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Telephone : (49)-6332-4870

U.K. : **KUBOTA (U.K.) LTD.**
Dormer Road, Thame, Oxfordshire, OX9 3UN, U.K.
Telephone : (44)1844-214500

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Calle Fernando Alonso número 15, Leganés, 28914 (Madrid), Spain
Telephone : (34)-91-508-6442

Turkey : **KUBOTA TURKEY MAKINE TIC.LTD.ŞTI.**
Cumhuriyet Mah. Yahya Kaptan Cad. No:3 Cayirova / Kocaeli/Turkey 41420
Telephone : (90)262-658-9045

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25-29 Permas Way, Truganina, VIC 3029, Australia
Telephone : (61)-3-9394-4400

Malaysia : **KUBOTA MALAYSIA SDN. BHD.**
Lot 766, Jalan Subang 4, off Persiaran Subang Sungai Penaga Industrial Park,
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Telephone : (63)2-422-3500

Taiwan : **SHIN TAIWAN AGRICULTURAL MACHINERY CO., LTD.**
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Telephone : (886)7-702-2333

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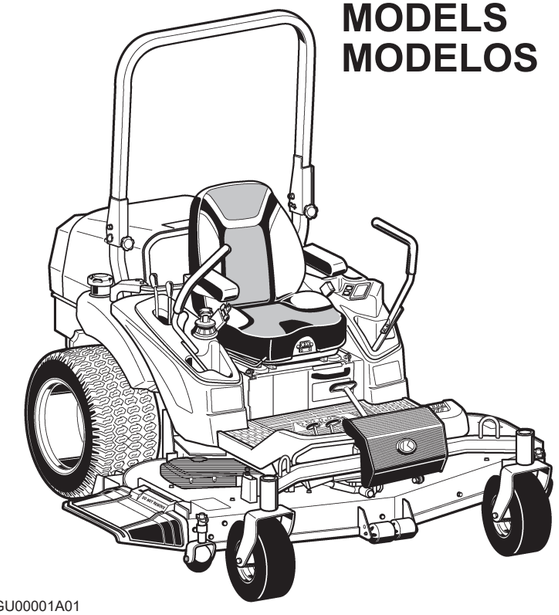
ZD1611LF-ZD1611RLF-ZD1611RL

OPERATOR'S MANUAL
KUBOTA
ZERO TURN MOWER

MANUAL DEL OPERADOR
KUBOTA
SEGADORA DE GIRO CERO

MODELS **ZD1611LF**
MODELOS **ZD1611RLF**
ZD1611RL



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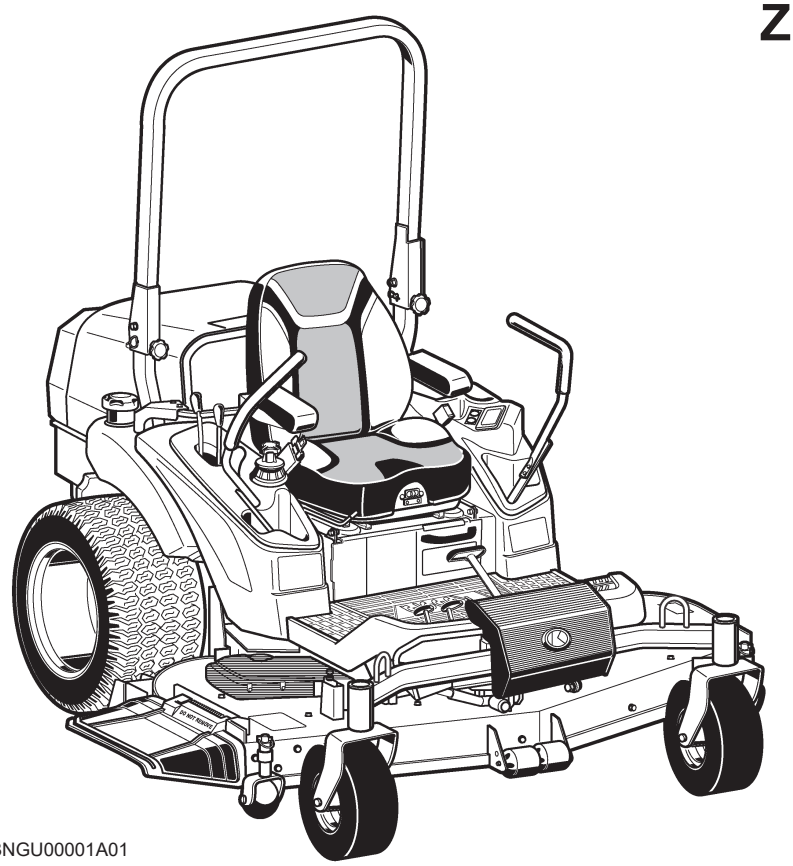
READ AND SAVE THIS MANUAL
LEA Y CONSERVE ESTE MANUAL

PRINTED IN U.S.A.
IMPRESO EN E.E.U.U.

OPERATOR'S MANUAL

KUBOTA
ZERO TURN MOWER

MODELS **ZD1611LF**
ZD1611RLF
ZD1611RL



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Kubota

ABBREVIATION LIST

Abbreviations	Definitions
API	American Petroleum Institute
ASTM	American Society for Testing and Materials, USA
fpm	Feet Per Minute
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
ROPS	Roll-Over Protective Structures
rpm	Revolutions Per Minute
r/s	Revolutions Per Second
SAE	Society of Automotive Engineers

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.

Canadian Electromagnetic Compatibility (EMC):
This machine complies with Industry Canada ICES-002.

UNIVERSAL SYMBOLS

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


Safety alert symbol


Diesel fuel


Fuel-level


Parking brake


Engine-STOP


Preheat


Engine-RUN


Starter control


Power take-off clutch control-OFF position (disengaged)


Power take-off clutch control-ON position (engaged)


Cutting height


Mower-LOWERED position


Mower-RAISED position


FAST


SLOW


Engine speed control


Battery


Oil pressure


Coolant temperature


Regeneration


Regeneration INHIBIT (switch)


Regeneration (switch)


PARKED regeneration


Master system warning


Engine - warning

FOREWORD

You are now the proud owner of a KUBOTA ZERO TURN 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.

CONTENTS

SAFE OPERATION

Careful operation is your best insurance against an accident.
The owner/user can prevent and is responsible for accidents or injuries occurring to themselves, other people or property. Read and understand this manual carefully before operating the machine. All operators, no matter how much experience they may have had, must read and understand this and other related manuals before operating the machine or any implement attached to it. It is the owner's obligation to instruct all operators in safe operation.
If the operator(s) or mechanic(s) cannot understand the contents, it is the owner's responsibility to explain this material to them. This mowing machine is capable of amputating hands, feet and throwing objects. Failure to observe the following safety instructions could result in serious injury or death.

BEFORE OPERATING THE MACHINE

Know your equipment and its limitations. Read all instructions in this manual before attempting to start and operate the machine.

1. General

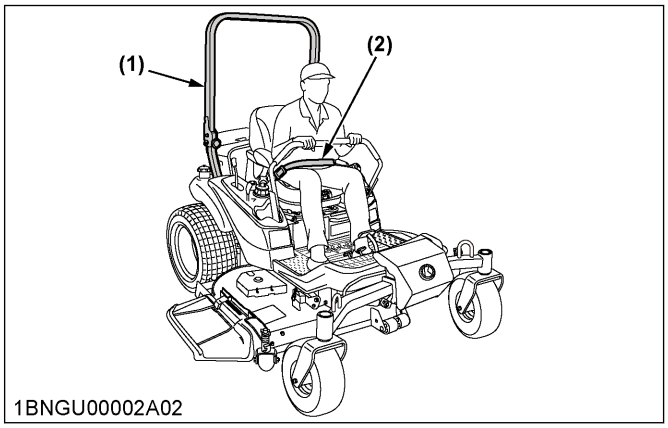
- The zero turn mowing machine has different steering characteristics than other machines with a steering wheel and does not have a service brake pedal (but, has a parking brake pedal that can be used to stop the machine in an emergency). Normal slowing down and stopping is done with the motion control levers. Read and understand the Operator's Manual before operating the machine. Practice operating the machine at low engine speed in an unobstructed area without engaging the mower.
- Pay special attention to the safety labels on the machine itself.
- Do not operate the machine or any attachments while under the influence of alcohol, medication, controlled substances or when fatigued.
- Do not wear loose, torn, or bulky clothing around the machine. The clothing may catch on moving parts or controls, leading to the risk of an accident. Wear and use any additional safety items such as a hard hat, safety boots or shoes, eye and hearing protection, gloves and so on, as appropriate or required.
- Do not wear radio or music headphones while operating the machine. Do not operate the machine or any attachments while using or texting with a cellphone or any other electronic device.
  Safe operation requires your full attention.
- Carefully check the vicinity before operating machine or any implement attached to it. Clear the work area of objects (such as wires and rocks,) that might be picked up and thrown. Check for overhead clearance which may interfere with the grass catcher.
- Check parking brakes and other mechanical parts for correct adjustment and wear. Replace worn or damaged parts promptly. Check the tightness of all nuts and bolts regularly.
  (See PERIODIC SERVICE on page 70 and ADJUSTMENT on page 111.)
- Keep all shields and guards in place. Replace any that are damaged or missing. Do not operate unless they are functioning properly.
- Before allowing other people to use your machine, explain how to operate and have them read this manual before operation.
- Do not allow any bystanders around or near machine during operation.
- Do not allow passengers, children or non-qualified operators on the machine at any time. The operator must remain in the machine seat throughout operation.
- In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern and prudence of personnel involved in the operation, transport, maintenance of the equipment.
- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Keep the machine and attachments in good operating condition and keep safety devices in place and in proper working condition. Do not operate unless they are functioning properly.
- Do not modify the machine. Unauthorized modification may affect the function of the machine, which may result in personal injury.
- Do not make any modifications to the engine or emission components as they may result in damage and malfunctions such as:
  - Damage to the power train from excessive engine output.
  - Engine overheating caused by exceeding the engine cooling performance capabilities.
  - Malfunctions of the exhaust gas aftertreatment control devices.

Modifications to the engine and its emission components may violate emission regulations and are subject to fines and penalties.
Kubota and its affiliates are not liable for any damage, malfunction or accidents caused by modifications to the engine or emission components.

- Use only implements approved by Kubota. Use proper ballast on the front or rear of the machine to reduce the risk of upsets. Follow the safe operating procedures specified in the manuals of the equipment.
- Keep your machine clean. Accumulations of dirt, grease, and trash can contribute to fires and lead to personal injury.
- The exhaust gas from the muffler is very hot. To prevent fire, do not expose dry grass, mowed grass, oil and any other combustible materials to the exhaust gas. Use a spark arrester where required. Keep the engine and muffler clean all the times.

2. ROPS

- The ROPS is an integral and effective safety device.
- Kubota recommends the use of a roll-over protective structure (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 you must set the ROPS in the upright and locked position and put on the seat belt for all other operations.
- Do not remove the ROPS.
- 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.
- If any structural member of the ROPS is damaged, replace the entire structure at your local Kubota Dealer. Any alterations to a ROPS must be approved by the manufacturer.
- Check the area to be mowed and never fold down a foldable ROPS in areas where there are slopes, drop-offs or water.
- Check carefully for overhead clearances (such as branches, doorways and electrical wires) before driving under any objects and do not contact them.
- Keep the ROPS in safe operating condition by periodically and thoroughly inspecting for damage and keeping all mounting fasteners tight.
- Always use the seat belt when the ROPS is upright. Do not use the seat belt if the ROPS is down or if there is no ROPS. Check the seat belt regularly and replace if frayed or damaged. Be certain that the seat belt can be released quickly in the event of an emergency.



(1) ROPS
(2) Seat belt

OPERATING THE MACHINE

1. Starting to operate the machine

- Always sit in the operator's seat when starting the engine or operating levers or controls.
- Before starting the engine make sure that the motion control levers are in *"NEUTRAL LOCK"*, the parking brake is applied, and the power take-off (PTO) is disengaged (OFF).
- Do not start the engine by shorting across starter terminals. The machine may start in gear and move if the normal starting circuitry is bypassed.
- Do not operate or idle the engine in a non-ventilated area. Carbon monoxide gas is colorless, odorless, and deadly.
- Do not start the engine while tilting deck.
- Do not start the engine when the front or rear tires are not on the ground.
- Check before each use that the operator presence control (OPC) system is functioning correctly.
  Test the safety systems.
  (See Checking the engine start system on page 87 and Checking the OPC system on page 87.)
  Do not operate unless they are functioning correctly.
- Check all fluids before starting.

2. Working the machine

- Do not turn sharply when driving at high speed.

- To avoid tip-over accidents, slow down when turning on uneven terrain or before stopping.
- Do not operate near ditches, holes, embankments, or other terrain, which may collapse under the machine's weight. The risk of machine tip-overs increases when the ground is loose or wet.
- Park the machine on a firm and level surface. Before you get off, apply the parking brake, place the motion control levers in their *"NEUTRAL LOCK"* positions, disengage the PTO, lower all attachments to the ground, turn off the engine, and remove the key.
- Watch where you are going at all times. Watch for and avoid obstacles. Be alert at curbs, shrubs, near trees, and other obstructions and hidden hazards. Obstacles can damage machine (fuel hoses, wire harness and so on).
- Know what is behind you before backing up. Look to the rear before and when backing. Do not mow while in reverse. Operate in reverse with the blades engaged only when 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 a grass catcher as your view to the rear is restricted.
- When working in groups, always let others know what you are doing ahead of time.
- Do not drive the machine on streets or highways. Watch for traffic when you cross roads or operate near roads.
- Be aware of the mower discharge direction and do not point it at anyone.
  Never operate with the discharge deflector raised, removed or altered, unless using a grass catcher.
- When using any attachments, never direct discharge material toward bystanders. Do not allow people or pets near the attachments while in operation.
  Do not mow when bystanders are present in the mowing area.
- To reduce fire hazards, keep the engine exhaust area free of grass or leaves.
- Be sure that the rotating blades and the engine are stopped and the key is removed before placing hands or feet near blades, cleaning blockages or unclogging the discharge deflector.
- Keep hands and feet away from the cutting units. Shut the engine off and wait for all movement to stop before removing the grass catcher or unclogging the discharge deflector.
- Always inspect the mower for damage after striking a foreign object. Repair or replace any damaged parts before restarting.
- Operate during daylight or in bright artificial light.
- If the machine starts to vibrate abnormally, disengage the drive to the attachments, stop the engine and remove the key. Then check the machine immediately.
- Do not operate the machine when there is a possibility of lightning. Even if the machine is equipped with a cabin, the operator is not protected from lightning.
- Never raise the deck with the blades running. Disengage the PTO and stop the blades from rotating if not mowing.

3. Safety for children

Tragic accidents can occur if the operator is not alert of the presence of children. Children are attracted to the machine and mowing activity.

- Never assume that children will remain where you last saw them.
- Keep children out of the mowing area and under the watchful care of another responsible adult.
- Be alert and turn the machine off if children enter the area.
- Before and when backing, look behind and down for small children.
- Never carry children. They may fall off and be seriously injured or interfere with safe machine operation.
- Never allow children to operate the machine, even under adult supervision. Local regulation can restrict the age of the operator.
- Use extra care when approaching blind corners, shrubs, trees, or other obstructions that might hide children from sight.
- Do not mow in reverse. Operate in reverse with the blades engaged only when it is absolutely necessary and make sure that the area to the rear is clear of children before doing so.

4. Operators, age 60 years and older

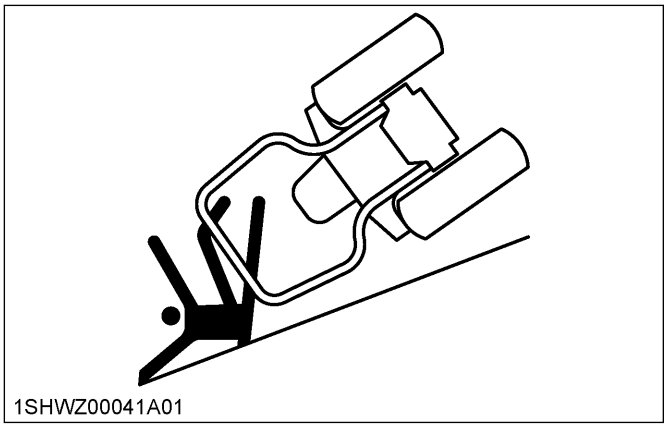
Data indicates that operators, age 60 years and older, are involved in a large percentage of machine-related injuries. These operators must evaluate their ability to operate the machine safely enough to protect themselves and others from serious injury.

5. Operating 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.

If the engine stops when operating on a slope, apply the parking brake immediately to prevent machine runaway.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Do

- To avoid tip-over accidents, operate across slopes, not up and down. Stay off hills and slopes too steep for safe operation.
- Remove obstacles such as rocks and tree limbs, weeds like hard stems and shrubs and so on.
- 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.
- Follow the manufacturer's recommendations for wheel weight or counterweights to improve stability.
- Keep all movement on slopes slow and gradual. Do not make sudden changes in speed or direction.
- Avoid starting or stopping on a slope. If tires lose traction, disengage the PTO and proceed slowly straight down the slope.
- Reduce the speed and exercise extreme caution on slopes and in sharp turns to prevent tip-over accidents or loss of control.
- Use special caution when changing direction on slopes. Slow down, and use extra caution when changing direction on a slope.

Do not

- Do not turn on slopes unless necessary. If necessary, turn uphill slowly and gradually.
- Do not mow near drop-offs, ditches, or embankments. The mower could suddenly turn over if a wheel is over the edge of cliff or ditch, or if an edge caves in.
- Do not mow on wet grass. Reduced traction could cause sliding and loss of control.
- Do not try to stabilize the machine by putting your foot on the ground.
- Do not use the grass catcher on steep slopes.
- Do not start or stop suddenly on slopes. If tires lose traction, disengage the PTO and proceed slowly straight down the slope.
- Never *"freewheel"*. Do not let the machine travel downhill with motion control levers at the *"NEUTRAL LOCK"* position or in *"NEUTRAL"*.
- Do not operate the machine without the mower deck installed.

6. Stopping the machine

- Park the machine on level ground.
- Make sure that the machine and all attachments have come to a complete stop before you get off.
- Before you get off, apply the parking brake, place the motion control levers in their *"NEUTRAL LOCK"* positions, disengage the PTO, lower all attachments to the ground, turn off the engine, and remove the key.
- Do not park the machine on dry grass or leaves.

7. Using the PTO

- Before installing or using PTO-driven equipment, read the manufacturer's manual and review the safety labels attached to the equipment.
- Wait until all moving components have completely stopped before connecting, disconnecting, adjusting, cleaning, or servicing any PTO-driven equipment.
- Use the PTO with Kubota approved attachments.

The speed of PTO:
ZD1611LF/ZD1611RLF/ZD1611RL without mower: 2480 to 2580 rpm at 2500 engine rpm

8. Using the lift link

- Use lift link only with authorized attachments designed for lift link usage.

TRANSPORTING THE MACHINE

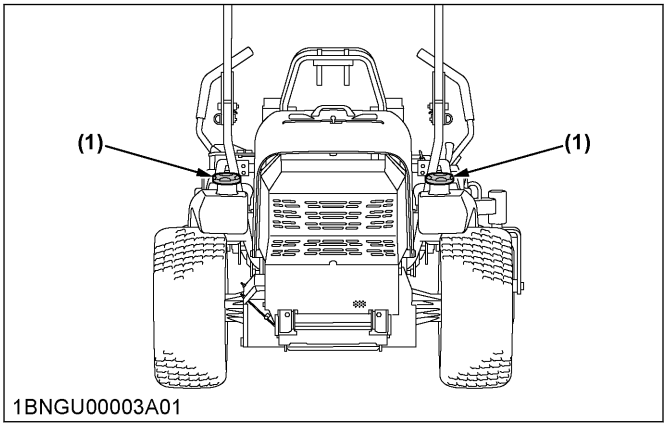
- Disengage power to attachment(s) when transporting or not in use.
- Do not tow this machine. Use a suitable truck or trailer when transporting on public roads.
- Use extra care when loading or unloading the machine into a trailer or truck. Use full width ramps for loading machine into a trailer or truck.
- This machine is not allowed to be used on public roads.
- Shut off fuel while storing or transporting.
- Tie the machine down securely using straps, chains, cables, or ropes.
- Both front and rear straps should be directed down and outward from the machine.

SERVICING AND STORAGE

1. Servicing the machine

- Before servicing, park the machine on a firm, level surface and apply the parking brake. Remove the key to prevent an accidental start-up.
- Allow the machine time to cool before touching the engine, muffler, radiator and so on.

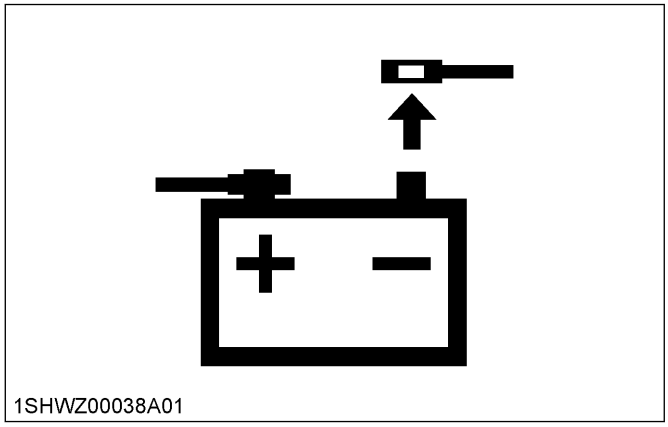
- Always stop the engine before refueling. Avoid spills and overfilling. If fuel is spilled, do not attempt to start the engine and avoid creating any source of ignition until fuel vapors have dissipated.

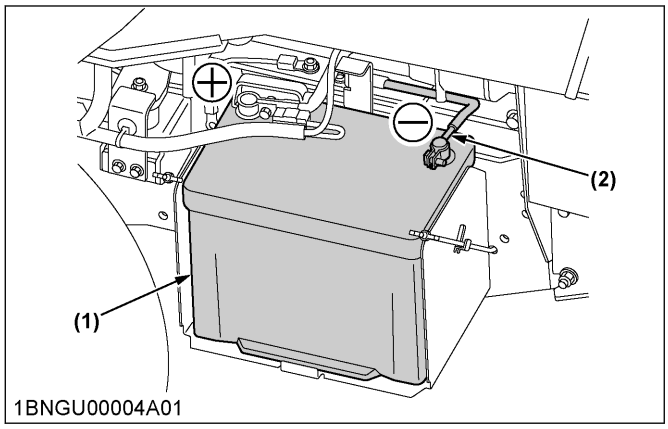


(1) Fuel tank cap

- Use extra care when handling diesel fuels. They are flammable.
  1. Use only an approved container.
  2. Do not remove the fuel cap or refuel with the engine running. Allow the 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 in a water heater.
- Do not smoke when working around battery or when refueling. Extinguish all cigarettes, cigars, pipes, and other sources of ignition. Keep all sparks and flames away from battery and fuel tank.

- Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground away from your vehicle before filling.
- Remove equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment with a portable container, rather than from a fuel dispenser nozzle. Keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock open device.
- If fuel is spilled on clothing, change the clothing immediately. Replace the fuel cap and tighten securely.
- Charge batteries in an open, well-ventilated area, away from spark and flames. A battery, especially when charging, will give off hydrogen and oxygen gases, which can explode and cause serious personal injury.
- Unplug the charger before connecting or disconnecting from battery.
- Before *"jump starting"* a dead battery, read and observe all of the instructions:
- Disconnect the battery before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect the positive first and negative last. Wear protective clothing and use insulated tools.

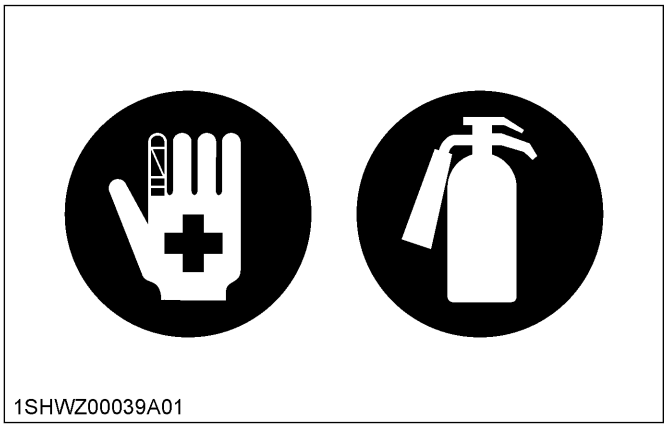




(1) Battery
(2) Ground cable
(+) Positive terminal
(-) Negative terminal

- 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.

- Keep a first aid kit and fire extinguisher handy at all times.



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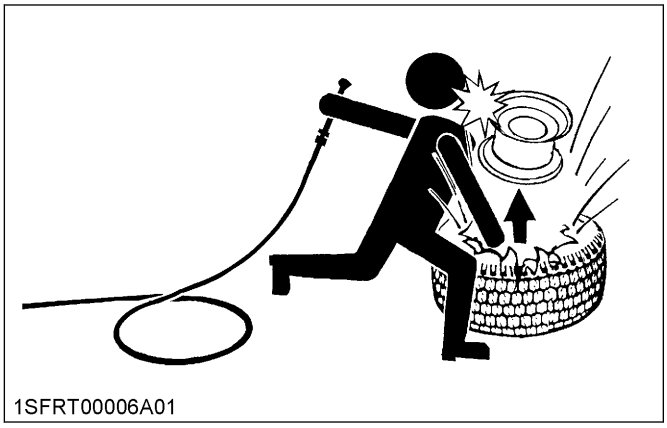
- Do not remove the radiator cap while coolant is hot. When cool, slowly rotate cap to the first stop and allow sufficient time for excess pressure to escape before removing the cap completely. If the machine has a coolant recovery tank, add coolant there instead of the radiator.
- Do not attempt to mount a tire on a rim unless qualified to do so and all proper safety precautions are followed. Never allow untrained personnel to service the machine.
- Always maintain the correct tire inflation pressure. Do not inflate tires above the recommended pressure shown in the Operator's Manual.



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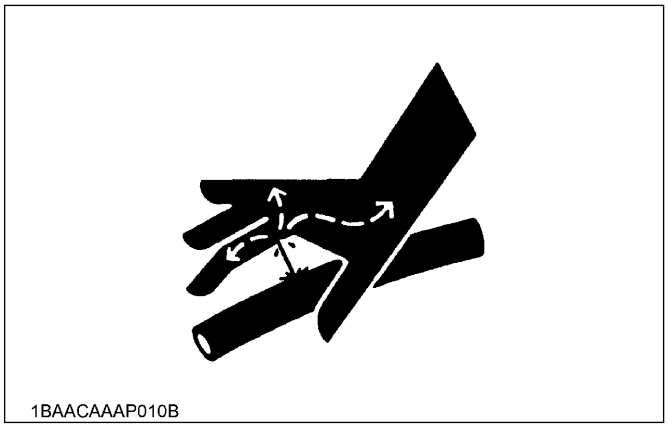
- Provide adequate support when changing wheels.
- Make sure that wheel nuts and bolts have been tightened to the specified torque.
- Escaping hydraulic fluid under pressure has sufficient force to penetrate the skin causing serious personal injury. Before disconnecting lines, relieve all pressure. Before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



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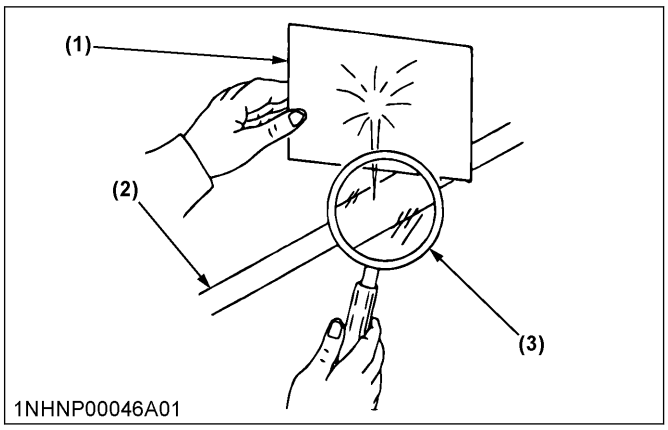
- Fluid escaping from pinholes may be invisible. Use a piece of cardboard or wood to search for suspected leaks: do not use hands. Use safety goggles or other eye protection.
  If you get injured by escaping fluid, see a medical doctor at once. Serious infection or reaction will result if proper medical treatment is not administered immediately. This fluid can produce gangrene or severe allergic reaction.



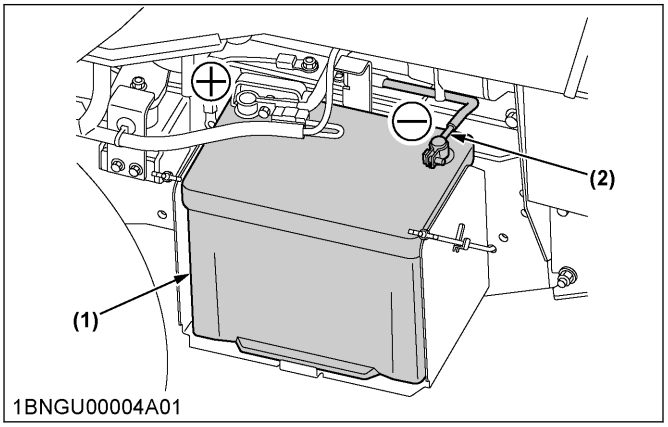
(1) Cardboard
(2) Hydraulic line
(3) Magnifying glass

- Keep hands and feet away from moving parts. If possible, do not make adjustments or repairs with the engine running.
- Keep the machine free of grass, leaves, or other debris build-up.
- Do not change the engine governor setting or overspeed the engine.
- Do not run the machine inside a closed area.
- Mower blades are sharp and can cut your hands. Wrap the blade(s) or wear gloves, and use extra caution when servicing them. Never straighten or weld blades.
- Keep nuts and bolts, especially blade attachment bolts, tight and keep equipment in good condition.
- Never tamper with safety devices. Check their operation for proper function regularly.
- Waste products such as used oil, fuel, coolant, brake fluid, and batteries can harm the

environment, people, pets and wildlife. Please dispose of the waste products properly.
- Do not use beverage containers for waste fluids or other products. Someone, particularly children, may drink them by mistake.
- Securely support the machine or any machine elements with stands or suitable blocking before working underneath. For your safety, do not rely on hydraulically supported devices as they may leak down, suddenly drop or be accidently lowered.
- Consult your local recycling center or Kubota Dealer to learn how to recycle or get rid of waste products.
  – A Material Safety Data Sheet (MSDS) provides specific details on chemical products, physical and health hazards, safety procedures, and emergency response techniques. The seller of the chemical products used with your machine is responsible for providing the MSDS for that product upon request.

2. Storage

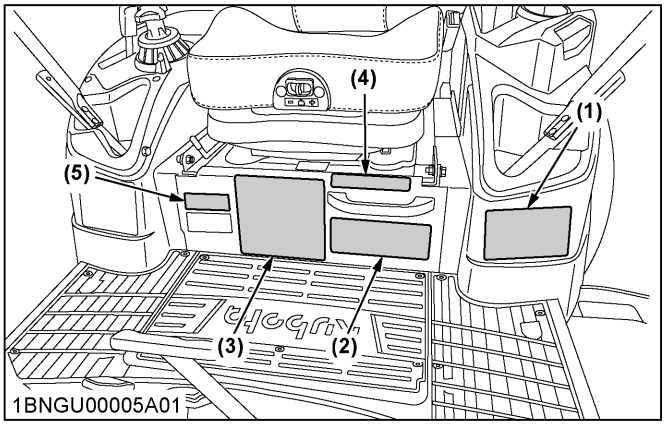
- Keep the machine and supply of fuel in locked storage and remove the ignition key to prevent children or others from playing or tampering with them.
- To avoid sparks from an accidental short circuit, always disconnect the battery's ground cable (-) first and reconnect it last.



(1) Battery
(2) Ground cable
(+) Positive terminal
(-) Negative terminal

- To avoid the danger of exhaust fume poisoning, do not operate the engine indoors without adequate ventilation.
- To reduce fire hazards, clean the machine thoroughly before storage. Dry grass and leaves around the engine and muffler may ignite.
- Let the engine cool before storing and do not store near flames.
- Shut off fuel while storing or transporting.

SAFETY LABELS



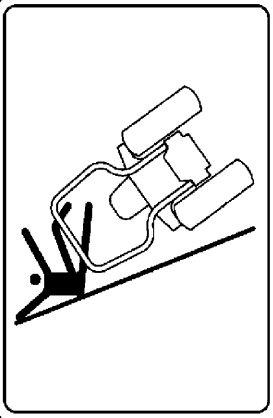
(1) Part No. K3181-6585-1

⚠WARNING

TO AVOID SERIOUS INJURY OR DEATH

1. Park the machine on level ground.
2. if necessary to park on an incline.
   ① Stop the machine.
   ② Apply the parking brake.
   ③ Stop the engine.
   If you stop the engine on an incline without applying the parking brake, the machine could move and runaway.
3. If the engine stops suddenly during operation, apply the parking brake immediately to prevent machine runaway.

