

CONTENTS

▲ SAFE OPERATION	1
SERVICING OF THE ENGINE	1
NAMES OF PARTS	2
PRE-OPERATION CHECK.....	3
BREAK-IN	3
DAILY CHECK	3
OPERATING THE ENGINE.....	4
STARTING THE ENGINE(NORMAL)	4
COLD WEATHER STARTING	5
STOPPING THE ENGINE.....	6
CHECKS DURING OPERATION	6
Radiator Cooling water(Coolant)	6
Oil pressure lamp.....	6
Fuel.....	6
Color of exhaust.....	7
Immediately stop the engine if:	7
REVERSED ENGINE REVOLUTION AND REMEDIES	7
How to tell when the engine starts running backwards.....	7
Remedies.....	7
EMISSION CONTROL SYSTEM	7
PRECAUTIONS ON GENERATOR-EQUIPPED ENGINE.....	7
MAINTENANCE	8
SERVICE INTERVALS.....	9
PERIODIC SERVICE.....	12
FUEL	12
Fuel level check and refueling	12
Air bleeding the fuel system.....	13
Checking the fuel pipes	13
Cleaning the fuel filter pot.....	14
Fuel filter cartridge replacement	14
ENGINE OIL.....	15
Checking oil level and adding engine oil.....	15
Changing engine oil	16
Replacing the oil filter cartridge	16
RADIATOR.....	17
Checking coolant level, adding coolant	17
Changing coolant.....	18
Remedies for quick decrease of coolant.....	18
Checking radiator hoses and clamp	18
Precaution at overheating.....	18
Cleaning radiator core(outside)	18
Anti-freeze	19



SAFE OPERATION

Careful operation is your best assurance against an accident. Read and understand this section carefully before operating the engine. All operators, no matter how much experience they may have, should read this and other related manuals before operating the engine or any equipment attached to it. It is the owner's obligation to provide all operators with this information and instruct them on safe operation.

Be sure to observe the following for safe operation.

1. OBSERVE SAFETY INSTRUCTIONS

- Read and understand carefully this "OPERATOR'S MANUAL" and "LABELS ON THE ENGINE" before attempting to start and operate the engine.
- Learn how to operate and work safely. Know your equipment and its limitations. Always keep the engine in good condition.
- Before allowing other people to use your engine, explain how to operate and have them read this manual before operation.
- DO NOT modify the engine. UNAUTHORIZED MODIFICATIONS to the engine may impair the function and/or safety and affect engine life. If the engine does not perform properly, consult your local Kubota Engine Distributor first.



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2. WEAR SAFE CLOTHING AND PERSONAL PROTECTIVE EQUIPMENT (PPE)

- DO NOT wear loose, torn or bulky clothing around the machine that may catch on working controls and projections or into fans, pulleys and other moving parts causing personal injury.
- Use additional safety items-PPE, e.g. hard hat, safety protection, safety goggles, gloves, etc., as appropriate or required.
- DO NOT operate the machine or any equipment attached to it while under the influence of alcohol, medication, or other drugs, or while fatigued.
- DO NOT wear radio or music headphones while operating the engine.



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OPERATING THE ENGINE

STARTING THE ENGINE(NORMAL)



WARNING

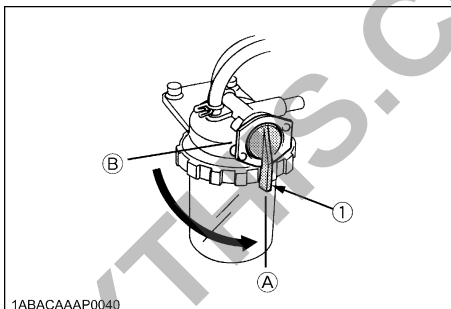
To avoid personal injury or death:

