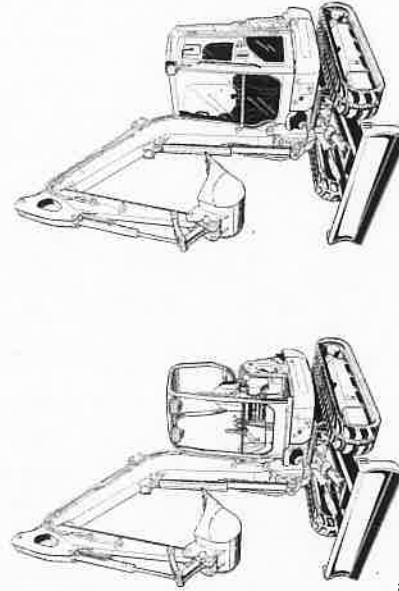


# OPERATOR'S MANUAL

# Kubota

# KUBOTA EXCAVATOR MODEL KX<sup>040-4</sup>



1BAAAHAPO180

1BAAAHAPO170

K X 0 4 0 - 4

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READ AND SAVE THIS MANUAL





































# Kubota

# LIST OF ABBREVIATION

Abbreviations	Description
API	American Petroleum Institute
ASTM	American Society for Testing and Materials, USA
CECE	Committee for European Construction Equipment
DIN	German Institute for Standards, Federal Republic of Germany
EN	European Standard
FRONT	"Front" means the front view towards the boom and dozer
Hi	High speed
ISO	International Standardization Organization
JIS	Japanese Industrial Standard
L	Volume (Liter)
L/min	Liter per minute
Lo	Low speed
MIL	Military Standards
OSHA	Occupational Safety and Health Administration
OPG (Top Guard Level I)	Operator Protective Guards of Top Guard Level I
rpm	Revolutions Per Minute
ROPS	Roll-Over Protective Structures
SAE	Society of Automotive Engineers, USA
TPSS	Two Pattern Selection System
AI	Auto Idle
CRS	Common Rail System
DPF	Diesel Particulate Filter
DOC	Diesel Oxidation Catalyst
P/L	Pressure Limiter
SCV	Swirl Control Valve
AFS	Air Flow Sensor
EGR	Exhaust Gas Re-circulation
PCV	Positive Crankcase Ventilation
MAF	Mass Air Flow

# GENERAL SYMBOLS

The instruments and operation elements have been marked with a series of symbols in order to simplify the operation of excavator. These symbols are listed below with the respective descriptions.

	Safety alert Symbol		Boom swing (left)
	Warning lamp "Fuel level too low"		Boom swing (Right)
	System lamp		Dozer raise
	Warning lamp "Engine Oil pressure"		Dozer lower
	Warning lamp "Battery charge"		Operation direction of control lever
	Warning lamp "Auto Idle (AI) Lamp"		Operation direction of control lever
	Indicator lamp "Glow"		Read operator's manual
	Working light switch		Engine stop control lamp
	Horn		DPF Standby / Regeneration
	Wiper/Washer switch		Engine Rev up
	Diesel		Inhibit DPF Regeneration
	Hydraulic fluid		Eco mode (Energy saving mode)
	Gear oil		
	Grease		
	Fast		
	Slow		
	Excavator - Overhead movement toward the front		
	Excavator - Overhead movement toward the rear		
	Boom up		
	Boom down		
	Arm up		
	Arm crowd		
	Bucket crowd		
	Bucket dump		

# FOREWORD

You are now the proud owner of a KUBOTA Excavator. This excavator is a product of KUBOTA quality engineering and manufacturing. It is made of fine materials and under a rigid quality control system. It will give you long, satisfactory service. To obtain the best use of your excavator, please read this manual carefully. It will help you become familiar with the operation of the excavator and contains many helpful hints about excavator maintenance. It is KUBOTA's policy to utilize as quickly as possible every advance in our research. The immediate use of new techniques in the manufacture of products may cause some small parts of this manual to be outdated. KUBOTA distributors and dealers will have the most up-to-date information. Please do not hesitate to consult with them.



## 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 assemble 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, could result in minor or moderate injury.

**IMPORTANT :** Indicates that equipment or property damage could result if instructions are not followed.

**NOTE :** Gives helpful information.

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# SAFE OPERATION

Careful operation is your best insurance against an accident.

**Read and understand this manual carefully, before operating the excavator.**

Every user, however experienced, should carefully read and understand this manual and those of the attachments and accessories before operating the excavator. The owner is obliged to inform all operators of these instructions in detail.

Keep this manual in the storage location. (See "Where to keep Operator's Manual" in "MAINTENANCE" section.)

## 1. BEFORE OPERATION

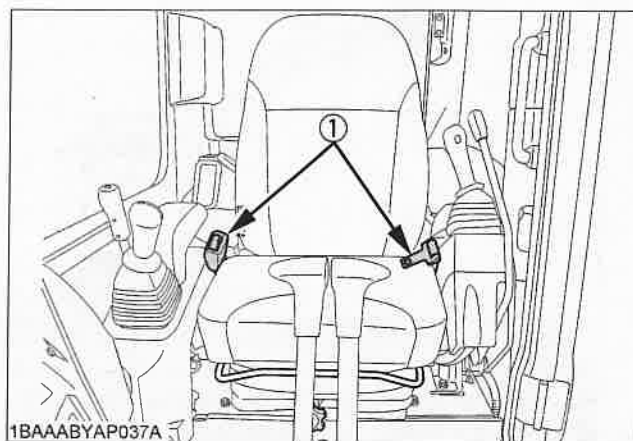
1. Know your equipment and its limitations. Read and understand this entire manual before attempting to start and operate the excavator.
2. Obey the danger, warning and caution labels on the machine.
3. For your safety, a ROPS/OPG (Top Guard Level I) with a seat belt is installed by KUBOTA.
  - ROPS: Roll-Over Protective Structure
  - OPG (Top Guard Level I): Operator Protective Guards of Top Guard Level I

OPG (Top Guard Level I) in accordance with ISO10262 is equivalent in definition to FOPS (Falling Object Protective Structure).

Always use the seat belt when the machine is equipped with a ROPS/OPG (Top Guard Level I) as this combination will reduce the risk of serious injury or death, should the excavator be upset or falling objects occur.

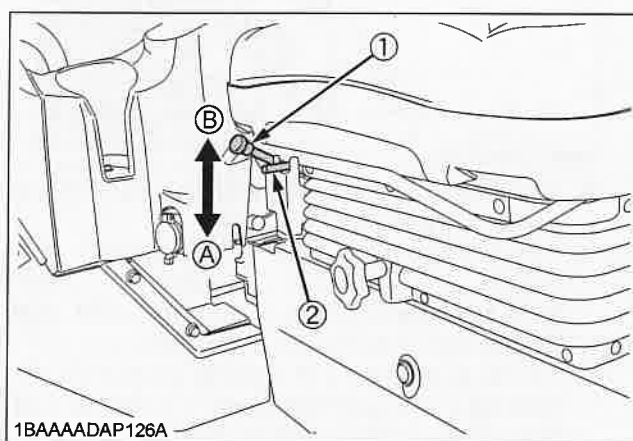
Do not modify any structural members of the ROPS/OPG (Top Guard Level I) by welding, drilling, bending, grinding or cutting, as this may weaken the structure. If any component is damaged, replace it. Do not attempt repairs. If the ROPS/OPG (Top Guard Level I) is loosened or removed for any reason, make sure all parts are reinstalled correctly. Tighten mounting bolts to proper torque.
4. ROPS meets requirements of ISO 3471.  
OPG (Top Guard Level I) meets requirements of OSHA 1926-1003/ISO 10262.

5. The seat belt must be inspected regularly and replaced if frayed or damaged.



(1) Seat belt

6. Always sit in the operator's seat when starting engine or operating levers or controls.
7. Study control lever pattern A and pattern B. Then choose the one which is most familiar.  
Familiarize yourself with the pattern selected by operating the unit slowly and at low engine speed.
  - Engage the lever lock to prevent accidental pattern change.

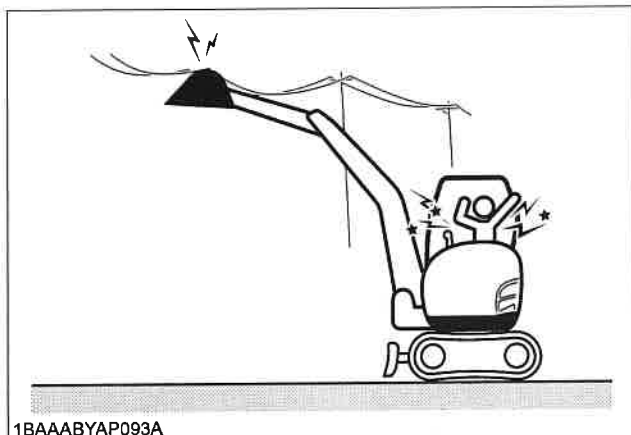


(1) Pattern selector lever (A) "Pattern A"  
(Two Pattern Selection System: TPSS) (B) "Pattern B"  
(2) Lever lock

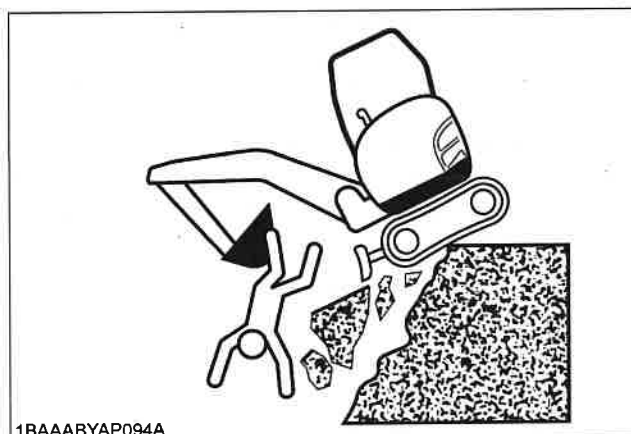
8. Do not operate the excavator while under the influence of alcohol, medication, controlled substances or while fatigued.

## ▲-2 SAFE OPERATION

9. Check the surroundings carefully before using the excavator or when attachments are being attached.
  - Pay attention to the overhead clearance with electric wires.



- Check for pipes and buried cables before digging.
- Check for hidden holes, obstacles, soft underground, and overhangs.



- Do not allow any persons within the working range of the excavator during operation.
  - Check local regulations before digging and call diggers hotline before working, [www.diggershotline.com](http://www.diggershotline.com) or 811 (WI) and [www.ne-diggers.com](http://www.ne-diggers.com) or 1-800-331-5666 (NE).
10. Do not allow anyone to use the excavator until they have been advised of the work to be performed and they have indicated that they have read and understood the operator's manual.

11. Do not wear baggy, torn or oversized clothing when working with the excavator as such clothing can get caught in rotating parts or control elements which can cause accidents or injuries. Wear adequate safety clothing, e.g. safety helmet, safety shoes, eye protection, ear protection, working gloves, etc., as necessary and as prescribed by law or statutes.

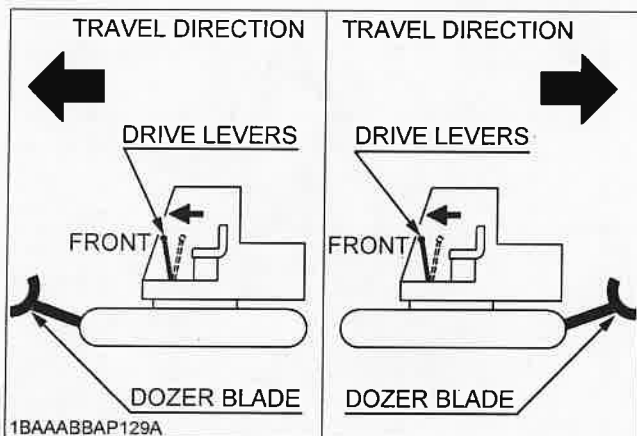


- |                           |                               |
|---------------------------|-------------------------------|
| (1) Helmet                | (7) Straw hat                 |
| (2) Clothing fit for work | (8) Towel                     |
| (3) Tight seams           | (9) Baggy trousers            |
| (4) Good grip footwear    | (10) Loose cuffs of the shirt |
| (5) Well fitting cuffs    | (11) Baggy shirt              |
| (6) Working gloves        | (12) Rubber sandals           |

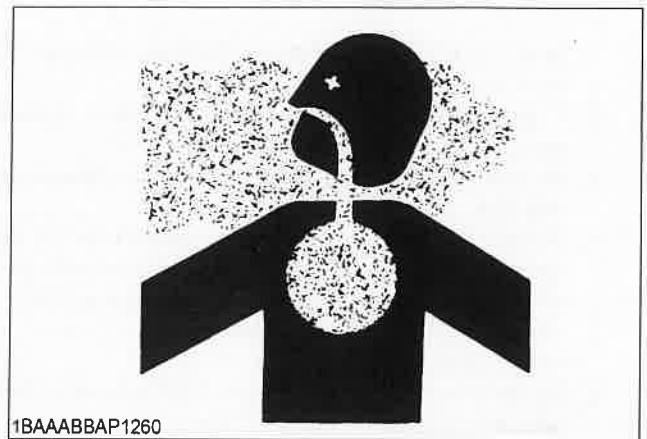
12. Do not allow passengers to ride on any part of the excavator at any time. The operator must remain in the excavator seat during operation.
13. Check levers, pedals and all mechanical parts for correct adjustment and wear. Replace worn or damaged parts immediately. Check nuts and bolts regularly for correct torque.
14. Keep your excavator clean. Heavy soiling, grease, dust and grass can cause fires, accidents or injuries.
15. Use only KUBOTA authorized attachments.
16. Before starting the excavator, be absolutely sure that the excavator has been filled with fuel, lubricated, greased and undergone all necessary maintenance.
17. Do not modify the excavator, as such could lead to unforeseen safety problems.
18. Do not operate a hydraulic hammer on anything that is above the operator's seat level as objects may fall into the operator station.
19. Make sure attachments, particularly those utilizing quick attach systems, are securely mounted.
20. Install protective guards on the excavator when working in areas where objects may fall or be thrown.

## 2. OPERATING THE EXCAVATOR

1. Mount and dismount the machine safely. Always face the machine. Always use handrails and available steps and keep yourself well balanced. Do not grab or hold any of the control levers and switches. Do not jump on or off the machine, whether stationary or in motion.
2. Start and control the excavator only from the operator's seat. The driver should not lean out of his seat when the engine is running.
3. Before starting the engine, make sure that the lock levers are in the "LOCKED" position and all control levers and pedals are in their neutral positions and the seat belt is fastened correctly.  
Before starting the engine, make sure that the control levers, travel lever, pedals and other control elements are not stuck and can be moved smoothly.  
If stuck, for example, a lever may fail to return, possibly putting you in danger.  
If anything wrong is found, immediately pinpoint the cause and correct it.
4. Before operating the excavator, make sure that the dozer blade is in front of you. If the levers are activated with the dozer blade at the rear, the tracks will move in the opposite direction of the drive levers.



5. Do not operate or idle engine in a non-ventilated area. Carbon monoxide gas is colorless, odorless, and deadly.



6. Keep all safety equipment and covers in place. Replace damaged or missing safety devices.
7. When operating, keep hands and body inside of the ROPS / OPG (Top Guard Level I) protective envelope. Do not touch or depress the control levers or the pedals from outside the cab while the engine is running.
8. Take precautions against tipping over. Stay away from steep slopes and embankments. Do not swing the bucket downhill. Lower the dozer blade when digging. Keep the bucket as low as possible while driving uphill. Turn slowly on slopes (at reduced speed). Do not place the excavator near the edges of trenches and banks, as the earth can give way due to the weight of the excavator.  
ALLOWABLE CLIMBING ANGLE : 36 % (20 deg.)  
ALLOWABLE ANGLE CROSS : 27 % (15 deg.)
9. Watch where you are going at all times. Watch for and avoid obstacles. Remain alert for trees, wires and other obstructions.

### ◆ Safety for children

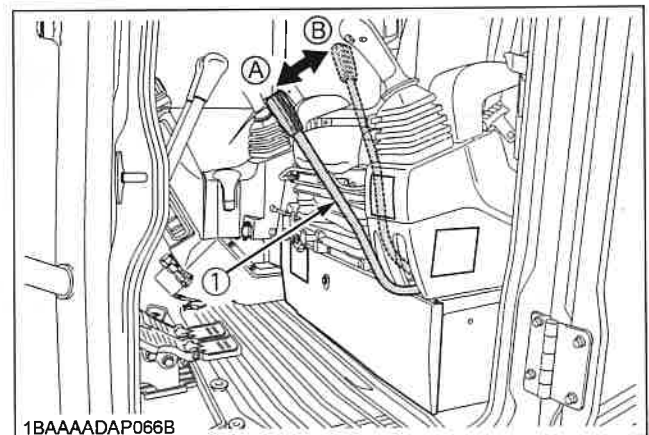
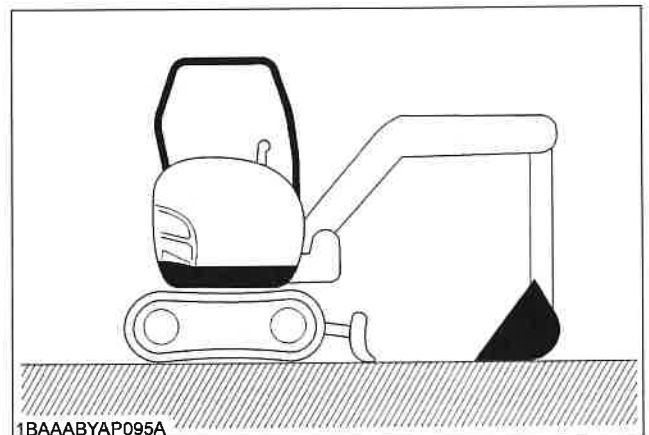
Tragedy can occur if the operator is not alert to the presence of children. Children generally are attracted to machines and the work they do.

1. Never assume that children will remain where you last saw them.
2. Keep children out of the work area and under the watchful eye of another responsible adult.
3. Be alert and shut your machine down if children enter the work area.
4. Never carry children on your machine. There is not a safe place for them to ride. They may fall off and be run over or interfere with your control of the machine.
5. Never allow children to operate the machine even under adult supervision.
6. Never allow children to play on the machine or on the attachments.
7. Use extra caution when backing up. Look behind and down to make sure the area clear before moving.
8. When parking your machine, if at all possible, park on a firm, flat and level surface; if not, park across a slope. Lower the bucket and dozer to the ground, stop the engine, release pressure in the hydraulic system, place the pilot control lock lever in the "LOCKED" position, remove the key and lock the cab door (if equipped), before you leave.

### 3. AFTER OPERATION

Before leaving the machine,

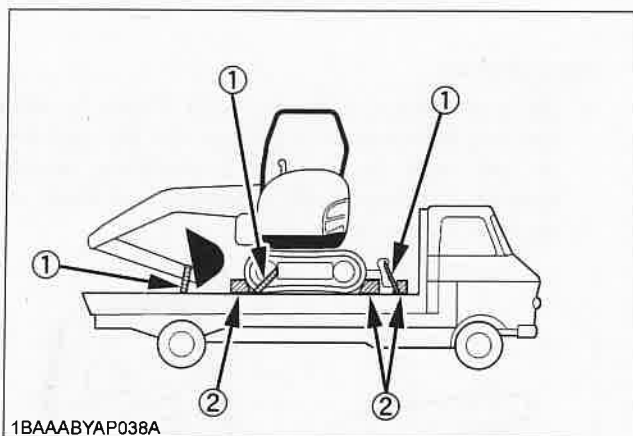
- Park the excavator on a firm, flat and level surface. If this is not possible, park across the slope.
- Lower the attachments and the dozer blade to the ground.
- Stop the engine.
- Release pressure in the hydraulic system.
- Lock all control levers.
- Remove the key.
- Lock the cab door (if equipped).



- (1) Pilot control lock lever      (A) "UNLOCK"  
 (B) "LOCKED"

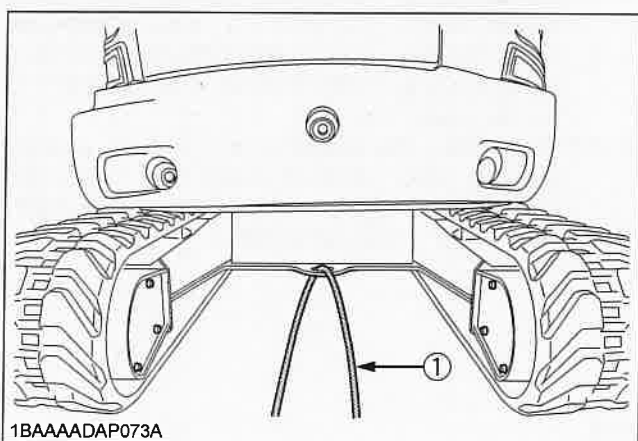
#### 4. SAFE LOADING AND TRANSPORT OF THE EXCAVATOR

1. Observe all regulations concerning the transport of excavators on public roads.
2. Use adequately long and robust ramps when loading on the machine. (for details see "TRANSPORTING THE EXCAVATOR ON A VEHICLE")
3. Do not change the running direction and to avoid tipping over, do not try to swing the attachment crosswise to the loading ramps.
4. Lower the attachment on the loading bed and release the pressure from the hydraulic system.  
After loading the excavator on the truck, block the tracks with blocks and tie down the excavator at the appropriate locations.



- (1) Chain  
(2) Block

5. Avoid abrupt braking of the vehicle with the excavator loaded. Sudden braking cause the excavator to move and may cause a serious accident.
6. When towing the excavator or pulling a load, the load must be less than the strength of the towing line attached to excavator. The towing eye should not be used for tie down or lifting of the machine.



- (1) Tow line

Max. drawbar pull at coupling hook	70450 N (7183 kgf)
Max. vertical load at coupling hook	7210 N (735 kgf)

7. Do not use the hooks on the roof of CAB for lifting the excavator.

#### 5. MAINTENANCE

Before doing maintenance work on the excavator, place the machine on a firm, flat and level surface, lower the attachments to the ground, stop the engine, release pressure trapped in the hydraulic system, lock all control levers and remove the key. When dismantling hydraulic parts, make sure that the hydraulic oil has cooled down sufficiently to avoid burns.

Start maintenance work carefully, e.g. loosen plug slowly so that oil will not squirt out.

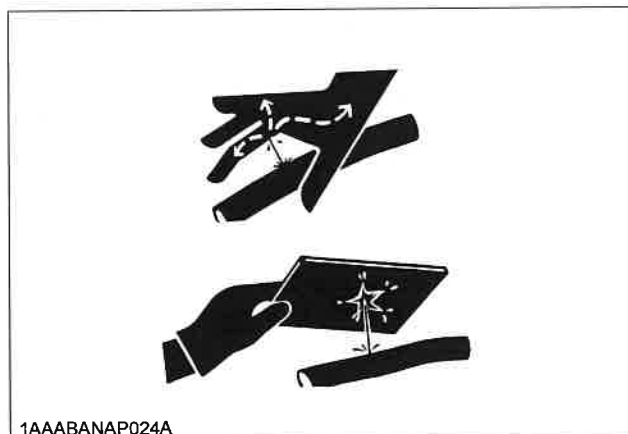
1. Before doing work on the engine, the exhaust system, the radiator and the hydraulics, let the excavator cool down sufficiently.
2. Always turn off the engine when filling the fuel tank. Avoid spilling and over-filling of fuel.
3. Smoking is prohibited while refueling or handling the battery. Keep sparks and fire away from the fuel tank and battery. Flammable gases escape from the battery, especially during charging.
4. Do not use or charge a refillable type battery if the fluid level is below the LOWER (lower limit level) mark. Otherwise, the battery component parts may prematurely deteriorate, which may shorten the battery's service life or cause an explosion. Check the fluid level regularly and add distilled water as required so that the fluid level is between the UPPER and LOWER levels.
5. Read and follow the directions "STARTING WITH AN AUXILIARY BATTERY" in "OPERATION OF THE ENGINE", when starting with an auxiliary battery.
6. Keep a first-aid box and a fire extinguisher at hand at all times.

## ▲-6 SAFE OPERATION

7. Do not open the radiator cap before the radiator has cooled down sufficiently.  
First loosen the cap to the first stop and allow the system enough time to release the remaining pressure. Then loosen the cap completely.

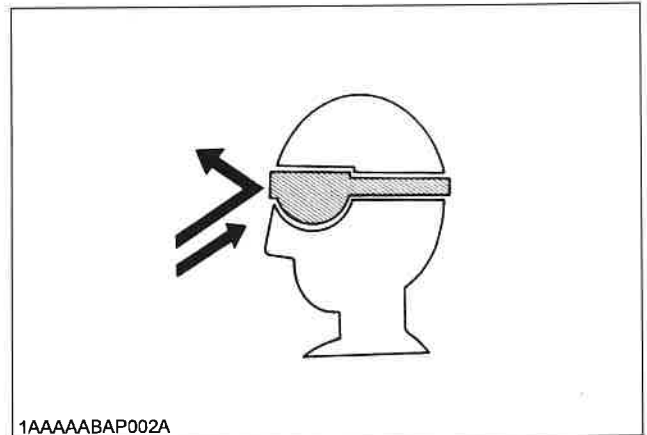


8. To avoid short-circuiting the battery, always remove the ground cable first and attach the positive cable first.
9. Oil under high pressure can penetrate the skin and may be harmful to your health if not treated immediately.
10. Leaking hydraulic fluid has enough pressure to penetrate the skin and cause serious injuries. Leakages from pin holes can be totally invisible. Do not use hands for checking for leaks. Always use a piece of wood or cardboard. It is strongly recommended that you use a face mask or eye protection.  
Should injuries occur with leaking hydraulic fluid, contact a doctor immediately. This fluid can cause gangrene or serious allergic reactions.

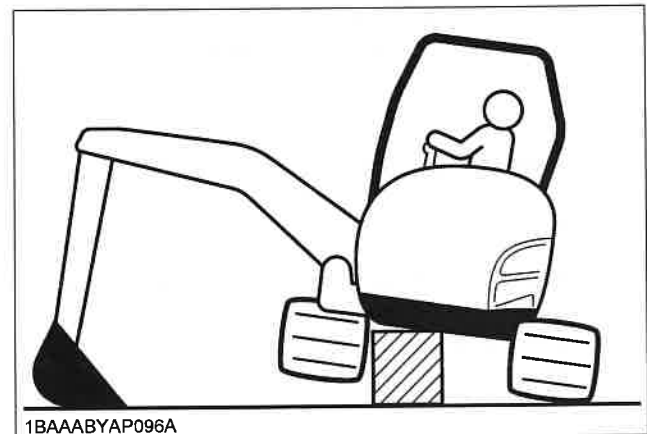


11. To avoid environmental damage from acid and heavy metals, dispose of the battery appropriately.
12. Observe all laws and regulations concerning the disposal of used oil, coolants, solvents, hydraulic fluids, battery acids and batteries.

13. To avoid fire, do not heat the hydraulic components (tanks, pipes, hoses, cylinders) before they have been drained and washed.
14. Use eye protection or a face mask to protect the eyes and respiratory system against dust and other foreign particles.



15. Securely support excavator with stands or suitable blocking before working underneath. For your safety, do not work under any hydraulically supported devices. They can settle, suddenly leak down, or be accidentally lowered.



16. Do not dismantle the spring of the track tensioner. If dismantling is necessary, contact your KUBOTA dealer where the machine was purchased, or competent service shop. The assembly must be done according to the KUBOTA work shop manual (W.S.M.) for the product involved.
17. When lifting the machine itself with an attachment, place a safety block or safety post to prevent the machine from rolling over. Keep the pilot control lock lever in the "LOCKED" position.



18. Inspect ROPS / OPG (Top Guard Level I) for damage and if damage is found contact your KUBOTA dealer for repair.
19. KUBOTA does not use asbestos containing components and recommends against the use of such components.  
Components containing asbestos should be handled in accordance with applicable regulations and industry practice.
20. Do not open high-pressure fuel system. High-pressure fluid remaining in fuel lines can cause serious injury. Do not disconnect nor attempt to repair fuel lines, sensors, or any other components between the high-pressure fuel pump and injectors on engines with high-pressure common rail fuel system.
21. To avoid hazardous high voltage, turn the key switch to the OFF position if it is necessary to check to repair the computer, harness or connectors.
22. For proceeding to regenerate the DPF, a warning indicator appears on the LCD to tell you to increase the engine rpm to its specified level. Follow that instruction.
23. When the Diesel Particulate Filter (DPF) is in the regenerating cycle, the exhaust gas and the DPF muffler become hot. During regeneration, take into account that the muffler will be very hot and keep the machine away from other people, animals, plants, and flammable material. Also keep the area near the DPF muffler clean and away from flammable material.
24. The DPF-regeneration-caused exhaust gas may adversely affect people, animals and plants. Before this action, look around the machine for added safety.
25. During DPF regeneration keep the surrounding environment in mind. Do not allow the ambient temperature to rise excessively due to heat from the regeneration. If such occurs activate the inhibit switch.
26. Fire prevention  
Excavator and some attachments have components that are at high temperatures under normal operating conditions. The primary source of high temperatures is the engine and exhaust system. The electrical system, if damaged or incorrectly maintained, can be a source of arcing or sparks.  
The following fire prevention guidelines will help to keep your equipment up and running efficiently and keep the risk of fire to a minimum.
  - Blow off all accumulated debris near hot engine exhaust components such as turbocharger and exhaust manifold as well as exhaust pipes and muffler more frequently when working in severe conditions.
  - Clean out all accumulated flammable debris such as leaves, straw, pine needles, branches, bark, small wood chips and any other combustible materials from inside the machine belly pans or lower unit structures as well as from area in proximity to the engine.
  - Inspect all fuel lines and hydraulic hoses for wear or for deterioration. Replace them immediately if they begin to leak.
  - Examine electrical wiring and connectors frequently for damage. Repair any wires that are loose or frayed before operating the machine. Clean all electrical connections and tighten all electrical connections as necessary.
  - Inspect the exhaust system daily for any signs of leakage. Check for broken pipes and muffler and also for loose or missing bolts, nuts and clamps. If any exhaust leaks or fractured parts are found, repairs must be completed prior to operation.
  - Always keep a multipurpose fire extinguisher on or near the machine. Be familiar with the operation of the fire extinguisher.

