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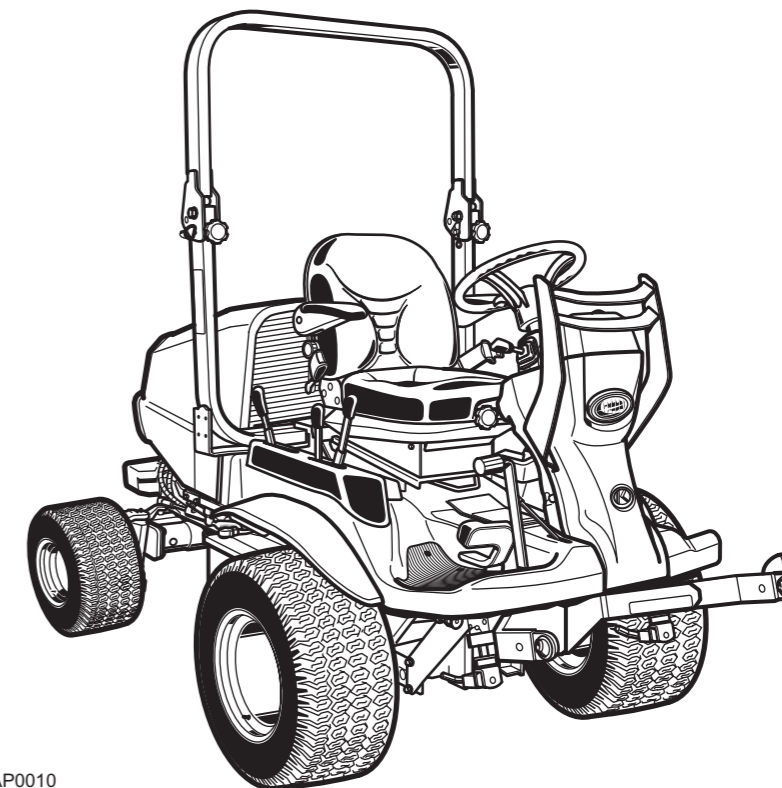
KUBOTA Corporation

English (AUS)  
Code No. K3603-6291-1

# OPERATOR'S MANUAL

# KUBOTA FRONT MOWER

MODELS **F2890**  
**F3690**



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READ AND SAVE THIS MANUAL



# ABBREVIATION LIST

Abbreviations	Definitions
2WD	2 Wheel Drive
4WD	4 Wheel Drive
API	American Petroleum Institute
ASABE	American Society of Agricultural and Biological Engineers, USA
ASTM	American Society for Testing and Materials, USA
DIN	Deutsches Institut für Normung, GERMANY
DT	Dual Traction [4WD]
fpm	Feet Per Minute
GST	Glide Shift Transmission
T/M	Transmission
Hi-Lo	High Speed-Low Speed
HST	Hydrostatic Transmission
m/s	Meters Per Second
PTO	Power Take Off
RH/LH	Right-hand and left-hand sides are determined by facing in the direction of forward travel
F&R	Front and rear sides are determined by facing in the direction of forward travel
ROPS	Roll-Over Protective Structures
rpm	Revolutions Per Minute
r/s	Revolutions Per Second
SAE	Society of Automotive Engineers, USA
SMV	Slow Moving Vehicle
SPT	Semi-Permanent Type
SUPER UDT	KUBOTA Original Transmission hydraulic fluid

## KUBOTA Corporation is ...

Since its inception in 1890, KUBOTA Corporation has grown to rank as one of the major firms in Japan.

To achieve this status, the company has through the years diversified the range of its products and services to a remarkable extent, until today, 19 plants and 16,000 employees produce over 1,000 different items, large and small.

All these products and all the services which accompany them, however, are unified by one central commitment. KUBOTA makes products which, taken on a national scale, are basic necessities. Products which are indispensable, products intended to help individuals and nations fulfill the potential inherent in their environment. For KUBOTA is the Basic Necessities Giant.

This potential includes water supply, food from the soil and from the sea, industrial development, architecture and construction, transportation.

Thousands of people depend on KUBOTA's know-how, technology, experience and customer service. You too can depend on KUBOTA.



































California Proposition 65

### **▲ WARNING ▲**

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

# UNIVERSAL SYMBOLS

As a guide to the operation of your machine, various universal symbols have been utilized on the instruments panels and controls. The symbols are shown below with an indication of their meaning.

	Safety Alert Symbol		Remote Cylinder-Retract
	Diesel Fuel		Remote Cylinder-Extend
	Fuel-Level		Steering Wheel-Tilt Control
	Engine-Rotational Speed n/min		Head Lights OFF
	Hourmeter/Elapsed Operating Hours		Head Lights ON
	Engine Coolant-Temperature		Fast
	Brake		Slow
	Parking Brake		Read Operator's Manual
	Battery Charging Condition		Machine-Forward Movement-Overhead View of Machine
	Engine Oil-Pressure		Machine-Rearward Movement-Overhead View of Machine
	Engine-Stop		Engine Speed Control
	Engine-Run		Neutral
	Diesel Preheat/Glow Plugs (Low Temperature Start Aid)		Full Time 4WD This position provides 4WD mechanically in any kind of the ground condition.
	Starter Control		Dual-Acting Overrunning 4WD This position provides 4WD automatically only when the ground speed dictate between front and rear wheels (forward and backward).
	Power Take-Off Control-Off Position (Disengaged)		Master System Warning
	Power Take-Off Control-On Position (Engaged)		
	Differential Lock		
	Position Control-Raised Position		
	Position Control-Lowered Position		

# FOREWORD

You are now the proud owner of a KUBOTA FRONT MOWER. This machine is a product of KUBOTA's quality engineering and manufacturing. It is made of excellent materials and under a rigid quality control system. It will give you long, satisfactory service. To obtain the best use of your machine, please read this manual carefully. It will help you become familiar with the operation of the machine and contains many helpful hints about machine 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 manufacturing of products may cause some small parts of this manual to become outdated. KUBOTA distributors and dealers will have the most up-to-date information. Please do not hesitate to consult 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 section carefully before operation. All operators, no matter how experienced they may be, should read this and other related manuals before operation of the machine or any implement attached to it. It is the owner's obligation to instruct all operators in safe operation.

This cutting machine is capable of amputating hands and feet and throwing objects. Failure to observe the following safety instructions could result in serious injury or death.

## 1. BEFORE OPERATING

1. Know your equipment and its limitations. Read, understand and follow all instructions in this manual before attempting to start and operate the machine.
2. Pay special attention to the safety labels on the machine and mower.
3. KUBOTA recommends the use of a Roll Over Protective Structures (ROPS) and seat belt in almost all applications. This combination will reduce the risk of serious injury or death, should the machine be upset.

The machine is equipped with a foldable ROPS, which may be temporarily folded down only when absolutely necessary for areas with height constraints.

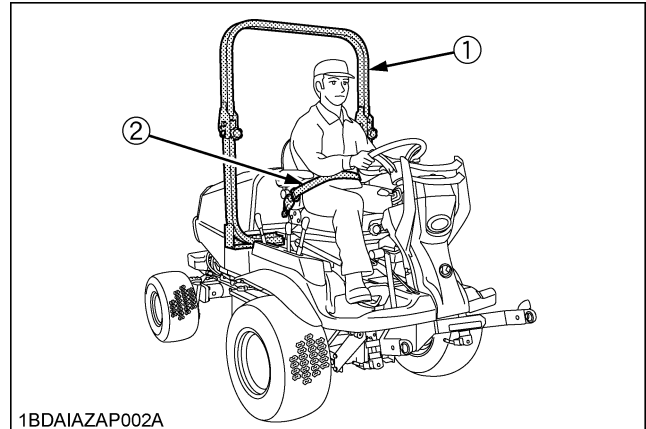
(There is no operator protection provided by the ROPS in the folded position. For operator safety the ROPS should be placed in the upright and locked position and the seat belt fastened for all other operations.)

If the ROPS is loosened or removed for any reason, make sure that all parts are reinstalled correctly before operating the machine.

Never modify or repair a ROPS because welding, bending, drilling, grinding, or cutting may weaken the structure.

A damaged ROPS structure must be replaced, not repaired or revised.

If any structural member of the ROPS is damaged, replace the entire structure at your local KUBOTA Dealer.



1BDAIAZAP002A

- (1) ROPS
  - (2) Seat belt
4. Always use the seat belt when the ROPS is upright. Do not use the seat belt without a ROPS being upright. Check the seat belt regularly and replace if frayed or damaged.
  5. The exhaust gas from the muffler is very hot. To prevent fire, do not expose dry grass, mowed grass, oil or any other combustible materials to exhaust gas. Use a spark arrester where required. Also keep the engine and muffler clean all the time. Replace the muffler if it has a fault.
  6. Never wear loose, torn, or bulky clothing. It may catch on moving parts or controls, leading to the risk of accident. Safety boots or shoes, eye and hearing protection, gloves, dust mask, etc. are recommended.
  7. Do not wear radio or music headphones while operating the machine. Safe operation requires your full attention.
  8. Carefully check the vicinity before operating machine or any implement attached to it. Clear the work area of objects (wires, rocks, etc.) that might be picked up and thrown. Check for overhead clearance which may interfere with a ROPS.
  9. Do not operate machine or any implement attached to it while under the influence of alcohol, drugs, or other substances or while fatigued.
  10. Check brakes, and other mechanical parts for faulty adjustment and wear. Replace worn or damaged parts promptly. Check the tightness of all nuts and bolts regularly. (For further details, see "MAINTENANCE" section.)

11. Keep the machine and attachments in good operating condition and keep safety devices in place and in proper working condition.
12. Do not modify the machine. Unauthorized modification may affect the function of the machine, which may result in personal injury.
13. Keep all shields and guards in place. Replace all missing or damaged items for your safety.
14. Never allow any bystanders around or near machine during operation.  
Be sure the area is clear of other people before mowing.  
Stop machine if anyone enters the area.
15. Before allowing other people to use your machine, explain proper operation to them and have them read this manual before operation.
16. Never allow passengers or non-qualified operators on the machine at any time. You must operate the machine from the seat only.
17. In addition to the design and configuration of equipment, hazard control and accident prevention are dependent on the awareness, concern, and prudence of personnel involved in the operation, transport, maintenance of facilities.
18. Keep your machine clean. Dirt, grease, and trash accumulations may contribute to fires or lead to personal injury.
19. Use only attachments recommended by KUBOTA.  
Use proper ballast to front or rear of machine to reduce the risk of upsets. Follow the "Safe Operation" procedures, specified in the Equipment's Manual.

## 2. OPERATING

### ◆ Starting

1. Never start the engine or operate levers from anywhere other than the seat.
2. Before starting the engine make sure that all levers and speed control pedal are in neutral, the parking brake is engaged, and Power Take Off (PTO) is disengaged.  
Fasten the seat belt if the ROPS is upright.
3. Do not start the engine while tilting the deck.
4. Do not start the engine by shorting across starter terminals or by bypassing the safety start switch. The machine may start and move if normal starting circuitry is bypassed.
5. Do not operate or idle engine in a poorly ventilated area. Exhaust gas contains carbon monoxide, a colorless, odorless gas they can be poisonous if not properly ventilated.

### ◆ Working

1. Watch where you are going at all times. Watch for and avoid obstacles. Be alert near trees and other obstructions.
2. To avoid tip over, slow down when turning on uneven terrain or before stopping.
3. Park the machine on a firm, level surface.
4. Do not drive at high speeds or turn the machine when the differential is locked.
5. Know what is behind you before backing up. Look to the rear before and while backing up. Do not mow while in reverse unless absolutely necessary and make sure the area immediately behind you is clear of obstructions or holes and small children. Use extra caution when the machine is equipped with the grass catcher. Your view to the rear is restricted.
6. When working in groups, always let others know what you are doing ahead of time.
7. Do not drive the machine on streets or highways. Watch for traffic when you cross roads or operate near roads.
8. Be aware of the mower discharge direction and do not point it at anyone.
9. When using any attachments, never direct discharge material toward bystanders. Do not allow anyone near the attachments while in operation.  
Do not mow when bystanders are present in the mowing area.
10. To reduce fire hazards, keep the engine exhaust area free of debris.
11. Be sure rotating blades and engine are stopped and the key is removed before placing hands or feet near blades and cleaning blockages or unclogging chute.
12. Shut the engine off and wait for all movement to stop before unclogging the chute of the grass catcher. [if equipped]
13. Always inspect the mower and the grass catcher [if equipped] after striking any foreign object. This will insure that all mower and grass catcher parts are safe and secure and not damaged.  
Repair or replace any damaged parts before re-starting.
14. Operate during daylight or in bright artificial light.
15. Do not operate where machine could tip or slip.  
Do not operate near ditches, holes, embankments, or other terrain which may collapse under the machine's weight. The risk of machine tip-over is increased when the ground is loose or wet.

### ◆ Operation on slopes

Slopes are a major factor related to loss-of-control and tip-over accidents, which can result in severe injury or death. All slopes require extra caution. If you cannot back up the slope or if you feel uneasy on it, do not mow it.

- Do not lift the grass container on a slope. [if equipped]
-

**DO**

1. To avoid tip over, operate up and down slowly, not across. Stay off hills and slopes too steep for safe operation.
2. Remove obstacles such as rocks, tree limbs, etc.
3. Stay alert for holes in the terrain and other hidden hazards. Keep away from drop-offs. Uneven terrain could overturn the machine. Tall grass can hide obstacles.
4. Follow KUBOTA's recommendations for wheel weights or counterweights to improve stability.
5. The weight of grass in the grass container may increase the possibility of tip over. [if equipped]
6. Keep all movement on slopes slow and gradual. Do not make sudden changes in speed or direction.
7. Avoid starting or stopping on a slope. If tires lose traction, disengage the blades and proceed slowly straight down the slope.
8. Reduce speed and exercise extreme caution on slopes and in sharp turns to prevent tip-over or loss of control.
9. Use special caution when changing direction on slopes.
10. Shift "High - Low Gear Shift Lever" to the Low position when mowing or operating on slopes.

**DO NOT**

1. Do not turn on slopes unless necessary and then turn slowly and gradually downhill, if possible.
2. Do not mow near drop-offs, ditches, or embankments. The machine could suddenly turn over if a wheel falls over the edge of a cliff or ditch, or if an edge caves in.
3. Do not mow on wet grass. Reduced traction could cause sliding.
4. Do not try to stabilize the machine by putting your foot on the ground.
5. Do not use the grass catcher on steep slopes. [if equipped]
6. Do not stop or start suddenly when going uphill or downhill.
7. Never "freewheel". Do not let the machine travel downhill with HST pedal at neutral position.

**◆ Children**

Tragic accidents can occur if the operator is not alert to the presence of children. Children are attracted to the machine and the mowing activity. Never assume that children will remain where you last saw them.

1. Keep children out of the mowing area and under the watchful care of another responsible adult.
2. Be alert and turn the machine off if children enter the area.
3. Before and when backing, look behind and down for small children.
4. Never carry children. They may fall off and be seriously injured or interfere with safe machine operation.
5. Never allow children to operate the machine, even under adult supervision. Local regulation can restrict the age of the operator.
6. Use extra care when approaching blind corners, shrubs, trees, or other obstructions that might hide children from sight.

**◆ Operators, age 60 years and above**

Data indicates that operators, age 60 years and above, are involved in a large percentage of machine-related injuries. These operators should evaluate their ability to operate the machine safely enough to protect themselves and others from serious injury.

**◆ Stopping**

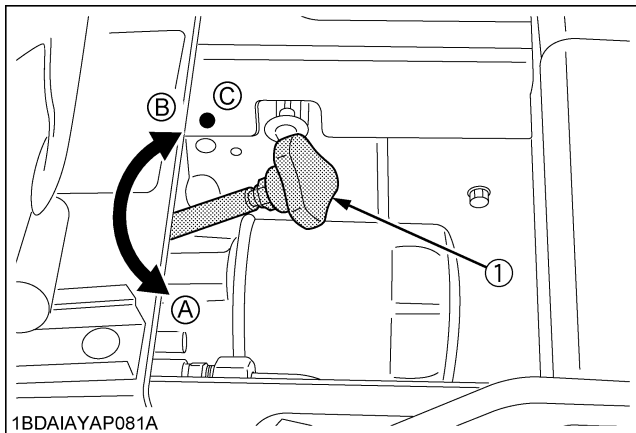
1. Make sure that the machine and all attachments have come to complete stop before dismounting.
2. Before dismounting, disengage the PTO, lower all implements, place all control levers in their neutral positions, apply parking brake, turn off the engine and remove the key.
3. Do not park the machine on a steep incline. Park on relatively flat areas.

**3. USING THE PTO**

1. Before installing or using PTO-driven equipment, read the manufacturer's manual and review the safety labels attached to the equipment.
2. Wait until all moving components have completely stopped before connecting, disconnecting, adjusting, cleaning, or servicing any PTO-driven equipment.
3. Use the PTO with KUBOTA approved attachments.  
The speed of the PTO:  
F2690E, F2690 2545 rpm at 3000 engine rpm  
F3990 2583 rpm at 2500 engine rpm

### 4. USING THE LIFT LINK

1. Use lift link only with authorized attachments designed for lift link usage.
2. When using a lift link mounted attachment, be sure to install the adequate counter ballast weight specified in the attachment's manual.
3. When moving the machine a long distance, set the implement lowering control in the "LOCK" position to hold the implement in the raised position.
4. Do not turn the knob quickly.



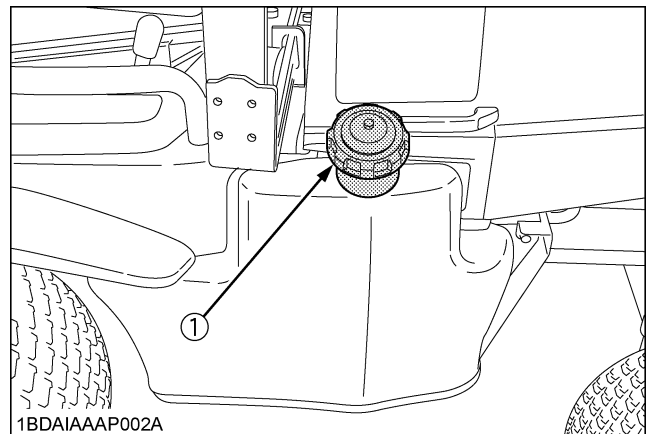
- (1) Lift link lowering speed control knob  
(A) "FAST": Turn counterclockwise slowly  
(B) "SLOW": Turn clockwise  
(C) "LOCK": Turn clockwise to the end

### 5. TRANSPORTING

1. Disengage power to attachment(s) when transporting or not in use.
2. Do not tow this machine. Use a suitable truck or trailer when transporting on public roads.
3. It is recommended that this machine not be used on public roads.
4. Use extra care when loading or unloading the machine into a trailer or truck.
5. Keep attachment(s) low when transporting.
6. Move very slowly when attachment is removed.

### 6. SERVICING

1. Before servicing the machine, park the machine on a firm, level surface, set the parking brake, stop the engine and remove the key.
2. Allow the machine to cool off before servicing the engine, muffler, etc.
3. Always stop the engine before refueling. Avoid spills and overfilling. Wipe up spilled fuel immediately.



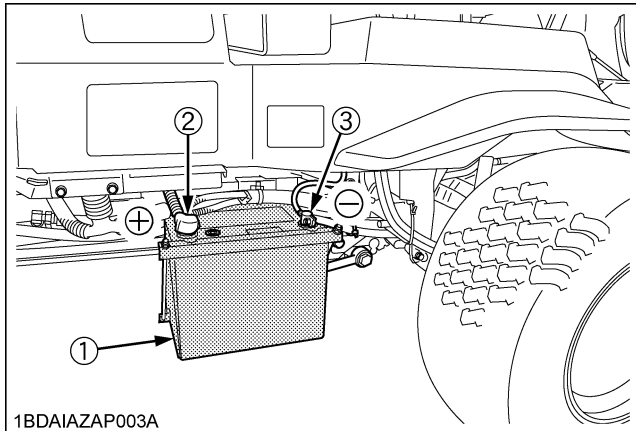
(1) Fuel tank cap

4. Use extra care in handling diesel fuel.
  - (1) Use only an approved container.
  - (2) Do not remove fuel cap or refuel with the engine running. Allow engine to cool before refueling. Do not smoke while refueling or when standing near fuel.
  - (3) Do not refuel the machine indoors and always clean up spilled fuel or oil.
  - (4) Do not store the machine or fuel container inside where there is an open flame, such as a water heater.
5. Do not smoke when working around the battery. Keep all sparks and flames away from battery. The battery presents an explosion hazard because it gives off hydrogen and oxygen...especially when recharging.
6. Before "JUMP STARTING" a dead battery, read and follow all of the instructions to help protect the alternator from damage due to extreme load changes. (See "JUMP STARTING" in "OPERATING THE ENGINE" section.)

Batteries contain sulfuric acid and produce explosive gases. Follow the instructions below to prevent personal injury.

  - Wear eye and skin protection.
  - Keep sparks and flame away.
  - Always have adequate ventilation while charging or using the battery.
7. Keep first aid kit and fire extinguisher available at all times.

8. Disconnect the battery's negative (-) cable before working on or near electric components.
9. Do not use or charge the 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.
10. To avoid sparks from an accidental short circuit, always disconnect the battery's negative (-) cable first and connect it last.

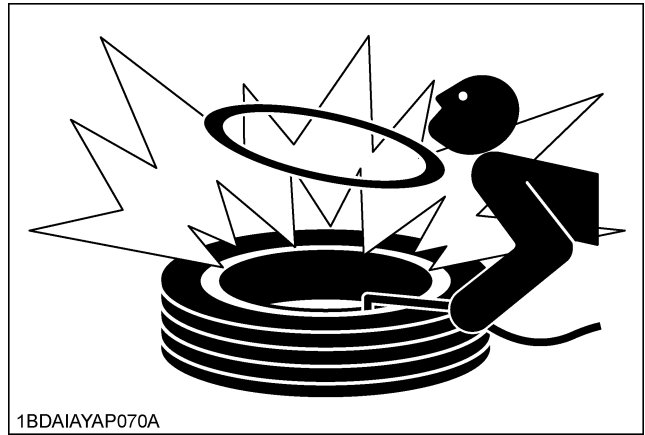


1BDIAZAP003A

- (1) Battery  
 (2) Positive cable (+)  
 (3) Negative cable (-)

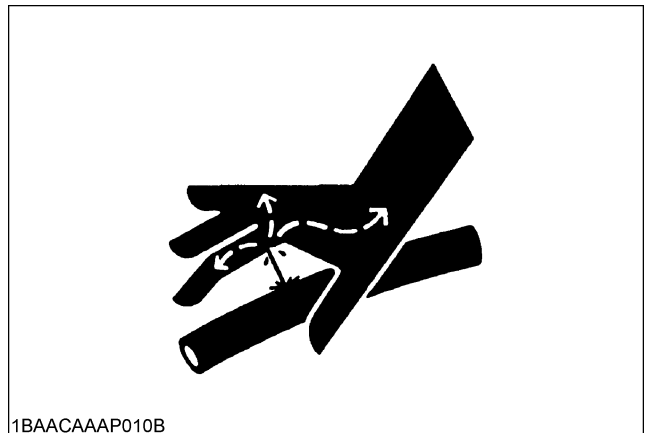
11. Do not remove the radiator cap while coolant is hot. When cool, slowly rotate cap to the first stop and allow sufficient time for excess pressure to escape before removing the cap completely. If the machine has a coolant recovery tank, add coolant there instead of the radiator.
12. Provide adequate support when changing wheels or the wheel.
13. Make sure that wheel nuts have been tightened to the specified torque.
14. Do not attempt to mount a tire on a rim. This should be done by a qualified person with the proper equipment.

15. Always maintain the correct tire inflation pressure. Do not inflate tires above the recommended pressure shown in the Operator's Manual.



1BDIAIYAP070A

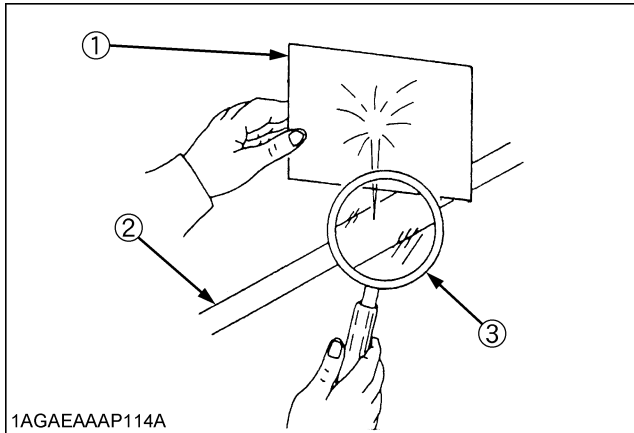
16. Securely support the machine when changing wheels.
17. Make sure that wheel bolts have been tightened to the specified torque.
18. Escaping hydraulic fluid under pressure has sufficient force to penetrate the skin causing serious personal injury. Before disconnecting lines, be sure to relieve all pressure. Before applying pressure to the system, make sure all connections are tight and that lines, pipes, and hoses are not damaged.



1BAACAAAP010B

19. Fluid escaping from pinholes may be invisible. Use a piece of cardboard or wood to search for suspected leaks: do not use hands. Use safety goggles or other eye protection.

If injured by escaping fluid, see a medical doctor at once. Serious infection or reaction will result if proper medical treatment is not administered immediately. This fluid can produce gangrene or severe allergic reaction.



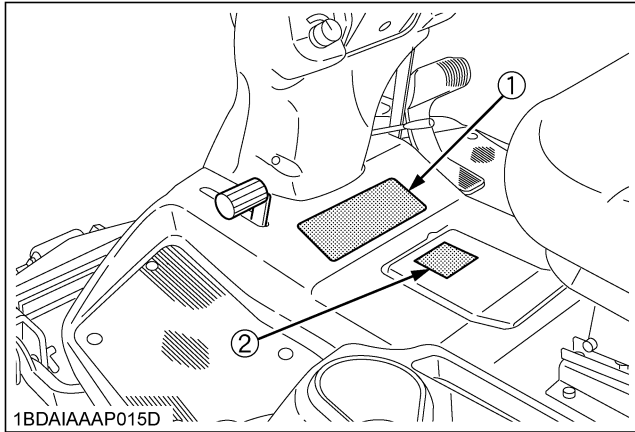
- (1) Cardboard
- (2) Hydraulic line
- (3) Magnifying glass

- 20. Do not make adjustments or repairs with the engine running.
- 21. Keep machine free of grass, leaves, or other debris build-up.
- 22. Do not run a machine inside a closed area.

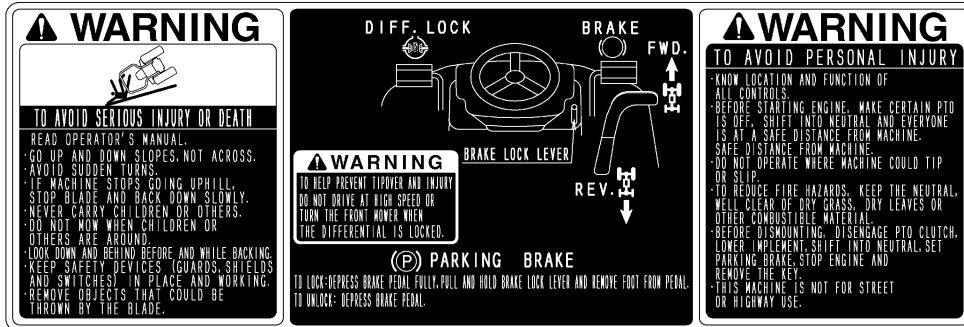
## 7. STORAGE

- 1. Keep the machine and fuel supply in a secure area and remove the key to prevent children or others from playing or tampering with them.
  - 2. Do not store the machine in an area that may ignite fuel vapor. Allow the engine to cool before storing.
  - 3. To avoid the danger of exhaust fume poisoning, do not operate the engine in a closed building without adequate ventilation.
  - 4. To reduce fire hazards, clean the machine thoroughly before storage. Dry grass and leaves around the engine and mufflers may ignite.
-

## 8. DANGER, WARNING AND CAUTION LABELS

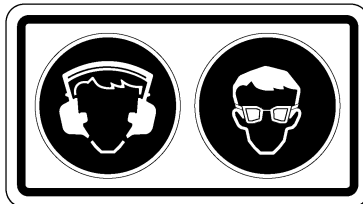


(1) Part No. K3601-4717-1



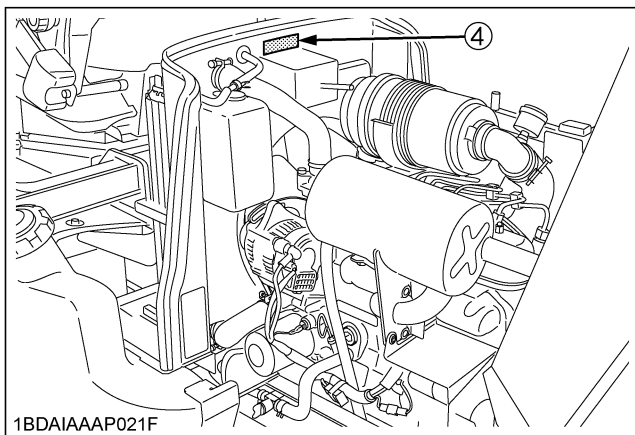
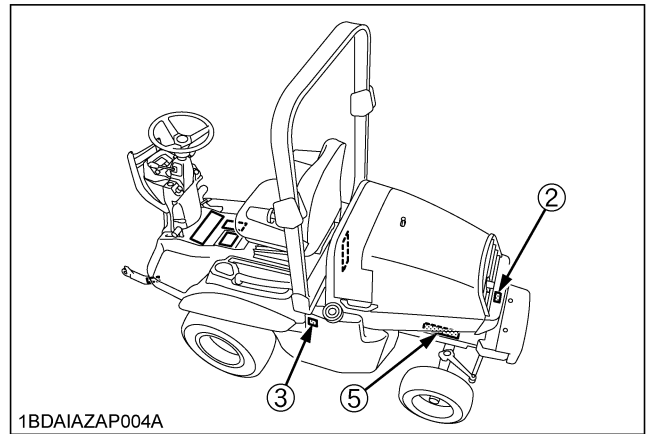
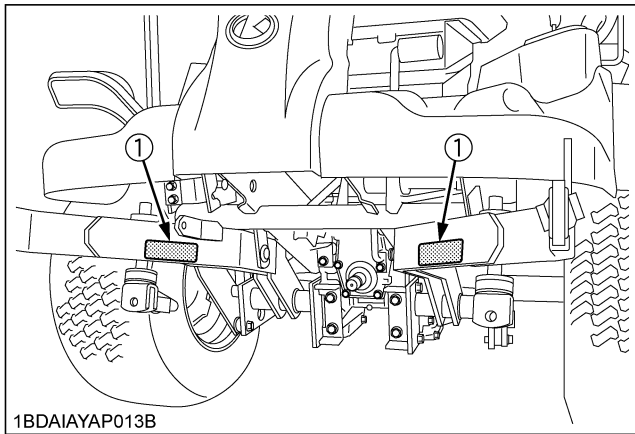
1BDAlAYAP071A

(2) Part No. K3603-4718-1



1BDABDMP011A

1BDAlAZAP006A

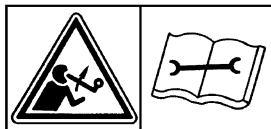


(3) Part No. K3611-4741-1  
Diesel fuel No fire only



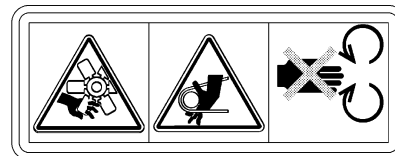
1BDAHADAP0300

(1) Part No. K3512-4721-1  
This arm can spring up upward.  
See operator's manual when  
disassembling



1BDAIAEAP013B

(4) Part No. K2581-6543-1  
Stay clear of engine  
fan and fan belt.



