

- Before operation, check all set bolts and nuts for looseness, and tighten if necessary.
- Make sure that all the protective covers are at its place.

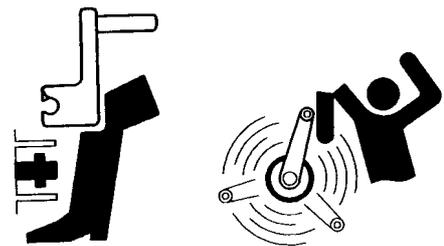


SAFETY ON ENGINE STARTING

- When starting the engine, make sure that the surrounding area is neat and clean.
- When there is somebody around the machine, make sure to have his/her attention to the fact that the engine is going to be started.
- Keep children away from the engine during operation.

[E-75N] (Crank Handle Starting – Manual Starting)

- Make sure to fit the Starting Handle firmly to the pin at the starting shaft.
- When the claw portion of the Starting Handle is deformed or worn out, do not use it. Replace it with new one.
- Hold the Starting Handle firmly even after the engine has started.



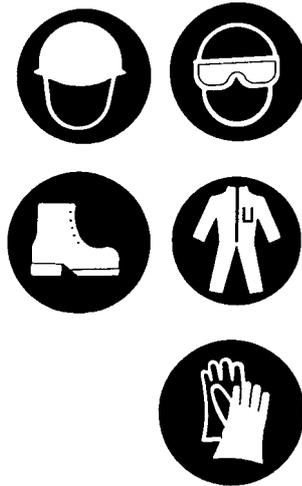
[E75NB3] (Electric Starting)

- Do not attempt to start the engine by short-circuiting the starter system. It may create danger and the damages to the engine.



OPERATORS' ACQUAINTANCESHIP

- Wear proper clothing and appropriate protective gears during the operation.
- Loose fit clothing and/or accessories, such as necklace, may catch the operation control and/or other, and may cause injury. Do not wear loose-fit clothes or accessories.
- When the operator is under the influence of Alcohol, extreme fatigue, and/or fever, do not attempt to operate the machine.



EXHAUST GAS

Exhaust Gas from the engine contains poisonous and harmful CARBON MONOXIDE.

- Avoid operating the engine in an ill-ventilated place or where exhaust gases accumulate easily.
- Take special care during operation to prevent exhaust gases from affecting yourself, or people or animals around you.



FUEL AND LUBRICANT

FUEL is highly flammable, and is very dangerous. The Lubricant is also flammable, and is dangerous as well. Handle Fuel and Lubricant with extreme caution.

- Make sure that the engine is stopped and cooled off before filling the fuel or adding the lubricant.
- Avoid any cigarette or open fires around the engine when filling the fuel and lubricant.
- Wipe off any of the spilt fuel on the engine.
- Wipe off any of the dust, dirt, and grease around the engine to prevent any fire.
- Keep the fuel in the suitable container, and keep it away from the source of the heat.



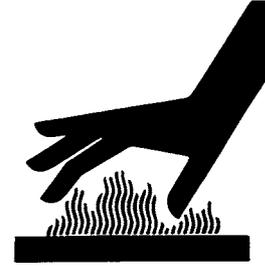
KEEP THE ENGINE CLEAN TO PREVENT FIRE

- Keep the surrounding of the engine, radiator, battery, fuel tank, exhaust pipe, muffler, fuel pipes, and electric cable clean and free from dirt, dust, grease, or fuel.
- When cleaning the engine, be sure to stop the engine.
- Avoid placing inflammable materials close to the engine during operation.
- Run the engine at idle for at least five minutes before stopping the engine to cool off. Otherwise, the temperature around the engine may go up very quickly to cause possible fire.



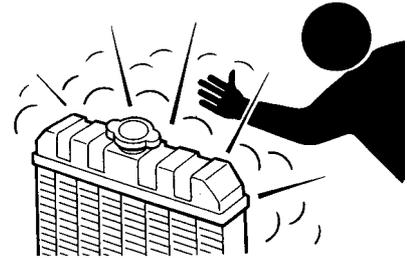
Burning Hazards

- Do not touch the muffler, exhaust pipe or other hot parts during or immediately after operation.
- Perform the maintenance and service of the engine after the engine and its radiators are completely cooled off. (Approximately 30 minutes after the engine has been stopped.)
- When the radiator cap needs to be removed, be sure that the cap is cooled down.
- The radiator cap must first be turned slowly to the first stop position, and leave it for a while to relieve the pressure. Then, turn the cap to remove it.



Burning Hazards (2)

- In the case the engine has been over-heated, the extremely hot vapor may be blasted out from the Radiator and/or reservoir tank. Pay extra care.
- Run the engine at idle for at least five minutes before stopping the engine to cool off.
- Perform the Pre-Operation checks as shown in this manual, and check for any cracks or irregularity of the components. Replace the components as necessary.