(2) Part No. K3181-6584-1



⚠WARNING

TO AVOID SERIOUS INJURY OR DEATH

1. Mow across slopes-Not up and down.
2. Use extreme caution when operating on slopes.
3. Loss of traction may occur when operating on slopes.
4. Drive slowly on slopes.
5. Do not operate on wet slopes.
6. Avoid sudden starts.
7. Execute turns slowly.

⚠ADVERTENCIA

PARA EVITAR LESIONES PERSONALES GRAVES O LA MUERTE

1. Corte el césped de manera transversal en las colinas - No de arriba hacia abajo.
2. Tenga mucho cuidado durante la operación en colinas.
3. Se puede perder tracción durante la operación en colinas.
4. Conduzca lentamente en las colinas.
5. No use la máquina en colinas húmedas.
6. Evite arranques súbitos.
7. Realice las vueltas lentamente.

(3) Part No. K3441-6582-1

⚠ WARNING TO AVOID SERIOUS INJURY OR DEATH

1. Read and understand the operator's manual before operation.
2. Do not operate this machine unless you are trained.
3. Before allowing other people to use the machine, have them read the operator's manual.
4. Check the tightness of all nuts and bolts regularly.
5. Before starting the engine, make certain that everyone is at a safe distance from the machine, PTO is disengaged and motion control levers are in neutral lock.
6. Remove objects that could be thrown by the blade.
7. Do not operate the machine when children and/or others are around.
8. Do not carry children or others on the machine at any time.
9. Before dismounting, disengage PTO cluch, lower the implement, place motion control levers in neutral lock position, set the parking brake, stop the engine and remove the key.
10. Keep safety devices (guards, shields and switches) in place, and working.
11. To reduce the fire hazard, keep the exhaust clear of dry grass, dry leaves or other combustible materials.
12. This machine is not for street or highway use.
13. Securely support the machine and implement before working underneath.

(4) Part No. K3441-6569-1

⚠ WARNING

When Engine is running, do not open this cover.

(5) Part No. K3441-6596-1

California Proposition 65

⚠WARNING⚠

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

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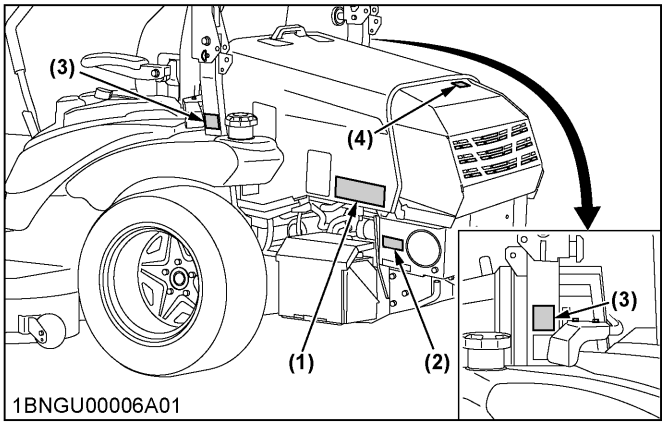
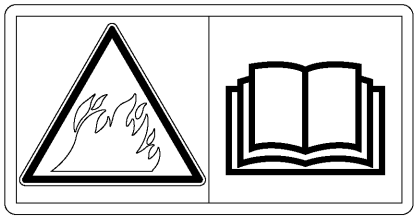


(1) Part No. K3181-6583-2

(2) Part No. K2054-6545-2

TO AVOID FIRE HAZARD:
Before operating the machine, clean inside of the hood and around the mower belt. Especially, dry grass and leaves around the exhaust manifold, the muffler or around the mower belt may ignite.
After using, air-blowing and pressure-washing, make sure there is nothing flammable around the exhaust manifold, the muffler or around the mower belt.
Grass, twigs, dirt or chaff in the hood may cause fire.



(3) Part No. K3181-6572-1

Diesel fuel only — No fire

(4) Part No. K2110-6573-1

HOT SURFACE,
DO NOT TOUCH

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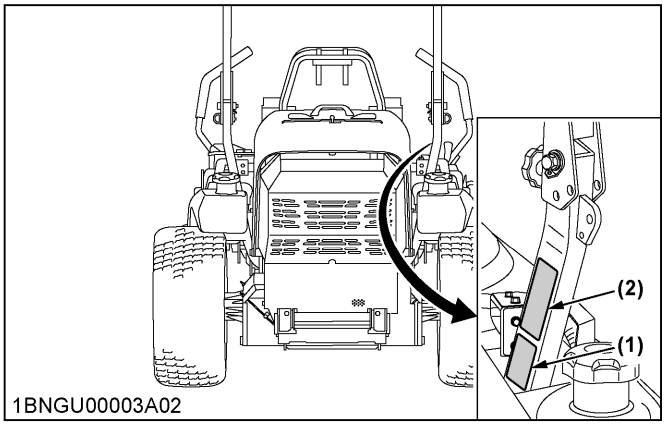

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(1) Part No. K3441-6566-1

WARNING

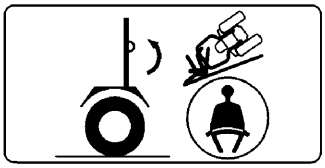
Never modify or repair a ROPS because welding, grinding, drilling, or cutting any portion may weaken the structure.

WARNING

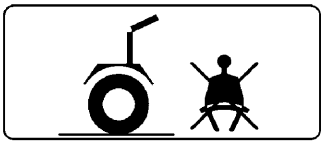
TO AVOID PERSONAL INJURY WHEN RAISING OR FOLDING ROPS:
1. Set parking brake and stop engine.
2. Remove any obstruction that may prevent raising or folding of the ROPS.
3. Do not allow any bystanders.
4. Always perform function from a stable position at the rear of the tractor.
5. Hold the top of the ROPS securely when raising or folding.
6. Make sure all pins are installed and locked.

(2) Part No. K3181-6563-1

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.

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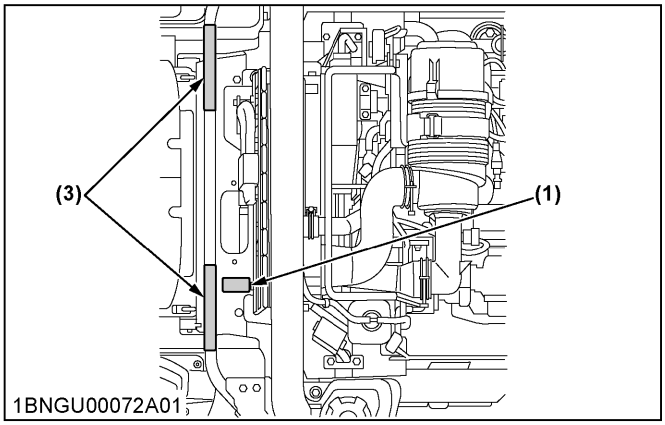
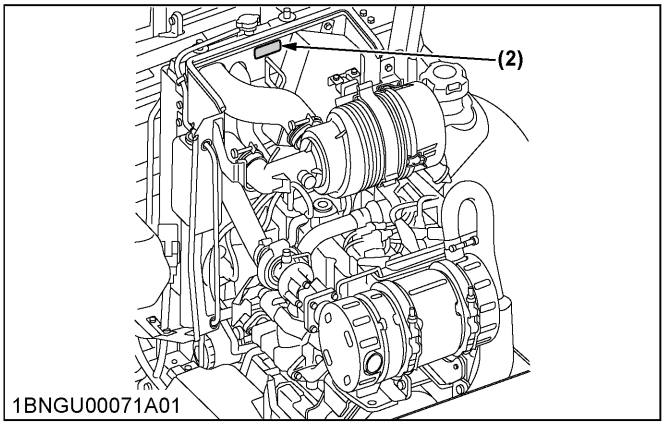
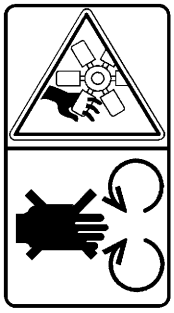




(1) Part No. K3111-6591-1
Do not get your hands close to fan belt.


1BDABCQAP107A

(2) Part No. K3452-6586-1
Do not get your hands close to engine fan and fan belt.

(3) Part No. K3441-6593-1

1BDABEJAP108A

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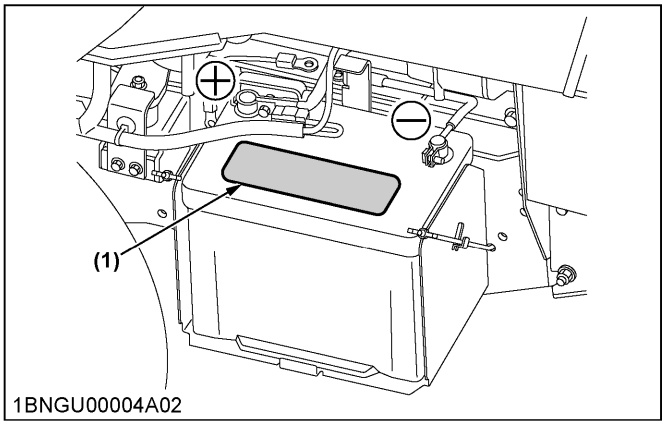
(1) Part No. K3181-6116-2

TO AVOID INJURY FROM BATTERY GASES AND ACIDES

- Keep away cigarettes, flames or sparks.
- Always shield eyes and face from battery.
- Keep out of reach of children.
- Poison causes severe burns.
- Contains sulfuric acid.
- Read and understand operator's manual.
- Danger explosive gases.

1BDAIAEAP0200



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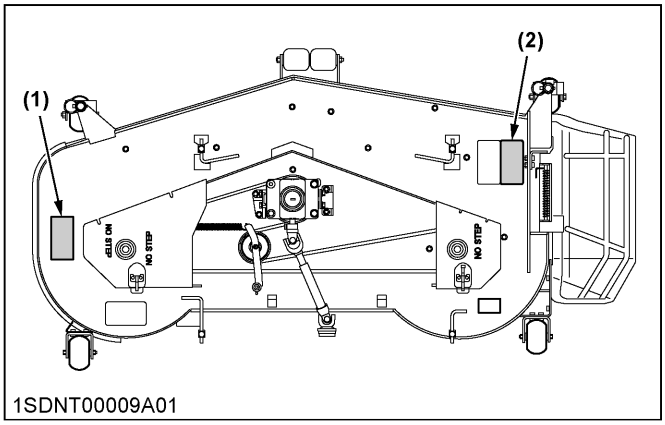
RCK72P



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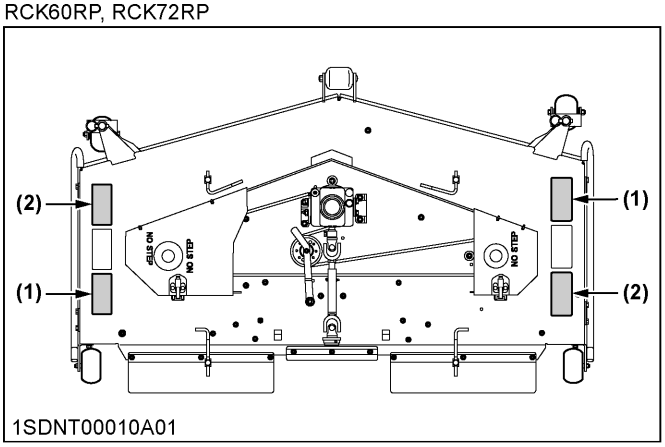
RCK60RP, RCK72RP



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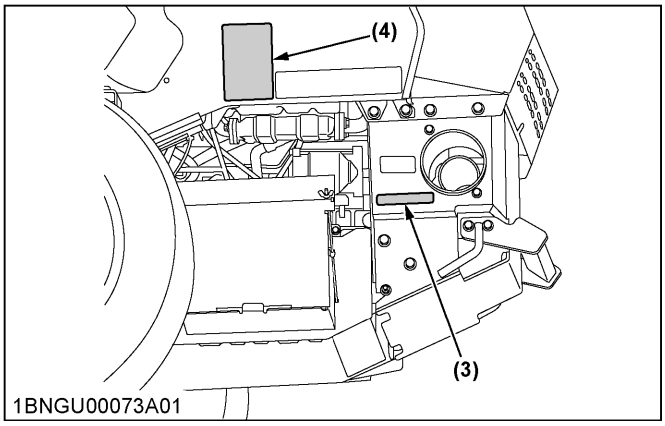
(1) Part No. K5681-7312-2

(2) Part No. K5681-7311-2



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(3) Part No. K3441-6532-1

(4) Part No. K3615-4721-2

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CARE OF SAFETY LABELS

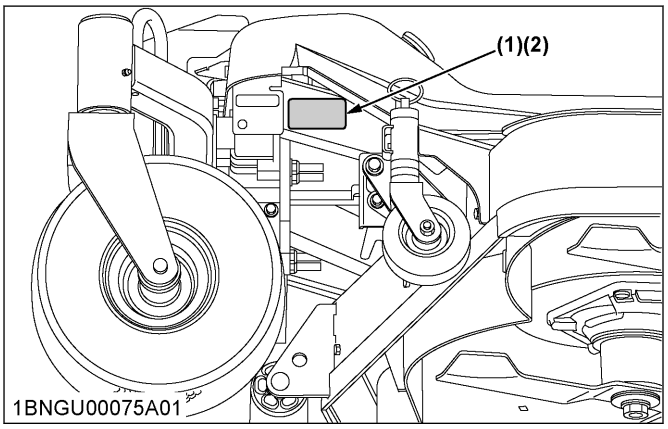
- Keep safety labels clean and free from obstructing material.
- Clean safety labels with soap and water, and dry with a soft cloth.
- Replace damaged or missing safety labels with new labels from your local Kubota Dealer.
- If a component with safety label(s) attached is replaced with a new part, make sure new label(s) is (are) attached in the same location(s) as the replaced component.
- Attach new safety labels by applying on a clean dry surface and pressing any bubbles to the outside edge.

SERVICING OF MACHINE

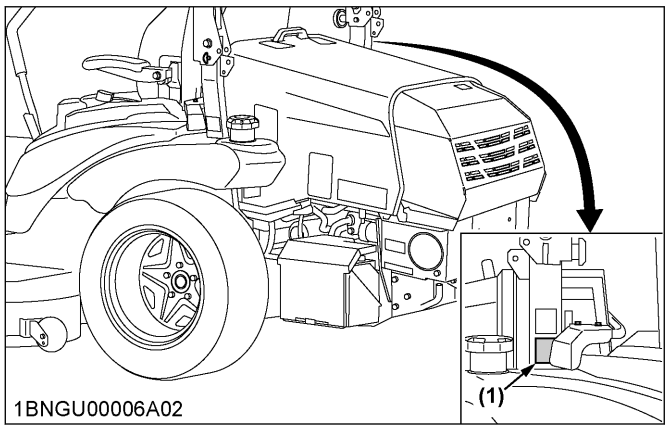
DEALER SERVICE

After reading this manual thoroughly, you will find that you can do some of the regular maintenance yourself. Your dealer has knowledge of your new machine and has the desire to help you get the best performance and the most value from it.
However, when in need of parts or major service, consult your local Kubota Dealer. When in need of parts, be prepared to give your dealer the product identification number (PIN), and the ROPS, engine and mower serial numbers.
Locate the PIN and serial numbers now, and record them in the space provided.

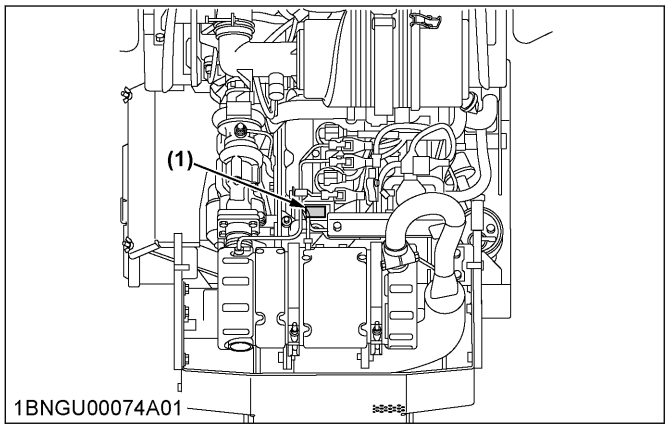
Date of purchase		
Name of dealer		
Machine type		
Product identification number		
	Type	Serial number
ROPS		
Engine		
Mower		



(1) Machine identification plate
(2) Product identification number

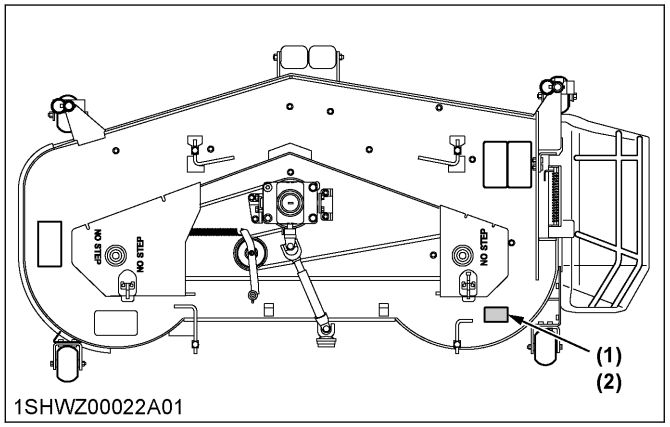


(1) ROPS serial number



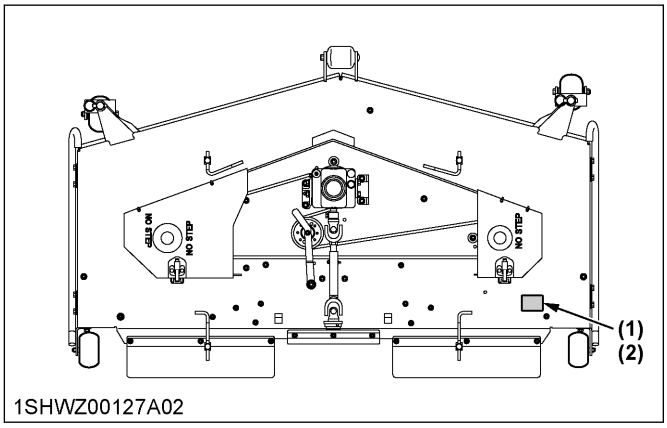
(1) Engine serial number

RCK72P



(1) Mower identification plate
(2) Mower serial number

RCK60RP, RCK72RP



(1) Mower identification plate
(2) Mower serial number

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 instructions given in the Operator's Manual, even if it is within the warranty period.

SCRAPPING THE MACHINE

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.

SPECIFICATIONS

SPECIFICATION TABLE

Model				ZD1611LF	ZD1611RLF	ZD1611RL
Engine	Model			**V1505-CR-TE5-ZD1**		
	Max. engine power (gross)		kW (HP)	23.0 (30.8) *1*2		
	Type			Direct injection. Vertical water-cooled, 4 cycle diesel		
	Number of cylinders			4		
	Bore and stroke		mm (in.)	78 × 78.4 (3.07 × 3.09)		
	Total displacement		cm^3 (cu. in.)	1498 (91.41)		
	Rated revolution		rpm	2500		
	Low idling revolution		rpm	1300 to 1400		
	Fuel			Diesel fuel No.1 (below -10 ℃ (14 ℉)) Diesel fuel No.2 (above -10 ℃ (14 ℉))		
	Starter			Electric starter with battery, preheat, 12 V, 1.4 kW		
	Lubrication			Forced lubrication by gear pump		
	Cooling			Liquid with pressurized radiator		
	Battery			SMF24R (12 V, RC: 115 min, CCA: 670 A)		
Capacities	Fuel tank		L (U.S.gals.)	49 (12.9)		
	Engine crankcase (with filter)		L (U.S.qts.)	4.3 (4.54)		
	Engine coolant		L (U.S.qts.)	4.6 (4.9)		
	Recovery tank		L (U.S.qts.)	0.6 (0.63)		
	Transmission case including rear axle gear case		L (U.S.qts.)	12.1 (12.8) *3		
Dimensions	Overall length		mm (in.)	2686 (105.7)		
	Overall width without mower deck		mm (in.)	1540 (60.6)		1510 (59.4)
	Overall height	With ROPS upright	mm (in.)	2000 (78.7)		
		With ROPS folded	mm (in.)	1640 (64.6)		
	Wheelbase		mm (in.)	1560 (61.4)		
	Min. ground clearance		mm (in.)	135 (5.31) with **72"**		135 (5.31) with **60"**
	Tread	Front	mm (in.)	1250 (49.2)		1064 (41.9)
		Rear	mm (in.)	1210 (47.6)		
Weight (without fuel, with mower deck)			kg (lbs.)	950 (2094) with **72"**	955 (2105) with **72"**	955 (2105) with **60"**
Traveling system	Tires	Front		15 × 6.5 - 8 Smooth semi-pneumatic tire		
		Rear		26 × 12.0 - 16 4PR turf low profile tire		
	Traveling speeds	Forward	mph (km/h)	0 to 10.6 (0 to 17.0)		
		Reverse	mph (km/h)	0 to 5.3 (0 to 8.5)		
	Steering			2 - hand levers		
	Transmission			2 - HST with gear		

(Continued)

Model			ZD1611LF	ZD1611RLF	ZD1611RL
Traveling system	Parking brake		Wet multi disk/foot applied, released		
	Min. turning radius	mm (in.)	0 (0)		
PTO	Revolution		1 speed (2570 rpm at 2500 engine rpm)		
	Drive system		Shaft drive, Kubota 10 tooth involute spline		
	Clutch type		Wet multi disks		

Specifications and design subject to change without notice.

*1 SAE J1995. The engine output value indicated on the EPA exhaust gas label is the ISO8178 net value without a cooling fan. **ZD1611LF**, **ZD1611RLF**, **ZD1611RL**: 22.7 kW

*2 At 2500 engine rpm

*3 Oil amount when the oil level is at the upper level.

Model			RCK72P-1500Z	RCK72RP-1500Z	RCK60RP-1500Z
Suitable machine			**ZD1611LF**	**ZD1611RLF**	**ZD1611RL**
Mower deck type			PRO commercial deck (fabricated deck)		
Cutting system			Aerodynamic cutting system (ACS)	Normal cutting system	Normal cutting system
Mounting method			Quick joint, parallel linkage		
Adjustment of cutting height			Dial gauge		
Cutting width		mm (in.)	1829 (72.0)		1524 (60.0)
Cutting height		mm (in.)	25 to 127 (1.0 to 5.0)		
Weight (approximation)		kg (lbs.)	171 (377)	175 (386)	148 (326)
Blade spindle speed		r/s (rpm)	46.7 (2800) *1		52.4 (3145) *1
Blade tip velocity		m/s (fpm)	93.0 (18300) *1		87.4 (17200) *1
Blade length		mm (in.)	625 (24.6)		523 (20.6)
Number of blades			3		
Mower gear box capacity		L (U.S.qts.)	0.5 (0.53)	0.4 (0.42)	
Dimensions	Total length	mm (in.)	1162 (45.8)	1155 (45.5)	1000 (39.4)
	Total width	mm (in.)	2180 (85.8)	1910 (75.2)	1600 (63.0)
	Total height	mm (in.)	421 (16.6)	413 (16.3)	420 (16.5)

*1 Engine maximum rpm

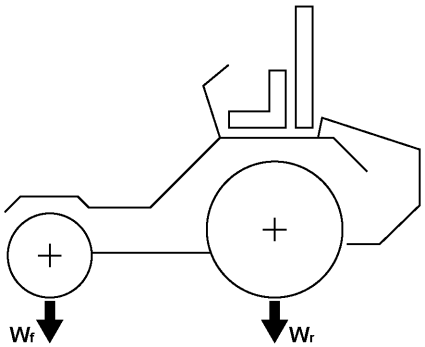
IMPLEMENT LIMITATIONS

The Kubota Machine has been thoroughly tested for proper performance with implements sold or approved by Kubota.
Use with implements below may result in malfunctions or failures of the machine, damage to other property and injury to the operator or others.

- Implements which are not sold or approved by Kubota
- Implements which exceed the maximum specifications listed below, or
- Implements which are otherwise unfit for use with the Kubota Machine

Any malfunctions or failures of the machine resulting from use with improper implements are not covered by the warranty.

Unit	Maximum loading weight		Maximum total weight
	Front axle W_f	Rear axle W_r	
ZD1611LF, **ZD1611RLF**, **ZD1611RL**	200 kg (441 lbs.)	905 kg (1995 lbs)	1105 kg (2436 lbs)



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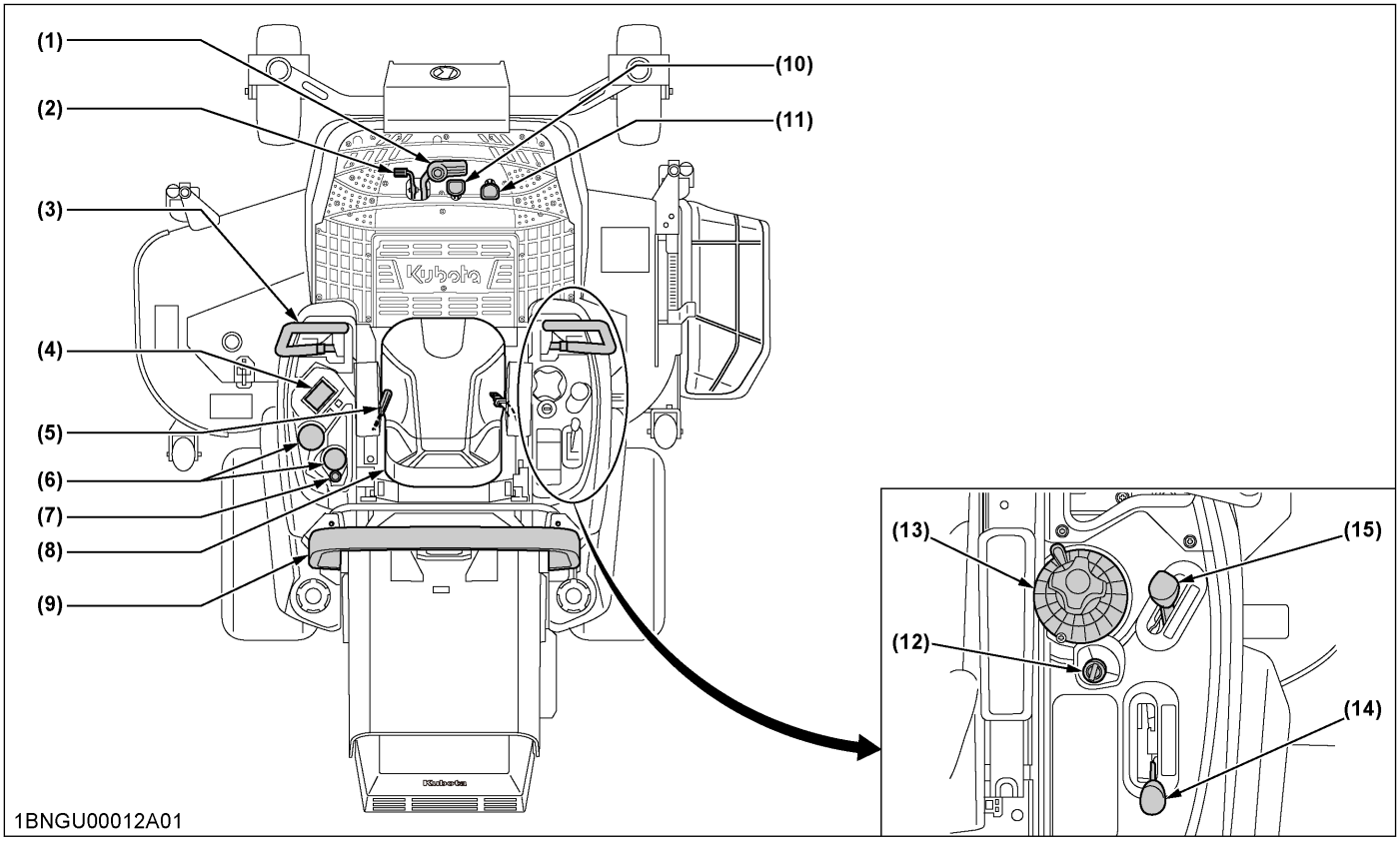
IMPORTANT :

- **Do not attach attachment or implement such as hitch kit or grass catcher other than standard mower.**

INSTRUMENT PANEL AND CONTROLS

INSTRUMENT PANEL, SWITCHES AND HAND CONTROLS



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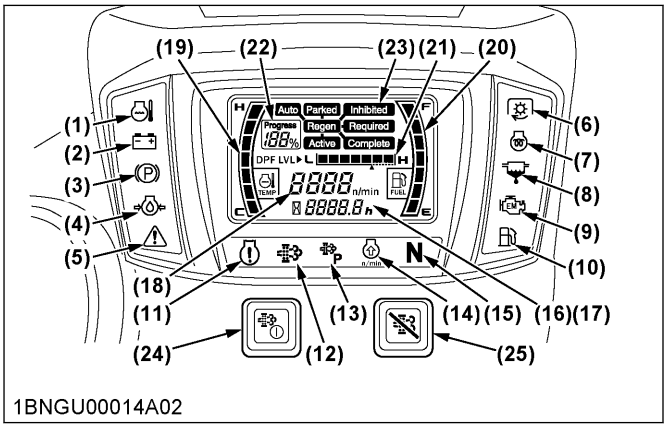

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Illustrated contents

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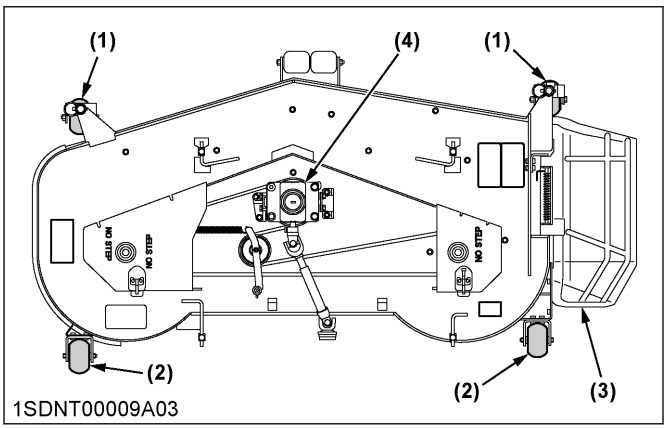
NOTE :

- **Items (1), (2), (4), (5), (7), (8), (9) and (10) correspond to the Easy Checker™.**

MOWER

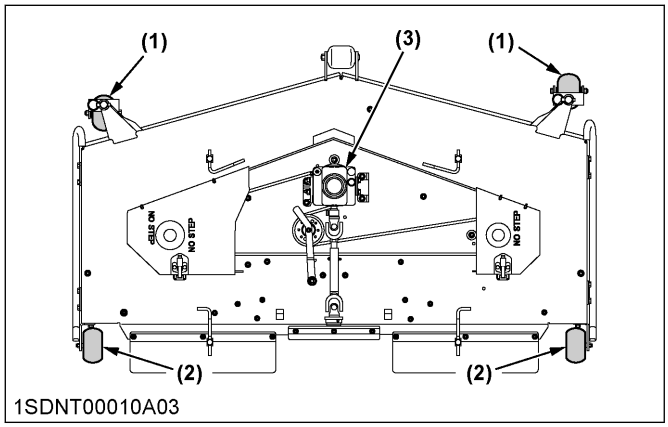
RCK72P



1SDNT00009A03

(1) Anti-scalp roller (front, swivel type)…62 to 65
*(2) Anti-scalp roller (rear, bolt shift type) rear RH roller is only for **RCK72P**…30, 62 to 65*
(3) Discharge deflector…51, 65
(4) Gear box

RCK60RP, RCK72RP



1SDNT00010A03

(1) Anti-scalp roller (front, swivel type)…62 to 65
(2) Anti-scalp roller (rear, bolt shift type)…30, 62 to 65
(3) Gear box

MOWER MOUNTING

MOUNTING THE MOWER DECK

⚠ WARNING

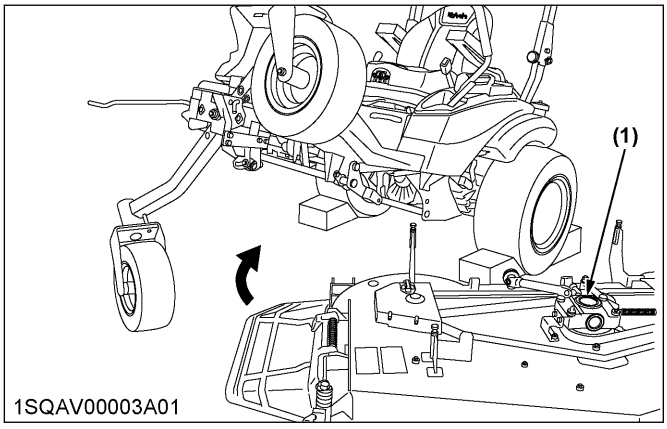
To avoid serious injury or death:

- **Park the machine on a firm and level surface.**
- **Apply the parking brake.**
- **Chock the rear tires.**
- **Stop the engine and remove the key.**

NOTE :

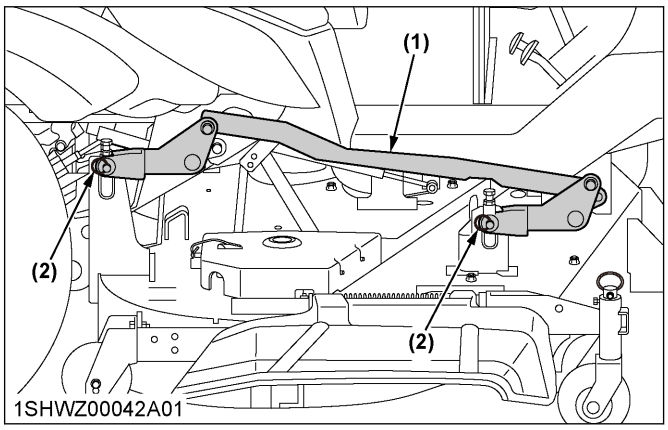
- **Rear discharge mowers (RCK60RP or RCK72RP) are not compatible with the side discharge mower unit (ZD1611LF).**

1. Before mounting the mower deck, raise the lift links to the full up position.
   (See STARTING THE MACHINE on page 53.)
2. Adjust the cutting height control dial to the 1 in. position.
3. Tilt up the machine with the maintenance lift system. (See TILTING UP THE MACHINE on page 71.)
4. Place the mower deck at the left side of the machine.