1AGAJAXAP052E

(2) Part No. K3512-4719-1  
HOT SURFACE  
DO NOT TOUCH



1BDABANAP080B

(5) Part No. TA040-4965-2



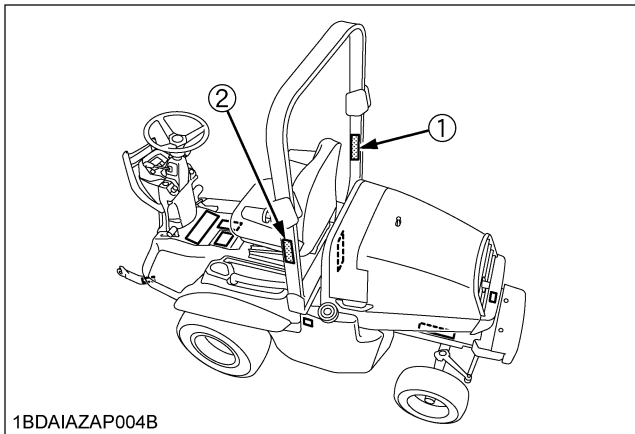
1AGAMAAP3810

**▲ DANGER**

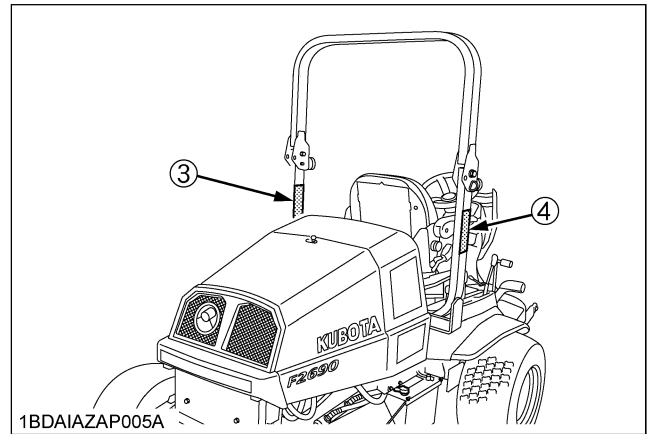
**TO AVOID POSSIBLE INJURY OR DEATH FROM A MACHINE RUNAWAY.**

1. Do not start engine by shorting across starter terminals or bypassing the safety start switch. Machine may start in gear and move if normal starting circuitry is bypassed.
2. Start engine only from operator's seat with transmission and PTO OFF. Never start engine while standing on the ground.





1BDAIAZAP004B



1BDAIAZAP005A

(1) Part No. K3611-8143-1

(2) Part No. K3611-8149-1

(3) Part No. K3615-8149-1

(4) Part No. K3615-8148-1

**⚠ WARNING**

**TO AVOID PERSONAL INJURY OR DEATH FROM ROLL-OVER:**

1. Keep Roll-Over Protective Structures (ROPS) in the upright and locked position.
2. Fasten SEAT BELT before operating.

**THERE IS NO OPERATOR PROTECTION WHEN THE ROPS IS IN THE FOLDED POSITION.**

1. Check the operating area and fold the ROPS only when absolutely necessary.
2. Do not wear SEAT BELT if ROPS is folded.
3. Raise and lock ROPS as soon as vertical clearance allows.
4. Read ROPS related instructions and warnings.

1BDAIAAAP053A  
1BDAIAZAP020A

**⚠ ADVERTENCIA**

**PARA EVITAR LESIONES PERSONALES O LA MUERTE A CAUSA DE VUELCOS:**

1. Mantenga las estructuras de protección contra vuelcos (marcos-techos) en posición erguida y bloqueada.
2. Abróchese el CINTURÓN DE SEGURIDAD antes de operar la máquina.

**NO HAY NINGUNA PROTECCIÓN PARA EL OPERADOR CUANDO EL MARCO-TECHO ESTÁ EN POSICIÓN DOBLADA**

1. Controle el área de operación y pliegue el marco-techo sólo cuando sea absolutamente necesario.
2. No use el cinturón de seguridad si el marco-techo está doblado.
3. Levante y trabaje el marco-techo en cuanto la holgura vertical lo permita.
4. Lea las advertencias e instrucciones relacionadas con el marco-techo.

1BDAIAAAP052A

**⚠ WARNING**

Never modify or repair a ROPS because welding, grinding, drilling or cutting any portion may weaken the structure.

**⚠ WARNING**

**TO AVOID INJURY WHEN RAISING OR FOLDING ROPS:**

- Set parking brake and stop engine.
- Remove any obstruction that may prevent raising or folding of the ROPS.
- Do not allow any bystanders.
- Always perform function from a stable position at the rear of the tractor.
- Hold the top of the ROPS securely when raising or folding.
- Make sure all pins are installed and locked.

1BDAIAYAP079A

**⚠ ADVERTENCIA**

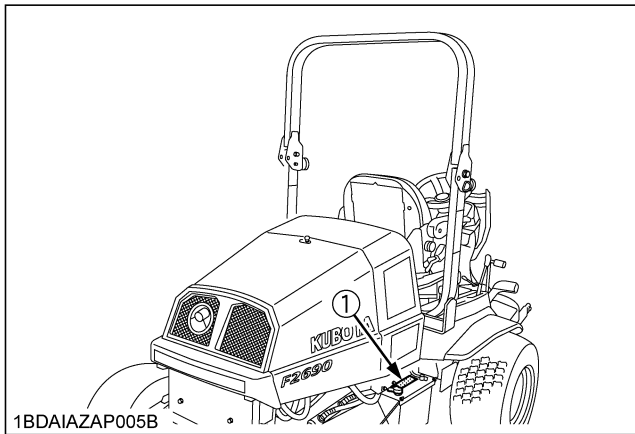
Nunca modifique ni repare un marco-techo dado que la soldadura, amoladura, perforación o corte de cualquier pieza puede debilitar la estructura.

**⚠ ADVERTENCIA**

**PARA EVITAR LESIONES AL LEVANTAR O PLEGAR UN MARCO-TECHO:**

- Coloque el freno de estacionamiento y apague el motor.
- Retire cualquier obstáculo que pueda evitar que el marco-techo se eleve o se pliegue.
- No permita que haya personas alrededor observando.
- Ejecute siempre la función desde una posición estable en la parte trasera del tractor.
- Sustenga firmemente la parte superior del marco-techo al levantarlo o plegarlo.
- Asegúrese de que todos los pasadores estén instalados y trabados.

1BDAIAYAP080A



1BDIAZAP005B

(1) Part No. TD060-3012-3

<p>FLAMMABLES</p>	<p>SHIELD EYES</p>	<p>KEEP OUT OF THE REACH OF CHILDREN</p>	<p>CAUTIOUS OF SULFURIC ACID</p>	<p>READ INSTRUCTION MANUAL CAREFULLY</p>	<p>EXPLOSIVE</p>																								
<p><b>DANGER</b></p> <ul style="list-style-type: none"> <li>• DUE TO HYDROGEN GAS GENERATED FROM BATTERY, HANDLING WITHOUT CARE CAN CAUSE FIRE AND EXPLOSION</li> <li>• THIS 12V BATTERY IS ONLY FOR STARTING ENGINE. DO NOT APPLY THIS PRODUCT FOR OTHER USES.</li> <li>• CHARGE THIS BATTERY ONLY AT WELL VENTILATED PLACES, AND AVOID SHORTS OR SPARKS.</li> <li>• REFER TO THE INSTRUCTION MANUAL OF VEHICLE OR BATTERY BEFORE USING BOOSTER CABLE.</li> <li>• SULFURIC ACID MAY CAUSE BLINDNESS OR SEVERE BURN. IN CASE EYES, SKIN, CLOTHES OR ANY ARTICLES ARE STAINED WITH ACID, FLUSH OBJECTS IMMEDIATELY WITH WATER. IF ACID BEING SWALLOWED, DRINK PLENTY OF WATER PROMPTLY. IN CASE OF ACCIDENTAL CONTACT, CONSULT A DOCTOR IMMEDIATELY.</li> <li>• BATTERY FILLED WITH ACID (DO NOT TILT OR SPILL) - FLAMMABLE. DO NOT CHARGE NEAR FIRE OR SPARKS</li> <li>• DO NOT CHARGE RAPIDLY - DO NOT DISASSEMBLE THE BATTERY (SEALED TYPE)</li> </ul>																													
<p><b>DANGER EXPLOSIVE GASES</b> Cigarettes, flames or sparks could cause battery to explode. Always shield eyes and face from battery. Do not charge or use booster cables or adjust post connections without proper instruction and training.</p> <p><b>POISON CAUSES SEVERE BURNS</b> Contains sulfuric acid. Avoid contact with skin, eyes or clothing. In event of accident flush with water and call a physician immediately.</p> <p><b>KEEP OUT OF REACH OF CHILDREN</b></p>																													
<p><b>S.O.C INDICATOR</b></p> <p> <input type="radio"/> OK                <input checked="" type="radio"/> CHARGE BATTERY                <input type="radio"/> REPLACE BATTERY         </p>																													
<p><b>PROPOSITION 65 WARNING</b> BATTERY POSTS, TERMINALS, AND RELATED ACCESSORIES CONTAIN LEAD AND LEAD COMPOUNDS. CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND REPRODUCTIVE HARM. WASH HANDS AFTER HANDLING.</p>																													
<p>FITTING DATE</p> <table border="0"> <tr> <td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td> <td>YEAR</td> </tr> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td> <td>MONTH</td> </tr> </table>						0	1	2	3	4	5	6	7	8	9	YEAR	1	2	3	4	5	6	7	8	9	10	11	12	MONTH
0	1	2	3	4	5	6	7	8	9	YEAR																			
1	2	3	4	5	6	7	8	9	10	11	12	MONTH																	
<p><b>80D26R</b> <b>12V</b></p>		<p><b>582CCA (SAE)</b> <b>70Ah(20HR)</b></p>		<p><b>550CCA (EN)</b> <b>RC 133(MIN)</b></p>																									
<p>LEAD RETURN RECYCLE</p>																													

1AGASABAP108B

**TO AVOID INJURY FROM BATTERY GASES AND ACIDES**

- |  |  |
|--|--|
|  | <ul style="list-style-type: none"> <li>• Keep away cigarettes, flames or sparks.</li> </ul>                        |
|  | <ul style="list-style-type: none"> <li>• Always shield eyes and face from battery.</li> </ul>                      |
|  | <ul style="list-style-type: none"> <li>• Keep out of reach of children.</li> </ul>                                 |
|  | <ul style="list-style-type: none"> <li>• Poison causes severe burns.</li> <li>• Contains sulfuric acid.</li> </ul> |
|  | <ul style="list-style-type: none"> <li>• Read and understand operator's manual.</li> </ul>                         |
|  | <ul style="list-style-type: none"> <li>• Danger explosive gases.</li> </ul>  |

1BDIAEAP0200

1BDIAZAP017A

## **9. CARE OF DANGER, WARNING AND CAUTION LABELS**

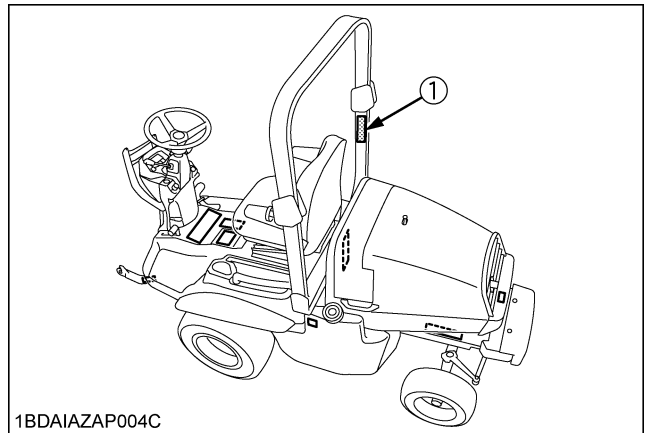
1. Keep danger, warning and caution labels clean and free from obstructing material.
  2. Clean danger, warning and caution labels with soap and water, dry with soft cloth.
  3. Replace damaged or missing danger, warning and caution labels with new labels from your local KUBOTA Dealer.
  4. If a component with danger, warning and caution label(s) affixed is replaced with new parts, 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.
-



# SERVICING OF MACHINE

After reading this manual thoroughly, you will find that you can do some of the regular maintenance yourself. Your dealer is interested in helping you get the best performance from your new machine and wants to help you get the most value from it. When in need of parts or major service, be sure to see your local KUBOTA Dealer. When in need of parts, be prepared to give your dealer the serial number of the machine, ROPS and engine. Locate the serial numbers now and record them in the space provided.

	Type	Serial No.
Machine		
Engine		
ROPS		
Date of Purchase		
Name of Dealer		
(To be filled in by purchaser)		



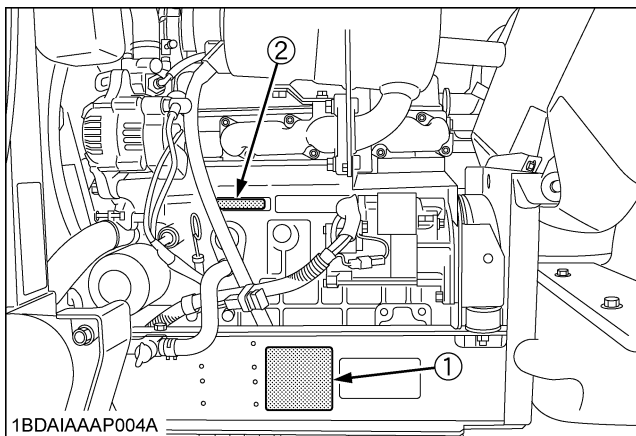
(1) ROPS serial No.

◆ **Warranty**

This machine 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 machine has not been handled according to the instruction given in the Operator's Manual even it is within the warranty period.

◆ **Scrapping the machine and its procedure**

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



(1) Machine serial No.

(2) Engine serial No.

# SPECIFICATIONS

		<b>Model</b>	<b>F2890</b>	<b>F3690</b>
Engine	Model		D1105	V1505
	Engine gross power (SAE) *1	kW (HP)	20.6 (28)	26.5 (36)
	Type		Indirect Injection. Vertical water - cooled, 4cycle diesel	
	Number of cylinders		3	4
	Bore and stroke	mm	78 x 78.4	
	Total displacement	cm <sup>3</sup>	1123	1498
	Rated revolution	rpm	3000	
	Low idling revolution	rpm	1300 to 1400	
	Fuel		Diesel fuel No.1 (S-15) [below -10°C] Diesel fuel No.2 (S-15)	
	Starter		Electric starter with battery, glow plug, 12 V, 1.4 kW	
	Lubrication		Forced lubrication by gear pump	
	Cooling		Liquid with pressurized radiator	
	Battery		12 V, RC: 133 min, CCA: 582 A	
Capacities	Fuel tank	L	61	
	Engine crankcase (with filter) *3	L	3.5	5.0
	Engine coolant	L	4.6	
	Recovery tank	L	0.6	
	Transmission case	L	14	
	Rear axle differential case	L	1.5	
	Rear axle gear case	L	0.5	
Dimensions	Overall length		mm	2450
	Overall width		mm	1370
	Overall height	Without ROPS	mm	1350
		With ROPS	mm	1985
	Wheelbase		mm	1300
	Min. ground clearance		mm	185
	Tread	Front	mm	1063
Rear		mm	1020	
Weight (W/O mower deck)		kg	770	788

	Model		F2890	F3690	
Traveling system	Tires	Front	24 x 12 - 12 (4PR) Turf	24 x 12 - 12 (4PR) Turf	
		Rear	18 x 9.5 - 8 (4PR) Turf	18 x 9.5 - 8 (4PR) Turf	
	Traveling speeds *2	Forward	Low	0 to 9 km/h	
			High	0 to 20 km/h	
		Reverse	Low	0 to 4.8 km/h	
			High	0 to 11 km/h	
	Steering		Power, hydrostatic		
	Transmission		Main - hydrostatic transmission. High - Low gear shift (2 forward, 2 reverse)		
	Brake		Wet disk type		
	Min. turning radius		mm	≤ 750 (Inside of Front Tire)	
	Differential	Front	Bevel gear		
Rear		Bevel gear			
4WD system		Dual - Acting Overrunning 4WD			
PTO	Revolution		1 speed (2545 rpm at 3000 engine rpm)		
	Drive system		Shaft drive. KUBOTA 10 tooth involute spline (2545 rpm)		
	Clutch type		Wet multi plates		
	PTO brake		Wet single plate		

(Specifications and design subject to change without notice)

**NOTE:**

\*1 Manufacture's estimate

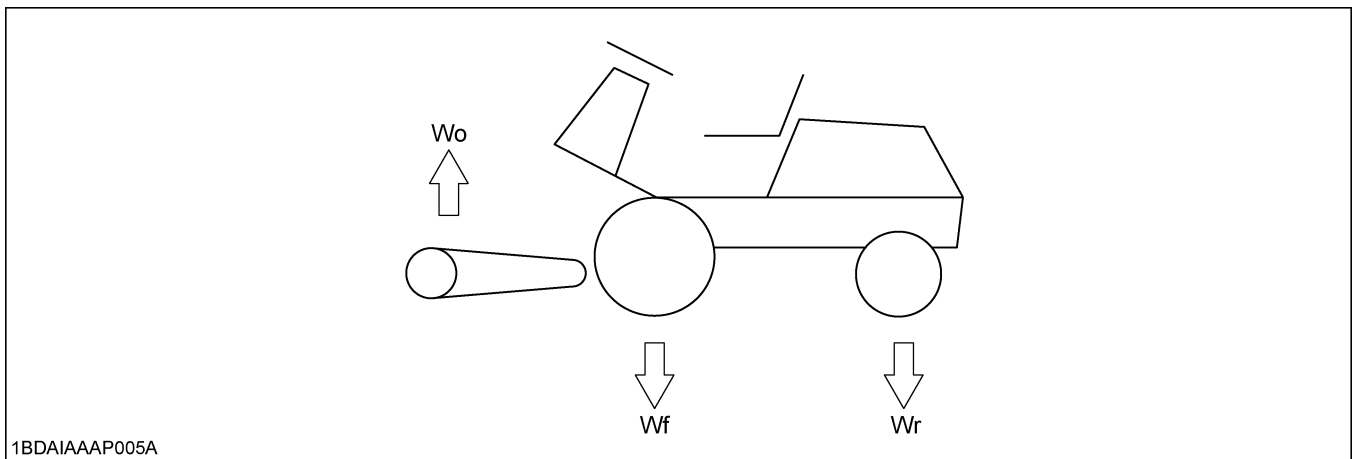
\*2 At 3000 engine rpm

\*3 Oil amount when the oil level is at the center of the oil level gauge

# IMPLEMENT LIMITATIONS

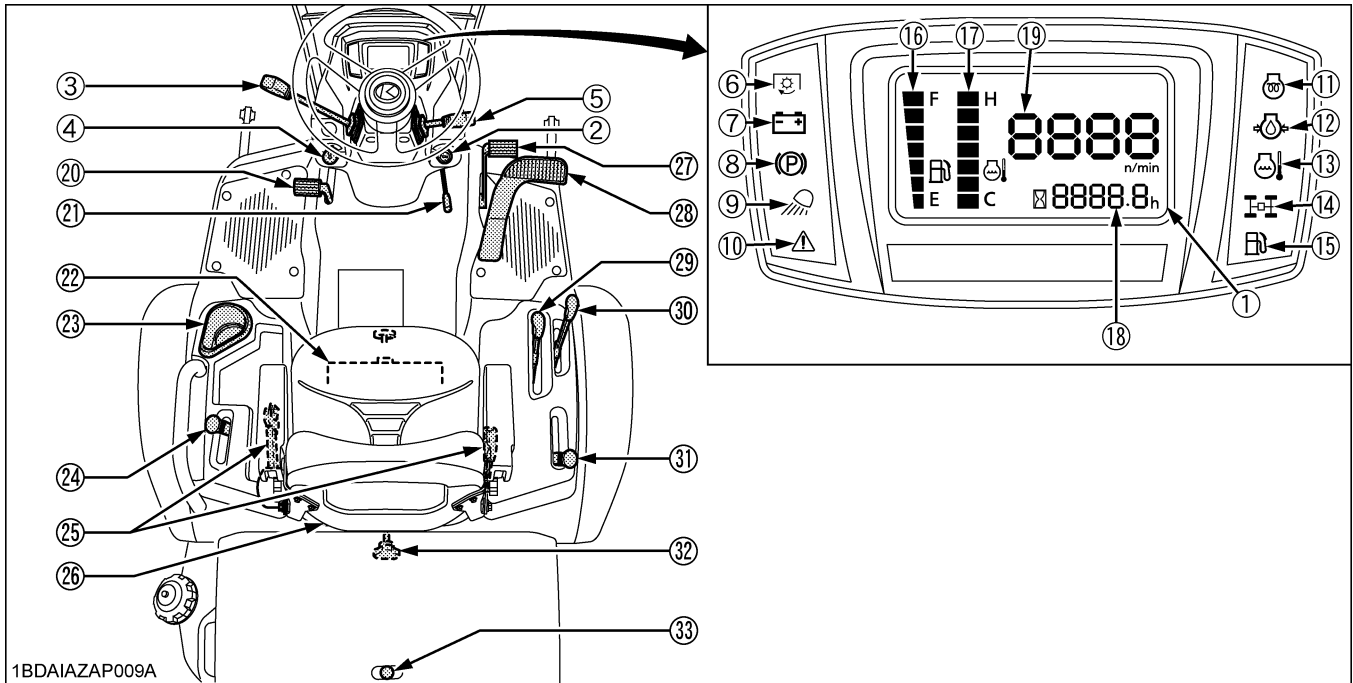
The KUBOTA Machine has been thoroughly tested for proper performance with implements sold or approved by KUBOTA. Use of implements which exceed the maximum loading weight listed below, or which are not recommended for use with the KUBOTA Machine may result in malfunctions or failures of the machine, damage to other property and injury to the operator or others. (Any malfunctions or failures of the machine resulting from use with improper implements are not covered by the warranty.)

	Maximum loading weight		Lift link end maximum loading weight $W_o$	Maximum total weight
	Front axle $W_f$	Rear axle $W_r$		
F2890 F3690	900 kg	600 kg	260 kg	1500 kg





# INSTRUMENT PANEL AND CONTROLS



1BDIAZAP009A

ILLUSTRATED CONTENTS

INSTRUMENT PANEL, SWITCHES and HAND CONTROLS

(1) Liquid crystal display.....	25
(2) Key switch.....	11
(3) Throttle lever.....	22
(4) Head light switch.....	19
(5) Steering wheel tilt lever.....	19
(6) PTO clutch indicator.....	9
(7) Electrical charge warning indicator.....	24
(8) Parking brake warning indicator.....	9
(9) Head light indicator.....	19
(10) Master system warning indicator.....	24
(11) Glow plug indicator.....	9
(12) Engine oil pressure warning indicator.....	24
(13) Engine overheat warning indicator.....	24
(14) 4WD indicator.....	21
(15) Fuel level indicator.....	9
(16) Fuel gauge.....	25
(17) Coolant temperature gauge.....	25

CONTROLS

(18) Hourmeter.....	26
(19) Tachometer.....	26
(20) Differential lock pedal.....	23
(21) Parking brake lever.....	9
(22) Globe box.....	18
(23) Cup holder	
(24) 4WD lock lever (4WD only).....	21
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(26) Operator's seat.....	18
(27) Brake pedal.....	22
(28) Speed control pedal (HST pedal).....	23
(29) High - Low gear shift lever.....	21
(30) Hydraulic lift lever.....	20
(31) PTO lever.....	22
(32) Lift link lowering speed control knob.....	20
(33) Hood lock lever.....	35

ILLUSTRATED CONTENTS

# MOWER MOUNTING

## MOUNTING THE MOWER

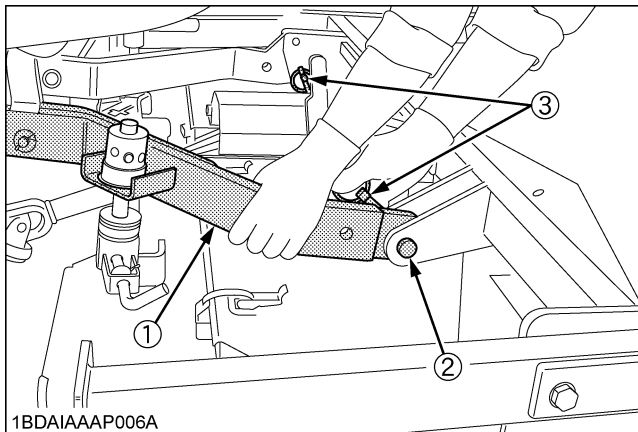


### WARNING

To avoid serious injury:

- Before mounting the mower deck, read and understand the use of the lift link lowering speed control knob. (See "Lift Link Lowering Speed Control Knob" in "OPERATING THE MACHINE" section in the operator's manual of the machine.)
- Place the PTO lever in the "DISENGAGE" position.
- Place the High-Low gear shift lever in the "NEUTRAL" position.
- The mower links (left hand, right hand) are spring-loaded. Have an assistant hold the arm in position when mounting the mower deck.

1. Move the mower deck under the mower links and place the hydraulic lift lever in the "DOWN" position.
2. Attach the front end of the mower links to the mower deck with clevis pins and set pins.



- (1) Mower link
- (2) Set pin
- (3) Clevis pin

3. Start the engine, raise the mower deck, lock the lift link lowering speed control knob and shut off the engine.
4. Install the lift rods to the mower deck with lock pins and lower the mower deck on the ground.

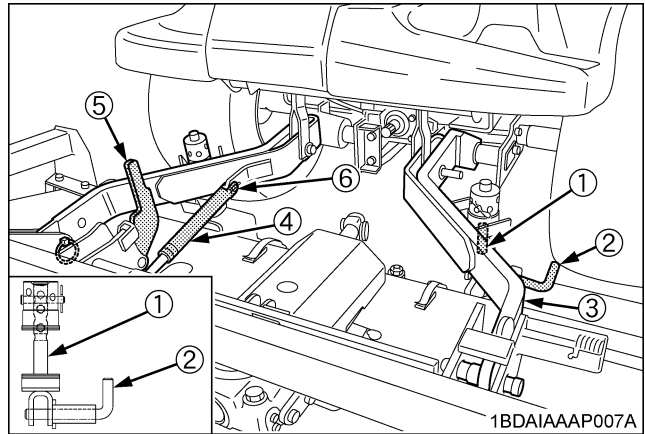
### [RCK72P-F39 / RCK72R-F36]

5. Attach the gas spring to the mower link with the clevis pin and the rue ring cotter.

### NOTE :

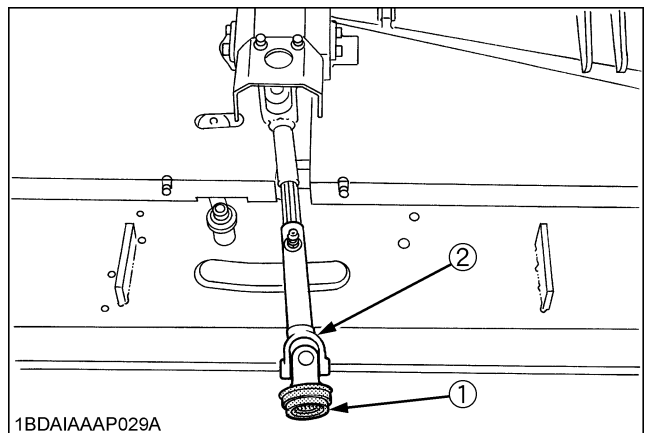
- When operating the mower, make sure the tilt lever is unlocked.

- For tilting up the mower, see "MOWER TILT UP" section in the operator's manual of the mower.