## 6. DANGER, WARNING AND CAUTION LABELS

(1) Part No. RD809-5736-1



1BAAACDAP243A

(2) Part No. RD809-5738-2



1BAAAAAP1000

(3) Part No. RB419-5793-2 [CAB]

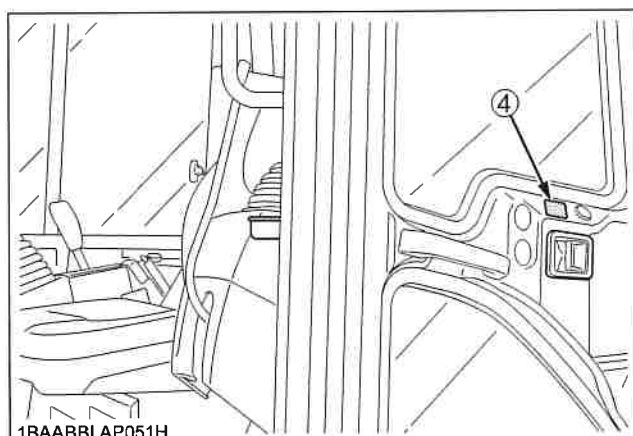
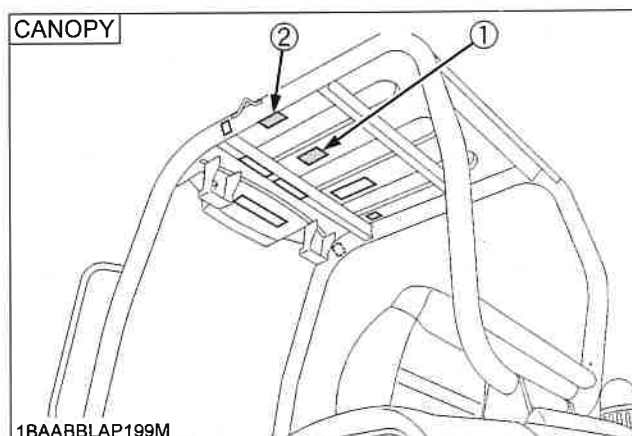


1BAAABYAP158E

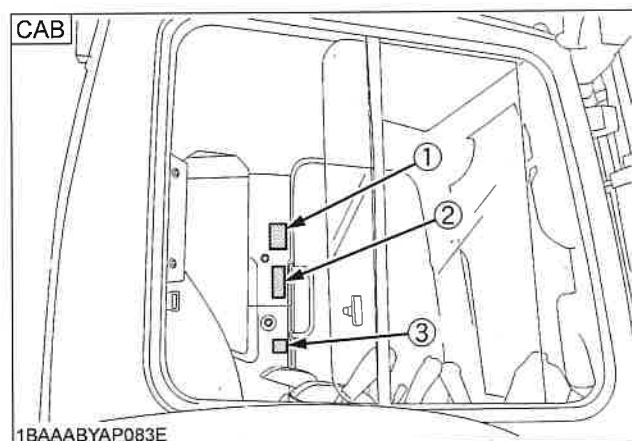
(4) Part No. RC788-5783-1



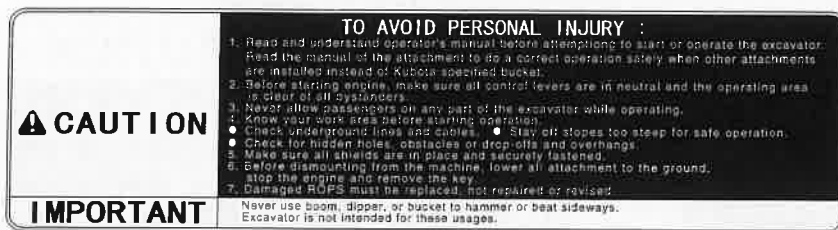
1BAAEALAP002A



1BAAAAHAP0140



(1) Part No. RD809-5728-2



1BAABBAP120E

(2) Part No. RD458-5737-1



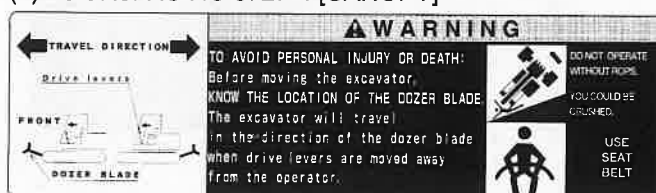
1BAAABYAP116E

(3) Part No. RD809-5727-1 [CAB]



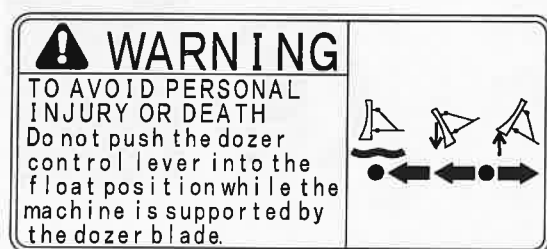
1BAAABBAP119E

(3) Part No. RC418-5727-4 [CANOPY]

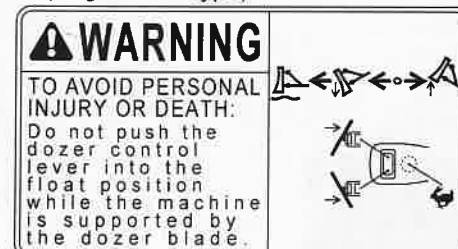


1BAAAQAP0790

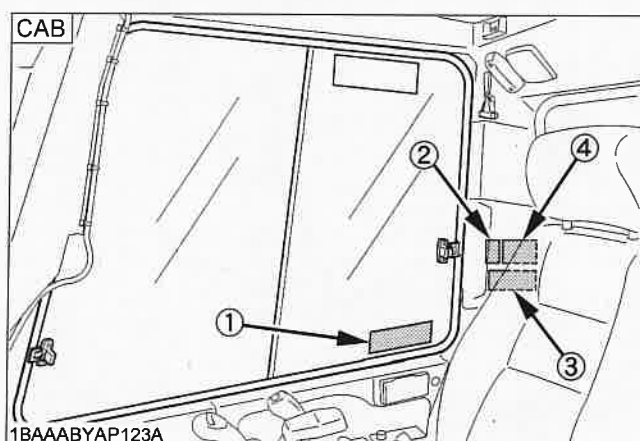
(4) Part No. RD358-5745-1



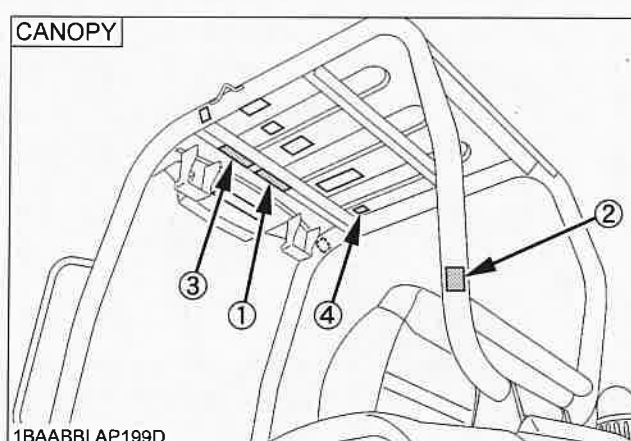
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(4) Part No. RD158-7596-1  
(Angle blade type)

1BAAAADAP1150



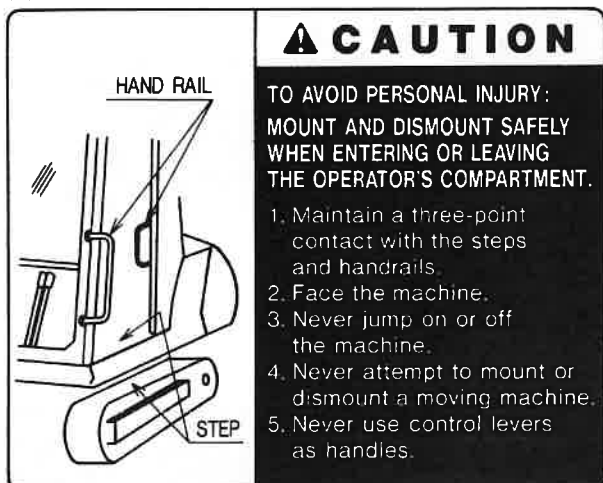
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1BAABBLAP199D

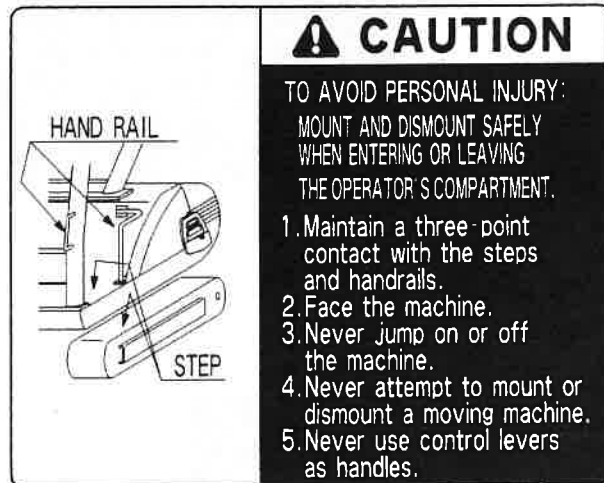
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(1) Part No. RC108-5765-2 [CAB]



1BAAGAAP0140

(1) Part No. RD118-5763-1 [Canopy]



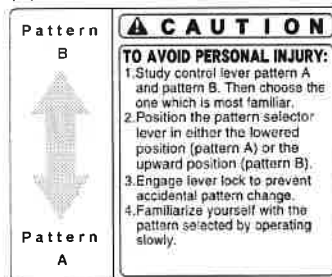
1BAAGAAP0160

(2) Part No. RC418-5753-2



1BAAABYAP138E

(3) Part No. RC418-5732-3

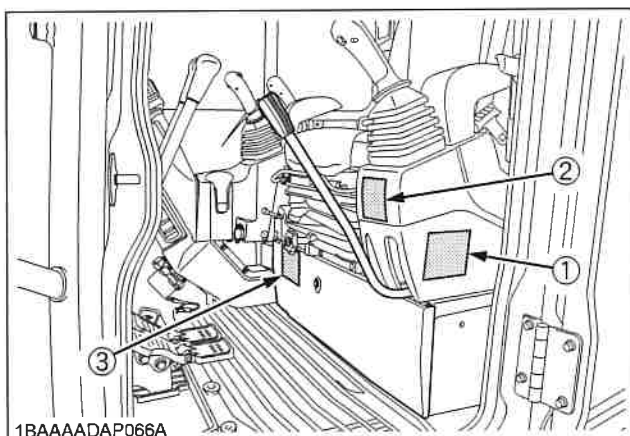


1BAAGAAP0170

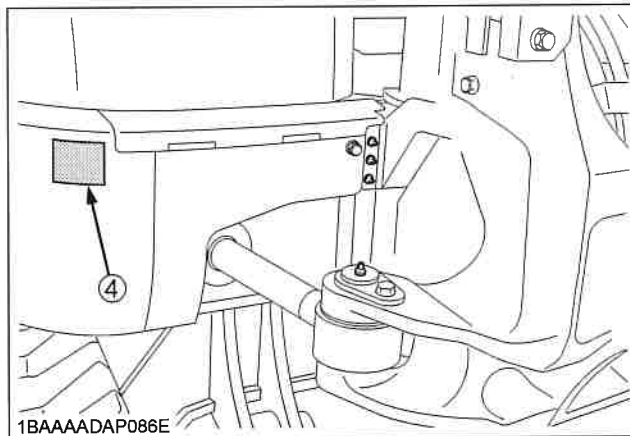
(4) Part No. RD118-5765-2



1BAAGAAP0310



1BAAAAHAP0150



(1) Part No. RD358-5736-1

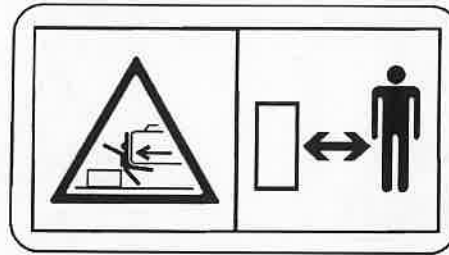
Diesel fuel only No fire



1BAAGAAAP1810

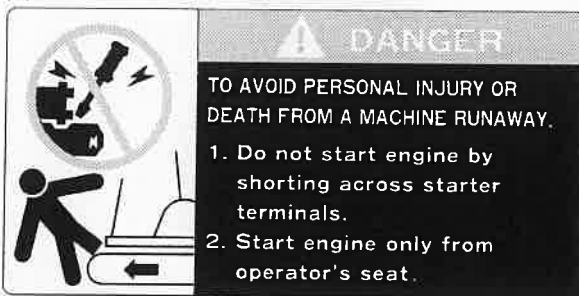
(2) Part No. RC788-5727-2

Do not allow any persons within the working range.



1BAAEAJAP069A

(3) Part No. RC108-5718-1



1BAAGAAAP0250

(4) Part No. RC108-5714-1



1BAAGAAAP0260

(5) Part No. 3C151-9861-1

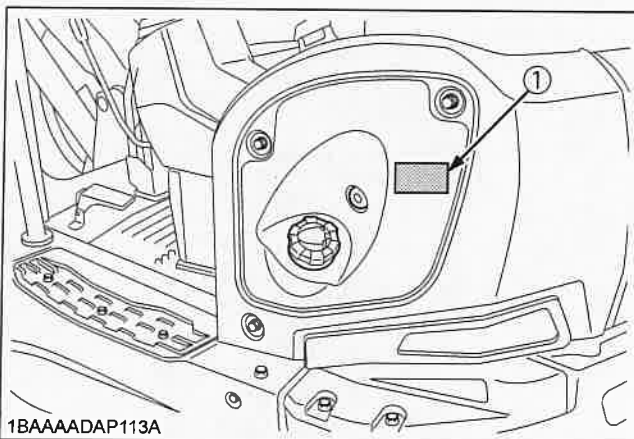


1BCAAAAAP2180

(6) Part No. RC788-5784-1

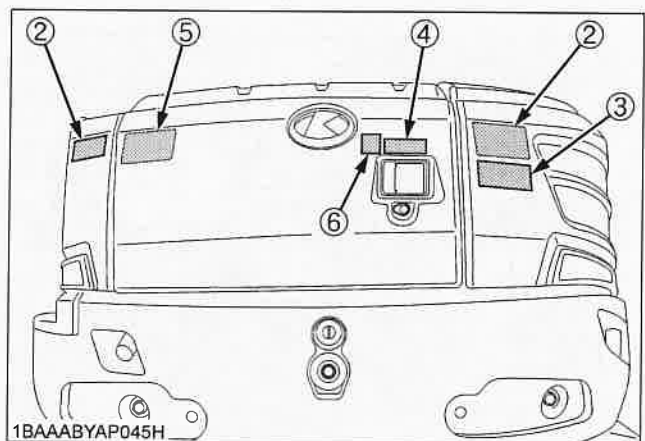


1BAAEALAP001A



1BAAAAADAP113A

1BAAAAHAP0160



1BAAABYAP045H

- (1) Part No. RB449-5738-1  
Do not touch hot parts  
such as exhaust etc.



1BAAAADAP0810

- (2) Part No. RC418-5737-5  
Keep away from fan  
and fan belt.



1BAAEBBAP0020

- (3)



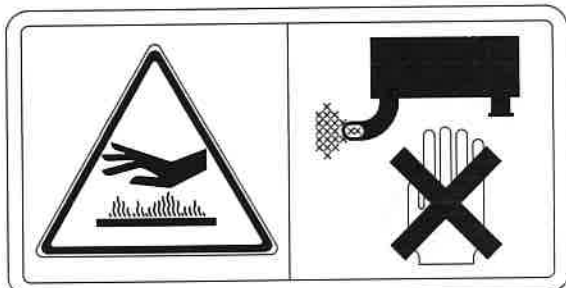
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- (4) Part No. RC108-5754-1

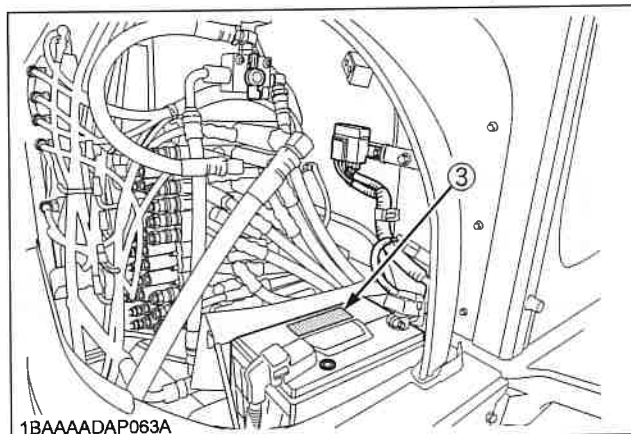


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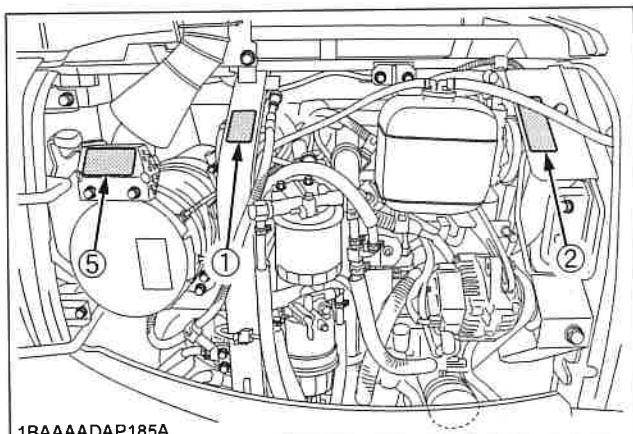
- (5) Part No. RD158-5745-1



1BAAAADAP1160

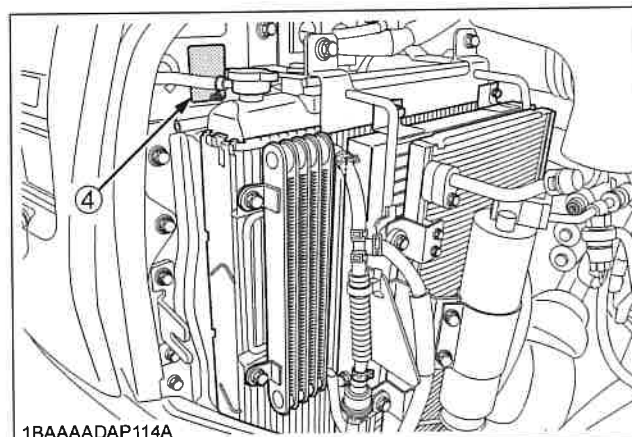


1BAAAADAP063A



1BAAAADAP185A

1BAAAADAP0790



1BAAAADAP114A

- (1) Part No. RB456-5795-1  
Do not loosen the grease nipple completely or too quickly.



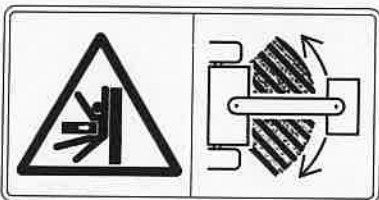
1BAAACDAP2740

- (2) Part No. RC108-5796-1 [Both sides]



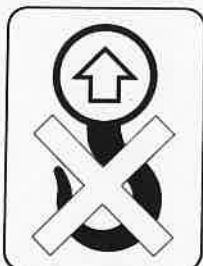
1BAAAAQAP0940

- (3) Part No. RB456-5722-1



1BAAACDAP2750

- (4) Part No. RB419-5796-2 [Both sides]

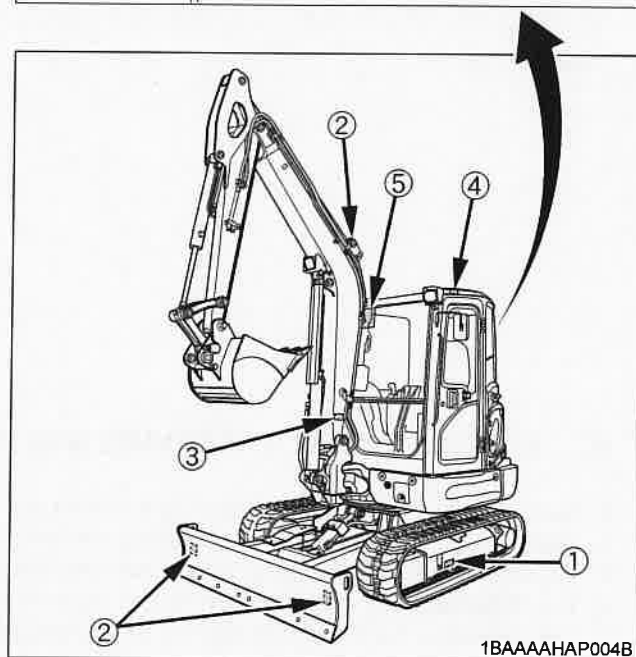
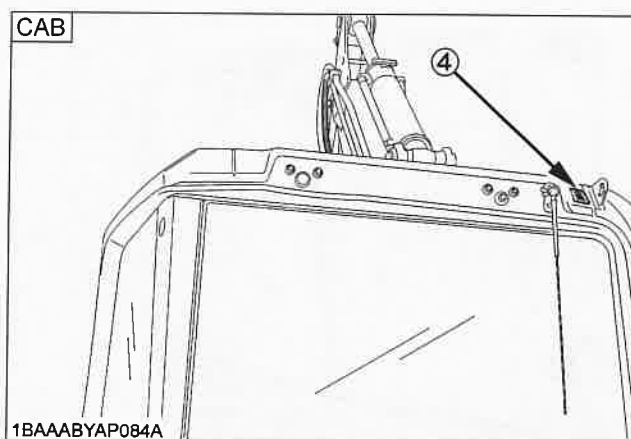
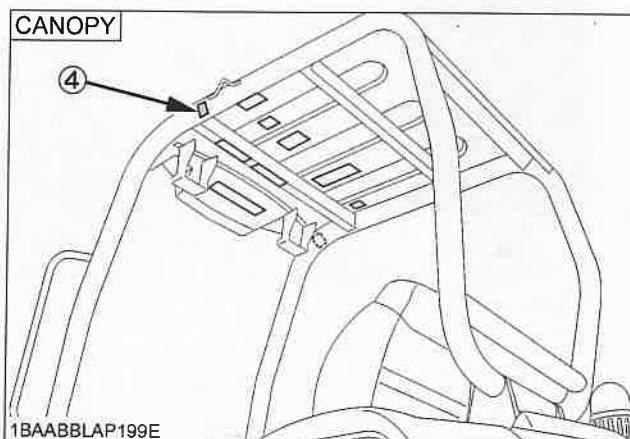


1BAABAUAP2720

- (5) Part No. RD358-5785-1 [CAB]



1BAAABYAP137E



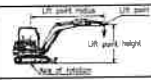


## ▲-14 SAFE OPERATION

### (1) Part No. RD158-5748-2

**TO AVOID PERSONAL INJURY OR DEATH:**

- Do not stand raised load over people.
- It is forbidden to lift loads greater than those values mentioned in the lifting capacity tables.
- The values mentioned in the table are valid only on machines with the same configuration as the machine on which the lifting capacity of the machine was determined. In the fact that the user is concerned, only on the side of the machine.
- The table values are requested at the end of the arm without the bucket in order to find the allowable load for machines with bucket. The bucket weight must be subtracted from the value in the table.



### ⚠ WARNING

Don't use this machine for the lifting of freely suspended loads.  
(Unless fitted with appropriate safety devices, as required under local regulations.)

1. The lifting capacities are based on ISO 10567 and do not exceed 75% of the static lift load of the machine or 87% of the hydraulic lifting capacity of the machine.

2. The strokes are as follows:

(1) The load point corresponds to the front end of the arm.

(2) The machine positions are (i) over-front (blade down), (ii) over-front (blade up), and (iii) over-side.

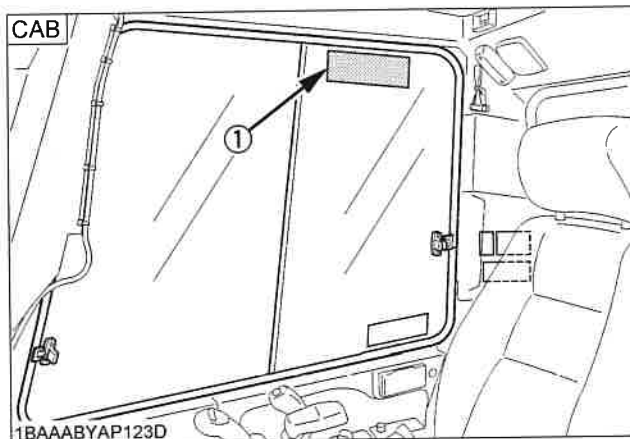
(3) The operating cylinder is the boom cylinder.

3. The bucket of the excavator, the hook, the sling and other lifting accessories are taken into consideration for the loads.

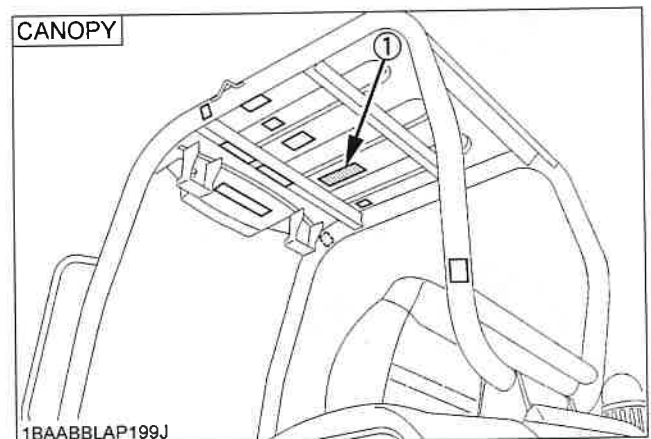
LIFT POINT HEIGHT (m)	LIFTING CAPACITY OVER-FRONT BLADE DOWN Unit=kN(kg)					LIFTING CAPACITY OVER-FRONT BLADE UP Unit=kN(kg)					LIFTING CAPACITY OVER-SIDE Unit=kN(kg)				
	LIFT POINT RADIUS (m)					LIFT POINT RADIUS (m)					LIFT POINT RADIUS (m)				
	MIN	2.0	3.0	4.0	MAX	MIN	2.0	3.0	4.0	MAX	MIN	2.0	3.0	4.0	MAX
3					7.2 (1750)					7.2 (1750)					8.2 (2000)
2		13.6 (3360)	9.3 (2320)	7.2 (1800)	7.2 (1800)		15.8 (3950)	8.1 (2030)	6.8 (1720)	6.8 (1720)		13.6 (3360)	9.3 (2320)	7.2 (1800)	8.2 (2000)
1		13.6 (3360)	9.3 (2320)	7.2 (1800)	7.2 (1800)		15.8 (3950)	8.1 (2030)	6.8 (1720)	6.8 (1720)		13.6 (3360)	9.3 (2320)	7.2 (1800)	8.2 (2000)
GL	9.9 (2460)	13.6 (3360)	14.0 (3490)	14.0 (3490)	14.0 (3490)	9.7 (2420)	13.6 (3360)	8.1 (2030)	6.8 (1720)	6.8 (1720)	9.7 (2420)	13.6 (3360)	14.0 (3490)	14.0 (3490)	14.0 (3490)
-1	13.6 (3360)	22.8 (5690)	17.5 (4380)	14.0 (3490)	14.0 (3490)	13.2 (3260)	18.5 (4590)	9.5 (2380)	8.4 (2100)	8.4 (2100)	13.2 (3260)	18.5 (4590)	17.5 (4380)	14.0 (3490)	14.0 (3490)
-2	25.0 (6250)	18.8 (4680)	10.0 (2500)	10.0 (2500)	10.0 (2500)	25.0 (6250)	18.8 (4680)	10.0 (2500)	10.0 (2500)	10.0 (2500)	25.0 (6250)	18.8 (4680)	10.0 (2500)	10.0 (2500)	10.0 (2500)

Machine with ROPS canopy and rubber crawler, without bucket.

1BAAAAHAP0100



1BAAAAHAP0110



## 7. CARE OF DANGER, WARNING AND CAUTION LABELS

1. Keep danger, warning and caution labels clean and free from obstructing material.
2. Clean danger, warning and caution labels with soap and water, and dry with a soft cloth.
3. Replace damaged or missing danger, warning and caution labels with new labels from your KUBOTA dealer.
4. If a component with danger, warning and caution label(s) affixed is replaced with new part, make sure new label(s) is (are) attached in the same location(s) as the replaced component.
5. Mount new danger, warning and caution labels by applying on a clean dry surface and pressing any bubbles to outside edge.



# DEALER SERVICE

Your KUBOTA dealer is always ready to help so that your excavator offers the best performance. After having carefully read these instructions, you will realize that much of the routine maintenance can be done by yourself. Your KUBOTA dealer is responsible for servicing and the delivery of spare parts. When ordering spare parts from your KUBOTA dealer, always mention the product identification number of the excavator and the serial number of the engine.

Note these numbers right away in the supplied lines.

Excavator Product identification number	
Dealer's name (To be filled in through the owner)	
Date of purchase	

	Model	Serial No.
Engine		

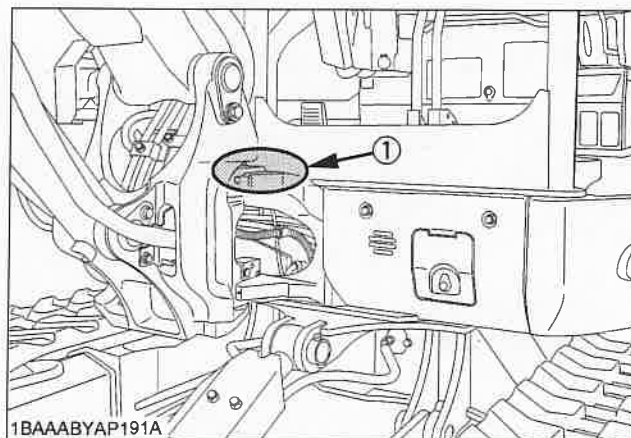
## ◆ Warranty policy

This product is warranted under the KUBOTA Limited Express Warranty, a copy of which may be obtained from your selling dealer. No warranty shall, however, apply if the product has not been handled according to the instruction given in the Operator's Manual even it is within the warranty period.

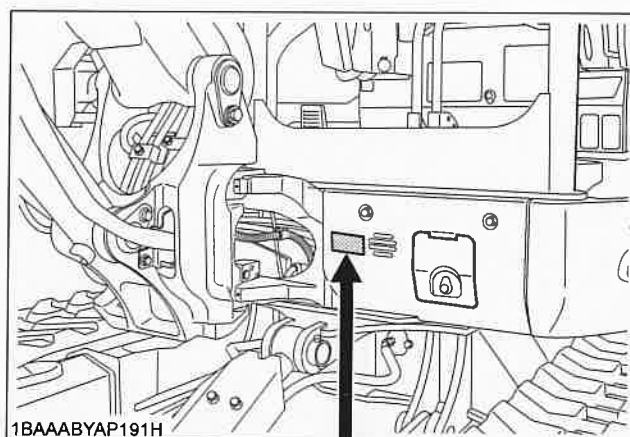
The Product(s) described in this Operator's Manual are designed and manufactured only for the country in which they are initially wholesaled by KUBOTA or one of its affiliated companies. Neither KUBOTA Corporation nor its affiliated companies provide warranty for any Product which is re-sold or retailed in any country other than the country for which the Product(s) were designed or manufactured.

## ◆ Scrapping the product and its procedure

To put the product out of service, correctly follow the local rules and regulations of the country or territory where you reside. If you have questions, consult your local KUBOTA Dealer.

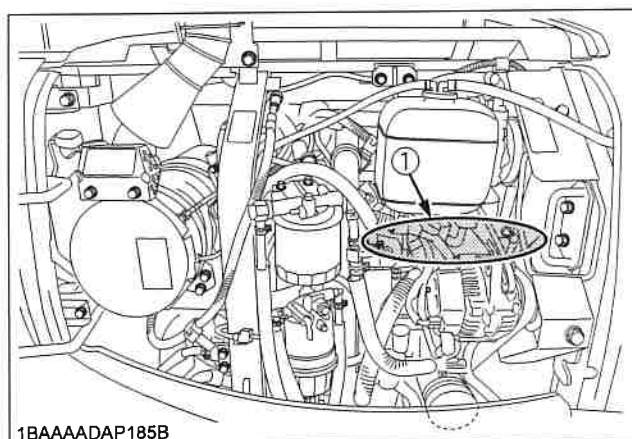


(1) Product identification number



<b>KUBOTA Corporation</b>	
2-47, Shikitsuhigashi 1-Chome Naniwa-ku, Osaka, 556-8601 JAPAN	
MODEL	
PRODUCT IDENTIFICATION NUMBER	
ENGINE No.	

1BAAABSAP1490



(1) Engine serial No.

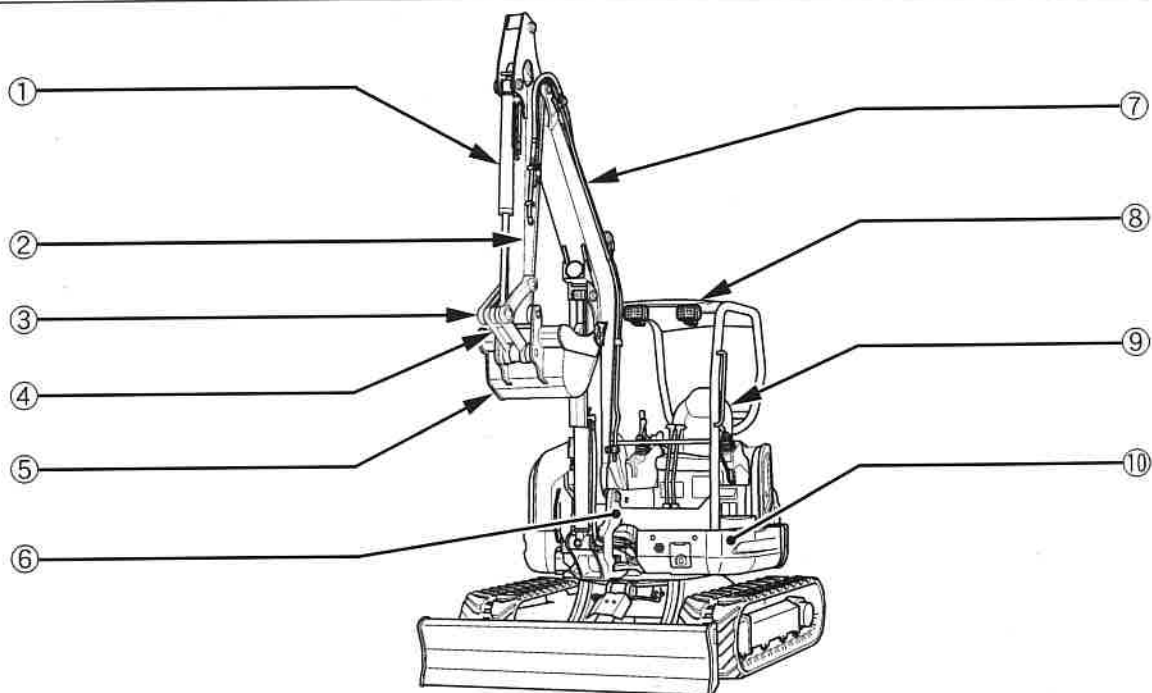
# TECHNICAL DATA

				KUBOTA EXCAVATOR				
Model name				KX040-4				
Type				Standard type		Angle blade type		
				Canopy	CAB	Canopy	CAB	
Operating weight (including operator's)		kg		4185	4325	4345	4485	
Engine	Type			Water cooled 4 cycle diesel engine with 3 cylinder				
	Model name			D1803-CR-TE4-BH1	D1803-CR-TE4-BH2	D1803-CR-TE4-BH1	D1803-CR-TE4-BH2	
	Total displacement		cc	1826				
	Engine power SAE J1955 gross		kW (Hp)	30.1 (40.4)				
	Rated speed		rpm	2200				
	Low idling speed		rpm	1150				
	Swivel speed		rpm	9.2				
Performance	Travel speed	Fast	km/h (mph)	5.0 (3.1)				
		Slow	km/h (mph)	2.9 (1.8)				
	Ground pressure (With operator)		kPa (kgf/cm <sup>2</sup> )	31.3 (0.319)	32.4 (0.331)	32.5 (0.332)	33.6 (0.343)	
	Max. climbing angle		% (deg)	*36 (20)				
	Angle in case of crossing slope		% (deg)	*27 (15)				
	Dozer	Width x Height		mm	1700 x 350		1700 x 385	
		Max swing angle	Left	deg	---		25	
Right			deg	---		25		
Boom swing angle		Left	rad (deg)	1.20 (70)				
		Right	rad (deg)	0.96 (55)				
Pressure connection for attachments	Max. displacement (Theoretical)		L / min	65 (AUX1 port) 37 (AUX2 port)				
	Max. pressure		MPa (kgf/cm <sup>2</sup> )	[AUX1 port] 17.2 (175)		[AUX2 port] 17.2(175)		
Fuel tank capacity			L	64				

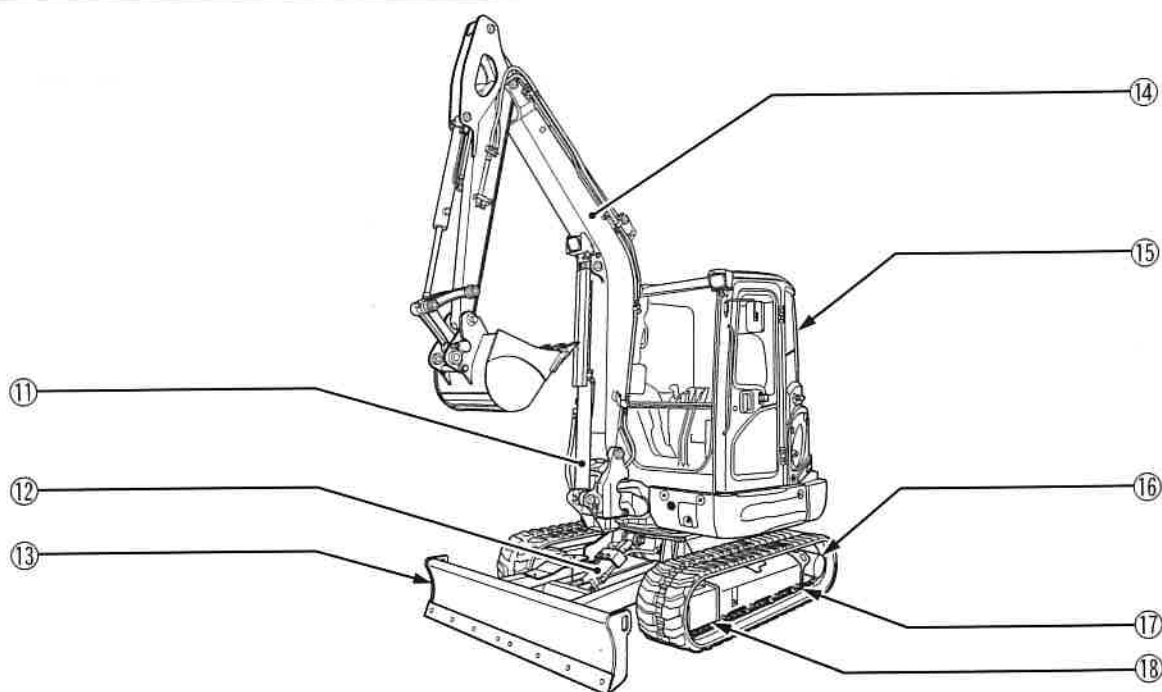
## NOTE :

- Above dimensions are based on the machine with QUICK HITCH BUCKET.
- Above dimensions are based on the machine with rubber track.
- Specifications subject to change without notice.
- \* With unloaded digging bucket.
- \* Firm compacted soil.
- \* Operators must exercise extra caution and follow instructions in the operator's manual.
- \* Worse condition or heavier attachment to the above will decrease climbing angle.
- ROPS/FORS structure complies with ISO 3471, ISO 3449 and OSHA regulations.