- Do not allow children to approach the machine while the engine is running.
- Be sure to install the machine on which the engine is installed, on a flat place.
- Do not run the engine on gradients.
- Do not run the engine in an enclosed area. Exhaust gas can cause air pollution and exhaust gas poisoning.
- Keep your hands away from rotating parts (such as fan, pulley, belt, flywheel etc.) during operation.
- Do not operate the machine while under the influence of alcohol or drugs.
- Do not wear loose, torn or bulky clothing around the machine. It may catch on moving parts or controls, leading to the risk of accident. Use additional safety items, e.g. hard hat, safety boots or shoes, eye and hearing protection, gloves, etc., as appropriate or required.
- Do not wear radio or music headphones while operating engine.
- Check to see if it is safe around the engine before starting.
- Reinstall safeguards and shields securely and clear all maintenance tools when starting the engine after maintenance.

IMPORTANT :

- Do not use ether or any starting fluid for starting the engine, or a severe damage will occur.
- When starting the engine after a long storage (of more than 3 months), first set the stop lever to the "STOP" position and then activate the starter for about 10 seconds to allow oil to reach every engine part.

1. Set the fuel lever to the "ON" position.

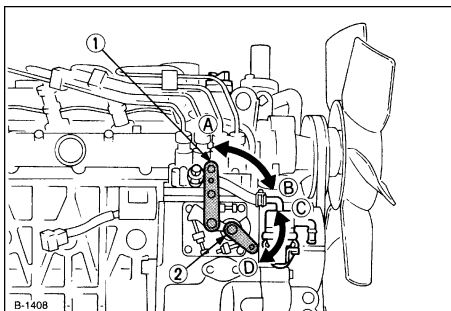


(1) Fuel lever

(A) "ON"
(B) "OFF"

2. Place the engine stop lever to the "START" position.

3. Place the speed control lever at more than half "OPERATION".



(1) Speed control lever
(2) Engine stop lever

(A) "IDLING"
(B) "OPERATION"
(C) "START"
(D) "STOP"

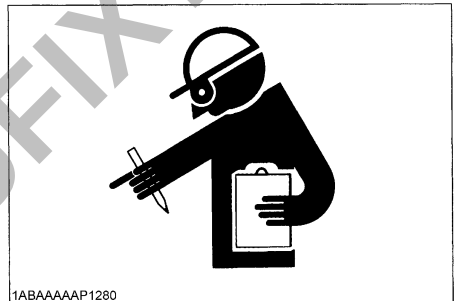
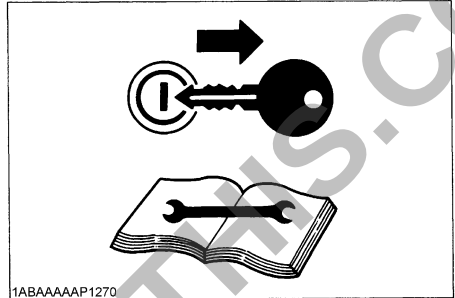
MAINTENANCE



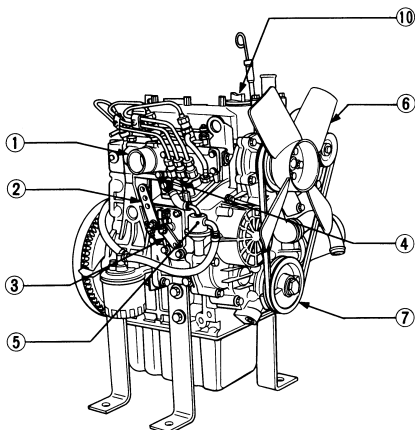
WARNING

To avoid personal injury or death:

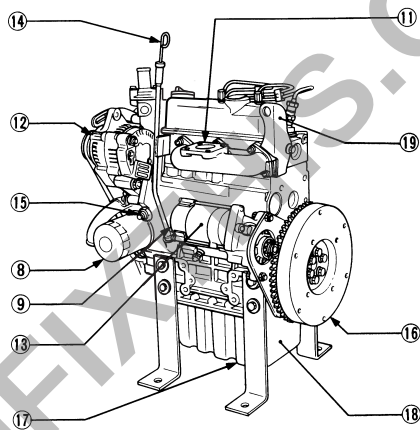
- Be sure to conduct daily checks, periodic maintenance, refueling or cleaning on a level surface with the engine shut off and remove the key.
- Before allowing other people to use your engine, explain how to operate, and have them read this manual before operation.
- When cleaning any parts, do not use gasoline but use regular cleanser.
- Always use proper tools, that are in good condition. Make sure you understand how to use them, before performing any service work.
- When installing, be sure to tighten all bolts lest they should be loose. Tighten the bolts by the specified torque.
- Do not put any tools on the battery, or battery terminals may short out. Severe burns or fire could result. Detach the battery from the engine before maintenance.
- Do not touch muffler or exhaust pipes while they are hot; Severe burns could result.



NAMES OF PARTS



1ABABAAAP149A



- (1) Intake manifold
- (2) Speed control lever
- (3) Engine stop lever
- (4) Injection pump
- (5) Fuel feed pump
- (6) Cooling fan
- (7) Fan drive pulley
- (8) Oil filter cartridge
- (9) Water drain cock

- (10) Oil filter plug
- (11) Exhaust manifold
- (12) Alternator
- (13) Starter
- (14) Oil level gauge
- (15) Oil pressure switch
- (16) Flywheel
- (17) Oil drain plug
- (18) Oil pan
- (19) Engine hook

ENGINE OIL

**WARNING**

To avoid personal injury or death:

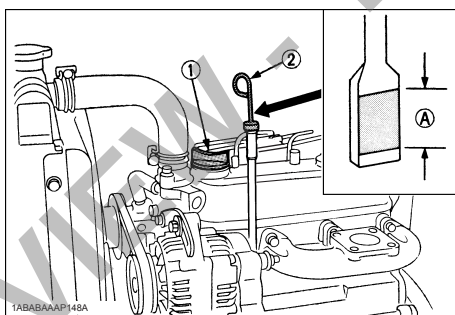
- Be sure to stop the engine before checking and changing the engine oil and the oil filter cartridge.
- Do not touch muffler or exhaust pipes while they are hot; Severe burns could result. Always stop the engine and allow it to cool before conducting inspections, maintenance, or for a cleaning procedure.
- Contact with engine oil can damage your skin. Put on gloves when using engine oil. If you come in contact with engine oil, wash it off immediately.

NOTE :

- Be sure to inspect the engine, locating it on a level place. If placed on gradients accurately, oil quantity may not be measured.

■ Checking oil level and adding engine oil

1. Check the engine oil level before starting or more than 5 minutes after stopping the engine.
2. Remove the oil level gauge, wipe it clean and reinstall it.
3. Take the oil level gauge out again, and check the oil level.



- (1) Oil filler plug
(2) Oil level gauge

[Lower end of oil level gauge]
(A) Engine oil level within this range is proper.

4. If the oil level is too low, remove the oil filler plug, and add new oil to the prescribed level.
5. After adding oil, wait more than 5 minutes and check the oil level again. It takes some time for the oil to drain down to the oil pan.

Engine oil quantity

Model	Quantity
D1005-E4, D1105-E4	5.1 L (1.35 U.S. gals.)
D1305-E4	5.7 L (1.51 U.S. gals.)
V1505-E4	6.0 L (1.59 U.S. gals.)

Oil quantities shown are for standard oil pans.

IMPORTANT :

- Engine oil should be MIL-L-2104C or have properties of API classification CF or higher. Change the type of engine oil according to the ambient temperature.

above 25°C (77°F)	10W-30 or 10W-40 or 15W-40
-10°C to 25°C (14°F to 77°F)	10W-30 or 10W-40 or 15W-40
below -10°C (14°F)	10W-30 or 10W-40

- Use of the following oil not only disallows the engine from performing well in low temperatures until it warms up sufficiently but may also lead to excessive engine wear or engine seizure.
 - Oil with a viscosity higher than 10W-30
 - Oil not recommended by KUBOTA
- When using oil of different brands from the previous one, be sure to drain all the previous oil before adding the new engine oil.