- (1) Lift rod
- (2) Lock pin
- (3) Mower link
- (4) Gas spring
- (5) Tilt lever ("UNLOCKED" position)
- (6) Rue ring cotter

6. Pull back the coupler of the universal joint. Push the universal joint onto the PTO shaft until the coupler locks. Slide the universal joint backward and forward to check that the universal joint is locked securely.



- (1) Coupler
- (2) Universal joint

### IMPORTANT :

- Finally pull the universal joint to see if it is locked tight in position.

After mounting the mower deck, adjust the lift link lowering speed.

(See "CONTROLS" in "INSTRUMENT PANEL AND CONTROLS" section.)

## DISMOUNTING THE MOWER DECK

For dismounting the mower deck, reverse the above procedures.



### WARNING

To avoid serious injury:

- The mower links (left hand, right hand) are spring-loaded. Have an assistant hold the arm in position when mounting the mower deck.

## MOWER TILT UP



### WARNING

To avoid serious injury:

- Do not start the engine while tilting the mower deck.



### WARNING

To avoid serious injury:

- Be sure to tilt the mower on a level surface and the parking brake ON.
- Place the PTO lever in the "DISENGAGE" position.
- Place the High-Low gear shift lever in the "NEUTRAL" position.

### ■ How To Tilt Up

For detailed procedure, refer to the mower operator's manual.

### ■ How To Mount Another Implement

For detailed procedure, refer to the implement instruction manual.

---

# PRE-OPERATION CHECK

## DAILY CHECK

To prevent trouble from occurring, it is important to know the condition of the machine well. Check it before starting.



### WARNING

To avoid serious injury:

- **Be sure to check and service the machine on a level surface with the engine shut off and the parking brake "ON" and implement lowered to the ground.**

### Check item

- Walk around inspection
  - Check engine oil level
  - Check transmission oil level
  - Check coolant level
  - Clean air conditioner condenser screen
  - Clean grill and radiator screen
  - Check air cleaner evacuator valve  
(When used in a dusty place)
  - Check brake pedal
  - Check indicators, gauges and meter
  - Check lights
  - Check wire harness
  - Check seat belt
  - Check movable parts
  - Refuel  
(See "DAILY CHECK" in "PERIODIC SERVICE" section.)
  - Care of danger, warning and caution labels  
(See "DANGER, WARNING AND CAUTION LABELS" in "SAFE OPERATION" section.)
-

# OPERATING THE ENGINE



## WARNING

To avoid serious injury:

- Read and understand "SAFE OPERATION" in the front of this manual.
- Read and understand the danger, warning and caution labels located on the machine.
- To avoid danger of exhaust fume poisoning, do not operate the engine in a closed building without proper ventilation.
- Never start the engine while standing on the ground. Start the engine only from the operator's seat.
- Make it a rule to set all shift levers to the "NEUTRAL" positions and to place the PTO lever in "OFF" position before starting the engine.

## IMPORTANT :

- Do not use starting fluid or ether.
- To protect the battery and the starter, make sure that the starter is not continuously turned for more than 30 seconds.

## STARTING THE ENGINE

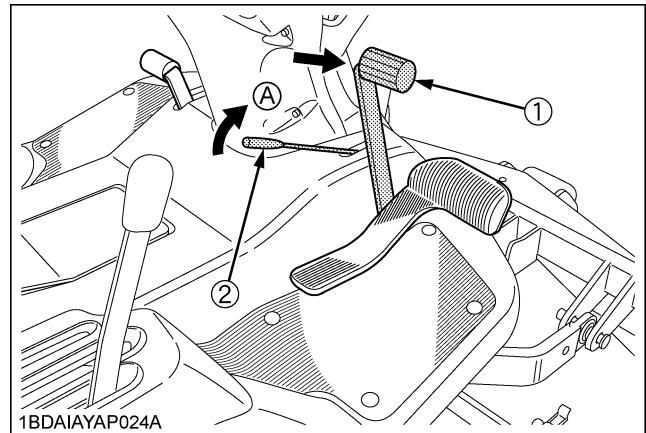
1. Sit on the operator's seat.
2. Apply the parking brake.

### To apply the parking brake:

Depress the brake pedal firmly and hold in position. Pull and hold the parking brake lever, and release the brake pedal.

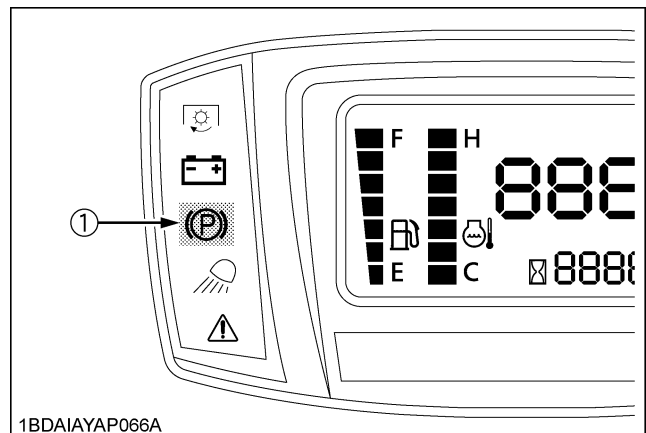
### To release the parking brake:

Depress the brake pedal and release slowly.



(1) Brake pedal  
(2) Parking brake lever

(A) "PARKING"

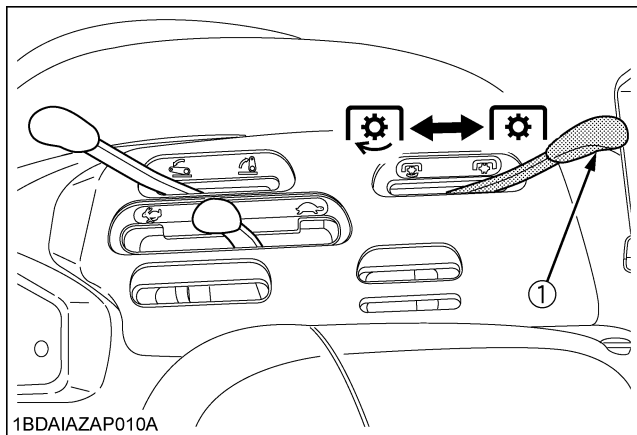


(1) Parking brake warning indicator

## NOTE :

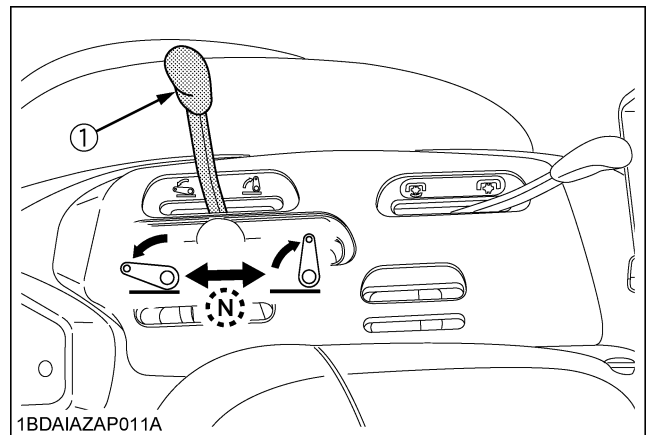
- It is recommended that the operator practice engaging and disengaging the parking brake on a flat surface without the engine running before operating the machine for the first time.

3. Make sure that the PTO lever is in the "DISENGAGED" position.



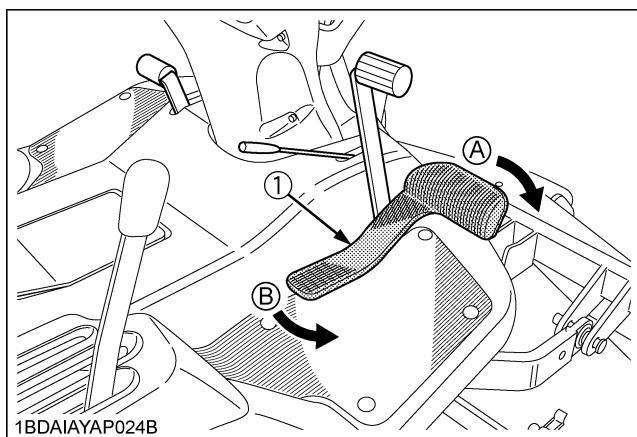
(1) PTO lever  
 [Gear icon]: "ENGAGED"  
 [Gear icon with slash]: "DISENGAGED"

5. Make sure that the hydraulic lift lever is in the "NEUTRAL" position.



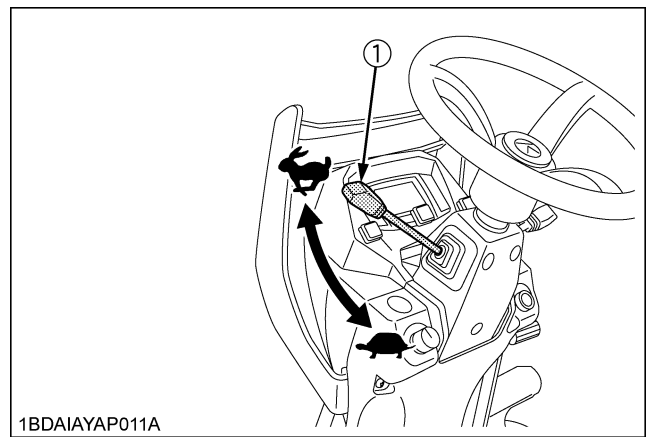
(1) Hydraulic lift lever  
 [Downward arrow icon]: "DOWN"  
 [Circle with N icon]: "NEUTRAL"  
 [Upward arrow icon]: "UP"

4. Make sure that the speed control pedal is in the "NEUTRAL" position.



(1) Speed control pedal  
 (A) "FORWARD"  
 (B) "REVERSE"

6. Set the throttle lever 1/2 way forward.

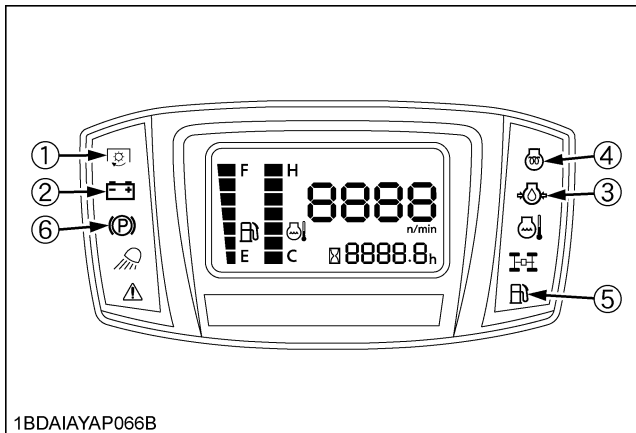
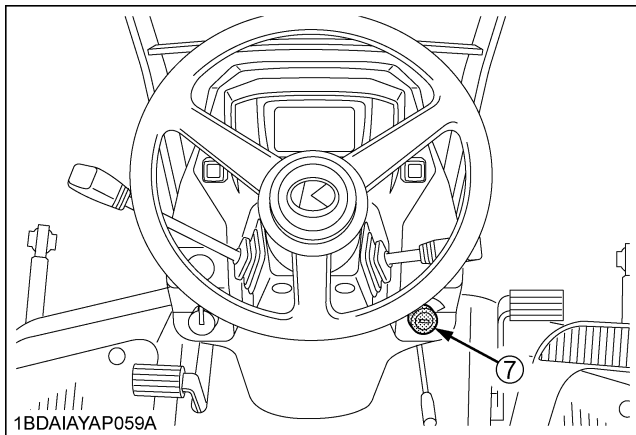


(1) Throttle lever  
 [Forward arrow icon]: "FAST"  
 [Backward arrow icon]: "SLOW"

7. Insert the key into the key switch and turn clockwise 1 notch. Make sure the easy checker lights are "ON".

◆ **Check Easy Checker(TM) Lamps:**

1. When the key is turned "ON", lamps (3) (4) should come on. If trouble should occur at any location while the engine is running, the indicator lamp corresponding to problem will turn "ON".
2. Suppose that the engine coolant temperature is not high enough yet. The glow plug indicator (4) also turns "ON" when the key is turned "ON" to preheat the engine and goes off automatically when preheat is completed.  
Illumination time of indicator varies according to the temperature of coolant.
3. The PTO clutch indicator (1) comes on while PTO lever is engaged "ON" and goes off when disengaged.
4. If the fuel level indicator (5) lights up, when fuel level is very low, therefore add fuel and the light will turn "OFF".
5. If the parking brake warning indicator (6) does not illuminate, make sure the parking brake is set.



- (1) PTO clutch indicator
- (2) Electrical charge warning indicator
- (3) Engine oil pressure warning indicator
- (4) Glow plug indicator
- (5) Fuel level indicator
- (6) Parking brake warning indicator
- (7) Key switch

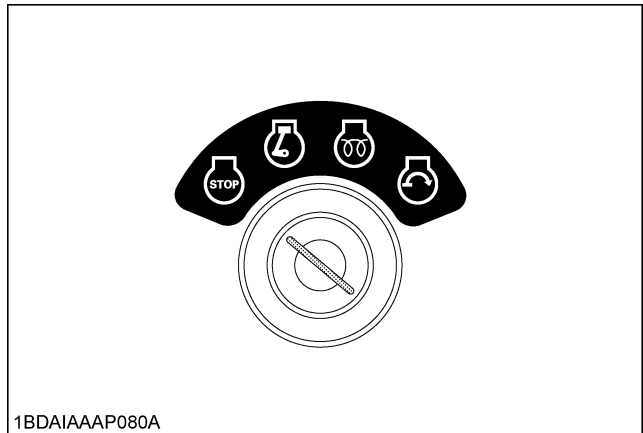
**NOTE :**

- Some of the Easy Checker(TM) lamps may illuminate or start flashing depending on the positions of the levers and switches.

**IMPORTANT :**

- Daily checks with the Easy Checker(TM) only, are not sufficient. Never fail to conduct daily checks carefully by referring to Daily Check. (See "DAILY CHECK" in "PERIODIC SERVICE" section.)

■ **Key Switch**



- ⏻ : "OFF" (Engine - Stop)
- ⏻ : "PREHEAT" (Preheat)
- ⏻ : "ON" (Engine - Run)
- ⏻ : "START" (Engine - Start)

**IMPORTANT :**

- Do not turn the key switch to the "START" position while the engine is running.
- When the temperature is below 0 °C , run the engine at medium speed to warm up the lubricant of the engine and the transmission for at least 10 minutes. If the machine is operated before the lubricant is warm enough, the machine life will be shortened.
- Do not operate the machine under full load until it is sufficiently warmed.
- Do not use starting fluid or ether.
- When the ambient temperature is less than -15 °C , remove the battery from the machine and store it somewhere warm until the next operation.

8. Turn the key switch to the "PREHEAT" position clockwise, and hold it for about 5 seconds.

For the appropriate preheating time, refer to the table below:

Temperature	Preheating Time
Over 0 °C	5 sec.
Below 0 °C	10 sec.

9. Turn the key switch to the "START" position and release the key to the "ON" position when the engine starts.

**IMPORTANT :**

- Because of the safety devices, the engine may not be started except when the PTO clutch is disengaged, the brake pedal is fully depressed and the operator sits in the seat.

**■ Cold Weather Starting**

When the ambient temperature is below -5 °C and the engine is very cold. (If the engine fails to start after 10 seconds, turn off the key for 30 seconds. Then repeat steps 8 and 9. To protect the battery and the starter, make sure that the starter is not continuously turned for more than 30 seconds.)

**■ Block Heater (Option)**

A block heater is available as an option from your local dealer. It will assist you in starting your machine when the ambient temperature is below -15 °C.

10. Check to see that all the lamps on the Easy Checker(TM) are "OFF".

If the lamp is still on, immediately stop the engine and determine the cause.

11. Warm the engine by running at medium speed.

**STOPPING THE ENGINE**

1. Set the parking brake.
2. After slowing the engine to idle, turn the key switch to the "OFF" position.
3. Remove the key.
4. Do not leave the key switch "ON" (key in the "ON" position) as the battery will discharge when the engine is not running.

**WARMING UP****WARNING**

To avoid serious injury:

- Be sure to apply the parking brake during warm-up.

For 5 minutes after engine start-up, allow engine to warm up without applying any load. This is to allow oil to reach every part of the engine. If load should be applied to the engine without this warm-up period, problems may develop such as seizure, breakage or premature wear.

**■ Warm-up and Transmission Oil in the Low Temperature Range**

Hydraulic oil serves as transmission oil and power steering fluid. In cold weather, the oil may be cold with increased viscosity. This can cause delayed oil circulation or abnormally low hydraulic pressure for some time after engine start-up. This in turn creates problems with the hydraulic system or may damage the hydraulic clutch.

To prevent the above, observe the following instructions: Warm up the engine at about 50% of rated rpm according to the table below:

Atmospheric temperature	Warm-up time requirement Higher
Higher than 0 °C	Approx. 5 minutes
-10 to 0 °C	5 to 10 minutes
-20 to -10 °C	10 to 15 minutes
Below -20 °C	More than 15 minutes

**IMPORTANT :**

- Do not operate unless the engine is well warmed up. If operation is attempted while the engine is still cold, the hydraulic mechanism will not function properly and its service life will be shortened.
- If noises are heard after the hydraulic control lever has been activated and the implement is lifting, the hydraulic mechanism is not adjusted properly. Unless corrected, the unit will be damaged. Contact your local KUBOTA Dealer for adjustment.



## ■ Engine Stop Lever and Fuel Valve (Inside the Hood)

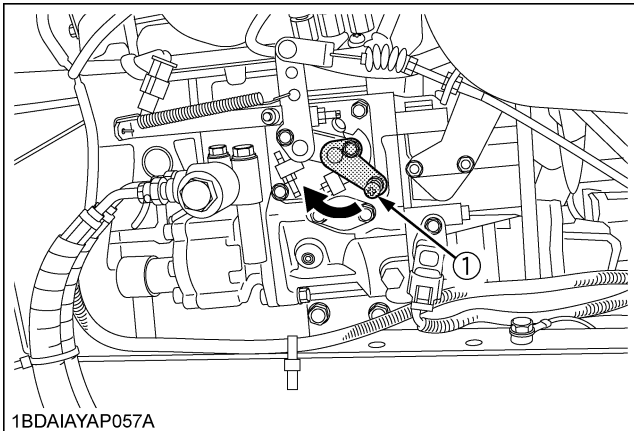
The engine stops when the key switch is turned "OFF". If the engine does not stop, make sure the speed control pedal is in the "NEUTRAL" position, the PTO lever is "OFF", the mower lowered to the ground and apply the parking brake, then carefully get off the machine. Open the hood and pull engine stop lever (Red mark) and hold it until the engine stops. Then contact your local KUBOTA Dealer immediately.



### WARNING

To avoid serious injury:

- Do not operate the machine until the engine stop system is repaired.



(1) Engine stop lever

## JUMP STARTING



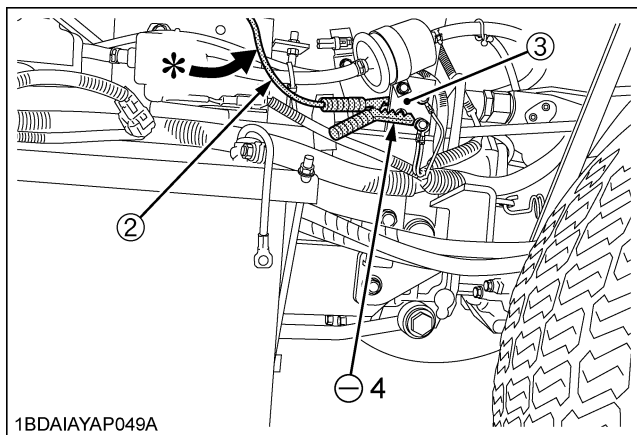
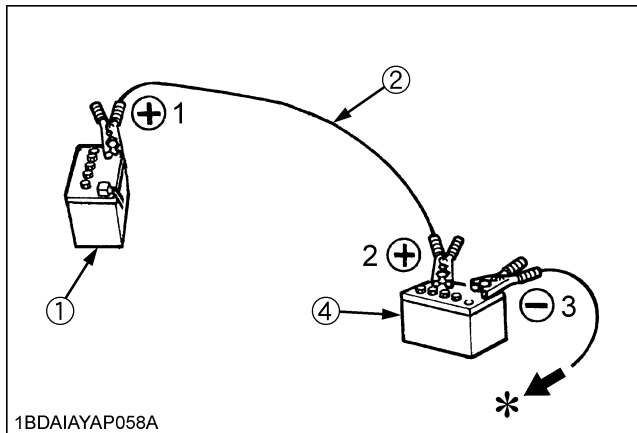
### WARNING

To avoid serious injury:

- Keep cigarettes, sparks, and flames away from battery.
- If machine battery is frozen, do not jump start engine.
- Do not connect other end of negative (-) jumper cable to negative (-) terminal of machine battery.

When jump starting the engine, follow the instructions below to safely start the engine.

1. Bring helper vehicle with a battery of the same voltage as the disabled machine within easy cable reach. "THE VEHICLES MUST NOT TOUCH".
2. Apply the parking brakes of both vehicles and put the shift levers in neutral. Shut the engine off.
3. Put on safety goggles and rubber gloves.
4. Ensure the vent caps are securely in place. (if equipped)
5. Attach the red clamp to the positive (red, (+) or pos.) terminal of the dead battery and clamp the other end of the same cable to the positive (red, (+) or pos.) terminal of the helper battery.
6. Clamp the other cable to the negative (black, (-) or neg.) terminal of the helper battery.
7. Clamp the other end to the engine block or frame of the disabled machine as far from the dead battery as possible.
8. Start the helper vehicle and let its engine run for a few moments. Start the disabled machine.
9. Disconnect the jumper cables in the exact reverse order of attachment. (Steps 7, 6 and 5).



- (1) Dead battery
- (2) Jumper cables
- (3) Frame
- (4) Helper battery

Connect cables in numerical order.  
Disconnect in reverse order after use.

**IMPORTANT :**

- This machine has a 12 volt negative (-) ground starting system.
- Use only same voltage for jump starting.
- Use of a higher voltage source on machine could result in severe damage to machine electrical system. Use only matching voltage source when "Jump starting" a low or dead battery condition.

# OPERATING THE MACHINE

## OPERATING NEW MACHINE

How a new machine is operated and maintained will determine the life of the machine.

A new machine just off the factory production line has been tested, but the various parts are not accustomed to each other, so care should be taken to operate the machine for the first 50 hours at a slower speed and avoid excessive work or operation until the various parts become "broken-in." The manner in which the machine is handled during the "breaking-in" period greatly affects the life of your machine. Therefore, to obtain the maximum performance and the longest life of the machine, it is very important to properly break-in your machine. In handling a new machine, the following precautions should be observed.

### ■ Changing Lubricating Oil for New Machines

The lubricating oil is especially important in the case of a new machine. The various parts are not "broken-in" and are not accustomed to each other; small metal grit may develop during the operation of the machine; and this may wear out or damage the parts. Therefore, care should be taken to change the lubricating oil a little earlier than would ordinarily be required.

For further details of change interval hours, see "SERVICE INTERVALS" in "MAINTENANCE" section.

### ■ Engine Break-in

After the first 50 hours of operation, change the engine oil and filter. (See "EVERY 200 HOURS" in "PERIODIC SERVICE" section.)

### ■ Machine Break-in

After the first 400 hours of operation, change the transmission fluid.

After the first 50 hours of operation, change the oil filter cartridge. (See "EVERY 400 HOURS" in "PERIODIC SERVICE" section.)



## WARNING

To avoid serious injury:

- Do not allow any person other than the driver to ride on the machine.
- Do not drive the machine close to the edges of ditches or banks which may collapse under the weight of the machine, especially when the ground is loose or wet.
- Slow down before turning.
- To avoid tip over, operate up and down slopes, not across. Avoid sudden starts and stops on slopes. Slow down, and use extra caution when changing direction on a slope. Do not use the machine on steep incline.  
Park the machine on a firm, level surface.
- Watch where you are going at all times. Watch for and avoid obstacles. Be alert at curbs, near trees, and other obstructions and hidden hazards.
- Do not drive a machine on streets or highways. Watch for traffic when you cross roads or operate near roads.
- Look to the rear before and when backing. Make sure the area immediately behind you is clear of obstructions, holes and small children. Use extra caution when a machine is equipped with Grass Catcher.

## OPERATING FOLDABLE ROPS

### WARNING

To avoid serious injury or death:

- Always use the seat belt when the ROPS is installed.
- Do not use the seat belt if a foldable ROPS is down or there is no ROPS.

### WARNING

To avoid serious injury:

- When raising or folding the ROPS, apply parking brake, stop the engine and remove the key.

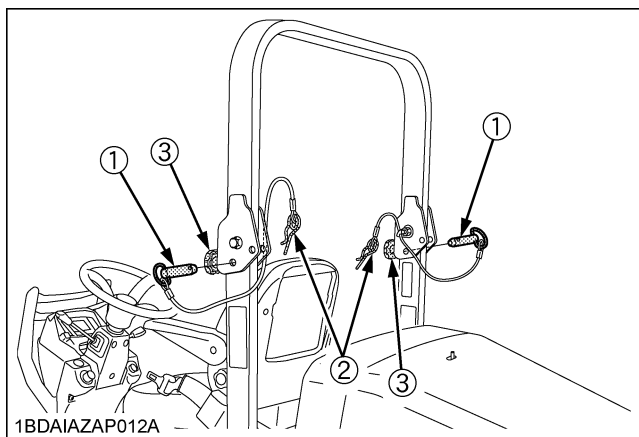
Always perform function from a stable position from the rear of the machine.

- Fold the ROPS down only when absolutely necessary and fold it up and lock it again as soon as possible.
- Before proceeding to fold the ROPS, check for any possible interference with installed implements and attachments.

If interference occurs, contact your local KUBOTA Dealer.

### ■ To Fold the ROPS

1. Unscrew the knob bolts 1 to 2 turns.
2. Remove both lock pins.



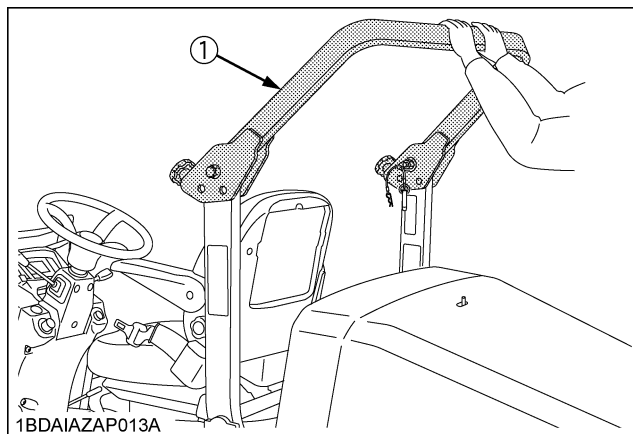
- (1) Lock pin
- (2) Hair pin
- (3) Knob bolt

3. Fold the ROPS.

### WARNING

To avoid serious injury:

- Hold the ROPS tightly with both hands and fold the ROPS slowly and carefully.



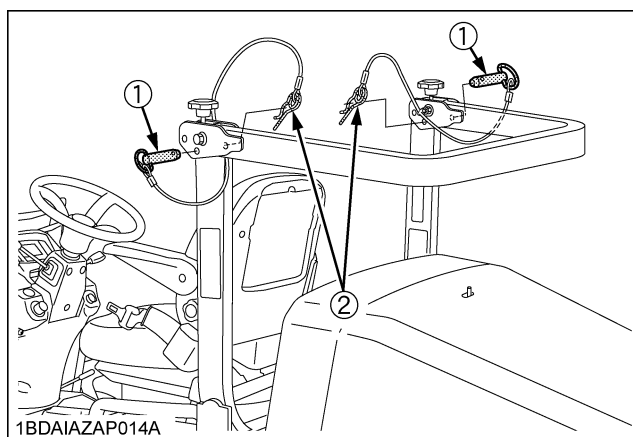
(1) ROPS

4. Align lock pin holes and insert both lock pins and secure them with the hair pins.

### WARNING

To avoid serious injury:

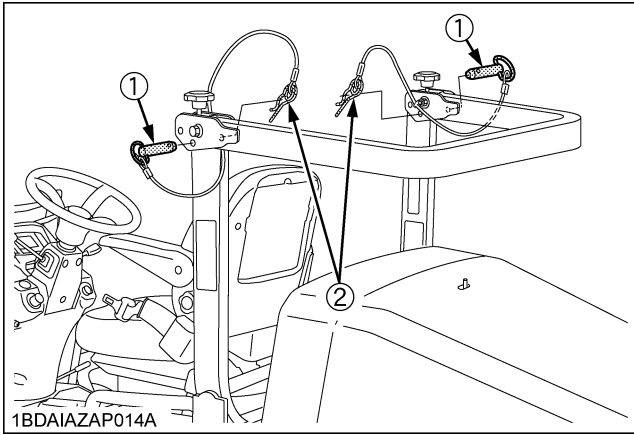
- Make sure that both lock pins are properly installed and secured with the hair pins.



- (1) Lock pin
- (2) Hair pin

## ■ To Raise the ROPS to Upright Position

1. Remove both hair pins and lock pins.



- (1) Lock pin  
(2) Hair pin

2. Raise ROPS to the upright position.

## ⚠ WARNING

To avoid serious injury:

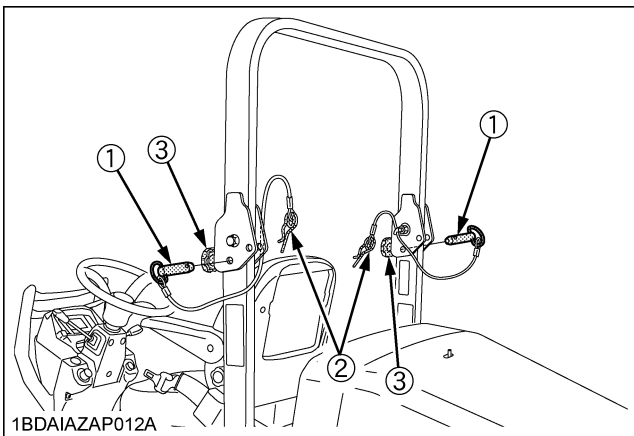
- Hold the ROPS tightly with both hands and raise the ROPS slowly and carefully.