# DESCRIPTION OF MACHINE PARTS



1BAAAAHAP003A



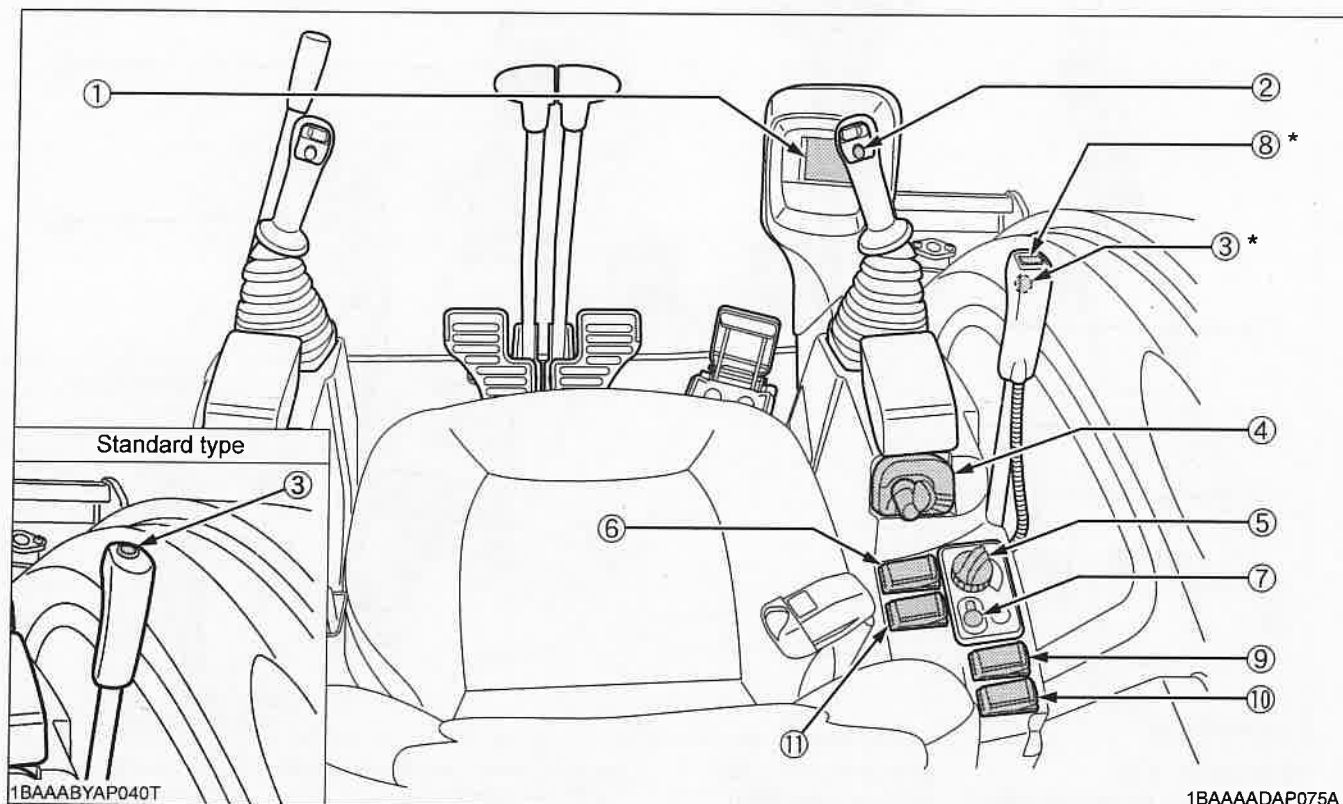
1BAAAAHAP004A

## DEPICTED CONTENTS

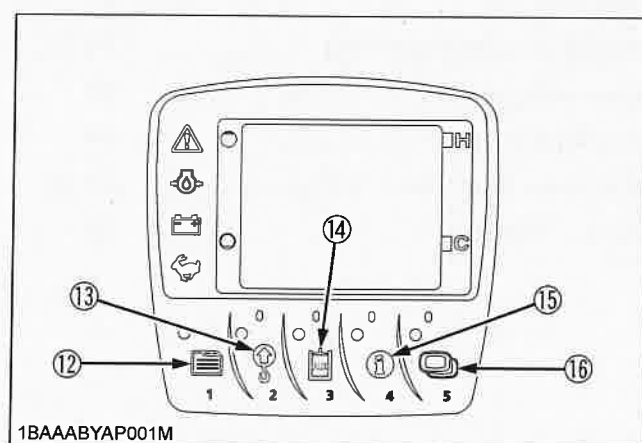
- |                         |                   |                     |                     |
|-------------------------|-------------------|---------------------|---------------------|
| (1) Bucket cylinder     | (6) Swing bracket | (11) Boom cylinder  | (16) Drive sprocket |
| (2) Arm                 | (7) Arm cylinder  | (12) Dozer cylinder | (17) Track roller   |
| (3) Bucket link 2 and 3 | (8) Canopy        | (13) Dozer blade    | (18) Front idler    |
| (4) Bucket link 1       | (9) Seat          | (14) Boom           |                     |
| (5) Bucket              | (10) Swivel frame | (15) Cab            |                     |

# INSTRUMENT PANEL AND CONTROL ELEMENTS

## ■ Instrument Panel, Switch



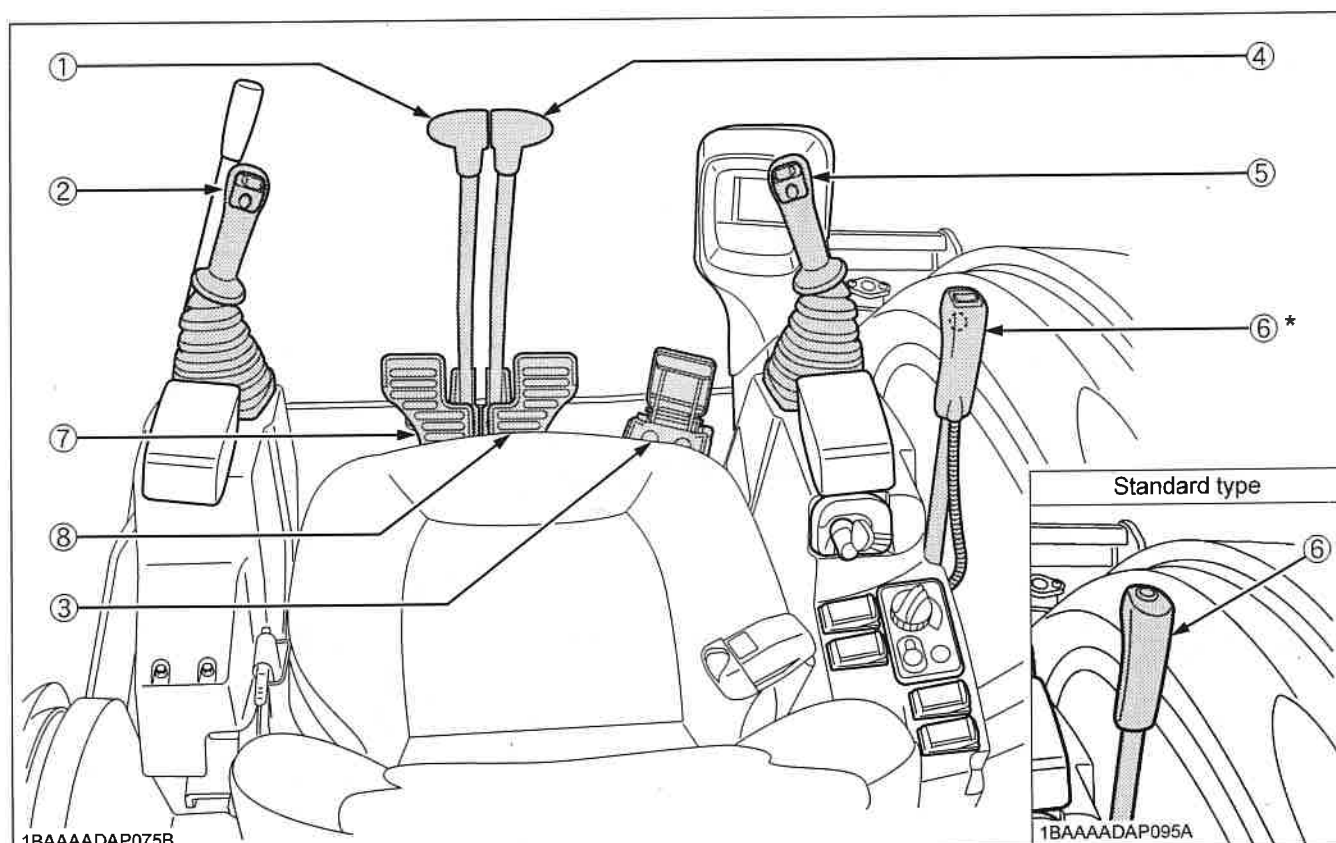
- |                         |                            |                                |                                     |
|-------------------------|----------------------------|--------------------------------|-------------------------------------|
| (1) LCD                 | (4) Starter switch         | (7) Auto idle control switch   | (9) Eco mode switch                 |
| (2) Horn switch         | (5) Throttle potentiometer | (8) Angle blade control switch | (10) DPF inhibit switch             |
| (3) Travel speed switch | (6) Light switch           | *Angle blade type only         | (11) Beacon light switch (Cab only) |



- |   |
|---|
| (12) User setting switch (Switch 1)     |
| (13) - (Switch 2)                       |
| (14) AUX port enable switch (Switch 3)  |
| (15) Information switch (Switch 4)      |
| (16) Display selector switch (Switch 5) |

	Ref. page
Starter switch.....	7
LCD.....	8
Fuel gauge	
Water temperature gauge	
Hour meter	
Engine tachometer	
Glow lamp	
User setting switch	
AUX port enable switch	
Information switch	
Display selector switch.....	8
Warning lamp.....	12
Horn switch.....	19
Light switch.....	19
Auto idle control switch.....	20
Throttle potentiometer.....	20
Travel speed switch.....	20

# Control Pedals and Levers



- (1) Drive lever (left)                      (3) Boom swing pedal                      (5) Attachment control lever (right)    (7) Drive pedal (left)  
(2) Attachment control lever (left)    (4) Drive lever (right)                      (6) Dozer control lever                      (8) Drive pedal (right)  
\* Angle blade type

Ref. page

Drive lever (left) .....	34
Attachment control lever (left) .....	38, 39
Boom swing pedal .....	39
Drive lever (right) .....	34
Attachment control lever (right) .....	38, 39
Dozer control lever .....	36

# CHECKS BEFORE START

## DAILY CHECKS

In order to avoid damage, it is important to check the condition of the excavator before starting.



### CAUTION

To avoid personal injury:

- Do maintenance work on the excavator only on level ground with the engine off and the pilot control lock lever in the "LOCKED" position.

### Checks

Go around the excavator and check for visual damage and wear.

Check coolant level. (See "DAILY CHECKS" in "MAINTENANCE" section.)

Check fuel level.

Check engine oil level.

Check hydraulic fluid level.

Check air filter for clogging.

Check all grease points.

Check all control lamps, indicators, tachometer and hour meter.

Check the light system.

Check the seat belt and the ROPS / OPG (Top Guard Level I) safety device.

Check the condition of the safety and warning labels.

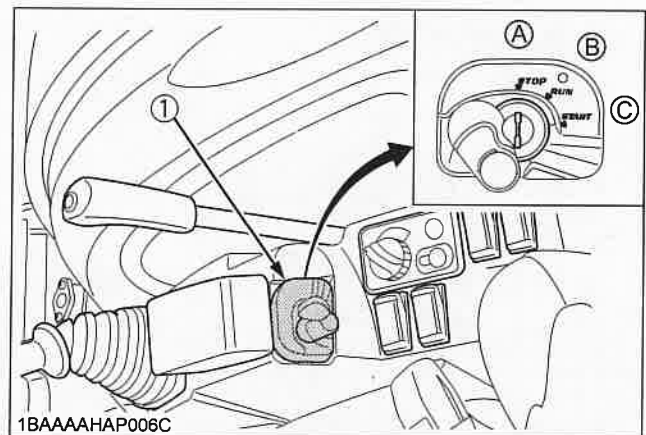
(See "DANGER, WARNING AND CAUTION LABELS" in "SAFE OPERATION" section.)

Inspect ROPS / OPG (Top Guard Level I) for damage and if damage is found, contact your KUBOTA dealer for repair.

## CHECKING THE DEVICES

### ■ Starter Switch

- **[STOP]**  
The key can be inserted at the "STOP" position.
- **[RUN]**  
Turn the key one click from the "STOP" position to the "RUN" position. All the circuitry gets energized to start preheating. The glow indicator is displayed. To check for any lamp breakage, however, the lamp lights up and stays on for about 1 second.
- **[START]**  
Move the pilot control lock lever to the "LOCKED" position. Turn the key from the "RUN" position another click to the "START" position. The starter motor is then activated to get the engine started. Release your hand from the key, and the key returns itself to the "RUN" position. In other words, once the engine has started, be sure to free the key.



(1) Starter switch

(A) STOP  
(B) RUN  
(C) START

### NOTE :

- If the key is repositioned from "RUN" to "STOP" but not pulled out, the message **"pull out key"** appears onscreen.
- With the key off and pulled out, nothing appears onscreen.

### [Status with the key off but not pulled out]

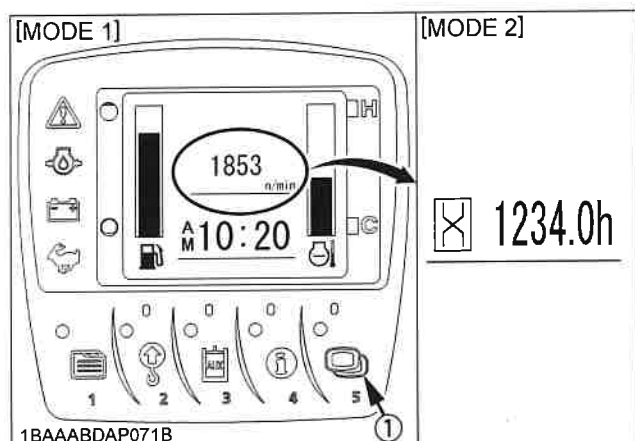


1BAABBLAP259B

### ■ Display Selector Switch

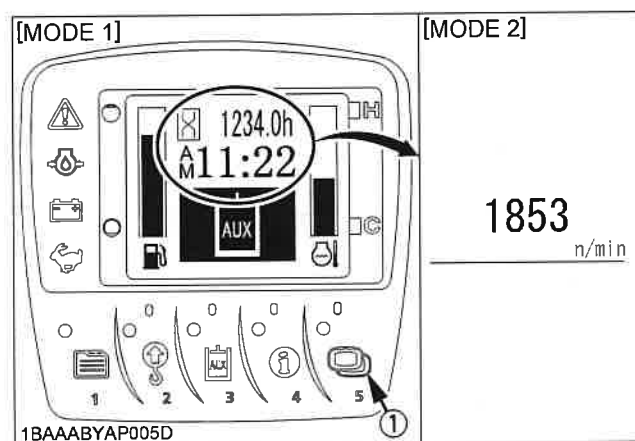
Press the display selector switch while the engine is running. The LCD meter display will change from one indication mode to the other.

Change the **two-mode** display according to your jobs.



(1) Display selector switch

### ◆ AUX port in use



(1) Display selector switch

### NOTE :

- Even with the starter key not yet inserted, press the electronic meter's user setting switch or the display selector switch, and the LCD shows the hour meter, fuel gauge, water temperature gauge and clock for 10 seconds.

### ■ LCD for Normal Operation

#### ◆ Fuel gauge

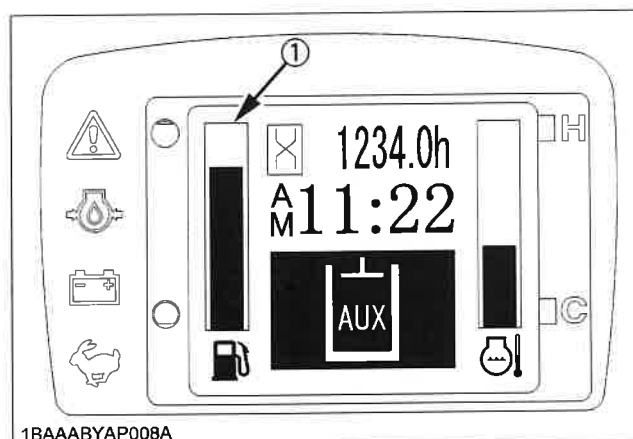


### CAUTION

To avoid personal injury:

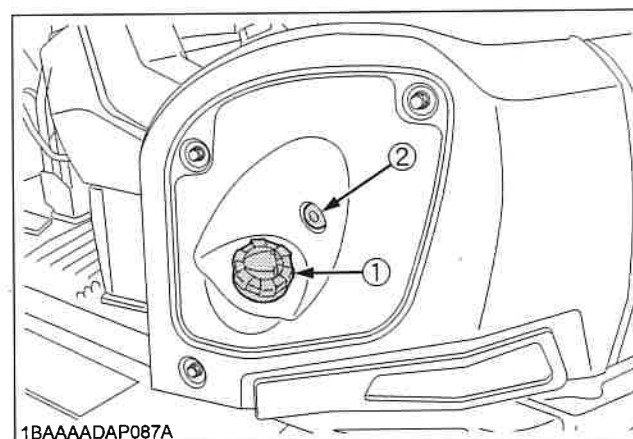
- Before adding fuel, be sure to stop the engine.
- Be sure to keep open flame away from the machine. Otherwise a fire may result.

With the starter key at the "RUN" position, the fuel remaining in the fuel tank is indicated in the block.



(1) Fuel gauge

If the fuel runs short, open the cap and refuel the tank.



(1) Fuel cap

(2) Fuel level audible indication switch

### IMPORTANT :

- If the fuel gauge indicator is near the "E" or the "FUEL" message appears, add fuel as soon as possible. If the indicator is near "E" and the machine is operated on a slope, the engine may run out of fuel.

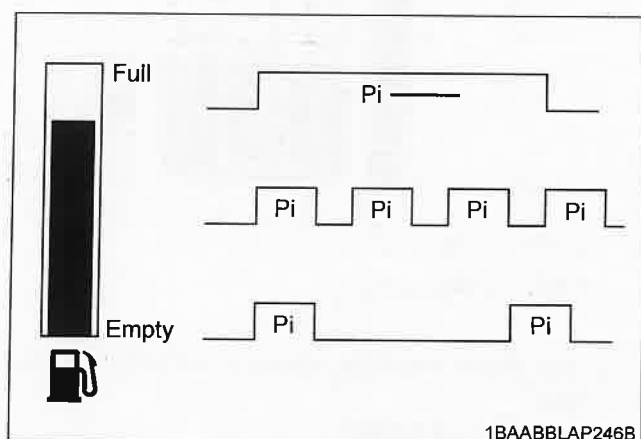
### NOTE :

- To open the fuel cap, keep the key inserted.



◆ **Fuel level audible indication switch (when refueling)**

1. With the starter key at the "OFF" position, press the fuel level audible indication switch, and the fuel level can be checked by the buzzer.
2. Start refueling the machine. The buzzer beeping intervals vary according to how much fuel is poured into the tank. As the fuel tank is filled up, the buzzer will sound almost continuously.
3. While refueling the machine, listen to the buzzer to know how much the fuel tank is filled.
4. If fuel is poured too slowly, the buzzer will stop beeping. When resumed normally, the buzzer will start beeping.
5. To stop refueling halfway (before filling up), press the fuel level audible indication switch or simply stop refueling for a while. The buzzer will stop sounding.



◆ **Coolant Temperature Gauge**

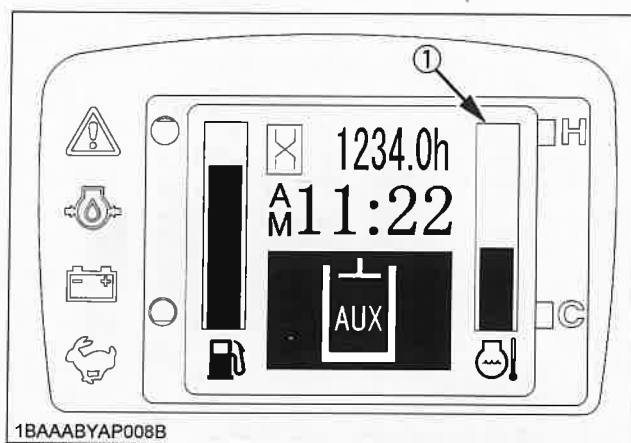


**CAUTION**

To avoid personal injury:

- Do not open the radiator cap during or just after operation. Hot coolant may gush out and scald you. Wait for the coolant to cool down before opening the cap.

With the starter key at the "RUN" position, the coolant temperature is indicated.



(1) Coolant temperature gauge

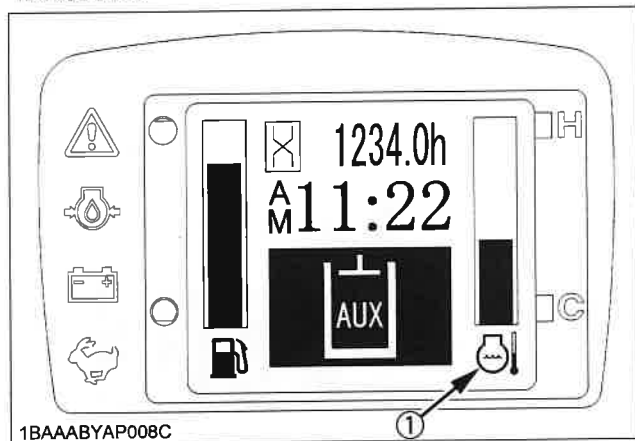
If the coolant temperature indicator is near "H", take the steps below.

Depending on the coolant temperature, the warning message "Water temp. is rising" or "Overheat Engine to idle for cooling" appears. In either case too, follow the same procedure below.

1. Discontinue the job.
2. Reduce engine rpm's to idle and keep it at idle for 5 minutes.
3. Stop the engine and check the following points (1)-(4).
  - (1) Low coolant level or leak
  - (2) Fan belt tension
  - (3) Mud or dust deposits on radiator
  - (4) Hydraulic oil leak

### ◆ Overheat warning

1. If the coolant temperature becomes too high, the message **"Water temp. is Rising"** appears onscreen for a certain period of time. The LCD then gets back to normal, but the coolant temperature sensor marker "①" starts blinking at 1-second intervals.



(1) Coolant temperature sensor marker

#### IMPORTANT :

- If this message is displayed, the EGR valve will begin to close and EGR system will not function. Interrupt the work and lower the engine rpm, which will reduce the coolant temperature.
2. The overheat warning appears onscreen. Also the following message shows up on the LCD, and the engine automatically starts idling. (Acceleration is not operative.)



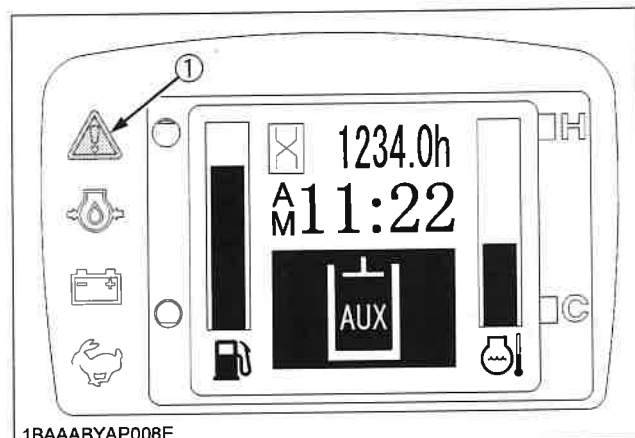
If the above message appears, take corrective measures, referring to the **"Precautions in case of Overheat"** section.

#### NOTE :

- When the coolant temperature has dropped, acceleration can be automatically enabled.

### ◆ Hydraulic oil temperature

If the hydraulic oil temperature becomes high, the following message appears and the warning lamp (yellow) starts turning on and off at 1-second intervals.



(1) Warning lamp (yellow)

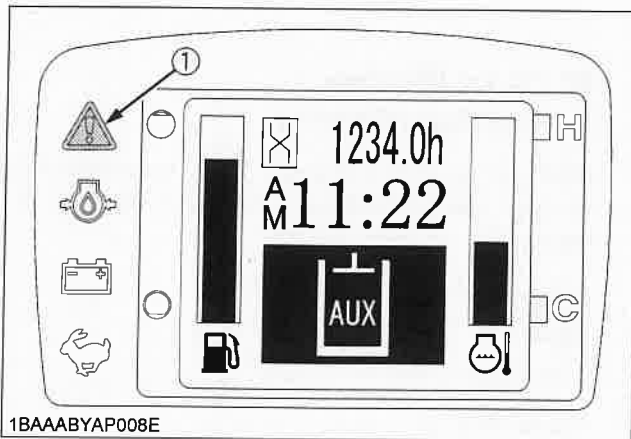
If the above message appears, follow the procedure below.

1. Discontinue the job.
2. Reduce engine rpm's to idle and keep it at idle for 5 minutes.
3. Stop the engine and check the following points (1)-(4)
  - (1) Low hydraulic oil level or leak
  - (2) Fan belt tension
  - (3) Mud or dust deposits on radiator
  - (4) Coolant leak

### ◆ Hydraulic oil overheat warning

If the hydraulic oil temperature becomes too high, the following message appears and the warning lamp (red) starts turning on and off at 1-second intervals.





(1) Warning lamp (red)

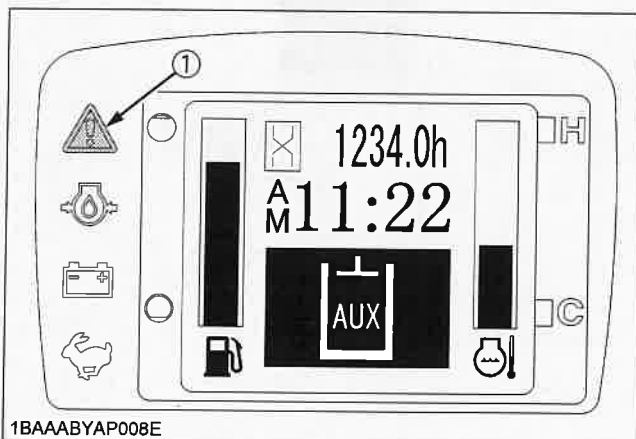
If the above message appears, the engine automatically starts idling. (Acceleration is not operative.)

**NOTE:**

- When the coolant temperature has dropped, acceleration can be automatically enabled.

◆ **Temperature drop indication of hydraulic oil**

If the hydraulic oil temperature is too low at a start of the engine, the following message appears and the warning lamp (yellow) starts turning on and off at 1-second intervals.



(1) Warning lamp (yellow)

If the above message appears, warm up the engine at lower than the medium speed. (See the warming-up instructions on page 29.)

If the above message appears, the engine rpm turns only up to the medium speed until the hydraulic oil temperature rises to an appropriate level.

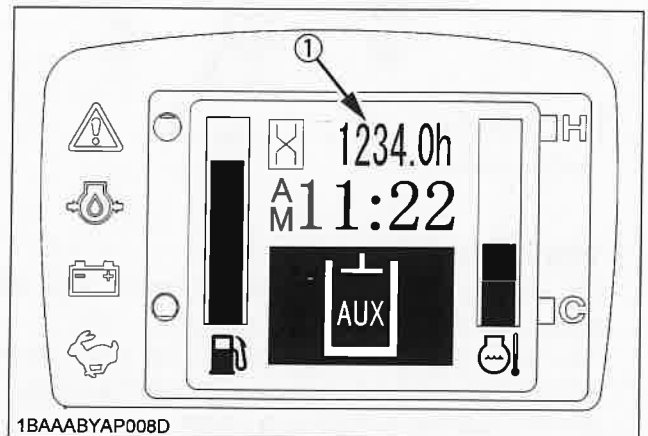
When the hydraulic oil temperature has risen to the appropriate level, the engine rpm may be raised to maximum level accordingly by stepping on the gas pedal.

◆ **Hour-meter**

Indicates the total operating hours of the machine.

How the indicator works

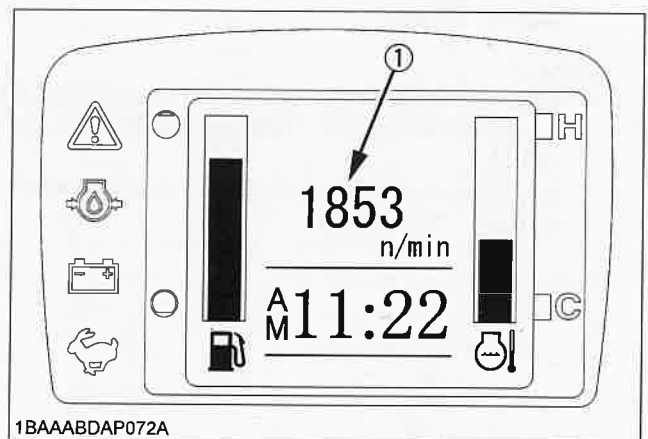
- The meter advances one hour after an hour of operation regardless of the engine rpm.



(1) Hour-meter

◆ **Engine tachometer**

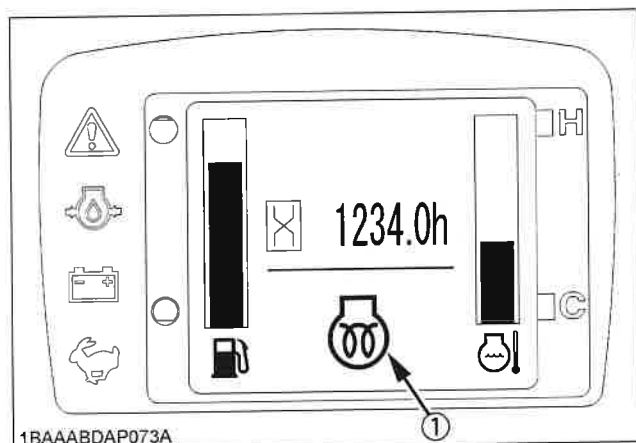
Indicates the current rpm of the engine.



(1) Engine tachometer

### ◆ Glow indicator

The indicator is displayed when the starter key is turned to the "RUN" position but the engine requires preheating. Wait until the indicator goes out, and then start the engine.



(1) Glow indicator

### ■ Warning Lamp

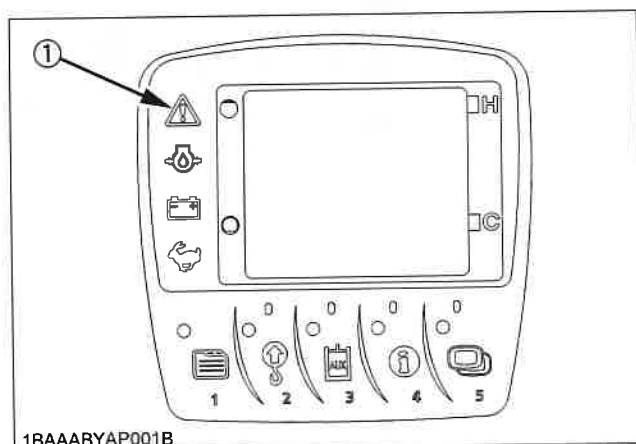
The warning lamp is used to indicate broken wire, short-circuit, fuel shortage and other problems. The warning lamp starts flashing in red if any problem occurs. If the system senses a warning signal, the warning lamp starts flashing in yellow.

#### IMPORTANT :

- If the warning illuminates, do not just look at the meter; carry out the appropriate inspection and correction accordingly.  
(See "REGULAR CHECKS AND MAINTENANCE WORK" section)

#### NOTE :


- If any warnings and problems are displayed, an alarm buzzer will beep. (See "LIST OF SCREENS" section for detail.)
- See your KUBOTA dealer for details concerning care and maintenance.



(1) Warning lamp (red, yellow)

### ■ LCD for Warning

#### ◆ Remaining fuel warning

When the fuel level is very low, the  lamp (yellow) starts flashing and the following message appears in the display.

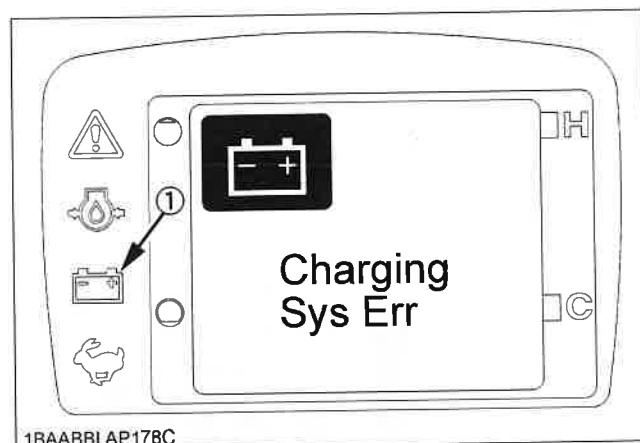


#### NOTE :

- After a short period of time, the display comes back to normal.
- After a short period of time, the message shows up again.
- Even while in the normal display mode, the warning lamp keeps on blinking.
- To see what warning is being given out, press the display selector switch. The current warning can then be identified.


#### ◆ Battery charge warning

If the starter key is turned to the "RUN" position without starting the engine, and the charging lamp stays off, the charging system has failed. If such occurs, immediately contact your local dealer for repair.

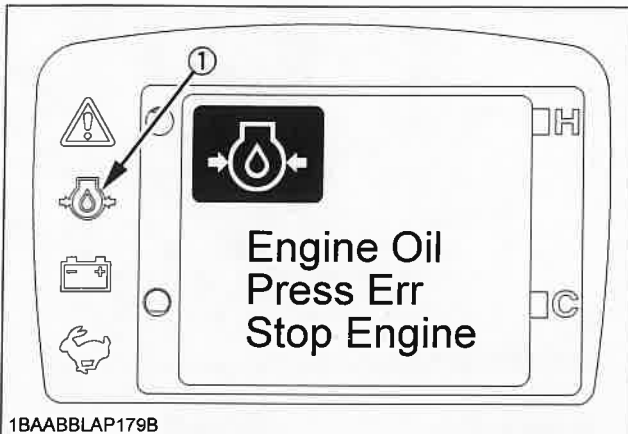


(1) Charging lamp

### ◆ Engine oil pressure low warning

When the engine oil pressure drops too low, the  lamp (red) starts flashing and the following message appears in the display.