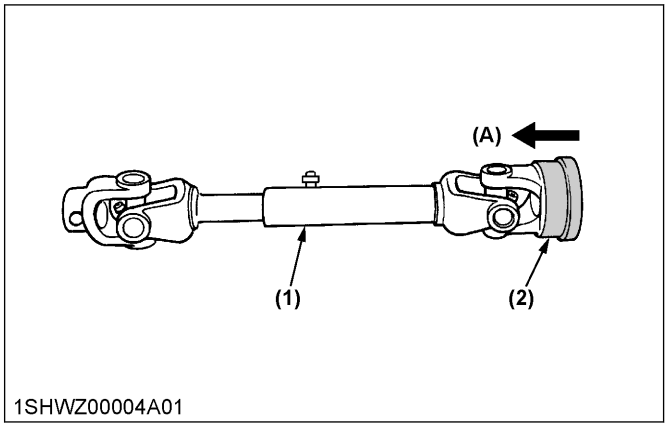
(1) Gear box

5. Slide the mower deck under the machine, and make sure that the mower gear box is placed properly in the center of the machine, lower the axle from the tilt-up position to the normal position.
6. Place 50 mm (2 in.) wood blocks under each side of the mower deck.
7. Depress the hydraulic lift control pedal (DOWN) and pull down the lift links.
8. Attach the lift links to the mower deck with attaching hardware.



(1) Lift link
(2) Clevis pin, plain washer, snap pin

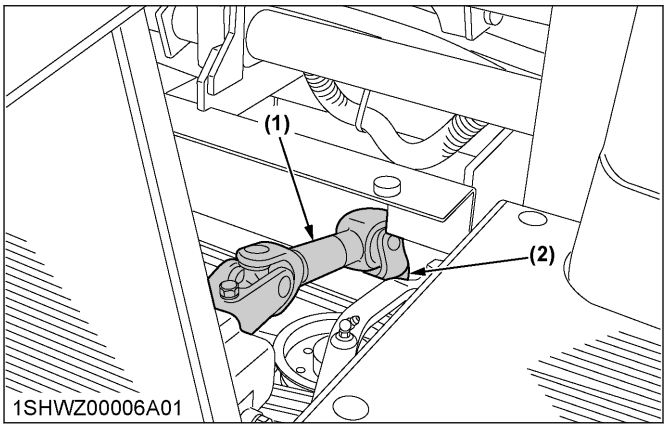
9. Pull back the coupler of the universal joint.



(1) Universal joint
(2) Coupler
(A) "PULL"

10. Install the universal joint.
    Push the universal joint onto the PTO shaft until the coupler locks.

    IMPORTANT :
    - **Tug the universal joint backward and forward to make sure it is locked securely.**



(1) Universal joint
(2) Coupler

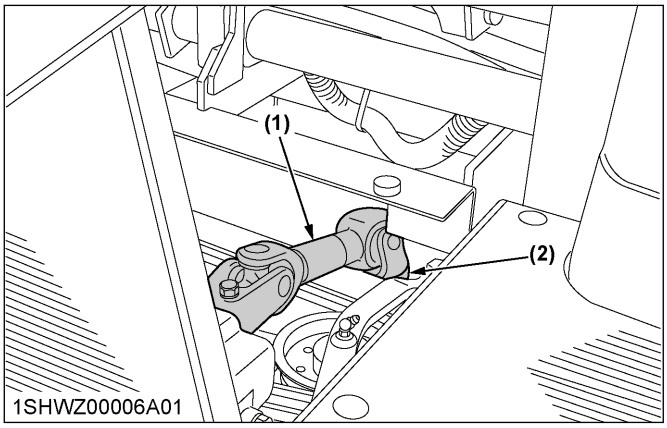
11. After mounting the mower, check the mower level. If necessary, adjust the mower level and anti-scalp rollers.

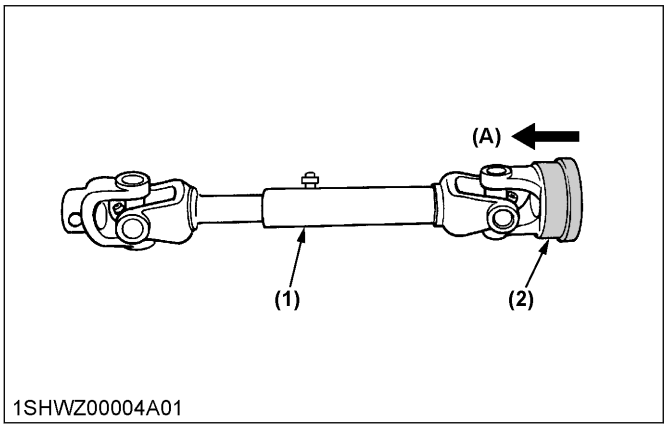
ADJUSTING THE MOWER

(See OPERATING THE MOWER on page 62 and ADJUSTMENT on page 111.)

DISMOUNTING THE MOWER DECK

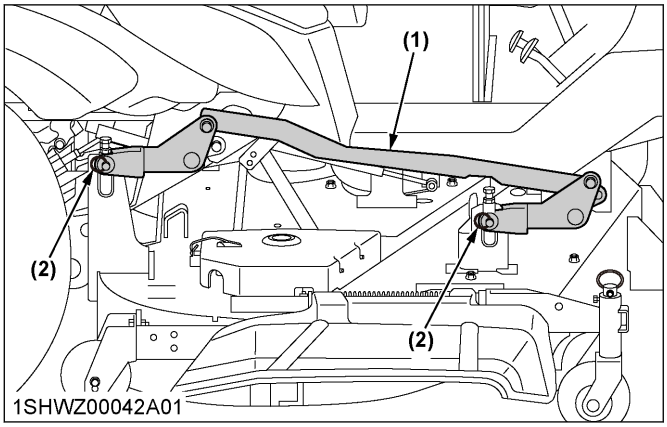
1. Before dismounting the mower deck, rise the lift links to the full up position.
   (See STARTING THE MACHINE on page 53.)
2. Place 50 mm (2 in.) wood blocks under each side of the mower deck.
3. Adjust the cutting height control dial to the 1 in. position.
4. Lower the mower deck to the lowest position.
5. Detach the universal joint.
   Pull back the coupler of the universal joint.





(1) Universal joint
(2) Coupler
(A) "PULL"

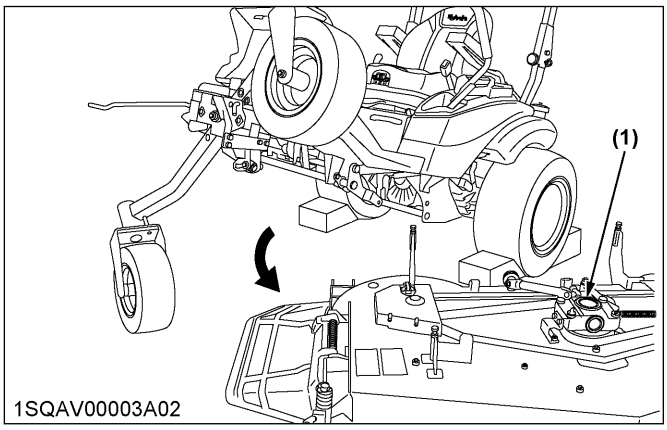
6. Detach the lift links from the mower deck with attaching hardware.



(1) Lift link
(2) Clevis pin, plain washer, snap pin

7. Tilt up the machine with the maintenance lift system.
   (See TILTING UP THE MACHINE on page 71.)

8. Slide the mower deck to lefft side of the machine. Lower the axle from the tilt-up position to the normal position.



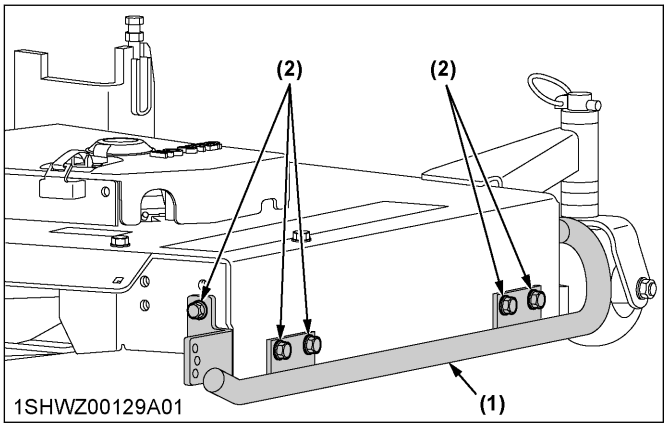
(1) Gear box

INSTALLING PARTS TO THE MOWER

1. Installation of skid

RCK60RP, RCK72RP
Install the skid with 5 flange bolts.

NOTE :
- **Right side shown, left side similar**



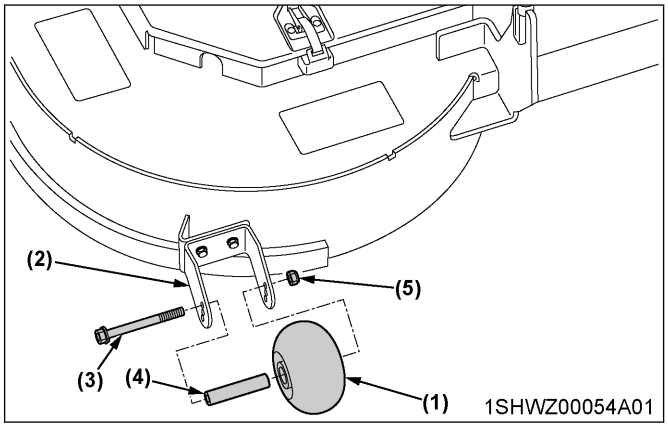
(1) Skid (RH)
(2) Flange bolt (M10)

2. Installation of gauge wheel

RCK72P
Install the gauge wheel to the stay (3L gauge) with gauge wheel boss, flange bolt and locking nut.

IMPORTANT :
- **Choose the hole of the stay (3L gauge) by cutting height.**
  (See ADJUSTING THE CUTTING HEIGHT on page 62.)

NOTE :
- **Left side of RCK72P shown, right side of RCK72P similar**
- **Install the flange bolt from outside.**

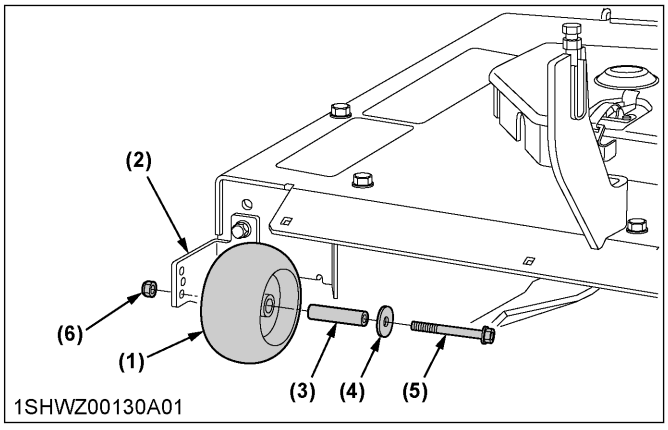


(1) Gauge wheel
(2) Stay (3L gauge)
(3) Flange bolt
(4) Gauge wheel boss
(5) Locking nut

RCK60RP, RCK72RP
Install the gauge wheel with gauge wheel boss, plain washer, sems bolt and locking nut.

IMPORTANT :
- **Choose the hole of the skid by cutting height.**
  (See ADJUSTING THE CUTTING HEIGHT on page 62.)

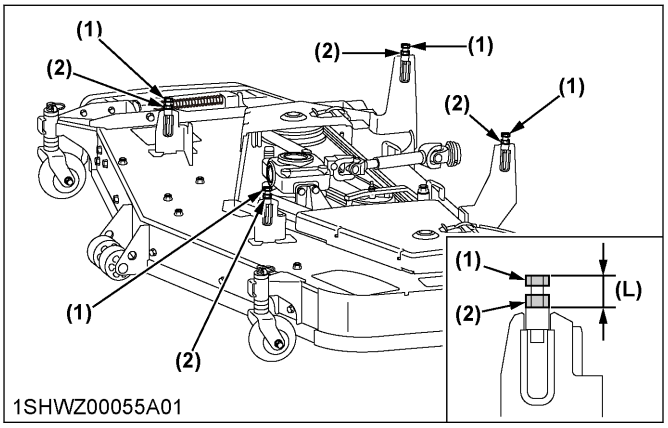
NOTE :
- **Left side of RCK72RP shown, right side of RCK72RP similar**
- **Install the sems bolt from inside.**



(1) Gauge wheel
(2) Skid (left)
(3) Gauge wheel boss
(4) Plain washer
(5) Sems bolt
(6) Locking nut

3. Installation of bolt (adjuster)

1. Install the bolt (adjuster) with the nut.
2. Adjust length (L).
3. Tighten the nut.



(1) Bolt (adjuster)
(2) Nut
(L) 25 mm (reference)

OPERATING THE ENGINE

⚠ WARNING

To avoid serious injury or death:

- **Read and understand the safe operation section.**
- **Read and understand the safety labels located on the machine.**
- **To avoid the danger of exhaust fume poisoning, do not operate the engine indoors 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.**

Details regarding safe operation can be found in a different section.
(See SAFE OPERATION on page 7.)

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 10 seconds.**
- **Operate, use and maintain the engine, including the emission control system, in accordance with the instructions provided to the end users, so that the engine's emission performance is kept within the requirements applicable to the engine's category.**
- **Do not deliberately tamper with or misuse the engine emission control system, especially with regard to deactivating or not maintaining an exhaust gas recirculation (EGR) system.**
- **When a warning lamp lights up, the engine is experiencing a trouble, which may also cause problems with the emission control system. Take prompt action and rectify any incorrect operation, use, or maintenance of the emissions control system in accordance with the rectification measures.**
  (See ENGINE TROUBLESHOOTING on page 120.)

EXHAUST AFTERTREATMENT DEVICES

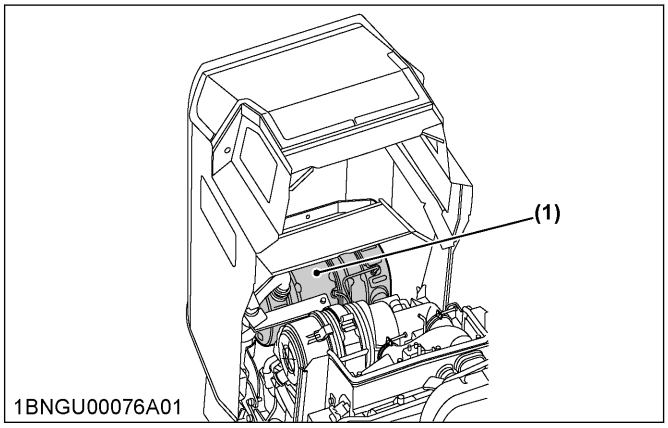
⚠ WARNING

To avoid serious injury or death:

- **During diesel particulate filter (DPF) regenerating operations, exhaust gases and exhaust filter components reach temperatures hot enough to burn people, or ignite or melt common materials.**
- **Keep machine away from people, animals or structures which may be susceptible to harm or damage from hot exhaust gases.**
- **During regeneration, white exhaust gases may be visible. Do not allow regeneration in a non ventilated garage or confined area.**
- **During regeneration, do not leave the machine.**

1. Diesel particulate filter (DPF) muffler

The diesel particular filter (hereinafter called DPF) serve to reduce hydrocarbons, carbon monoxide and other toxic gases, all of which are contained in diesel engine emissions, to harmless carbon dioxide and water. The DPF also traps particulate matter (PM).
To meet the emission regulations in your country, the DPF is installed on your machine.
Read this Operator's Manual before running in your machine.
It is imperative for the machine owner and operator to handle the DPF in a safe and environmentally responsible manner.



(1) Diesel particulate filter (DPF)

2. Handling points

When a specific amount of particulate matter (PM) has accumulated in the DPF muffler, it is necessary to refresh the DPF muffler by burning the PM inside it.
This burning off work is called *"Regeneration"*.
To extend operating time to reach this regeneration, and to avoid DPF muffler trouble, observe the following handling matters.

2.1 Fuel

Use ultra low sulfur fuel (S15).

IMPORTANT :
- **Use of diesel fuel other than ultra low sulfur fuel may adversely affect the engine and DPF performance.**
  Use of fuels other than ultra low sulfur fuel (S15) may not meet regulations for your region.

2.2 Engine oil

Use DPF-compatible oil (CJ-4) for the engine.

IMPORTANT :
- **If any engine oil other than CJ-4 is used, the DPF may become clogged earlier than expected and the fuel economy may drop.**

2.3 Prohibition of unnecessary short-time operation

At the start of the engine, significant PM is generated. Avoid running the machine (turning on and off the engine) for a short period of time whenever possible, as this will increase PM accumulation.

2.4 Regeneration

When there is *"Regeneration"* instruction sign by lamp or buzzer, immediately perform the required procedure for regeneration.

IMPORTANT :
- **Interrupting the regeneration cycle or continuing operation while ignoring the warning signs may cause DPF and engine damage.**
- **Operation with a clogged air cleaner can cause a regeneration failure and DPF damage.**

DPF REGENERATION PROCESS

DPF regeneration process can be performed by choosing from *"Auto regeneration"* or *"Regeneration inhibit"* mode according to your job conditions.

NOTE :
- **For jobs not affected by hot gases emitted during regeneration, the *"Auto regeneration"* is advisable.**

	Auto regeneration mode	**Regeneration inhibit mode**
How to activate each mode	Start the engine (switch operation is unnecessary), the *"Auto regeneration"* mode automatically activates. 	After starting the engine, press the *"Regeneration inhibit switch"* for 5 seconds. The *"Regeneration inhibit"* mode will activate with the switch lamp on. 
Regeneration starts or is inhibited.	When a specific amount of PM has accumulated, and the regeneration conditions are satisfied, the DPF will be automatically regenerated whether the machine is in motion or parked. (See Tips on diesel particulate filter (DPF) regeneration on page 34.) In this way, work efficiency is improved.	The PM which has accumulated inside the DPF will not be burnt. The *"Regeneration inhibit"* mode is effective for work in poorly ventilated work spaces.
For more details.	See Operating procedure for auto regeneration mode on page 35.	See Operating procedure for regeneration inhibit mode on page 41.

1. Tips on diesel particulate filter (DPF) regeneration

Regeneration cycle time	Approximately 15 to 20 minutes

NOTE :

- **Actual regeneration time may differ depending on ambient temperature, exhaust temperature and engine speed.**

1.1 Avoid prolonged idling if possible

- The higher in speed or load the engine operates, the higher the exhaust temperature rises. As a result, particulate matter (PM) inside the DPF is consumed and the regeneration process is required less frequently over time.
- The lower in speed or load the engine operates, the lower the exhaust temperature. Accordingly, less particulate matter (PM) inside the DPF is consumed and more accumulation of PM will occur, which requires frequent regeneration. Therefore, avoid prolonged idling if possible.

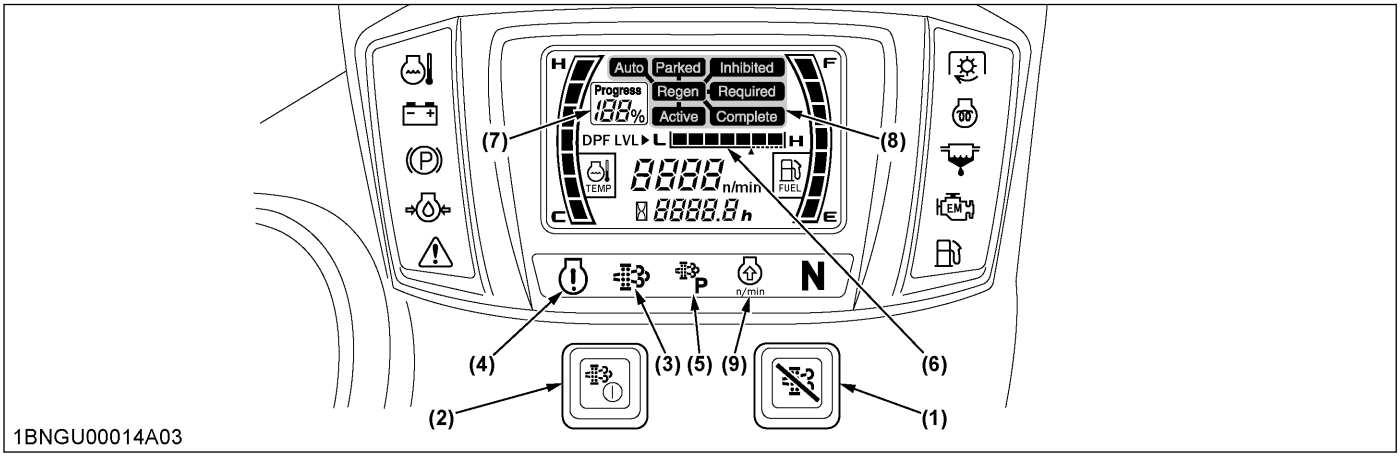
1.2 Necessary conditions for *“Regeneration”*

- If even one condition is deviated, after starting regeneration, the regeneration will be interrupted.
  - The engine coolant temperature.
  - The DPF temperature.
  - The engine speed is 2500 rpm or higher (depending on the environment).
- It is recommended to do the regenerating while the engine is warm and high revolution.
- Do not unnecessarily start and interrupt the regeneration process. Otherwise, a small amount of fuel becomes mixed with the engine oil, which degrades the oil quality.

1.3 Other notes

- While the DPF is being regenerated, the engine air flow rate is automatically limited to keep up the exhaust temperature. Because of this, the engine may sound differently, but this is normal for this engine.
- Just after the regeneration has ended, the DPF muffler remains hot. It is advisable to keep the engine running for about 5 minutes to allow cooling of the exhaust components.

2. Operating procedure for auto regeneration mode



(1) Regeneration inhibit switch
(2) Parked regeneration switch
(3) Regeneration indicator
(4) Engine warning indicator
(5) Parked regeneration indicator
(6) DPF level gauge
(7) Regeneration progress
(8) Regeneration status indicator
(9) Engine-rpm-increase indicator

Regeneration operating procedure

NOTE :

- **When the engine is started, the *"Auto regeneration"* mode is automatically activated.**
- ***"Regeneration inhibit"* mode is activated when the regeneration inhibit switch is pushed after the engine is started.**

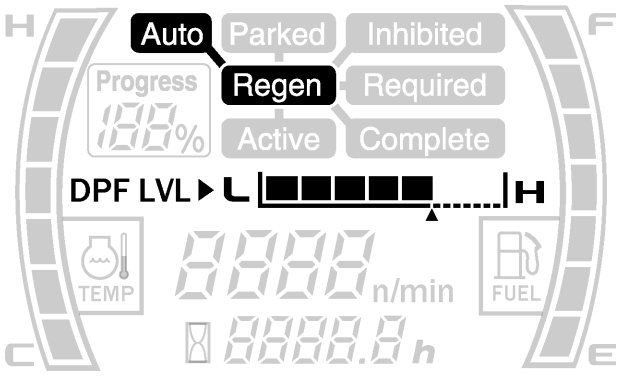
1. Start the engine.

   Make sure that the regeneration inhibit switch lamp  is *"OFF"*.

   Switch lamp *"OFF"*: Auto regeneration mode activated.
   Switch lamp *"ON"*: Regeneration inhibit mode activated.

2. When a specific amount of PM has built up in the DPF, the regeneration indicator  turns *"ON"*.

LCD monitor display



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The DPF gauge will fill as PM builds up. Regeneration will start when the DPF level gauge and regeneration status indicator show the display in the above figure.
(See PM warning level and required procedures on page 37.)
Continue to operate the machine, and the regeneration process will start automatically; make sure you are working in a safe area as DPF and exhaust temperature will rise.
When the regeneration cycle has completed, the regeneration indicator turns *"OFF"*.

IMPORTANT :

- **When ambient temperature is so low or when working with such extraordinary use of electricity that the regeneration conditions are not satisfied, the regeneration indicator starts flashing.**

   **If the regeneration indicator turns *"ON"* for a while and then starts flashing, keep on working and rev up the engine to the maximum rpm so that the regeneration indicator stops flashing and remains *"ON"*.**

3. When the engine-rpm-increase indicator 

starts flashing:

   Keep on working and increase the engine rpm until the indicator turns *"OFF"*.

   NOTE :

   - **Even if the auto regeneration mode is selected, DPF regeneration may not begin because system requirements have not been satisfied.**
   - **The engine rpm increase indicator is used as a guide to satisfy the regeneration conditions. If the engine load is too heavy, the engine rpm increase indicator may continue to flash, even though regeneration system conditions are satisfied and regeneration may begin automatically.**
   - **(See Tips on diesel particulate filter (DPF) regeneration on page 34.)**

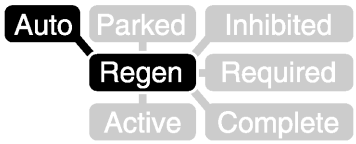
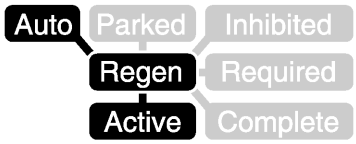
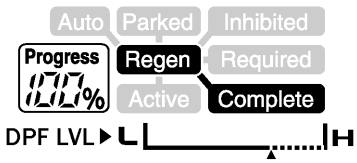
2.1 PM warning level and required procedures

During auto regeneration mode when the PM has built up in the DPF, the regeneration cycle will start automatically.
If the regeneration cycle is interrupted or the regeneration conditions are not satisfied, the buzzer starts sounding and the indicator display changes in response to the PM warning level in order to prompt the operator to perform the required procedure listed in the following table.

IMPORTANT :

- **Once PM warning level has been reached, immediately perform the required procedure for regeneration. Interrupting the regeneration cycle or continuing operation by ignoring the warning signs may cause DPF and engine damage.**
- **If the regeneration cycle is interrupted several times, parked regeneration will be required.**

<table>
<tr><th colspan="4">Auto regeneration mode</th></tr>
<tr><th>PM warning level / Buzzer</th><th colspan="2">Indicator</th><th>Required procedure</th></tr>
<tr><td>PM warning level: 0</td><td>DPF LVL gauge</td><td>0 to 4th gauge from the left are filled.
</td><td></td></tr>
<tr><td rowspan="4">PM warning level: 1
Buzzer: Not sounding

Condition of DPF muffler:
A specific level of PM has build up in the DPF muffler.</td><td>DPF LVL gauge</td><td>0 to 5th gauge from the left are filled.
</td><td rowspan="4">Continue to work the machine to raise the DPF temperature.</td></tr>
<tr><td rowspan="3">Regen status indication</td><td>Required
  </td></tr>
<tr><td>During regen
  </td></tr>
<tr><td>Complete
  </td></tr>
<tr><td>Lamp action</td><td>  The regeneration indicator starts flashing.
  The rpm increase indicator starts flashing.</td><td>Continue the work and increase the engine rpm until the indicator turns “OFF”.</td></tr>
</table>

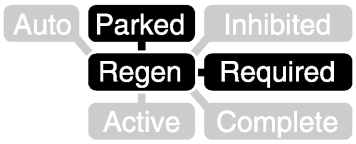
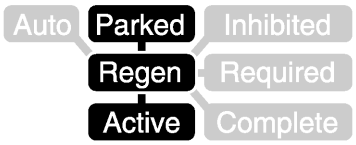
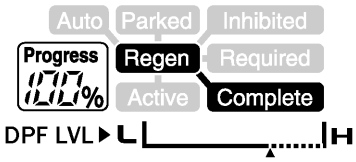
(Continued)

<table>
<tr><th colspan="4">Auto regeneration mode</th></tr>
<tr><th>PM warning level / Buzzer</th><th colspan="2">Indicator</th><th>Required procedure</th></tr>
<tr><td rowspan="2">PM warning level: 1
Buzzer: Not sounding

Condition of DPF muffler:
A specific level of PM has build up in the DPF muffler.</td><td rowspan="2">Lamp action</td><td>  </td><td>The parked regeneration indicator starts flashing.</td><td rowspan="2">The parked regeneration can also be started.
(See Operating procedure for parked regeneration on page 42.)

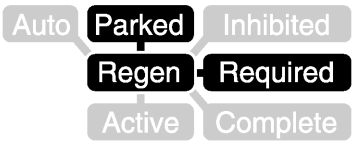
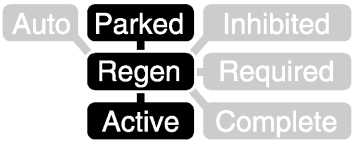
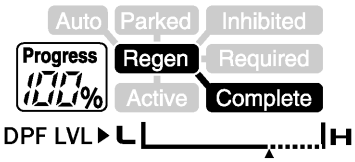
The regeneration cycle begins and continues until the cycle is complete, and then the indicator will turn “OFF”.</td></tr>
<tr><td>  </td><td>The regeneration indicator will stop flashing and remain “ON” constantly.</td></tr>
<tr><td rowspan="5">PM warning level: 2-1
Buzzer: Sounding every 5 seconds

PM warning level: 2-2
Buzzer: Sounding every 3 seconds

Condition of DPF muffler:
If the regeneration cycle was interrupted or the conditions were not satisfied for regeneration, the PM warning system is now in Level 2.</td><td>DPF LVL gauge</td><td colspan="2">0 to 6th gauge from the left are filled
  </td><td rowspan="5">Move the machine to a safe area, then begin the parked regeneration cycle process.
(See Operating procedure for parked regeneration on page 42.)</td></tr>
<tr><td rowspan="4">Regen status indication</td><td>Required</td><td>  </td></tr>
<tr><td>During regen</td><td>  </td></tr>
<tr><td>Complete</td><td>  </td></tr>
<tr><td rowspan="4">Lamp action</td><td colspan="2">The regeneration indicator continues flashing.</td></tr>
<tr><td>  </td><td>The rpm increase indicator starts flashing.</td></tr>
<tr><td>  </td><td>The parked regeneration indicator continues flashing.</td></tr>
<tr><td>  </td><td>The regeneration indicator will stop flashing and remain “ON” constantly.</td></tr>
</table>

(Continued)

<table>
<tr><th colspan="4">Auto regeneration mode</th></tr>
<tr><th>PM warning level / Buzzer</th><th colspan="2">Indicator</th><th>Required procedure</th></tr>
<tr><td rowspan="5">PM warning level: 3
Buzzer: Sounding every 1 second
Engine output: 50 %

Condition of DPF muffler:
If the parked regeneration cycle was interrupted or the machine was continuously operated, the PM warning system is now in Level 3.</td><td>DPF LVL gauge</td><td colspan="2">All gauge are filled
  </td><td rowspan="5">Immediately stop working the machine, move the machine to a safe area, then begin the parked regeneration cycle process.
(See Operating procedure for parked regeneration on page 42.)
If the machine is operated further and the operator ignores the warning signs, then regeneration will be disabled.</td></tr>
<tr><td rowspan="4">Regen status indication</td><td>Required</td><td>  </td></tr>
<tr><td>During regen</td><td>  </td></tr>
<tr><td>Complete</td><td>  </td></tr>
<tr><td rowspan="2">Lamp action</td><td>  </td><td>The engine warning indicator starts flashing.</td></tr>
<tr><td>  </td><td>The parked regeneration indicator continues flashing</td></tr>
</table>

(Continued)

<table>
<tr><th colspan="4">Auto regeneration mode</th></tr>
<tr><th>PM warning level / Buzzer</th><th colspan="2">Indicator</th><th>Required procedure</th></tr>
<tr><td rowspan="4">PM warning level: 4
Buzzer: Sounding every 1 second
Engine output: 50 %

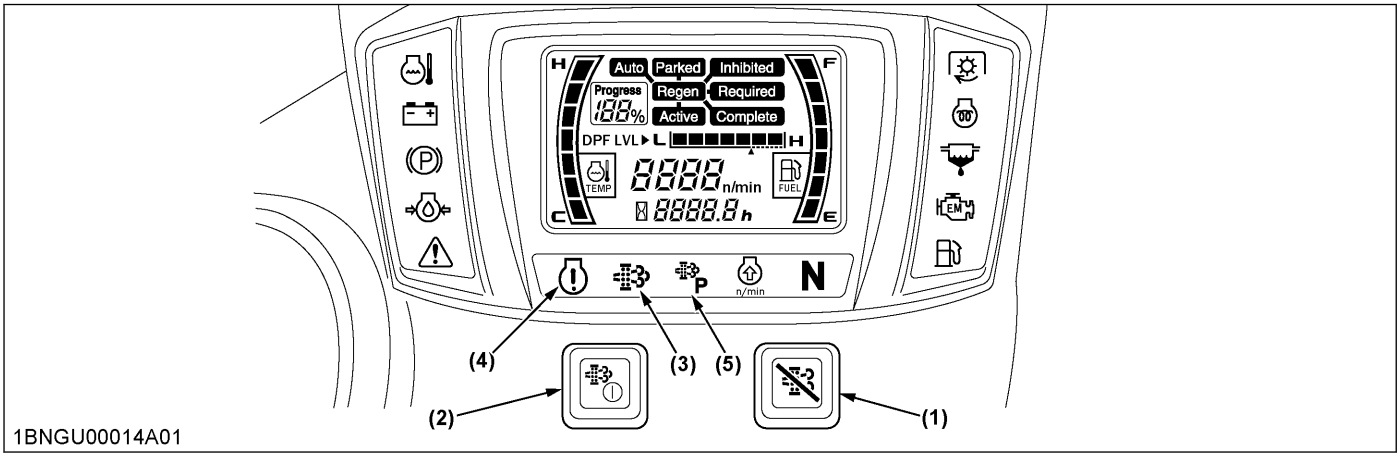
Condition of DPF muffler:
If the parked regeneration cycle was interrupted or the machine was continuously operated ignoring the warning signs, the PM warning system is now in Level 4.</td><td>DPF LVL gauge</td><td colspan="2">All gauge are filled
DPF LVL L ■■■■■■■■ H</td><td rowspan="4">Immediately move the machine to a safe place, park it there and turn the engine “OFF”.
Contact your local Kubota Dealer.