3. Align lock pin holes, insert both lock pins and secure them with the hair pins.
4. Tighten the knob bolts slightly.

## ⚠ WARNING

To avoid serious injury:

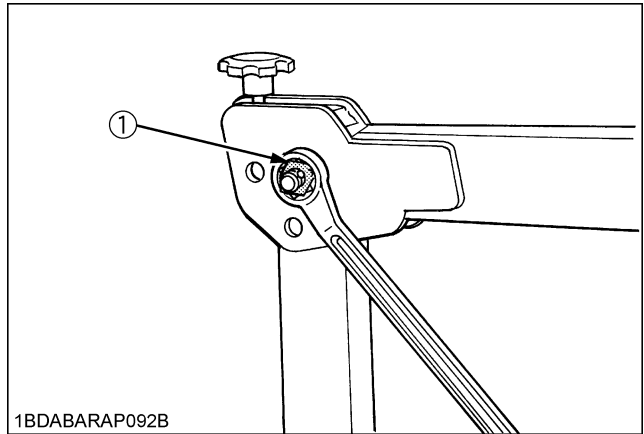
- Make sure that both lock pins are properly installed as soon as the ROPS is in the upright position and secured with the hair pins.



- (1) Lock pin  
(2) Hair pin  
(3) Knob bolt

## ■ Adjustment of Foldable ROPS

- Adjust free fall of the ROPS upper frame regularly.
- If you feel less friction when folding the ROPS, tighten the nut (1) until you feel the right friction in the movement.



- (1) Nut

## STARTING

### 1. Adjust the operator's position and apply the seat belt.

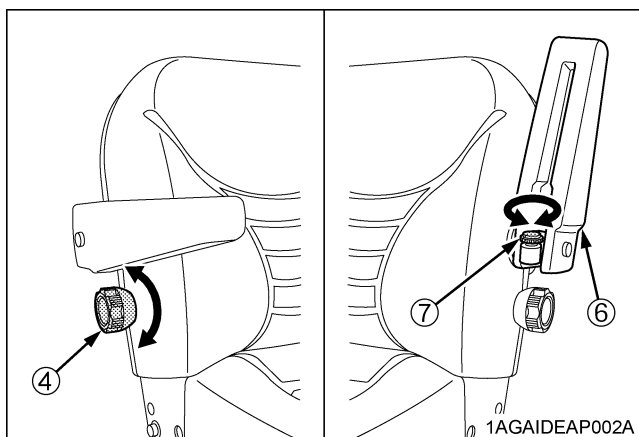
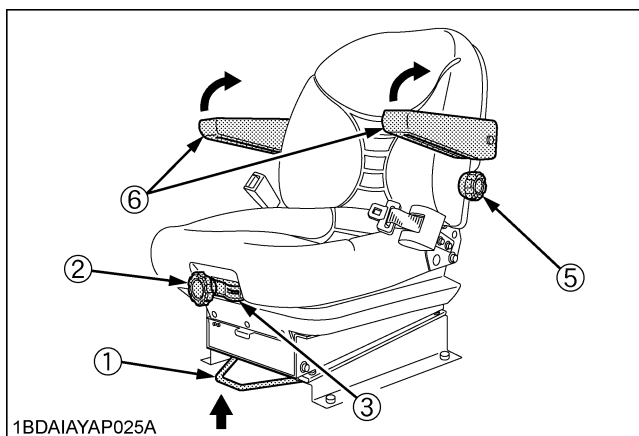
#### ■ Operator's Seat



#### WARNING

To avoid serious injury:

- Make adjustments to the seat only while the machine is stopped.
- Make sure that the seat is completely secured after each adjustment.
- Do not allow any person other than the driver to ride on the machine.



- |                               |                                |
|-------------------------------|--------------------------------|
| (1) Travel adjust lever       | (5) Lumbar support adjust knob |
| (2) Suspension adjust knob    | (6) Arm rest                   |
| (3) Indicator of suspension   | (7) Arm rest angle adjust knob |
| (4) Backrest tilt adjust knob |                                |

#### ◆ Travel adjustment

Unlock the travel adjust lever and slide the seat backward or forward, as required. The seat will lock in position when the lever is released.



#### WARNING

To avoid serious injury:

- Use extra caution when unlocking the travel adjust lever because the seat might slide forward by itself.

#### ◆ Suspension adjustment

Turn the suspension adjust knob to achieve the optimum suspension setting.

#### ◆ Lumbar support adjustment

Turn the lumbar support adjust knob to the desired position.

#### ◆ Backrest tilt adjustment

Turn the backrest tilt adjust knob to the desired angle.

#### ◆ Arm rest

Arm rest may be set at upright position if desired.

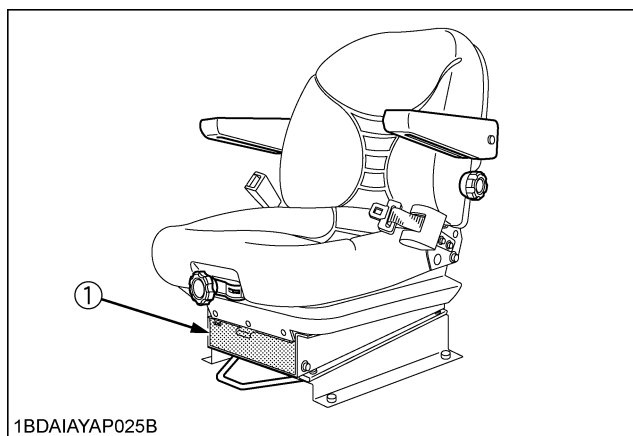
#### ◆ Arm rest angle adjustment

Turn the arm rest angle adjust knob to the desired angle.

#### IMPORTANT :

- After adjusting the operator's seat, be sure to check and see that the seat is properly locked.

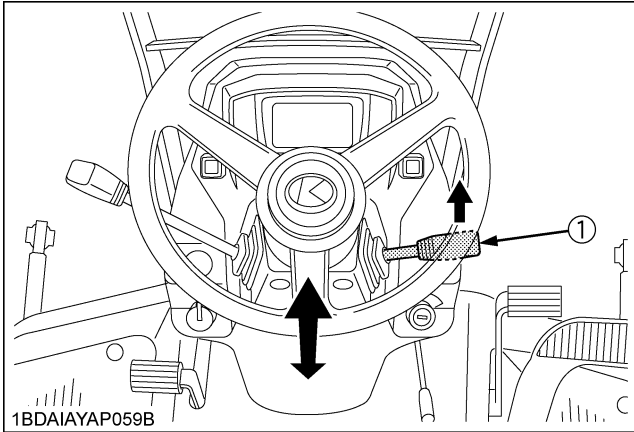
#### ■ Globe Box



- (1) Globe box

**Steering Wheel Tilt Lever**

By pulling the steering wheel tilt lever upward, the lock is released and the steering wheel can be adjusted to a desired tilt angle from the choice of 4 settings.



(1) Steering wheel tilt lever

**Seat Belt**

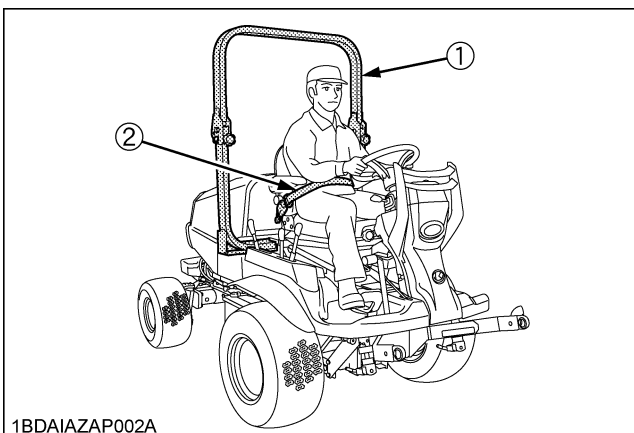


**WARNING**

To avoid serious injury or death:

- Always use the seat belt when the ROPS is installed.
- Do not use the seat belt if a foldable ROPS is down or there is no ROPS.

Adjust the seat belt for proper fit and connect to the buckle. The seat belt is an auto-locking retractable type.

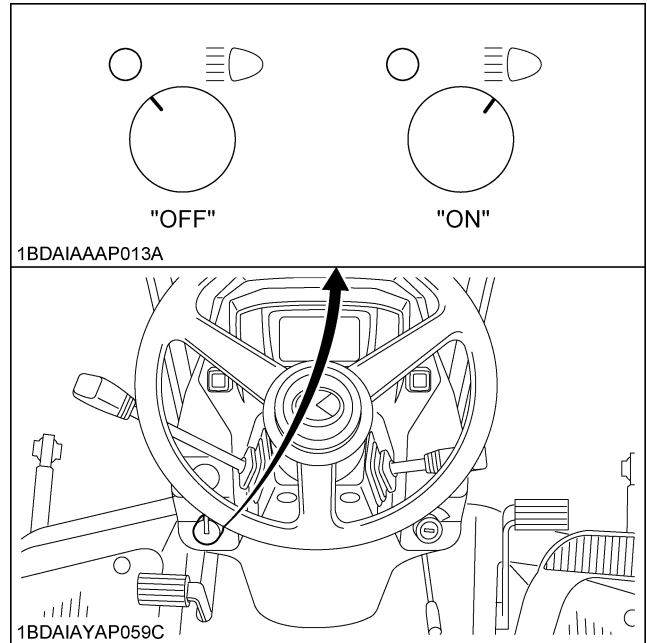


(1) ROPS  
(2) Seat belt

**2. Selecting Light Switch Positions**

**Head Light Switch**

Turning the light switch clockwise illuminates the headlight.



- .....Head light OFF
- ☉ .....Head light ON

**3. Start the engine.  
See "OPERATING THE ENGINE" section.**

## 4. Raising the implement

### ■ Lift Link Lowering Speed Control Knob

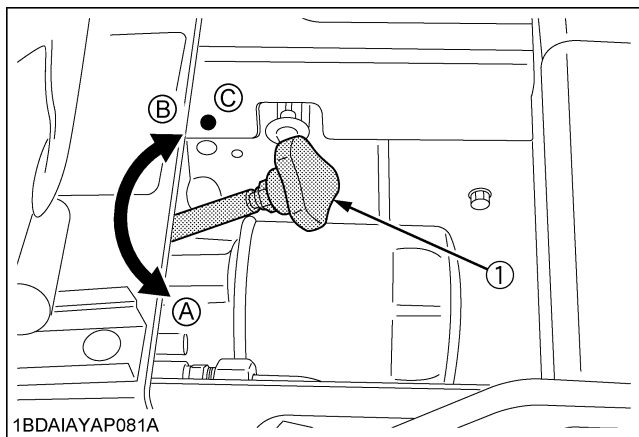


#### WARNING

To avoid serious injury:

- Fast lowering speed may cause damage or injury. Lowering speed of the implement should be adjusted to 2 or more seconds.

The lowering speed of the lift link can be controlled by adjusting the lift link lowering speed control knob.



- (1) Lift link lowering speed control knob  
 (A) "FAST": Turn counterclockwise slowly  
 (B) "SLOW": Turn clockwise  
 (C) "LOCK": Turn clockwise to the end

#### ◆ How to adjust the Lowering Speed

1. Park the machine on a level surface and apply the parking brake.
2. Move the PTO lever in the "DISENGAGE" position.
3. Move the High-Low gear shift lever in the "NEUTRAL" position.
4. Start the engine and raise the implement fully.
5. Turn the lift link lowering speed knob clockwise to the "LOCK" position.
6. Stop the engine and move the Hydraulic lift lever in the "DOWN" position.
7. Turn the knob counterclockwise slowly to adjust the lowering speed.

#### IMPORTANT :

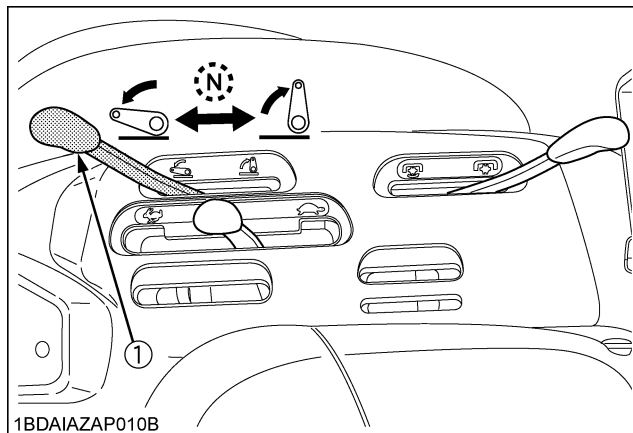
- Before adjustment, never check near or under the implement.
- Turn the knob slowly and carefully to avoid sudden fall of the implement.

### ■ Hydraulic Lift Lever

The hydraulic lift lever is used to raise and lower the implement used with the machine (ex. Mower).

To lower the implement, push the lever FORWARD.

To raise it, pull the lever BACKWARD.



(1) Hydraulic lift lever

⬇ : "DOWN"  
 N : "NEUTRAL"  
 ⬆ : "UP"

#### IMPORTANT :

- Do not operate until the engine is warmed up. If operation is attempted when the engine is still cold, the hydraulic system may be damaged.
- Do not operate at slow Engine rpm. Move the throttle lever above 1/2.
- If noises are heard when implement is lifting after the hydraulic lift lever has been activated, the hydraulic mechanism is not adjusted properly. Contact your local KUBOTA Dealer for adjustment.



## 5. Selecting the Travel Speed

### High-Low Gear Shift Lever



#### WARNING

To avoid serious injury or death:

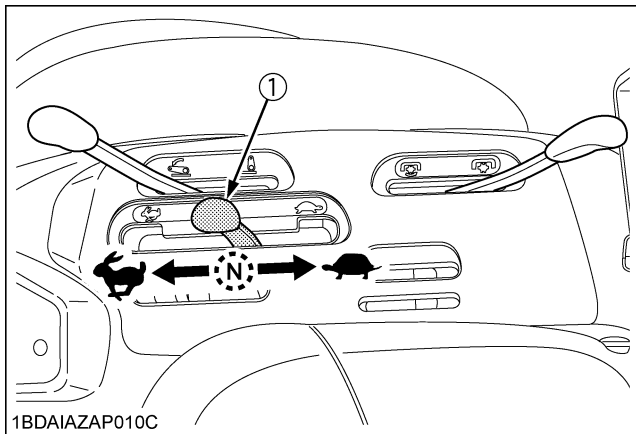
- Shift "High-Low Gear Shift Lever" to the Low position before mowing or operating on slopes.

High-Low gear shift lever moves in the form of an "I" in 3 stages, "LOW", "NEUTRAL" and "HIGH".

By using the speed control pedal and high-low gear shift lever, additional speeds can be obtained.

#### IMPORTANT :

- To shift high-low gear shift lever, stop the machine before attempting to proceed with speed change.



(1) High-Low gear shift lever

- : "HIGH"
- : "NEUTRAL"
- : "LOW"

### 4WD Lock Lever

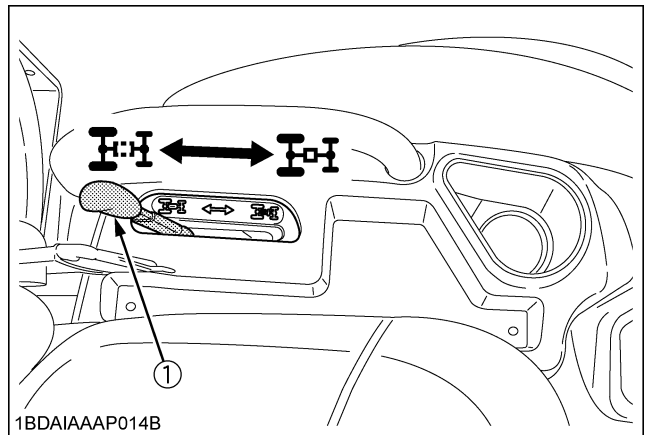


#### WARNING

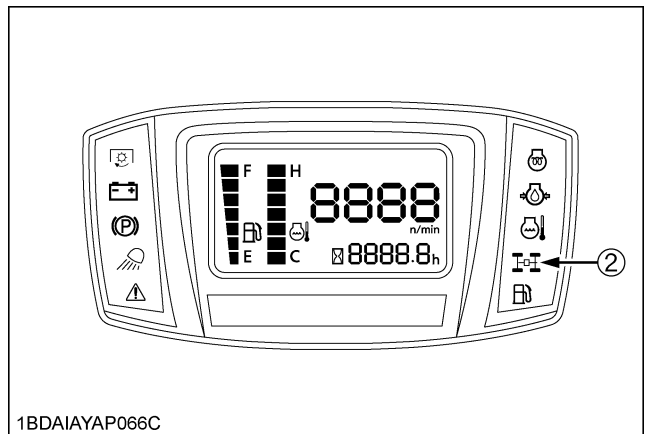
To avoid serious injury or death:

- Do not change the 4WD lock lever to the Dual-Acting Overrunning 4WD position on slopes. Set it Full time 4WD position on slopes. Do not change the 4WD lock lever to the Full time 4WD position when turning or transporting.

1. Change the lever to the Dual-Acting Overrunning 4WD position so that you can turn smoothly without damaging the lawn.



1BDAIAAAP014B



1BDAlAYAP066C

- (1) 4WD lock lever
- (2) 4WD indicator

- : Full time 4WD
- : Dual-Acting Overrunning 4WD

#### IMPORTANT :

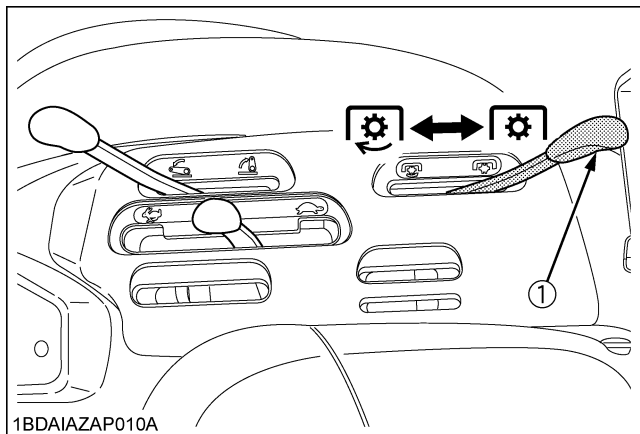
- Do not steer the rear wheel sharply when the 4WD lock lever is in the "Full Time 4WD" position.

#### NOTE :

- When the 4WD lock lever is in the "Dual-Acting Overrunning 4WD" position, the 4WD indicator goes off. When the 4WD lock lever is in the "Full time 4WD" position, the 4WD indicator comes on.

**PTO Lever**

To drive the PTO, move the PTO lever to the "ENGAGED" position.



(1) PTO lever

☑: "ENGAGED"  
☒: "DISENGAGED"

1. If you get off the seat while the PTO is running, the engine will stop automatically. (Seat safety control)
2. Before starting the engine, pull the PTO lever to the "DISENGAGE" position. If it is at the "ENGAGED" position, the engine will not start.

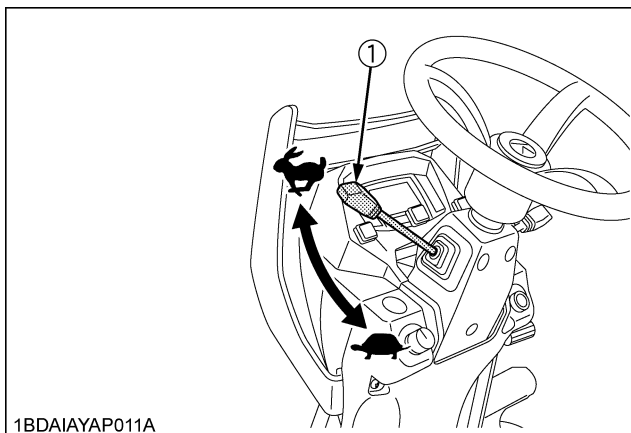
**NOTE :**

- These safety features are built-in.

**6. Accelerating the Engine**

**Throttle Lever**

Pulling the throttle lever backward decreases the engine speed and pushing it forward increases the engine speed.



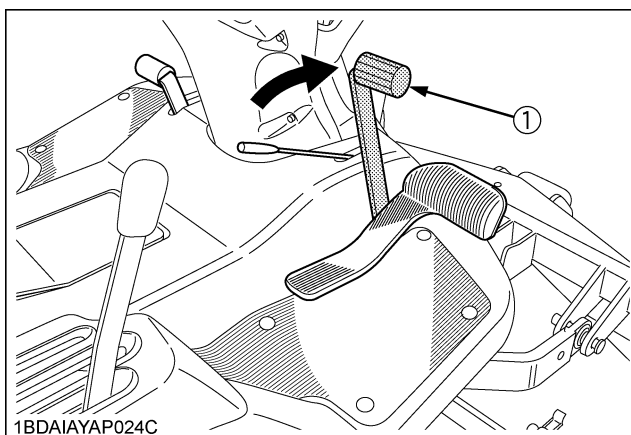
(1) Throttle lever

☑: "FAST"  
☒: "SLOW"

**7. Unlocking the Parking Brake**

**Parking Brake**

To release the parking brake, depress the brake pedal again.



(1) Brake pedal

## 8. Depressing the Speed Control Pedal

### ■ Speed Control Pedal



#### WARNING

To avoid serious injury:

- Do not operate if the machine moves on a level ground with foot off Speed Control Pedal.

#### "FORWARD"

Depress the speed control pedal with the toe of your right foot to move forward.

#### "REVERSE"

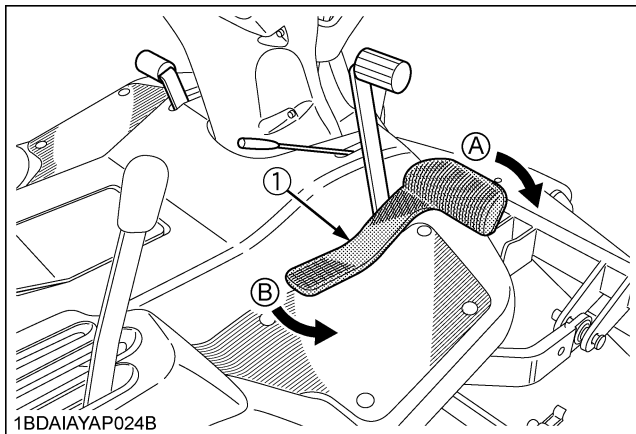
Depress the speed control pedal with the heel of your right foot to move in reverse.

Depress the speed control pedal a little and you can drive slowly.

To increase travel-speed, depress the speed control pedal more until the desired speed is reached.

#### NOTE :

- When the parking brake is applied, the speed control pedal is locked in the "NEUTRAL" position.



(1) Speed control pedal

(A) "FORWARD"  
(B) "REVERSE"

### ■ Differential Lock Pedal



#### WARNING

To avoid serious injury:

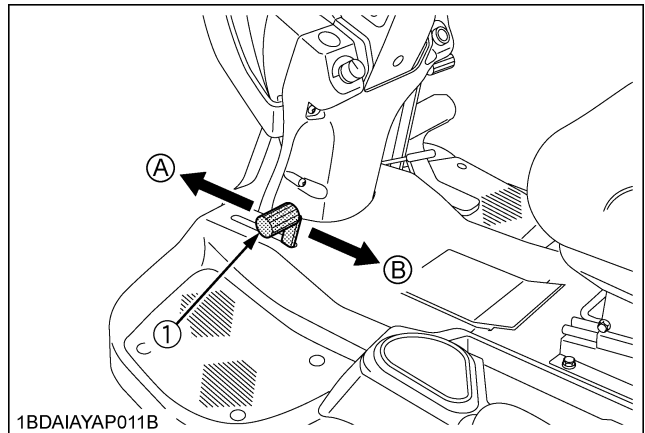
- Do not drive at high speed or turn the machine when the differential is locked. Release the lock before making such a turn.

If 1 of the front wheels should slip, step on the differential lock pedal. Then both wheels will turn together, reducing slippage.

The differential lock is applied only when the pedal is being depressed.

#### IMPORTANT :

- If the "Differential Lock" will not release when the pedal is released, alternately step the speed control pedal forward and backward slightly.
- Do not apply the differential lock pedal when traveling at high speed, or damage to the transmission may result.



(1) Differential lock pedal

(A) "ENGAGE"  
(B) "DISENGAGE"

## STOPPING

### ■ Stopping

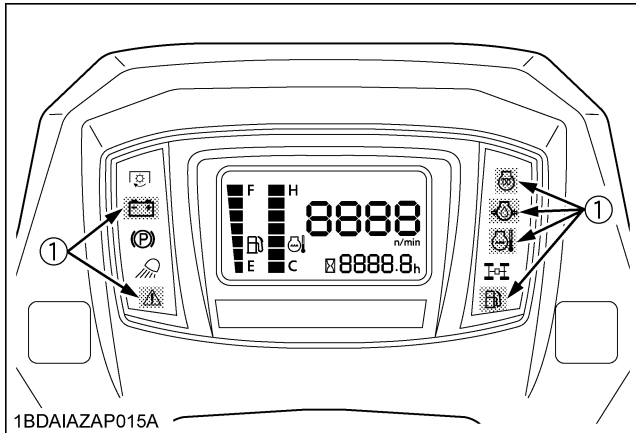
1. Release the speed control pedal and depress the brake pedal to stop the machine.
2. Slow the engine down.
3. Shift PTO lever to the "DISENGAGE" position.
4. Lower all attachments, and place all control levers in their "NEUTRAL" positions.
5. Apply the parking brake, turn off the engine and remove the key from the switch.

## CHECK DURING DRIVING

### ■ Immediately Stop the Engine if:

- The engine suddenly slows down or accelerates.
- Unusual noises suddenly occur.
- Exhaust fumes suddenly become discolored.

While driving, make the following checks to see that all the parts are functioning normally.



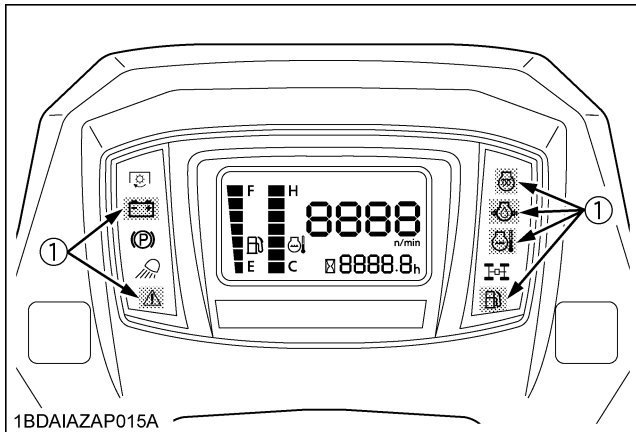
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(1) Easy Checker(TM)

### ■ Easy Checker (TM)


If the warning lamps of the Easy Checker(TM) come on during operation, immediately stop the engine, and find the cause as shown below.


Never operate the machine while Easy Checker(TM) lamp is on.




1BDIAZAP015A

(1) Easy checker(TM)


-  Engine overheat  
 If the water temperature gauge reads an unusual level and the warning lamp in the Easy Checker(TM) comes on, the engine may be overheated. Check the machine by referring to "TROUBLESHOOTING" section.


-  Engine oil pressure  
 If the oil pressure in the engine goes below the prescribed level, the warning lamp in the Easy Checker(TM) will come on.  
 If this should happen during operation, and it does not go off when the engine is accelerated to more than 1000 rpm, check level of engine oil.  
 (See "Checking Engine Oil Level" in "DAILY CHECK" in "PERIODIC SERVICE" section)


-  Fuel level  
 If the fuel in the tank goes below the prescribed level, the warning lamp in the Easy Checker(TM) will come on.  
 If this should happen during operation, refuel as soon as possible.  
 (See "Checking Amount of Fuel and Refueling" in "DAILY CHECK" in "PERIODIC SERVICE" section.)

### IMPORTANT :

- When the fuel warning lamp lights up, refuel the tank as soon as possible. If the machine runs out of fuel and stalls, the engine and its components may be damaged.

-  Electrical charge  
 If the alternator is not charging the battery, the warning lamp in the Easy Checker(TM) will come on.  
 If this should happen during operation, check the electrical charging system or consult your local KUBOTA Dealer.

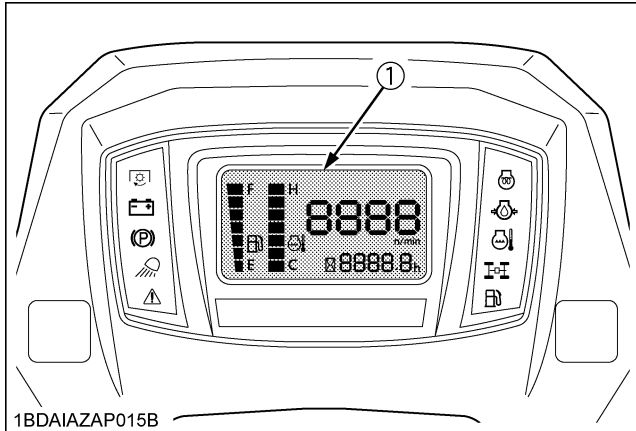
-  Master system warning  
 If trouble should occur at the engine, transmission or other control parts, the indicator flashes as a warning. If the trouble is not corrected by restarting the machine, consult your local KUBOTA Dealer.

-  Glow plug Indicator (Pre-heating Indicator)  
 When the key switch is in the "PREHEAT" position, the glow plug indicator illuminates.