Immediately stop the engine and check the engine oil level.



(1) Oil lamp

#### NOTE :

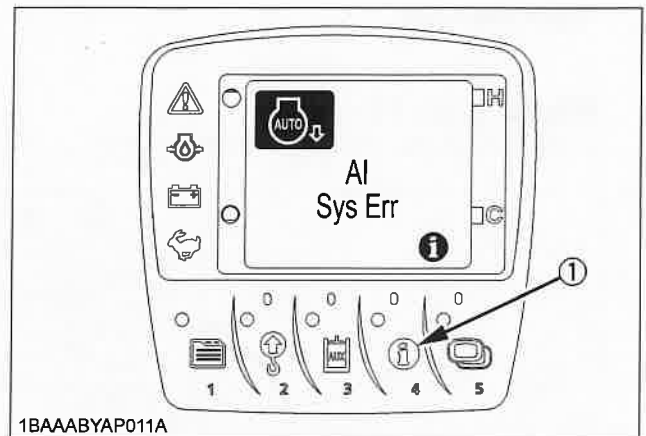
- If the starter key is turned to the "RUN" position without running the engine and the oil lamp stays off, then the hydraulic system may have failed. If such occurs, immediately contact your local dealer for repair.

### ◆ Various error warnings

If any components are detected to be in trouble, the following message appears onscreen.  
(See "LIST OF SCREENS" section)



### Information



(1) Information switch

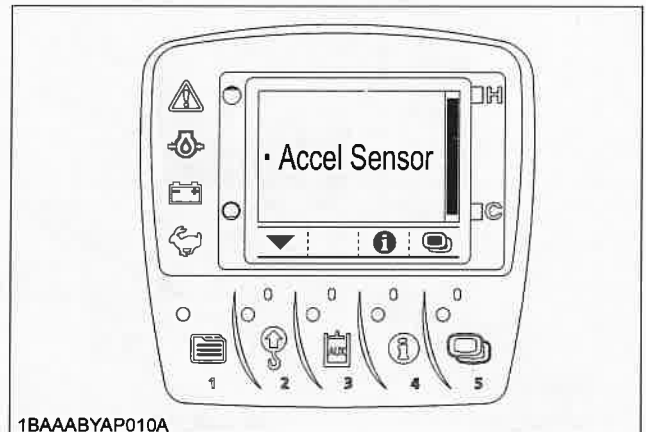
A "i mark" may appear together with a warning message.

If such occurs, the details can be checked by pressing the information switch.

When contacting your local dealer for repair, notify them of the information provided.

#### For Example;

Press the information switch, and a detail such as shown below appears.



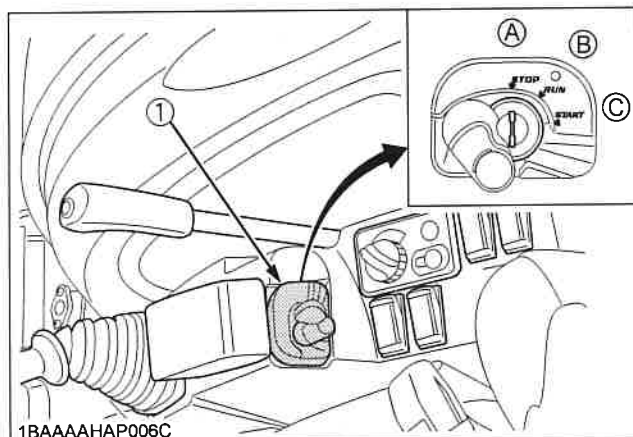
#### NOTE :

- Press the information switch again, and the display goes back to the previous screen.

## User settings

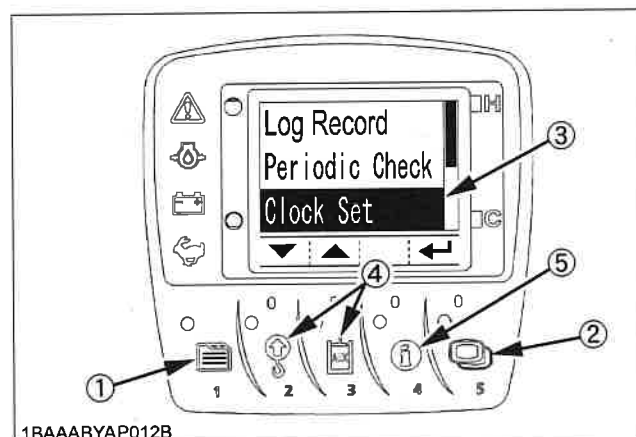
### ■ Setting the Clock

1. Turn the starter key to the "RUN" position.



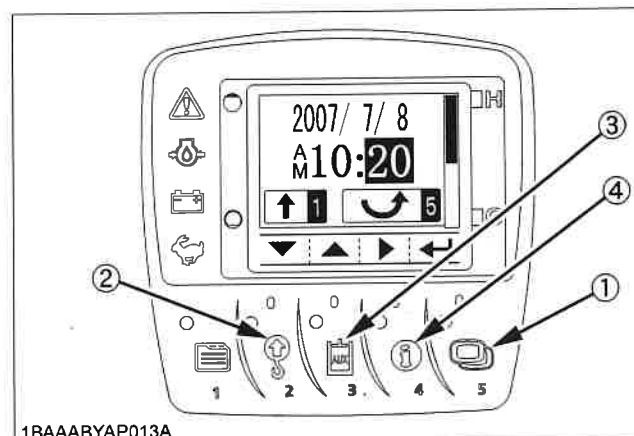
- (1) Starter switch  
(A) STOP  
(B) RUN  
(C) START

2. Press the switch 1 to make the log record/periodic check/clock set screen appear.



- (1) Switch 1  
(2) Switch 5  
(3) Cursor  
(4) Switch 2 and 3  
(5) Switch 4

3. Press the switch 2 twice to move the cursor into position. Then press the save switch 5 to make the following screen appear. By pressing the switch 4, the year, month, day, hour and minute will be selected in this order. Select an item to readjust.




- (1) Switch 5  
(2) Switch 2  
(3) Switch 3  
(4) Switch 4

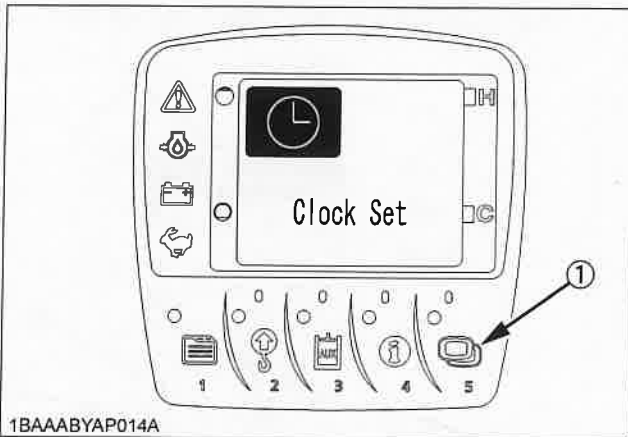
Press the ▼ switch (Switch 2) and the numeric setting will be smaller.

Press the ▲ switch (Switch 3) and the numeric setting will be larger.

Hold down the ▼ or ▲ switch, and the numeric setting will change quickly.

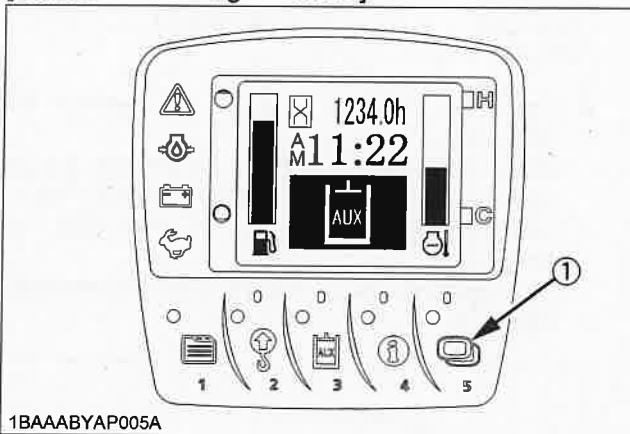
Press the ► switch (Switch 4), and the year, month, day, hour and minute will be selected in this order.

4. Save the new setting with the  switch (Switch 5). Press this switch 5 again to set the clock.



(1) Switch 5

[Status after setting the clock]



(1) Switch 5



## CAUTION

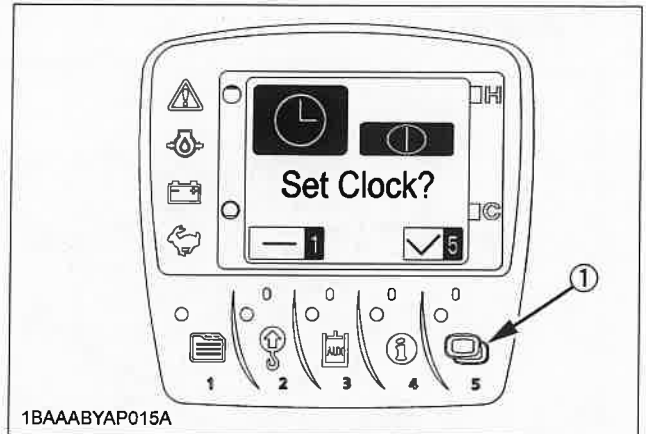
- Be careful not to accidentally press the switch 5 on the clock setting screen. Otherwise the seconds will be set to "00" and the clock will show the wrong time.

### NOTE :

- When the user setting switch (Switch 1) is pressed on the clock setting screen, the clock is not readjusted and returns to the previous menu screen.

### IMPORTANT :

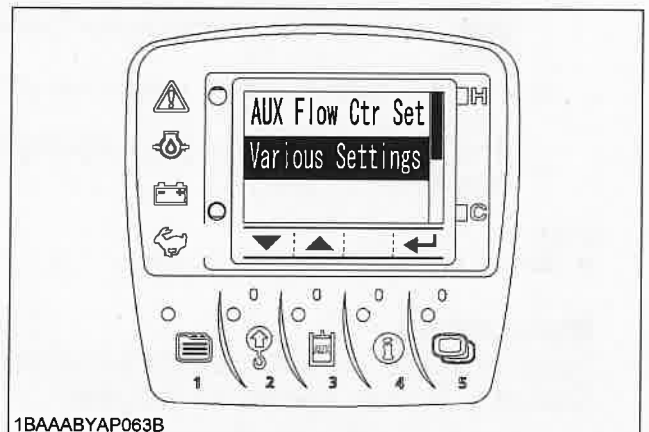
- If the clock is interrupted, for example when the battery is disconnected, the following message appears onscreen. Press the switch 5 to set the clock again.



(1) Switch 5

## Reordering the year/month/day and Changing the AM/PM System to the 24-hour One

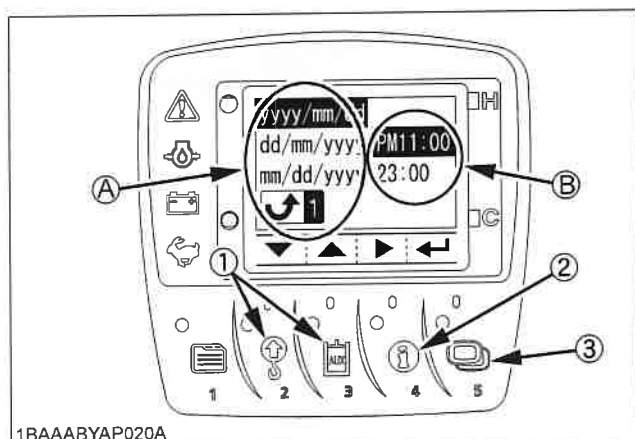
- On the user setting screen, select "Various Settings".



- Select "Calendar/Clock Set" menu screen.



3. Press the switch 5 and the following detailed screen shows up.



- (1) Switch 2 and 3 (A) Year/month/day display  
(2) Switch 4 (B) Clock display  
(3) Switch 5

- (1) Using the switch 2 and 3, move up and down the items. The year/month/day on Side (A) will be reordered.
- (2) Using the switch 4, move the cursor to Side (B). Select the "AM/PM" system or the "24-hour" system.
- (3) Press the switch 5, and the new settings will be made.  
If the switch 1 is pressed, the previous settings will remain.

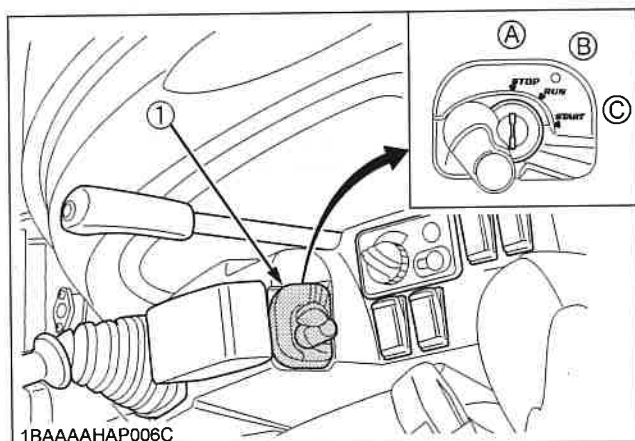
#### NOTE :

- Consult your KUBOTA dealer for details.

### ■ Log Record

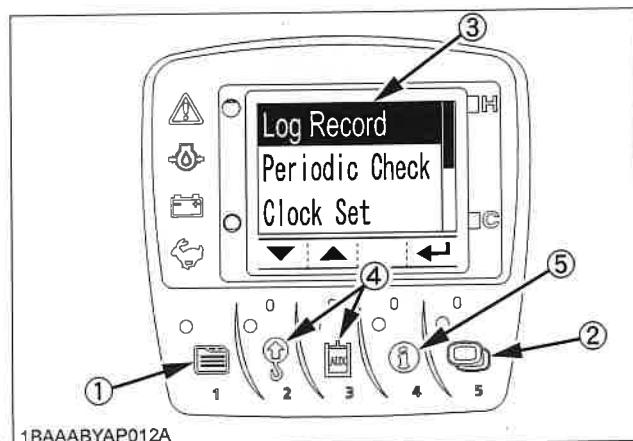
The log record helps you check the last 3-month operating record of the machine. Take the following steps.

1. Set the starter key to the "RUN" position.



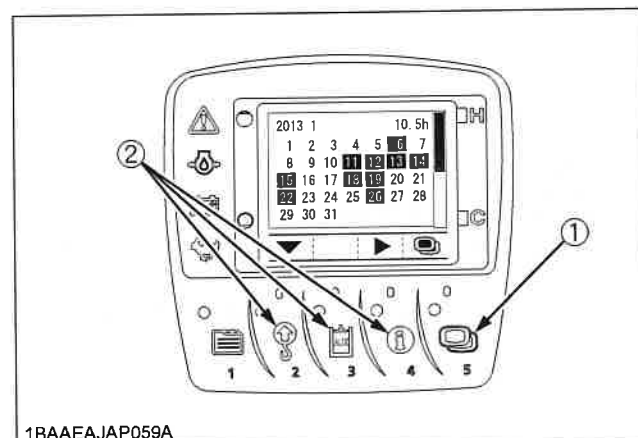
- (1) Starter switch  
(A) "STOP"  
(B) "RUN"  
(C) "START"

2. Press the switch 1 to make the menu appear onscreen.
3. Press the switch 2 and 3 to select the log record. Fix this choice with the ← switch (Switch 5).



- (1) Switch 1 (4) Switch 2 and 3  
(2) Switch 5 (5) Switch 4  
(3) Cursor

4. Press the switch 5 to make the calendar appear onscreen.  
Press the switch 2, and the log records (machine's operating days and operating hours) for the last month and the month before last (90 days ago) can be reviewed.  
The highlighted days indicate when the machine was operated.



- (1) Switch 5  
(2) Switch 2, 3 and 4

#### IMPORTANT :

- Some days may appear marked with [-] when the log record is unknown because of a new setting of the clock, a disconnection of the battery or other factors.

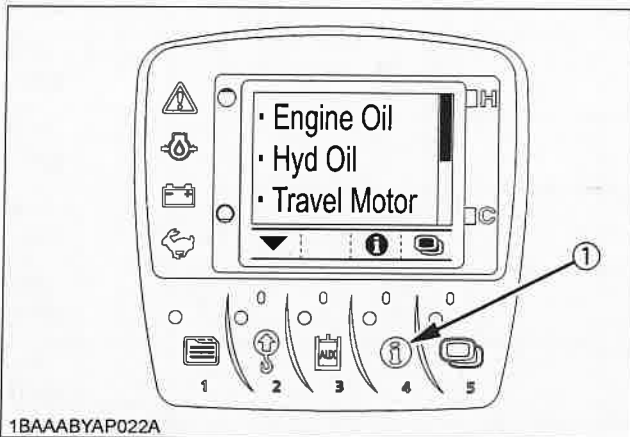


### ■ Periodic Check

The following message appears on the LCD 10 hours before a periodic check.



Press the switch 4 to see the check results.



(1) Switch 4

Do the following servicing listed below.

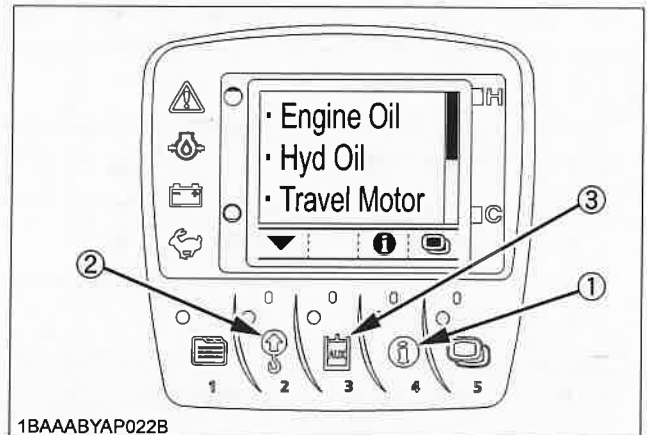
#### IMPORTANT :

- When the servicing has been completed, turn the key switch ON and OFF 10 times or more and the check screen automatically disappears.
- When the periodic check interval has passed, the message **"Periodic Check Passed"** shows up. Immediately perform the specified servicing.
- The periodic check screen can also be preset to be made to disappear manually only. To do this, it is necessary to select **"Periodic Check"** on the user setting menu.

For make this setting, contact your local dealer.

### ■ If All the Check Points are not Displayed at a Glance on a Single Screen

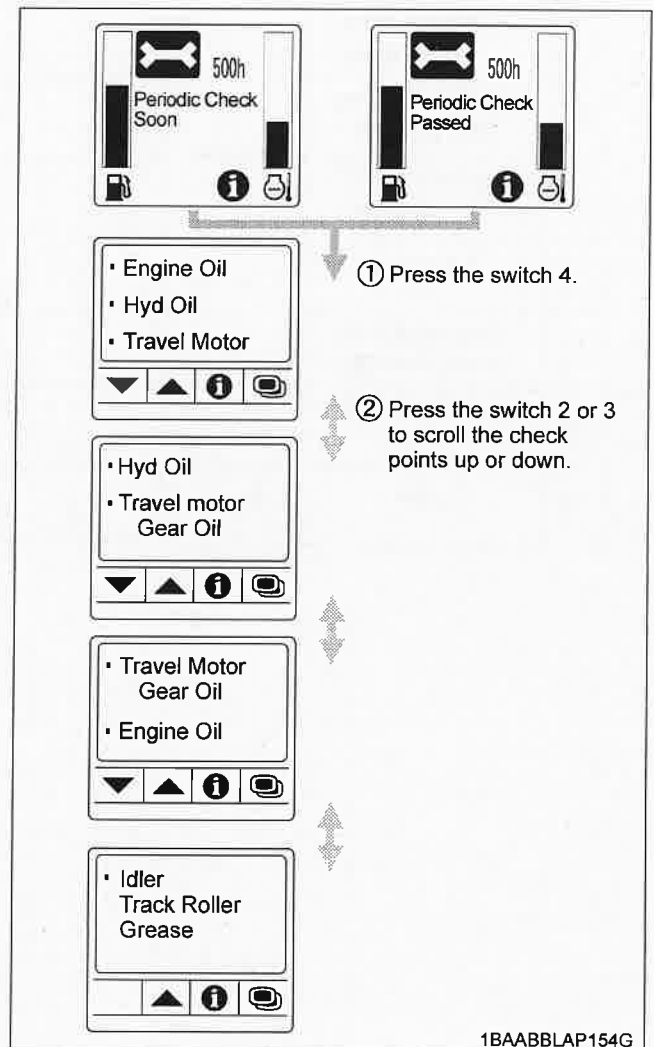
1. Press the switch 4.
2. Each time the switch 2 or 3 is pressed, the check points scrolled up or down.



(1) Switch 4

(2) Switch 2

(3) Switch 3



## ◆ Service hour meter

When the hour meter reaches the hours circled in the maintenance list below, a message appears. The message shows up as follows.

up as follows.

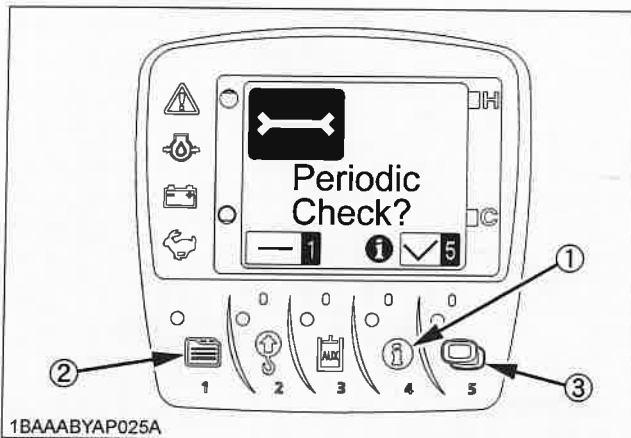
No.	Check points		Measures	Hour meter indicator								Intervals	
				50	250	500	550	750	1000	1500	2000		3000
1	Engine oil (CF-4)		change	●	○	○		○	○	○	○	○	every 250 hrs
2	Fuel filter		replace			○			○	○	○	○	every 500 hrs
3	Engine oil filter			●	○	○		○	○	○	○	○	every 250 hrs
4	Drive unit oil		change	●		○			○	○	○	○	every 500 hrs
5	Breather filter		replace			○			○	○	○	○	every 500 hrs
6	Hydraulic oil		change						○		○	○	every 1000 hrs
7	Air filter element	Outer element	replace						○		○	○	every 1000 hrs
		Inner element						○		○	○	every 1000 hrs	
8	Hydraulic return filter element							○		○	○	every 1000 hrs	
9	Hydraulic suction filter element							○		○	○	every 1000 hrs	
10	Pilot filter							○		○	○	every 1000 hrs	
11	Engine oil mist separator filter									○		○	every 1500 hrs
12	Idler, Track roller, grease		-							○		every 2000 hrs	
13	DPF		clean								○	every 3000 hrs	

● First operation

### ■When the Check-up is Completed

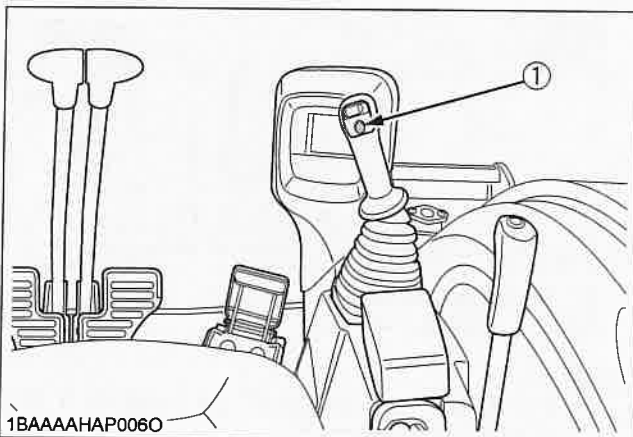
When the check-up is completed, perform the following procedure to make the Periodic Check disappear from the screen.

1. The message below appears onscreen to prompt the completion of the check-up.
2. To take a look at the check points, press the information switch. The check points appear onscreen.
3. When the check-up has been completed, press the switch 5. If not, press the switch 1 to go back to the previous screen.



- (1) Switch 4  
(2) Switch 1  
(3) Switch 5

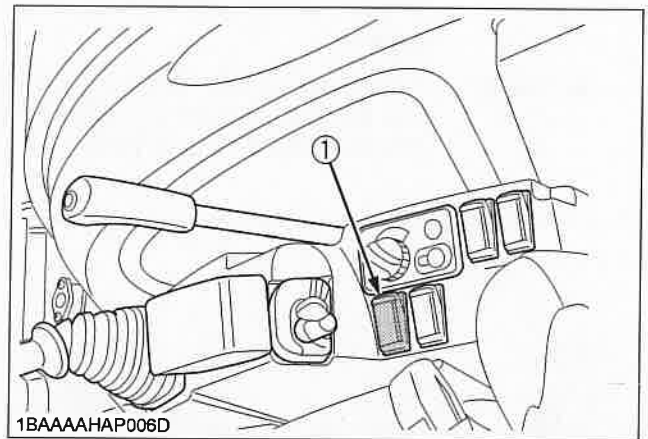
### ■Horn Switch



- (1) Horn switch

### ■Light Switch

When the starter switch is in position "RUN", the working light(s) and CAB light(s) will be switched on by pressing the switch.



- (1) Light switch

### ◆ Night operation



### CAUTION

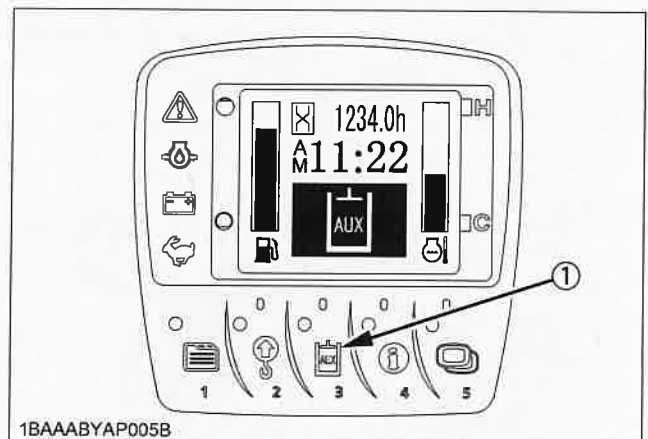
To avoid personal injury:

- When the working light and CAB light alone do not provide sufficient visibility, prepare additional stationary artificial lighting and observe safety rules for night work.

### ■AUX Port Flow Rate Limit Switch

It is possible to freely readjust the actuator's maximum flow rate in the AUX operating mode.

(See "AUX PORT OPERATION" section for detail.)

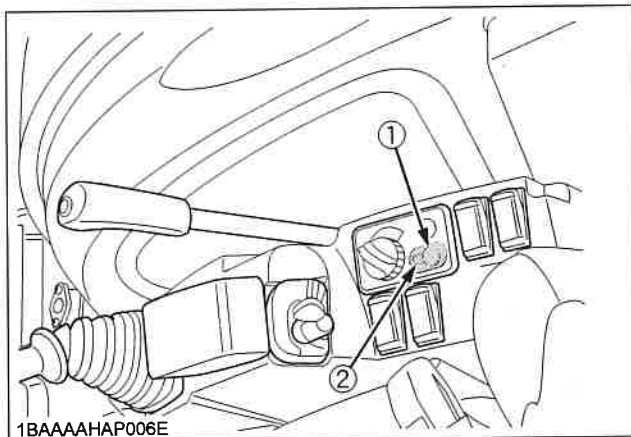


- (1) AUX port flow rate limit switch

### ■ Auto Idle Switch

The switch is used to enable and disable the Auto Idle control.

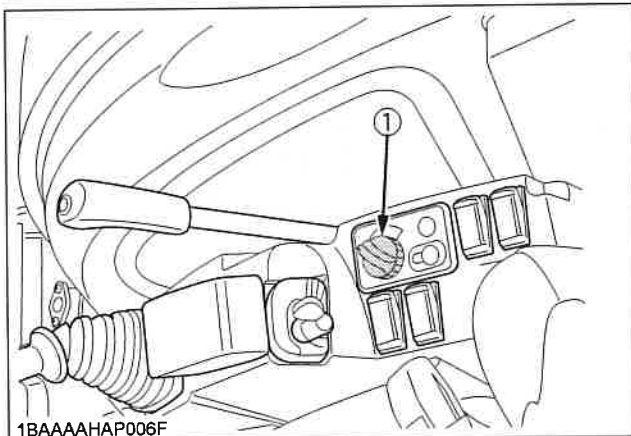
- **Enable:** Press the Auto Idle switch. When the Auto Idle control is on, the Auto Idle lamp stays on.
- **Disable:** Press the Auto Idle switch once again. Now the Auto Idle control is deactivated (The Auto Idle lamp goes out.)



(1) Auto idle switch  
(2) Auto idle lamp

### ■ Throttle Potentiometer

1. Sit down on the operator's seat and turn the throttle potentiometer clockwise (toward the high speed), and the engine revs up.
2. To stop the engine, turn the throttle potentiometer fully toward the low speed and keep the engine at the idling speed. Then set the starter key to the "STOP" position.





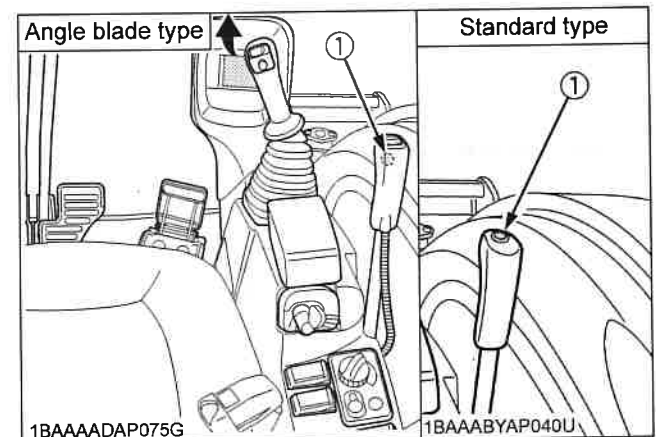
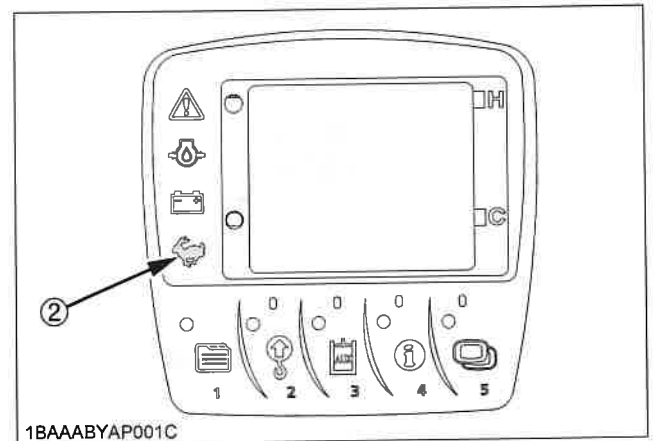
(1) Throttle potentiometer

### ■ Travel Speed Switch

Travel speed will increase when this switch is pushed down.

Switching the dual travel speed:

1. Press the travel speed switch. The buzzer beeps twice and the travel speed changes from low to high. The  symbol lights up.
2. Press the travel speed switch again, and the buzzer beeps once and the travel speed changes from high speed to low. The  symbol goes out.



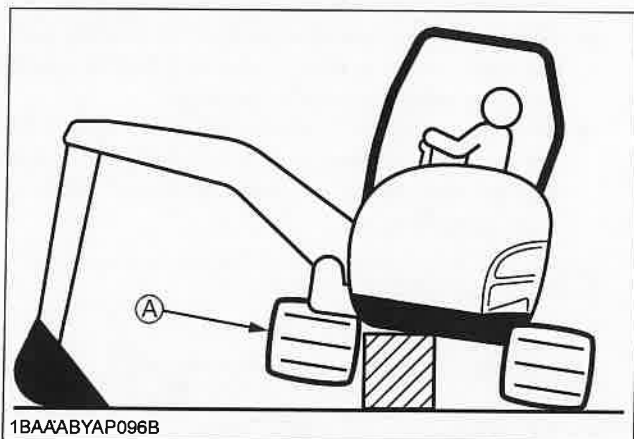
(1) Travel speed switch  
(2) Speed indicator light

#### NOTE :

- When activating the travel speed switch, it must be pushed down completely.
- Each time the travel speed switch is pressed, the travel speed is switched between low and high.

**IMPORTANT :**

- The travel speed automatically changes into first speed (low speed) when the drive resistance increases while traveling second speed (high speed). Thereafter, when the resistance decreases, it returns to second speed.
- If the tracks are clogged with sand or gravel while working on soft ground, lift up the track with the help of the boom, arm and bucket and dozer blade, and let the track rotate to remove the sand and gravel.



(A) "Rotate to remove sand and gravel"

**WARNING**

To avoid personal injury:

- Do not push the dozer control lever into the float position as this will cause the machine to suddenly drop.

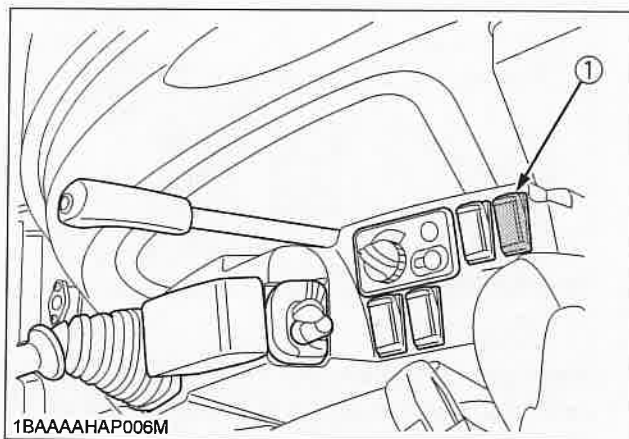
**DANGER**

To avoid serious injury or death:

- Do not work under the machine in this condition.

### ■ Inhibit Diesel Particulate Filter (DPF) Regeneration Switch

Inhibit Diesel Particulate Filter (DPF) regeneration switch (hereinafter called inhibit switch) disables the Auto DPF regeneration cycle. Activate this switch to turn "off" Auto DPF Regeneration when working around people, animals, plants, and flammable materials. Certain work conditions may require the Auto DPF regeneration cycle to be disabled. Depress the switch once to turn off Automatic mode. Depress the switch once again to return from disable to Automatic mode.