FIRE PREVENTION

The leak of flammable liquid, such as fuel, from the hose or pipe may attract the fire.

- Check the condition of the fuel hose and fuel pipe periodically, and should there be any sign of cracks or breakage, replace it with the new one.
- Check the tightness of the hose clamp.
- The Fuel hose made of rubber deteriorate, and it needs to be replaced in every two years of operation, even if there is no sign of crack.



The short circuit of the electric cable and wire may cause fire.

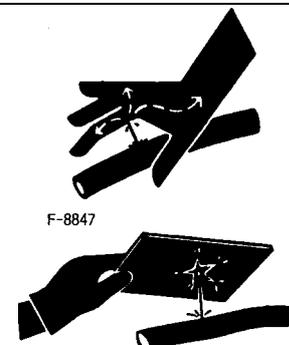
- Check to see if there is any worn-out wire or broken wires in the electric circuit.
- Keep the terminal portion of every electrical connections clean.

To prevent fire on the adjacent building, keep the engine away from the building by at least 1mm.

PRESSURIZED OIL AND FUEL

Pressurized Fuel and Oil is hazardous when it splashes on your skin.

- When checking the leak of the pressurized oil and fuel from the pipe and hose, use a piece of cardboard or wood. Do not expose your hand or body to the pressurized oil and fuel.
- When the skin is contaminated with the pressurized oil or fuel, immediately consult with your doctor. It may cause sphacelus or skin cancer.



EXPLOSION OF BATTERY

The vapor of the battery acid may explode.

- Do not let the spark or open flame near to the battery.
- Do not check the condition of the battery by short-circuiting the Positive and Negative terminal with a piece of metal. Always use the proper voltage meter and hydrometer.
- 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.

**DO NOT TOUCH ANY MOVING PARTS**

- Do not touch the moving Cooling Fan and/or V-belt.
- Do not touch the Power take-off shaft, V-belt, Pulley, and/or flywheel during the operation.
- Be sure to stop the engine before servicing the Cooling fan or V-belt.
- Do not operate the engine without the protective covers provided.

**SAFE DISPOSAL**

- When draining the Fuel, Lubricant, or Coolant, make sure to put the suitable container under the drainage output pot.
- Dispose of the drainage in the environmentally friendly manner.
- Do not let any of the drainage to be disposed to the river, ocean, ponds, lake, or ground.

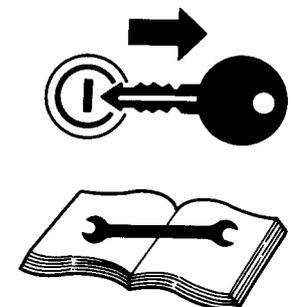
**COOLANT**

COOLANT IS POISONOUS.

- Be sure to wear the proper glove when working with the coolant.
- Wash your hands with flowing water when the coolant is in contact with your skin.
- Do not mix the different type of coolant. It may lead to the chemical reaction, which would cause the harmful substances.

**SAFETY ON MAINTENANCE AND SERVICE**

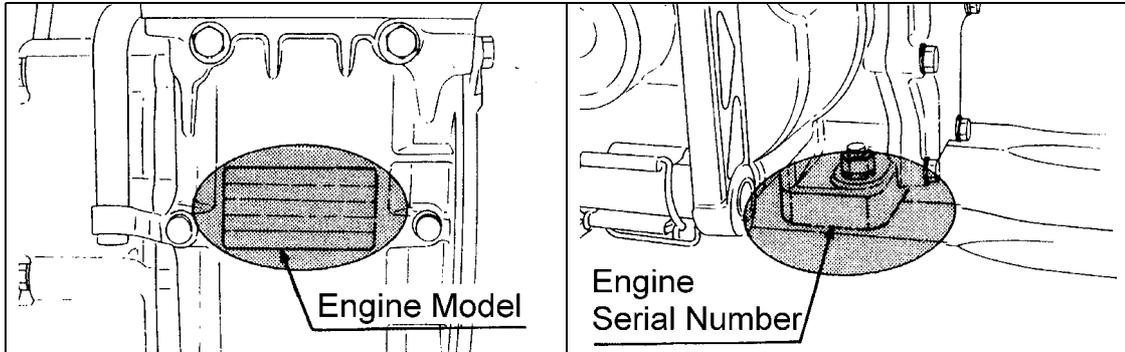
- When performing the maintenance and service of the engine, place the engine on the flat and rigid places. Hold the engine with the proper block or stand.
- Always stop the engine at the time of maintenance and service.
- Keep the surrounding clean.
- Remove the Battery when the engine is to be serviced.
- Make sure to take the starter key off from the key cylinder to avoid any sudden starting attempt by the other person.
- Let the engine cool off before attempting to service the engine.
- Use proper tools, and know how to use the tool before attempt to use it.
- Do not use Cooling fan or V-belt to turn the engine for servicing. Always use the Power Take Off shaft.
- The Fuel hose made of rubber deteriorate, and it needs to be replaced in every two years of operation, even if there is no sign of crack.