**NOTE :**

- For checking and servicing of your machine, consult your local KUBOTA Dealer for instructions.

**LCD MONITOR**



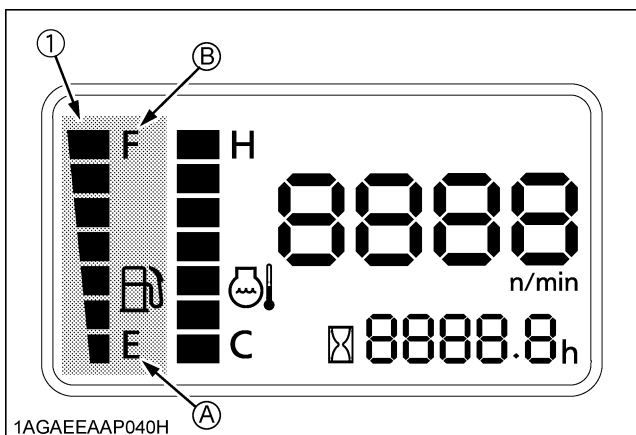
(1) LCD monitor

**Fuel Gauge**

When the key switch is on, the fuel gauge indicates the fuel level.

Be careful not to empty the fuel tank. Otherwise air may enter the fuel system.

Should this happen, the system should be bled. (See "Bleeding Fuel System" in "SERVICE AS REQUIRED" in "PERIODIC SERVICE" section)



(1) Fuel gauge

- (A) "EMPTY"
- (B) "FULL"

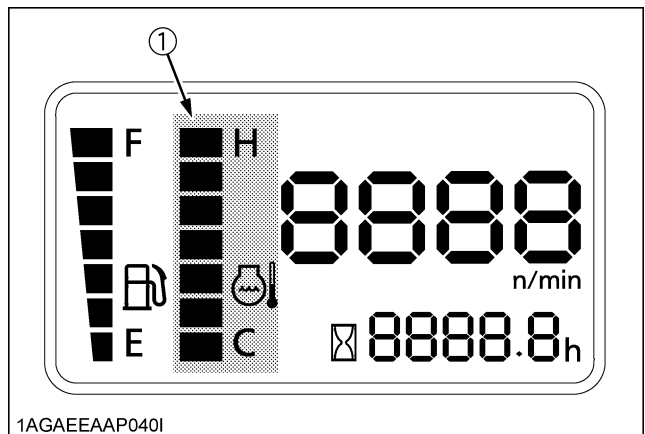
**Coolant Temperature Gauge**

**WARNING**

To avoid serious injury:

- Do not remove radiator cap until coolant temperature is well below its boiling point. Then loosen the cap slightly to relieve any pressure before removing the cap completely.

- With the key switch "ON", this gauge indicates the temperature of the coolant. "C" for "cold" and "H" for "hot".
- If the indicator reaches the "H" position (red zone), engine coolant is overheated. Check the machine by referring to "TROUBLESHOOTING" section.

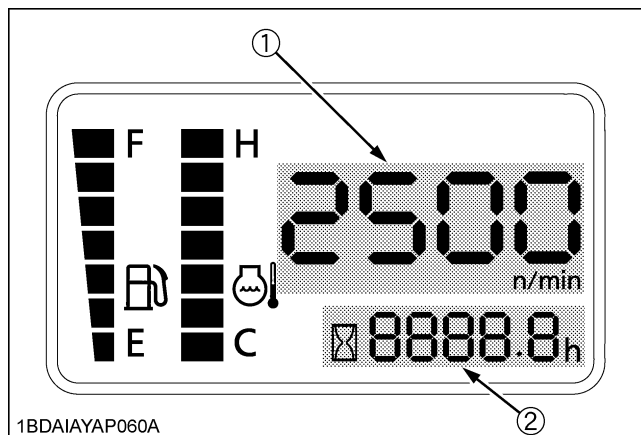


(1) Coolant temperature gauge

### Hourmeter / Tachometer

This meter gives readings for engine speed and the hours the machine has been operated.

1. The tachometer indicates the engine speed.
2. The hourmeter indicates in 5 digits the hours the machine has been used; the last digit indicates 1/10 of an hour.



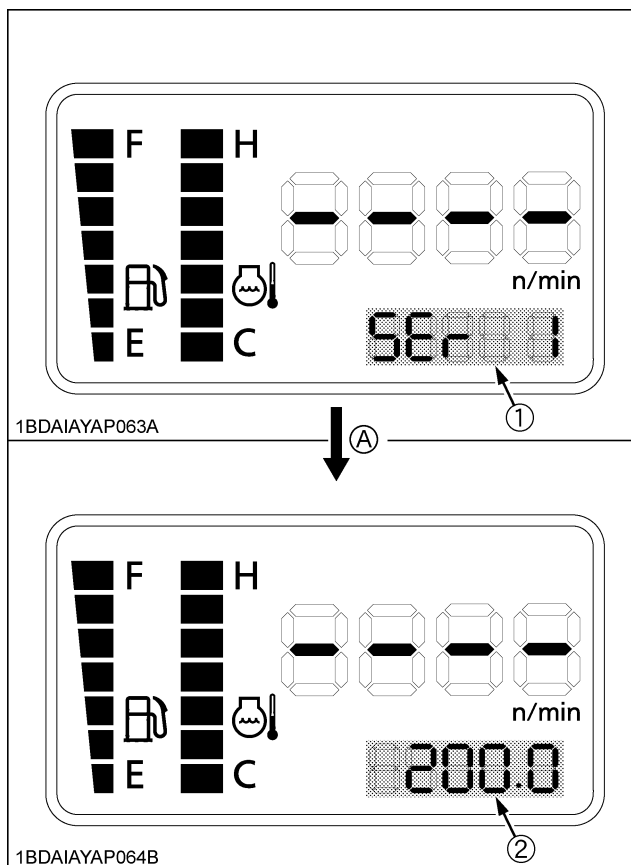
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- (1) Engine revolution
- (2) Hours used

### Service Code Display

The key switch is on, and if the service code ("5E200" or "5E202") shown in the figure below is displayed on the liquid crystal display, the servicing tasks corresponding to the indication on hour meter (displayed at 10 seconds after that) should be carried out on the machine.

See "SERVICE INTERVALS" in "MAINTENANCE" section.



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1BDAIAYAP064B

- (1) Service code
- (A) At 10 seconds after the service code has displayed.
- (2) Hours used

### Overheat Alarm

If the temperature of the coolant rises to overheat temperature, the overheat alarm whistles.

Check the machine by referring to "TROUBLE SHOOTING" section.

## PARKING

### ■ Parking



### WARNING

To avoid serious injury:

Before leaving the operator's position:

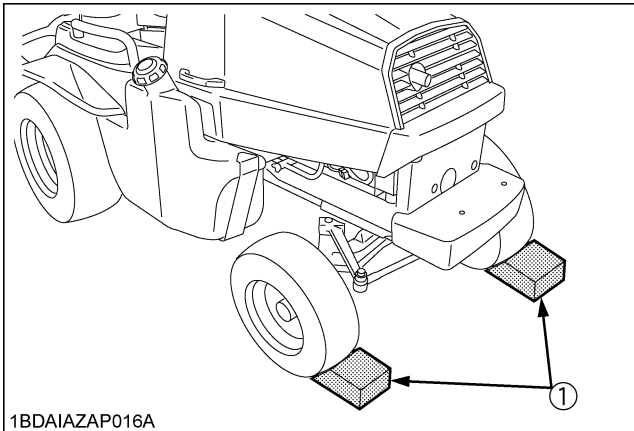
- Apply parking brake.
- Lower all implements to the ground.
- Shut off the engine.
- Remove the key.

1. When parking, be sure to set the parking brake.

#### To apply the parking brake;

Depress the brake pedal firmly and hold it in position. Pull and hold parking brake lever, and release the brake pedal.

2. Before getting off the machine, disengage the PTO, lower all implements to the ground, place all control levers in their neutral positions, set the parking brake, stop the engine and remove the key.
3. If it is necessary to park on an incline, be sure to chock the wheels to prevent accidental rolling of the machine.



(1) Chocks

## TRANSPORTING

1. Do not tow this machine a long distance, or damage to the transmission may result.
2. Transport the machine on a trailer.
  - Fasten the machine to the trailer.
  - Prevent the hood from opening by the wind by securing the hood adequately. If necessary, load the machine backward or use the stable strap.

### ■ Directions for Use of Power Steering

1. Power steering is activated only while the engine is running. Slow engine speeds make the steering a little heavier. While the engine is stopped, the machine functions in the same manner as machines without power steering.
2. When the steering wheel is turned all the way to the stop, the relief valve is activated. Do not hold the steering wheel in this position for a long period of time.
3. Avoid turning the steering wheel while the machine is stopped, or tires may wear out sooner.
4. The power steering mechanism makes the steering easier. Be careful when driving on a road at high speeds.

# TIRES, WHEELS AND BALLAST

## TIRES



### WARNING

To avoid serious injury:

- Do not attempt to mount a tire on a rim. This should be done by a qualified person with the proper equipment.
- Always maintain the correct tire pressure. Do not inflate tires above the recommended pressure shown in the Operator's Manual.

### IMPORTANT :

- Do not use tires other than those approved by KUBOTA.



### WARNING

To avoid serious injury:

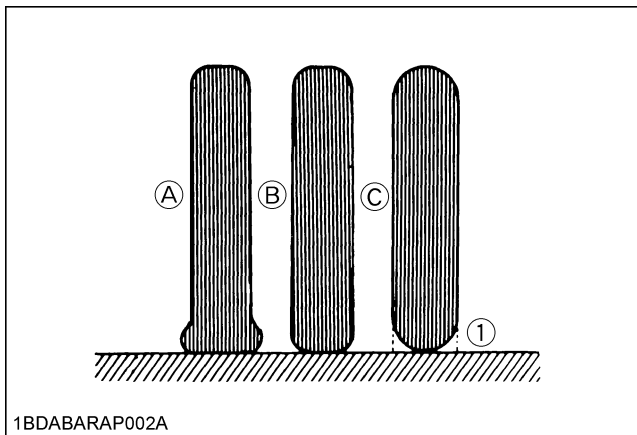
Never operate the machine with a loose rim, wheel, or axle.

- Whenever bolts are loosened, retighten to specified torque.
- Check all bolts frequently and keep them tightened.

### ■ Inflation Pressure

Though the inflation pressure is factory-set to the prescribed level, it naturally drops slowly in the course of time. Thus, check it everyday and inflate as necessary.

		Tire sizes	Recommended Inflation Max. Pressure
Front	F2890 F3690	24 x 12 - 12, 4PR	140 kPa (1.4 kgf/cm <sup>2</sup> )
Rear	F2890 F3690	18 x 9.5 - 8, 4PR	250 kPa (2.5 kgf/cm <sup>2</sup> )



(1) Ground

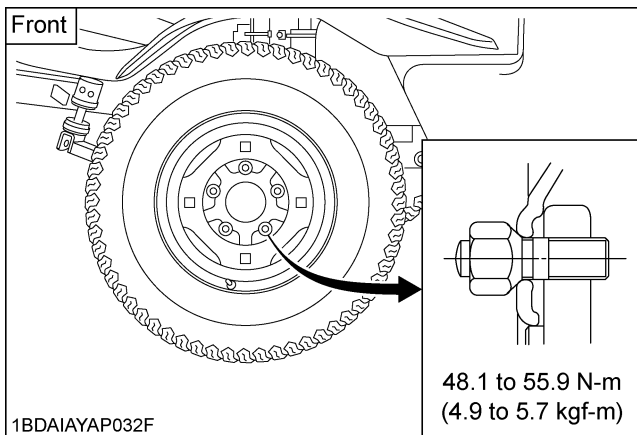
- (A) "INSUFFICIENT"
- (B) "NORMAL"
- (C) "EXCESSIVE"

## WHEELS

### IMPORTANT :

- Follow the same checking procedure when the machine is first used.

### ■ Front Wheels (Drive Wheels)

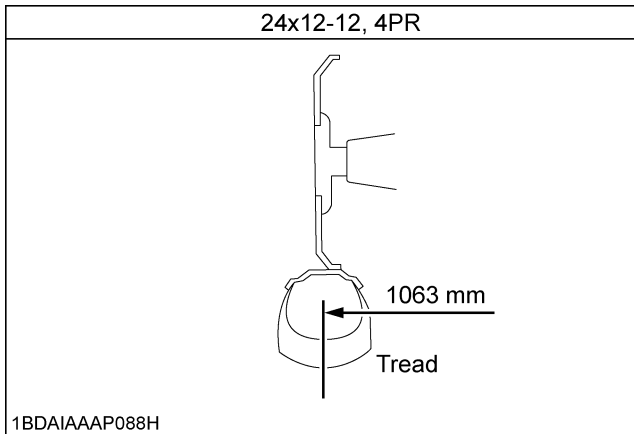


48.1 to 55.9 N-m  
(4.9 to 5.7 kgf-m)

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Wheels with beveled or tapered holes:  
Use the tapered side of the lug nut.



## BALLAST



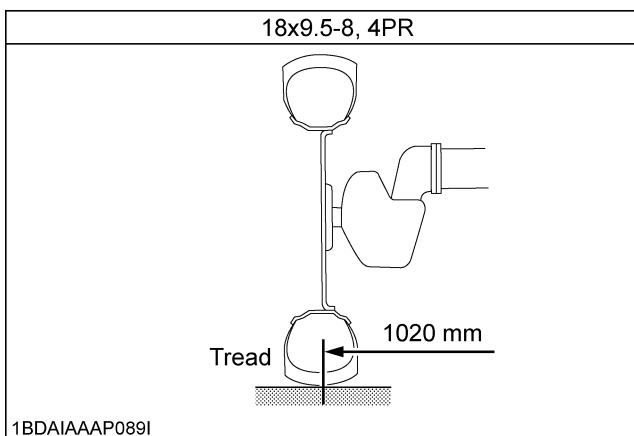
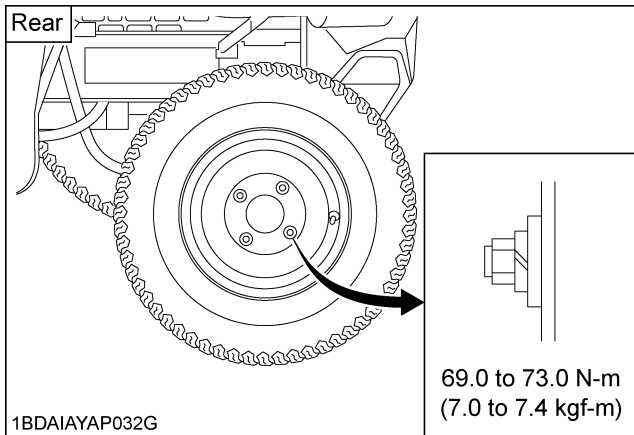
### WARNING

To avoid serious injury:

- Additional ballast will be needed for operating heavy attachments. When the attachment is raised, drive slowly over the rough ground, regardless of how much ballast is used.

Add ballast to the rear end if needed for stability. Heavy front mounted attachments tend to lift rear wheels. Add enough ballast to maintain steering control and prevent tipover. The Attachment's Manual shows how much rear ballast is required for your application. Rear ballast is available from your local KUBOTA Dealer.

### ■ Rear Wheels (Steering Wheels)



# MAINTENANCE

## SERVICE INTERVALS

The following servicing tasks should be carried out on the machine at the stated running-time intervals.

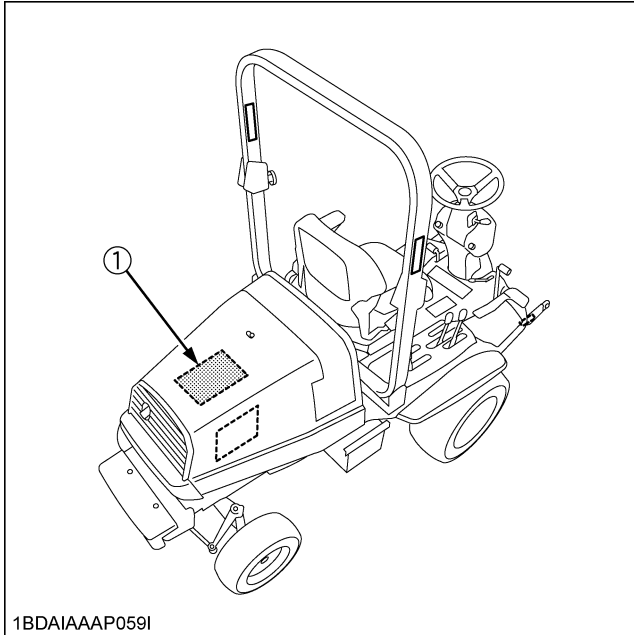
No.	Items		Indication on hour meter (Hr)												Interval	Ref. page	
			50	100	150	200	250	300	350	400	450	500	550	600			
1	Engine start system	Check	○	○	○	○	○	○	○	○	○	○	○	○	every 50 Hr	41	
2	OPC system	Check	○	○	○	○	○	○	○	○	○	○	○	○	every 50 Hr	42	
3	Greasing	-	○	○	○	○	○	○	○	○	○	○	○	○	every 50 Hr	42	
4	Wheel bolt torque	Check	○	○	○	○	○	○	○	○	○	○	○	○	every 50 Hr	44	
5	Oiling	-	○	○	○	○	○	○	○	○	○	○	○	○	every 50 Hr	44	
6	Battery condition	Check		○		○		○		○		○		○	every 100 Hr	45	
7	Air cleaner element	Clean		○		○		○		○		○		○	every 100 Hr	46	*1
		Replace													every 1 year	55	
8	Engine oil	Change	◎			○				○				○	every 200 Hr	49	
9	Fan belt	Adjust		○		○		○		○		○		○	every 100 Hr	49	*2
10	Brake pedal	Adjust		○		○		○		○		○		○	every 100 Hr	48	
11	Fuel filter element	Check		○		○		○		○		○		○	every 100 Hr	47	
		Replace								○					every 400 Hr	55	*2
12	Engine oil filter	Replace	◎			○				○				○	every 200 Hr	50	
13	Transmission fluid	Change								○					every 400 Hr	52	
14	Transmission oil filter	Replace	◎			○				○				○	every 200 Hr	51	
15	Transmission strainer	Clean								○					every 400 Hr	53	
16	Rear axle differential case fluid	Change								○					every 400 Hr	54	
17	Rear axle gear case (RH & LH) fluid	Change								○					every 400 Hr	54	
18	Radiator hose and clamp	Check				○				○				○	every 200 Hr	50	
		Replace													every 2 years	57	*2

No.	Items		Indication on hour meter (Hr)												Interval	Ref. page	
			50	100	150	200	250	300	350	400	450	500	550	600			
19	Hydraulic hose	Check				○				○				○	every 200 Hr	51	
		Replace													every 2 years	57	*2
20	Fuel line	Check		○		○		○		○		○		○	every 100 Hr	47	
		Replace													every 2 years	57	*2
21	Intake air line	Check				○				○				○	every 200 Hr	52	
		Replace													every 2 years	57	*4
22	Engine breather hose	Replace													every 2 years	57	*3
23	Rear axle pivot	Adjust								○					every 400 Hr	55	
24	Engine valve clearance	Adjust													every 800 Hr	55	*3
25	Fuel injection nozzle (injection pressure)	Check													every 1500 Hr	55	*3
26	Injection pump	Check													every 3000 Hr	55	*3
27	Radiator	Clean													every 2 year	56	
28	Coolant	Change													every 2 year	56	
29	Fuel system	Bleed													Service as Required	59	
30	Fuse	Replace												58			
31	Light bulb	Replace												59			
32	Lift spring	Adjust												59			

**IMPORTANT :**

- The jobs indicated by ○ must be done initially.
- \*1 This maintenance should be done daily more often in dusty conditions than in normal conditions.  
Suggested cleaning interval is every 100 hours in normal conditions.
- \*2 These items should be serviced by an authorized KUBOTA Dealer, unless the owner has the proper tools and is mechanically proficient.
- \*3 Consult your local KUBOTA Dealer for this service.
- \*4 Replace only if necessary.

# PERIODIC SERVICE CHART LABEL



1BDIAAAP059I

(1) Part No. K3615-4761-3 (ENGLISH)

INTERVAL		RECOMMENDED SERVICE See Operator's Manual in details.
DAILY	CHECK	1. Tire pressure, wear or damage. 2. Oil and water leakage from machine and mower. 3. Engine oil, transmission fluid, recovery tank coolant and fuel level. 4. Damage to machine body, tightness of all bolts, nuts and pins, etc. 5. Mower blades and belt for wear or damage. 6. Brake pedal and safety switches. 7. Color of the exhaust fumes, abnormal noise and vibrations. 8. Seat belt and flaps.
	CLEAN	-Radiator screen/Bonnet screen/Air cleaner primary element/Mower deck
	GREASE	-Mower U-joint(3 places)/ Spindle shaft(3 places)/Belt tension pulley and pivot
FIRST 50 Hr. (BREAK-IN) (MUST BE DONE)	CHANGE	- Engine oil/Mower Gear box oil
	REPLACE	- Engine oil filter/Transmission oil filter
E	50 Hr. CHECK	-Safety device/Wheel bolt torque/Mower gear box oil
	50 Hr. GREASE	-Speed control pedal boss/Lift link boss(R&L)/Differential lock pedal boss(Universal joint/DT drive shaft)(Knuclle arm(4WD)/Rear axle pivot(2WD)/Seat adjuster/Cable(Throttle)(F2690/F2890/F3090/F3690/F3890)/Front gauge wheels and gauge wheel brackets/Front roller
V	100 Hr. ADJUST	-Fan belt/Brake pedal
	100 Hr. CHECK	-Battery condition/Fuel line
E	150 Hr. CLEAN	-Fuel filter element/Air cleaner primary element★
	150 Hr. CHANGE	-mower gear box oil
R	200 Hr. CHANGE	-Engine oil
	200 Hr. CHECK	-Radiator hose and clamp/Hydraulic hose/Intake air line
Y	400 Hr. REPLACE	-Engine oil filter/Transmission oil filter
	400 Hr. ADJUST	-Rear axle pivot
Y	400 Hr. CHANGE	-Transmission fluid/Rear axle gear case fluid/Differential case fluid
	400 Hr. CLEAN	-Transmission strainer
Y	800 Hr. REPLACE	-Fuel filter element/Hydraulic oil filter
	800 Hr. ADJUST	-Engine valve clearance★
Y	1500 Hr. CHECK	-Fuel injection nozzle injection pressure★
	3000 Hr. CHECK	-Injection pump★/Turbo charger★
Y	1 Year REPLACE	- Air cleaner element
	1 Year CHANGE	-Coolant
Y	2 Year FLUSH	-Cooling system
	2 Year REPLACE	-Radiator hose and clamp/Hydraulic hose/Fuel line★/ Mower gear box oil seal★/Intake air line★

★ : SHOULD BE SERVICED BY KUBOTA DEALER. ★ : REQUIRED MORE OFTEN IN DUSTY CONDITIONS.  
Tire maximum pressure and tightening torque recommendation.

Tire sizes		Inflation Pressure	tightening torque
Front	4WD 24x12.0-12	140 kPa(20psi)	49.0 Nm(36 ft · lbs)
	2WD 23x10.5-12	—	—
Rear	4WD 18x9.5-8	250 kPa(36psi)	88.3 Nm(65 ft · lbs)
	2WD 16x6.5-8	190 kPa(28psi)	—

Approximate fluid capacities

	F2690/F2890	F3090/F3690/F3890	F3990	F2690/F2890/F3090/F3690/F3890/F3990
Engine	3.5L (3.59qts.)	5.0L (5.28qts.)	4.7L (4.91qts.)	Differential case 1.5L (1.59qts.)
Radiator	4.6L (4.86qts.)	—	3.7L(3.91qts.)	Rear axle gear case 0.5L (0.53qts.)
Reserve tank	0.6L (0.63qts.)	—	1.1L(1.16qts.)	Mower gear box 0.4L (0.42qts.)
Transmission	—	14L (14.79qts.)	—	—

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## LUBRICANTS, FUEL AND COOLANT

Place	Capacities		Lubricants	
	F2890	F3690		
Fuel	61 L		<ul style="list-style-type: none"> <li>• No.2-D S15 diesel fuel</li> <li>• No.1-D S15 diesel fuel if temperature is below -10 °C</li> </ul>	
Coolant	4.6 L		Fresh clean water with anti-freeze	
Recovery tank	0.6 L			
Engine crankcase	3.5 L*1	5.0 L*1	<ul style="list-style-type: none"> <li>• Engine oil: Refer to next page</li> </ul>	
			Above 25 °C	SAE30, SAE10W-30 or 15W-40
			-10 °C to 25 °C	SAE20, SAE10W-30 or 15W-40
			Below -10 °C	SAE10W-30
Transmission case	14 L		<ul style="list-style-type: none"> <li>• KUBOTA SUPER UDT-2 fluid*2</li> </ul>	
Rear axle Differential case	1.5 L		<ul style="list-style-type: none"> <li>• KUBOTA SUPER UDT-2 fluid*2 or SAE80 - SAE90 gear oil</li> </ul>	
Rear axle gear case (RH & LH)	0.5 L			

**Note** \*1 Oil amount when the oil level is at the upper level of the oil level gauge.

\*2 The product name of KUBOTA genuine UDT fluid may be different from that in the Operator's Manual depending on countries or territories. Consult your local KUBOTA Dealer for further detail.

Greasing**	No. of greasing points		Capacity	Type of grease
	F2890	F3690		
Speed control pedal shaft	1	1	Until grease overflows	<ul style="list-style-type: none"> <li>• Multipurpose EP2 Grease (NLGI Grade No. 2)</li> </ul>
Lift link boss (RH & LH)	2	2		
Differential lock pedal boss	1	1		
Universal joint	3	3		
Rear wheel drive shaft (F & R)	2	2		
Knuckle arm (RH & LH)	2	2		
Seat adjuster	2	2	Moderate amount	<ul style="list-style-type: none"> <li>• Oil</li> </ul>
HST neutral shaft	1	1		
Cable (Throttle)	1	1		

**Note** \*\* See "Lubricating All Grease Fittings" in "EVERY 50 HOURS" in "PERIODIC SERVICE" section for details.

### IMPORTANT :

- To prevent serious damage to hydraulic systems, use only KUBOTA genuine fluid or its equivalent.

### NOTE :

#### ◆ Engine Oil:

- Oil used in the engine should have an American Petroleum Institute (API) service classification and Proper SAE Engine Oil according to the ambient temperatures as shown above:

- Refer to the following table for the suitable API classification engine oil according to the engine type (with DPF or non-DPF (Diesel Particulate Filter) type engines) and the fuel.
- The CJ-4 engine oil is intended for DPF (Diesel Particulate Filter) type engine.

Fuel used	Engine oil classification (API classification)	
	Oil class of engines except DPF [F2890, F3690]	Oil class of engines with DPF [n/a]
Ultra Low Sulfur Fuel [<0.0015% (15 ppm)]	<b>CF, CF-4, CG-4, CH-4 or CI-4</b>	<b>CJ-4</b>

◆ **Fuel:**

- Use the ultra low sulfur diesel fuel only [below 0.0015% (15 ppm)] for these engines.
- Cetane number of 45 minimum. Cetane number greater than 50 is preferred, especially for temperatures below -20 °C or elevations above 1500 m.
- Diesel fuels specified to EN 590 or ASTM D975 are recommended.
- No.2-D is a distillate fuel of lower volatility for engines in industrial and heavy mobile service. (SAE J313 JUN87)

◆ **Transmission Oil:**

\*KUBOTA Super UDT-2: For an enhanced ownership experience, we highly recommend Super UDT-2 to be used instead of standard hydraulic/transmission fluid.

Super UDT-2 is a proprietary KUBOTA formulation that delivers superior performance and protection in all operating conditions.

Regular UDT is also permitted for use in this machine.

- Indicated capacities of water and oil are manufacturer's estimate.

# PERIODIC SERVICE



## WARNING

To avoid serious injury:

- Do not work under any hydraulically supported devices. They can settle, suddenly leak down, or be accidentally lowered. If necessary to work under the machine or any machine elements for servicing or adjustment, securely support them with stands or suitable blocking beforehand.

## HOW TO OPEN THE HOOD

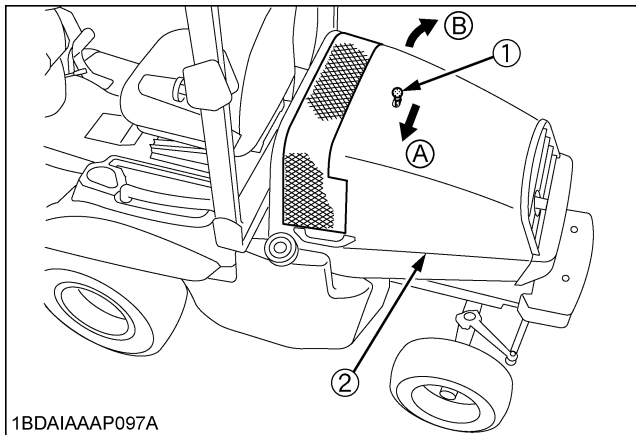


## WARNING

To avoid serious injury from contact with moving parts:

- Never open the hood while the engine is running.
- Do not touch muffler or exhaust pipes while they are hot; Severe burns could result.

### ◆ How to Open the Hood



1BDAIAAAP097A

- (1) Hood lock lever  
(2) Hood

- (A) Pull the lever  
(B) Open the hood

### To open:

1. Pull the lever.
2. Open the hood.

### To close:

1. Close the hood.
2. Check the hood is locked.

## DAILY CHECK

To prevent trouble from occurring, it is important to know the condition of the machine. Check it before starting.