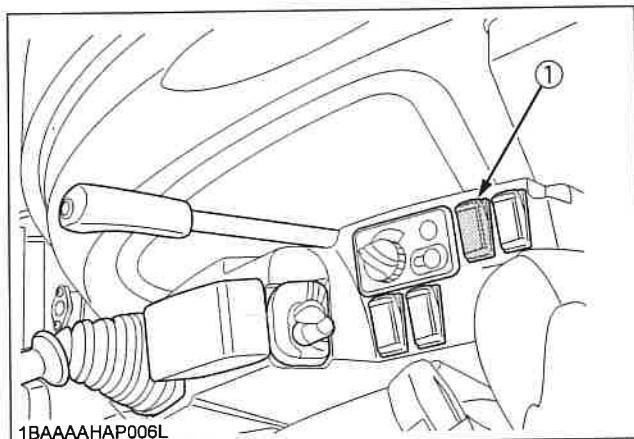


(1) Inhibit Switch

## ECO MODE

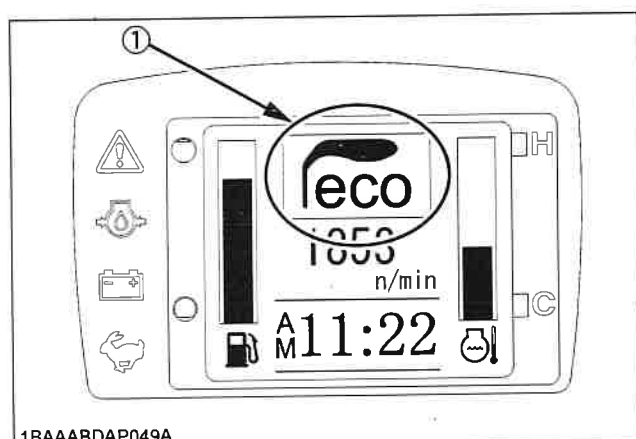
In the ECO mode, the jobs can be carried on with better fuel efficiency than in the standard mode.

Press the eco mode switch, and the implement panel lamp lights up and the machine comes in the ECO mode. Press this switch again, and the above lamp goes out and the machine comes back in the standard mode.



(1) ECO mode switch

When the machine operates in the ECO mode, the ECO mode mark appears on the LCD screen as shown in the following figure.



1BAAAADAP049A

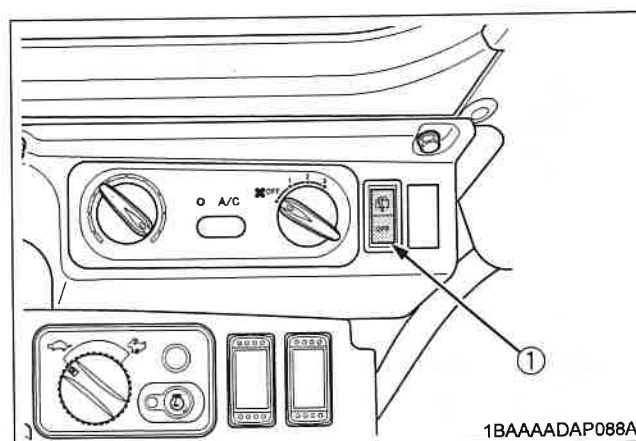
(1) ECO mode mark

## CAB TYPE MACHINES

### Wiper/Washer Switch

To engage the wiper, turn on the switch for the wiper when the starter key is in the "RUN" position. A further push on the switch will activate the washer system. Even when the wiper switch is in the "OFF" position, the washer switch functions if it is pressed.

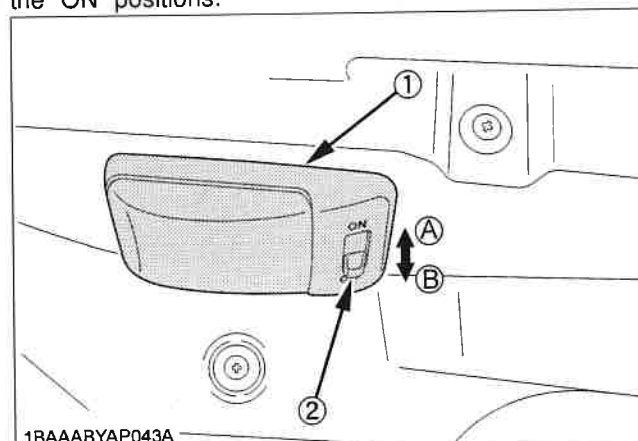
- Do not activate the washer switch if the tank for the cleaning fluid is empty; the pump can be damaged.
- Do not activate the wiper switch if the window is dry. In this case, make sure that cleaning fluid is applied to the pane before activating the wiper.
- In frosty conditions, make sure that the wiper blade is not frozen to the glass before switching-on. The motor can be damaged if the wiper system is used under such conditions.



(1) Wiper switch

### Interior Lamp

To turn on the interior lamp, set the interior lamp switch to the "ON" positions.



1BAAABYAP043A

(1) Interior lamp

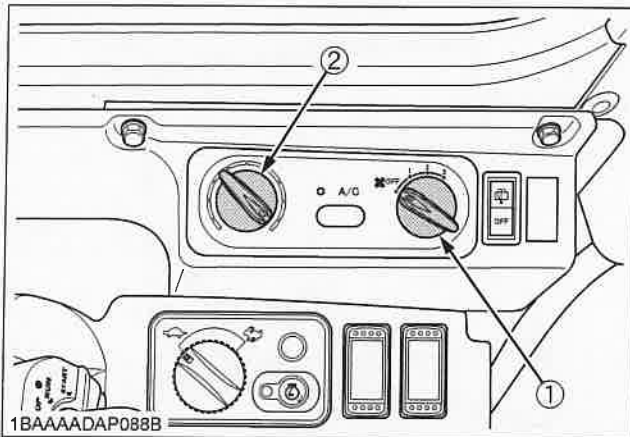
(2) Interior lamp switch

(A) "ON"

(B) "OFF"

### ■ Heater Switch

Turn the starter switch to the "RUN" position and turn the heater switch clockwise, the heater fan will be activated and the cabin will start to warm up. The heater has three position.

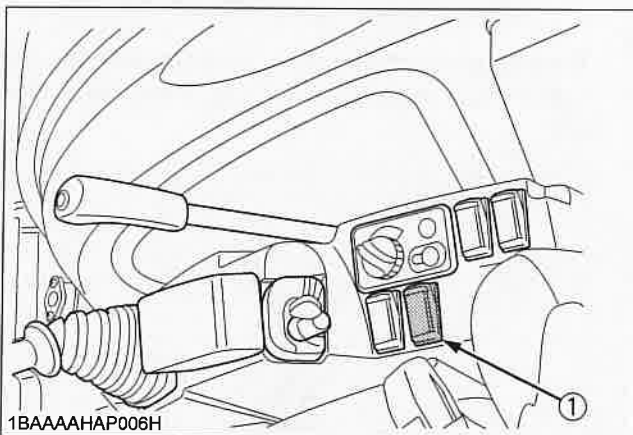


- (1) Heater switch
- (2) Temperature control dial

#### IMPORTANT :

- During summer, turn the heater valve clockwise to close the valve.

### ■ Beacon Light Switch



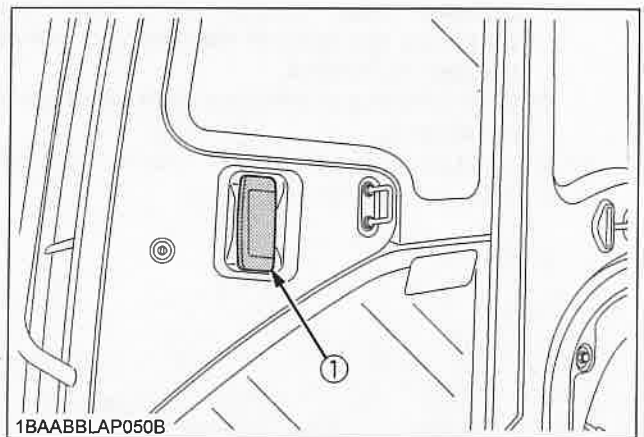
- (1) Beacon light switch

It is equipped only with the switch (including the coupler for connecting in a rear left speaker).

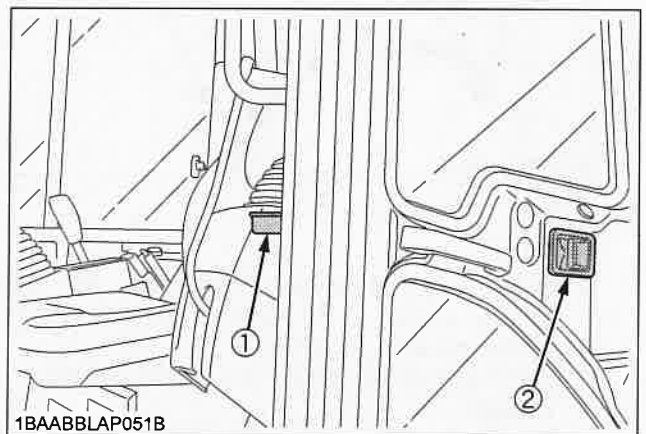
Since it isn't equipped with the beacon main part, please install when required.

### ■ Opening/Closing of CAB Door

1. Unlock the CAB door and pull the knob. Open the CAB door fully until fixed into place.
2. To close the CAB door, push the release lever down and close the door.



- (1) Door knob (outside)



- (1) Release lever
- (2) Door knob (inside)

3. When leaving the excavator, always lock the door.

## ■ Opening/Closing of Front CAB Window



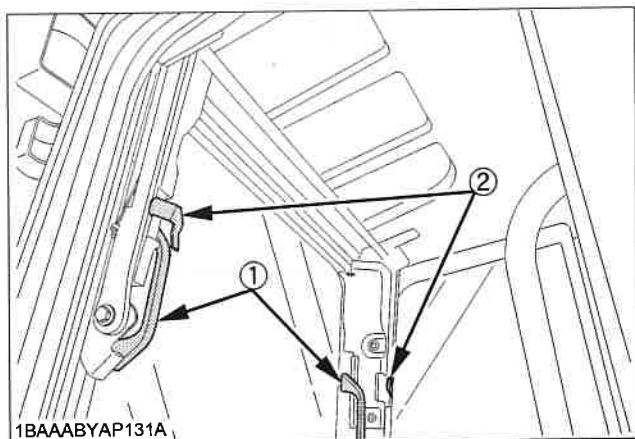
### CAUTION

To avoid personal injury:

- Keep hands and feet away from the area between front window and CAB frame. Otherwise the operator risks serious pinching or crushing injuries.
- Other persons should stay clear when opening the window.

To open and close the front window, take the steps below.

1. Push the lock levers beside grip.

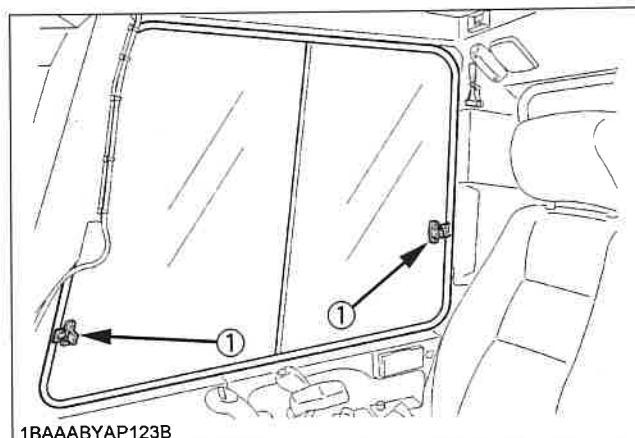


- (1) Grip  
(2) Lock lever

2. Hold the grips tightly with both hands. Pull the grip slightly upward and toward yourself to let the windshield slide inward.
3. Pull the windshield all the way to the lock at the back of CAB.
4. To close the window, take the reverse steps 3, 2 and 1.

## ■ Opening/Closing of Side CAB Window

1. Pull the grip to release the lock and pull side window open to the rear or to the front.
2. To close the side window, slide it forward or backward until the lock snaps in at the window frame.



- (1) Grip

## ■ Emergency Hammer

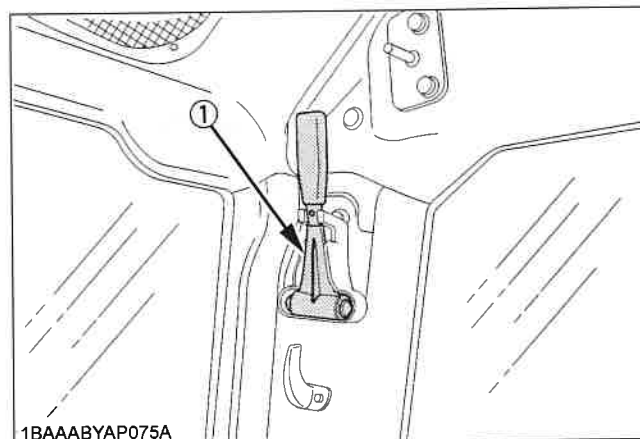


### CAUTION

To avoid personal injury:

- When breaking the window pane, close your eyes and cover them with an arm.

The emergency hammer is for breaking a window pane in order to quick escape from the cab, should the window not open.



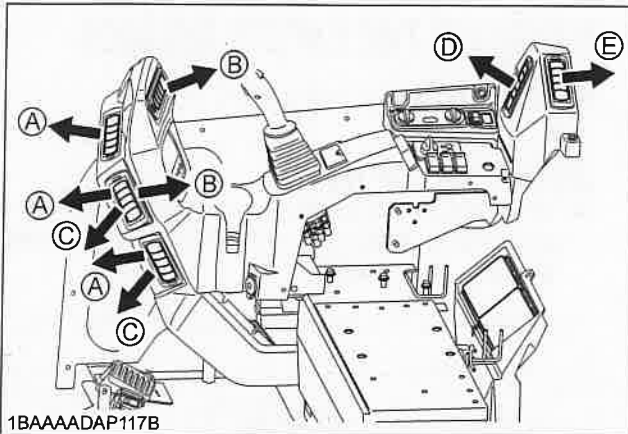
- (1) Emergency hammer



## AIR CONDITIONER

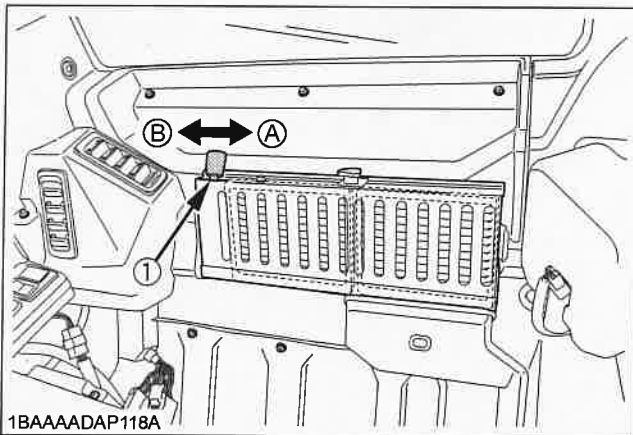
### ■ Air Flow

Air in the CAB and fresh air introduced into the CAB flow as shown in the figure. Adjust the six air outlet ports to obtain the desired condition.

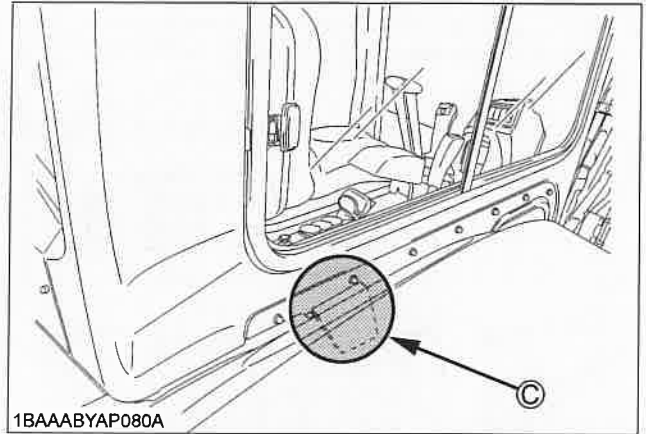


- (A) "FRONT WINDOW"
- (B) "CHEST AREA"
- (C) "FOOT AREA"
- (D) "SIDE WINDOW"
- (E) "BACKWARD"

Position the inlet selector lever to the desired position.



- (1) Inlet selector lever (A) "FRESH AIR INLET" position
- (B) "INNER AIR RECIRCULATION" position



(C) "FRESH AIR INLET"

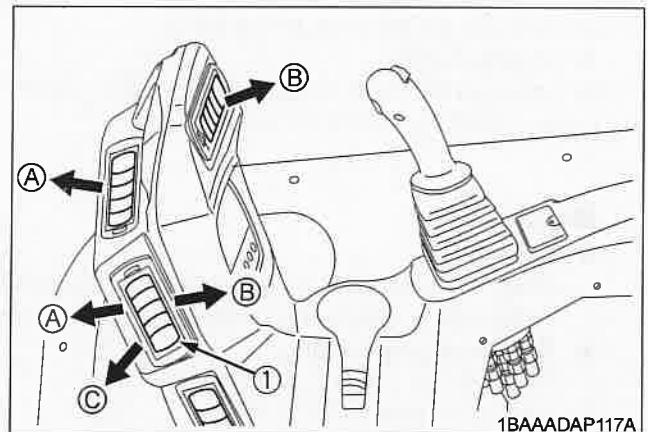
### IMPORTANT :

- Do not allow water to enter the fresh air port while washing the excavator.

### ■ Air Control Vent

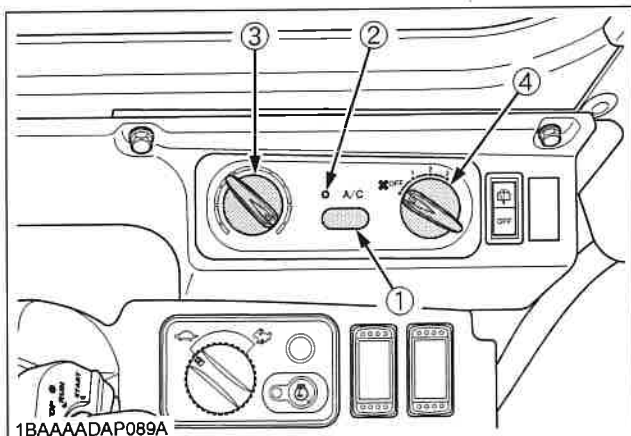
#### ◆ Front air outlet

The front air outlets can be independently adjusted as required. To defrost the windshield, rotate the outlets toward the windshield.



- (1) Front air outlet
- (A) "FRONT WINDOW"
- (B) "CLOSED"
- (C) "FOOT AREA"

## Control Panel



- (1) Air conditioner switch      (3) Temperature control dial  
(2) Indicator light              (4) Blower switch

### Air Conditioner Switch and Indicator Light

Push this switch to activate the air conditioner. An indicator light will light up when the switch is set to "ON". Push switch again to turn air conditioner off, the indicator light will go off.

### Temperature Control Dial

Set this dial at the desired position to obtain the desired air temperature. Turn the dial to the right to obtain cooler air. Turn it to the left to obtain warmer air.

### Blower Switch

Air volume can be changed in three steps. At the "3" position, the largest air volume is obtained.

## Operation

### Heating

1. Adjust the blower (1/2/3) switch and the temperature control dial to achieve the desired temperature level.

### Dehumidifying-heating

1. Press and turn on the air-conditioner switch.
2. Turn on the blower (1/2/3) switch.
3. Adjust the temperature control dial to the "COOL" or an intermediate position to achieve the desired temperature level.

### NOTE :

- Be sure to close the door while the air conditioner is ON otherwise, you may overload the compressor.

### Cooling

1. Press and turn on the air-conditioner switch.
2. Turn on the blower (1/2/3) switch.
3. Adjust the temperature control dial to the "COOL" or an intermediate position to achieve the desired temperature level.

### Defrosting or demisting

To defrost or demist the windshield, take the following steps.

1. Open the front air outlet and direct it to the windshield.
2. Set the blower switch and the temperature control dial to the "3" and "WARM" (leftmost) positions, respectively.

## HANDLING THE SAFETY DEVICES

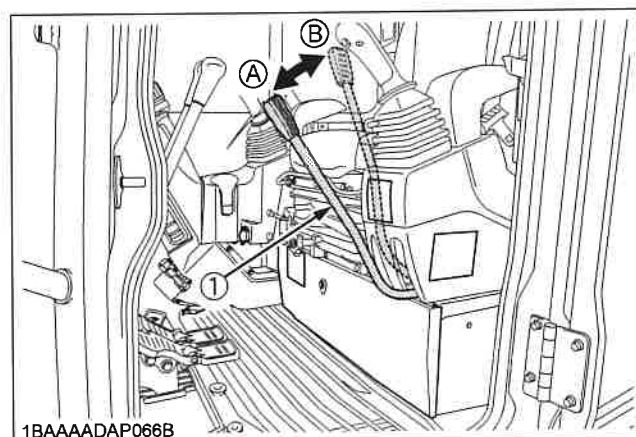
### Pilot Control Lock Lever



### CAUTION

- When the excavator is not used or left unattended, be sure to place the pilot control lock lever in position "LOCKED".

The pilot control lock lever is located on the left side.



(1) Pilot control lock lever

(A) "UNLOCK"  
(B) "LOCKED"

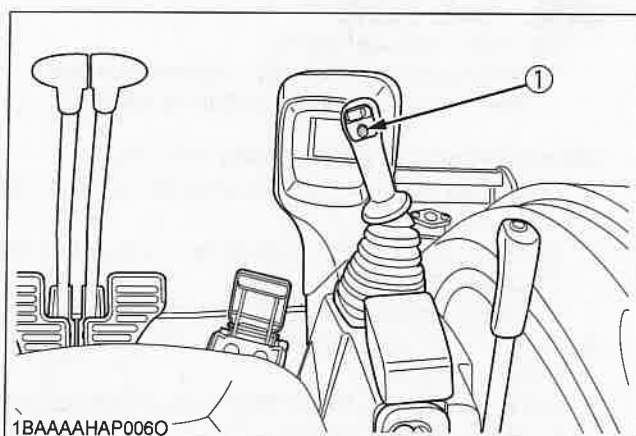
# OPERATION OF THE ENGINE



## CAUTION

To avoid personal injury:

- Read "SAFE OPERATION" at the beginning of this operator's manual.
- Obey the danger, warning and caution labels on the excavator.
- To avoid the danger of exhaust fume poisoning, do not operate the machine in a closed building without proper ventilation.
- Always start the engine from the operator's seat. Do not start the engine while standing next to the excavator. Before starting the engine, sound the horn to get the attention of persons standing nearby.



(1) Horn switch

## IMPORTANT :

- Do not use starting fluid or ether.
- In order not to overload the battery and starter, avoid engaging the starter for more than 10 sec.
- If the engine does not start in 10 sec., please wait 20 sec. or more, before attempting to restart.

## STARTING THE ENGINE



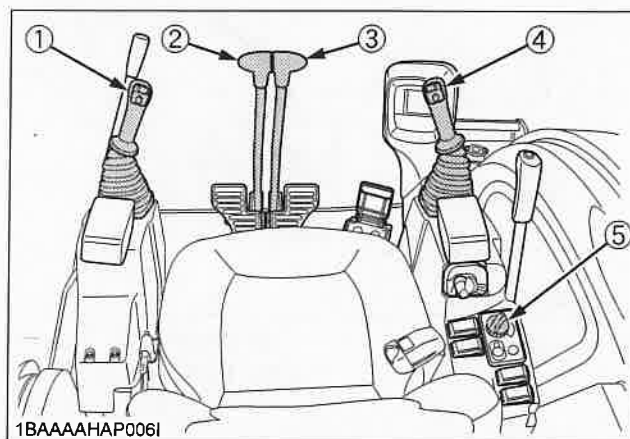
## CAUTION

To avoid personal injury:

- The operator should not depend solely on the warning lamps, but should always conduct the routine checks (see "MAINTENANCE").

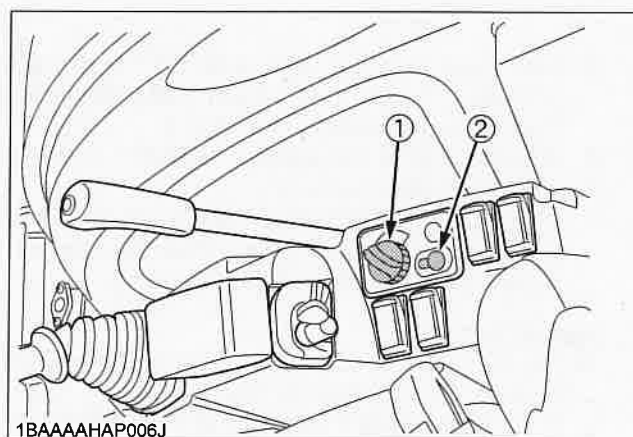
Start the engine in the following manner:

1. Before starting the engine, make sure that all control levers are in the neutral positions.



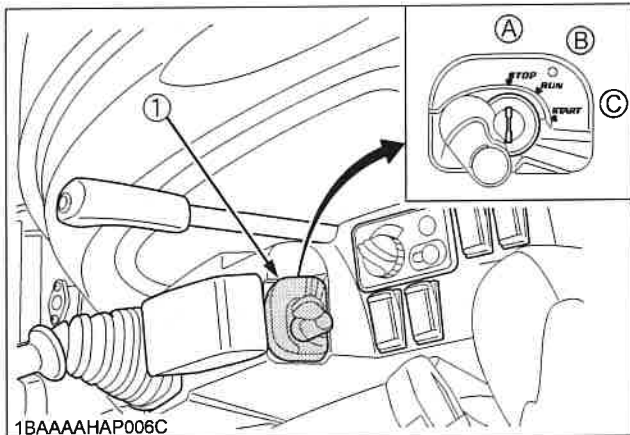
- (1) Attachment control lever (left)
- (2) Drive lever (left)
- (3) Drive lever (right)
- (4) Attachment control lever (right)
- (5) Throttle potentiometer

2. Pull the pilot control lock lever all the way back. ("LOCKED" position)
3. Put the throttle potentiometer in the middle between "🐢" and "🐇" symbols. The auto idle control switch is in the OFF position. (See "AUTO IDLE (AI) OPERATION" in the Excavator operation.)



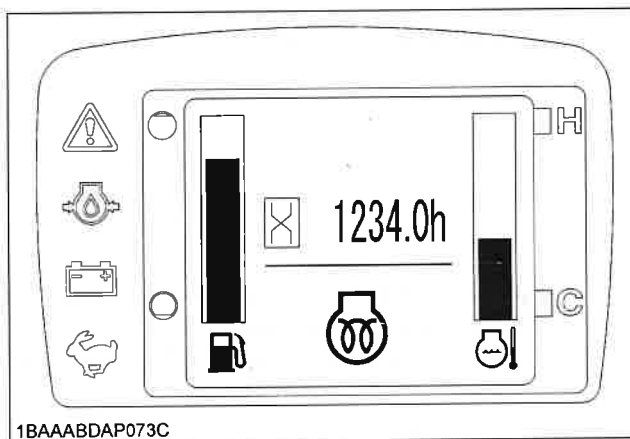
- (1) Throttle potentiometer
- (2) Auto idle control switch

4. Set the starter key to the **"RUN"** position. Hold the key at this position until the "00" mark on the display panel disappears.



(1) Starter switch

(A) "STOP"  
(B) "RUN"  
(C) "START"



1BAAABDAP073C

- Now make sure the "⚠" and "🔋" marks appear onscreen. If not, the system has malfunctioned. Contact your local dealer for repairs.
- Turn the key to the position **"START"** and release after the engine has started.
- Check if all warning lamps have gone out. Should a warning lamp still be lit up, stop the engine then remove the key and check for the cause.

#### IMPORTANT :

- The starter motor draws a large current. Avoid running it longer than 10 seconds continuously. If the engine fails to start within 10 seconds, set the key to the **"STOP"** position, wait for 20 seconds or longer, and repeat the above steps 5 thru 7.
- If the battery is dead and must be connected to another battery with jumper cable, be sure to use a 12V battery. Never use 24V batteries.

#### NOTE :

- If you keep the pilot control lock lever at **"UNLOCK"** and try to start the engine, **"Up Lever Lock"** appears on the meter panel and the engine cannot be started. Before starting the engine, make sure the pilot control lock lever is set at the **"LOCKED"** position.



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- When the engine starts, the meter may momentarily turn off and a beep may sound. This is not a problem.

## STARTING THE ENGINE UNDER COLD CONDITIONS



### CAUTION

To avoid personal injury:

- Make sure that the pilot control lock lever is in the **"LOCKED"** position during warm up.

Start the engine in the following manner;

- Make sure the auto idle control switch is at the **"OFF"** position (lamp off).
- Pull the pilot control lock lever all the way back. (**"LOCKED"** position)
- Insert the starter key into the starter switch.
- Turn the throttle potentiometer toward "⚡" (high speed) position.
- Set the starter key to the **"RUN"** position. Hold the key at this position until the "00" mark on the display panel disappears.
- Turn the starter key to the **"START"** position.
- Once the engine starts, release your hand from the key. The key will return back to the **"RUN"** position.
- If the engine fails to start, set the starter key to the **"STOP"** position, and repeat the above steps 5 thru 7.

#### IMPORTANT :

- Let the engine warm up after start-up for approx. 10 minutes under no load conditions. If the hydraulic fluid temperature is too low, the operation will be affected. Do not operate the excavator under full load until the engine has sufficiently warmed up.

## STARTING WITH AN AUXILIARY BATTERY



### CAUTION

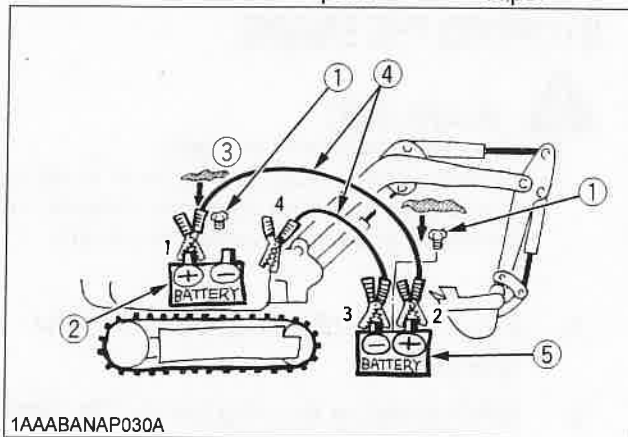
To avoid personal injury:

- Battery gases can explode.  
Do not smoke and keep sparks and flames away.
- Do not start the engine with an auxiliary battery if excavator battery is frozen.
- Do not connect the black jumper cable to the negative (-) terminal of the excavator battery.

### ■ Observe Following Guidelines when Starting with an Auxiliary Battery

1. Bring the helping machine with the same battery voltage as near as possible to the excavator.  
THE MACHINES MUST NOT COME IN CONTACT WITH EACH OTHER.
2. Bring the levers and pedal of both vehicles in the neutral position and put the pilot control lock lever in the "LOCKED" position.
3. Wear eye protection and rubber gloves.
4. Open the side cover. (See "Opening / closing of the Side Cover" in "MAINTENANCE" section.)
5. Ensure the vent caps are securely in place (if equipped).
6. Cover the battery opening with a cloth. Make sure that the cloth does not touch the battery terminals.
7. Connect the terminal of the red jumper cable with the plus (+) terminal of the low battery and connect the other end of the cable to the plus (+) terminal of the auxiliary battery.
8. Connect the black negative cable to the minus (-) terminal of the auxiliary battery.
9. Connect the other end of the black cable (coming from the auxiliary battery) to the excavator frame as far away as possible from the low battery.
10. Start the engine of the helping machine and let it run for a while. Start the excavator with the low battery.
11. Disconnect the jumper cables in the reverse sequence (Steps 8, 7, 6).

12. Remove the cloth and replace the vent caps.



1AAABANAP030A

- (1) Lay a damp rag over the vent caps
- (2) Low battery
- (3) Put a cloth over the battery openings
- (4) Jumper cables
- (5) Auxiliary battery

### IMPORTANT :

- This excavator has a negative (-) ground 12 Volt starting system.
- Use only the same voltage when using an auxiliary battery.
- Using a higher voltage will cause serious damage to the electrical system. When using an auxiliary battery, only the compatible (same) voltage is permissible.

## CHECK POINTS AFTER STARTING THE ENGINE

After starting the engine, but before starting operation, check the following points:

1. Put the throttle potentiometer in the middle between "🐢" and "🐇" symbols and let the engine idle for approx. five minutes. This allows the engine lubricant to warm up and penetrate every part of the engine.
2. Once the engine has warmed up, check:
  - the warning lamp "Engine oil pressure" has gone out.
  - the warning lamp "Battery charge" goes out when engine speed is increased.
  - the color of the exhaust is normal and no abnormal noises or vibrations are heard or felt.
  - no fluid is leaking from pipes or hoses.

### ◆ Should any following conditions occur, stop the engine immediately.

- The engine rpm's increases or decreases suddenly.
- Sudden abnormal noises are heard.
- Exhaust is black.
- Warning lamp for engine oil lights up during operation.

### IMPORTANT :

- In these cases, the excavator must be checked and serviced by your local the KUBOTA dealer.

## STOPPING THE ENGINE



### WARNING

To avoid personal injury or death:

- Do not keep the bucket or dozer in an elevated position, as a person could accidentally touch the levers and cause serious accidents.

1. Place the bucket and dozer on the ground.
2. After slowing the engine to idle, wait 3 to 5 minutes for turbo to slow down and then turn the key to "STOP" position.
3. Remove the key.
4. Pull the pilot control lock lever to "LOCKED" position.

### ■ Engine Stop Button



### CAUTION

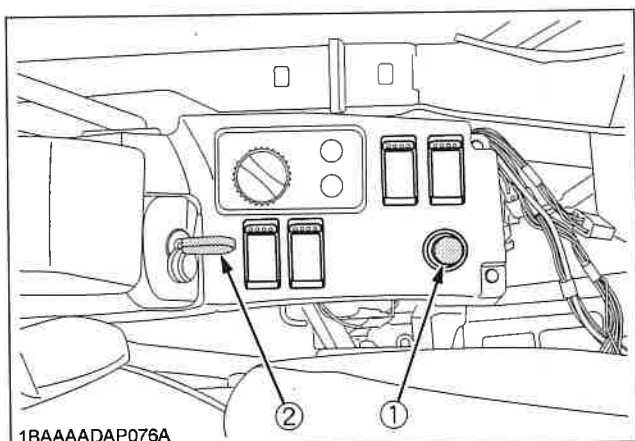
To avoid personal injury:

- Keep hands away from rotating parts.

#### IMPORTANT :

- Be sure to return the stop button to former position after the engine stops.

The engine stops when the starter key is turned off. If the engine does not stop, pull the stop button to stop the engine.



- (1) Stop button  
(2) Starter key

### ■ Precautions in case of Overheat



### CAUTION

To avoid personal injury:

- Do not open the radiator cap during operation or just after shut-down. Otherwise, steam or very hot coolant may gush out, getting you scalded. Make sure the radiator has cooled down enough before opening its cap.

If by any chance the coolant temperature rises close to or above the boiling point ("H" on the water temperature gauge) (overheat condition), take the following steps.