1. SERVICING

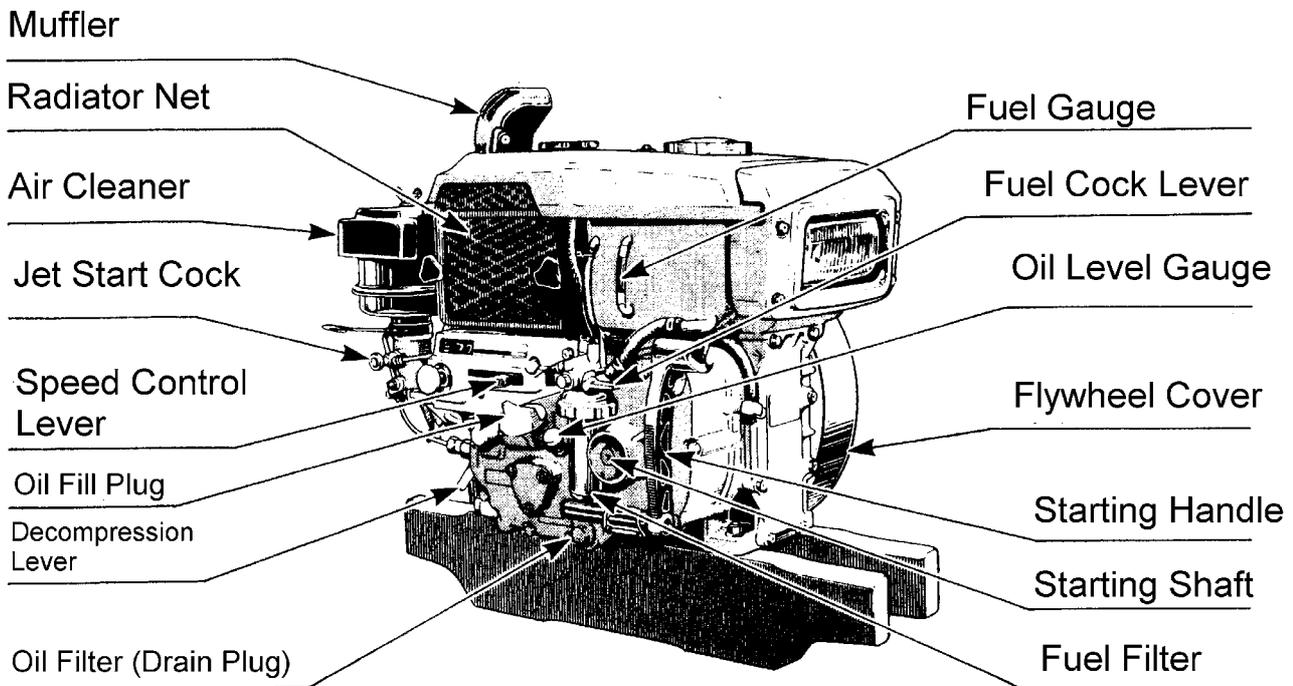
If you should have any questions or require servicing for your machine, contact a KUBOTA Dealer with the following information:

Model name and serial number.



	<p>ALTERATION OF THE ENGINE is not only dangerous but also to void the engine warranty.</p>
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2. NAMES OF THE PARTS

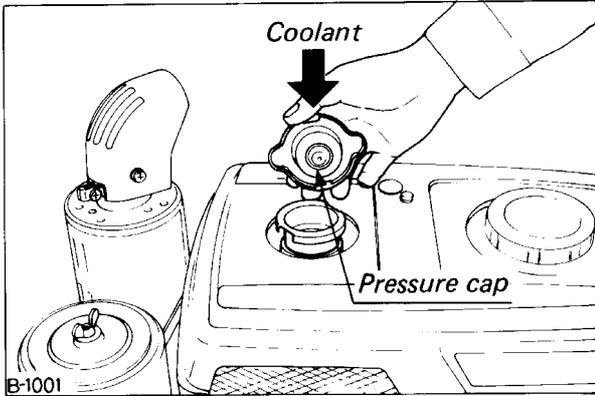


3. PRE-START CHECKS

Check the engine prior to starting as described below.