## WARNING

To avoid serious injury:

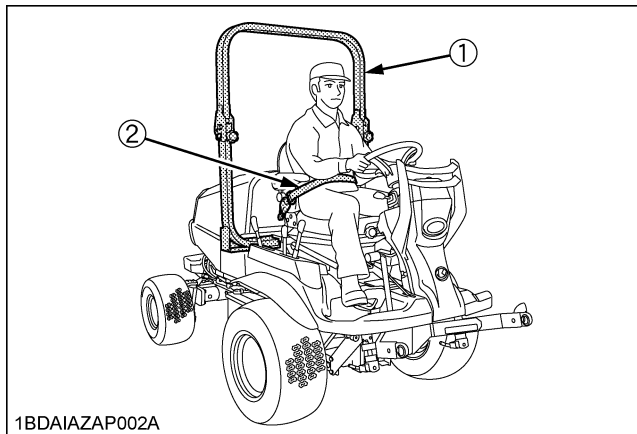
- Be sure to check and service the machine on a level surface with the engine shut off, the key removed and the parking brake securely set.

	No.	Check item	Ref. Page
Walking around the machine	1	Tire pressure, wear and damage	28, 39
	2	Oil and water leak	---
	3	Engine oil level	36
	4	Transmission fluid level	39
	5	Coolant level in the recovery tank	40
	6	Damage to machine body, tightness of all bolts and nuts	---
	7	Radiator screen Bonnet screen	38
	8	Brake pedal	48
	9	Fuel level	37
	10	Air cleaner	46
While sitting in the operator's seat	1	Speed control pedal Brake pedal	---
	2	Parking brake	---
Turning the key switch "ON"	1	Performance of the easy checker light	24
Starting the engine	1	Color of the exhaust fumes	---
	2	Safety start switch and seat safety control. If either of these do not operate properly, contact your local KUBOTA Dealer immediately.	41, 42
	3	Check for abnormal noise and vibration.	---

	No.	Check item	Ref. Page
Others	1	Check the areas where previous trouble was experienced.	---

**■Checking Seat Belt and ROPS**

1. Always check condition of the seat belt and ROPS attaching hardware before operating the machine.
2. Replace anything that is frayed or damaged.



(1) ROPS  
(2) Seat belt

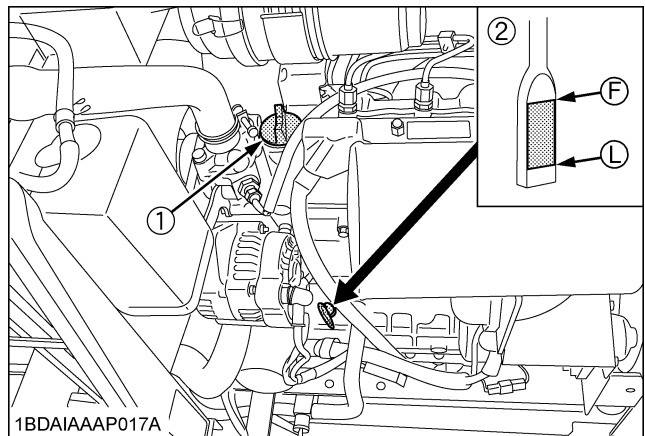
**■Checking Engine Oil Level**

**! WARNING**

To avoid serious injury:

- Always stop the engine and remove the key before checking oil.

1. Check engine oil before starting and 5 minutes or more after the engine has stopped.
2. Wipe dipstick area clean.
3. To check the oil level, remove the dipstick, wipe it clean, replace it, and draw it out again. Check to see that the oil level is between the 2 notches.
4. Add new oil to the prescribed level at the oil port if necessary.



(1) Engine oil port (F) "UPPER LEVEL"  
(2) Oil level dipstick (L) "LOWER LEVEL"

5. When using a different brand or viscosity oil from the previous one, remove all of the old oil and oil filter. Never mix 2 different types of oil.
6. Use the proper Engine Oil SAE according to the ambient temperatures. (See "LUBRICANTS, FUEL AND COOLANT" in "MAINTENANCE" section.)



**■Checking Amount of Fuel and Refueling**

**⚠ WARNING**

To avoid serious injury:

- Handle fuel carefully. If the engine is running, do not fill the fuel tank. If engine is hot, let engine cool several minutes before adding fuel. Do not smoke while filling the fuel tank or servicing the fuel system. Fill fuel tank only to bottom of filler neck.

**IMPORTANT :**

- Be sure to use Ultra Low Sulfur Fuel (S15).
- Do not permit dirt or trash to get into the fuel system.
- Be careful not to let the fuel tank become empty, otherwise air will enter the fuel system, this will require bleeding before next engine start.
- If the engine runs out of fuel and stalls, the engine components may be damaged.
- Be careful not to spill during refueling. If a spill should occur, wipe it off at once, or it may cause a fire.
- To prevent condensation (water) accumulation in the fuel tank, fill the tank before parking overnight.

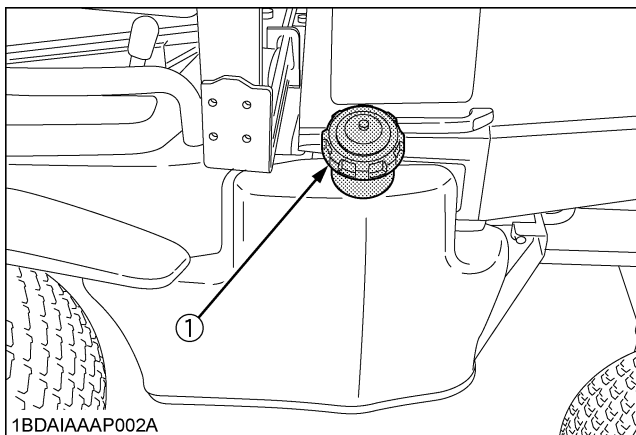


Check the fuel level. Take care that the fuel tank does not become empty.

Fuel tank capacity	61 L
--------------------	------

**IMPORTANT :**

- Use Diesel Fuel Only
1. Use No.2 diesel fuel.
  2. Use No.1 diesel fuel if the temperature is below -10 °C .
  3. Always use a strainer when refueling to prevent fuel injection pump contamination.



(1) Fuel port

## ■ Checking and Cleaning Radiator Screen and Bonnet Screen to Prevent Overheating



### WARNING

To avoid serious injury:

- Be sure to stop the engine and remove the key before cleaning.

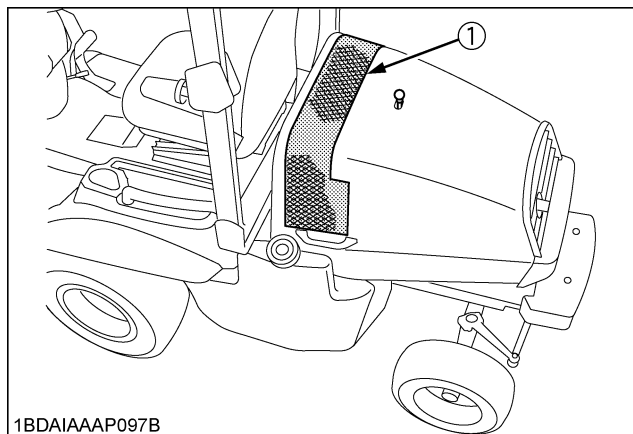
### IMPORTANT :

- The air intake area must be clear of debris to prevent the engine from overheating.

Daily or after every 5 hours of operation, check to be sure the radiator screen and the bonnet screen are clean.

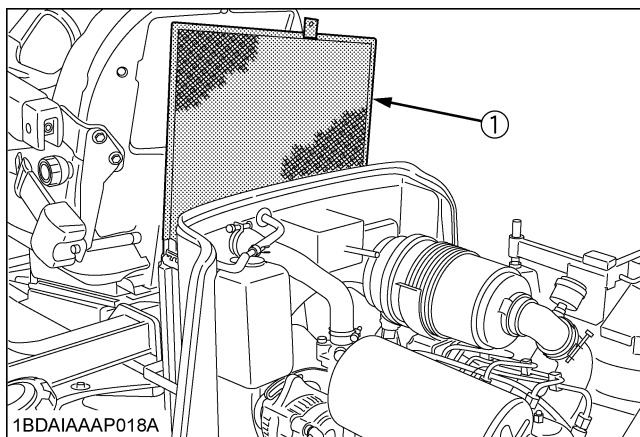
Dirt or chaff on the radiator screen or bonnet screen decrease cooling performance.

1. Remove the radiator screen and the bonnet screen, and remove all foreign material.
2. Remove the dust from between the fins and the tube.
3. Tighten the fan drive belt as necessary. For this, refer to "EVERY 100 HOURS" in "PERIODIC SERVICE" section.
4. If the scale forms in the tube, clean with the scale inhibitor or its equivalent.
5. Each time the bonnet screen is covered with grass during operation, rub it off the screen with the hand.  
Check the radiator screen from time to time if grass accumulates.



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(1) Bonnet screen



1BDAIAAAP018A

(1) Radiator screen

### ■ Checking Tire Pressure

#### **WARNING**

To avoid serious injury:

- Do not attempt to mount a tire on a rim. This should be done by a qualified person with the proper equipment.
- Always maintain the correct tire pressure. Do not inflate tires above the recommended pressure shown in the Operator's Manual.
- Never operate machine with a loose rim, wheel, or axle.

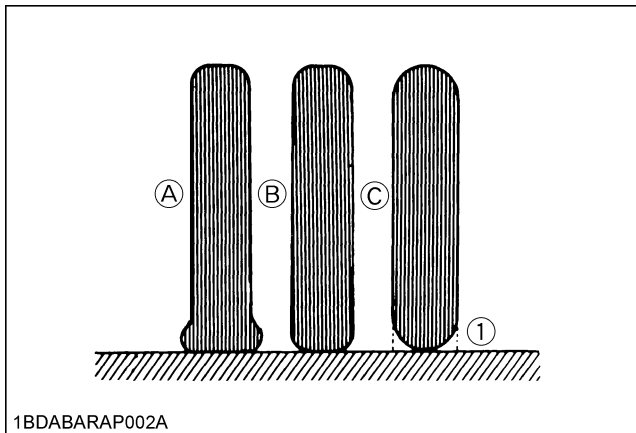
Whenever bolts are loosened, retighten to specified torque.

Check all bolts frequently and keep them tightened.

#### ◆ Inflation Pressure

Though the inflation pressure is factory-set to the prescribed level, it naturally drops slowly in the course of time. Thus, check it everyday and inflate as necessary.

		Tire sizes	Recommended Inflation Max. Pressure
Front	F2890 F3690	24 x 12 - 12, 4PR	140 kPa (1.4 kgf/cm <sup>2</sup> )
Rear	F2890 F3690	18 x 9.5 - 8, 4PR	250 kPa (2.5 kgf/cm <sup>2</sup> )

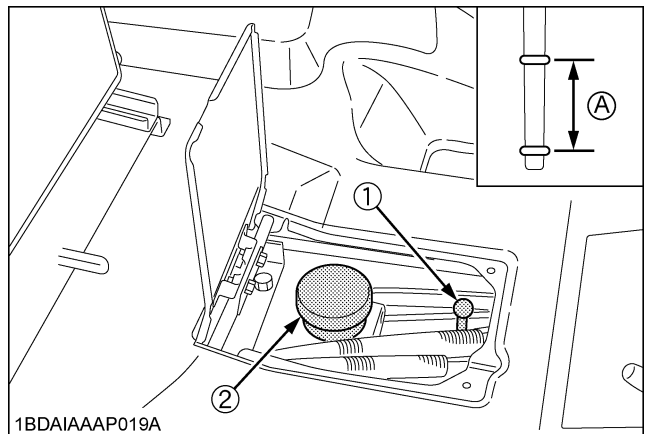


(1) Ground

- (A) "INSUFFICIENT"
- (B) "NORMAL"
- (C) "EXCESSIVE"

### ■ Checking Transmission Fluid Level

1. Park the machine on a flat surface, lower the implement to the ground, shut off the engine and remove the key.
2. To check the oil level, draw out the dipstick, wipe it clean, replace it, and draw it out again. Check to see that the oil level lies between the 2 notches. If the level is too low, add new oil to the prescribed level at the oil inlet.  
(See "LUBRICANTS, FUEL AND COOLANT" in "MAINTENANCE" section.)



- (1) Oil level dipstick
- (2) Oil inlet

(A) Oil level is acceptable within this range.

#### **IMPORTANT :**

- If oil level is low, do not run the engine.

## ■ Checking Coolant Level



### WARNING

To avoid serious injury:

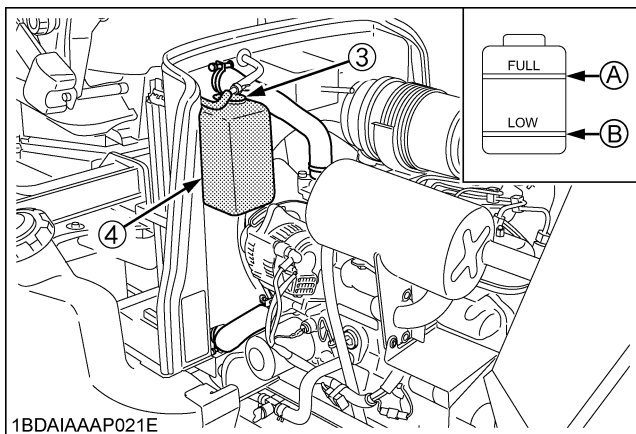
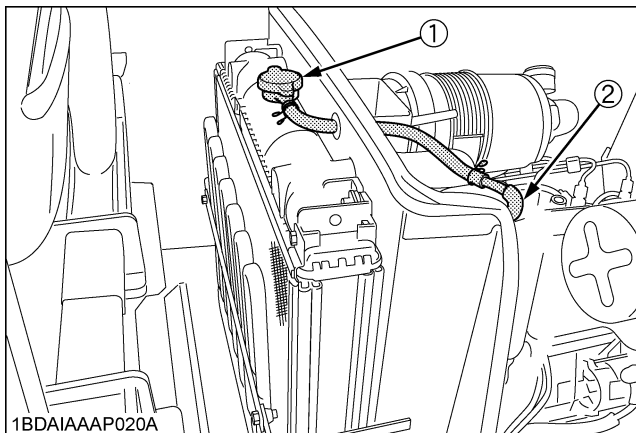
- Do not remove the radiator cap when the engine is hot. Loosen cap slightly, to the stop, to relieve any excess pressure before removing cap completely.

Check the coolant level daily both the radiator and the recovery tank before starting engine.

1. Remove the radiator cap and check to see that the coolant level is just below the fill port.
2. Check to see that the coolant level is between the "FULL" and "LOW" marks of recovery tank.
3. When the coolant level drops due to evaporation, add water only up to just below the fill port of the radiator and the full level of the recovery tank.

In case of leakage, add anti-freeze and water in the specified mixing ratio up to the full level.

(See "Flush Cooling System and Changing Coolant" in "EVERY 1 YEAR" in "PERIODIC SERVICE" section.)



- |                       |            |
|-----------------------|------------|
| (1) Radiator cap      | (A) "FULL" |
| (2) Over flow pipe    | (B) "LOW"  |
| (3) Recovery tank cap |            |
| (4) Recovery tank     |            |

### IMPORTANT :

- If the radiator cap has to be removed, follow the caution above and securely retighten the cap.
- Use clean, distilled water and anti-freeze to fill the radiator and the recovery tank.
- If water should leak, consult your local KUBOTA Dealer.

## ■ Checking Movable Parts

If any of the movable parts, such as levers and pedals, is not smoothly moved because of rust or anything sticky, do not attempt to force it into motion.

In the above case, remove the rust or the sticky object, and apply oil or grease on the relevant spot.

Otherwise, the machine may get damaged.

## EVERY 50 HOURS

### ■ Checking Engine Start System

The Engine Start System in your machine are designed to protect you while operating. Please check these Engine Start System periodically. It is recommended to check the Engine Start System before daily operation.



### WARNING

To avoid serious injury:

- Do not allow anyone near the machine while testing.
- If the machine does not pass one of the following tests, do not operate the machine. See your local KUBOTA Dealer.
- Sit on operator's seat for all tests except for Test1.

### IMPORTANT :

- Check the following tests before operating the machine.

**Test1:** Switch for the operator's seat

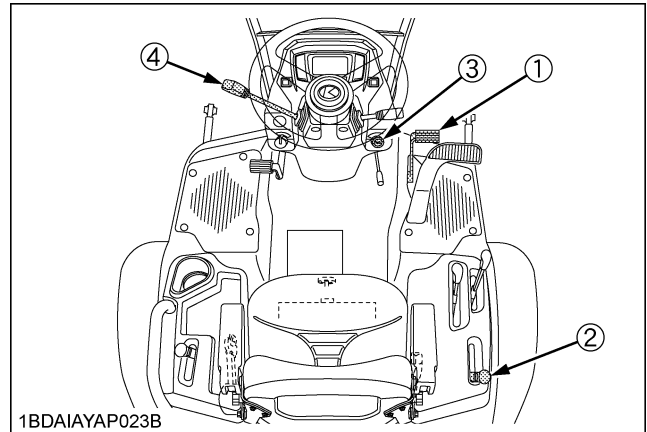
1. Do not sit on the operator's seat.
2. Depress the brake pedal fully.
3. Shift the PTO lever to the "DISENGAGE" position.
4. Turn the key switch to the "START" position.
5. The engine must not crank.

**Test2:** Switch for the brake pedal

1. Sit on the operator's seat.
2. Do not depress the brake pedal.
3. Shift the PTO lever to the "DISENGAGE" position.
4. Turn the key switch to the "START" position.
5. The engine must not crank.

**Test3:** Switch for the PTO lever

1. Sit on the operator's seat.
2. Depress the brake pedal fully.
3. Shift the PTO lever to the "ENGAGE" position.
4. Turn the key switch to the "START" position.
5. The engine must not crank.



- (1) Brake pedal  
 (2) PTO lever  
 (3) Key switch  
 (4) Throttle lever

## ■Checking OPC System

The OPC (Operator Presence Control) system in your machine are designed to protect you while operating. Please check these OPC system periodically. It is recommended to check the OPC system before daily operation.



### WARNING

To avoid serious injury:

- Do not allow anyone near the machine while testing.
- If the machine does not pass one of the following tests, do not operate the machine. See your local KUBOTA Dealer.

#### IMPORTANT :

- Check the following tests before operating the machine.

#### Test1:

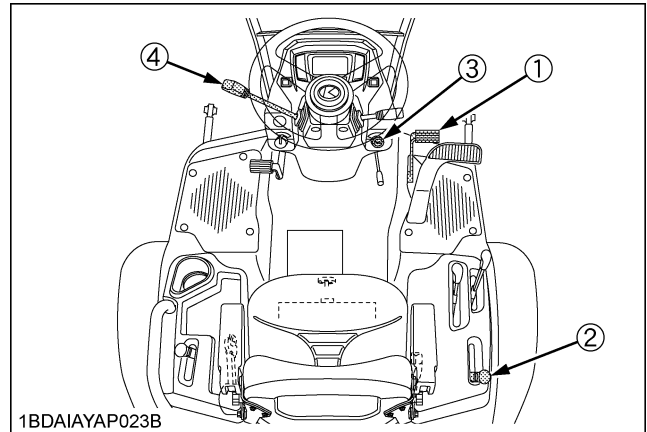
1. Start the engine.
2. Shift the PTO lever to the "DISENGAGE" position.
3. Release the brake pedal.
4. Stand up. (DO NOT GET OFF THE MACHINE.)
5. The engine must shut off.

#### Test2:

1. Start the engine.
2. Shift the PTO lever to the "ENGAGE" position.
3. Release the brake pedal.
4. Stand up. (DO NOT GET OFF THE MACHINE.)
5. The engine must shut off.

#### Test3:

1. Start the engine.
2. Depress the brake pedal fully and lock the parking brake.
3. Shift the PTO lever to the "ENGAGE" position.
4. Stand up. (DO NOT GET OFF THE MACHINE.)
5. The engine must shut off.



- (1) Brake pedal
- (2) PTO lever
- (3) Key switch
- (4) Throttle lever

## ■Lubricating All Grease Fittings

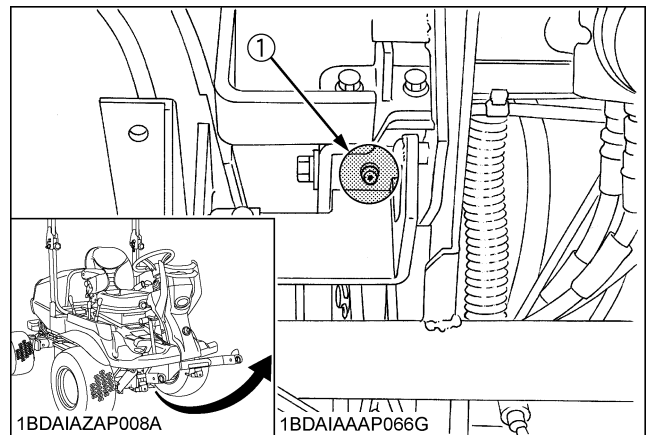


### WARNING

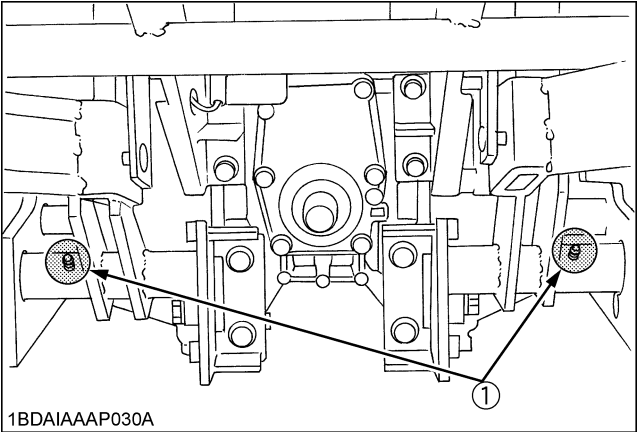
To avoid serious injury:

- Be sure to stop the engine and remove the key before greasing.

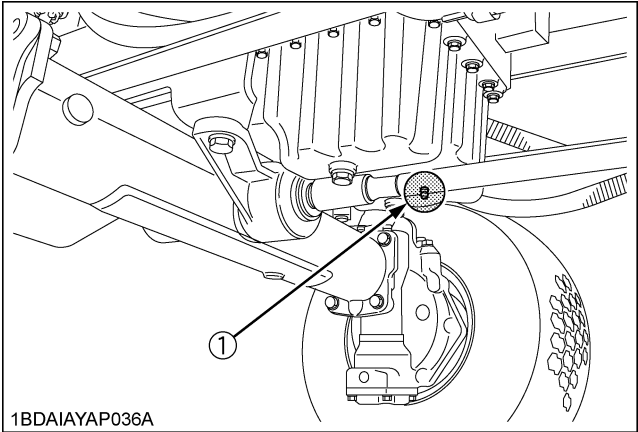
Grease the following location.



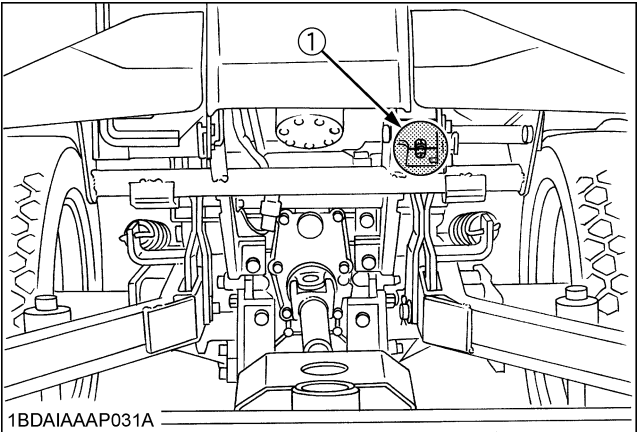
- (1) Speed control pedal shaft



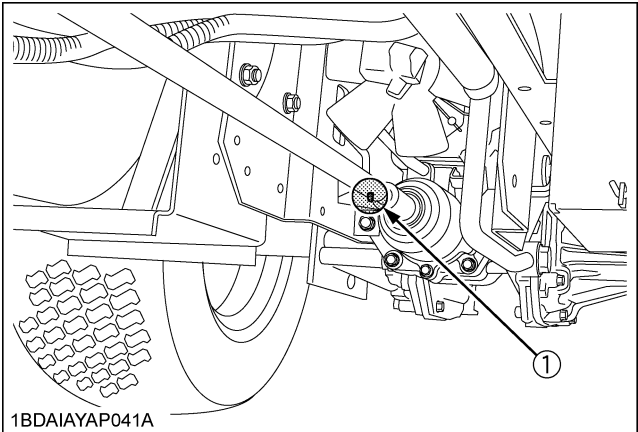
(1) Lift link boss (RH & LH)



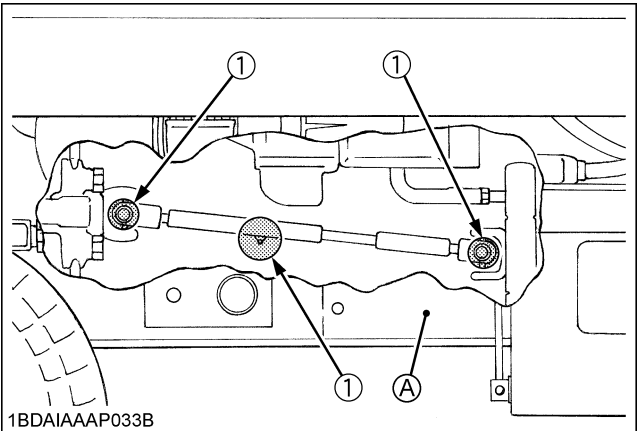
(1) Rear wheel drive shaft (4WD) (Rear side)



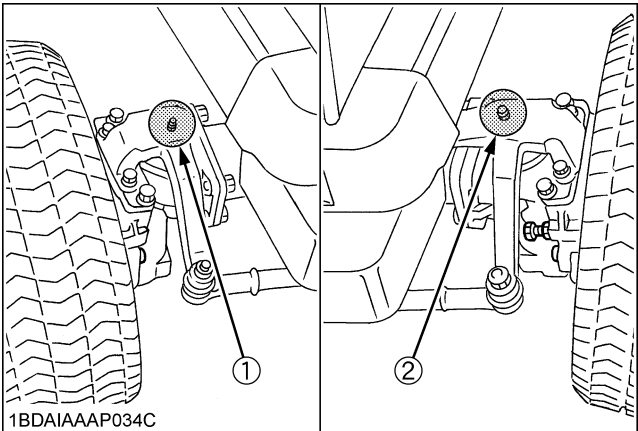
(1) Differential lock pedal boss



(1) Rear wheel drive shaft (4WD) (Front side)



(1) Universal joint (A) Frame



(1) Knuckle arm (Left)  
(2) Knuckle arm (Right)

**NOTE :**

- Apply grease to the indicated points of the universal joint that is inside of the frame.

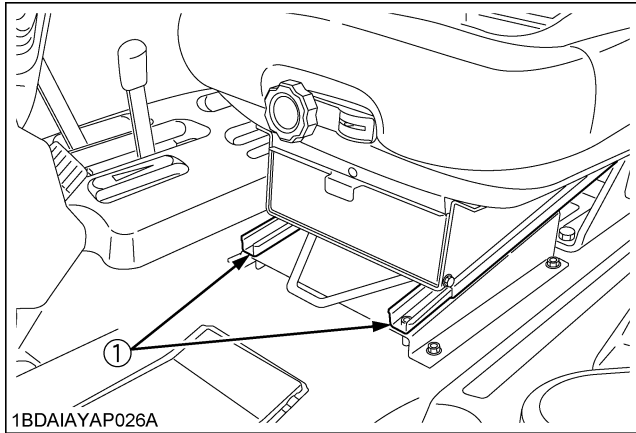
■ Oiling

**! WARNING**

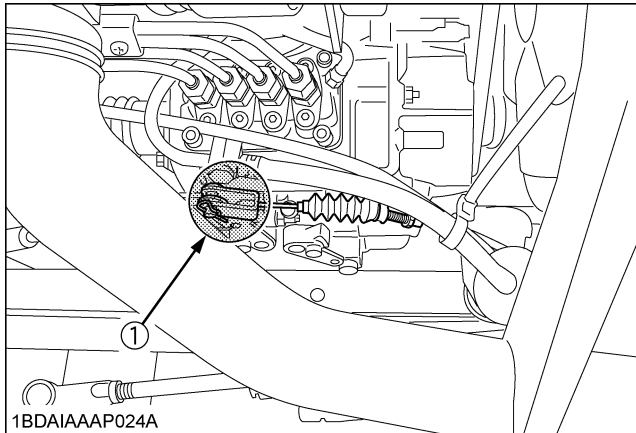
To avoid serious injury:

- Be sure to stop the engine and remove the key before oiling.

Oil the following locations.



(1) Seat adjuster



(1) Throttle cable

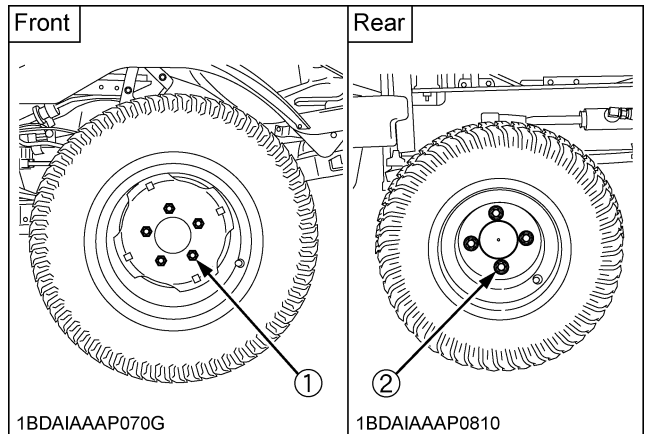
■ Checking Wheel Bolt Torque

**! WARNING**

To avoid serious injury:

- Never operate machine with a loose rim, wheel, or axle.
- Any time bolts and nuts are loosened, retighten to specified torque.
- Check all bolts and nuts frequently and keep them tight.