TROUBLESHOOTING

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

■When it is difficult to start the engine

Cause	Countermeasures
Fuel is thick and doesn't flow.	* Check the fuel tank and fuel filter. * Remove water, dirt and other impurities. * As all fuel will be filtered by the filter, if there should be water or other foreign matters on the filter, clean the filter with kerosene.
Air or water mixed in fuel system	* If air is in the fuel filter or injection lines, the fuel pump will not work properly. * To attain proper fuel injection pressure, check carefully for loosened fuel line coupling, loose cap nut, etc. * Loosen joint bolt stop fuel filter and air vent screws of fuel injection pump to eliminate all the air in the fuel system.
Engine oil becomes thick in cold weather and engine cranks slow.	* Change grade of oil according to the weather (temperature).
Battery is discharged and the engine will not crank.	* Charge battery. * In winter, always remove battery from machine, charge fully and keep indoors. Install in machine at time of use.

■When output is insufficient

Cause	Countermeasures
Fuel is insufficient.	* Check fuel system.
Overheating of moving parts	* Check lubricating oil system. * Check to see if lubricating oil filter is working properly. * Filter element deposited with impurities would cause poor lubrication. Change element.
Air cleaner is dirty	* Clean the element every 100 hours of operation.
Injection pump wear	* Do not use poor quality fuel as it will cause wear of the pump. Only use No. 2-D diesel fuel. (See "FUEL" in "PERIODIC SERVICE" Section.)

NOTE :

- If the cause of trouble can not be found, contact your KUBOTA dealer.

SPECIFICATIONS

Model	D1005-E4	D1105-E4
Type	Vertical, water-cooled, 4-cycle diesel engine	
Number of cylinders	3	
Bore and stroke mm (in.)	76 × 73.6 (2.99 × 2.90)	78 × 78.4 (3.07 × 3.09)
Total displacement cm ³ (cu.in.)	1001 (61.08)	1123 (68.53)
Combustion chamber	Spherical Type (E-TVCS)	
SAE NET Intermittent H.P. (SAEJ1349) kW / rpm (HP / rpm)	17.7/3200 (23.7/3200)	17.8/3000 (23.9/3000)
SAE NET Continuous H.P. (SAEJ1349) kW / rpm (HP / rpm)	15.4/3200 (20.6/3200)	15.4/3000 (20.7/3000)
Maximum bare speed rpm	3420	3220
Minimum bare idling speed rpm	1300	900
Order of firing	1-2-3	
Direction of rotation	Counter-clockwise (viewed from flywheel side)	
Injection pump	Bosch MD Type Mini Pump	
Injection pressure	13.73 Mpa (140 kgf/cm ² , 1991 psi)	
Injection timing (Before T.D.C.)	20°	18°
Compression ratio	24 : 1	
Fuel	Diesel Fuel No.2-D (ASTM D975)	
Lubricant (API classification)	above CF grade	
Dimension mm (in.) (length × width × height)	497.8 × 396.0 × 602.0 (19.60 × 15.59 × 23.7)	
Dry weight (BB Spec.) kg (lbs.)	93 (205.0)	
Starting system	Cell starter (with glow plug)	
Starting motor	12 V, 1.2 kW	
Charging generator	12 V, 480 W	
Recommended battery capacity	12 V, 65 AH, equivalent	
EU engine family name	HKBXL01.5BCB	HKBXL01.5BCB
CO ₂ Emission data g/kWh	1018.0	1018.0
Non-road steady-state test cycle		

NOTE :

- Specifications are subject to change without notice.
- This CO₂ measurement results from testing over a fixed test cycle under laboratory conditions a(n) (parent) engine representative of the engine type (engine family) and shall not imply or express any guarantee of the performance of a particular engine.

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