IMPORTANT :
• At this level, do not continue to operate the machine; otherwise, damage may result to the DPF and engine.</td></tr>
<tr><td rowspan="3">Regen status indication</td><td>Required</td><td>Auto Parked Inhibited
Regen Required
Active Complete</td></tr>
<tr><td>During regen</td><td>Auto Parked Inhibited
Regen Required
Active Complete</td></tr>
<tr><td>Complete</td><td>Auto Parked Inhibited
Progress 100% Regen Required
Active Complete
DPF LVL L H</td></tr>
<tr><td>Lamp action</td><td>  </td><td>The engine warning indicator remains constantly “ON”.</td></tr>
</table>

IMPORTANT :

- **When the regeneration interval becomes shorter, parked regeneration will be required as follows.**
  1.  **If it takes shorter than 4 hours or so for the regeneration indicator to go out and light up again.**
  2. **The buzzer starts sounding.**
     ***Buzzer: Sounding every 5 seconds.**
  3. **Immediately discontinue working the machine and begin the parked regeneration cycle process.**

3. Operating procedure for regeneration inhibit mode

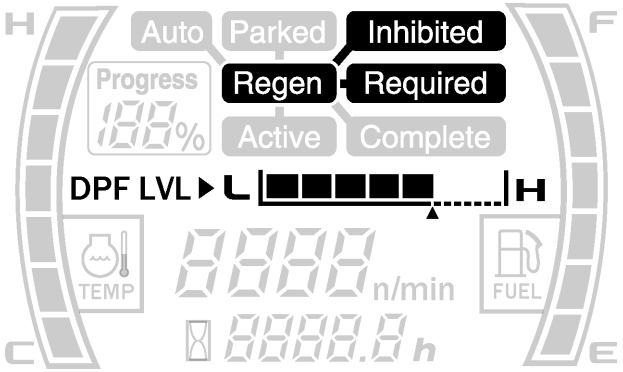


(1) Regeneration inhibit switch
(2) Parked regeneration switch
(3) Regeneration indicator
(4) Engine warning indicator
(5) Parked regeneration indicator

1. Press the regeneration inhibit switch for 5 seconds to activate the regeneration inhibit mode. The following text will appear on the LCD monitor.

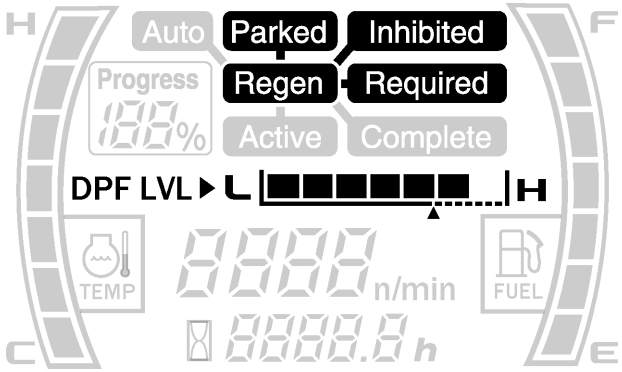
LCD monitor display

PM warning level 0 to 1



1BNGU00066A05enUS

PM warning level 2 to 4



1BNGU00066A03enUS

IMPORTANT :

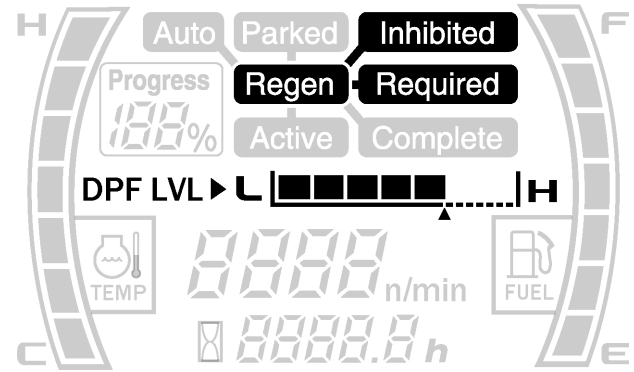
- **Only use the regeneration inhibit mode when you are in an environment where regeneration is not possible.**
- **Once you have moved to an environment where it is possible to regenerate, immediately disengage the regeneration inhibit mode.**
  (See PM warning level and required procedures on page 37.)

4. Operating procedure for parked regeneration

1. Park the machine in a safe area away from buildings, people, and animals.
2. Set the motion control lever to *"NEUTRAL"* position.
3. Set the parking brake.
4. Set the PTO lever to *"OFF"* position.
5. Lower the implement to the ground.
6. Clean the hood screen and the radiator screen.
7. Return the engine rpm to the idle speed.
8. Check that the regeneration inhibit switch lamp is *"OFF"*. If the lamp is *"ON"*, press the regeneration inhibit switch to turn it *"OFF"*.

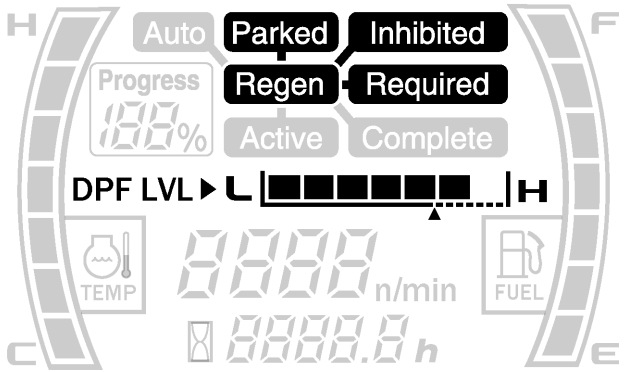
Regeneration inhibited mode

PM warning level 0 to 1



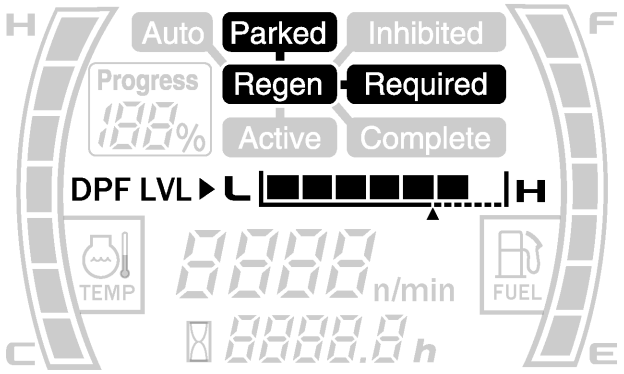
1BNGU00066A05enUS

PM warning level 2 to 4



1BNGU00066A03enUS

Regeneration active mode

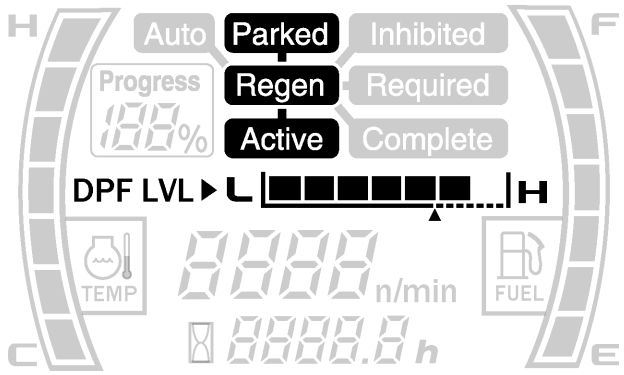


1BNGU00066A04enUS

9. When the regeneration conditions are satisfied (from 2 to 4 and 7, 8), the parked regeneration switch lamp starts flashing.

10. Press the parked regeneration switch  to start the regeneration cycle.

LCD monitor display



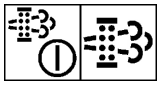
1BNGU00066A06enUS

The switch lamp will stop flashing and remain *"ON"* constantly during the cycle.

11. The engine rpm will automatically rise, and the regeneration process will start.

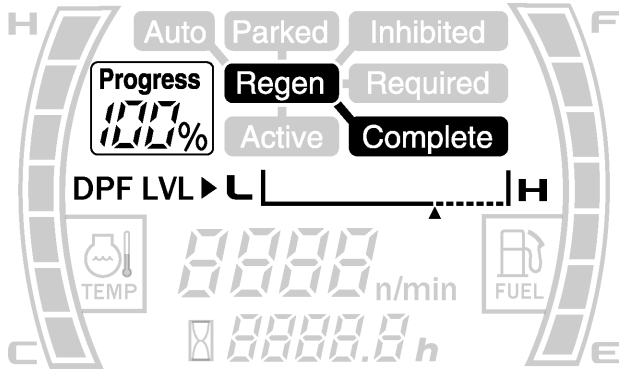
NOTE :

- **For a while after the start of regeneration, the engine runs at high speed for warming it up and regeneration of electricity.**

12. Both indicators  stay *"ON"* while regenerating the DPF.

They turn *"OFF"* when the cycle is complete.

LCD monitor display



1BNGU00066A07enUS

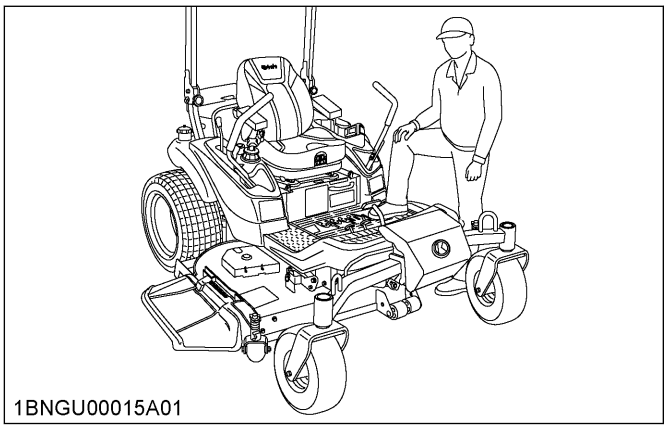
13. After the lamp turns *"OFF"*, normal machine work may resume.
When driving in *"Regeneration inhibit"* mode, keep pressing the regeneration inhibit switch for 5 seconds to turn on the switch lamp.

NOTE :

- **During the regeneration cycle, do not touch the above levers and switches (in steps 2, 3, 4), nor change the engine rpm other than for an emergency stop. Otherwise, the regeneration will be interrupted.**
- **Never leave the machine when the parked regeneration process is activated.**
- **If the parked regeneration cycle is interrupted, the engine rpm is fixed at the idling level for about 30 seconds. For this period, keep the hand accelerator lever at the idle position. Do not move it. It will function again in 30 seconds.**

GETTING ON AND OFF THE MACHINE SAFELY

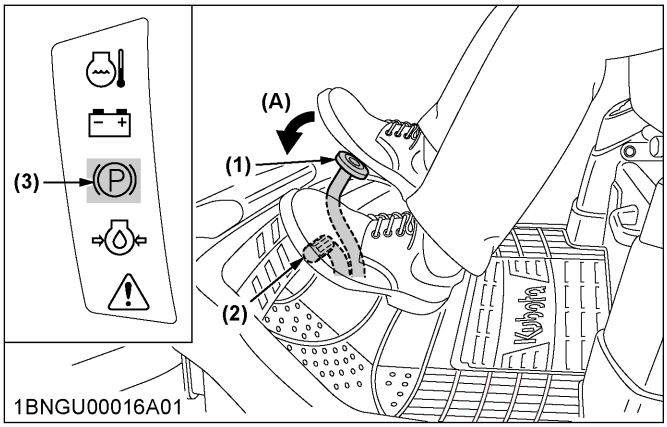
When getting on or off the machine, do not step on the mower deck or mower deck shields.



STARTING THE ENGINE

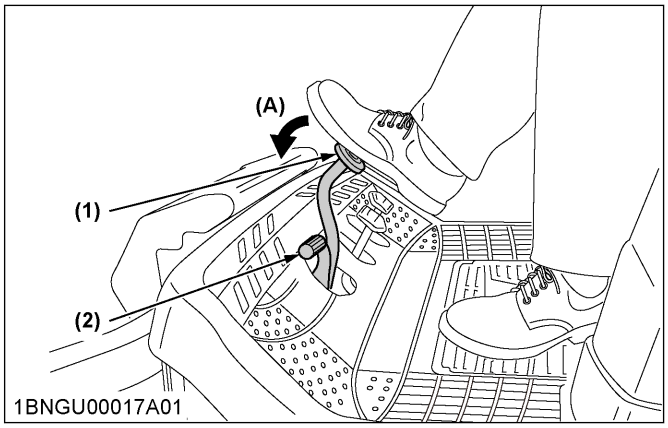
1. Sit on the operator's seat. Put on the seat belt.
2. Apply the parking brake.

   To apply the parking brake:
   a. Depress the parking brake pedal firmly with your right foot and the parking brake lock pedal simultaneously with your left foot.
   b. Then release the parking brake pedal while holding the parking brake lock pedal down.
   c. Parking brake warning indicator will come *"ON"*.



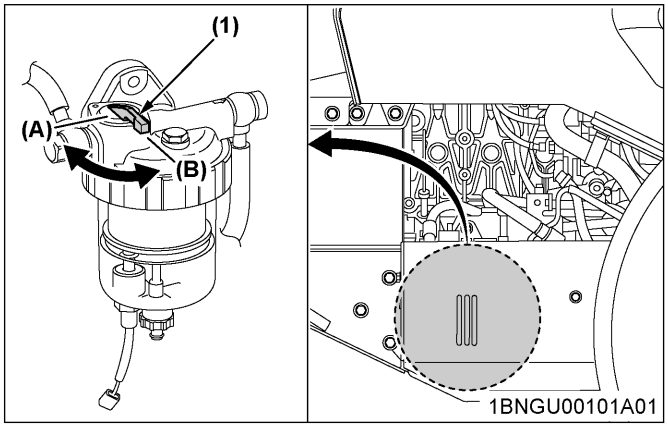
(1) Parking brake pedal
(2) Parking brake lock pedal
(3) Parking brake warning indicator
(A) "DEPRESS"

   To release the parking brake:
   Depress the parking brake pedal and release it slowly with your right foot without pressing the parking brake lock pedal.



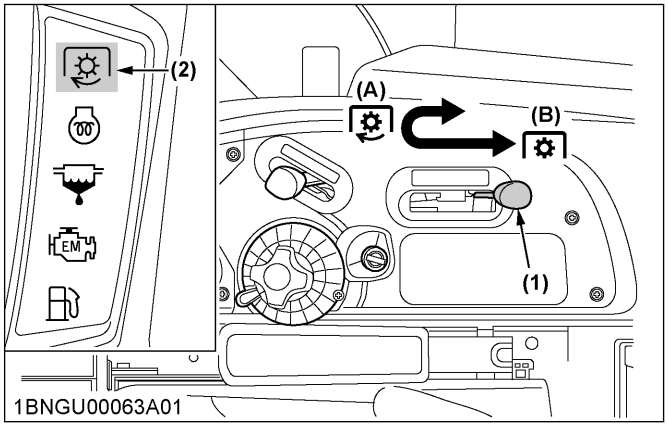
(1) Parking brake pedal
(2) Parking brake lock pedal
(A) "DEPRESS"

3. Make sure the fuel shutoff-valve is in the *"OPEN"* position.



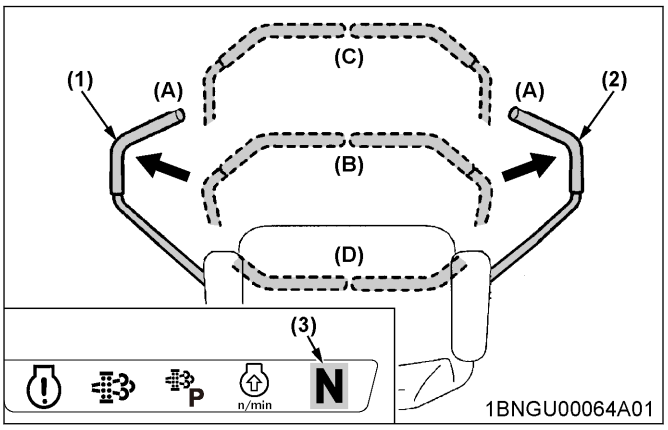
(1) Fuel shutoff-valve
(A) "CLOSE"
(B) "OPEN"

4. Place the PTO lever in the *"DISENGAGED"* (OFF) position.
   PTO clutch indicator will come *"OFF"*.



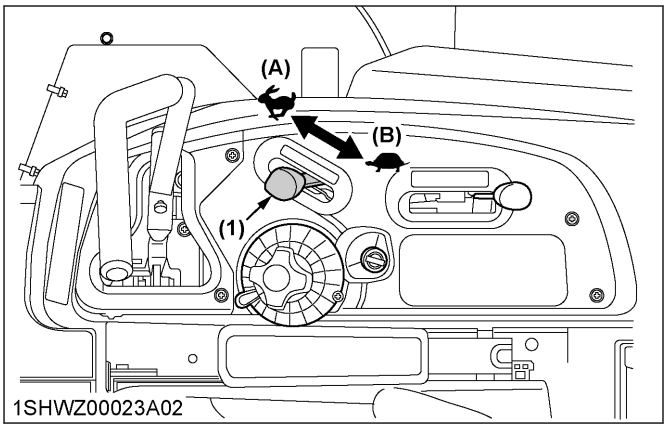
(1) PTO lever
(2) PTO clutch indicator
(A) "ENGAGED" (ON)
(B) "DISENGAGED" (OFF)

5. Place the motion control levers in the *"NEUTRAL LOCK"* position.
   Neutral indicator will come *"ON"*.



(1) Motion control lever (LH)
(2) Motion control lever (RH)
(3) Neutral indicator
(A) "NEUTRAL LOCK" position
(B) "NEUTRAL" position
(C) "FORWARD"
(D) "REARWARD"

6. Set the accelerator lever at the minimum speed position.

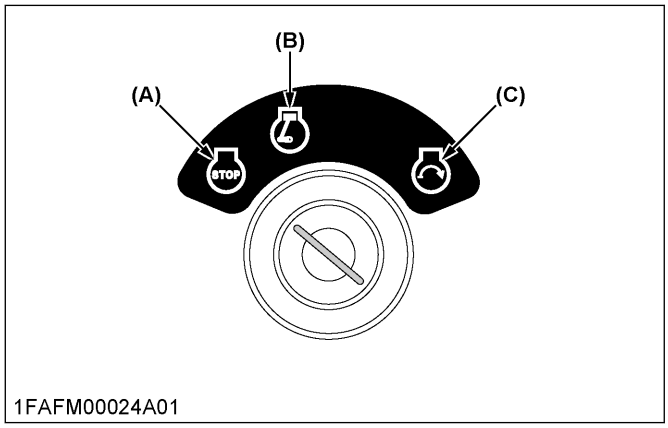


(1) Accelerator lever
(A) "FAST"
(B) "SLOW"

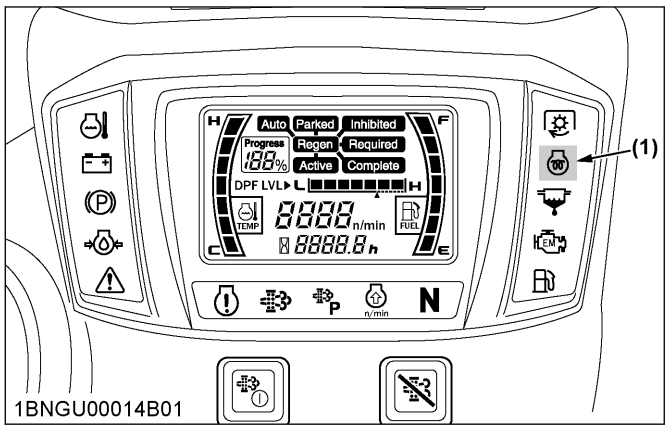
7. Insert the key into the key switch and turn clockwise 1 notch.
   Make sure the Easy Checker™ lights are *"ON"*.
   (See Key switch on page 46.)

⚠ WARNING
To avoid serious injury or death:
- **Do not depress the hydraulic lift control pedal.**
  When the engine is off, depressing the hydraulic lift control pedal (UP or DOWN) will lower the implement.

8. If the ambient temperature is below 0 ℃ and the engine is very cold, turn the key to the *"ON"* position until the air heater indicator turns off.



(A) "OFF" (Engine - Stop)
(B) "ON" (Engine - Run)
(C) "START" (Engine - Start)



(1) Air heater indicator

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

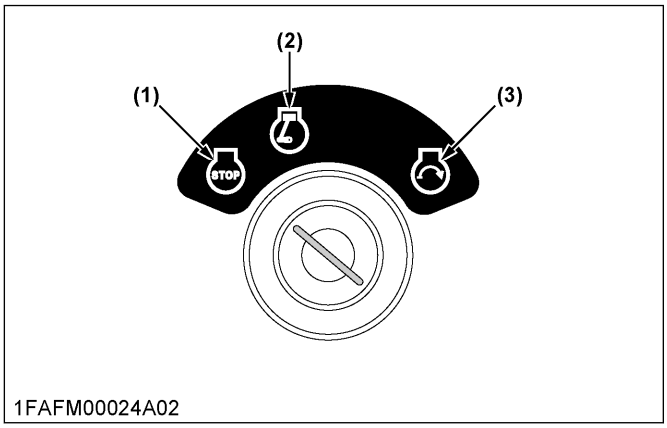
   IMPORTANT :
   - **Do not use starting fluid or ether.**
   - **To protect the battery and the starter, make sure that the starter is not continuously turned for more than 10 seconds.**
   - **Do not turn the key switch while the engine is running.**
   - **Do not operate the machine under full load until it is sufficiently warmed up.**
   - **When the ambient temperature is less than -15 ℃ (5 ℉), remove the battery from the machine and store it somewhere warm until next operation.**

10. Make sure that the Easy Checker™ lights have gone off. If the light is still on, immediately stop the engine and check the remedy following the instruction.
    (See CHECK DURING OPERATING on page 46.)
11. Warm up the engine by running at medium speed.

1. Key switch

IMPORTANT :

- **Because of the engine start system, the engine may not be started except when the PTO clutch is *"DISENGAGED"* (OFF), the parking brake lock pedal is applied, motion control levers are in *"NEUTRAL LOCK"* position and the operator is sitting in the seat.**



(1) "OFF" (Engine - Stop)
(2) "ON" (Engine - Run)
(3) "START" (Engine - Start)

(1) OFF
The position where the key can be inserted into or removed from the key switch. When the key is turned to this position, the engine shuts off.

(2) ON
The engine keeps running.
The heater turns on automatically.

(3) START
Apply the parking brake and turn the key switch to this position to start the engine.

STOPPING THE ENGINE

1. Place the motion control levers in the *"NEUTRAL LOCK"* position.
2. Apply the parking brake.
3. After idling the engine, turn the key switch to the *"OFF"* position.
4. Remove the key.
5. Do not leave the key switch *"ON"* (key in the *"ON"* position) as the battery will discharge when the engine is not running.

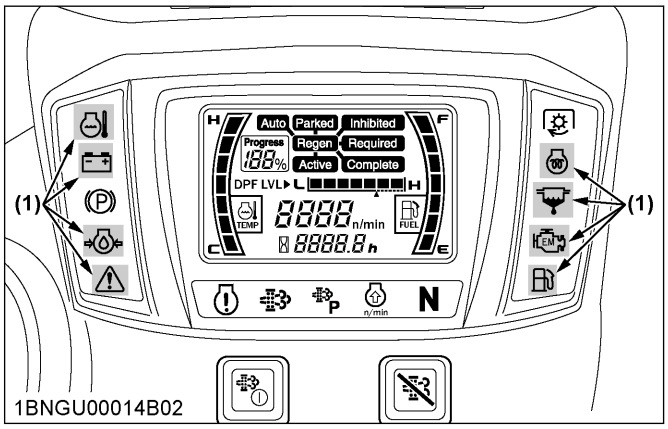
CHECK DURING OPERATING

IMPORTANT :
Immediately stop the engine if:

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

While operating, make the following checks to see that all the parts are functioning normally:

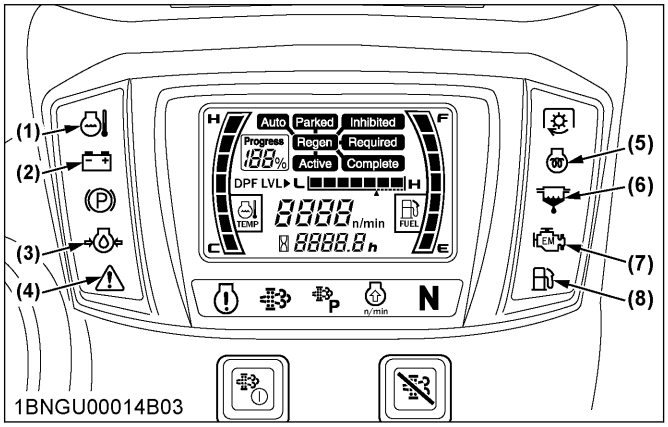
- Easy Checker™ on page 46



(1) Easy Checker™

1. Easy Checker™

If the warning indicators of the Easy Checker™ come on during operation, immediately stop the engine, and find the cause as shown as follows.
Never operate the machine while Easy Checker™ indicator is on.



(1) Engine overheat warning indicator
If the water temperature gauge reads an unusual level and the warning indicator in the Easy Checker™ comes on, the engine may be overheated. Check the machine.
(See TROUBLESHOOTING on page 120.)

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

(3) Engine oil pressure warning indicator
If the oil pressure in the engine goes below the prescribed level, the warning indicator in the Easy Checker™ will come on.
If this should happen during operation, check the level of engine oil.
(See Checking the engine oil level on page 78.)

(4) Master system warning indicator
If trouble should occur at the control parts, the indicator flashes as a warning. If the trouble is not corrected by restarting the machine, consult your local Kubota Dealer.

(5) Air heater indicator
When using the heater, the air heater indicator turns on.

(6) Water separator warning indicator
If water or impurities collect in the water separator, the indicator on the Easy Checker™ will light up. If this should happen during operation, drain the water from the water separator as soon as possible.
(See Checking water separator on page 79.)

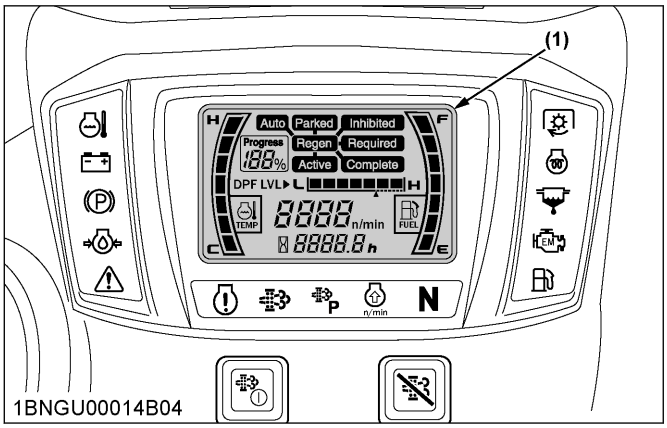
(7) Emission warning indicator
If this indicator lights up, take steps to lower the water temperature. This helps keep the emission clean.

(8) Fuel level warning indicator
If the fuel in the tank goes below the prescribed level, the warning indicator in the Easy Checker™ will come on.
If this should happen during operation, refuel as soon as possible.
(See Checking the amount of fuel and refueling on page 78.)

IMPORTANT :
- **When the fuel warning indicator 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.**

NOTE :
- **For checking and servicing of your machine, consult your local Kubota Dealer for instructions.**

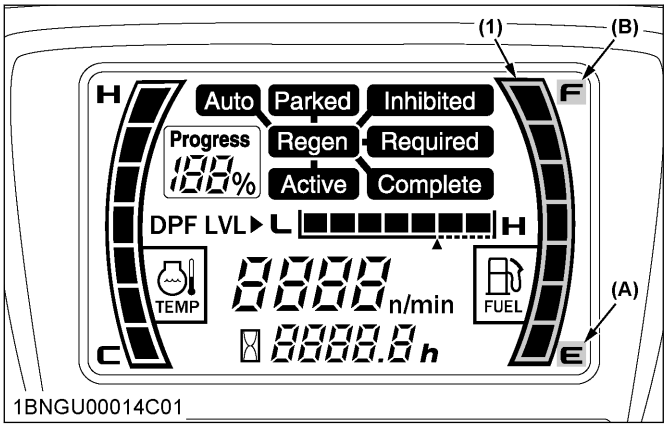
LCD MONITOR



(1) LCD monitor

1. Fuel gauge

When the key switch is on, the fuel gauge indicates the fuel level.
Be careful not to run the fuel tank completely empty. Otherwise air may enter the fuel system.
Should this happen, the fuel system must be bled.
(See Bleeding fuel system on page 107.)



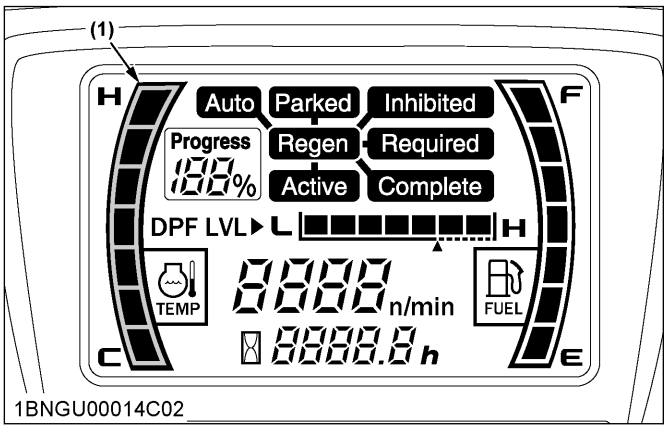
(1) Fuel gauge
(A) "EMPTY"
(B) "FULL"

2. Coolant temperature gauge

⚠ WARNING
To avoid serious injury or death:
- **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.**

1. With the key switch *"ON"*, this gauge indicates the temperature of the coolant. **[C]** for *"cold"* and **[H]** for *"hot"*.
2. If the indicator reaches the **[H]** position, engine coolant is overheated.

Check the machine by reading the troubleshooting section of this manual.
(See TROUBLESHOOTING on page 120.)

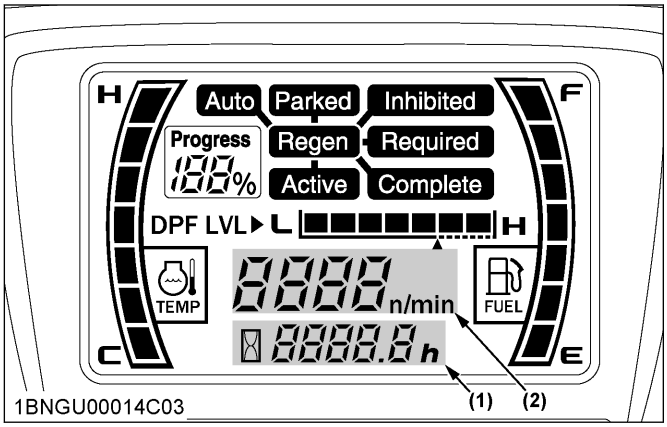


(1) Coolant temperature gauge

3. Hour meter, 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 hour meter indicates in 5 digits the hours the machine has been used; the last digit indicates 1/10 of an hour.