Check wheel bolts and nuts regularly especially when new. If they are loose, tighten them as follows.



(1) Nut: 48.1 to 55.9 N-m (4.9 to 5.7 kgf-m)

(2) Nut: 69.0 to 73.0 N-m (7.0 to 7.4 kgf-m)



## EVERY 100 HOURS

### ■ Checking Battery Condition



#### DANGER

To avoid the possibility of battery explosion:  
For the refillable type battery, follow the instructions below.

- Do not use or charge the 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.



#### DANGER

To avoid serious injury or death:

- When the battery is being activated, hydrogen and oxygen gases in the battery are extremely explosive. Keep open sparks and flames away from the battery at all times, especially when charging the battery.



#### WARNING

To avoid serious injury:

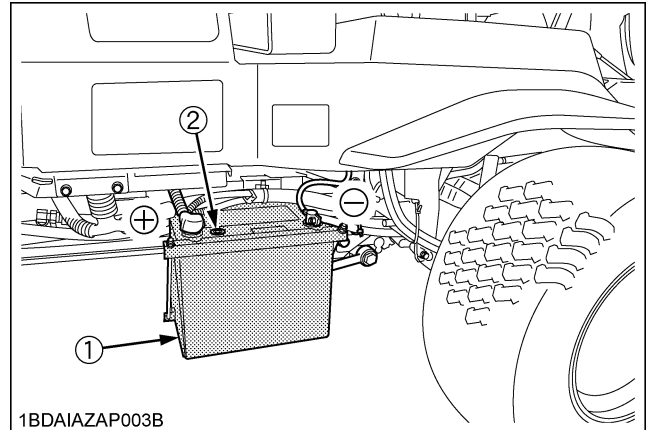
- Batteries, battery posts, terminals and related accessories contain lead and lead compounds, and other chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. **WASH HANDS AFTER HANDLING.**
- Never remove the battery cap while the engine is running.
- Keep electrolyte away from eyes, hands and clothes. If you come in contact with the electrolyte, wash it away completely with water immediately and get medical attention.
- Keep open sparks and flames away from the battery at all times. Hydrogen gas mixed with oxygen becomes very explosive.
- Wear eye protection and rubber gloves when working around battery.

The factory-installed battery is of non-refillable type. If the battery is weak, charge the battery or replace it with new one.

Mishandling the battery shortens the service life and adds to maintenance costs.

The original battery is maintenance free, but needs some servicing.

If the battery is weak, the engine will be difficult to start and the lights will be dim. It is important to check the battery periodically.



1BDAIAZAP003B

- (1) Battery
- (2) Indicator

#### ◆ How to read the indicator

Check the battery condition by reading the indicator.

State of indicator display	
Green	Specific gravity of electrolyte and quality of electrolyte are both in good condition.
Black	Needs charging battery.
White	Needs replacing battery.

#### ◆ Battery Charging



#### DANGER

To avoid serious injury or death:

- When the battery is being activated, hydrogen and oxygen gases in the battery are extremely explosive. Keep open sparks and flames away from the battery at all times, especially when charging the battery.



#### WARNING

To avoid serious injury:

- When charging the battery, ensure the vent caps are securely in place. (if equipped)
- When disconnecting the cable from the battery, start with the negative terminal first. When connecting the cable to the battery, start with the positive terminal first.
- Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.

1. To slow charge the battery, connect the battery positive terminal to the charger positive terminal and the negative to the negative, then recharge in the standard fashion.
2. A boost charge is only for emergencies. It will partially charge the battery at a high rate and in a short time. When using a boost-charged battery, it is necessary to recharge the battery as early as possible. Failure to do this will shorten the battery's service life.
3. The battery is charged if the indicator display turns green from black.
4. When exchanging an old battery for a new one, use battery of equal specification shown in **table 1**.

**[TABLE 1]**

Battery Type	Volts (V)	Capacity at 5H.R (Ah)	Reserve Capacity (min)	Cold Cranking Amps	Normal Charging Rate(A)
80D26R	12	55	133	582	5.5

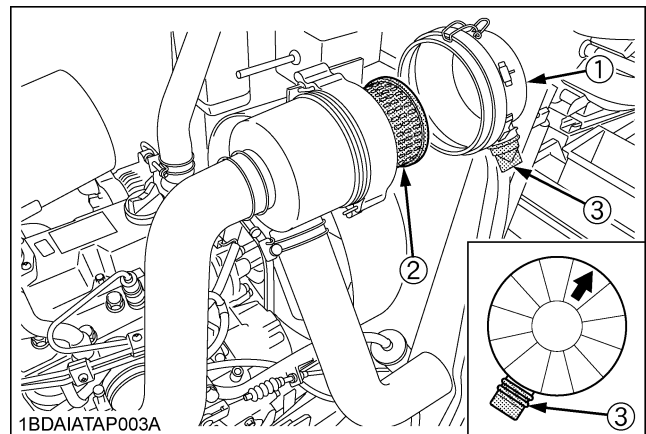
#### ◆ Direction for Storage

1. When storing the machine for a long period, remove the battery from machine, adjust the electrolyte to the proper level and store in a dry place out of direct sunlight.
2. The battery self-discharges while it is stored. Recharge it once every 3 months in hot seasons and once every 6 months in cold seasons.

#### ■ Cleaning Air Cleaner Element

1. Remove the element.
2. Clean the element:
  - (1) When dry dust adheres to the element, blow compressed air from the inside turning the element. Pressure of compressed air must be under 205kPa (2.1kgf/cm<sup>2</sup>).
  - (2) When carbon or oil adheres to the element, soak the element in detergent for 15 minutes, and then wash it several times in water, rinse with clean water and dry it naturally.
  - (3) After element is fully dried, inspect the inside of the element with a light and check if it is damaged or not. (referring to the instructions on the label attached to the case.)
3. Replace the air cleaner element if:
 

Once yearly or after every sixth cleaning, whichever comes first.



- (1) Cover  
 (2) Element  
 (3) Evacuator valve

#### IMPORTANT :

- The air cleaner uses a dry element. Never apply oil.
- Do not run the engine with the filter element removed.
- Be sure to refit the dust cup with the arrow ↑ (on the rear) upright. If the dust cup is improperly fitted, dust passes by the baffle and directly adheres to the element.

## ■ Checking Fuel Lines and Fuel Filter



### WARNING

To avoid serious injury:

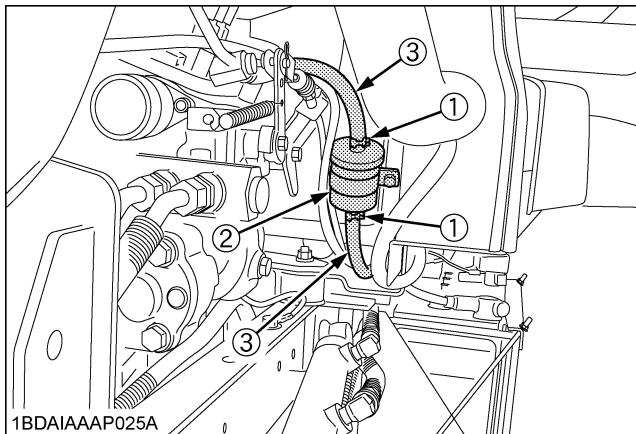
- Be sure to stop the engine and remove the key when attempting to make the following checks and changes.
- Never fail to check the fuel lines periodically. The fuel lines are subject to wear and aging. Fuel may leak out onto the running engine, causing a fire.

The fuel line connections should be checked annually or every 100 service hours, whichever comes first.

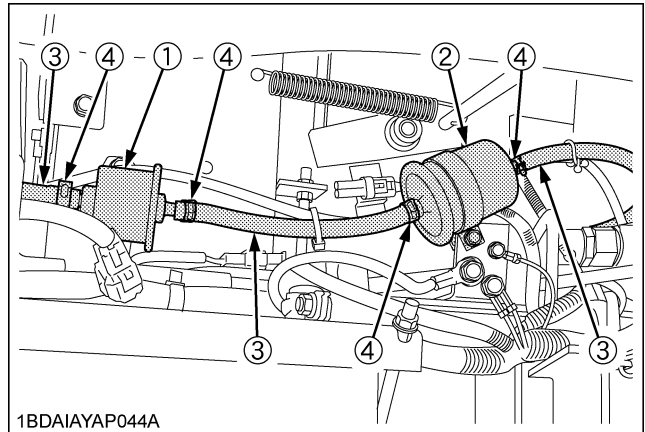
1. The fuel line is made of rubber and ages regardless of service period.
2. If the fuel line and clamps are found to be damaged or deteriorated, replace them.
3. Check fuel filter, if it is clogged by debris or contaminated with water, replace it.

### IMPORTANT :

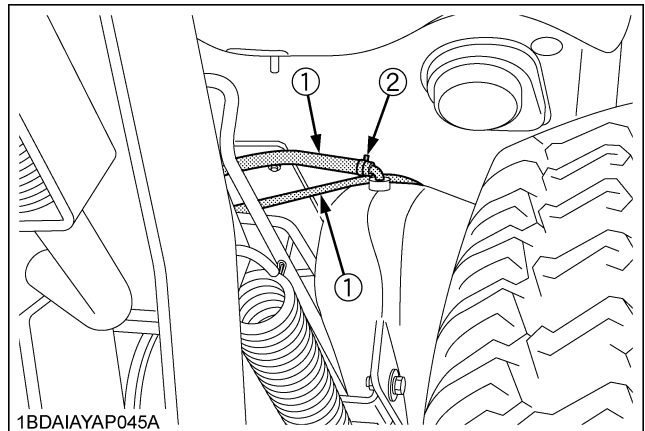
- When the fuel line is disconnected for maintenance or repair, close both ends of the fuel line with a piece of clean cloth or paper to prevent dust and dirt from entering. In addition, particular care must be taken not to admit dust and dirt into the fuel pump. Entrance of even a small amount dust or dirt cause premature wear and malfunction of the fuel pump and injector components.



- (1) Hose clamp
- (2) Fuel filter
- (3) Fuel line



- (1) Fuel pump
- (2) Fuel filter
- (3) Fuel line
- (4) Hose clamp



- (1) Fuel line
- (2) Hose clamp

### ■ Checking and Adjusting Brake Pedal

**⚠ WARNING**

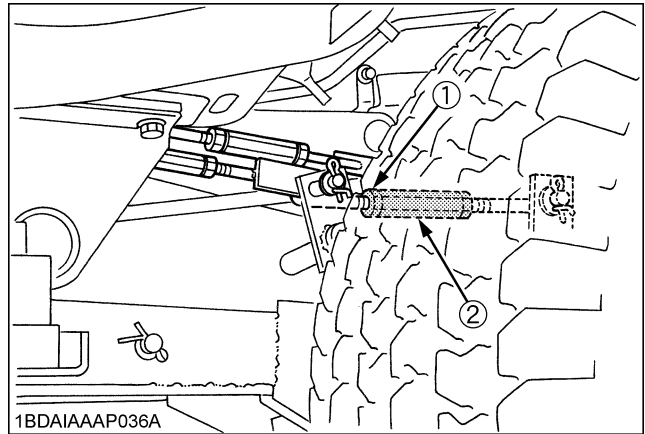
To avoid serious injury:

- Park the machine on a firm and level surface.
- Stop the engine and chock the wheels before checking the brake pedal.

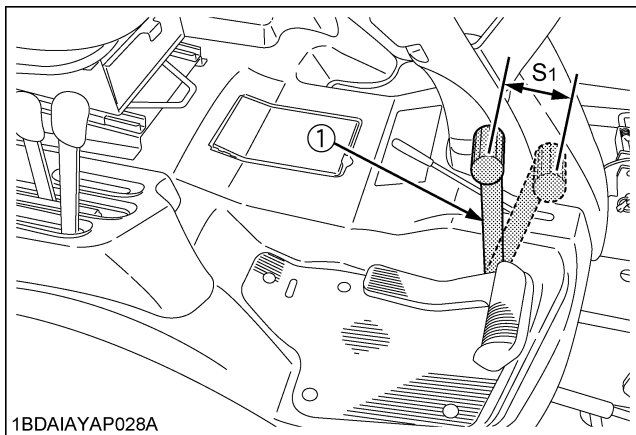
Proper brake pedal free travel	20 to 40mm on the pedal
--------------------------------	-------------------------

**NOTE :**

- If the turn assist brake device is attached, adjust the brake pedal. (See Instruction manual for Turn Assist Brake Pedals.)
  - If the speed set device is attached, remove the speed set release rod before adjusting, and replace it after adjusting. (See Instruction manual for Cruise Control.)
1. Release the parking brake.
  2. Slightly depress the brake pedal and measure free travel at the top of pedal stroke.
  3. If adjustment is needed, loosen the lock nut and turn the turnbuckle to adjust the rod length within acceptable limits.
  4. Retighten the lock nut.



(1) Lock nut  
(2) Turnbuckle



(1) Brake pedal

(S<sub>1</sub>) Free travel

### ■Checking Fan Drive Belt Tension

#### **WARNING**

To avoid serious injury:

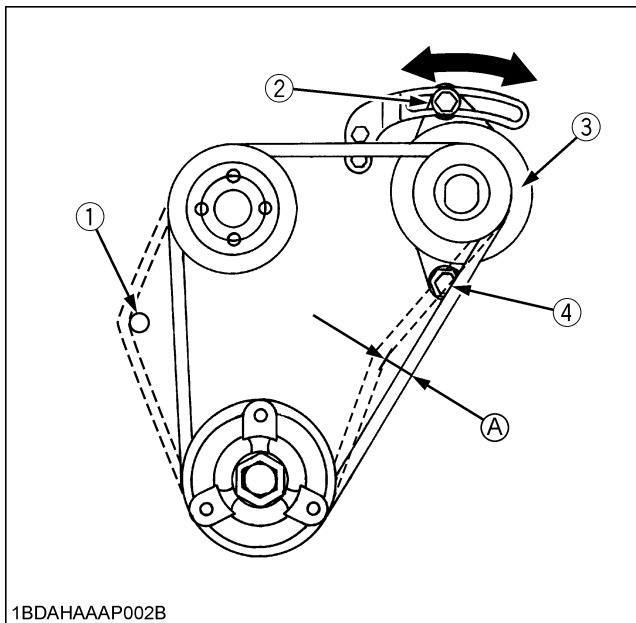
- When making adjustments, park the machine on a level surface, apply the parking brake, stop the engine and remove the key.

Proper fan belt tension	A deflection between 9 to 11 mm when the belt is pressed in the middle of the span.
-------------------------	---

1. Stop the engine and remove the key.
2. Apply moderate thumb pressure to the belt between pulleys.
3. If tension is incorrect, loosen the alternator mounting bolts and, using a lever placed between the alternator and the engine block, pull the alternator out until the deflection of the belt falls within the acceptable limits.
4. Replace the fan belt if it is damaged.

Moderate belt tension:

The belt should deflect approx. 10 mm when the center of the belt is depressed with finger pressure of 98N (10 kgf).



1BDAHAAAP002B

- (1) Cap
- (2) Tension bolt
- (3) Alternator
- (4) Adjusting bolt

(A) 10 mm

#### **IMPORTANT :**

- When replacing the fan drive belt, be careful not to catch it on the cap under the water pump.

### EVERY 200 HOURS

#### ■Changing Engine Oil

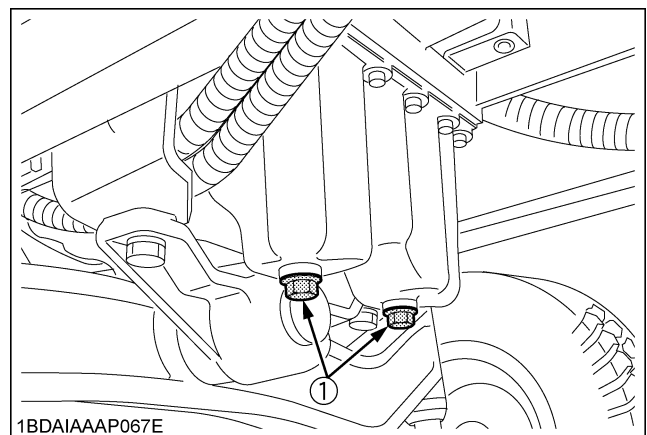
#### **WARNING**

To avoid serious injury:

- Be sure to stop the engine and remove the key before changing the oil.
- Allow engine to cool down sufficiently; oil can be hot and may cause burns.

Oil capacity with filter	F2890	3.5 L
	F3690	5.0 L

1. To drain the used oil, remove the drain plug at the bottom of the engine and drain the oil completely into the oil pan.  
All the used oil can be drained out easily when the engine is still warm.
2. After draining reinstall the drain plug.
3. Fill with the new oil up to the center on the dipstick, between the upper and lower notch.  
(See "LUBRICANTS, FUEL AND COOLANT" in "MAINTENANCE" section.)



1BDAIAAAP067E

(1) Drain plug

## ■ Replacing Engine Oil Filter Cartridge

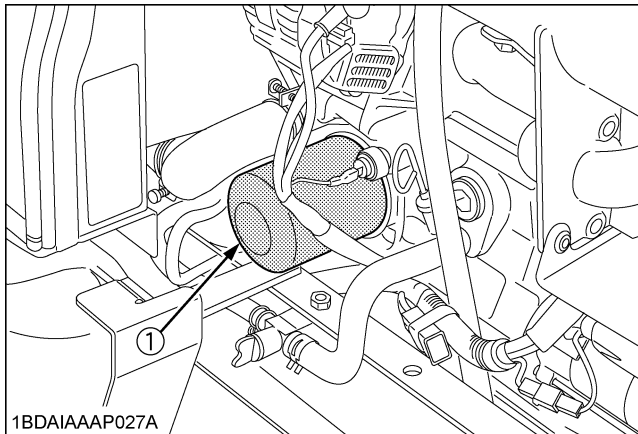


### WARNING

To avoid serious injury:

- Be sure to stop the engine and remove the key before changing the oil and the oil filter cartridge.
- Allow engine to cool down sufficiently; oil can be hot and may cause burns.

1. Remove the oil filter.
2. Put a film of engine oil on the rubber seal of the new filter.
3. Tighten the filter quickly until it contacts the mounting surface.
4. Tighten the filter by hand an additional 1/2 turn only.
5. After the new filter is replaced, the engine oil normally decreases a little. Check that the engine oil does not leak through the seal and be sure to check the oil level on the dipstick.
6. Then, replenish the engine oil up to the prescribed level.



1BDAIAAAP027A

(1) Engine oil filter cartridge

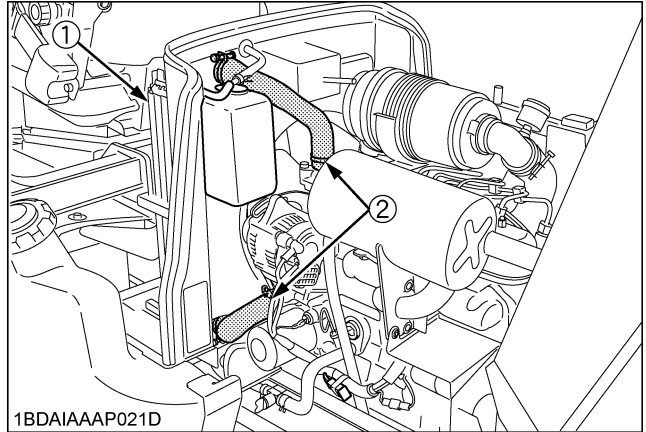
### IMPORTANT :

- To prevent serious damage to the engine, use only a genuine KUBOTA filter.

## ■ Checking Radiator Hose and Clamp

Check to see if radiator hoses are properly fixed every 200 hours of operation or 6 months, whichever comes first.

1. If hose clamps are loose or water leaks, tighten clamps securely.
2. Replace hoses and tighten hose clamps securely, if radiator hoses are swollen, hardened or cracked.



1BDAIAAAP021D

(1) Radiator core  
(2) Radiator hose

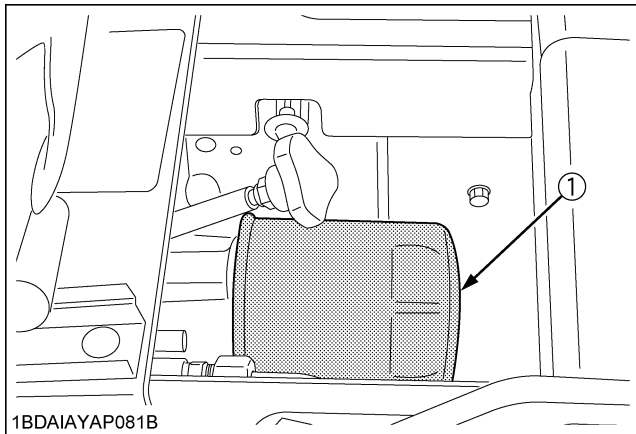
## ■ Replacing Transmission Oil Filter Cartridge

### **WARNING**

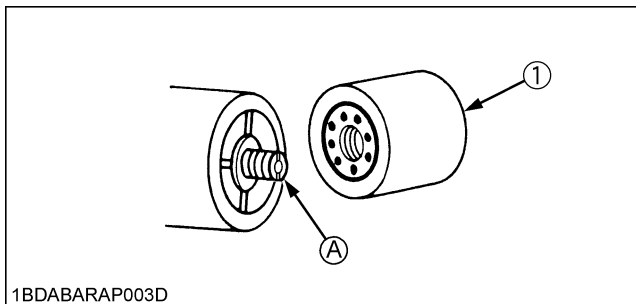
To avoid serious injury:

- Be sure to stop the engine and remove the key before changing the oil filter cartridge.
- Allow transmission case to cool down sufficiently; oil can be hot and may cause burns.

1. The oil filter cartridge must be changed every 200 service hours.



(1) Oil filter cartridge



(1) Oil filter cartridge (A) Screw

2. Remove the oil filter cartridge by using the filter wrench.
3. Apply a slight coat of oil onto the cartridge gasket.
4. To install the new cartridge, screw it in by hand. Over tightening may cause deformation of the rubber gasket.
5. After the new cartridge is replaced, the transmission fluid level normally decreases a little. Add fluid if necessary.
6. Check for oil leaks around the filter gasket.

### **IMPORTANT :**

- To prevent serious damage to a hydraulic system, replace a highly efficient, 10  $\mu$ m filter. Use only a genuine KUBOTA filter.

- When using the auxiliary hydraulics, replace the filter cartridge after initial 50 service hours of operation.

## ■ Checking Hydraulic Hose

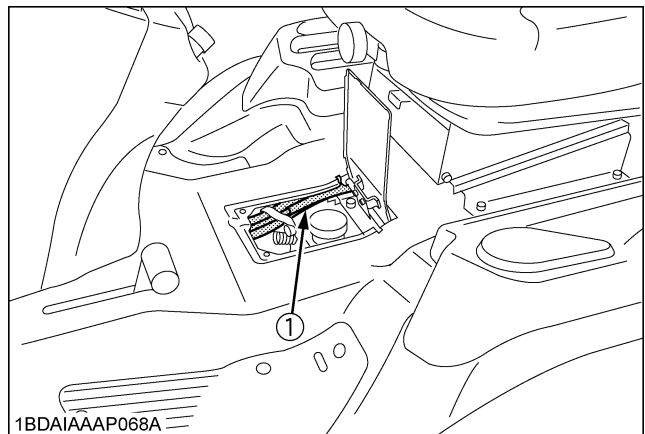
### **WARNING**

To avoid serious injury:

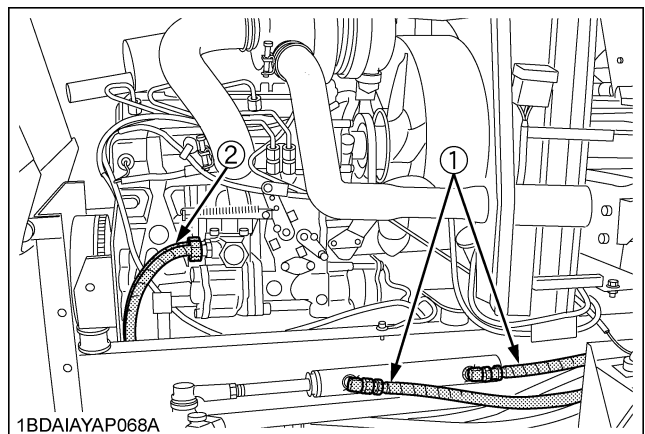
- Be sure to stop the engine and remove the key before checking and replacing hydraulic hose.
- Allow transmission case to cool down sufficiently; oil can be hot and may cause burns.

Check to see if hydraulic hoses are properly fixed every 200 hours of operation.

1. Check to see that all lines and hose clamps are tight and not damaged.
2. If hoses and clamps are found worn or damaged, replace or repair them at once.



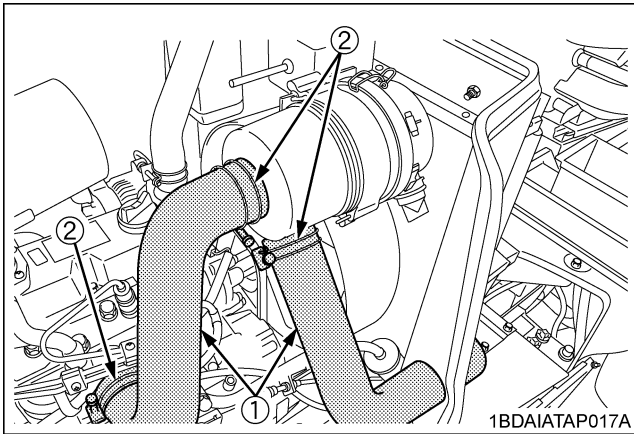
(1) Power steering hoses



(1) Power steering hoses  
(2) Pump hoses

**■Checking Intake Air Line**

1. Check to see that hoses and hose clamps are tight and not damaged.
2. If hoses and clamps are found worn or damaged, replace or repair them at once.



(1) Hose  
(2) Clamp

**EVERY 400 HOURS**

**■Changing Transmission Fluid**

**⚠ WARNING**

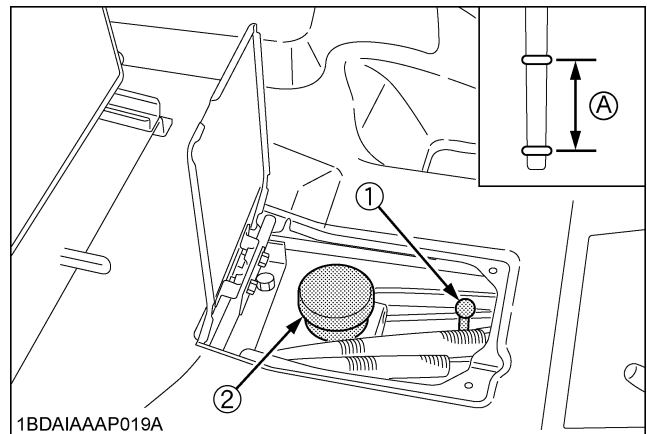
To avoid serious injury:

- Be sure to stop the engine and remove the key before changing or checking the oil.
- Allow transmission case to cool down sufficiently; oil can be hot and may cause burns.

The fluid in the transmission case is also used for the hydrostatic drive system.

1. To drain oil, remove the drain plug at the bottom of the transmission case and drain oil completely into the oil pan.
2. After draining, reinstall the drain plug.
3. Fill with the new KUBOTA SUPER UDT fluid up to the upper notch on the dipstick.  
(See "LUBRICANTS, FUEL AND COOLANT" in "MAINTENANCE" section.)
4. After running the engine for a few minutes, stop it and check the oil level again; add oil to the prescribed level.

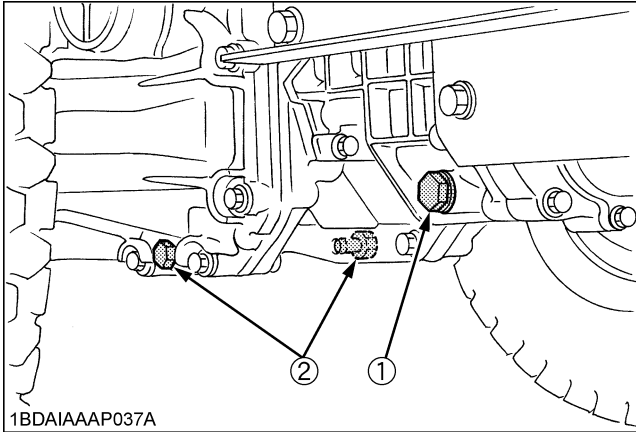
Oil capacity	14 L
--------------	------



(1) Oil level dipstick  
(2) Oil inlet

(A) Oil level is acceptable within this range





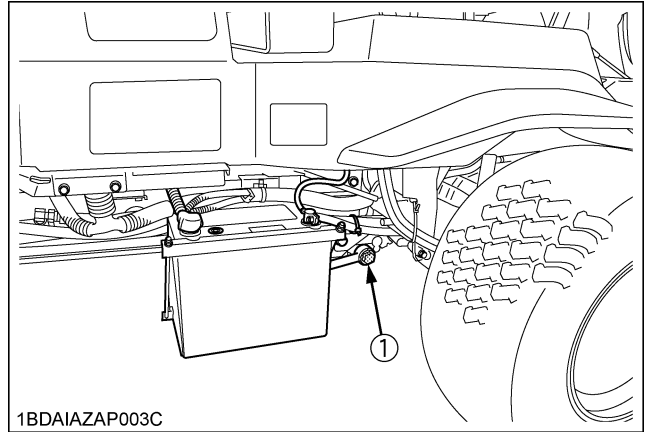
(1) Drain plug (LH)  
 (2) Drain plugs (Both sides)

**IMPORTANT :**

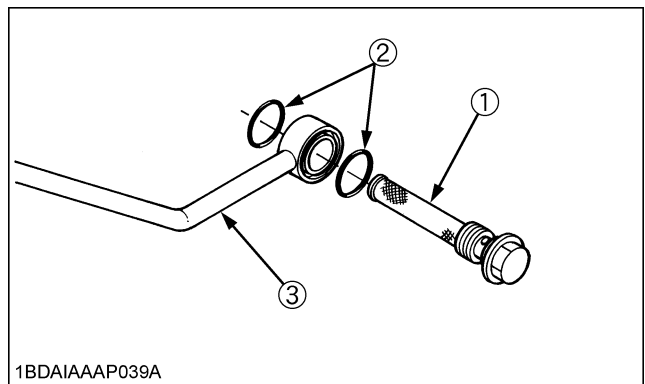
- Do not operate the machine immediately after changing the transmission fluid.
- Run the engine at medium speed for a few minutes to prevent damage to the transmission.