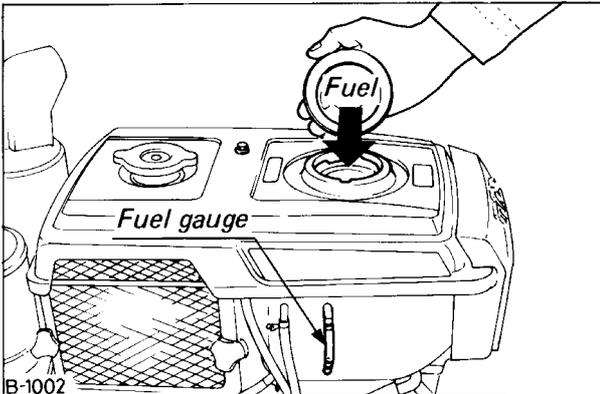
3.1 Coolant

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



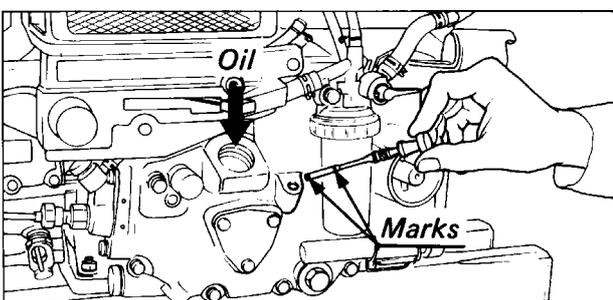
3.2 Fuel

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



3.3. CARAKCASE OIL

Keep the engine horizontal, and fill the crankcase with SAE 30 in summer (above 20 C), SAE20 in spring or autumn (5C through 20C), and SAE10W or 10W-30 in winter climates (below 5C) to the top mark on the oil level gauge. The oil level gouge must be screwed in.



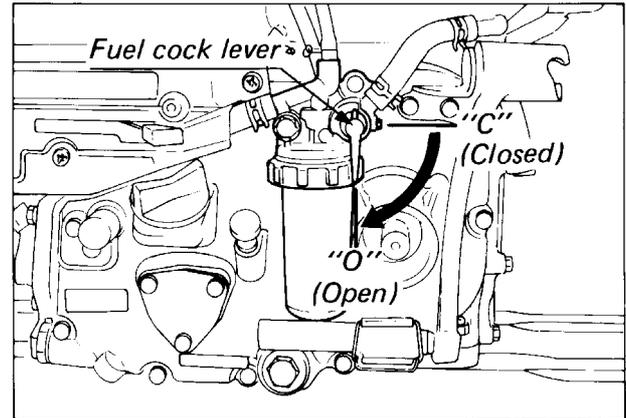
3.4. AIR VENTING

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.

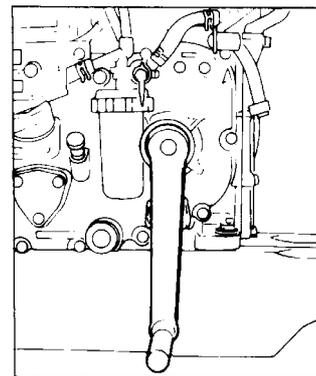
- (2) Do not move the lever but leave in the "O" (open) position when running the engine.



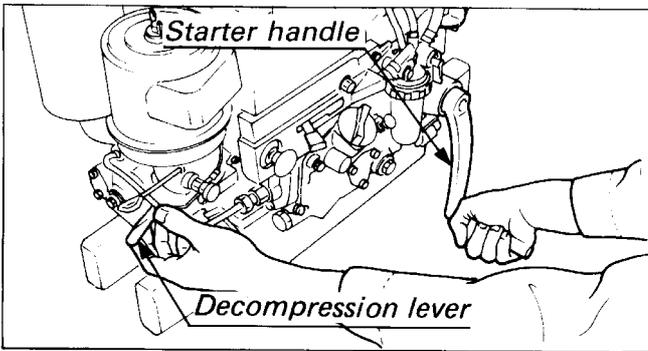
4.STARTING

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 is 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.



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 DODELS]

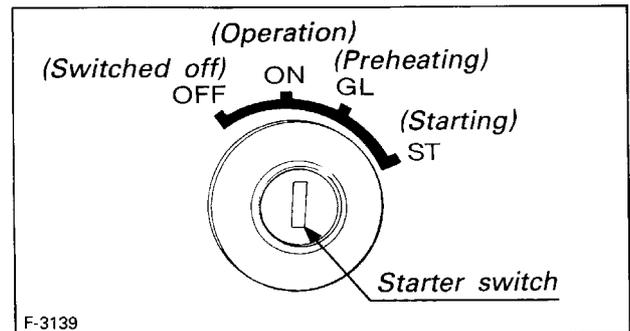
- (1) Set the speed-adjusting lever to position "RUN".
- (2) Insert the key into the starter switch, turn it [GL] (Preheating) and keep it at [GL] for several seconds.