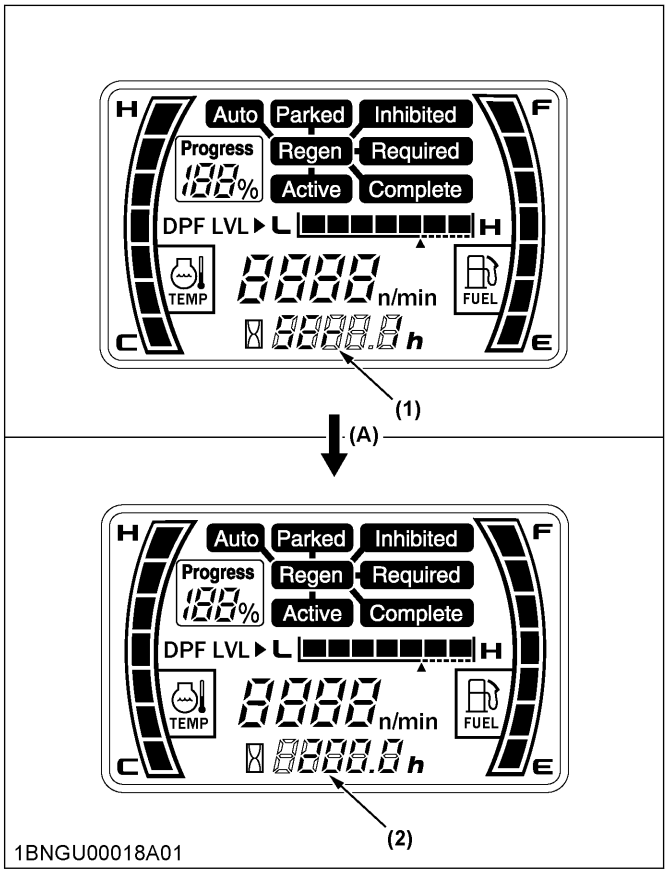
(1) Hours used
(2) Tachometer

4. Service code display

If hour meter will be 50±5 hr, 200±5 hr, 400±5 hr, 600±5 hr, 800±5 hr, 1000±5 hr..., the liquid crystal display will show the service code (“SEr 1” or “SEr 2”) whenever the key is turned *“ON”*. It will show the code for the first 10 seconds that the key is *“ON”*.

For example, if you turn the key *“ON”* and the operated time is 200.0 hours, it will show “SEr 1” for 10 seconds. After 10 seconds, “200.0h” will show.

(See SERVICE INTERVALS on page 84.)



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

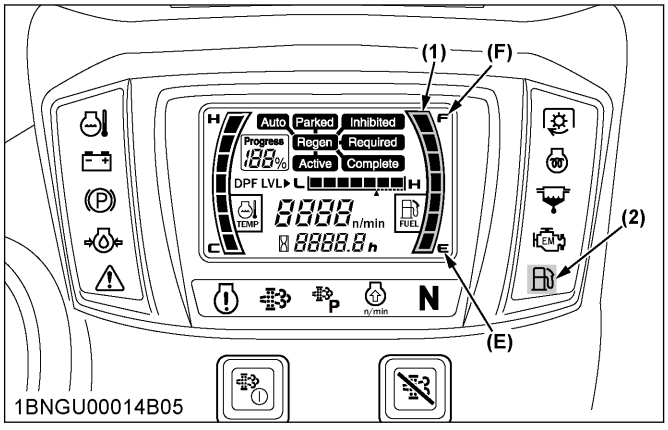
5. Overheat alarm

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

Check the machine by reading the troubleshooting section of this manual.

(See TROUBLESHOOTING on page 120.)

6. Fuel gauge, warning indicator and fuel valve

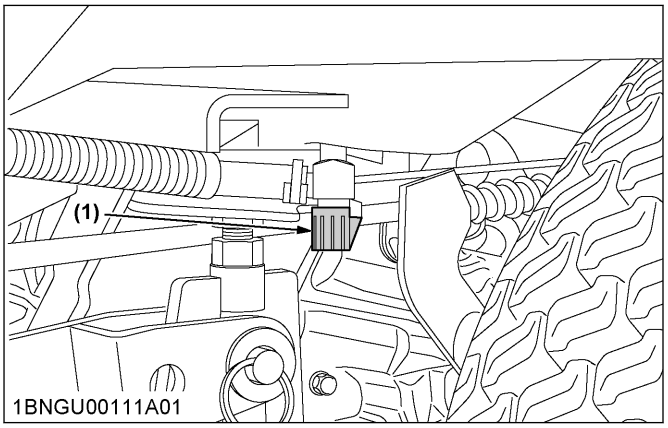


(1) Fuel gauge
(2) Fuel level warning indicator
(E) “EMPTY”
(F) “FULL”

1. The fuel gauge shows the amount of fuel left in the RH tank.
2. Fuel level warning indicator flashes when fuel amount is below 7 L.

IMPORTANT :

- **Fill the fuel tank only to bottom of the filler neck.**
- **Be careful not to empty the fuel tank. Otherwise air may enter the fuel system.**
  Should this happen, you must bleed the system.
  (See Bleeding fuel system on page 107.)
- **When refueling, basically fill both fuel tanks full.**
- **In the case you have a small amount of fuel, if fuel is still in the fuel tank RH, fill the fuel tank LH first.**
- **The fuel gauge shows the fuel level of fuel tank RH. When the fuel gauge flashes, fill fuel as soon as possible.**
- **When the fuel gauge flashes, do not fill fuel on a slope. Air can get into the fuel system, causing the engine to stall.**
- **If the engine stalled with some remaining in the fuel tank RH, close the fuel valve of fuel tank LH and you can operate. (Refer to the following figures.)**



(1) Fuel valve

COLD WEATHER STARTING

- When the ambient temperature is below -0 ℃ (32 ℉) 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 7 and 8. Details regarding steps 7 and 8 can be found in a different section.
  (See STARTING THE ENGINE on page 44.)
- To protect the battery and the starter, make sure not to turn the starter continuously for more than 10 seconds.

WARMING UP THE ENGINE

⚠ WARNING

To avoid serious injury or death:

- **Apply the parking brake during warm-up.**

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

1. Warm-up and transmission oil in the low temperature range

Hydraulic oil serves as transmission oil. In cold weather conditions, 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, result in trouble in the hydraulic system or damage to the hydraulic clutch.
To prevent this from happening warm up the engine at about 50 % of rated rpm according to the following table.

Ambient temperature	Warm-up time requirement
Higher than 0 ℃ (32 ℉)	Approximately 5 minutes
-10 to 0 ℃ (14 to 32 ℉)	5 to 10 minutes
-20 to -10 ℃ (-4 to 14 ℉)	10 to 15 minutes
Below -20 ℃ (-4 ℉)	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 (motion control levers, PTO lever, mower lift pedal) 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.**

JUMP STARTING

⚠ WARNING

To avoid serious injury or death:

- **Keep cigarettes, sparks, and flames away from the battery.**

- **If the machine battery is frozen, do not jump start the engine.**
- **Do not connect the other end of the negative jumper cable to the negative terminal of the machine battery.**

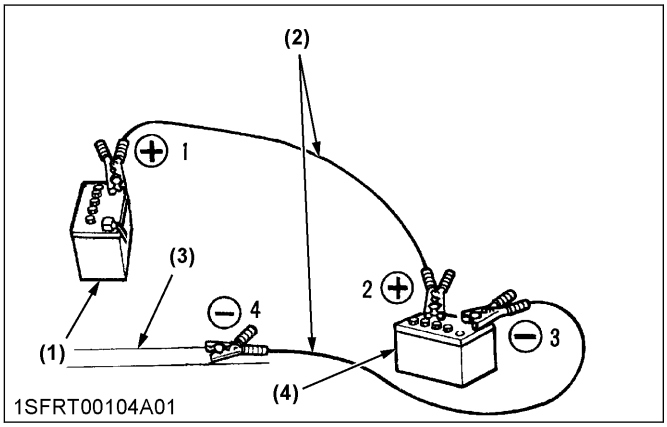
When jump starting the engine, observe the following instructions to start the engine safely:

1. Bring a helper vehicle with a battery of the same voltage as the disabled machine within easy cable reach.

   IMPORTANT :
   - **The vehicles must not touch.**

2. Apply the parking brakes of both vehicles and put the shift levers in the *"NEUTRAL"* position. Shut the engine off.
3. Put on safety goggles and rubber gloves.
4. Ensure that 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 the 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).

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



(1) Dead battery
(2) Jumper cables
(3) Engine block or frame
(4) Helper battery

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 the machine could result in severe damage to the machine electrical system.**
  Use only a matching voltage source when *"jump starting"* a low or dead battery.

OPERATING THE MACHINE

OPERATING A NEW MACHINE

⚠ DANGER

To avoid serious injury or death:

- **Do not operate the mower without the discharge deflector in the down position.**

⚠ WARNING

To avoid serious injury or death:

- **The machine relies upon the engine driven transmission for speed, direction, and motion control. If the engine is not running, the machine cannot be driven or controlled.**
  If the engine stops when operating on a slope, apply the parking brake immediately to prevent a machine runaway.
- **Do not allow anyone 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.**
- **When making a turn, reduce the travel speed and operate the motion control levers carefully.**
- **To avoid tip-over accidents, operate across slopes, not up and down. Avoid sudden starts and stops on slopes. Slow down and use extra caution when changing direction on a slope.**
  Park the machine on a firm and 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 mow near drop-offs, ditches or embankments. The mower could turn over if a wheel is over the edge of a cliff or ditch, or if an edge caves in.**
- **Do not drive the 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 or holes, and small children. Use extra caution when the machine is equipped with a grass catcher.**
- **Keep bystanders, especially children, and animals away from the mowing area.**
- **Clear the work area of objects which might be picked up and thrown by the blades.**
- **Do not direct the opening of the discharge deflector at bystanders or animals. Discharged objects may cause injury. Plan your mowing carefully before starting operation.**
- **Disengage the PTO and sit on the operator's seat before starting the engine.**

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

1. Changing lubricating oil for new machine

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 it would ordinarily be required.
Details regarding normal service intervals can be found in a different section.
(See SERVICE INTERVALS on page 84.)

2. Engine break-in

After the first 50 hours of operation, change the engine oil and filter.
(See EVERY 200 HOURS on page 97.)

3. Machine break-in

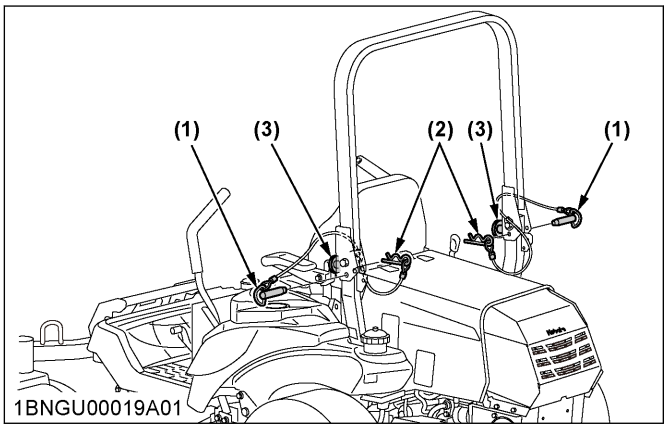
After the first 400 hours of operation, change the transmission oil.
(See EVERY 400 HOURS on page 98.)
After the first 50 hours of operation, change the oil filter.
(See EVERY 200 HOURS on page 97 and EVERY 400 HOURS on page 98.)

OPERATING THE 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 if there is no ROPS.**

1. Folding the ROPS

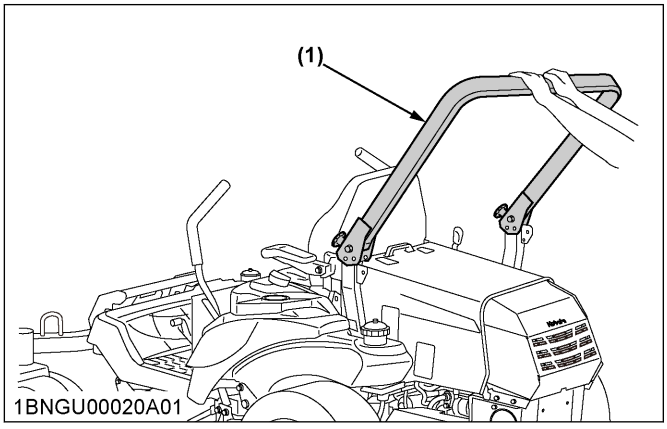
1. Loosen the knob bolts 1 to 2 turns.
2. Remove both lock pins.



(1) Lock pin
(2) Snap pin
(3) Knob bolt

3. Fold the ROPS.

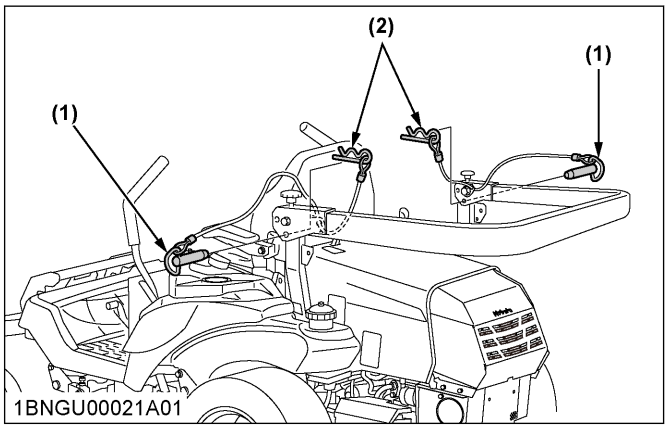
⚠ CAUTION
To avoid personal injury:
- **Hold the ROPS tightly with both hands and fold the ROPS slowly and carefully.**



(1) ROPS

⚠ WARNING
To avoid serious injury or death:
- **Make sure that both lock pins are properly installed and secured with the snap pins.**
- **Do not use your fingers to align the holes.**

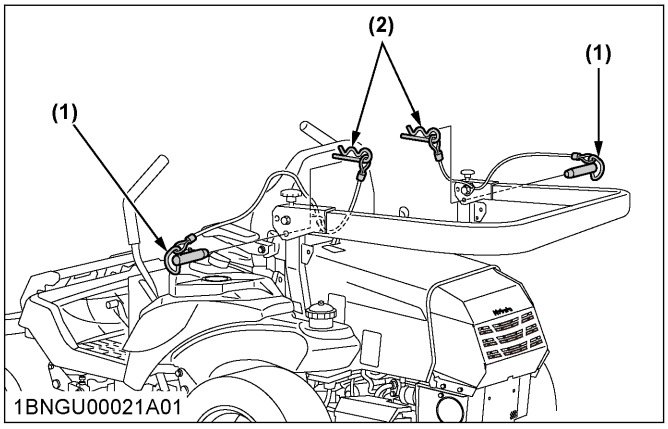
4. Align the lock pin holes and insert both lock pins and secure them with the snap pins.



(1) Lock pin
(2) Snap pin

2. Raising the ROPS to the upright position

1. Remove both snap pins and lock pins.



(1) Lock pin
(2) Snap pin

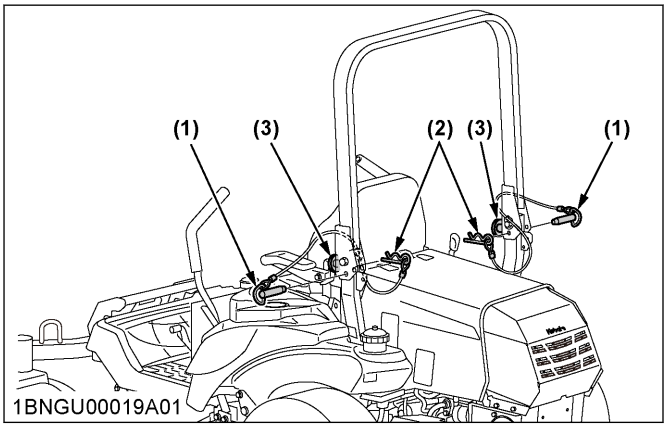
2. Raise the ROPS to the upright position.

⚠ WARNING
To avoid serious injury or death:
- **Hold the ROPS tightly with both hands and raise the ROPS slowly and carefully.**
- **Do not use your fingers to align the holes.**

3. Align the lock pin holes, insert both lock pins and secure them with the snap pins.

4. Tighten the knob bolts slightly.

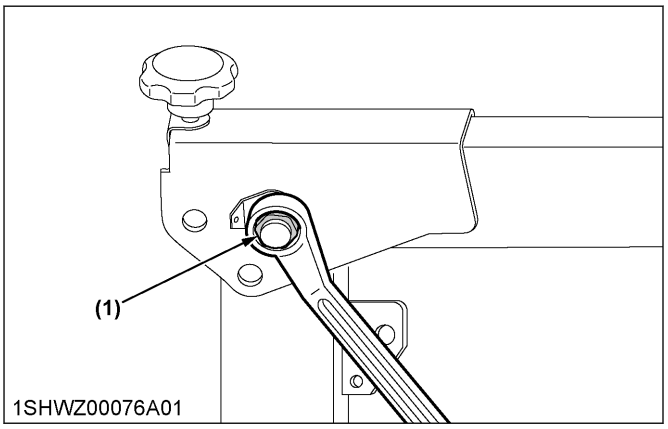
⚠ CAUTION
To avoid personal injury:
- **Make sure that both lock pins are properly installed as soon as the ROPS is in the upright position and secured with the snap pins.**



(1) Lock pin
(2) Snap pin
(3) Knob bolt

3. Adjusting the foldable ROPS

1. Adjust the free fall of the ROPS upper frame regularly.
2. If you feel less friction when folding the ROPS, tighten the nut (1) until you feel the right friction when moving it. Then replace the snap pin.



(1) Nut

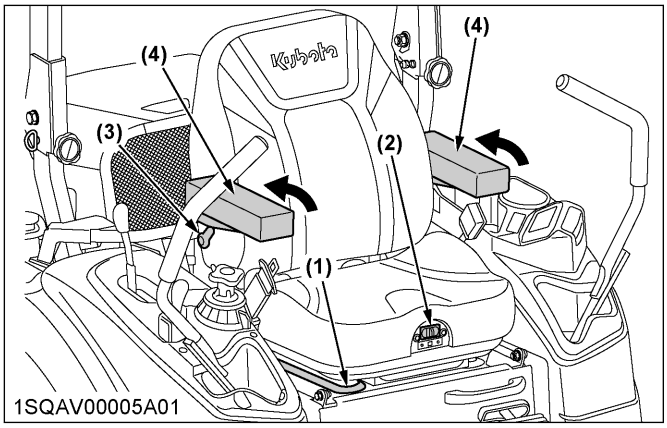
STARTING THE MACHINE

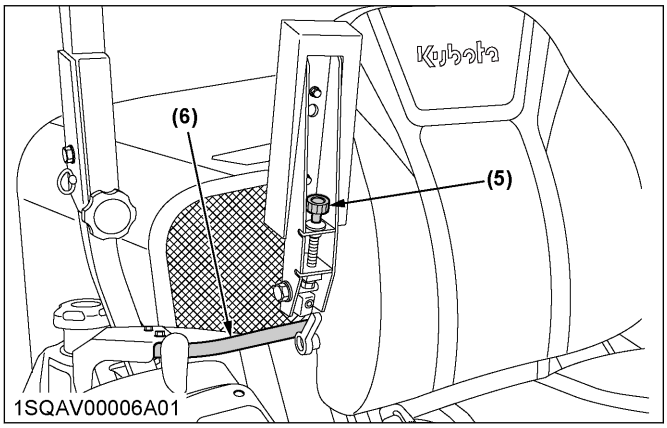
⚠ WARNING
To avoid serious injury or death:
- **Read and understand the safe operation section.**
- **Read and understand the safety labels located on the machine.**
- **To avoid the danger of exhaust fume poisoning, do not operate the engine indoors without proper ventilation.**
- **Never start the engine while standing on the ground. Start the engine only from the operator's seat.**

1. Adjust the operator's position and apply the seat belt.
   - Operator's seat on page 53
   - Seat belt on page 54
2. Start the engine.
   - OPERATING THE ENGINE on page 32
3. Raise the implement.
   - Hydraulic lift control pedal on page 55
4. Accelerate the engine.
   - Accelerator lever on page 55
5. Unlock the parking brake.
   - Parking brake pedal on page 55
6. Operate the machine.
   - Motion control lever on page 56
   - Stop position of the motion control lever on page 56
   - Operating position of the motion control lever on page 56
   - Re-start on slopes on page 58

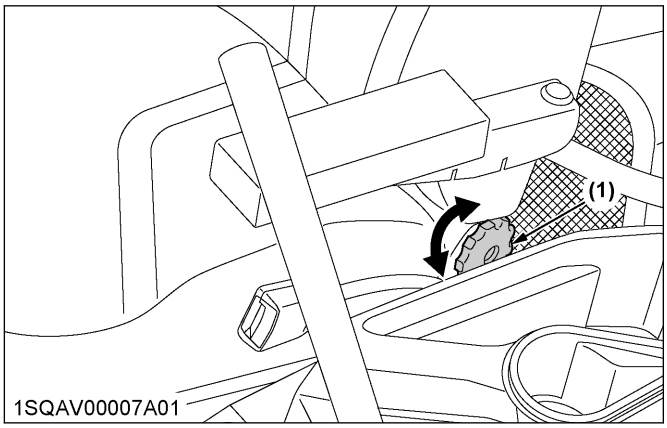
1. Operator's seat

⚠ WARNING
To avoid serious injury or death:
- **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 anyone other than the driver to ride on the machine.**





(1) Travel adjust lever
(2) Air suspension switch
(3) Lumbar support adjust lever
(4) Arm rest
(5) Arm rest angle adjuster
(6) Bypass pipe



(1) Backrest tilt adjust knob

⚠ WARNING

To avoid serious injury or death:

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

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.

Suspension adjustment

To get the optimum suspension setting, turn on the air suspension switch.

Lumbar support adjustment

Turn the lumbar support adjust lever to the desired position.

Arm rest

Arm rest may be set at upright position if desired.

Arm rest angle adjustment

Turn the arm rest angle adjuster to the desired angle.

Backrest tilt adjustment

Turn the backrest tilt adjust knob to the desired angle.

IMPORTANT :

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

NOTE :

- **Depending on the seat adjustment level, the seat may contact the bypass pipe during operating. In case of contact, readjust the travel adjust lever, the suspension adjust knob, the backrest tilt adjust knob or the lumbar support adjust lever.**

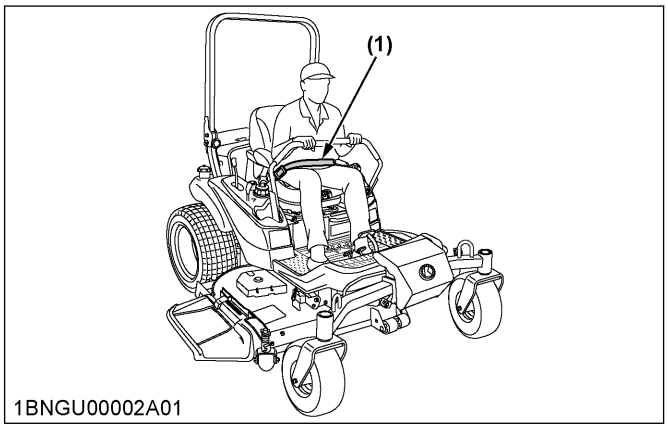
2. Seat belt

⚠ 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 if 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) Seat belt

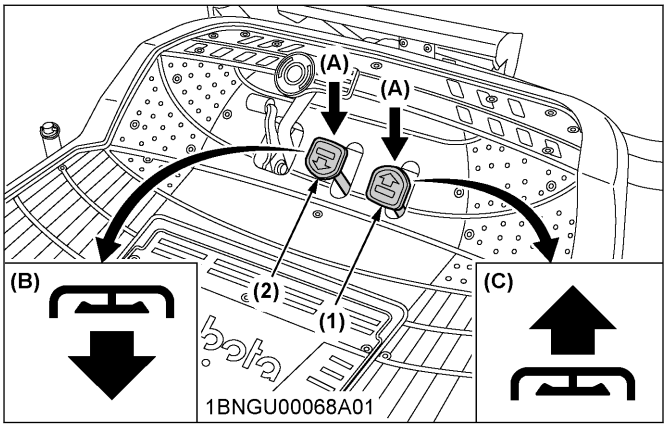
3. Hydraulic lift control pedal

⚠ WARNING

To avoid serious injury or death:

- **When the engine is off, do not depress the hydraulic lift control pedal.**
  When the engine is off, depressing the hydraulic lift control pedal (UP or DOWN) will lower the implement.

The hydraulic lift control pedal is used to raise and lower the implement used with the machine (mower).
To lower the implement, depress the hydraulic lift control pedal (DOWN).
To raise it, depress the hydraulic lift control pedal (UP).



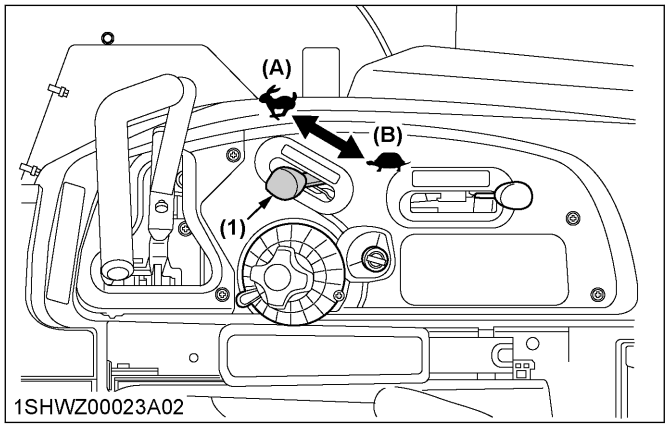
(1) Hydraulic lift control pedal (UP)
(2) Hydraulic lift control pedal (DOWN)
(A) "DEPRESS"
(B) "DOWN"
(C) "UP"

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 accelerator lever above 1/2.**
- **If noises are heard when implement is lifting after the hydraulic lift control pedal has been activated, the hydraulic mechanism is not adjusted properly. Contact your local Kubota Dealer for adjustment.**

4. Accelerator lever

- Move the accelerator lever backward to decrease the engine speed.
- Move it forward to increase the engine speed.

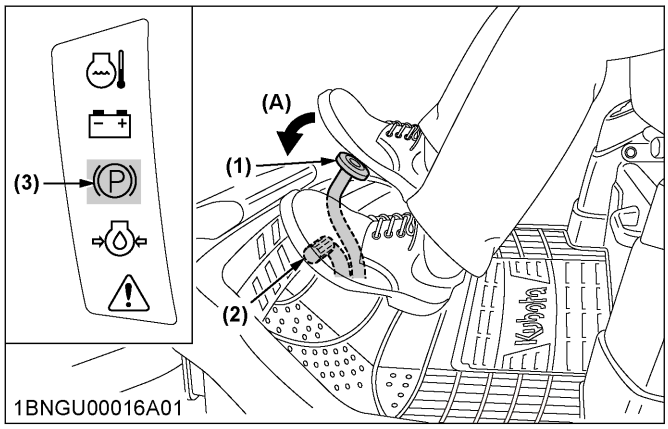


(1) Accelerator lever
(A) "INCREASE"
(B) "DECREASE"

5. Parking brake pedal

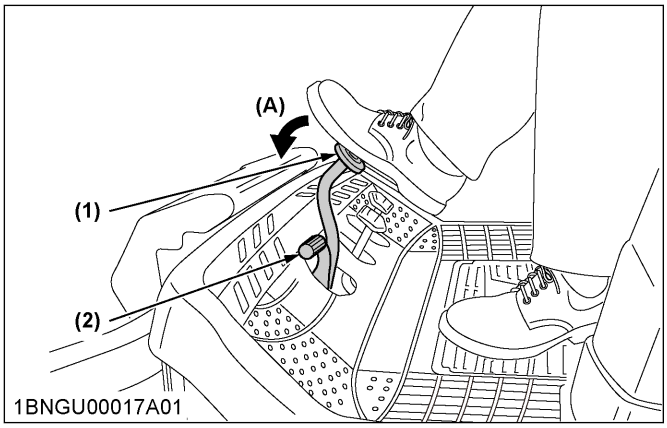
To apply the parking brake:

1. Depress the parking brake pedal firmly with your right foot and the parking brake lock pedal simultaneously with your left foot.
2. Then release the parking brake pedal while holding the parking brake lock pedal down.
3. Parking brake warning indicator will come *"ON"*.

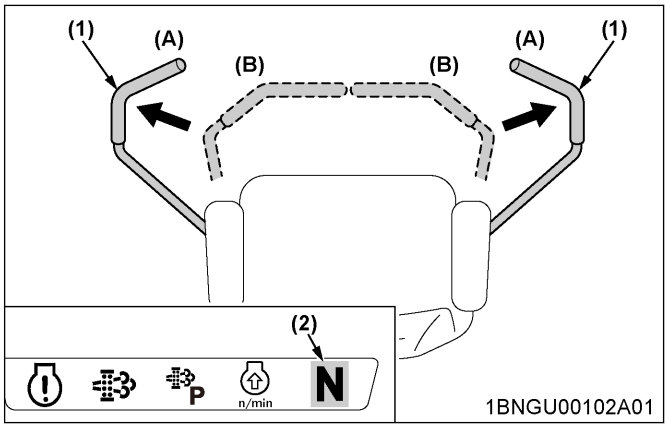


(1) Parking brake pedal
(2) Parking brake lock pedal
(3) Parking brake warning indicator
(A) "DEPRESS"

To release the parking brake:
Depress the parking brake pedal and release it slowly with your right foot, without pressing the parking brake lock pedal.



(1) Parking brake pedal *(A) "DEPRESS"*
(2) Parking brake lock pedal



(1) Motion control levers *(A) "NEUTRAL LOCK" position*
(2) Neutral indicator *(B) "NEUTRAL" position*

6. Motion control lever

⚠ WARNING

To avoid serious injury or death:

- **Understand how to use the motion control levers and practice in an unrestricted area at slightly more than idle speed without the PTO engaged until becoming proficient in the operation of the machine.**
- **Do not move motion control levers from the *"FORWARD"* to *"REARWARD"* or from the *"REARWARD"* to *"FORWARD"* position rapidly. Sudden direction changes could cause the loss of control or damage to the machine or property.**
- **Do not make sharp turns at high speed. Fast and sharp turns could cause the loss of control.**
- **Motion control levers must be in the *"NEUTRAL LOCK"* position to safely enter and exit the operator's seat or to carry out maintenance and safety checks.**
- **This machine can make sharp turns. Always make sure your intended path is clear of obstructions or people.**

6.1 Stop position of the motion control lever

Neutral lock position

Forward and rearward movements of the motion control levers are locked when these levers are in the *"NEUTRAL LOCK"* position (the engine can only be started with levers in this position).

6.2 Operating position of the motion control lever

Machine speed and steering is controlled by the motion control levers, when the engine is running and the parking brake is released.

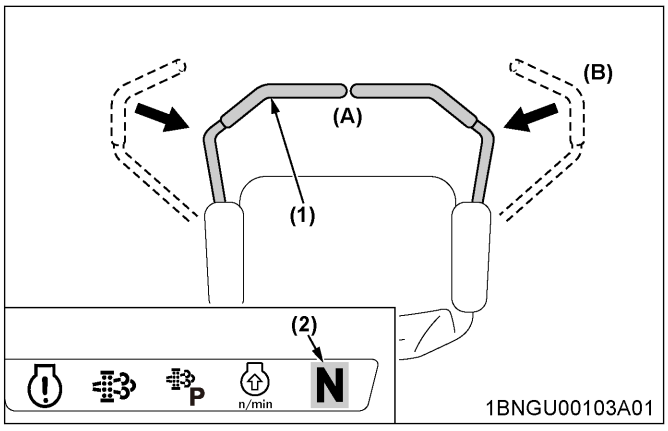
⚠ WARNING

To avoid serious injury or death:

- **No control is provided by the motion control levers when the engine is off.**

Neutral position

Grasp the motion control levers and move them inward from the *"NEUTRAL LOCK"* position so that the machine is in *"NEUTRAL"* (the engine cannot be restarted).



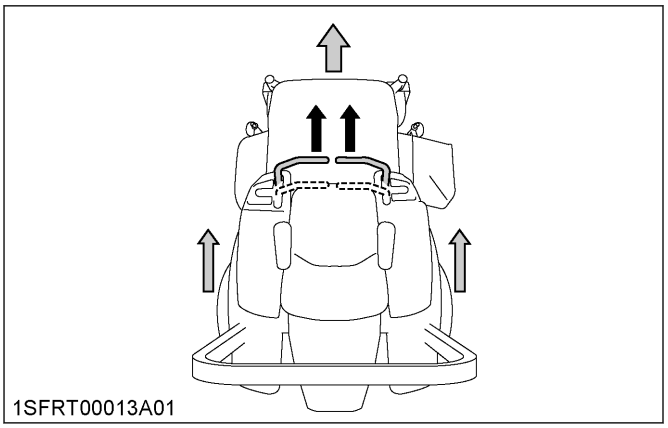
(1) Motion control levers *(A) "NEUTRAL" position*
(2) Neutral indicator *(B) "NEUTRAL LOCK" position*

Forward and rearward motion:

1. Move the accelerator lever to the *"FAST"* position.
2. Release the parking brake.
3. Move both motion control levers from the *"NEUTRAL LOCK"* position inward to the *"NEUTRAL"* position.
4. To move your machine, see the following figures.

To stop:
Move and hold both motion control levers to the *"NEUTRAL"* position until the machine comes to a stop.