1. Stop operating the machine.  
(Relieve the engine of any load.)
2. Do not shut off the engine suddenly. Before shutting off the engine, keep it idling under no load for about 5 minutes.
3. Stay away from the engine or overflow for 10 minutes or until the steam overflow stops.
4. Be sure that there is no danger of getting scalded. Pinpoint and remove the cause of overheat, referring to the "TROUBLESHOOTING" section. Once the issue is resolved, the engine may be restarted.

### ■ DPF Regeneration

This machine is equipped with a DPF (Diesel Particulate Filter) muffler.

DIESEL PARTICULATE FILTER serves to trap particulate matters (PM) that are contained in exhaust gases and to automatically burn (DPF-regenerate) these matters. In the regeneration, buzzer sounds and warning light blink and display shows messages.

Follow that instruction.

(Refer to page 115)

# EXCAVATOR OPERATION

## RUNNING-IN OF THE NEW EXCAVATOR

The operation and care of the new excavator influences its life span. Your new excavator has been carefully checked and tested before leaving the factory. In spite of this, all movable components must run-in during the first 50 work hours. Do not work with full rpm's and full loads during this period. It is very important to run-in your excavator properly in order to achieve its full performance and longevity. During the running-in, the following points should be adhered to in all cases.

### ■ Do not Work with Full Engine Rpm's or Full Loads during the First 50 Working Hours

- Let the engine warm up sufficiently in the cold season.
- Do not let the engine rev-up more than necessary except the DPF regeneration.

### ■ Oil Change in the Run-in Stage

The lubrication oil plays a specific and important role during the run-in phase of the excavator. The numerous movable parts are not yet run-in, so many fine metal particles are generated, which can cause damage and shorten the life of many components. Pay attention to the oil-change intervals and complete them sooner than later. See "REGULAR CHECKS AND MAINTENANCE WORK" section for more details on the oil-change intervals.

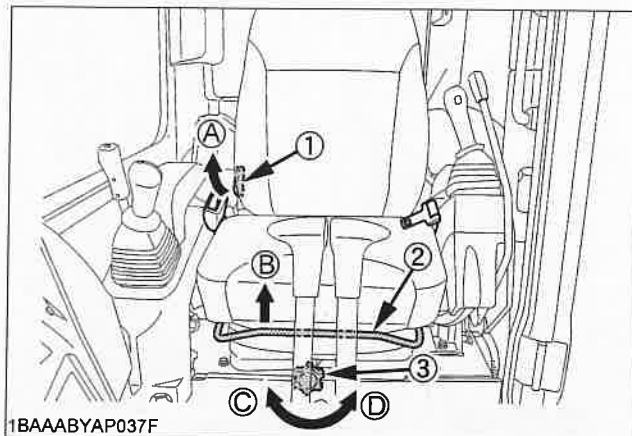
## ■ Adjusting the Operator's Seat



### CAUTION

To avoid personal injury:

- Make sure that the seat is completely secured after each adjustment.



- |                                |                           |
|--------------------------------|---------------------------|
| (1) Backrest tilt adjust lever | (A) "UNLOCK"              |
| (2) Travel adjust lever        | (B) "UNLOCK"              |
| (3) Weight adjust lever        | (C) "TO INCREASE TENSION" |
|                                | (D) "TO DECREASE TENSION" |

### ◆ Tilt adjustment

Pull the backrest tilt adjust lever in the direction of [A] and move the backrest to the desired angle.

### ◆ Travel adjustment

Pull the travel adjust lever in the direction of [B] and slide the seat backward or forward, as required. The seat will lock in position when the lever is released.

### ◆ Weight adjustment

Turn the weight adjust lever to achieve the optimum suspension setting.

### ◆ Height adjustment

The seat height can be adjusted to three positions. To adjust the seat height, slowly raise the seat until it automatically engages in the next stop.

When the seat is raised over the highest stop, it will be lowered automatically to the lowest position again.

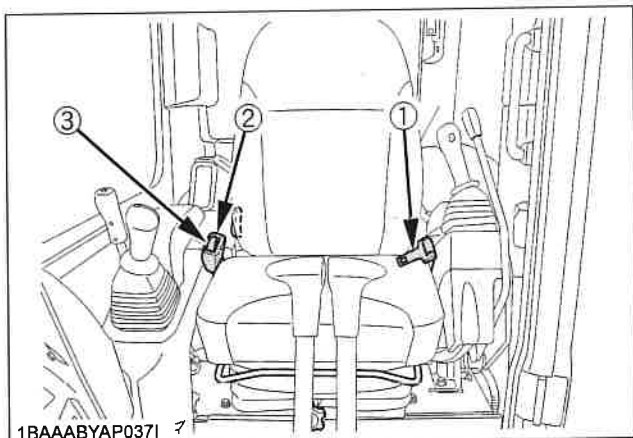
## ■ How to Use the Seat Belt



### WARNING

To avoid personal injury or death:

- Always use the seat belt with a ROPS and OPG protection structure. Adjust the operator's seat to the optimal position and buckle it up.
- Always fasten the seat belt securely before starting the engine.



- (1) Seat belt  
(2) Socket  
(3) Button

### ◆ Fastening the seat belt

1. Pull the seat belt from the retractable (left) side of the operator's seat.
2. Insert the fixture of the seat belt into the socket at the right side of the operator's seat until the fixture clicks deep into position.

### ◆ Releasing the seat belt

1. Press the red button of the socket to release the seat belt.  
The seat belt reels itself and gets retracted to the left side.

### IMPORTANT :

- When removing the seat belt, store the belt straight. If you store the belt without straightening it, the seat belt locking mechanism may not work properly.

## STARTING



### CAUTION

To avoid personal injury:

- No persons, other than those who have read and understand this manual and who are familiar with the excavator, should be allowed to use the excavator.
- Do not allow any person other than the operator to ride on the excavator.
- When operating, keep hands and body inside of the ROPS/OPG (Top Guard Level I) protective.
- Do not touch the control levers and the pedals from outside the cab while the engine running.

## ■ Pilot Control Lock Lever



### CAUTION

To avoid personal injury:

- To avoid injuries, check safety aspects all around the excavator.

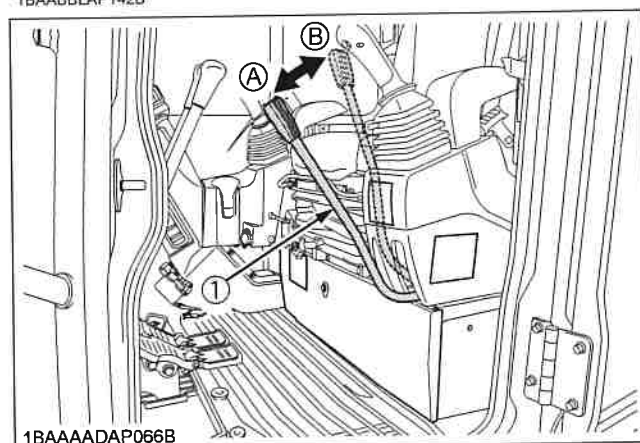
### NOTE :

- If the pilot control lock lever is pulled down, the engine will fail to start.

Don't attempt to start the machine with the pilot control lock lever in the down position (A), if attempt is made the following message appears on the LCD.



1BAABBLAP142B



(1) Pilot control lock lever

(A) "UNLOCK"  
(B) "LOCKED"

### IMPORTANT :

- Always pull pilot control lock lever up to "LOCKED" position (B) when you stop the engine or leave the operating structure.



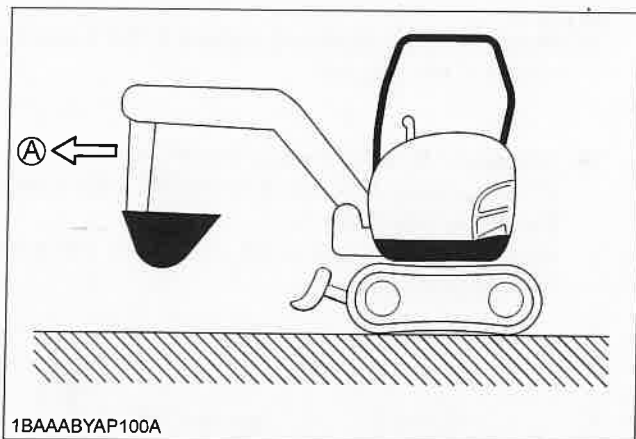
## DRIVING



### WARNING

To avoid personal injury or death:

- Before starting the engine, make sure that no one is near the excavator.
- Before operating the excavator, check the track direction. (Front idler and dozer blade to the front of the excavator).

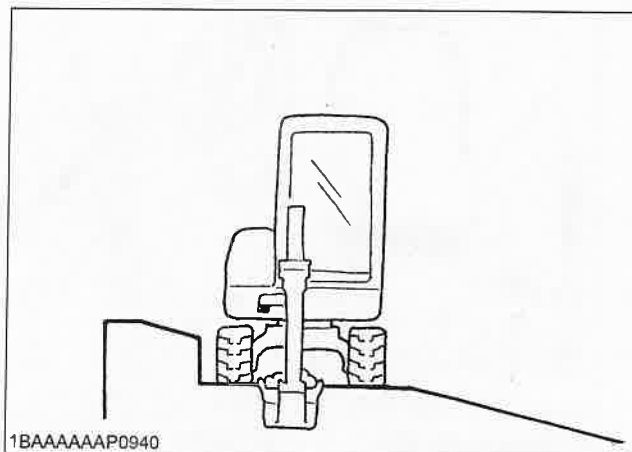


(A) "Front of the excavator"

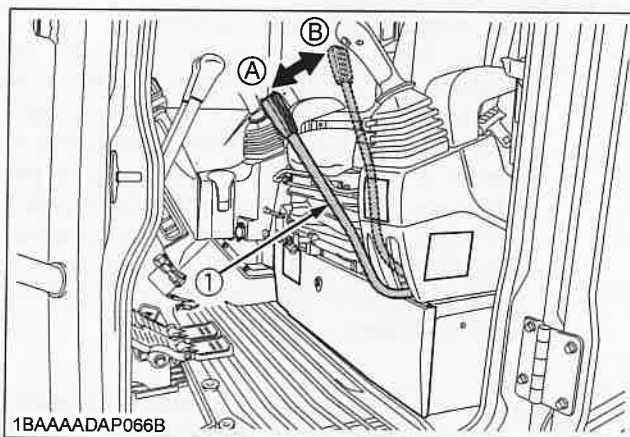
- Use extra caution when traveling across a slope or working sideways on a slope.



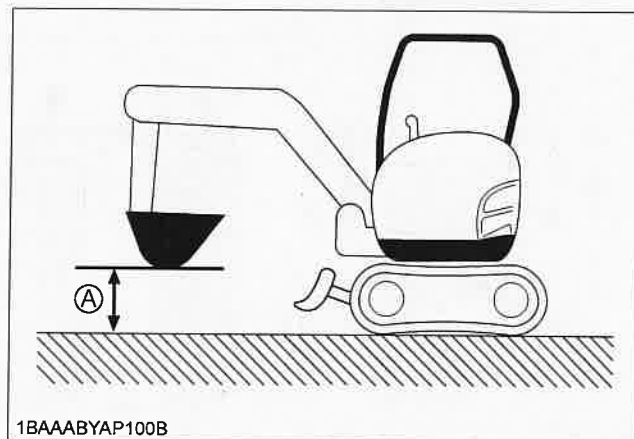
- Recommended technique for working on a slope.



1. Adjust the engine speed from idling to an intermediate speed.
2. Unlock the pilot control lock lever and pull in the bucket and hold the bucket about 20 to 40 cm above the ground.



- (1) Pilot control lock lever (A) "UNLOCK"  
(B) "LOCKED"



(A) 20 to 40 cm

3. Activate the dozer control lever to raise the dozer.



- (1) Dozer control lever  
(2) Dozer

- (A) "Raise"  
(B) "Lower"

### ■ Drive Levers (Right, Left)

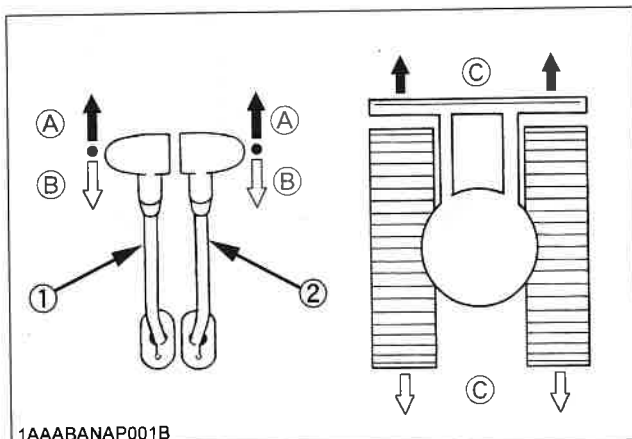


### WARNING

To avoid personal injury or death:

- When driving the excavator keep the dozer blade in front. To move the excavator forward, move the drive levers to (A) and to move in reverse, move the drive levers to (B) with dozer blade in front. If the dozer blade is behind operator station, then the controls are reversed, moving the excavator forward will require (B) and moving the excavator backwards will require (A), but this is not recommended.

Pushing the drive levers forward, moves the excavator forwards, and vice-versa. The front of the excavator is the side where the dozer is located; the drive sprocket is in the rear of the excavator.



- (1) Drive lever (left)  
(2) Drive lever (right)

- (A) "Forward"  
(B) "Backward"  
(C) "Straight"

## URNS



### CAUTION

To avoid personal injury:

- Do not change direction on steep slopes, or the excavator could tip over.
- Before changing direction, beware of people in the work area.

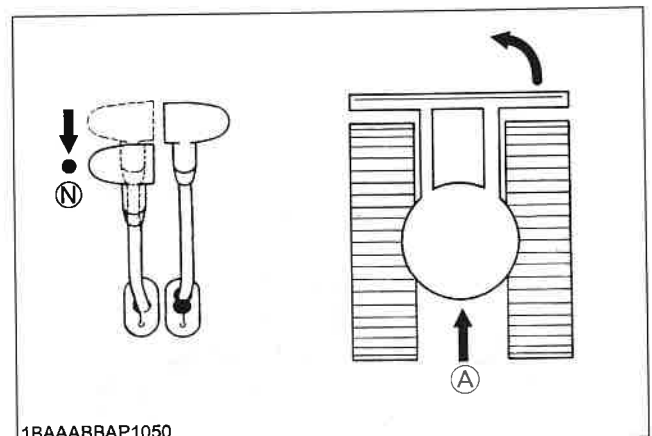
### ■ Pivot Turn

#### NOTE :

- Movement as illustrated is done with the dozer blade in front of the operator.

### ◆ Change of Direction while Travelling

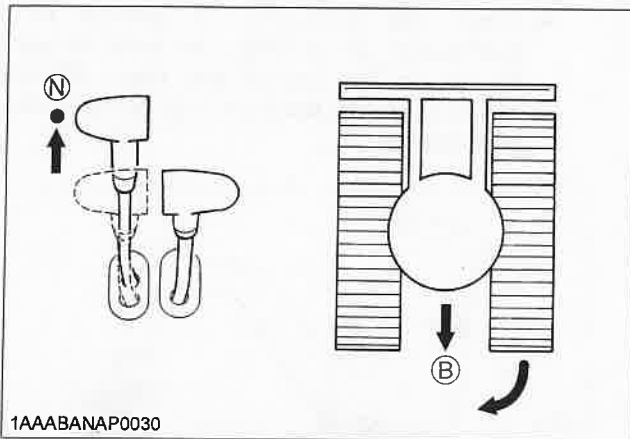
- While travelling forward, bring the left drive lever into the neutral position; the excavator will turn in the direction of the arrow of the illustration below.



- (A) "Travelling forward"

- (N) "Neutral position"

- While travelling backward, bring the left drive lever into the neutral position; the excavator will turn in the direction of the arrow of the illustration below.

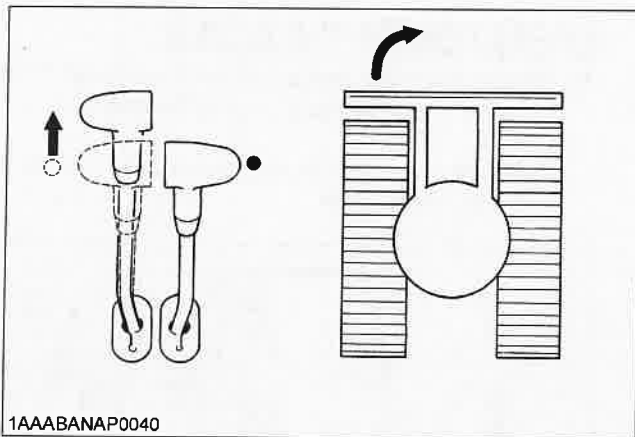


(B) "Travelling backward"

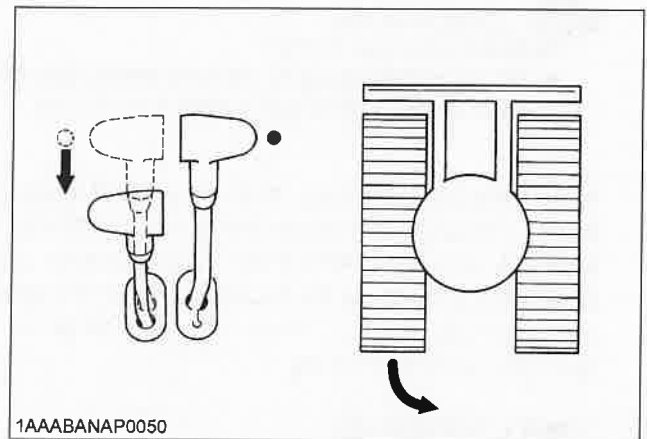
(N) "Neutral position"

#### ◆ Change of Direction while Stationary

- Push the left drive lever forward; the excavator will turn in the direction of the arrow of the illustration below.

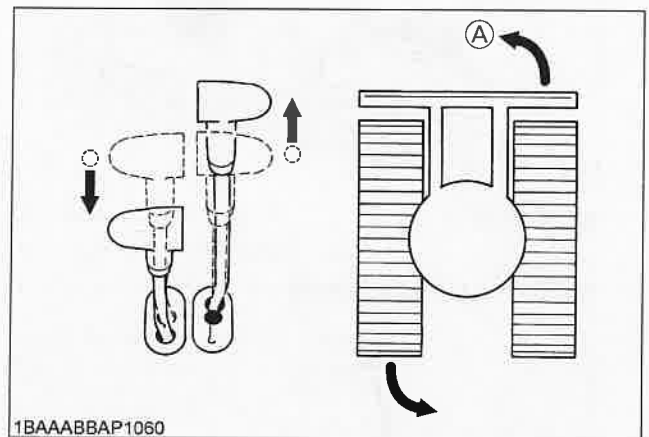


- Pull the left drive lever backward; the excavator will turn in the direction of the arrow of the illustration below.

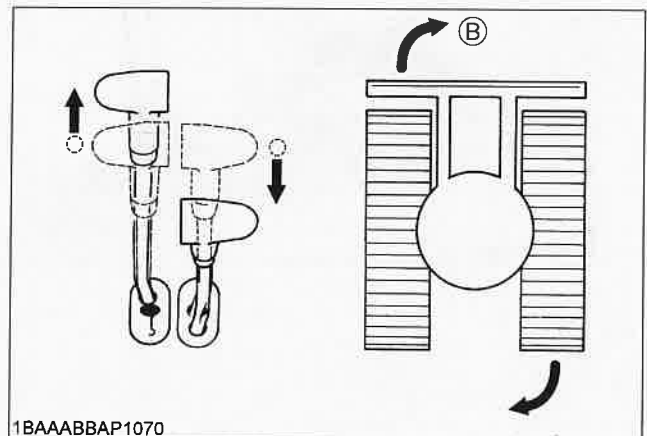


#### ■ Spin Turn

When both drive levers are activated in the opposite directions, both tracks will rotate with the same speed but in opposite directions. The center of rotation is the center of the excavator.



(A) "Left spin turn"



(B) "Right spin turn"

## UP AND DOWNHILL DRIVING



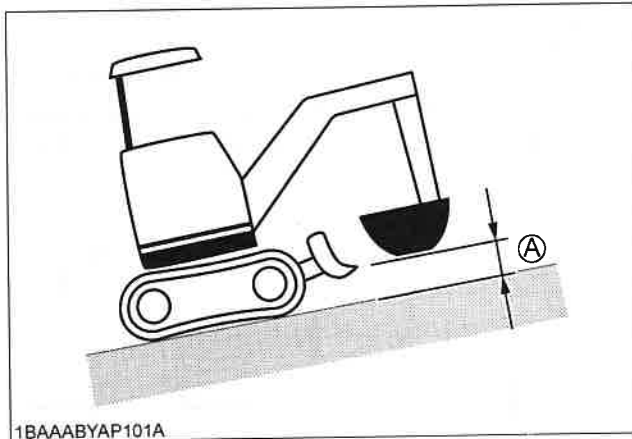
### CAUTION

To avoid personal injury:

- When travelling up or down a slope, use extra caution and follow the instructions below.

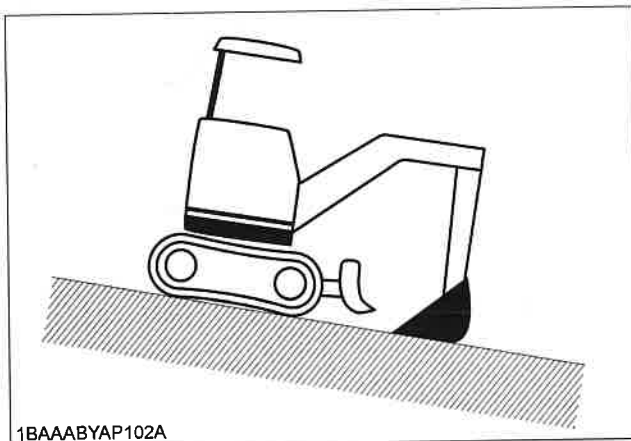
While traveling uphill, keep the lower edge of the bucket approx. 20 to 40 cm above the ground. Although the KUBOTA excavator will not slip easily because of the tracks, it is safer to let the bucket slide over the ground while traveling downhill. Always choose slow speed for uphill and downhill traveling.

### [UPHILL TRAVELING]



(A) 20 to 40 cm

### [DOWNHILL TRAVELING]



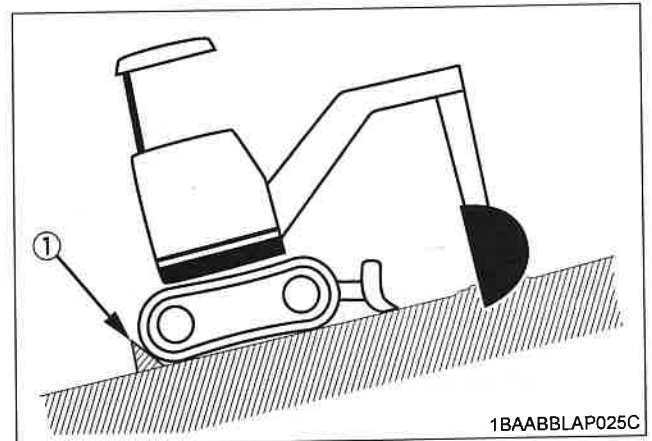
## PARKING ON A SLOPE



### WARNING

To avoid personal injury or death:

- When the excavator is parked or left unattended on a slope, be sure to put the bucket on the ground and place all control levers in neutral position, then brace the tracks with chocks.

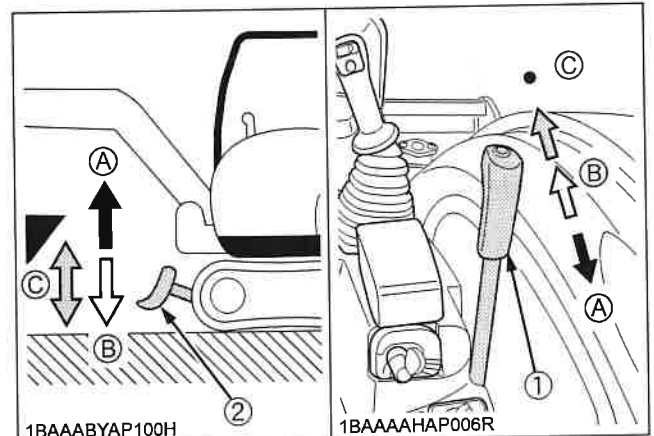


(1) Chock

## OPERATION OF THE DOZER

1. To raise the dozer, pull back the control lever. To lower the dozer, push the control lever forward.

To float the dozer, push the control lever more forward to the locked position.



- (1) Dozer control lever
- (2) Dozer

- (A) "Raise"
- (B) "Lower"
- (C) "Float" (Locked position)

2. While undertaking earth moving work, control both drive levers with the left hand and the dozer control lever with the right hand.

## TWO PATTERN SELECTION SYSTEM (TPSS)



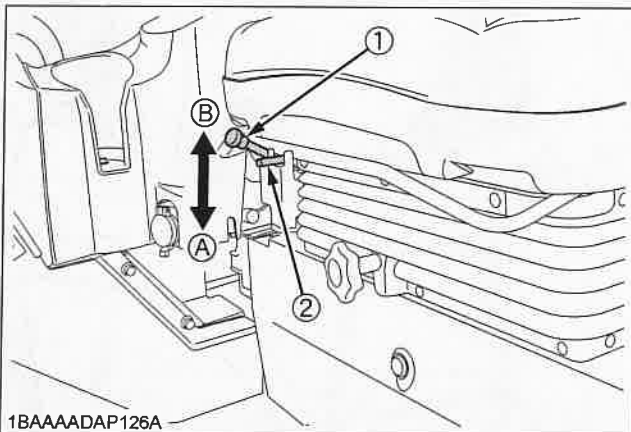
### CAUTION

To avoid personal injury:

- Study control lever pattern A and pattern B. Then choose the one which is most familiar.
- Position the pattern selector lever (located on the right side of operator's seat) in either the lower position (Pattern A) or the upper position (Pattern B).
- Engage the lever lock to prevent accidental pattern change.
- Familiarize yourself with the pattern selected by operating slowly.

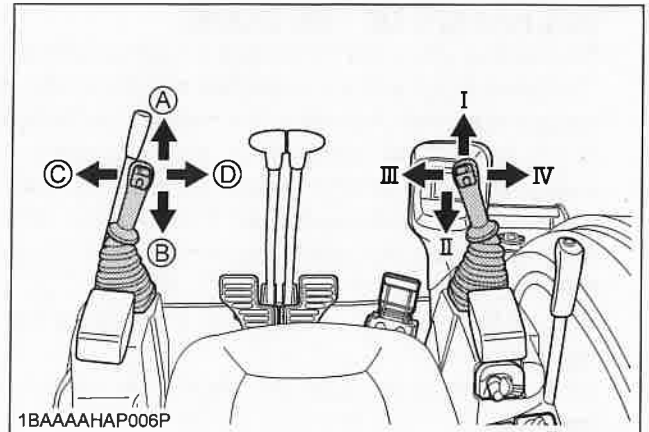
### Pattern Change

1. Disengage the lever lock to open the cover and position the pattern selector lever to the desired position.
2. Close the cover and engage the lever lock.



- (1) Pattern selector lever  
(Two Pattern Selection System: TPSS)
- (2) Lever lock

- (A) "Pattern A"  
(B) "Pattern B"



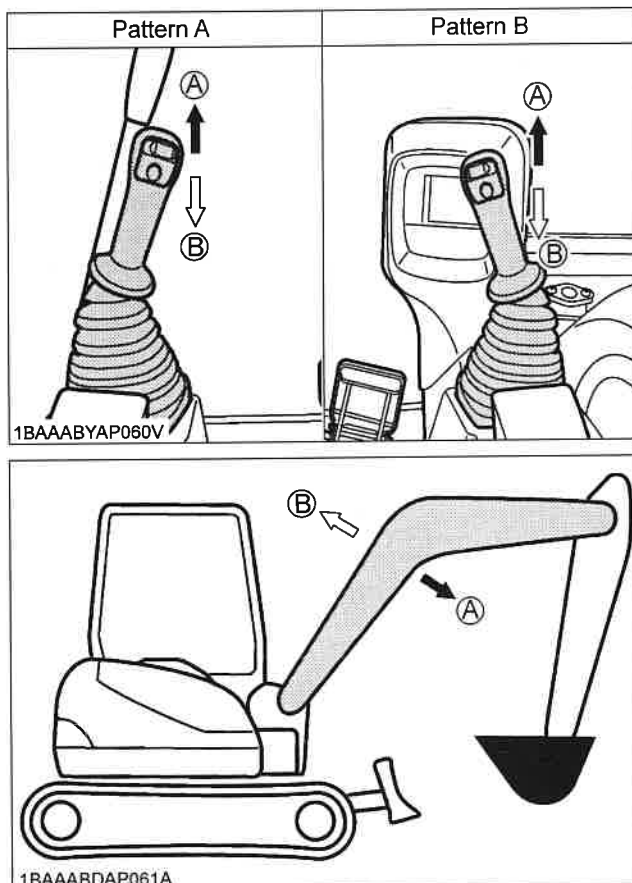
Lever Position		Pattern A	Pattern B
Attachment Control Lever (Left)	A	Boom down	Arm up
	B	Boom up	Arm crowd
	C	Swivel left	Swivel left
	D	Swivel right	Swivel right
Attachment Control Lever (Right)	I	Arm up	Boom down
	II	Arm crowd	Boom up
	III	Bucket crowd	Bucket crowd
	IV	Bucket dump	Bucket dump

## OPERATION OF THE BOOM

To raise the boom, pull the attachment control lever back. The boom is equipped with a cushion cylinder which helps prevent excavated material in the bucket from falling out. At low hydraulic oil temperature, (e.g. after starting the engine in cold weather) the cushioning function will be effected for a short period of time (approx. 3 to 5 seconds). This condition results from the viscosity of the hydraulic oil and is not a sign of malfunction.

The cushion cylinder will operate normally as the oil warms up.

To lower the boom, push the attachment control lever forward.

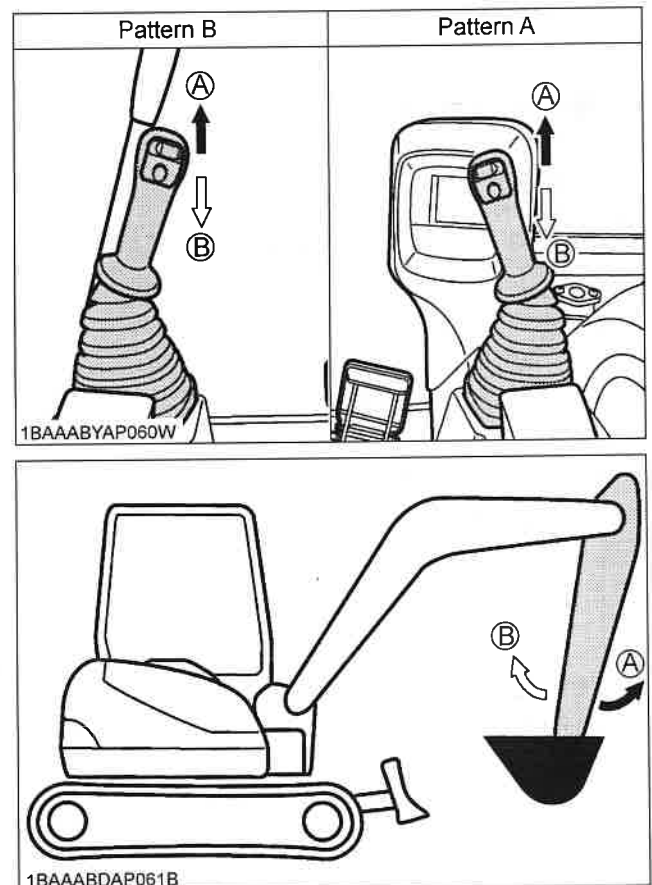


## OPERATION OF THE ARM

Pull back the attachment control lever and the arm will be pulled in. To move the arm out, push the control lever towards the front.

### NOTE :

- When pulling in the arm, the movement may stop for a short moment when the arm is in its vertical position. This is caused by the combined load of the arm and bucket moving the cylinder piston away from the hydraulic flow causing a delay in the cylinder action, until the flow catches up with cylinder piston. This is a characteristic of the hydraulic system and is not a sign of malfunction.

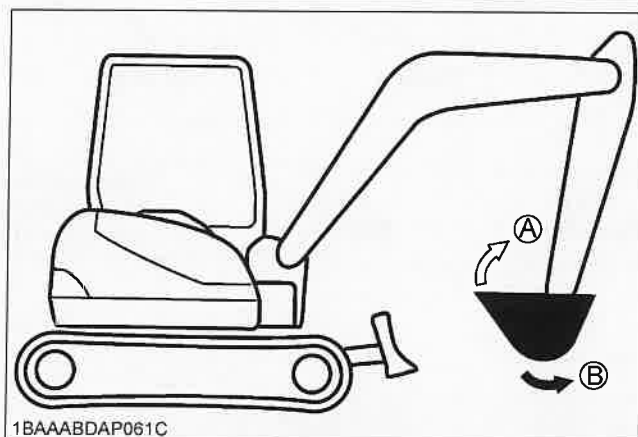
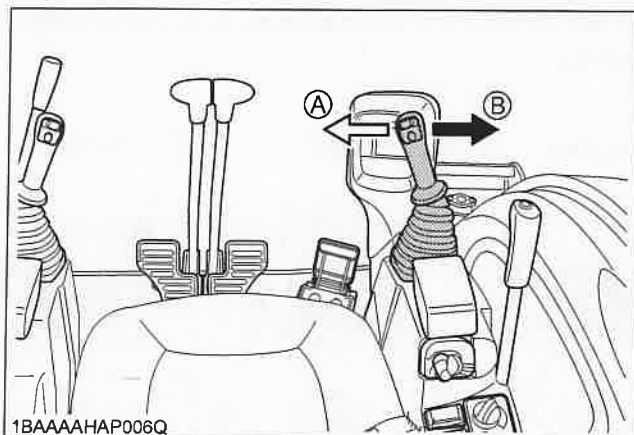


### IMPORTANT :

- When lowering the boom, make sure that it does not hit the dozer and that the bucket teeth do not touch the dozer.

## OPERATION OF THE BUCKET

To dig using the bucket, move the right attachment control lever from the neutral position, left. Moving the control lever right, moves the bucket outwards and empties its contents.