If the ambient temperature is (too) low, increase the preheating time. The relationship between the ambient temperature and preheating time is as follows.

Ambient Temperature	Preheating Time
Above - 5C	5 sec.
-5C to -20C	10 sec.

- (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.



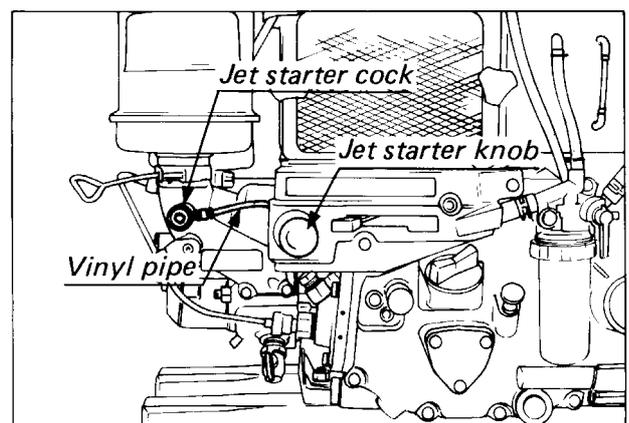
IMPORTANT

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

4.3 COLD STATING

JET STARTER

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



- (1) Turn the cock counterclockwise to open.
- (2) Pull and push the jet starter knob 4 to 5 times. Increase or decrease the number of times as needed, depending on the ambient

temperature.

- (3) After injecting fuel, close the cock completely.
- (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 with force, release the lever. Keep turning the handle with even more force to overcome compression.

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.
- (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 sucked in.

DECOMPRESSION LEVER [ELTCRIC START MDELS]

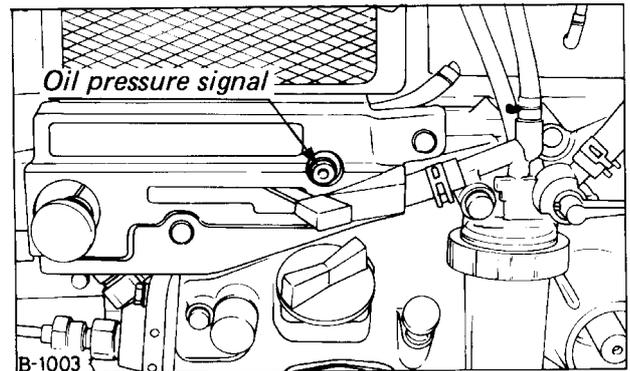
Pull the decompression lever, turn on the starter switch, and then set the lever free after the engine rotates. The engine will start easily.

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 being red, the engine may be burned up. Immediately stop the engine and in such cases it would be preferable to have to a specialist check and necessary repairs because he would be able to make repairs much quicker than inexperienced persons.

4.6. WARMING-UP

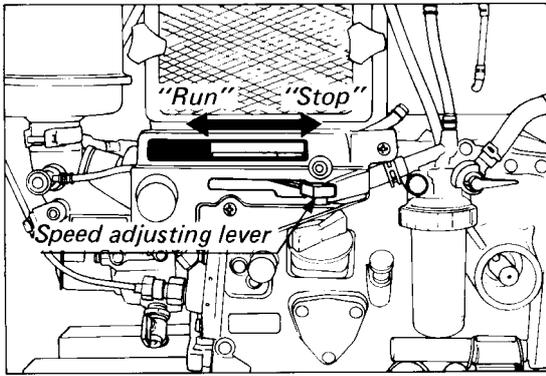
After the engine has caught, it is necessary to allow time for the oil to penetrate all the engine parts. Warm up the engine for several minutes at no load.

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. STORAGE

- (1) Close the fuel cock to stop fuel supply. Drain coolant completely. Change engine oil.
Clean all the parts
- (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
 - (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.

7. INSPECTIONSERVICING

7.1 TABLE OF INSPECTION INTERVALS

C = Check-up R = Replenishing CL=Cleaning CH=Changing

No.	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		C/R									CH
2	Crankcase Oil		C	CL/CH	CL/CH							
3	Fuel Feed piping			C								CH
4	Air Cleaner Element		C	C	CL						CH	
5	Fuel Filter				CL		CH					
6	Fuel Tank		C/R			CL						
7	Valve Clearance							C				
8	Nozzle								C/CL			
9	Injection Pump									C		
10	Fan Belt						CH					
11	Battery				C							