Forward:
For forward travel in a straight line, push both motion control levers forward equally and slowly.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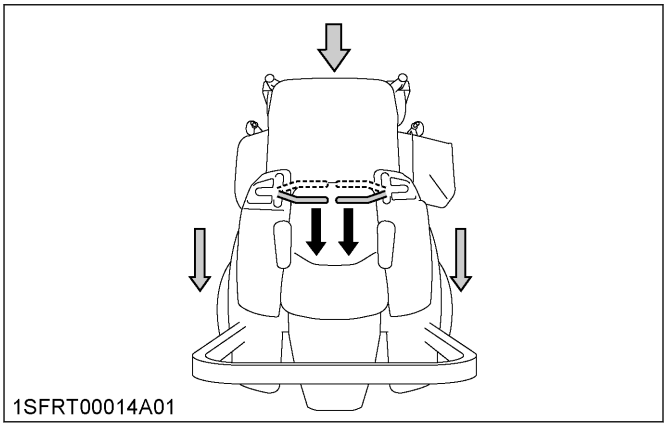
Rearward:
For rearward travel in a straight line, pull both motion control levers past center rearward equally and slowly.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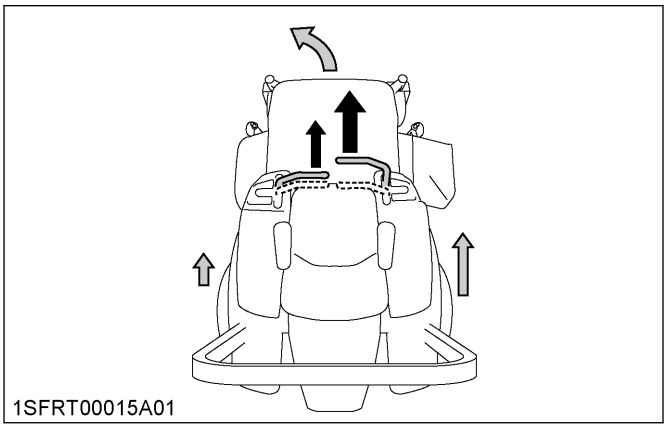
General left turn:
For forward travel to the left, push the right motion control lever further forward than the left motion control lever.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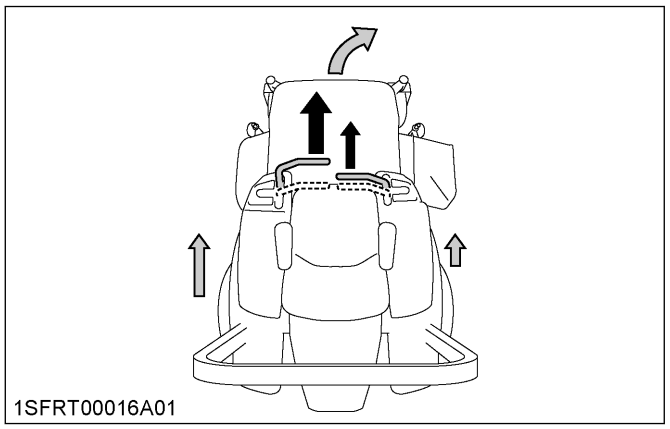
General right turn:
For forward travel to the right, push the left motion control lever further forward than the right motion control lever.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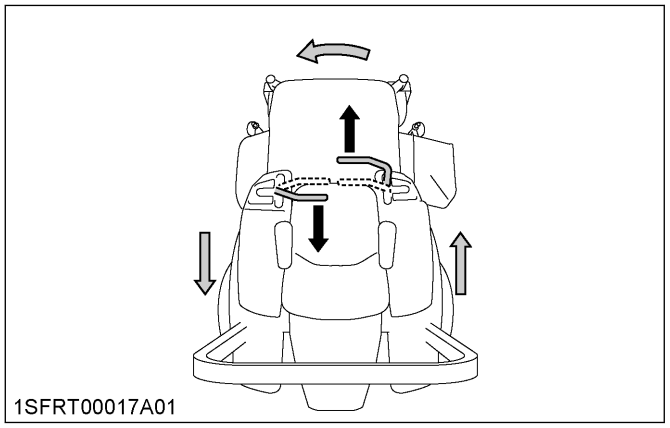
Sharp (zero) left turn:
Push the right motion control lever forward and pull the left motion control lever rearward at the same time.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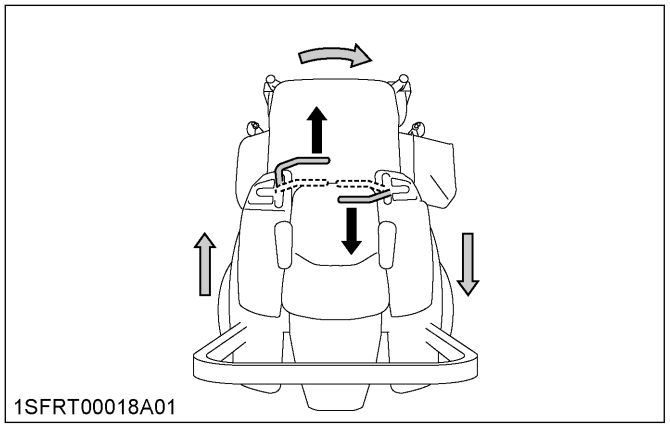
Sharp (zero) right turn:
Push the left motion control lever forward and pull the right motion control lever rearward at the same time.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Adjustment

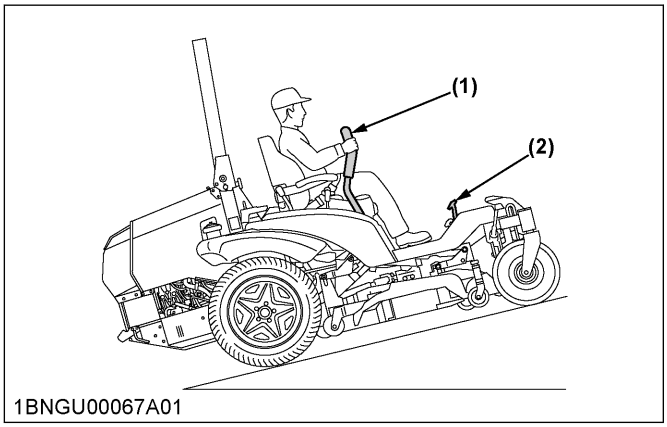
WARNING
To avoid serious injury or death:
- **The motion control lever adjustment is important to ensure the machine operates properly.**

NOTE :
- **If adjustment is required, the motion control linkages are adjustable.**
  (See ADJUSTMENT on page 111.)
  We recommend you to contact your local Kubota Dealer.

6.3 Re-start on slopes

WARNING
To avoid serious injury or death:
- **Do not stop or change directions on slopes. These operations could cause loss of the machine traction or control.**
- **Starting procedure on slopes is different from the usual start mode on a flat surface, understand how to re-start on slopes and use extra caution.**

If a situation occurs where it is necessary to stop and restart on a slope, refer to the following operational steps.



(1) Motion control lever
(2) Parking brake pedal

How to re-start on the slopes:
1. Firmly apply parking brake (enough to prevent movement).
2. Start the engine.
3. Set the accelerator lever to the middle position.
4. Place the control levers inward to the *"NEUTRAL"* position gradually.
5. Release the parking brake within about 3 seconds. If you take more time, the engine will suddenly stop because of a safety device. (This is to prevent the machine from being operated with the parking brake applied.)
   When the engine stops, start over by firmly reapplying the parking brake, and repeat steps 2 through 5 and then 6.
6. Move the machine slowly and carefully.

STOPPING THE MACHINE

WARNING
To avoid serious injury or death:
- **Park the machine on level ground.**
  If necessary to park on an incline, stop the machine, apply the parking brake, and then stop the engine.
- **If you stop the engine on an incline without applying the parking brake, the machine could move and run away.**

IMPORTANT :
- **The parking brake pedal is for parking and emergency use only. If the parking brake is applied when the motion control levers are not in the *"NEUTRAL LOCK"* position, the engine will stop within approximately 3 seconds. This feature is to prevent brake and transmission damage during operation.**
- **If on a slope and the engine quits, use the parking brake as the emergency brake and immediately stop the unit.**

1. Move both motion control levers to the *"NEUTRAL"* position to stop the machine.
2. Move both motion control levers to the *"NEUTRAL LOCK"* position.
3. Apply the parking brake.
4. Accelerator lever in slow position and shift PTO lever to the *"DISENGAGE"* (OFF) position.
5. Lower all implements to the ground.
6. Turn off the engine and remove the key.

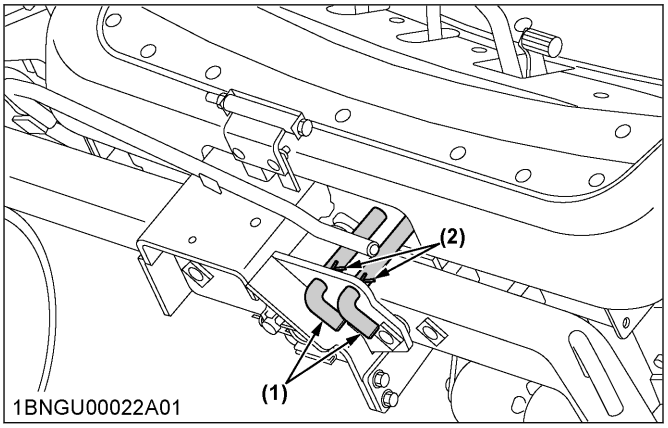
FRONT AXLE

1. Fixing the front axle

WARNING
To avoid serious injury or death:
- **Park the machine on a firm and level surface.**
- **Stop the engine, remove the key and engage the parking brake.**

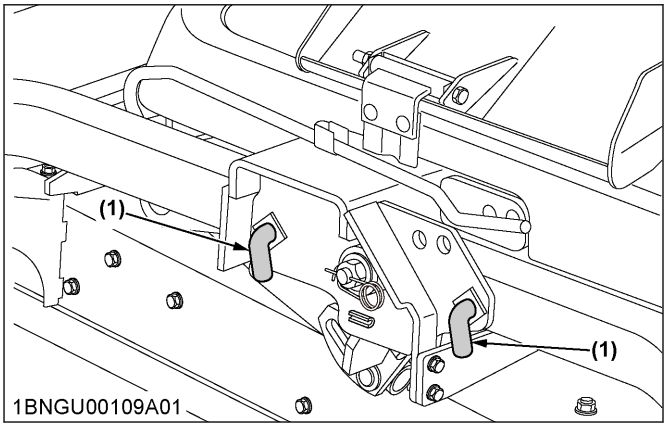
A rigid front axle is recommended for a more even cut under mowing the rough terrain.

1. Open the front cover.
2. Remove the 2 L-pins from their original position.



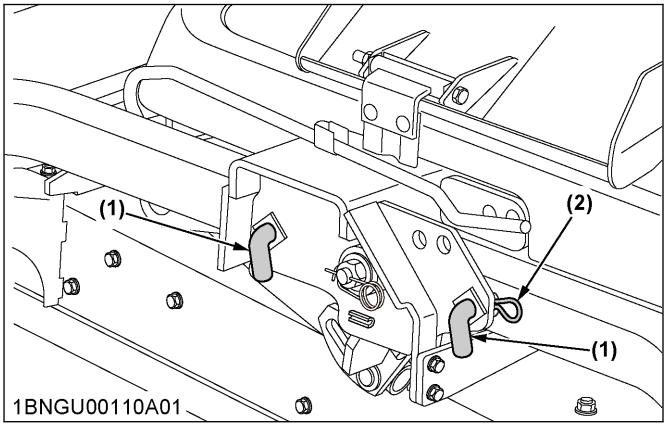
(1) L-pin
(2) Snap pin

3. Insert L-pins into the holes on the front axle as shown below.



(1) L-pin

4. Install the snap pins between the axle mount frame and the front axle.



(1) L-pin
(2) Snap pin

2. Oscillating the front axle

For oscillating the front axle, reverse the previous procedures.
The oscillating front axle provides a smoother ride than the rigid front axle and oscillates with the terrain.

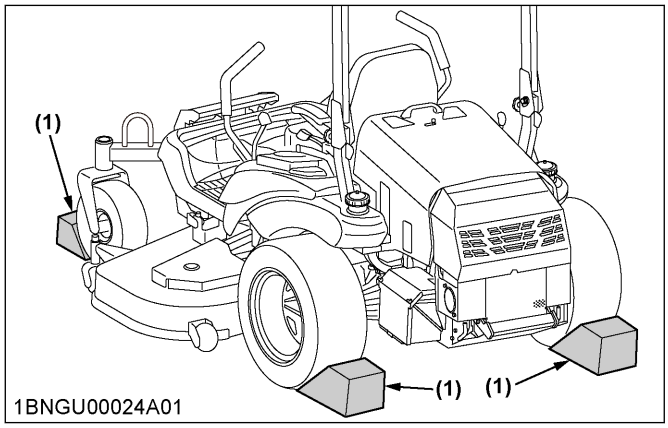
PARKING THE MACHINE

⚠ WARNING
To avoid serious injury or death:
Before leaving the operator's position:
- **Apply the parking brake.**
- **Lower all implements to the ground.**
- **Shut off the engine.**
- **Remove the key.**
- **Place the motion control levers in the *"NEUTRAL LOCK"* position.**

To lock:
1. Depress the parking brake pedal firmly with your right foot, and the parking brake lock pedal simultaneously with your left foot.
2. Then release the parking brake pedal while holding the parking brake lock pedal down.

To unlock:
Depress the parking brake pedal and release it slowly with your right foot without pressing the parking brake lock pedal.

If necessary to park on an incline, chock the wheels on the downhill side to prevent accidental rolling of the machine.



(1) Chock

NOTE :
- **See Parking brake pedal on page 55.**

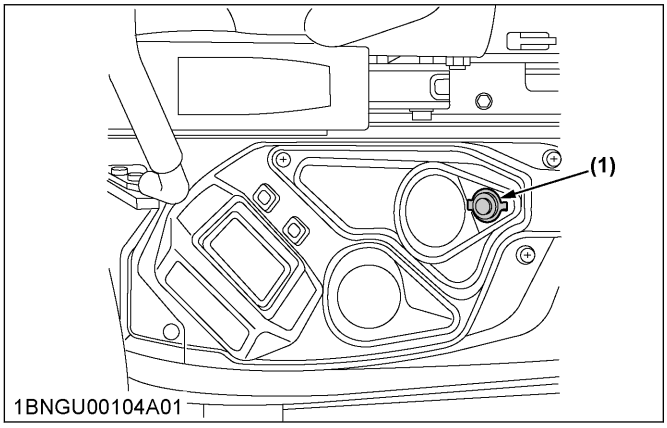
ACCESSORY

1. 12 V electric power socket

You may use the 12 V electric power socket to connect an auxiliary light or other devices.

- A 12 V outlet is on the left-hand fender. An electrical charger or other device may be connected to this outlet.
- The outlet and plug are only powered when the key switch is at the *"ON"* or *"START"* position.
- Do not connect any electric devices that draw more than a total of 62 W (watts) to these power outlets. The battery may discharge very rapidly, or the outlet or plug may fail.
- Maximum allowable W with LED light kit is 48 W.

IMPORTANT :
- **Do not use the outlet as a cigarette lighter.**
- **Do not use the outlet or the plug when it is wet.**
- **Make sure that the outlet cap is closed when the outlet is not used.**



(1) 12 V electric power socket

TRANSPORTING THE MACHINE

⚠ WARNING

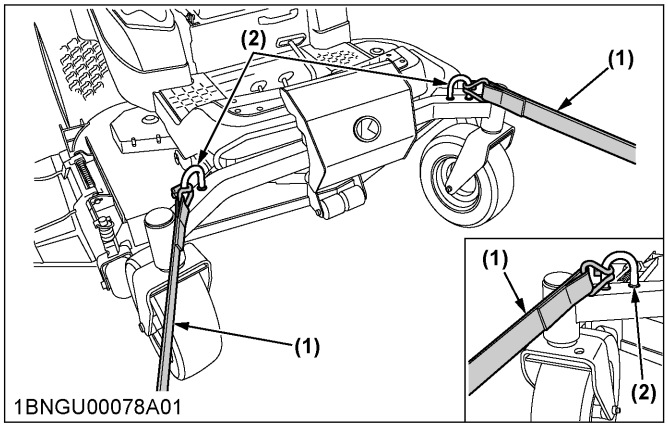
To avoid serious injury or death:
- **Follow all federal and local regulations for securement.**
- **Do not attempt to tow this machine, or damage to the transmission may result.**

1. Transporting the machine on a suitable trailer

IMPORTANT :
- **Hook the strap from the inside of the rod.**
- **The straps should be directed down and outward from the machine.**
- **Do not hook the strap to the curved section of the rod.**

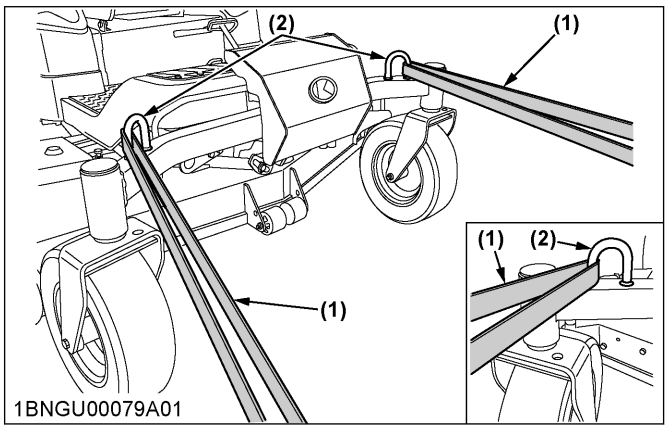
1. Shut off the fuel valves below the fuel tanks while transporting.
2. To prevent the hood from opening by wind while in transit, verify that the hood is securely latched.
3. Apply the parking brake and lower the mower deck to the lowest position.
4. Remove the key.
5. Secure the front portions of the machine as shown in the following figures, using heavy duty straps.

Hook method



(1) Heavy-duty strap
(2) Tie-down point

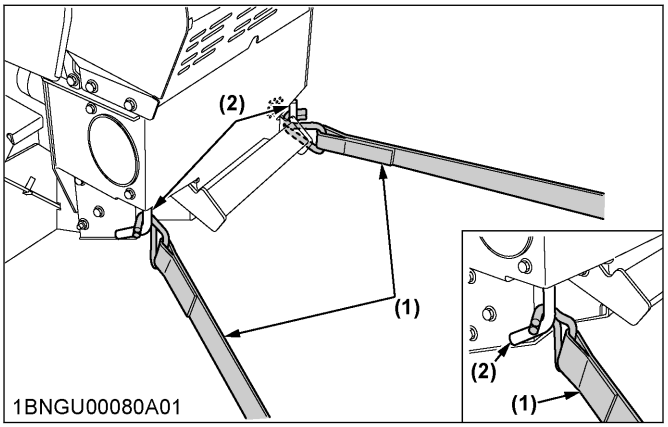
Pass through method



(1) Heavy-duty strap
(2) Tie-down point

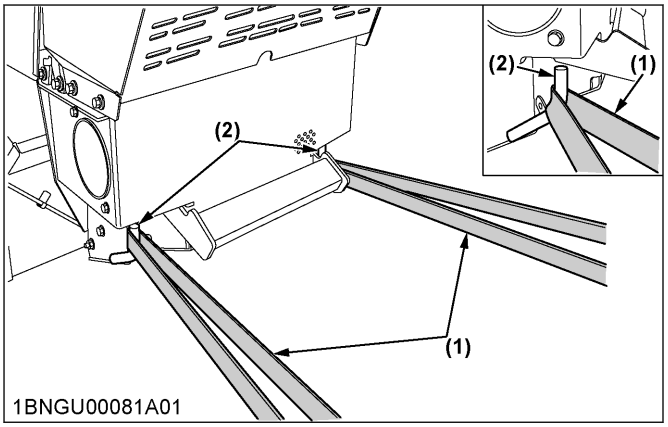
6. Secure the rear portions of the machine as shown in the following figures, using heavy duty straps.

Hook method



(1) Heavy-duty strap
(2) Tie-down point

Pass through method



(1) Heavy-duty strap
(2) Tie-down point

2. Transporting the machine by driving

When you drive the machine for a long distance transit, set the mower deck to the highest position.

OPTIONAL EQUIPMENT

For the operation and precautions of option kit, obey the instructions of the manuals attached in the option kit.

OPERATING THE MOWER

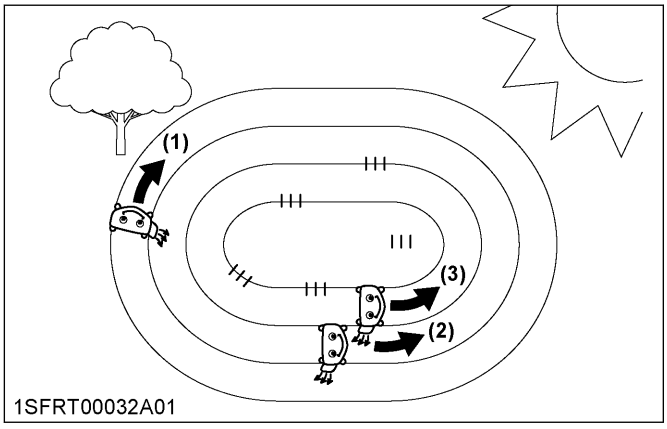
MOWING TIPS

⚠ WARNING

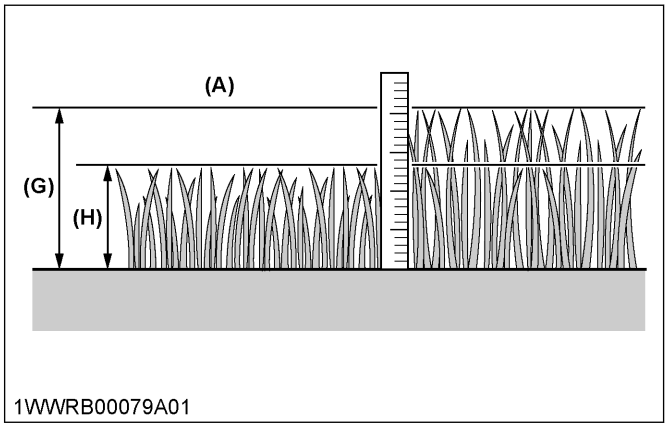
To avoid serious injury or death:

- **Clear the work area of objects which might be picked up and thrown by the blades.**
- **Keep bystanders and animals away from the mowing area.**
- **Disengage the PTO and sit on the operator's seat before starting the engine.**

1. When using the mower for the first time, choose a smooth level area and cut in straight and slightly overlapping strips.
2. The size and type of the area to be mowed will determine the proper mowing pattern. Take into account obstructions, such as trees, fences and buildings. To keep grass clippings off fences, sidewalks and so on, it is advisable to go over the outside of the area to be mowed several times in a clockwise direction. To mow the area remaining, work in a counterclockwise direction so that the clippings are dispersed onto the previously cut area.



3. Always keep the left side of the mower toward trees, posts or other obstacles on the first trip around the obstacle.
4. Most lawns must be mowed to keep the grass approximately 50 to 80 mm (2 to 3 in.) high. Best results are obtained by cutting often and not too short. To keep a green lawn, never mow more than 1/3 of the height of the grass or a maximum of 25 mm (1 in.) in 1 mowing.
   For extremely tall grass, set the cutting height at maximum cutting height for the first mowing, then reset to the desired height and mow again. Allow the grass to grow to 80 mm (3 in.), then cut off only the top 25 mm (1 in.).
5. Clippings may be left on the lawn unless they form clumps or rows.



(A) H/G>2/3
(G) Before mowing
(H) Best cut grass height: 50 to 80 mm

6. For best appearance, grass must be cut in the afternoon or evening when it is free of moisture.

ADJUSTING THE CUTTING HEIGHT

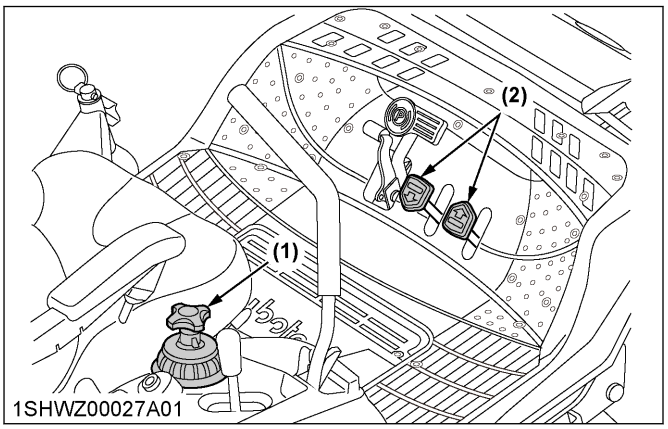
⚠ DANGER

To avoid serious injury or death:

- **Do not engage the mower in the transport position.**

1. Before adjusting the cutting height, check that all tire pressures are correct. If necessary, adjust to the correct tire pressure.
2. To set the cutting height, start engine and depress the hydraulic lift control pedal (UP) to raise mower deck to the top position. Adjust the cutting height control dial to desired height.
   Lower the mower deck by depressing the hydraulic lift control pedal (DOWN).
   Then the mower deck will be set to the cutting height.

3. Use the higher settings for mowing in a rough area or when mowing tall grass. Lower settings must be used only for smooth lawns where short grass is desired.



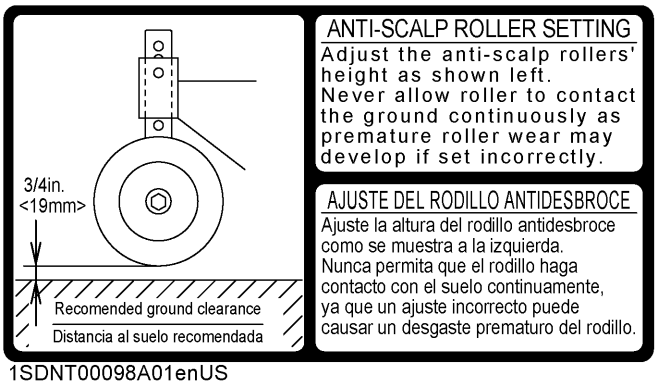
(1) Cutting height control dial
(2) Hydraulic lift control pedal

4. Adjust the anti-scalp rollers' height as recommended below for normal operating condition. To minimize gouging and roller damage or wear, the anti-scalp rollers will maintain the ground clearance of 19 mm (0.75 in.).

IMPORTANT :

- **Never allow the rollers to contact the ground continuously as premature roller wear may develop if set incorrectly.**
- **Anti-scalp rollers must maintain a minimum clearance of 6 mm (0.25 in.) to the ground.**

Bolt setting



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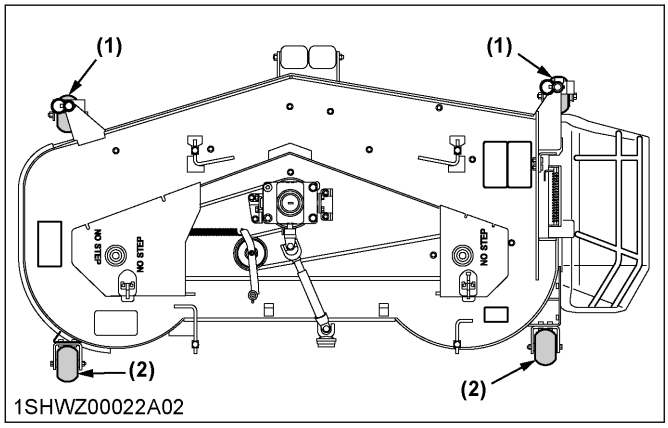
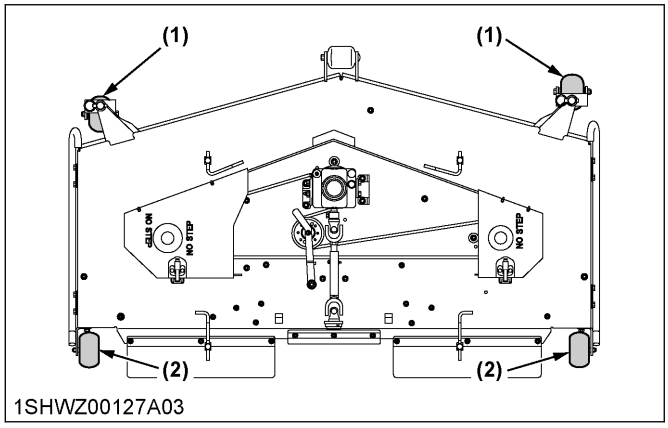
RCK72P



(1) Anti-scalp roller (front, swivel type)
(2) Anti-scalp roller (rear, bolt shift type)

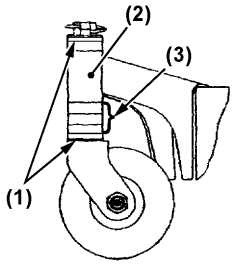
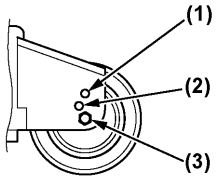
RCK60RP, RCK72RP



(1) Anti-scalp roller (front, swivel type)
(2) Anti-scalp roller (rear, bolt shift type)

1. Cutting height reference chart

- Set position for recommended ground clearance 19 mm (0.75 in.).

Cutting height inch (mm)	The number of collars under the boss	Position of bolts	Ground clearance mm (Ref.)	
			Anti-scalp roller	
	 1SHWZ00005A01 *(1) Plain washer* *(2) Boss* *(3) Collar*	 1SHWZ00018A01	Pin shift type	Bolt shift type
1.00" (25)	0	1	6	6
1.25" (32)	0		13	12
1.50" (38)	0		19	19
1.75" (44)	1		13	25
2.00" (50)	1	2	19	19
2.25" (58)	2		13	25
2.50" (64)	2	3	19	19
2.75" (70)	3		13	25
3.00" (76)	3		19	(31) *1
3.25" (83)	4		13	(38) *2
3.50" (89)	4		19 *3	(44) *2
3.75" (95)	4		13 *2	(51) *2
4.00" (102)	4		19 *2	(57) *2
4.25" (108)	4		13 *2	(63) *2
4.50" (114)	4		19 *2	(70) *2
4.75" (121)	4		25 *2	(76) *2
5.00" (127)	4		31 *2	(83) *2

*1 For cutting heights above 3.0". The anti-scalp rollers will still be effective against scalping.

*2 Use it if necessary.

*3 For cutting heights above 3.5". The anti-scalp rollers will still be effective against scalping.

OPERATING THE MOWER

DANGER

To avoid serious injury or death:

- **Do not operate the mower without the discharge deflector being in place properly.**

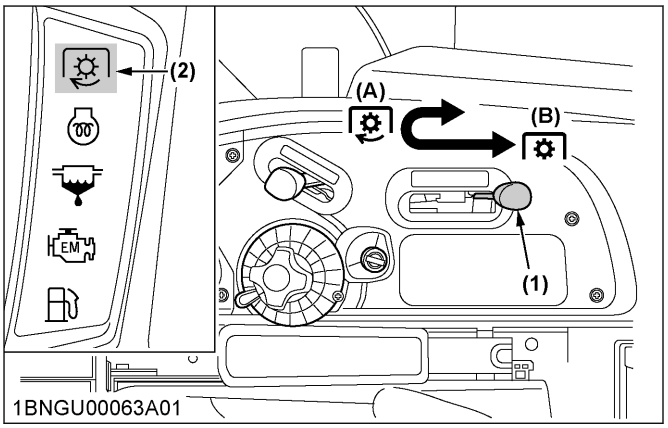
WARNING

To avoid serious injury or death:

- **Clear the work area of objects which might be picked up and thrown.**
- **Do not direct the opening of the discharge deflector at bystanders, especially children, or animals. Discharged objects may cause injury. Plan your mowing carefully before starting the operation.**
- **Keep bystanders and animals away from the mowing area.**
- **Disengage the PTO clutch of the mower before attempting to start the engine.**

1. PTO lever

To engage the PTO, move the PTO lever to the *"ENGAGED"* (ON) position.



(1) PTO lever
(2) PTO clutch indicator
(A) "ENGAGED" (ON)
(B) "DISENGAGED" (OFF)

1. If you get off the seat while the PTO is running, the engine will stop automatically. (Operator presence control)
2. Before starting the engine, pull the PTO lever to the *"DISENGAGED"* (OFF) position. If it is at the *"ENGAGED"* (ON) position, the engine will not start.

   NOTE :
   - **These safety features are built-in.**

2. Starting the machine

WARNING

To avoid serious injury or death:

- **Engine components can get extremely hot from operation. To prevent severe burns, do not touch these areas while the engine is running, or immediately after it is turned off.**
- **Never operate the engine without heat shields or guards.**

1. Sit on the operator's seat.
   Put on the seat belt.
2. Start the engine.
3. Engage the PTO lever.
4. Disengage the parking brake.
5. Speed up the engine by moving the accelerator lever forward.
6. Push or pull the motion control levers to move forward or rearward.