**■ Cleaning Transmission Strainer**

When changing the transmission fluid, remove and clean completely the oil strainers with kerosene. Be careful not to damage the strainer parts when installing.



(1) Strainer



(1) Strainer  
 (2) O ring  
 (3) Suction pipe

**IMPORTANT :**

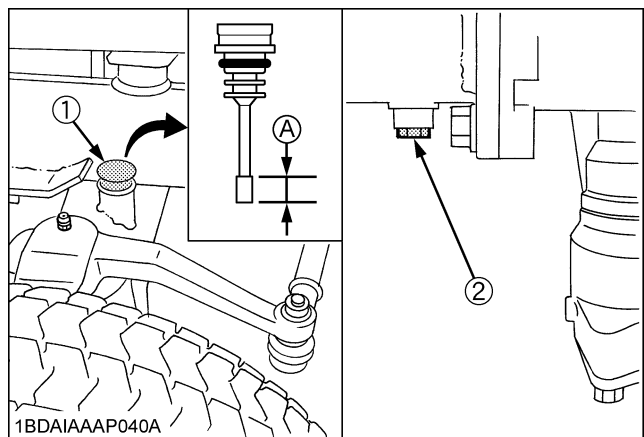
- The fine filings in the oil could injure the component parts of the hydraulic system, it has been precision build to withstand high pressure that the suction line end is provided within an oil strainer.

## ■ Changing Rear Axle Differential Case Fluid [4WD]

(See "LUBRICANTS, FUEL AND COOLANT" in "MAINTENANCE" section.)

Remove the drain and filling port plug. After draining, replace the drain plug and fill with new oil.

Oil capacity	1.5 L
--------------	-------



(1) Filling plug with dipstick  
(2) Drain plug

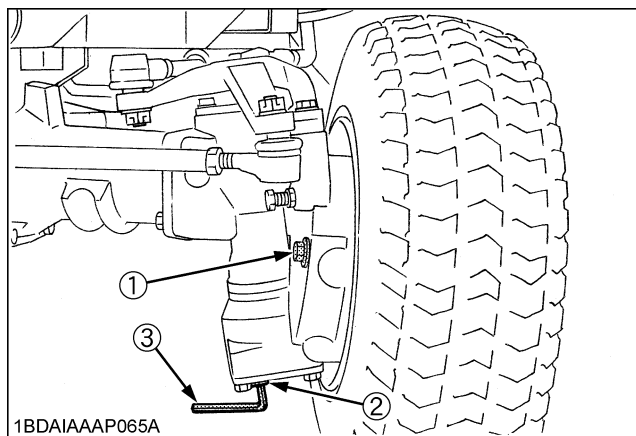
(A) Oil level is acceptable within the range

## ■ Changing Rear Axle Gear Case Fluid [4WD]

(RIGHT AND LEFT) (See "LUBRICANTS, FUEL AND COOLANT" in "MAINTENANCE" section.)

- To check the oil level, remove the check plug (bolt).
  - Place the mower on a level surface. Loosen the check plug. Oil should be visible through the opening. If the oil level is too low or high, adjust it.
- To change gear oil, remove the drain and filling port plug with the hex head wrench to drain the used oil. After draining, replace the drain plug and fill with new oil.

Oil capacity	0.5 L
--------------	-------



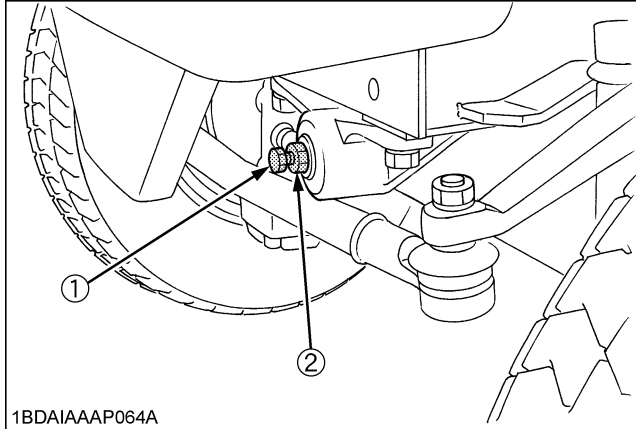
- (1) Filling and checking port plug  
(2) Drain plug  
(3) Hex head wrench

### ■ Adjusting Rear Axle Pivot

If the rear axle pivot pin adjustment is not correct, rear wheel vibration can occur causing vibration in the steering wheel.

#### ◆ Adjusting procedure

Loosen the lock nut, tighten adjusting screw all the way, and then loosen the screw by 1/6 turn. Retighten the lock nut.



(1) Adjusting screw  
(2) Lock nut

### ■ Replacing Fuel Filter

Change fuel filter every 400 hours. This should be done by your local KUBOTA Dealer.

## EVERY 800 HOURS

### ■ Adjusting Engine Valve Clearance

Consult your local KUBOTA Dealer for this service.

## EVERY 1500 HOURS

### ■ Checking Fuel Injection Nozzle (Injection Pressure)

Consult your local KUBOTA Dealer for this service.

## EVERY 3000 HOURS

### ■ Checking Injection Pump

Consult your local KUBOTA Dealer for this service.

## EVERY 1 YEAR

### ■ Replacing Air Cleaner Primary Element and Secondary Element

(See "Cleaning Air Cleaner Element" in "EVERY 100 HOURS" in "PERIODIC SERVICE" section.)

#### IMPORTANT :

- To prevent serious damage to the engine, use only a KUBOTA genuine filter.

## EVERY 2 YEARS

### ■ Flush Cooling System and Changing Coolant

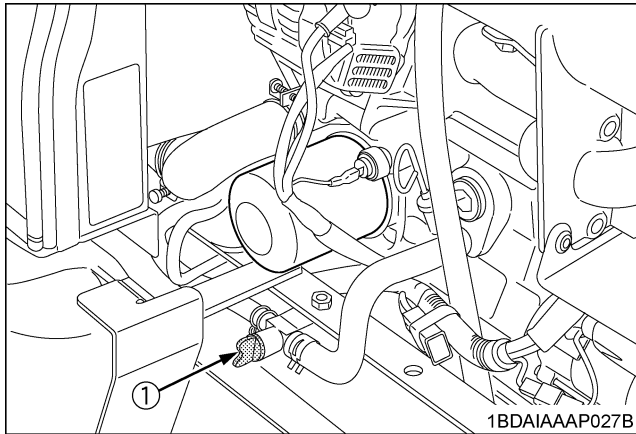


#### WARNING

To avoid serious injury:

- Do not remove the radiator cap when the engine is hot. Then loosen cap slightly to the stop to relieve any excess pressure before removing cap completely.

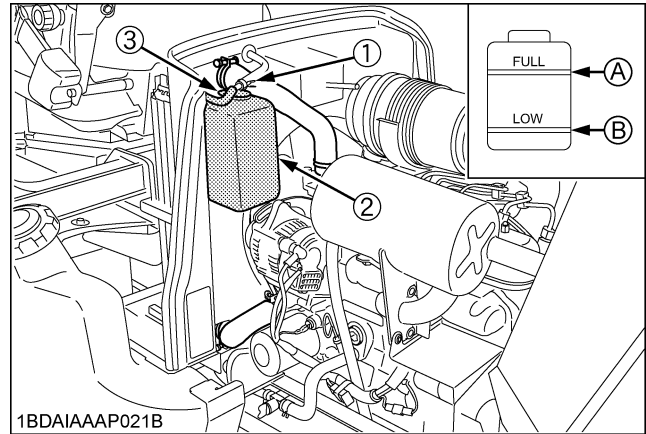
1. Stop the engine and let it cool down.
2. To drain the coolant, remove the drain plug, and then the radiator cap. The radiator cap must be removed to completely drain the coolant.



(1) Drain plug

3. After all coolant is drained, install the drain plug.
4. Fill with clean water and cooling system cleaner.
5. Follow directions of the cleaner instruction.
6. After flushing, fill with clean water and anti-freeze until the coolant level is just below the fill port on the radiator.  
Install the radiator cap securely.
7. Fill with coolant up to the "FULL" mark on the recovery tank.
8. Start and operate the engine for a few minutes.
9. Stop the engine and let it cool down.
10. Check coolant level of recovery tank and add coolant if necessary.

Coolant capacity	4.6 L
Recovery tank capacity	0.6 L



- (1) Clamp  
(2) Recovery tank  
(3) Recovery tank cap

- (A) "FULL"  
(B) "LOW"

#### IMPORTANT :

- Do not start engine without coolant.
- Use clean, distilled water and anti-freeze to fill the radiator and recovery tank.
- When mixing the anti-freeze with water, the anti-freeze mixing ratio is 50%.
- Securely tighten radiator cap. If the cap is loose or improperly fitted, water may leak out and the engine could overheat.

■ **Anti-freeze**



**WARNING**

To avoid serious injury:

- When using anti-freeze, put on some protection such as rubber gloves. (Anti-freeze contains poison.)
- If it is swallowed, seek immediate medical help. Do NOT make a person throw up unless told to do so by poison control or a health care professional. Use standard first aid and CPR for signs of shock or cardiac arrest. Call your local Poison Control Center or your local emergency number for further assistance.
- When anti-freeze comes in contact with the skin or clothing, wash it off immediately.
- Do not mix different types of Anti-freeze. The mixture can produce chemical reaction causing harmful substances.
- Anti-freeze is extremely flammable and explosive under certain conditions. Keep fire and children away from anti-freeze.
- When draining fluids from the engine, place some container underneath the engine body.
- Do not pour waste onto the ground, down a drain, or into any water source.
- Also, observe the relevant environmental protection regulations when disposing of anti-freeze.

Always use a 50/50 mix of long-life coolant and clean soft water in KUBOTA engines.

Consult your local KUBOTA dealer concerning coolant for extreme conditions.

1. Long-life coolant (hereafter LLC) comes in several types. Use ethylene glycol (EG) type for this engine.
2. Before employing LLC-mixed cooling water, fill the radiator with fresh water and empty it again. Repeat this procedure 2 or 3 times to clean up the inside.
3. Mixing the LLC  
Premix 50% LLC with 50% clean soft water. When mixing, stir it up well, and then fill into the radiator.
4. The procedure for the mixing of water and anti-freeze differs according to the make of the anti-freeze and the ambient temperature. Refer to SAE J1034 standard, more specifically also to SAE J814c.

**IMPORTANT :**

- When mixing the anti-freeze with water, the anti-freeze mixing ratio is 50%.

Vol% Anti-freeze	Freezing Point	Boiling Point *
	°C	°C
50	-37	108

\* At 1.013X10<sup>5</sup>Pa (760mmHg) pressure (atmospheric). A higher boiling point is obtained by using a radiator pressure cap which permits the development of pressure within the cooling system.

5. Adding the LLC
  - (1) Add only water if the mixture reduces in amount by evaporation.
  - (2) If there is a mixture leak, add the LLC of the same manufacturer and type in the mixing ratio 50%.  
\*Never add any long-life coolant of different manufacturer. (Different brands may have different additive components, and the engine may fail to perform as specified.)
6. When the LLC is mixed, do not employ any radiator cleaning agent. The LLC contains anti-corrosive agent. If mixed with the cleaning agent, sludge may build up, adversely affecting the engine parts.
7. Kubota's genuine long-life coolant has a service life of 2 years. Be sure to change the coolant every 2 years.

**NOTE :**

- The above data represent industry standards that necessitate a minimum glycol content in the concentrated anti-freeze.

■ **Replacing Hydraulic Hose**

Replace hoses and hose clamps every 2 years or earlier if checked and found that hoses are swollen, hardened or cracked.

■ **Replacing Fuel Lines**

This should be done by your local KUBOTA Dealer.

■ **Replacing Engine Breather Hose**

Consult your local KUBOTA Dealer for this service.

■ **Replacing Radiator Hose**

Replace hoses and clamp bands every 2 years or earlier if checked and found that hoses are swollen, hardened or cracked.

■ **Replacing Intake Air Line**

(See "Checking Intake Air Line" in every 200 hours maintenance.)

## SERVICE AS REQUIRED

### ■ Replacing Fuses

The machine electrical system is protected from potential damage by fuses.

A blown fuse indicates that there is an overload or short somewhere in the electrical system.

If any of the fuses should blow, replace with a new one of the same capacity.

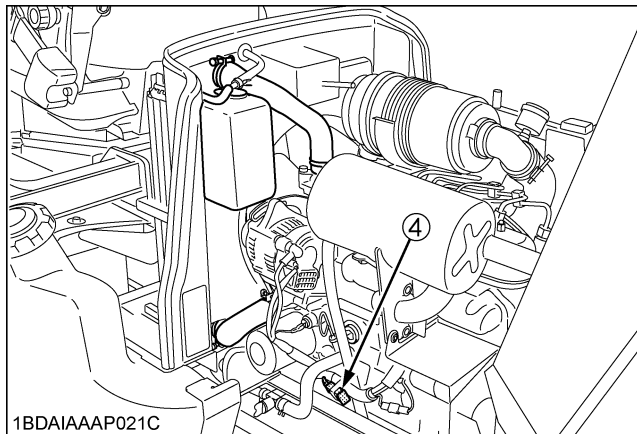
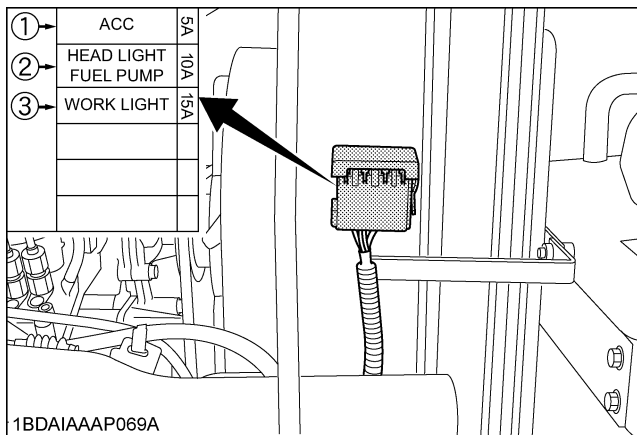
#### IMPORTANT :

- Before replacing a blown fuse, determine why the fuse blew and make any necessary repairs. Failure to follow this procedure may result in serious damage to the machine electrical system. Refer to the "TROUBLESHOOTING" section of this manual or your local KUBOTA Dealer for specific information dealing with electrical problems.

If any of them should blow, replace with a new one of the same capacity.

Do not use a fuse that is rated for a different capacity.

FUSE No.	CAPACITY (A)	Protected circuit
①	5	ACC
②	10	Head lights, Fuel pump
③	15	Work light
④	Slow blow fuse 50	Check circuit against wrong battery connection



**■ Replacing Light Bulb**

1. Head light  
Take the bulb out of the light body and replace with a new one.
2. Other lights  
Detach the lens and replace the bulb.

Light	Capacity
Headlight	55W

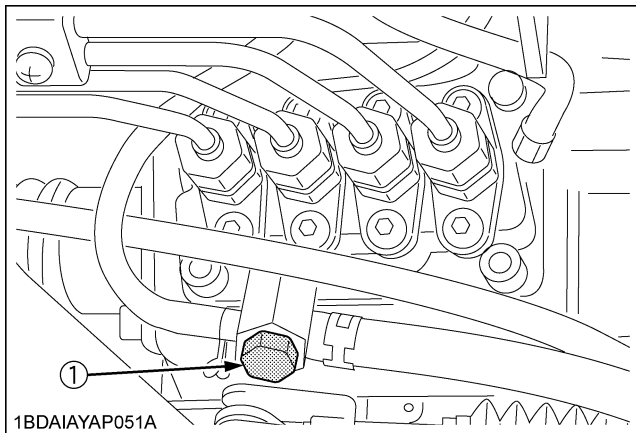
**■ Bleeding Fuel System**

Air must be removed:

1. When the fuel filter or lines are removed.
2. When tank is completely empty.
3. After the machine has not been used for a long period of time.

**◆ Bleeding procedure is as follows:**

1. Fill the fuel tank with fuel.
2. Start the engine and run for about 30 seconds, and then stop the engine.
3. Open the bleed screw.  
When bubbles disappear from fuel coming out of the plug, tighten the bleed screw.

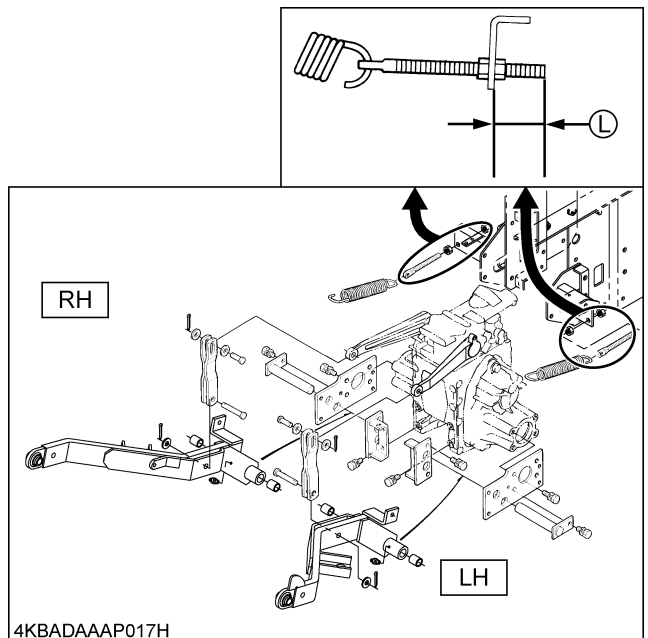


(1) Bleeding screw

**■ Adjusting Lift Springs (LH & RH)**

In order to help improve traction, adjust the lift springs according to the chart below.

	RCK72P-F39, RCK72R-F36, RCK60P-F39, RCK60R-F36
RH	L = 50 mm
LH	L = 70 mm



(L) RIGHT HAND: 50mm  
LEFT HAND: 70mm

# STORAGE



## WARNING

To avoid serious injury:

- To reduce fire hazards, allow the engine and exhaust system to cool before storing the machine in an enclosed space or near combustible materials.
- To avoid the danger of exhaust fume poisoning, do not operate the engine in a closed building without proper ventilation.
- Do not clean the machine with engine running.
- To avoid fire hazards, do not leave grass and leaves in the mower and the grass catcher. (if equipped)
- When storing, remove the key from the key switch to avoid operation by unauthorized persons.

When the machine will not be operated for over 2 months, clean the machine and perform the following operations before storage.

1. Repair parts as necessary.
2. Check bolts and nuts and tighten as necessary.
3. Apply grease or engine oil to parts most likely to rust.
4. Inflate the tires to a little above the standard pressure levels. (Approximately 110%)
5. Lower the mower to the ground.
6. Remove the battery from the machine, recharge it, adjust the electrolyte to the proper level, and store in a cool dry place.  
The battery discharges over time even while in storage. Recharge it once a month in hot seasons and once every 2 months in cold seasons.
7. Drain fuel tank, fuel lines.
8. Store the machine where it is dry and sheltered from rain. Cover the machine with a tarpaulin.
9. Moisture content in most grasses can damage the mower and grass catcher (if equipped) if these components are not properly cleaned after use.  
Make sure the mower and the grass catcher are clean and completely empty before storage.
10. Jack the machine up and place blocks under the front and rear axles so that all 4 tires are off the ground.  
Keep the tires out of direct sunlight and extreme heat.

### IMPORTANT :

- When washing the machine, be sure to stop the engine. Allow sufficient time for the engine to cool before washing.
- Cover the machine after the muffler and the engine have cooled down.

## REMOVING THE MOWER FROM STORAGE

1. Check the tire air pressure and inflate the tires if they are low.
2. Jack the machine up and remove the support blocks.
3. Install the battery. Before installing the battery, make sure it is fully charged.
4. Check the fan belt tension.
5. Check all fluid levels (engine oil, transmission / hydraulic oil, engine coolant and any attached implements).
6. Start the engine. Observe all gauges. If all gauges are functioning properly and reading normal, move the machine outside.
7. Once outside, park the machine and let the engine idle for at least 5 minutes.
8. Shut the engine off and walk around machine and make a visual inspection looking for evidence of oil water leaks.
9. With the engine fully warmed up, release the parking brake and test the brakes for proper adjustment as you move forward. Adjust the brakes as necessary.



# TROUBLESHOOTING

## ENGINE TROUBLESHOOTING

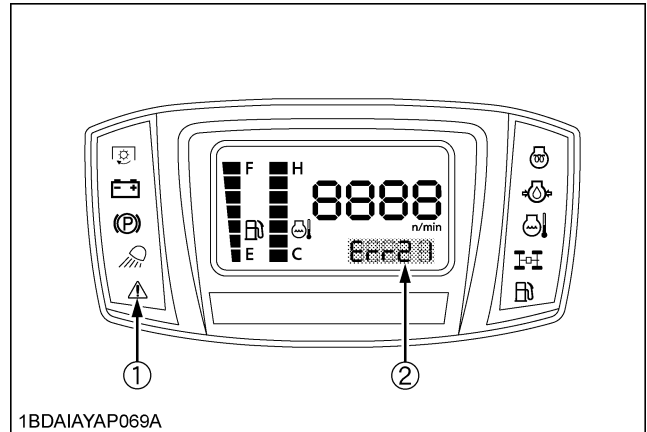
If something is wrong with the engine, refer to the table below for the cause and its corrective measure.

Trouble		Cause	Countermeasure
Engine is difficult to start or won't start.		<ul style="list-style-type: none"> <li>No fuel flow</li> </ul>	<ul style="list-style-type: none"> <li>Check the fuel tank and the fuel filter. Replace the filter if necessary.</li> </ul>
		<ul style="list-style-type: none"> <li>Air or water is in the fuel system.</li> </ul>	<ul style="list-style-type: none"> <li>Check to see if the fuel line coupler bolt and nut are tight.</li> <li>Bleed the fuel system. (See "Bleeding Fuel System" as required in "PERIODIC SERVICE" section.)</li> </ul>
		<ul style="list-style-type: none"> <li>In winter, oil viscosity increases, and engine revolution is slow.</li> </ul>	<ul style="list-style-type: none"> <li>Use oils of different viscosities, depending on ambient temperatures.</li> <li>Use the engine block heater. (Optional)</li> </ul>
		<ul style="list-style-type: none"> <li>Battery becomes weak and the engine does not turn over quick enough.</li> </ul>	<ul style="list-style-type: none"> <li>Clean battery cables &amp; terminals.</li> <li>Charge the battery.</li> <li>In cold weather, always remove the battery from the engine, charge and store it indoors. Install it on the machine only when the machine is going to be used.</li> </ul>
Insufficient engine power		<ul style="list-style-type: none"> <li>Insufficient or dirty fuel</li> <li>The air cleaner is clogged.</li> </ul>	<ul style="list-style-type: none"> <li>Check the fuel system.</li> <li>Clean or replace the element.</li> </ul>
Engine stops suddenly.		<ul style="list-style-type: none"> <li>Insufficient fuel</li> </ul>	<ul style="list-style-type: none"> <li>Refuel.</li> <li>Bleed the fuel system if necessary.</li> </ul>
Exhaust fumes are colored.	Black	<ul style="list-style-type: none"> <li>Fuel quality is poor.</li> <li>Too much oil</li> <li>The air cleaner is clogged.</li> </ul>	<ul style="list-style-type: none"> <li>Change the fuel and fuel filter.</li> <li>Check the proper amount of oil.</li> <li>Clean or replace the element.</li> </ul>
	Blue white	<ul style="list-style-type: none"> <li>The inside of exhaust muffler is dumped with fuel.</li> <li>Injection nozzle trouble</li> <li>Fuel quality is poor.</li> </ul>	<ul style="list-style-type: none"> <li>Heat the muffler by applying load to the engine.</li> <li>Check the injection nozzle.</li> <li>Change the fuel and fuel filter.</li> </ul>
Engine overheats.		<ul style="list-style-type: none"> <li>Engine overloaded</li> </ul>	<ul style="list-style-type: none"> <li>Shift to lower gear or reduce load.</li> </ul>
		<ul style="list-style-type: none"> <li>Low coolant level</li> </ul>	<ul style="list-style-type: none"> <li>Fill cooling system to the correct level; check the radiator and hoses for loose connections or leaks.</li> </ul>
		<ul style="list-style-type: none"> <li>Loose or defective fan belt</li> </ul>	<ul style="list-style-type: none"> <li>Adjust or replace fan belt.</li> </ul>
		<ul style="list-style-type: none"> <li>Dirty radiator screen or bonnet screen</li> </ul>	<ul style="list-style-type: none"> <li>Remove all trash.</li> </ul>
		<ul style="list-style-type: none"> <li>Coolant flow route corroded</li> </ul>	<ul style="list-style-type: none"> <li>Flush cooling system.</li> </ul>

If you have any questions, contact your local KUBOTA Dealer.

## POWER TRAIN TROUBLE SHOOTING

If something is wrong with the power train, the master system warning indicator starts blinking and the error code shown below is displayed on the liquid crystal display, indicating the location of the trouble. If an error code appears, immediately contact your local KUBOTA Dealer for repairs.



(1) Master system warning indicator  
 (2) Error code

Displayed error code	Trouble	Operator's action
Err 1	Water temperature sensor trouble	Contact your local KUBOTA Dealer.
Err 2	Fuel sensor trouble	
Err 3	Meter panel memory reading trouble	

## BATTERY TROUBLESHOOTING

Trouble	Cause	Remedy	Preventive measure
Starter does not function.	<ul style="list-style-type: none"> <li>● Battery overused until lights are dim.</li> </ul>	<ul style="list-style-type: none"> <li>● Charge the battery sufficiently.</li> </ul>	<ul style="list-style-type: none"> <li>● Charge the battery properly.</li> </ul>
	<ul style="list-style-type: none"> <li>● Battery has not been recharged.</li> </ul>		
	<ul style="list-style-type: none"> <li>● Poor terminal connection</li> </ul>	<ul style="list-style-type: none"> <li>● Clean the terminal and tighten securely.</li> </ul>	<ul style="list-style-type: none"> <li>● Keep the terminal clean and tight. Apply grease and treat with anticorrosive.</li> </ul>
	<ul style="list-style-type: none"> <li>● Battery life expired.</li> </ul>	<ul style="list-style-type: none"> <li>● Replace the battery.</li> </ul>	
From beginning starter does not function, and lights soon become dim.	<ul style="list-style-type: none"> <li>● Insufficient charging</li> </ul>	<ul style="list-style-type: none"> <li>● Charge the battery sufficiently.</li> </ul>	<ul style="list-style-type: none"> <li>● Battery must be serviced properly before initial use.</li> </ul>
When viewed from top, the top of plates looks whitish.	<ul style="list-style-type: none"> <li>● Battery was used with an insufficient amount of electrolyte.</li> </ul>	<ul style="list-style-type: none"> <li>● Add distilled water and charge the battery.</li> </ul>	<ul style="list-style-type: none"> <li>● Regularly check the electrolyte level.</li> </ul>
	<ul style="list-style-type: none"> <li>● Battery was used too much without recharging.</li> </ul>	<ul style="list-style-type: none"> <li>● Charge the battery sufficiently.</li> </ul>	<ul style="list-style-type: none"> <li>● Charge the battery properly.</li> </ul>
Recharging is impossible.	<ul style="list-style-type: none"> <li>● Battery life expired.</li> </ul>	<ul style="list-style-type: none"> <li>● Replace the battery.</li> </ul>	
Terminals are severely corroded and heat up.	<ul style="list-style-type: none"> <li>● Poor terminal connection</li> </ul>	<ul style="list-style-type: none"> <li>● Clean the terminal and tighten securely.</li> </ul>	<ul style="list-style-type: none"> <li>● Keep the terminal clean and tight. Apply grease and treat with anticorrosive.</li> </ul>
Battery electrolyte level drops rapidly.	<ul style="list-style-type: none"> <li>● There is a crack or pin holes in the electrolytic cells.</li> </ul>	<ul style="list-style-type: none"> <li>● Replace the battery.</li> </ul>	

If you have any questions, contact your local KUBOTA Dealer.

**MACHINE TROUBLESHOOTING**

Trouble	Cause	Counter measure
Machine operation is not smooth.	<ul style="list-style-type: none"><li>● Hydrostatic transmission fluid is insufficient.</li><li>● Filter is clogged.</li><li>● Strainer is clogged.</li></ul>	<ul style="list-style-type: none"><li>● Replenish oil.</li><li>● Replace the filter.</li><li>● Clean the strainer.</li></ul>
Machine does not move while engine is running.	<ul style="list-style-type: none"><li>● Parking brake is on.</li><li>● Transmission fluid level is insufficient.</li></ul>	<ul style="list-style-type: none"><li>● Release the parking brake.</li><li>● Replenish oil.</li></ul>
Machine moves when speed control pedal is not depressed. (Engine is operated.)	<ul style="list-style-type: none"><li>● Hydrostatic lever linkage is not correctly adjusted.</li></ul>	<ul style="list-style-type: none"><li>● Ask your dealer for hydrostatic lever linkage adjustment or pressure adjustment.</li></ul>

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