## SWIVEL AND BOOM SWING OPERATION



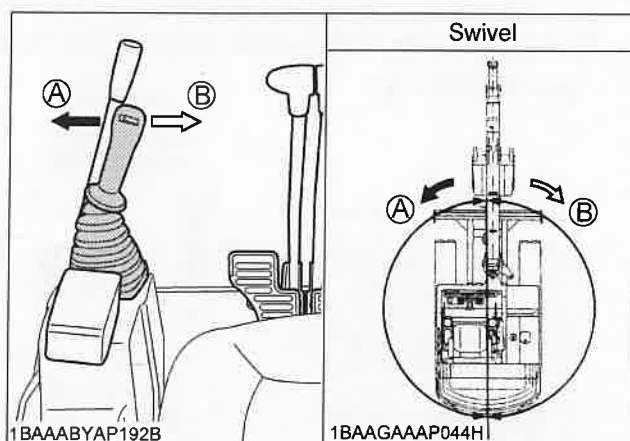
### CAUTION

To avoid personal injury:

- When working in groups, always let the others know what you are going to do before you do it.
- Keep others away from the machine working area.
- Be sure to lock the boom swing pedal when the boom swing function is not used.

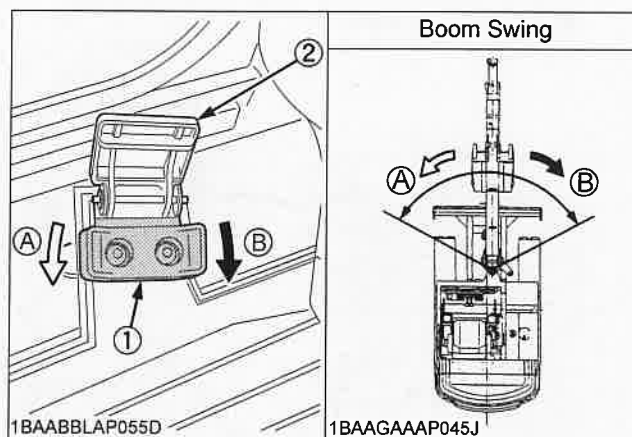
### Swivel Operation

1. Move the control lever to the left and the upper structure will turn to the left.
2. Move the control lever to the right and the upper structure will turn to the right.



### Boom Swing Operation

1. Flip the pedal lock up to unlock the pedal.
2. Step on the left side of the pedal to swing the boom to the left.
3. Step on the right side of the pedal to swing the boom to the right.



- (1) Boom swing pedal  
(2) Pedal lock

### IMPORTANT:

- Do not operate the left attachment control lever abruptly from right to left (or vice versa), because the inertia may cause high impact loads on the swivel gear and the swivel motor, shortening the life of the excavator.

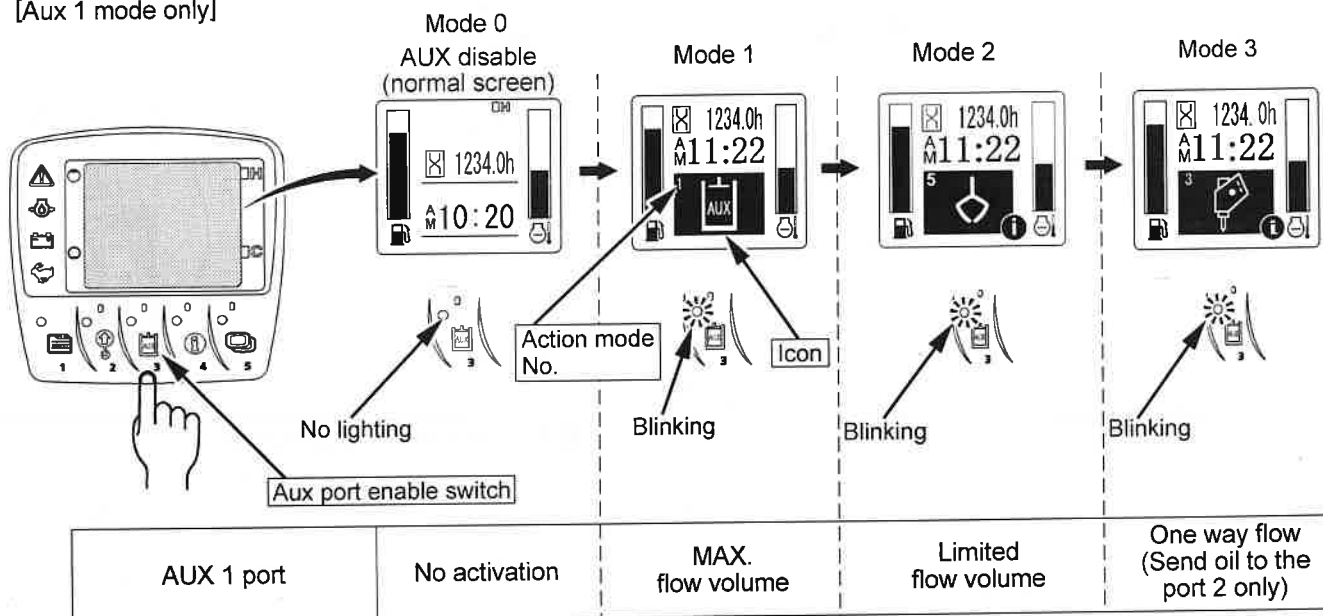
## AUXILIARY PORT OPERATION

The auxiliary port enable switch is used to operate hydraulic attachment such as hammers.

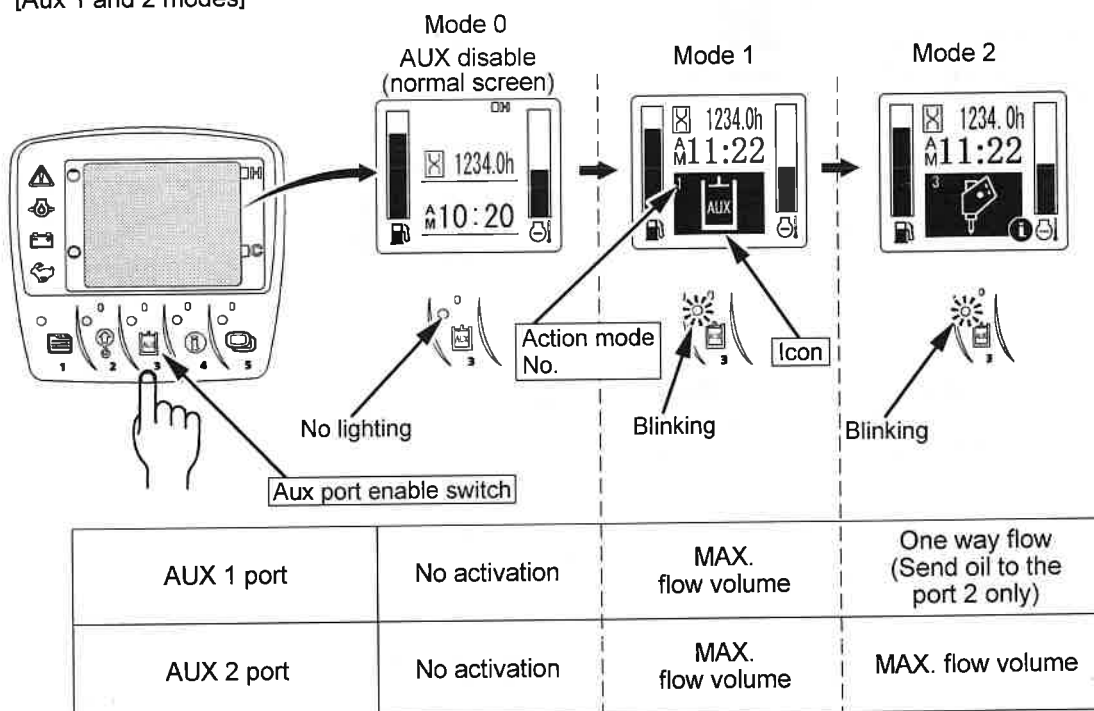
### ■Selecting the Action Modes

The AUX port has been factory-set to three action modes. You can select one of them. Up to five action modes can be preset. Each time the AUX port enable switch (switch 3) is pressed, the action modes change over one after another. And the icon and action mode number on the screen change accordingly.

[Aux 1 mode only]



[Aux 1 and 2 modes]



1BAAAAHAP0070

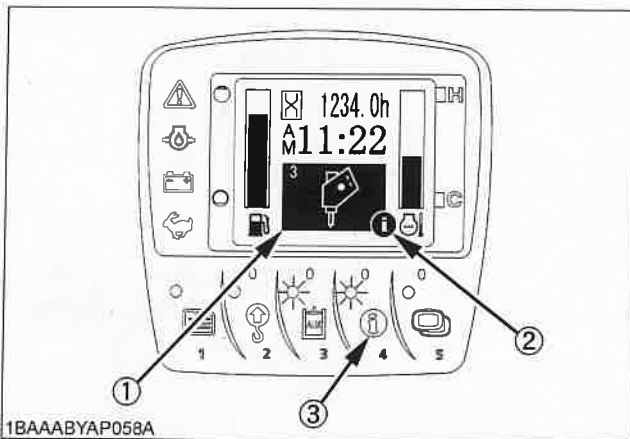
#### NOTE :

- When turning the starter key to the "RUN" position, the action mode will return to the last action mode used.
- AUX1 or AUX2 functions are workable while automatic regeneration. Refer to page 49.



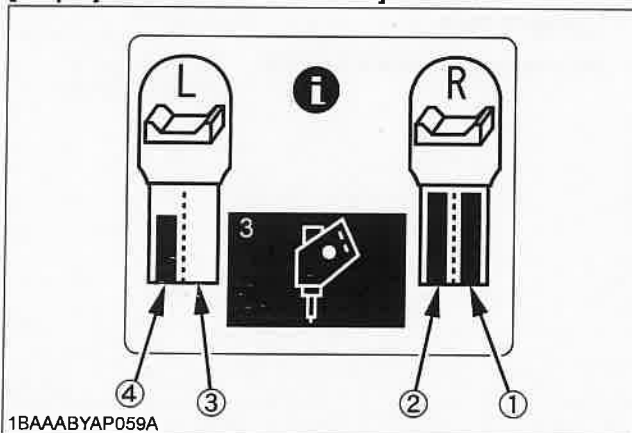
### ◆ Checking the settings of each action mode

When an action mode is selected and the "i" mark appears at the lower right of the icon, the flow volume setting gets displayed by pressing the switch 4.



- (1) Icon
- (2) Information mark
- (3) Information switch (Switch 4)

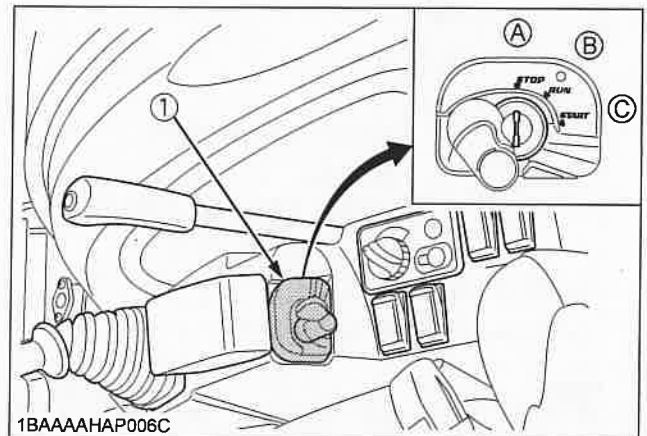
### [Display in AUX 1 and 2 modes]



- (1) AUX Port 1
- (2) AUX Port 2
- (3) AUX Port 3
- (4) AUX Port 4

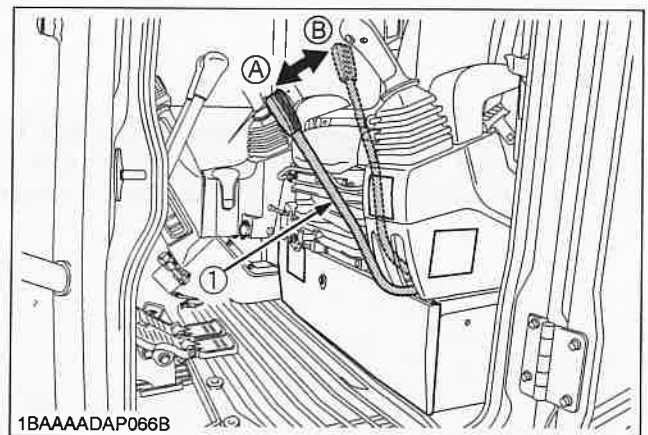
### ■ AUX Port Handling Procedure

1. Turn the starter key to the "RUN" position.  
Let the engine warm up after start-up for approx. 10 minutes under no load conditions.



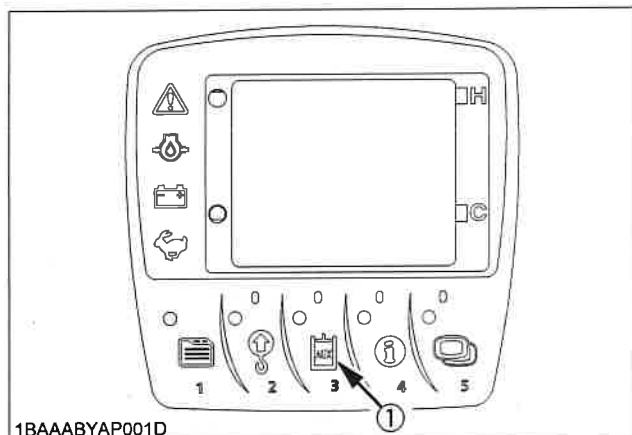
- (1) Starter switch
- (A) "STOP"
- (B) "RUN"
- (C) "START"

2. Lower the pilot control lock lever (UNLOCK).



- (1) Pilot control lock lever
- (A) "UNLOCK"
- (B) "LOCKED"

3. Push the AUX port enable switch (switch 3).



(1) AUX port enable switch (Switch 3)

**NOTE :**

- If the pilot control lock lever is at the "LOCKED" position, the following message appears onscreen. Down this lever to the "UNLOCK" position and then press the AUX port enable switch (switch 3).

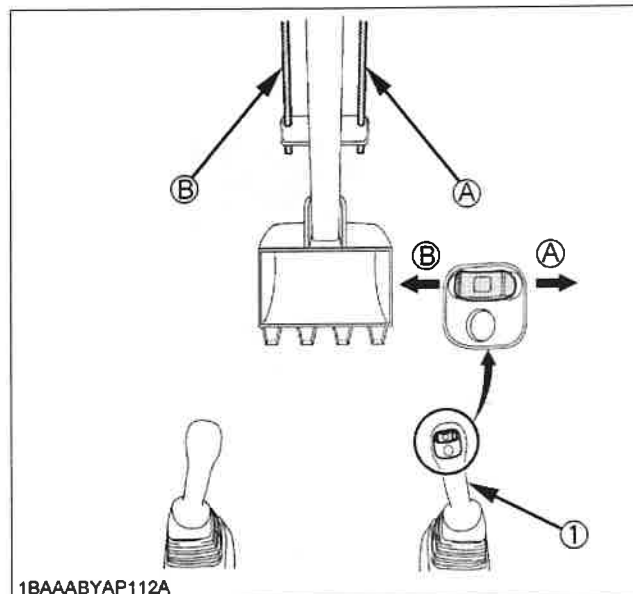


1BAABBLAP257B

- AUX is cancelled when the pilot control lock lever raised up "LOCKED" position. Push the AUX port enable switch to set the AUX mode when necessary.

4. **[AUX 1 only]**

Move the AUX port knob of the right attachment control lever to the right to send oil to the AUX port 1. Move the AUX port knob to the left to send oil to the AUX port 2.

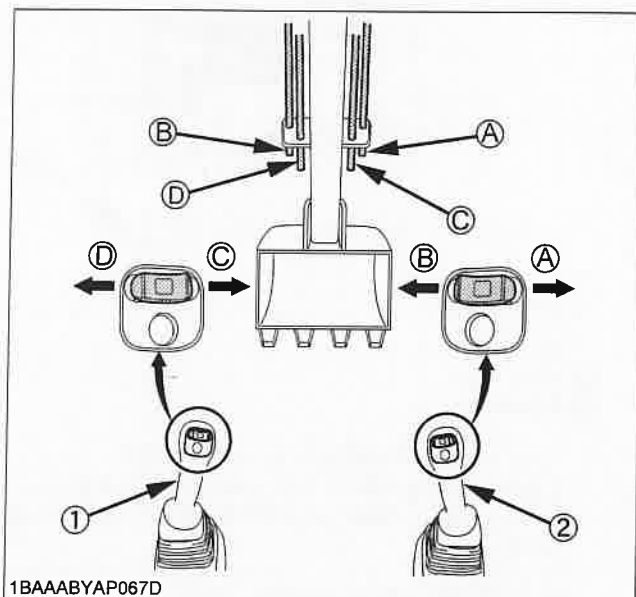


(1) Attachment control lever (right) (A) "AUX port 1"  
(B) "AUX port 2"

**[AUX 1 and 2 modes]**

If the machine is equipped with the AUX 1 port, move the AUX port knob of the left attachment control lever to the right to send oil to the AUX port 3.

Move the AUX port knob of the left attachment control lever to the left to send oil to the AUX port 4.



- (1) Attachment control lever (left) (A) "AUX port 1"  
 (2) Attachment control lever (right) (B) "AUX port 2"  
 (C) "AUX port 3"  
 (D) "AUX port 4"

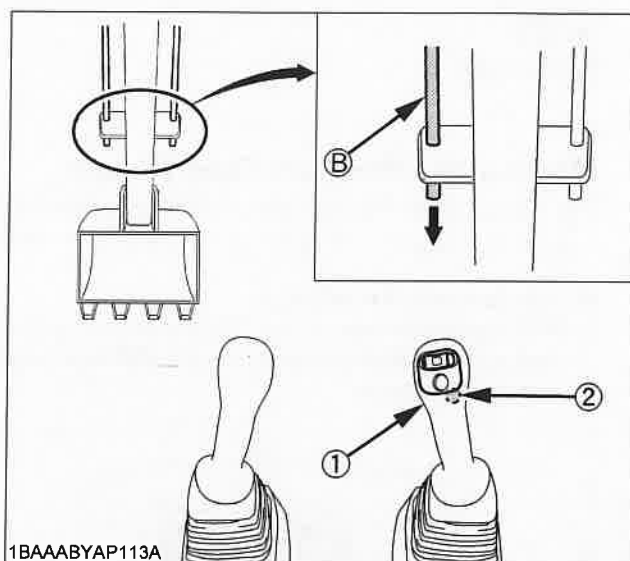
**IMPORTANT :**

- Proportional control of the AUX port knob allows for slow-to-fast movement of attachment.

Example; If you move the AUX port knob halfway, the attachment will move at approximately one-half speed.

**◆ One way hold****[AUX 1 mode only]**

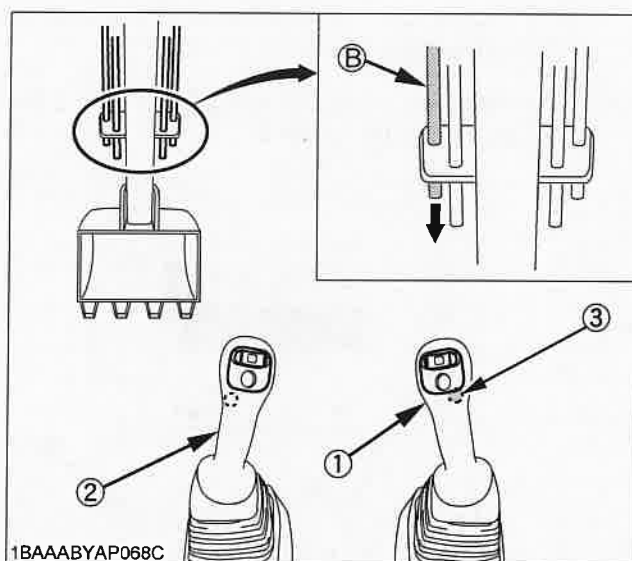
Press the one way hold switch of the right attachment control lever, and the oil continues to flow through the AUX port 2. Press this switch again or move the AUX port knob, and the oil flow is interrupted.



- (1) Attachment control lever (right) (B) "AUX port 2"  
 (2) One way hold switch (right)

**[AUX 1 and 2 modes]**

Press the one way hold switch of the right attachment control lever, and the oil continues to flow through the AUX port 2. Press this switch again or move the AUX port knob, and the oil flow is interrupted.



- (1) Attachment control lever (right) (B) "AUX port 2"  
 (2) Attachment control lever (left)  
 (3) One way hold switch (right)

**NOTE :**

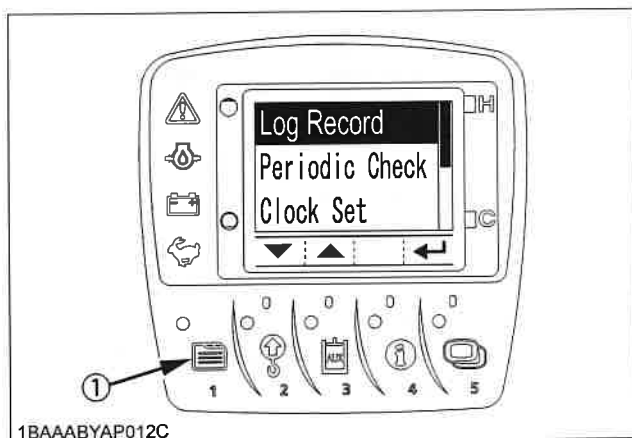
- Even if the one way hold switch of the left attachment control lever is pressed, no function is assigned. In this case, the following message appears onscreen.

**■Setting the Maximum Flow Volume**

The AUX port has been factory-set to three action modes 1, 2 and 3. The action modes 4 and 5 can also be preset.

**◆ How to make the settings**

1. With the starter key at the "RUN" position, press the user setting switch (switch 1), and the following display appears onscreen.



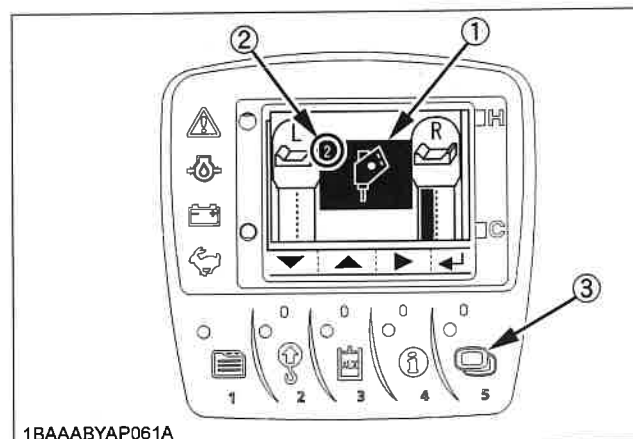
- (1) User setting switch (switch 1)

2. Press the switch 2 or 3 to select "AUX Flow Ctrl Set", and then press the switch 5.



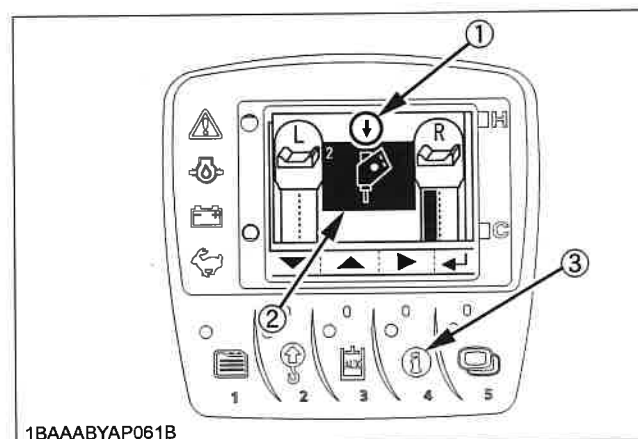
- (1) Switch 2 and 3
- (2) Switch 5

3. Each time the switch 5 is pressed, the mode number changes. Select your desired setting mode number.



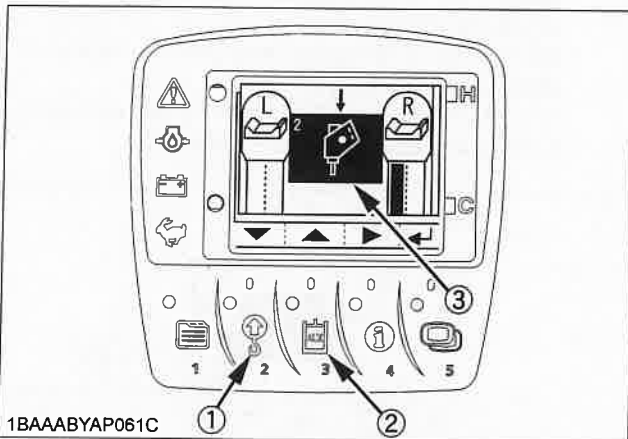
- (1) Icon
- (2) Mode No.
- (3) Switch 5

4. Take the following steps to set the icons. Each time the switch 4 is pressed, the setting cursor (arrow mark) shifts position. Move the cursor above the icon.



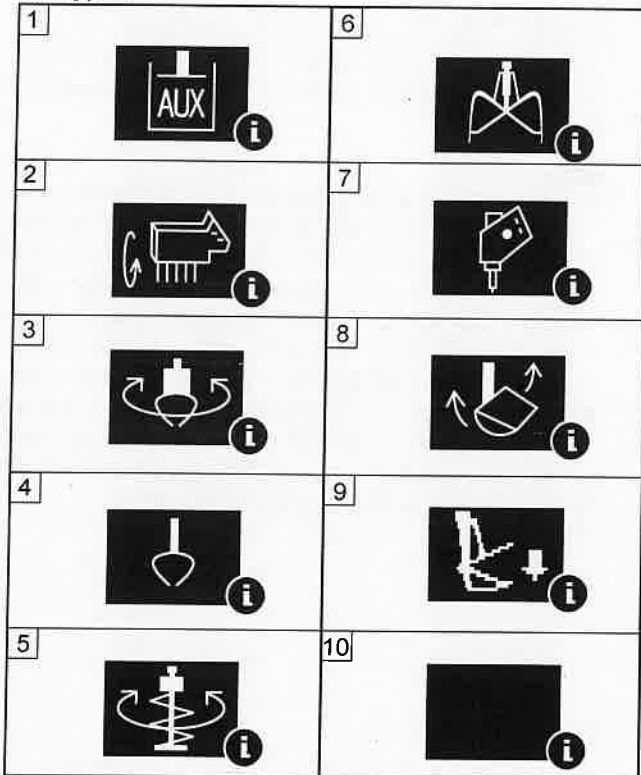
- (1) Setting cursor (arrow mark)
- (2) Icon
- (3) Switch 4

5. Each time the switch 2 or 3 is pressed, the icon changes. Select your desired icons.



- (1) Switch 2  
(2) Switch 3  
(3) Icon

#### ◆ Types of AUX icons



- (1) AUX (Standard)      (6) Clamshell  
(2) Brush cutter      (7) Breaker  
(3) Rotary grapple    (8) Tilt bucket  
(4) Grapple            (9) Thumb  
(5) Auger              (10) Blank (disable)

#### NOTE :

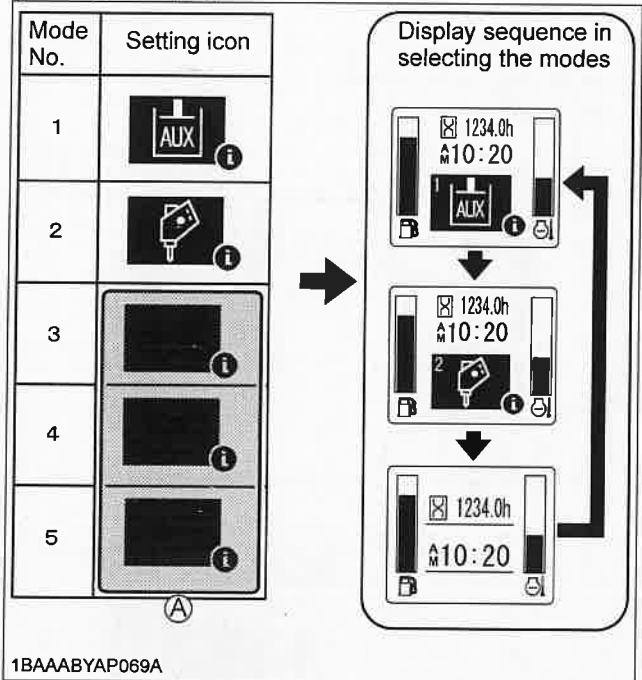
- There is no relationship between the icons and the flow control settings. Select icons to suit the images of attachments to be connected.
- In an action mode with the disable icon preset, such action mode is skipped even if selected.

Take an example of the following settings:

AUX (standard) icon for action mode 1,  
Breaker icon for action mode 2,  
Disable icon for actions modes 3, 4 and 5.

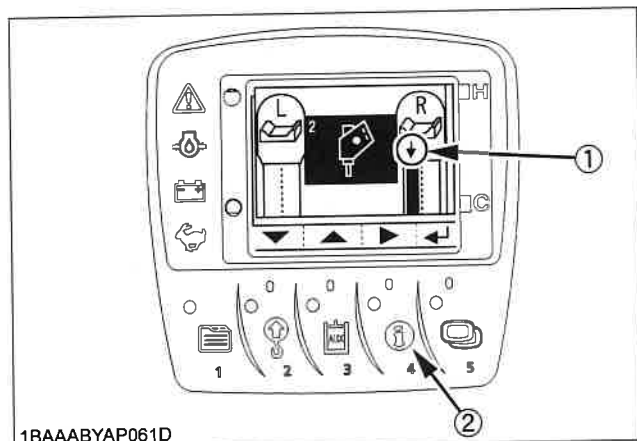
Each time the AUX port enable switch (switch 3) is pressed, the display changes from action mode 1, action mode 2 to normal mode in this order.

#### [Setting example]

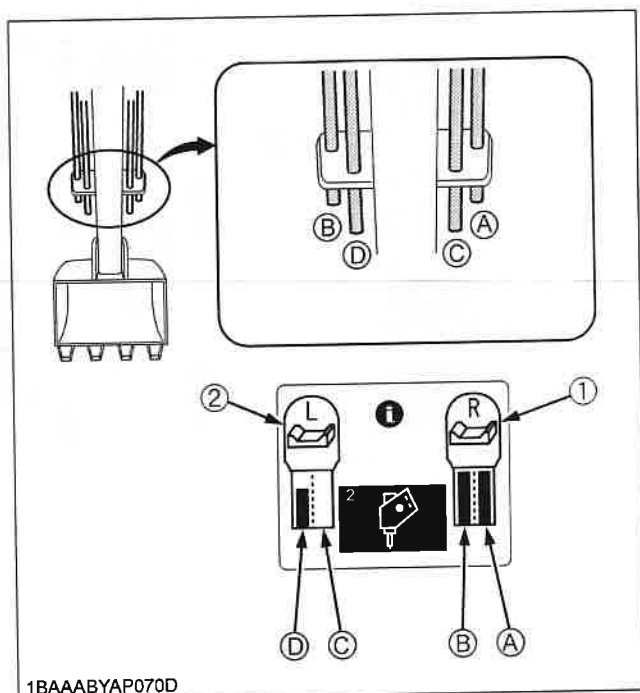


(A) Blank (disable) icon

6. Set the maximum flow volume for each AUX port.  
Press the switch 4 to move the setting cursor (arrow mark) to the port 2 position of Thumb port at the right.



- (1) Setting cursor (arrow)  
(2) Switch 4

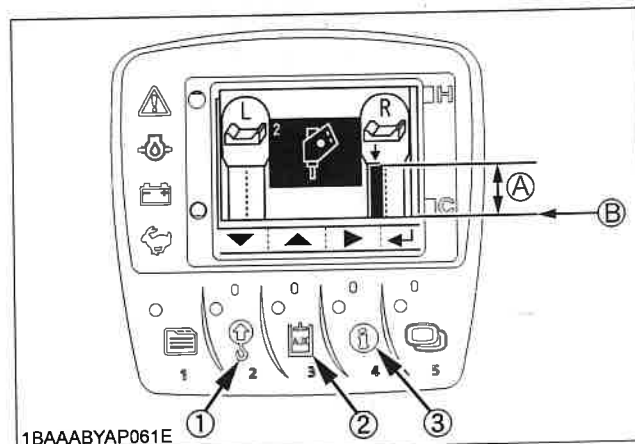


1BAAABYAP070D

#### [AUX 1 and AUX 2 modes]

- (1) Thumb port  
(2) AUX 1  
(A) "AUX port 1"  
(B) "AUX port 2"  
(C) "AUX port 3"  
(D) "AUX port 4"

7. Press the switch 2 or 3 to preset the maximum flow volume.  
Set the bar to the highest level, and the flow volume will be maximized.  
Set the bar to the lowest level (no bar displayed), and there will be no oil flow.  
Then press the switch 4 to go to the next port, and make the settings for all the other ports.

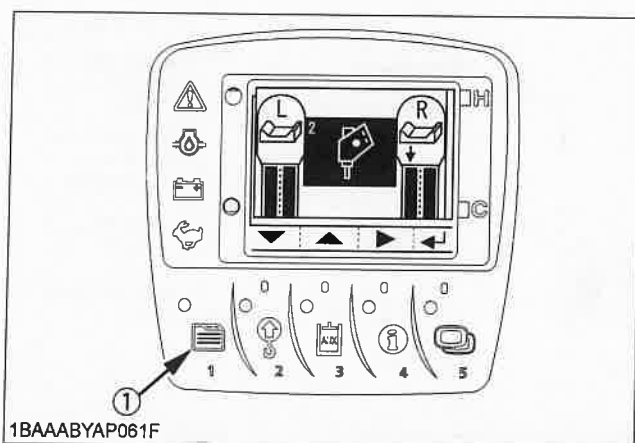


- (1) Switch 2 (Higher flow volume) (A) "MAX. flow volume"  
(2) Switch 3 (Lower flow volume) (B) "Output interrupted"  
(3) Switch 4

#### NOTE :

- Some attachments might not be activated even when the bar level is still somewhat above the lowest position. Or even when the bars of ports 1 and 2 (or of ports 3 and 4) are at the same level, the same speed might not be achieved. This does not indicate a machine problem, however. Readjust the bar to the optimum level according to your attachment manual.
- Suppose that the same attachment is mounted on another machine. Even if the same flow control setting is made, the same speed cannot be achieved. Make an optimum setting on each machine.

8. Go back to Step 3 to make settings for the next action mode. When all the settings of all the action modes have been made, press the switch 1 to return to the normal screen.