   IMPORTANT :
   - **Never attempt to move the machine with the parking brake *"ENGAGED"* (ON).**

   NOTE :
   - **Keep the engine running at full throttle for best results. Control the travel speed with the motion control levers.**
   - **During heavy duty use, operate the machine at a slower ground speed or go over the area twice.**
   - **Keep the mower deck in the raised position when the mower is disengaged.**
   - **The mower will not cut cleanly if the ground speed is too high or if the blade speed drops due to an overload.**
   - **To prevent the engine from overheating, keep the radiator and radiator screen clean. Check the radiator and radiator screen as often as needed.**

TREATMENT OF MOWER DECK INSIDE SKID

RCK60RP, RCK72RP

NOTE :

- **If you wish to avoid the streaking of grass clippings which remain behind after the grass is cut, removing the skids will help prevent streaks of grass clippings from forming.**

IMPORTANT :

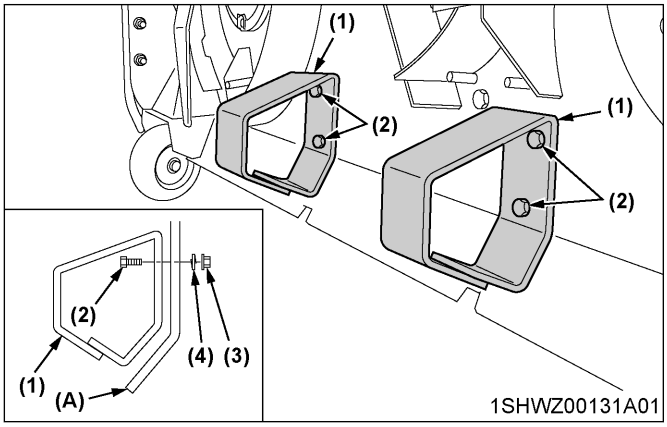
- **Mowing without the skids on a surface that is not properly flat may result in damage to the**

mower deck. Use caution whenever mowing without the skids attached.
- **Mowing without the skids must be done only in locations that are completely flat.**

1. Removing skids

WARNING
To avoid serious injury or death:
- **Park the machine on a firm and level surface.**
- **Apply the parking brake.**
- **Stop the engine and remove the key.**

1. Dismount the mower deck.
   (See DISMOUNTING THE MOWER DECK on page 29.)
2. Stand up the mower deck.
3. Remove 4 bolts as shown in the figure and remove 2 skids.
4. Mount the mower deck.
   (See MOUNTING THE MOWER DECK on page 28.)



(1) Skid
(2) Bolt
(3) Nut
(4) Spring washer
(A) Mower deck

PREVENTING GRASS CLIPPINGS AND DUST FROM SCATTERING

RCK60RP, **RCK72RP**

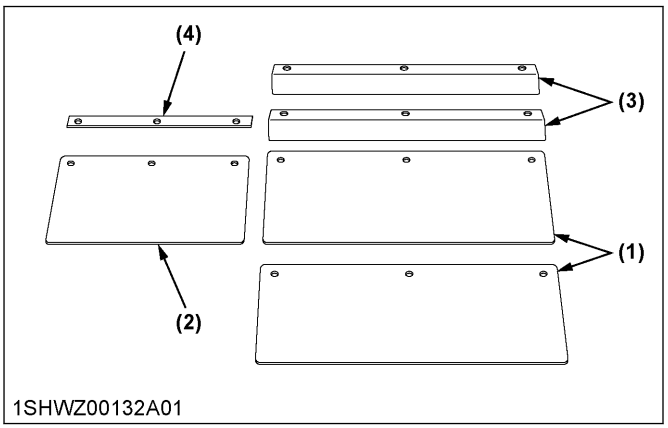
NOTE :
- **Never remove the rubber plates off the mower deck. Grass clippings will scatter and pile up to the hood and surrounding area during mowing. Continuous mowing under these conditions may result in overheating. This machine is equipped with an overheat warning buzzer as standard.**
  Even when the rubber plates are installed, clean the areas around the hood and the transmission at a minimum once every 5 hours.
  (See Checking and cleaning radiator screen and hood screen on page 81.)
- **Be aware that when mowing with the rubber plates installed onto the rear of the mower deck, the cut grass will be left in even clearer lines than usual.**

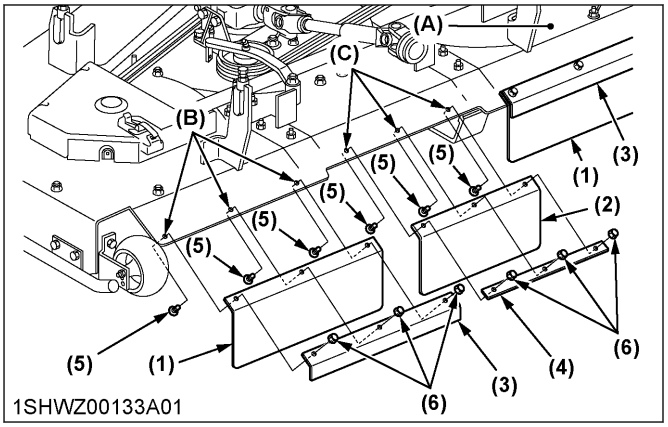
1. Rubber plates installation

WARNING
To avoid serious injury or death:
- **Park the machine on a firm and level surface.**
- **Apply the parking brake.**
- **Stop the engine and remove the key.**

1. Dismount the mower deck.
   (See DISMOUNTING THE MOWER DECK on page 29.)
2. As shown in the figure, use 3 short square neck bolts and 3 flange nuts to install the rubber plate 2 and upper plate 2 onto the rear center of the mower deck. Tighten the bolts securely.
3. As shown in the figure, use 6 short square neck bolts and 6 flange nuts to install the 2 rubber plates 1 and the 2 upper plates 1 onto both sides of the mower deck. Tighten the bolts securely.

4. Mount the mower deck.
   (See MOUNTING THE MOWER DECK on page 28.)





(1) Rubber plate 1 (both sides)
(2) Rubber plate 2 (center)
(3) Upper plate 1 (both sides)
(4) Upper plate 2 (center)
(5) Short square neck bolt
(6) Flange nut
(A) Mower deck
(B) Hole for installing upper plate 1
(C) Hole for installing upper plate 2

TIRES AND WHEELS

TIRES

⚠ WARNING

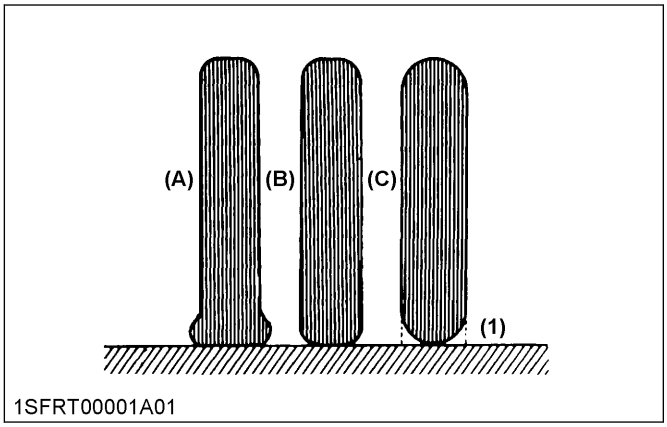
To avoid serious injury or death:

- **Do not attempt to mount a tire. 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.**
- **The inflation pressure in the front tires rises quickly when using compressed air.**
- **Never operate the machine with a loose rim, wheel, or axle.**
- **Whenever bolts and nuts are loosened, retighten to the specified torque.**
- **Check all the bolts and nuts frequently and keep them tightened.**

1. Inflation pressure

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

	Tire sizes	Recommended inflation pressure
Front	15 × 6.5 - 8, Smooth semi-pneumatic tire	–
Rear	26 × 12.0 - 16, 4PR turf low profile tire	83 kPa 0.84 kgf/cm^2 12 psi



(1) Ground

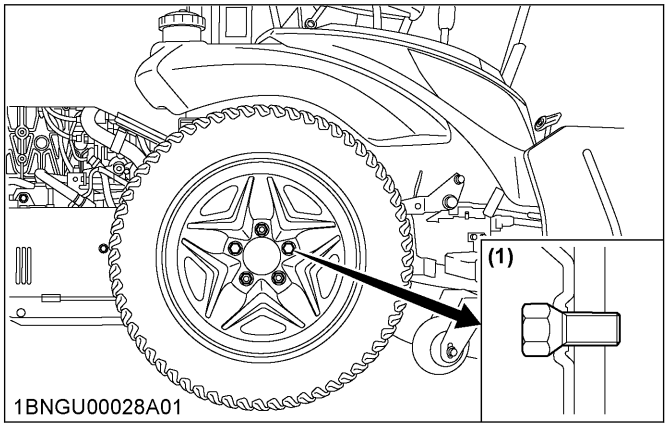
(A) "INSUFFICIENT"
(B) "NORMAL"
(C) "EXCESSIVE"

WHEELS

IMPORTANT :

- **When refitting a wheel, tighten the wheel bolts and nuts to the following torques then recheck after traveling 200 m (200 yards), changing directions several times.**

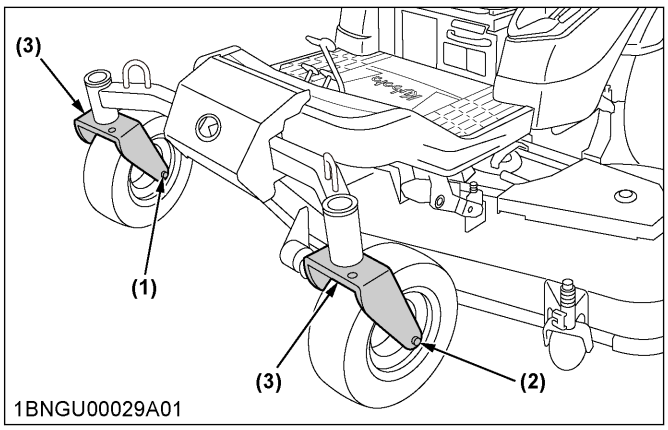
Rear



(1) 108.5 to 130.2 N·m
80 to 96 lbf·ft
11.1 to 13.3 kgf·m

When using wheels with beveled or tapered holes, use tapered wheel bolts and nuts.

1. Removing the front caster wheels

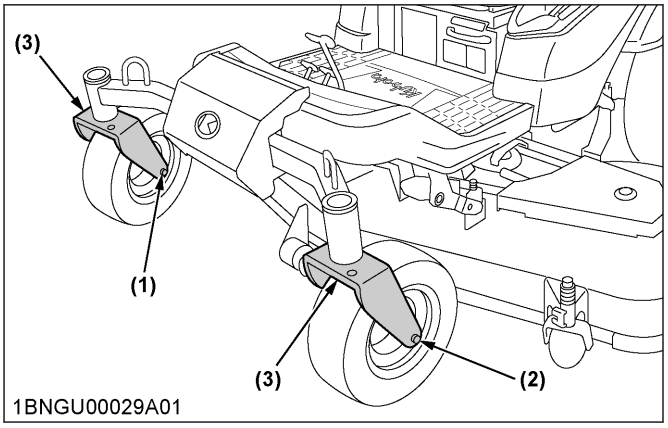


(1) Lock nut
(2) Wheel bolt
(3) Yoke

1. Park the machine on a firm and level surface.
2. Stop the engine and apply parking brake.
3. Lift the front of machine with a safe lifting device.

4. Remove the lock nut and the wheel bolt. Then remove the wheel cap.
5. Remove the wheel from assembly yoke.

2. Installing the front caster wheels



(1) Lock nut
(2) Wheel bolt
(3) Yoke

1. Install the replacement wheel.
2. Install the wheel cap with the wheel bolt and the lock nut.
3. Tighten the nut.

IMPORTANT :
- **Insert the wheel bolt from the outside of the yoke.**
- **Tighten the nut gradually until the wheel bearing play is eliminated and the wheel turns freely by hand.**

Tightening torque	20 to 25 N·m 14.8 to 18.4 lbf·ft 2 to 2.5 kgf·m

4. Lower the machine.

PERIODIC SERVICE

OPENING THE HOOD, FRONT COVER AND STEP

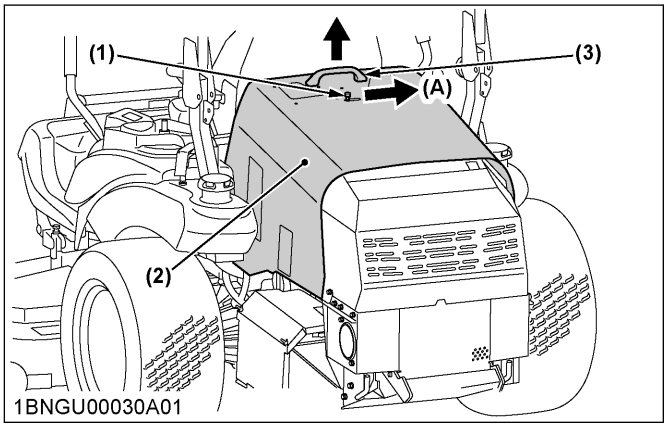
⚠ WARNING

To avoid serious injury or death from contact with moving parts:

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

1. Hood

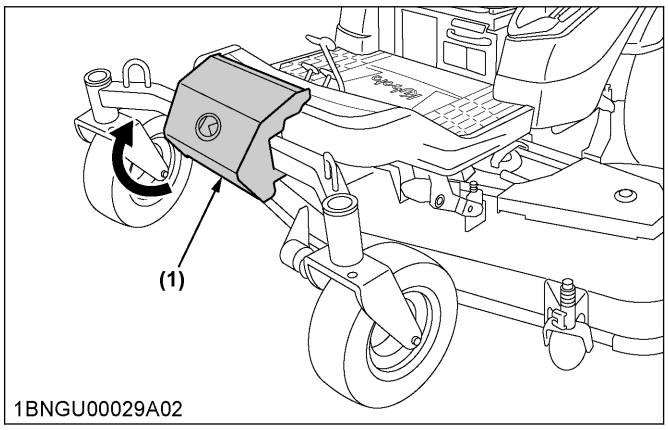
1. To open the hood, pull the latch lever to right. Lift the grip.



(1) Latch lever *(A) "RELEASE"*
(2) Hood
(3) Grip

2. Front cover

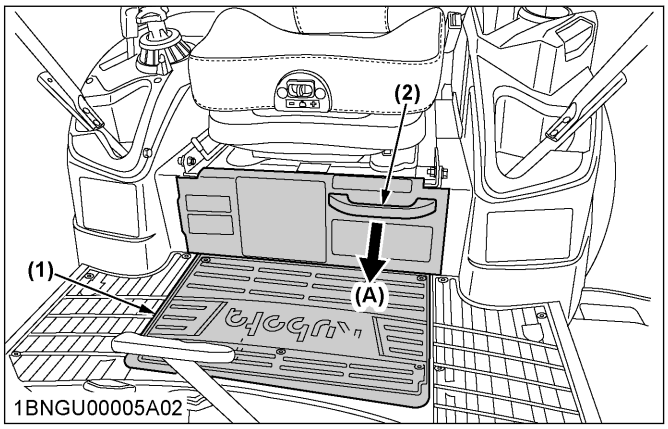
1. To open the front cover, pull the bottom edge of the front cover.



(1) Front cover

3. Step

1. To open the step, move the seat to the backmost position. Then pull the grip.



(1) Step *(A) "PULL"*
(2) Grip

RAISING AND LOWERING THE OPERATOR'S SEAT

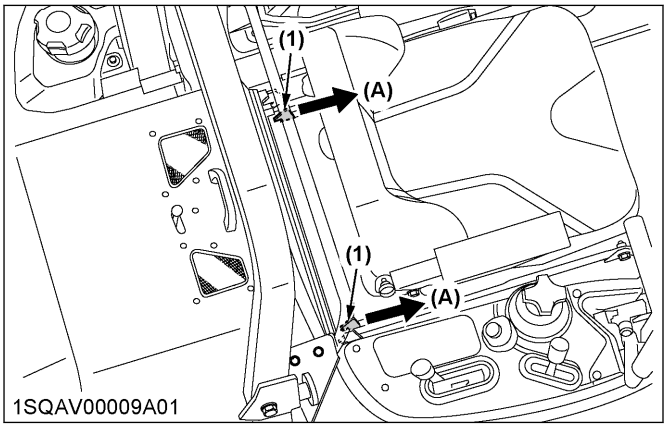
Raising

⚠ WARNING

To avoid serious injury or death:

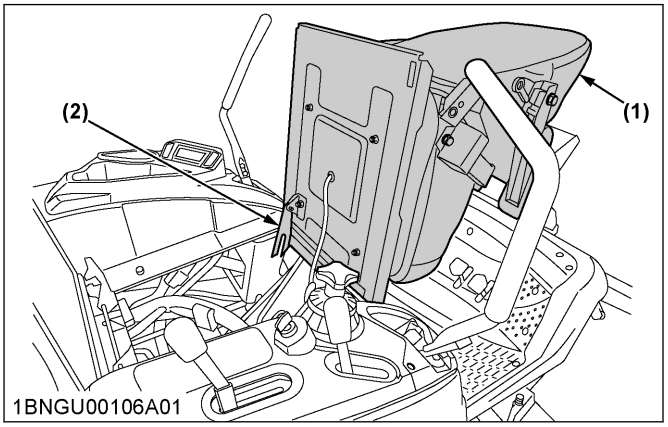
- **Fully raise the operator's seat.**
  (To the locked position)
  Do not keep the seat halfway.

1. Seat must be all the way back before raising.
2. Pull the latch lever on the seat panel frontward.



(1) Latch lever *(A) "PULL"*

3. Raise the operator's seat to the *"LOCK"* position.



(1) Operator's seat
(2) Seat support

Lowering

⚠ WARNING

To avoid serious injury or death:

- **Do not drop the seat to close it.**
- **Watch your hands. Do not place your hands under the seat, when closing.**

1. Pull up the seat support rod and release the *"LOCK"*.
2. Lower the seat slowly to lock.
3. Slide the seat to proper position.

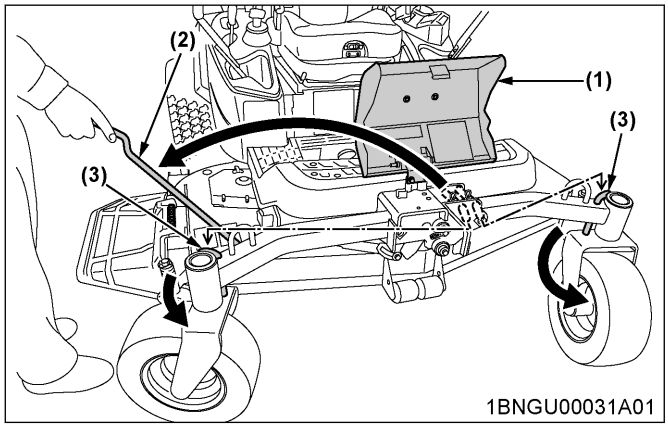
TILTING UP THE MACHINE

⚠ WARNING

To avoid serious injury or death:

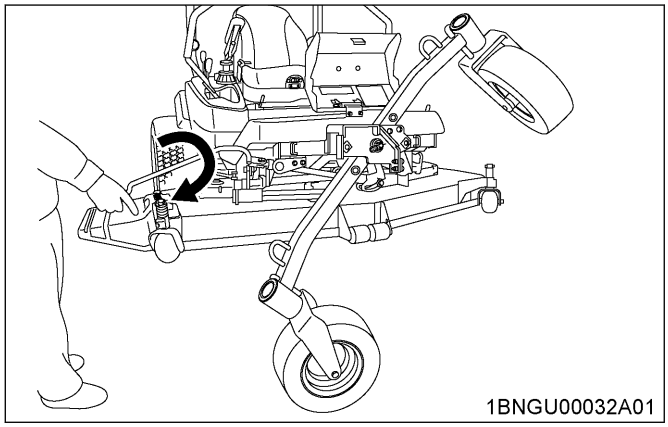
- **Park the machine on a firm and level surface.**
- **Set the mower deck height to 5 inch.**
- **Stop the engine, remove the key and engage the parking brake.**
- **Chock the wheels.**
- **Lock the raised axle with an L-pin and snap pin before working under the machine.**

1. Lower the forward right anti-scalp roller to the lowest position.
2. Fully open the front cover.
3. Unfold the tilt lever.
4. Keep the front cover opened.
5. Remove 2 L-pins.
6. Insert L-pins to both sides of the front axle to position the front wheels. As shown below.



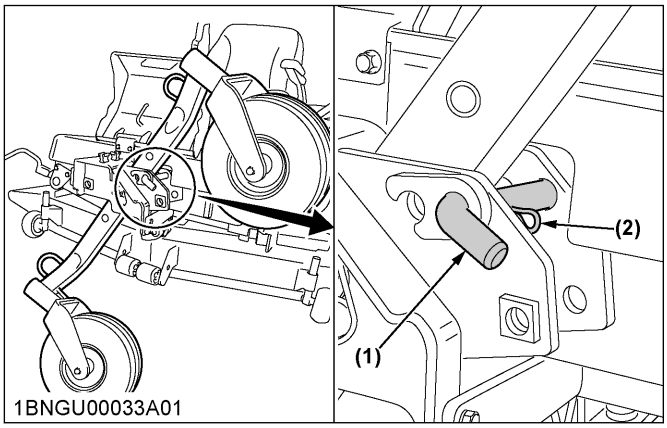
(1) Front cover
(2) Tilt lever
(3) L-pin

7. Turn the tilt lever clockwise to raise the axle to the stop.



8. Remove the L-pin of the raised wheel and insert it to the outside hole of the frame.

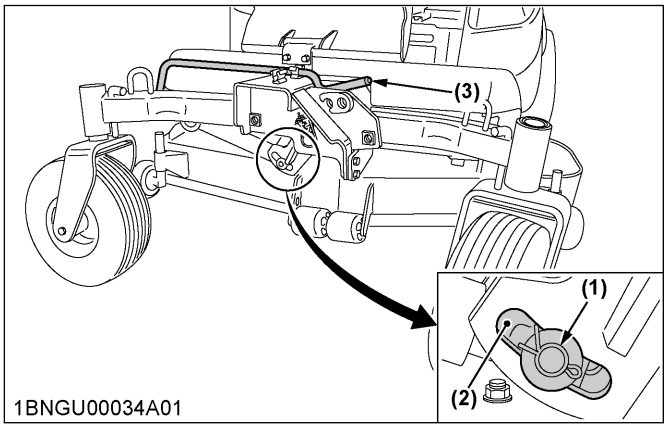
9. Insert the snap pin.



(1) L-pin
(2) Snap pin cotter

Return to the normal position.
Reverse to the above procedure.

IMPORTANT :
- **To ensure equal oscillation of the axle and prevent loss of parts.**
  Be sure the clevis pin returns to the center position of the front axle arm slot.
  And install removed parts.



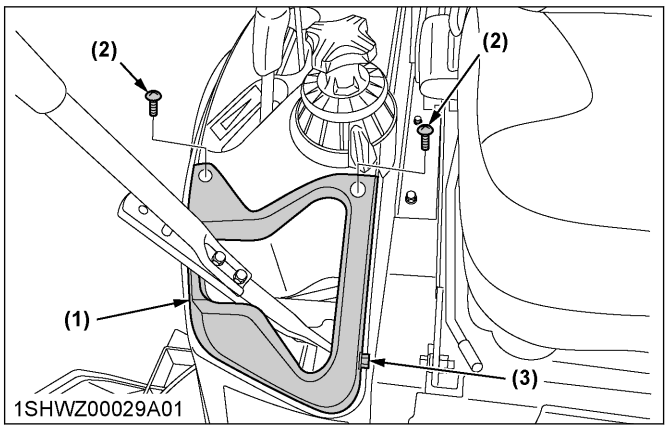
(1) Clevis pin
(2) Slot
(3) Tilt lever

OPENING THE LEVER GUIDE

⚠ WARNING
To avoid serious injury or death:
- **Park the machine on a firm and level surface.**
- **Stop the engine, remove the key and apply the parking brake.**

1. Remove the screw of the lever guide.
2. Pull up the lever guide.

How to install the lever guide.
1. Install the lever guide.
2. Tighten the screw, nut and washers.

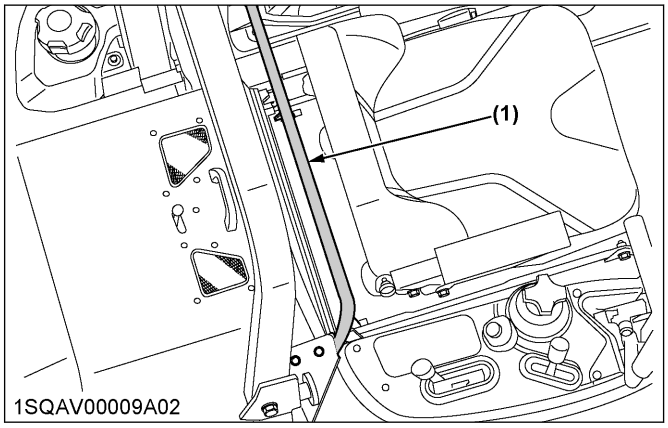


(1) Lever guide
(2) Screw
(3) screw, nut and washers

LIFT-UP POINT

⚠ WARNING
To avoid serious injury, death or machine damage:
- **Do not work under the machine unless it is secured by safe stands or suitable blocking.**

IMPORTANT :
- **When you lift the unit, do not lift the bypass pipe between the fuel tanks LH and RH.**

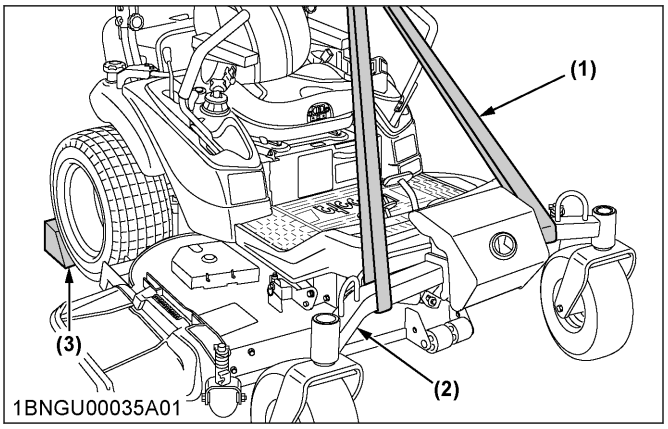


(1) Bypass pipe

1. Front side:

1. Lift the front axle with nylon slings. Or jack up the front axle.
   Never lift up the mower deck.

   IMPORTANT :
   - **When you use nylon slings or a jack, block rear wheels with chocks.**
   - **Do not lift using the tie-down points.**

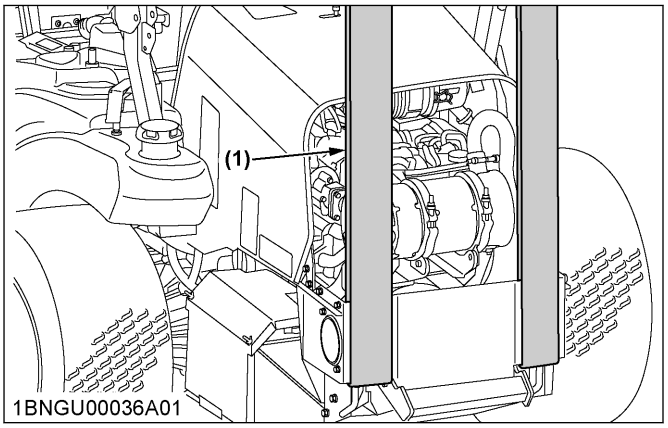


(1) Nylon sling
(2) Front axle
(3) Chock

2. Rear side:

1. Remove the DPF cover with Kubota mark.
2. Lift the rear frame with a nylon sling.
   Never lift up the engine oil pan or battery support.
3. When reassembling, make sure that flammable materials are not in contact with the DPF muffler and the surroundings of the exhaust pipe.

   IMPORTANT :
   - **When you use a nylon sling or a jack, block front wheels with chocks.**



(1) Nylon sling

LUBRICANTS, FUEL AND COOLANT

<table>
<tr><th rowspan="2">Place</th><th colspan="3">Capacities</th><th colspan="2" rowspan="2">Lubricants</th></tr>
<tr><th>ZD1611LF</th><th>ZD1611RLF</th><th>ZD1611RL</th></tr>
<tr><td>Fuel</td><td colspan="3">49 L (12.9 U.S.gals.)</td><td colspan="2">• No.2-D diesel fuel
• No.1-D diesel fuel if temperature is below -10 ℃ (14 ℉)</td></tr>
<tr><td>Coolant</td><td colspan="3">4.6 L (4.86 U.S.qts.)</td><td colspan="2" rowspan="2">Fresh clean water with antifreeze</td></tr>
<tr><td>Recovery tank</td><td colspan="3">0.6 L (0.6 U.S.qts.)</td></tr>
<tr><td>Engine crankcase</td><td colspan="3">4.3 L (4.54 U.S.qts.) *1</td><td colspan="2">• Engine oil: API service Classification CJ-4
Above 25 ℃...SAE30, SAE10W-30 or 15W-40 (77 ℉)
0 to 25 ℃.....SAE20, SAE10W-30 or 15W-40 (32 to 77 ℉)
Below 0 ℃.....SAE10W, SAE10W-30 or 15W-40 (32 ℉)</td></tr>
<tr><td>Transmission case with filter and hose
Rear axle gear case (RH and LH)</td><td colspan="3">12.1 L (12.8 U.S.qts.)</td><td colspan="2">• Kubota SUPER UDT-2 fluid *2</td></tr>
<tr><td rowspan="2">Mower gear box</td><td>—</td><td colspan="2">0.4 L (0.42 U.S.qts.) *3</td><td colspan="2">Gear oil: API Service Category: more than GL-3, SAE 90</td></tr>
<tr><td>0.5 L (0.52 U.S.qts.)</td><td colspan="2">0.4 L (0.42 U.S.qts.) *3</td><td colspan="2">Gasoline engine oil: API Service Category: SH or higher, SAE 10W-30</td></tr>
<tr><td>Greasing</td><td colspan="3">No. of greasing points</td><td>Capacity</td><td>Type of grease</td></tr>
<tr><td>King pin</td><td colspan="3">2</td><td rowspan="11">Until grease overflows</td><td rowspan="11">• Multipurpose EP2 Grease (NLGI Grade No.2)</td></tr>
<tr><td>Center pin</td><td colspan="3">1</td></tr>
<tr><td>Front wheel</td><td colspan="3">2</td></tr>
<tr><td>Rear mower link bushing</td><td colspan="3">4</td></tr>
<tr><td>Front mower link bushing</td><td colspan="3">2</td></tr>
<tr><td>Tilt lever</td><td colspan="3">1</td></tr>
<tr><td>Universal joint</td><td colspan="3">3</td></tr>
<tr><td>Seat adjuster</td><td colspan="3">2</td></tr>
<tr><td>Parking brake lock pedal</td><td colspan="3">1</td></tr>
<tr><td>Bonnet latch</td><td colspan="3">1</td></tr>
<tr><td></td><td colspan="3">MOWER</td><td colspan="2"></td></tr>
<tr><td>Universal joint</td><td colspan="3">3</td><td rowspan="7">Until grease overflows</td><td rowspan="7">• Multipurpose EP2 Grease (NLGI Grade No.2)</td></tr>
<tr><td>3 spindle shafts</td><td colspan="3">3</td></tr>
<tr><td>Belt tension pulley</td><td colspan="3">1</td></tr>
<tr><td>Belt tension pivot</td><td colspan="3">1</td></tr>
<tr><td>Front anti scalp roller pivot boss</td><td colspan="3">2</td></tr>
<tr><td>Front anti scalp roller</td><td colspan="3">2</td></tr>
</table>

*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.

*3 Check a label on the mower gear box to know which oil you must use in it. (See Checking gear box oil level on page 88 or Changing gear box oil on page 95.)

IMPORTANT :

- **To prevent serious damage to gears, bearings and oil seals, do not mix different kinds of oil.**
- **To prevent serious damage to hydraulic systems, use only Kubota genuine fluid or its equivalent.**

Fuel:

- Cetane number of 45 is minimum. Cetane number greater than 50 is preferred, especially for temperatures below -20 ℃ (-4 ℉) or elevations above 1500 m (5000 ft).
- If diesel fuel with sulfur content greater than 0.5 % (5000 ppm) sulfur content is used, reduce the service interval for engine oil and filter by 50 %.
- Never use diesel fuel with sulfur content greater than 0.05 % (500 ppm) for external EGR type engine.
- Do not use diesel fuel with sulfur content greater than 1.0 % (10000 ppm).
- 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)
- If the engine is to be operated within the European Union on diesel or non-road gas-oil, a fuel with sulfur content lower than 10 mg/kg (20 mg/kg at point of final distribution), a cetane number greater than 45 and a fatty acid methyl ester (FAME) content lower than 7 % volume per volume (v/v) shall be used.

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 in the previous table.
- Refer to the following table for the suitable API classification engine oil according to the engine type (with Diesel Particulate Filter (DPF) type engines) and the fuel.

Fuel used	**Engine oil classification (API classification)**
	Oil class of engines with DPF
Ultra low sulfur fuel <0.0015 % (15 ppm)	**CJ-4**

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 oil.
  Super UDT-2 is a proprietary Kubota formulation that deliveries 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.

1. Biodiesel fuel (BDF)

B0-B20 Biodiesel fuels (BDF): mixed diesel fuels containing 20 % or less biodiesel can be utilized under the following conditions.