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

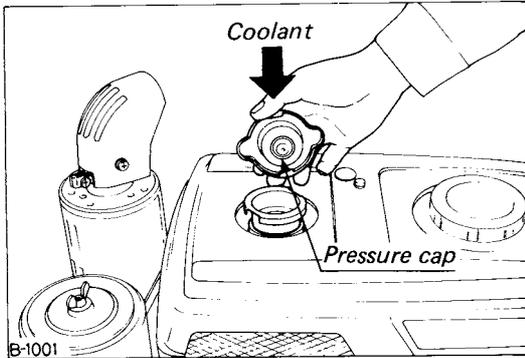
7.2 TABLE OF INSPECTION

No.	Location	Interval	Method
1	Radiator Coolant	Daily	Check the coolant level, and add water if necessary.
		Every 2 years	Change
2	Crankcase and oil filter	Daily	Check the oil level with the gauge and add oil if necessary
		Every 100 hours (After first 50 hours of operation)	Change oil and clean oil filter.
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.
		Every 100 hours	Clean of element and dust cup.
		Appropriately	When used in a dusty place, check and clean. Replace element if defective.
5	Fuel Filter	Every 100 hours	Detach the filter, and remove impurities. Clean the filter and filter paper with light oil. Replace if defective.
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.
8	Nozzle	Every 1500 hours	Check and clean. Consult your KUBOTA Dealer.
9	Injection Pump	Every 3000 hours	Check. Consult your KUBOTA Dealer.
10	Fan Belt	Every 500 hours	Check. Consult your KUBOTA Dealer
11	Battery	Every 100 hours	Check the electrolyte level.

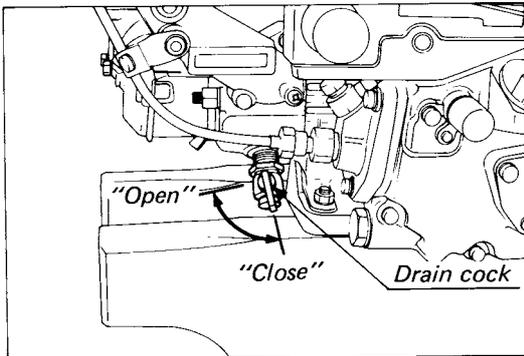
8.MAINTENANCE, CLEANING AND ADJUSTMENT

8.1.RADIATOR

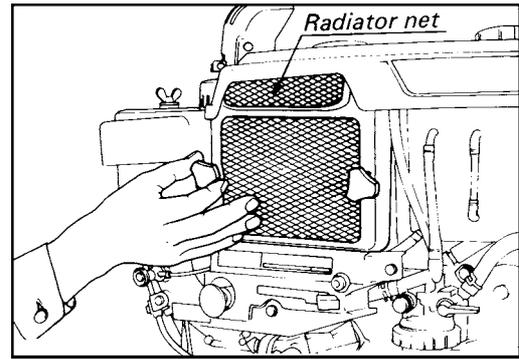
- (1) Fill the radiator with tap or fresh water. Dirt or dust in the water will hinder water flow, impairing cooling efficiency. If the engine is used within normal loads, radiator coolant should last more than one week. Check the coolant level before each use.



- (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 does not use anything hard like a screwdriver or a spatula, which may scratch the fin.



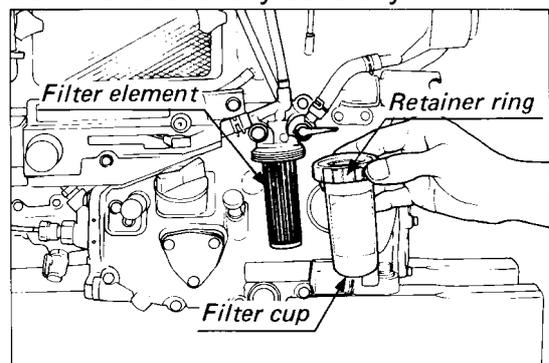
During operation or immediately after operation, the coolant in the radiator is extremely hot. If the pressure cap is removed, hot water may gush out, causing scalding. Open the pressure cap after the engine has cooled off.

8.2. FUEL

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

8.3. 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. Dusts 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.



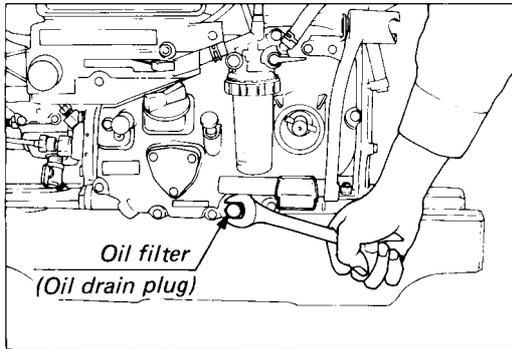
NOTE

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

8.4. 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:

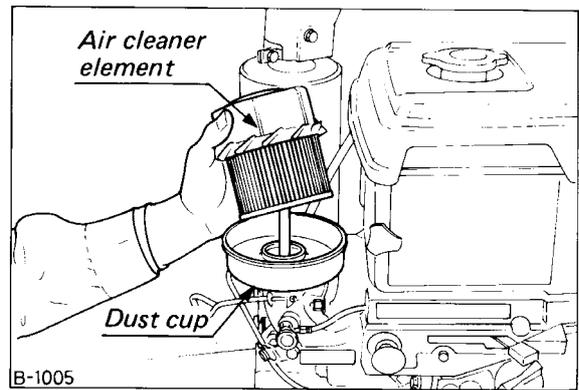
Summer	Above 20C	SAE30
Spring and Autumn	5C to 20C	SAE20
Winter	Below 5C	SAE10W or 10W-30

8.5. 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.

8.6. ANTI-FREEZE

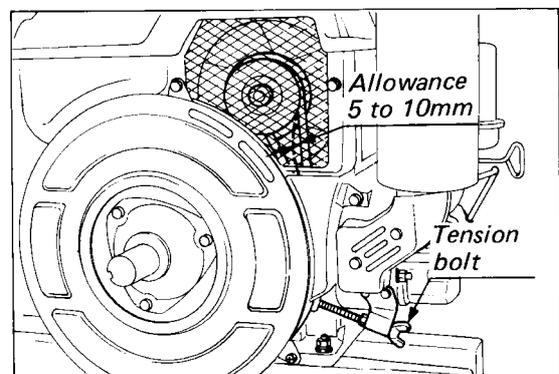
In cold weather, coolant in the radiator may freeze, breaking it. To prevent this, add an anti-freeze to the coolant. Decide the mixing ratio according to the direction of the anti-freeze manufacturer. When not using an anti-freeze, and there is a chance of freezing, be sure to drain coolant after each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

8.7. 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.



Check and adjust the fan belt with the engine stopped.

8.8. BATTERY [ELECTRIC START MODELS]

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.

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.



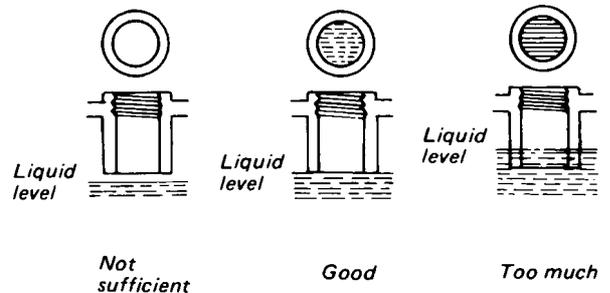
- **Do not spoil clothes and skin with battery electrolyte. As the battery electrolyte is dilute sulfuric acid, it will damage the clothes. Wash away when battery electrolyte sticks to the clothes.**

- (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.

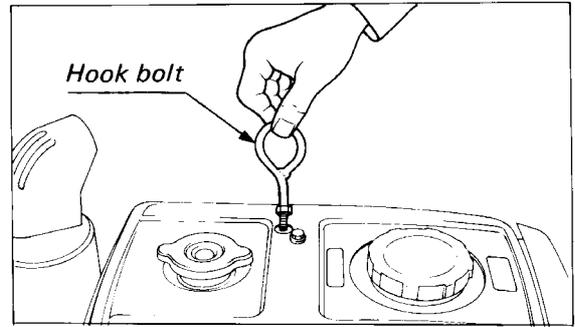
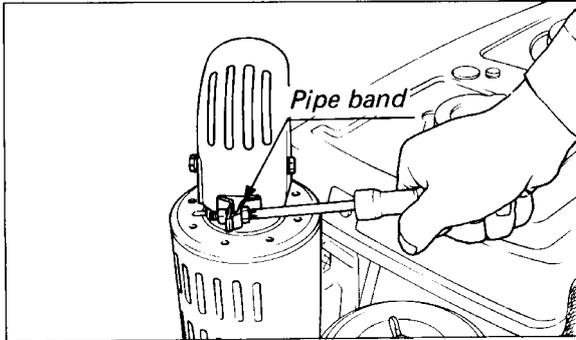
Notice during storage

- (1) When storing the engine for a long period, disconnect the battery from engine, charge the battery, and check the electrolyte and the 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.

9. OTHERS

9.1 CHANGING THE DIRECTION OF MUFFLER

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



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

9.2. 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.