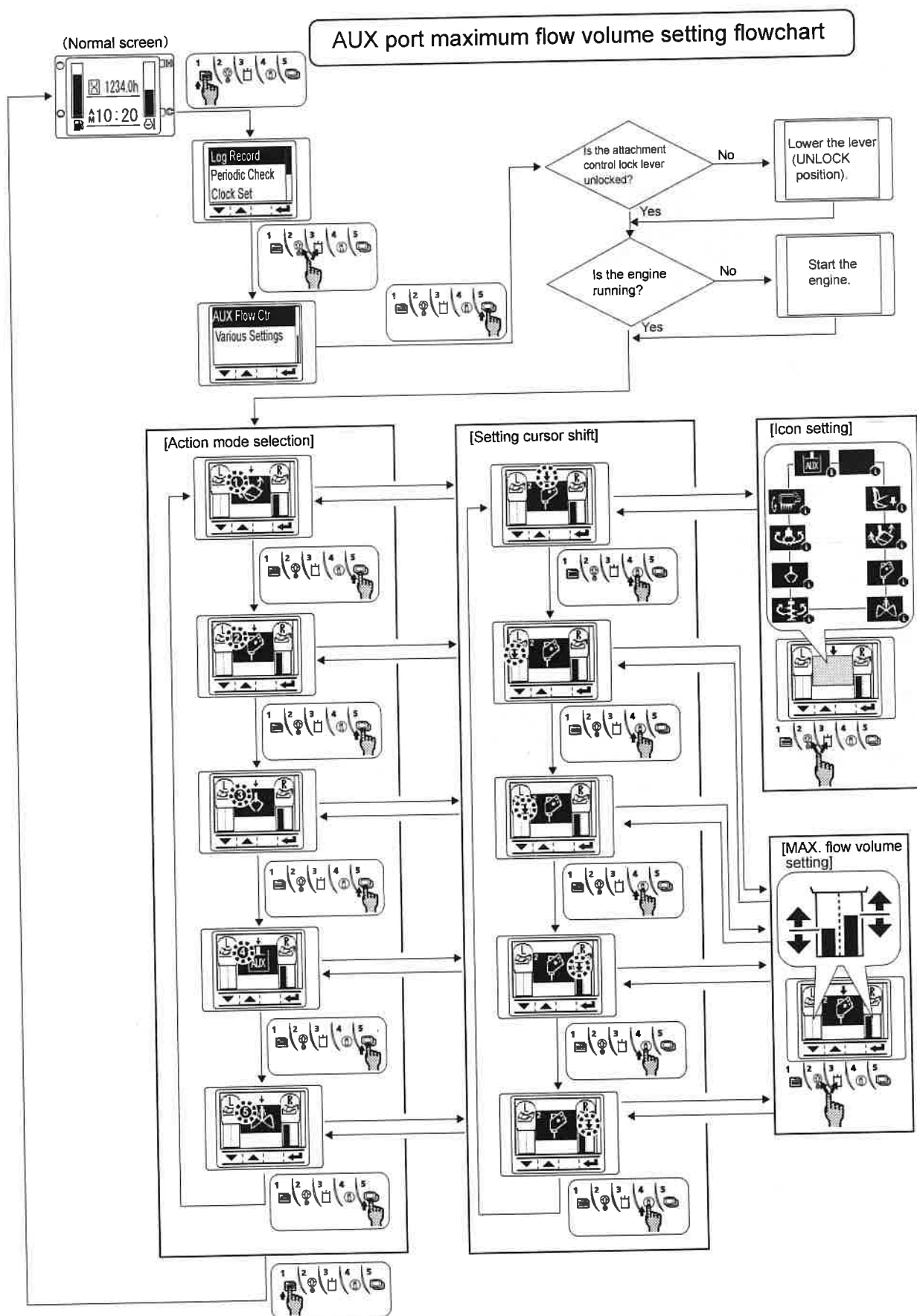
(1) Switch 1

◆ **AUX port MAX. Flow volume**

	AUX 1 port	AUX 2 port
MAX. flow volume (Theoretical) L/min	65	37
MAX. pressure MPa (kgf/cm <sup>2</sup> )	17.2 (175)	17.2 (175)

**IMPORTANT :**

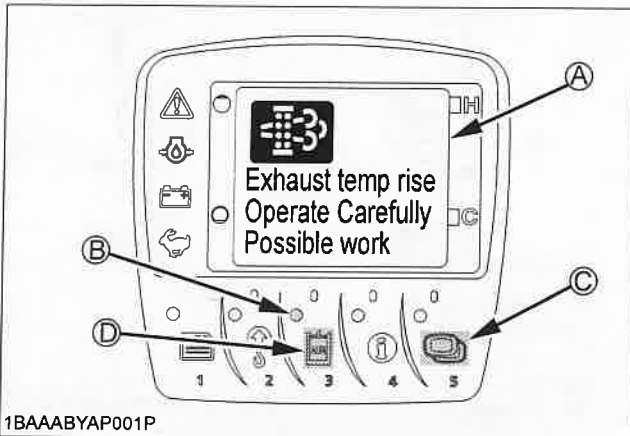
- When the AUX port is not used for a long period, dirt particles can settle in the lower part of the AUX port lines. When the plugs on the AUX port lines are removed to connect attachments, drain approx. 100 cc (3.4 oz) of oil before making connections.





### ■How to Resume the AUX Setting While Processing the DPF Regeneration

When the automatic regeneration process of DPF gets started with the AUX port in use, the warning (A) is displayed on the LCD. The indicator (B) turns off, however, the operator can continue to use the AUX port function. To resume the AUX port settings while the warning is displayed, follow the procedure.



- (A) Warning
- (B) Indicator
- (C) Switch 5
- (D) Switch 3

1. The indicator turns off, and the warning appears on the LCD.
2. Press the switch 5.
3. The warning disappears temporarily and the normal display shows up again.
4. Press the switch 3 to continue to set the AUX settings as usual.

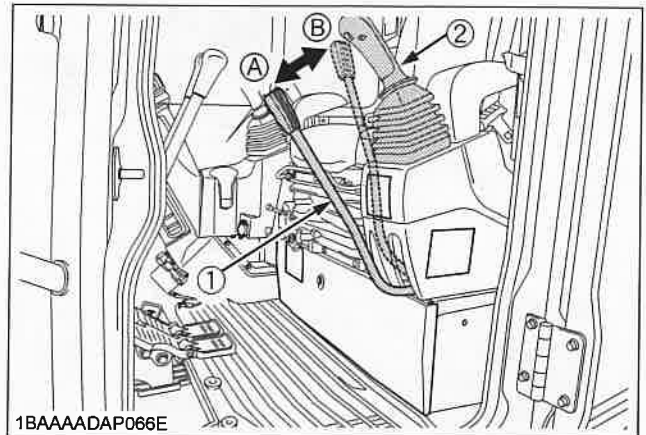
Even when the warning temporarily disappears according to the above procedure, however, the warning reappears in a certain period of time during the automatic regeneration.

#### NOTE :

- While a warning message like as "Raise up engine speed." is on the LCD, operator is requested to take directive procedure and take above procedure if operator require to continue to set AUX setting.

### HOW TO RELEASE PRESSURE TRAPPED IN THE HYDRAULIC SYSTEM

1. Lower the attachments and the blade down to the ground.
2. Turn the key to "STOP" position and shut off the engine.
3. After stopping the engine, turn the key to "RUN" position.
4. Set the pilot control lock lever to "UNLOCK" position.

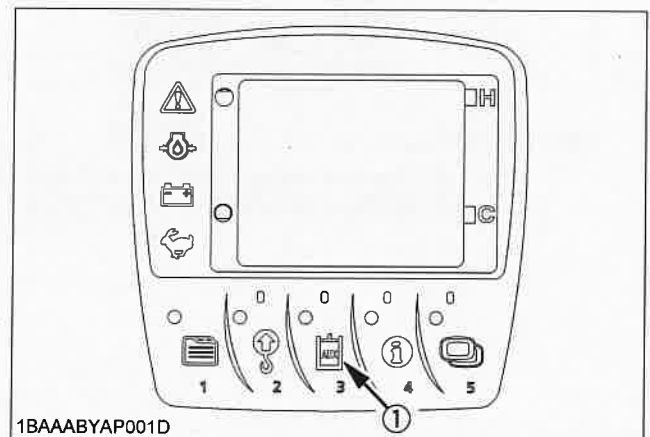


- (1) Pilot control lock lever
- (2) Attachment control lever (left)
- (A) "UNLOCK"
- (B) "LOCKED"

5. Move the operating lever to release pressure in the hydraulic system.

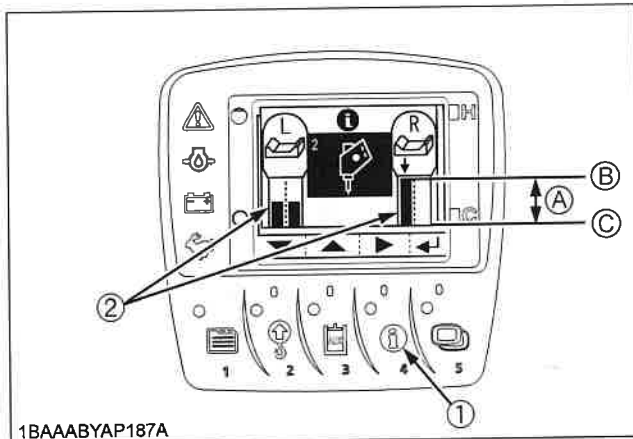
#### [How to release pressure trapped in the AUX port]

1. Perform the above operations of 1 to 4.
2. Turn "ON" the AUX port enable switch.

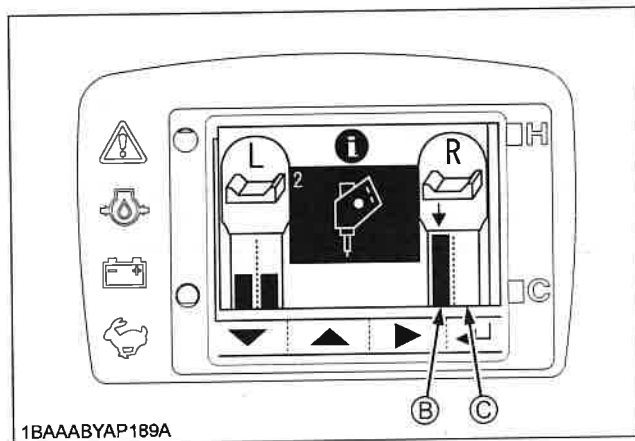


- (1) AUX port enable switch (Switch 3)

3. Press the switch 4 to make sure that the flow volume in all the AUX ports is not minimized.  
If the pressure is removed after minimizing the flow volume in the AUX port, release pressure is not removed completely and the hose coupler may be unable to connect and disconnect.

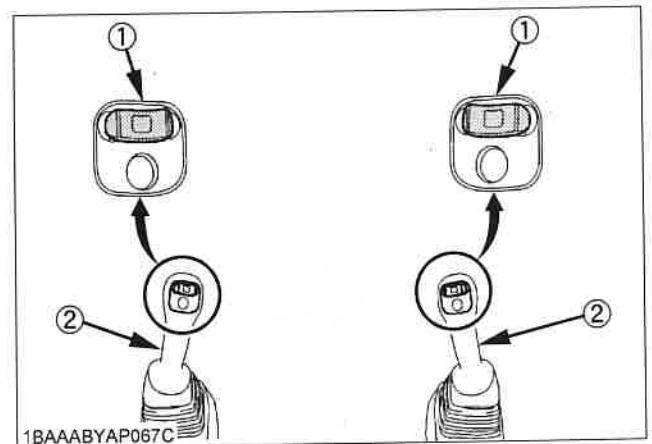


- (1) Switch 4  
(2) Flow volume in AUX port display  
(A) Flow volume in AUX port  
(B) Maximum  
(C) Minimum



- (B) Maximum status of flow volume in AUX port  
(C) Minimum status of flow volume in AUX port

4. Move the AUX port knob mounted to the operating lever to the right and left to release pressure in the AUX port.



- (1) AUX port knob  
(2) Attachment control lever

#### NOTE :

- There are two types of machine, one has the AUX port knobs mounted to the right and left operating levers, the other has the AUX port knob mounted to one operating lever.  
Make choice according to the type of machine.

## ANGLE BLADE OPERATION



### WARNING

To avoid personal injury or death:

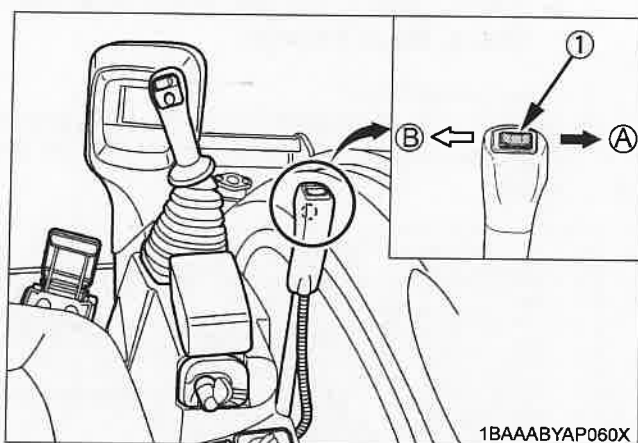
- Never jack up or lift the machine with the angle blade placed at an angle.

Stability of the machine is affected with blade at angle, keep at neutral position.

Before starting the job, position and keep the angle blade at the standard 0° marking (Refer to Figure (A)).

- Do not work under the machine.

1. Push the angle blade control switch to the right or left, and the angle dozer is placed at an angle.

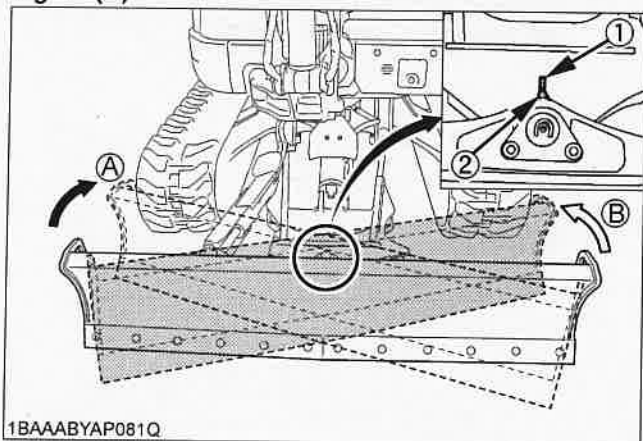


(1) Angle blade control switch

(A) Turn the right  
(B) Turn the left

2. For the right-hand angle setting, push the angle blade control switch in direction (A). The angle blade will be placed at an angle toward (A).
3. For the left-hand angle setting, push the angle blade control switch in direction (B). The angle blade will be placed at an angle toward (B).

Figure (A)



(1) Mark (red)

(2) Mark (red)

(A) Turn the right

(B) Turn the left

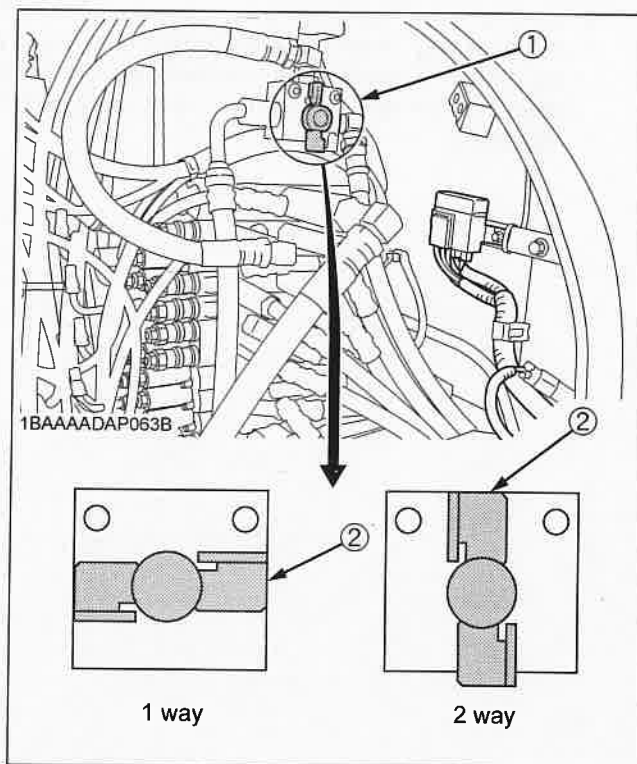
## 1-way or 2-way CIRCUIT SELECTION VALVE OPERATION

A selection valve which selects 1-way or 2-way circuit of service port has been installed on the hydraulic tank.

1. When equipment which needs a 1-way circuit will be used, position the arrow, by using the selector lever, on the axis of the selection valve to the 1-way circuit position, to reduce the back pressure.
2. When equipment which needs a 2-way circuit will be used, position the arrow on the axis of the selection valve to the 2-way circuit position.

### NOTE :

- 1-way circuit..... HAMMER etc.
- 2-way circuit..... THUMB, TILT BUCKET, AUGER, GRAPPLE etc.



1 way

2 way

(1) Selection valve

(2) Selector lever

**CAUTION**

To avoid personal injury:

- Stop the engine before removing/changing the equipment.
- Release pressure in the hydraulic system before removing/changing the equipment. (See "HOW TO RELEASE PRESSURE TRAPPED IN THE HYDRAULIC SYSTEM".)
- Position the selection valve to the correct position (either 1-way or 2-way circuit selection) before mounting the equipment.
- Always select the correct valve position before mounting the equipment (1-way or 2-way circuit selection) to avoid sudden movement of the equipment.

**NOTE :**

- Leaving the selection valve to 1-way circuit selection and attaching 2-way circuit equipment may cause the equipment to move (drop) suddenly due to its own weight, as the tank line remains open, even with the engine off.

**BOOM LOWERING VALVE**

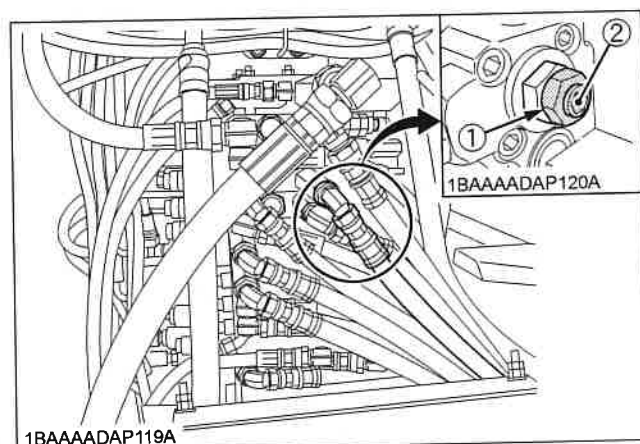
Use this valve if the engine fails to get started and the accumulator fails to operate and there is an urgent need to lower the boom.

**WARNING**

To avoid personal injury or death:

- When the engine functions, move the control lever to lower the boom. Never use the boom lowering valve.
- Loosen the boom lowering valve set screw slowly a quarter turn at a time. Be careful not to loosen it a full turn or more at once because otherwise oil may squirt out accidentally.
- Before starting this job, make sure there is nobody below the boom.

1. Open the right hood.
2. Loosen the boom lowering valve nut located below the control valve boom block first and then the set screw slowly.



- (1) Nut  
(2) Set screw

3. After this operation, tighten the boom lowering valve nut and the set screw in place.

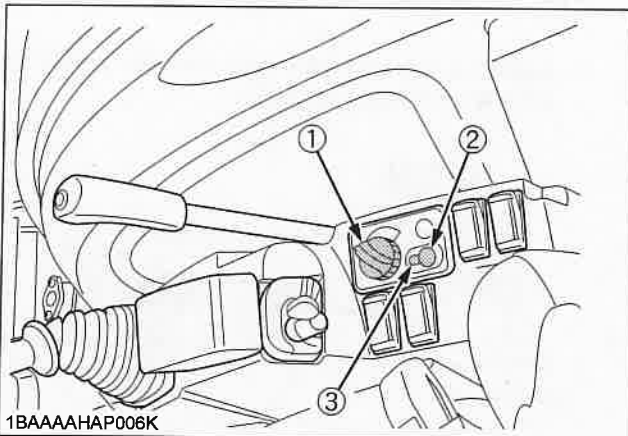
## AUTO IDLE (AI) OPERATION

### 1. Throttle potentiometer

With this potentiometer the operator can adjust the engine speed when the auto idle control is activated.

### 2. Auto idle (AI) control switch

With this switch the auto idle control is turned on or off. The auto idle control allows the engine speed to drop to idle speed when the control levers are left in neutral for longer than four seconds. If the control is activated, the engine speed rises immediately to the preset rpm. If the auto idle is not activated the throttle potentiometer can be utilized to control engine speed in a similar way to a conventional throttle control lever.



- (1) Throttle potentiometer
- (2) Auto idle control switch
- (3) Auto idle lamp

### IMPORTANT :

- It is possible that the auto idle may not function until hydraulic oil warms up in the cold weather. Therefore it is not recommended that the auto idle be activated until the machine is completely warmed up.

### NOTE :

- Before operating the control lever, check the auto idle lamp.
- When operating in confined spaces or when loading onto a vehicle, turn the auto idle control switch off (lamp off). This is to prevent unwanted engine speed increases when control levers are activated.
- The auto idle control, when selected by a switch, provides the operator with a way to control engine speed without moving the throttle potentiometer, simply by not activating any control levers for about four seconds after stopping work, and then to simply restore a preset (by potentiometer) engine speed by activating any control lever to return to work.
- The purpose of the system is to reduce fuel consumption, noise and operator fatigue.
- When the dozer control lever is locked at the "Float" position on the angle blade type, the auto idle function is not activated even if any other control lever is set in the neutral position.

## IMPORTANT INFORMATION ON EXCAVATOR OPERATION

- Do not try to crush concrete or boulders using side swings with the bucket. Also avoid using side sweeps of the bucket to move earth piles.
- Under all circumstances avoid the following operations:
  - Excavation using the gravitational impact of the machine.
  - Compacting of gravel or soil using the dropping action of the bucket.
  - Excavation using the traveling power of the machine.
- Do not try to drop or shake off soil adhering to the bucket in the manner given in the points below. This can cause damage to the machine. Adhering soil can be shaken off when the bucket is being emptied by moving the bucket out to the maximum stroke of the cylinder. Should this not suffice, swing out the arm as far as possible and operate the bucket back and forth.
- Do not hit the dozer with the boom cylinder! Make sure that the boom cylinder does not hit the dozer when doing deep excavation. If necessary swivel around so that the dozer is in the back of the machine.
- Pay attention when pulling in the bucket! When pulling in the bucket (for driving or transportation) avoid hitting the dozer.
- Avoid collisions! When moving the excavator, pay attention that the dozer does not collide with obstructions such as boulders, etc. Such collisions shorten the life of the dozer and the cylinder substantially.
- Support the machine correctly! When stabilizing the machine with the dozer, lower the dozer to engage the full width on the ground.
- If the water or mud level reaches higher than the top of the tracks, the swivel bearing, swivel motor gear and ring gear may be exposed to mud, water and other foreign objects. The excavator must be properly pressure washed after each use.
  - Thoroughly clean the area around the swivel bearing, swivel motor gear and ring gear to remove foreign objects.
  - Inspect the swivel motor oil sump (if equipped) for water contamination. If water is present, refer to operator's manual for lubricant replacement procedure.
  - Refer to operator's manual for proper swivel bearing, swivel motor gear and ring gear lubrication procedures.
  - Reinstall any protective covering if removed earlier.

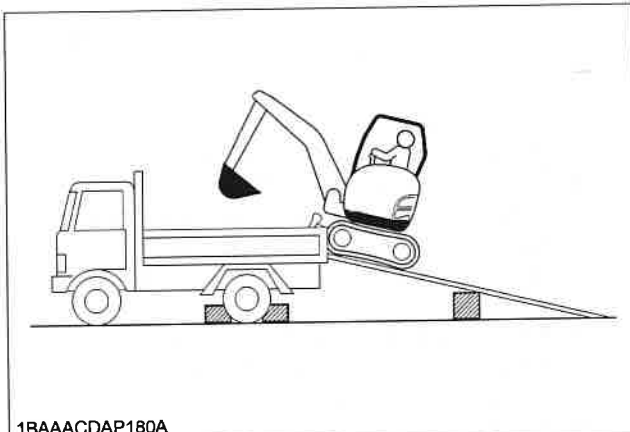
# TRANSPORTING THE EXCAVATOR ON A VEHICLE



## DANGER

To avoid serious injury or death:

- No directional changes should be made when the excavator is on the ramp. Should a change of direction be necessary, drive off the ramp completely and make the turn.
- When driving forwards or backwards onto the vehicle, or when swiveling the upper body, make sure that neither the CAB or the gates of the vehicle will be damaged.



- When the excavator reaches the point between the ramps and the bed, halt and then move very slowly until the excavator reaches the horizontal position.
- Move the excavator onto the vehicle only with the arm completely pulled in.
- Do not jack up the machine using its boom to load or unload the excavator from the vehicle. Doing this is dangerous. Otherwise the CAB of the vehicle could be damaged when swiveling around the upper body.
- Make sure the ramps are of sufficient capacity and securely connected to the vehicle to support the machine safety throughout the loading / unloading operation.

## ■ Transporting on a Truck



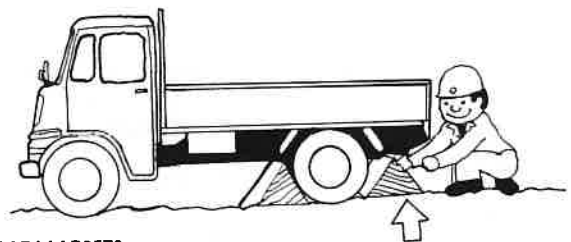
## WARNING

To avoid personal injury or death:

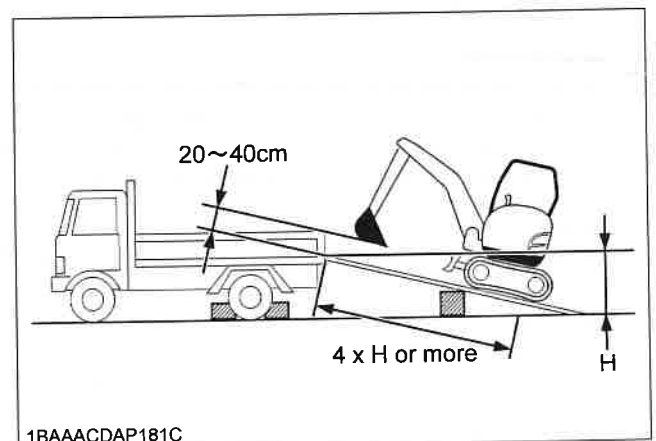
- After loading the machine on the truck, lower the bucket and dozer onto the truck bed.

Prepare a platform to load or unload the excavator. Take following steps when using ramps.

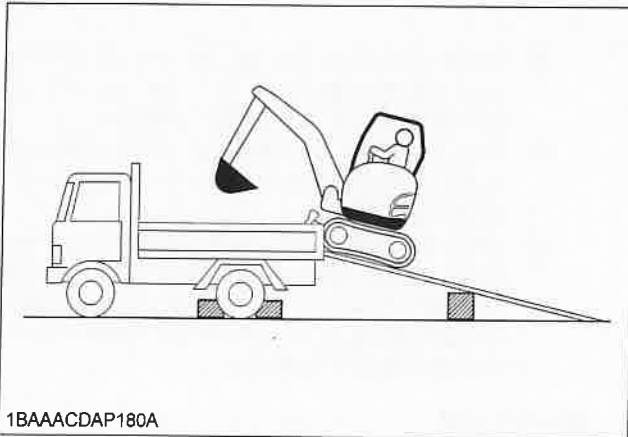
1. Apply the parking brakes of the vehicle, and block the drive wheels from both sides.



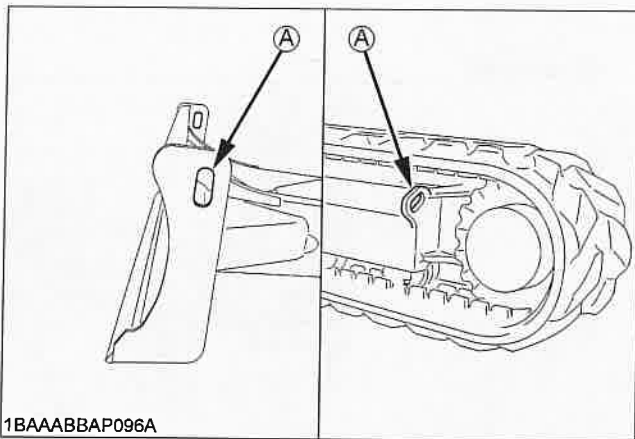
2. Use mounting brackets to secure the ramp properly. Connect the ramps directly with the bed.



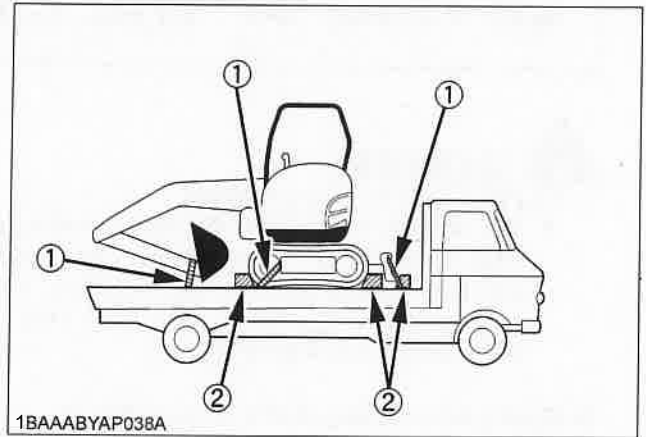
3. For additional safety, use blocks or supports under the ramps and the bed.



4. Completely align the ramps and the tracks and then drive the excavator slowly up the ramps. After ensuring that the tracks are completely on the bed, swivel the upper body around to the back of the vehicle.
5. Lower the dozer onto the bed.
6. Pull in the bucket and arm completely. Then lower the boom.
7. Stop the engine, release pressure trapped in the hydraulic system and remove the key.
8. Raise the pilot control lock lever.
9. Block the tracks with blocks and tie down the excavator.



(A) Tie down point



- (1) Chain  
(2) Block

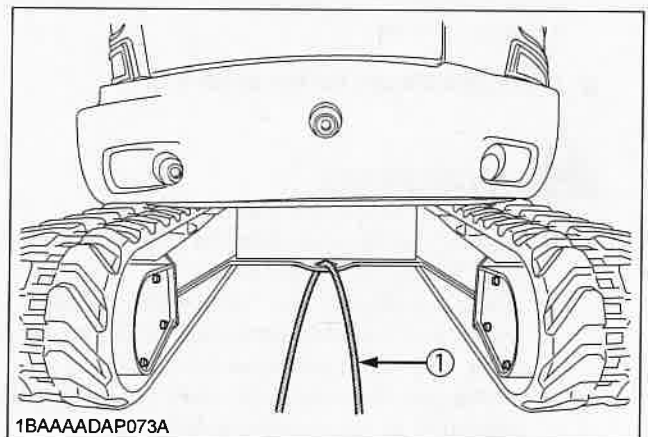
### ■ Towing the machine



#### CAUTION

To avoid personal injury:

- When towing the excavator or pulling a load must be less than the strength of the towing line attached to excavator. Not to be used for tie-down or lifting the machine.
  - Towing is only allowed over a short distance and at walking speed.
1. Attach the tow bar or towing rope to the hook on the excavator and to the pulling vehicle. The tow bar should be mounted at a right angle to the vehicles.
  2. The operator must be seated during the recovery procedure.
  3. Drive slowly with the tractive vehicle to avoid abrupt loads.



- (1) Tow line

# LIFTING OF THE EXCAVATOR



## DANGER

To avoid serious injury or death:

- The correct instructions for safe handling are described here. Read these instructions carefully before moving the machine. Make sure that the operating personnel read the operator's manual carefully.

### ■ Basics when Lifting with Cables or Straps

1. The lifting and crane operation is to be undertaken according to the safe operation guidelines described.
2. The equipment used for lifting mentioned in these instructions are only given as reference, the standards concerning strength, control and other details are based on the respective applicable guidelines.

### ■ Safety Aspects when Lifting with Cables or Straps

Abide by the following steps when lifting:

1. Do not lift loads that exceed the maximum load capacity of the crane.
2. Choose correct equipment suitable to the weight, size and form of the load.
3. First assess the center of gravity of the load, position the hook directly over the load and lift the load so that the center of gravity of the load is as low as possible.
4. The steel cables or straps must be fixed in the middle of the hook.
5. The load must be lifted vertically from the ground.
6. Do not enter the working area under suspended loads and do not move the load over people. The load must only be moved in an area where the balance can be easily maintained.

### ■ Lifting Procedure for the Excavator



## WARNING

To avoid personal injury or death:

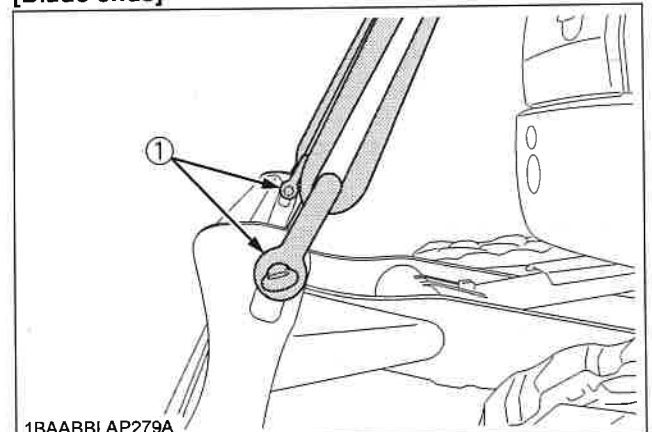
- Do not use the hooks on the roof of canopy and CAB for lifting the excavator.
- When applying the shackles through the boom's and blade's openings for lifting, be sure to do two-point lifting for added safety.
- Never lift the machine with the angle blade placed at an angle. (Angle blade type)

### ◆ General guidelines for lifting

1. Lifting position. (see illustration below)
  - (1) Rotate the upper swivel structure until the blade positions itself 180-degree opposite the attachment.
  - (2) Raise the blade all the way.

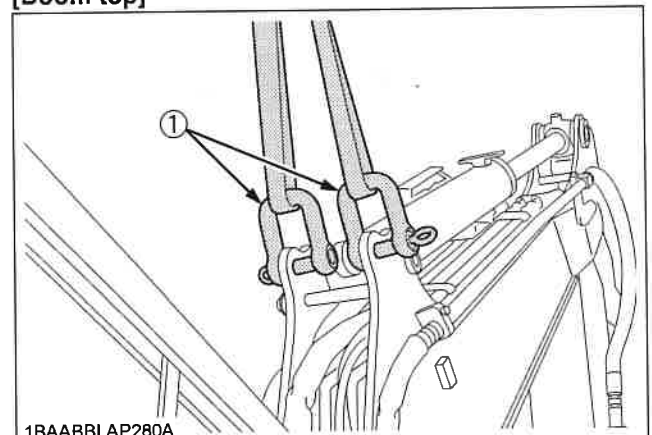
- (3) Raise the boom and get the bucket and arm in their crowded position. Next set the pilot control lock lever to the "LOCKED" position.
- (4) With the boom not swinging, set the swing pedal to the neutral position, place the pedal cover and stop the engine.
- (5) Apply shackles (3200 kg or heavier-duty) through the openings at both ends of the blade. And apply shackles (2000 kg or heavier-duty) through the two openings at the boom top. Pass wire ropes through these shackles.

[Blade ends]



(1) Shackle

[Boom top]



(1) Shackle