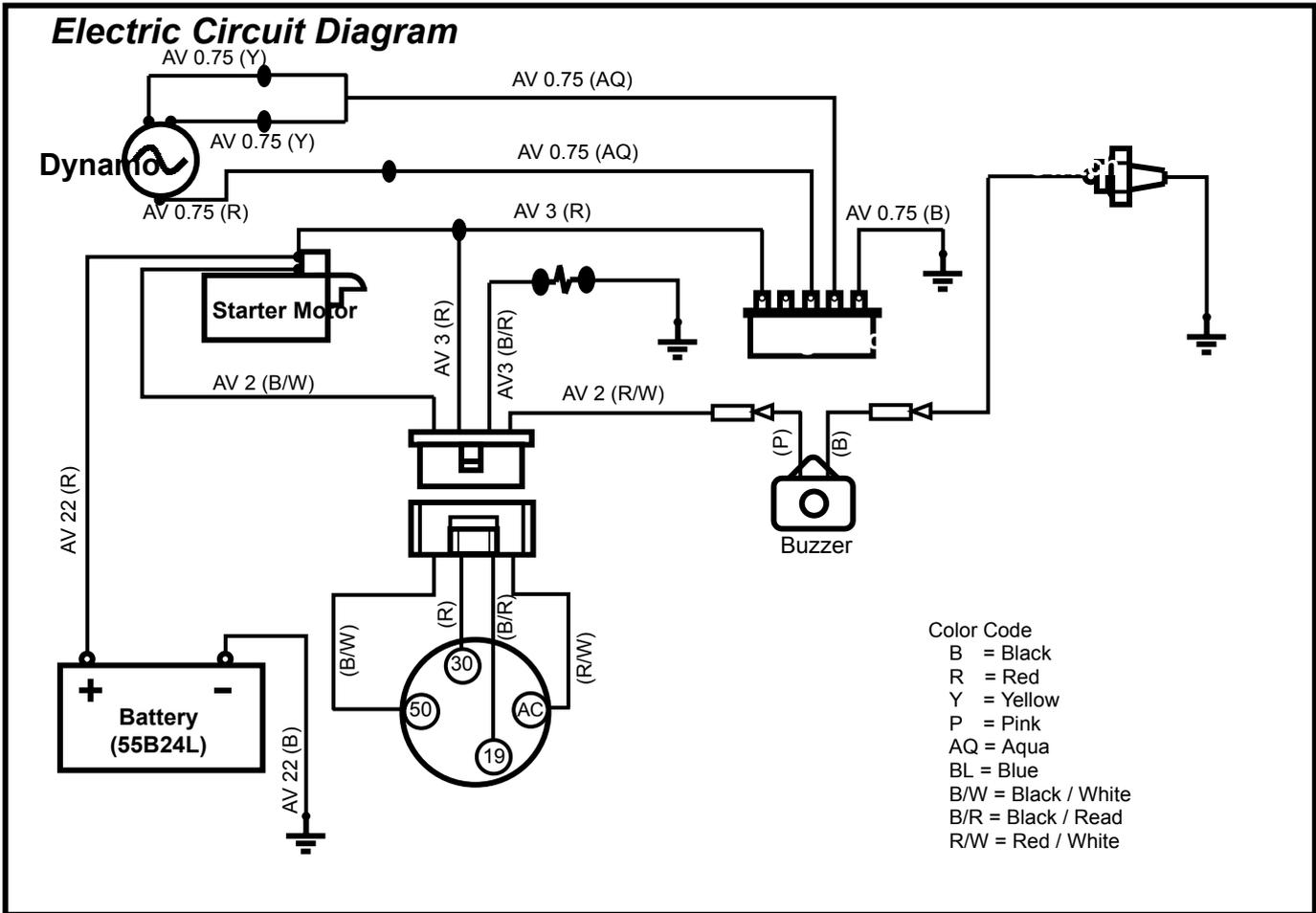
9.3 PULLEYS

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.

NOTE

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

10. Wiring Diagram (Electric Start Models)



11. SPECIFICATIONS

	E75N	E75NB3
Type	Horizontal Cylinder, Water-cooled 4 Cycle Diesel Engine	
Number of Cylinders	1	
Bore x Stroke	77mm x 70mm	
Total Displacement	0.325 cc	
Rated Output	4.0 kW (5.5PS) @2,500 rpm	
Max. Output	4.8 kW (6.5PS)@2,500 rpm	
Overall Dimensions (LxWxH)	535 x 312 x 457mm	566 x 312 x 457 mm
Dry Weight	47 Kg	55.5 Kg
Cooling System	Radiator	
Combustion Chamber	Three Vortex Combustion System	
Fuel	Diesel Fuel	
Lubrication	Forced Lubrication with Trochoid Pump	
Coolant Capacity	1.2 Liter	
Fuel Tank Capacity	4.7 Liter	4.8 Liter
Lubricating Oil Capacity	1.3 Liter	
Direction of Rotation	Counter-clockwise (When seen from the output shaft side)	
Starting	Crank Handle Starting	Electric Starting
Starter Motor		12V, 1.4kW