IMPORTANT :

- **Refueling and handling fuel should be done with caution in order to avoid contact with the fuel and spillage that could create a potential environmental or fire hazard. Wear appropriate protective equipment when refueling.**

Applicable BDF:

1. Blended diesel fuels containing 6 % through 20 % BDF (B6 - B20) which comply with American Society for Testing and Materials (ASTM) D7467 Standard, as revised, can be used without adversely affecting the performance and durability of the engine and fuel system components.
2. Any mineral oil diesel fuel, if used, must conform to ASTM D975 (or the European EN590) standard, as revised.
   B100 fuel used to make biodiesel blended fuels must meet ASTM D6751 (or EN14214) standard, as revised.
   The final blended fuel B20 must conform to ASTM D7467 standard, as revised.
   Straight vegetable oil is not allowed in any blended fuel.
3. Allowable blended fuel is mineral oil diesel fuel blended with B100 (that is 100 % BDF).
   The blended fuel ratio shall be less than 20 % B100 and 80 % or more diesel fuel.
   The B100 source used for biodiesel blends must be purchased from an accredited BQ-9000 marketer or producer.
   More information about qualified marketer(s) and producer(s) can be found at http://www.bq-9000.org .

Preparation:

1. Before using BDF concentrations greater than B5, you are advised to replace the engine oil, engine oil filter and fuel filter with new oil and filters.
   Details regarding the replacement procedures can be found in a different section.
   (See MAINTENANCE on page 84.)

Product warranty, emission and other precautions:

1. The engine emission control system was certified according to current regulations based on the use of non-BDF. When using BDF, the owner is advised to check applicable local and federal emission regulations and comply with all of them.
2. BDF may cause restricted or clogged fuel filters during cold weather conditions, resulting in the engine not operating properly.
3. BDF encourages the growth of microorganisms which may cause degradation of the fuel.
   This in turn may cause fuel line corrosion or reduce fuel filter flow earlier than expected.
4. BDF inherently absorbs moisture which may cause degradation of the fuel earlier than expected.
   To avoid this, drain the water separator and fuel filter port often.
5. Do not use biodiesel concentrations higher than 20 % (that is greater than B20).
   Engine performance and fuel consumption will be affected, and degradation of the fuel system components may occur.
6. Do not readjust the engine fuel control system as this will violate emission control levels for which the equipment was approved.
7. Compared with soybean-based and rapeseed-based feedstock, palm oil-based feedstock has a thicker consistency (that is, higher viscosity) at lower temperatures.
   Consequently, fuel filter performance may be reduced, particularly during cold weather conditions.
8. The Kubota warranty, as specified in the owner's warranty information guide, only covers defects in product materials and workmanship. Accordingly, any problems that may arise due to the use of poor quality fuels that fail to meet the previous requirements, whether biodiesel or mineral oil based, are not covered by the Kubota warranty.

Routine handling:

1. Avoid spilling BDF onto painted surfaces as this may damage the finish.
   If fuel is spilled immediately wipe clean and flush with soapy water to avoid permanent damage.
2. When using BDF, you are advised to maintain a full tank of fuel, especially overnight and during short term storage, to reduce condensation within the tank. Tighten the fuel cap after refueling to prevent moisture build up within the tank. Water in the biodiesel mixture will damage fuel filters and may damage engine components.

Maintenance requirements when using BDF B0 through B5:
Follow the recommended oil change intervals.
(See MAINTENANCE on page 84.)
Extended oil change intervals may result in premature wear or engine damage.

Maintenance requirements when using BDF B6 through B20:
The maintenance intervals for fuel related parts changes.
See the following table for the new maintenance intervals.

Items		Interval	Remarks
Fuel filter element	Replace	Every 200 hrs	Consult your local Kubota Dealer for this service.
Fuel line	Check	Every 6 months	Replace if any deterioration (crack, hardening, scar, or deformation) or damage occurred.
	Replace	Every 2 years	Consult your local Kubota Dealer for this service.

Long term storage:
1. BDF easily deteriorates due to oxygen, water, heat and foreign substances.
   Do not store B6 through B20 longer than 1 month and B5 longer than 3 months.
2. When using B6 through B20 and storing the machine longer than 1 month, drain the fuel from the tanks and replace with light mineral oil diesel fuel.
   Subsequently, run the engine at least 30 minutes to remove all of the biodiesel from the fuel lines.
3. When using B5 fuel and storing machine longer than 3 months, drain the fuel from the tanks and replace with light mineral oil diesel fuel.
   Subsequently, run the engine at least 30 minutes to remove all of the biodiesel from the fuel lines.

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 or death:
- **Check and service the machine on a level surface with the engine shut off, the key removed and the parking brake securely set or the rear wheels chocked.**

	Check item	Ref. page
Walking around the machine	Tire pressure, wear and damage	68, 82
	Oil and water leak	97, 98, 99, 101, 104
	Fuel level	78
	Engine oil level	78
	Transmission oil level	80
	Coolant level in the radiator and the recovery tank	80

(Continued)

	Check item	Ref. page
Walking around the machine	Damage of machine body, tightness of all bolts and nuts	—
	Machine body cleaning	—
	Radiator screen	81
	Hood screen	81
	Inside of the hood	81
	Brake play	92
	Air cleaner primary element	90
	DPF muffler and its surroundings	82
	Clean cut grass in engine bottom cover (**ZD1611RL**, **ZD1611RLF**)	82
	Clean around the mower belt.	81
	Clean the hot surface. For example, exhaust manifold or muffler.	—
Mower	Oil leak	88
	Make sure blade bolts are tight.	108
	Belt and blades wear or damage	108
	Around the mower belt	81
	Check all hardware.	—
	Make sure all pins are properly in place.	28

(Continued)

	Check item	Ref. page
Mower	Mower deck cleaning	108
	Greasing • Universal joint • 3 spindle shafts • Belt tension pulley • Belt tension pivot • Front anti-scalp roller pivot boss • Front anti-scalp roller	83
While sitting in the operator's seat	Motion control levers move smoothly.	111
	Parking brake turns *"ON"*, *"OFF"* smoothly.	92
Turning the key switch *"ON"*	Performance of the Easy checker™ light	46
Starting the engine	Color of the exhaust fumes	46
	Check for abnormal noise and vibration.	46
	Engine start system/OPC system. If either of these do not operate properly, contact your local Kubota Dealer immediately.	87, 87
Others	Check the areas where previous trouble was experienced.	–

1. Checking the engine oil level

⚠ WARNING

To avoid serious injury or death:

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

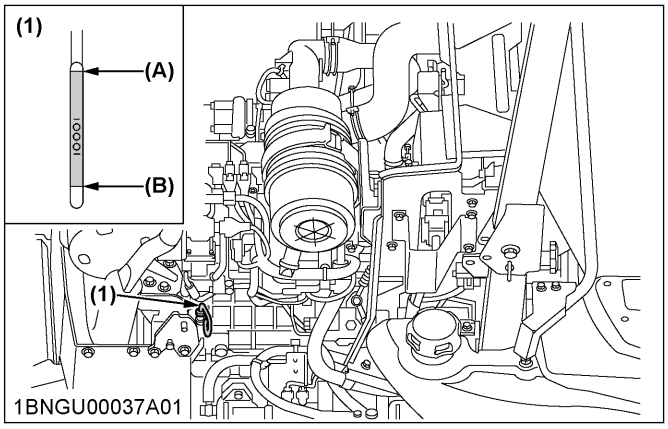
IMPORTANT :

- **When using a different brand or viscosity oil from the previous one, remove all of the old oil and the oil filter. Never mix 2 different types of oil.**
- **Use the proper SAE engine oil according to the ambient temperature.**
  (See LUBRICANTS, FUEL AND COOLANT on page 74.)

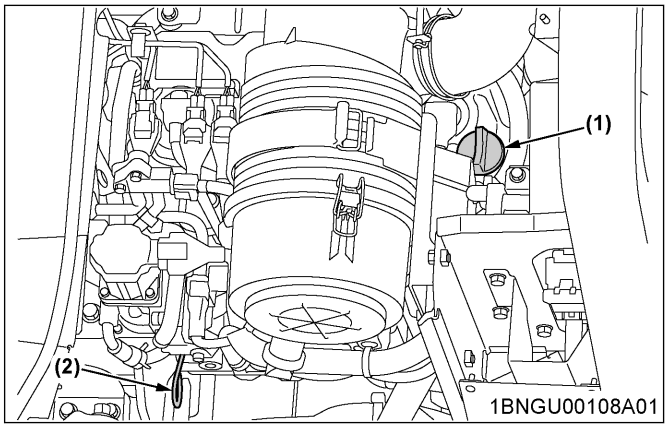
1. Check the engine oil before starting and 5 minutes or more after the engine has stopped.
2. Wipe the dipstick area clean.
3. To check the oil level, remove the dipstick, wipe it clean, replace it, and draw it out again. Check to see that the oil level is between the 2 notches.
4. If the level is too low, add the new oil to the prescribed level at the oil port.
   (See LUBRICANTS, FUEL AND COOLANT on page 74.)

IMPORTANT :

- **Always use a funnel when pouring oil into the engine oil port.**



(1) Oil level dipstick
(A) "UPPER LEVEL"
(B) "LOWER LEVEL"



(1) Engine oil port
(2) Oil level dipstick

2. Checking the amount of fuel and refueling

⚠ WARNING

To avoid serious injury or death:

- **Handle the fuel carefully. If the engine is running, do not fill the fuel tank. If the engine is hot, let the engine cool down several minutes before adding fuel.**
- **Do not smoke while filling the fuel tank or servicing the fuel system. Fill the fuel tank only to the bottom of the filler neck.**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Check the fuel level. Take care that the fuel tank does not become empty.

Fuel tank capacity	49 L (12.9 U.S.gals.)

IMPORTANT :
- **Use diesel fuel only**

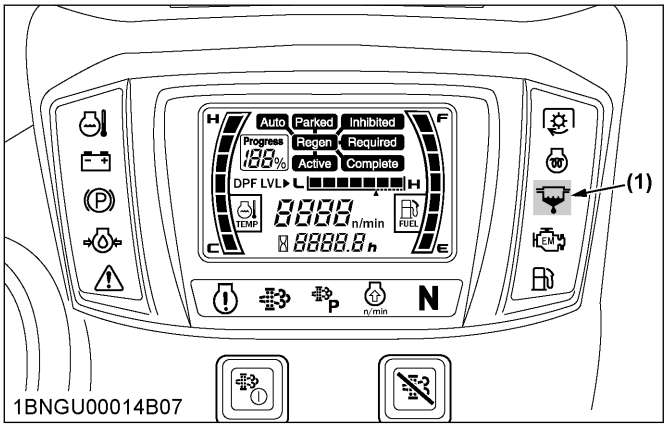
1. Use No.2 diesel fuel.
2. Use No.1 diesel fuel if the temperature is below -10 ℃ (14 ℉).
3. Always use a strainer when refueling to prevent fuel injection pump contamination.

IMPORTANT :
- **Do not permit dirt or trash or water to get into the fuel system.**
- **Be careful not to empty the fuel tank otherwise air will enter the fuel system, necessitating bleeding before next engine start.**
- **Be careful not to spill fuel during refueling. If a spill should occur, wipe it off at once, or it may cause a fire. Avoid generating any sparks, static or otherwise, during fueling.**
- **To prevent condensation (water accumulation) in the fuel tank, fill the tank before parking overnight.**
- **When refueling, basically fill both fuel tanks full.**
- **In the case you have a small amount of fuel, if fuel is still in the fuel tank RH, fill the fuel tank LH first.**
- **The fuel gauge shows the fuel level of fuel tank RH. When the fuel gauge flashes, fill fuel as soon as possible.**
- **When the fuel gauge flashes, do not fill fuel on a slope. Air can get into the fuel system, causing the engine to stall.**
- **If the engine stalled with some remaining in the fuel tank RH, close the fuel valve of fuel tank LH and you can operate.**

3. Checking water separator

IMPORTANT :
- **After completing the following procedure, the cover must be reinstalled. Operating the machine without the cover can lead to damage to the fuel components.**

1. The water collection level in the water separator is shown by a red float that can be seen through the panel grate located behind the right-hand rear wheel.
2. When the water has collected up to the upper limit in the water separator, the water separator warning indicator on the instrument panel lights up and a warning buzzer sounds.



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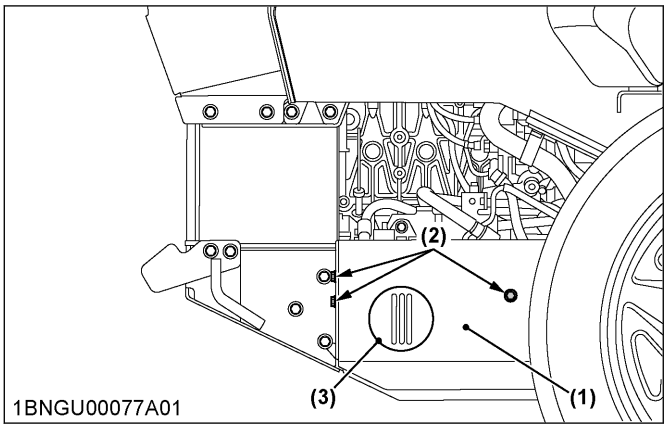
(1) Water separator warning indicator

3. In this case, remove the 3 bolts and the cover.



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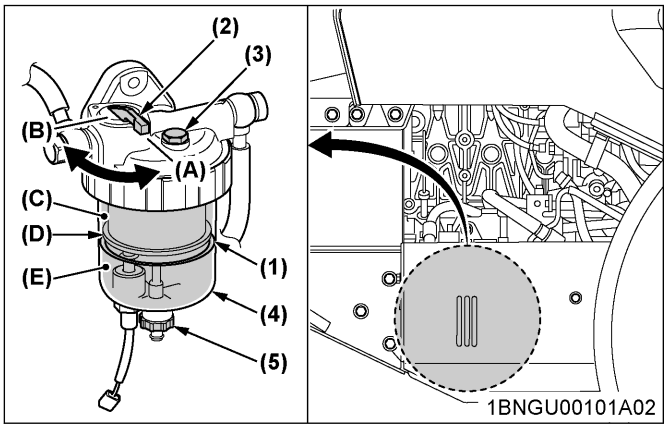
(1) Cover
(2) Bolt
(3) Panel grate

4. Close the fuel shutoff-valve and loosen the air plug and drain plug by several turns.



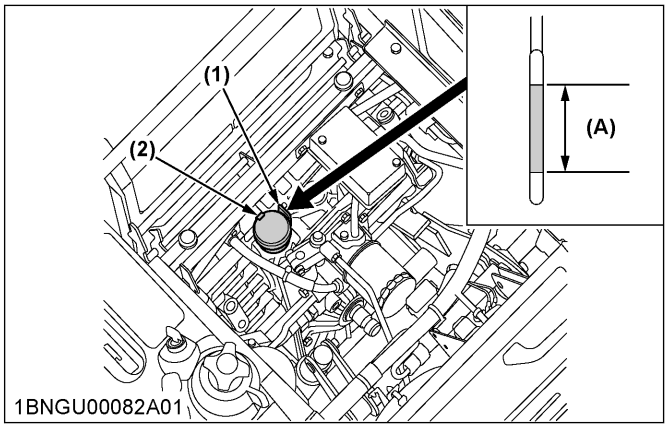
(1) Red float
(2) Fuel shutoff-valve
(3) Air plug
(4) Cup
(5) Drain plug
(A) "OPEN"
(B) "CLOSE"
(C) "FUEL"
(D) "UPPER LIMIT"
(E) "WATER"

5. Allow the water to drain. When no more water comes out and fuel starts to flow out, retighten the air plug and drain plug.
6. Bleed the fuel system.
(See Bleeding fuel system on page 107.)
7. Reinstall the cover.

4. Checking transmission oil level

⚠ WARNING
To avoid serious injury or death:
- **Allow the transmission case to cool down sufficiently when cleaning its surface.**

1. Park the machine on a flat surface, lower the implement to the ground and shut off the engine and remove the key.
Allow the machine to idle for 1-3 minutes, and then check fluid.
2. Raise and lock the operator's seat.
3. 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 the new oil to the prescribed level at the oil inlet.
(See LUBRICANTS, FUEL AND COOLANT on page 74.)



(1) Oil level dipstick
(2) Oil plug and breather cup
(A) Oil level is acceptable within this range.

NOTE :
- **If oil level is low, do not run engine.**

5. Checking coolant level

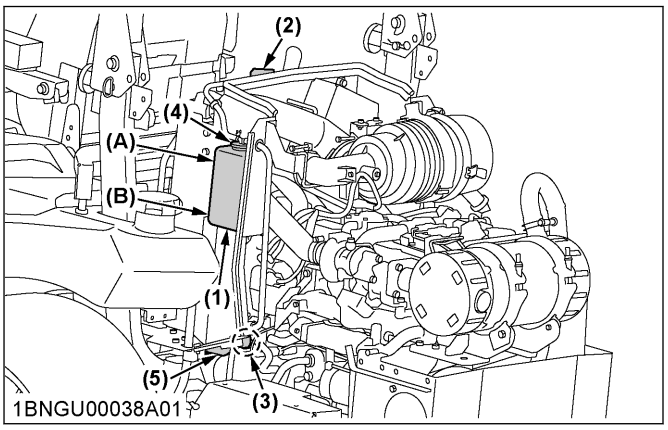
⚠ WARNING
To avoid serious injury or death:
- **Do not remove the radiator cap when the engine is hot. Then loosen cap slightly to the stop to relieve any excess pressure before removing cap completely.**

IMPORTANT :
- **Start engine with the hood closed.**
- **If the radiator cap has to be removed, follow the caution above and securely retighten the cap.**
- **Use clean, distilled water and antifreeze to fill the radiator and the recovery tank.**
- **If water should leak, consult your local Kubota Dealer.**

Check the coolant level daily for 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 antifreeze and water in the specified mixing ratio up to the full level.
(See Flushing cooling system and changing coolant on page 101.)

4. Check radiator hoses for wear, cracks, bubbles or leaks. If any such are found, repair immediately.
(See Replacing radiator hose on page 105.)



(1) Recovery tank
(2) Radiator cap
(3) Lower hose band
(4) Recovery tank cap
(5) Radiator hose
*(A) **[FULL]***
*(B) **[LOW]***

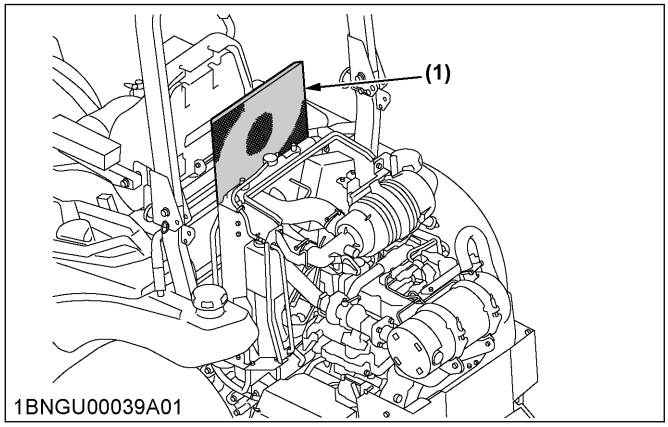
6. Checking and cleaning radiator screen and hood screen

⚠ WARNING
To avoid serious injury or death:
- **Stop the engine and remove the key before checking and cleaning.**
- **Engine components can get extremely hot from operation. To prevent severe burns, do not touch these areas while the engine is running, or immediately after it is turned off.**
- **Never operate the engine without heat shields or guards.**

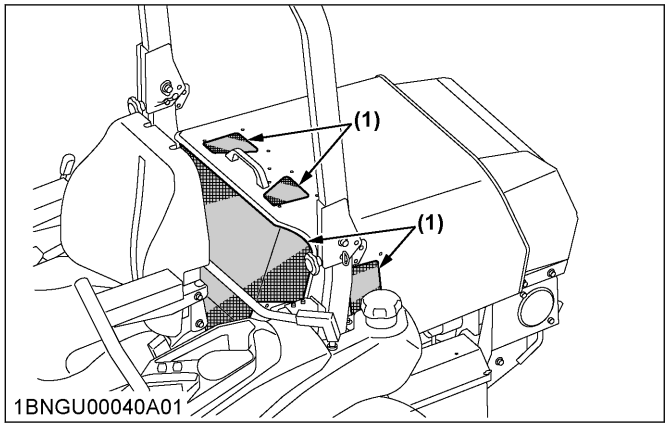
IMPORTANT :
- **The air intake area must be clear of debris to prevent the engine from overheating.**

Daily or after every 5 hours of operation, check to be sure the radiator screen and the hood screen are clean (required more often in dusty conditions).
Dirt or chaff on the radiator screen, hood screen or radiator decrease cooling performance.

1. Remove the radiator 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. Details regarding this procedure can be found in a different section.
(See 3. Adjusting fan drive belt tension on page 91.)
4. If the scale forms in the tube, clean with the scale inhibitor or its equivalent.
5. Each time the hood 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.
6. If the dust or chaff has accumulated inside of the hood, remove the radiator screen and clean inside completely.
After cleaning, replace the radiator screens properly.
7. Check the radiator for dust or chaff build up.
If the dust or chaff has accumulated in the radiator, clear with air pressure (not to exceed 30 psi) or a hose.



(1) Radiator screen



(1) Hood screen

7. Checking and cleaning inside of the hood and around the mower belt to avoid fire hazard

⚠ WARNING
To avoid serious injury or death:
- **Stop the engine and remove the key before checking and cleaning.**

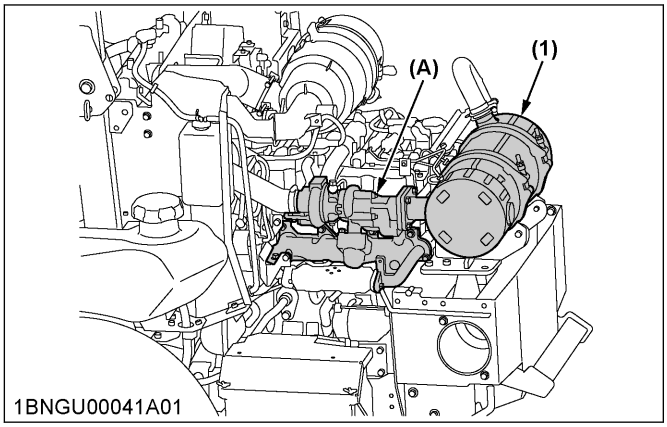
- **Engine components can get extremely hot from operation. To prevent severe burns, do not touch these areas while the engine is running, or immediately after it is turned off.**
- **Never operate the engine without heat shields or guards.**

Check and clean inside of the hood and around the mower belt. Especially, dry grass and leaves around the exhaust manifold, the muffler or around the mower belt may ignite.
After using, air-blowing and pressure-washing, make sure there is nothing flammable around the exhaust manifold, the muffler or around the mower belt. Grass, twigs, dirt or chaff in the hood may cause fire.

8. Checking and cleaning DPF muffler and its surroundings

⚠ WARNING
To avoid serious injury or death:
- **Before checking or cleaning the DPF muffler, stop the engine and wait long enough until it is cooled down.**

Check the DPF muffler and its surroundings for build-up of anything flammable. Otherwise a fire may result.



(1) DPF muffler *(A) Surrounding parts*

9. Checking the tire pressure

⚠ WARNING
To avoid serious injury or death:
- **Park the machine on a firm and level surface.**
- **Apply the parking brake.**
- **Stop the engine and remove the key before checking the tire pressure.**
- **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.**

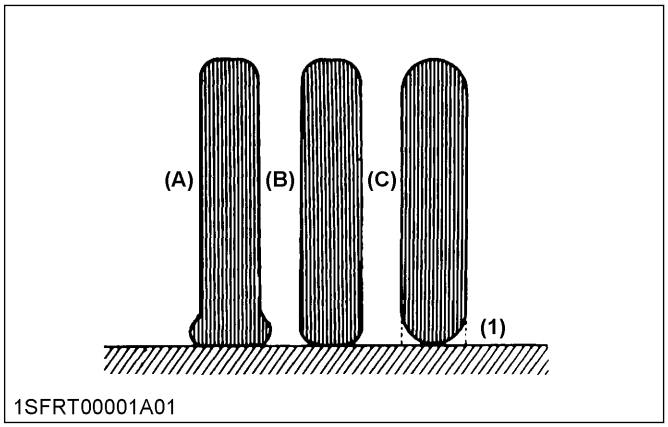
The inflation pressure in the front tires rises quickly when using compressed air.
Do not inflate the tires above the recommended pressure shown in the Operator's Manual.

IMPORTANT :
- **Do not use tires other than specified.**

9.1 Inflation pressure

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

	Tire sizes	Recommended inflation pressure
Front	15 × 6.5 - 8, Smooth semi-pneumatic tire	—
Rear	26 × 12.0 - 16, 4PR turf low profile tire	83 kPa 0.84 kgf/cm^2 12 psi



(1) Ground
(A) "INSUFFICIENT"
(B) "NORMAL"
(C) "EXCESSIVE"

10. Checking movable parts

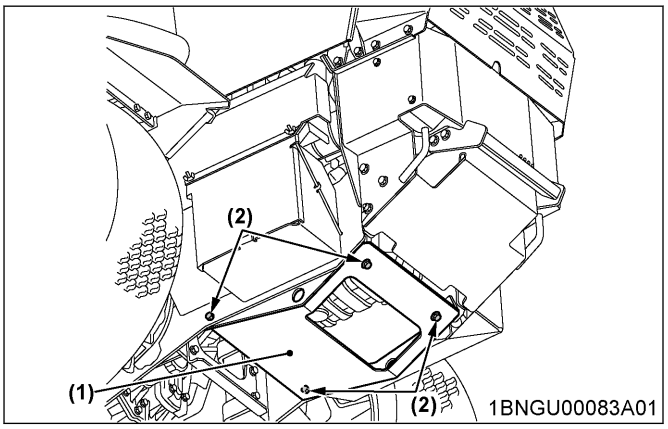
If any of the movable parts, such as levers and pedals, cannot be smoothly moved because of rust or anything sticky, do not attempt to force it into motion.
In this case, remove the rust or the sticky object, and apply oil or grease on the relevant spot. Otherwise, the machine may get damaged.

11. Cleaning cut grass in the bottom cover

⚠ WARNING
To avoid serious injury or death:
- **Stop the engine and remove the key before cleaning.**

RCK60RP, **RCK72RP**

1. Remove the 4 bolts and the bottom cover.
2. Clean out all the cut grass.
3. After cleaning, reinstall the bottom cover.



(1) Bottom cover
(2) Bolt

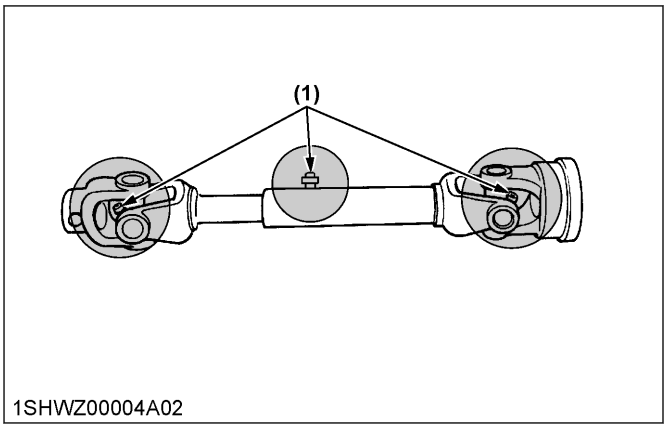
12. Lubricating all grease fittings

⚠ WARNING

To avoid serious injury or death:

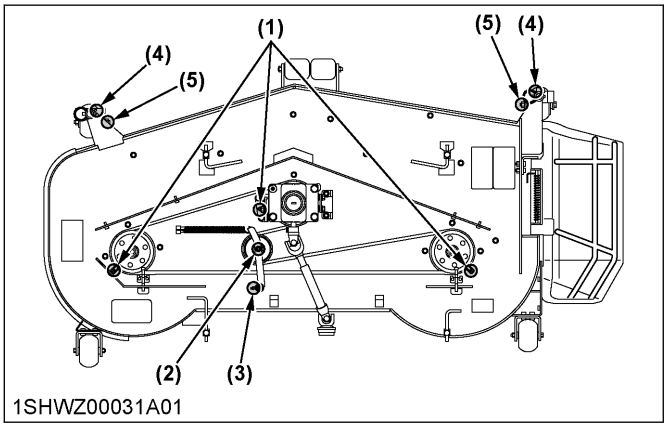
- **Stop the engine and remove the key before greasing.**

Grease the following locations.

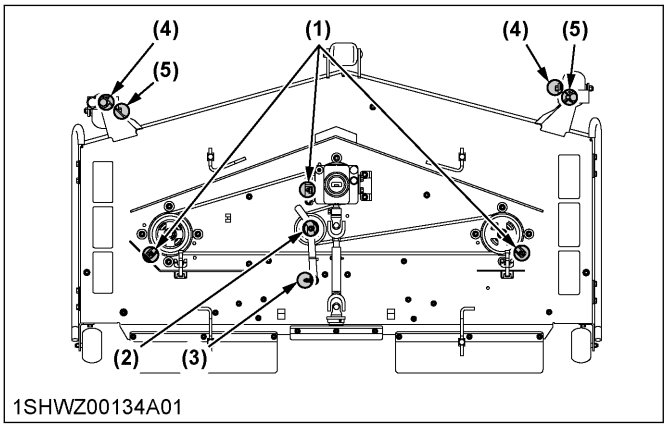


(1) Mower universal joint

RCK72P



RCK60RP, RCK72RP



(1) Spindle shaft
(2) Belt tension pulley
(3) Belt tension pivot
(4) Front anti-scalp roller pivot boss
(5) Front anti-scalp roller

MAINTENANCE

SERVICE INTERVALS

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

Items		Indication hour meter (Hr)												Interval	Ref. page		
		50	100	150	200	250	300	350	400	450	500	550	600				
Engine start system	Check	●	●	●	●	●	●	●	●	●	●	●	●	every 50Hr	87		
OPC system	Check	●	●	●	●	●	●	●	●	●	●	●	●	every 50Hr	87		
Mower gear box oil	Check	●	●	●	●	●	●	●	●	●	●	●	●	every 50Hr	88		
	Change			●			●			●			●	every 150Hr	95		
Except mower and mower link bushings	Grease	●	●	●	●	●	●	●	●	●	●	●	●	every 50Hr	89		
Mower link bushings, pivot	Grease		●		●		●		●		●		●	every 100Hr	93		
Air cleaner primary element	Clean		●		●		●		●		●		●	every 100Hr	90	*1	
	Replace													every 1000Hr or 1 year	101	*2	@
Air cleaner secondary element	Replace													every 1000Hr or 1 year	101	*2	
Fan belt	Adjust		●		●		●		●		●		●	every 100Hr	91	*3	
Parking brake	Adjust		●		●		●		●		●		●	every 100Hr	92	*3	
Battery condition	Check		●		●		●		●		●		●	every 100Hr	93	*4	
Engine oil	Change	◎			●				●				●	every 200Hr	97	*5	
Engine oil filter	Replace	◎			●				●				●	every 200Hr	97	*5	
Transmission oil filter (HST)	Replace	◎			●				●				●	every 200Hr	97	*5	
Front axle pivot	Adjust		◎		●				●				●	every 200Hr	98	*6	
Transmission oil and rear axle gear case (RH and LH) fluid	Change								◎					every 400Hr	98		
Hydraulic oil filter	Replace								●					every 400Hr	99		
Water separator	Replace								●					every 400Hr	100		
Fuel filter	Replace								●					every 400Hr	101		
Engine valve clearance	Adjust													every 800Hr	101	*7	
Fuel injection nozzle injection pressure	Check													every 1500Hr	101	*7	@
EGR cooler	Check													every 1500Hr	101	*7	
Radiator	Clean													every 2000Hr or 2 years	101	*8	
Coolant	Change													every 2000Hr or 2 years	101	*8	
Injection pump	Check													every 3000Hr	103	*7	@
Turbo charger	Check													every 3000Hr	103	*7	@
EGR system	Check													every 3000Hr	103	*7	
Supply pump	Check													every 3000Hr	103	*7	
DPF muffler	Clean													every 3000Hr to 6000Hr	103	*7	

(Continued)

Items		Indication hour meter (Hr)													Ref. page		
		50	100	150	200	250	300	350	400	450	500	550	600	Interval			
Exhaust manifold	Check													every 1 year	104	*7	@
Fuel line	Check													every 1 year	104	*3 *9	@
	Replace													every 4 years	105	*7	
Radiator hose and clamp	Check													every 1 year	104	*3 *9	
	Replace													every 4 years	105	*3	
Hydraulic hose	Check													every 1 year	104	*3 *9	
	Replace													every 4 years	105	*7	
Intake air line	Check													every 1 year	105	*3 *9	@
	Replace													every 4 years	105	*3	
Engine breather hose	Check													every 1 year	105	*7 *9	
	Replace													every 4 years	105	*7	
Mower gear box oil seal	Check													every 1 year	105	*7 *9	
	Replace													every 4 years	105	*7	
Fuel system	Bleed													Service as required	107		
Fuse	Replace														106		
Blade	Replace														108		
Mower belt	Replace														109		

*1 Air cleaner must be cleaned more often in dusty conditions than in normal conditions.

*2 Every 1000 hours or every 1 year whichever comes faster.

*3 If you feel you are unable to make this service correctly and safely, contact your local Kubota Dealer.

*4 When the battery is used for less than 100 hours per year, check the battery condition by reading the indicator annually.

*5 The initial 50 hours is not the scheduled maintenance cycle.

*6 The initial 100 hours should not be an adjustment cycle.

*7 Consult your local Kubota Dealer for this service.

*8 Every 2000 hours or every 2 years whichever comes faster.

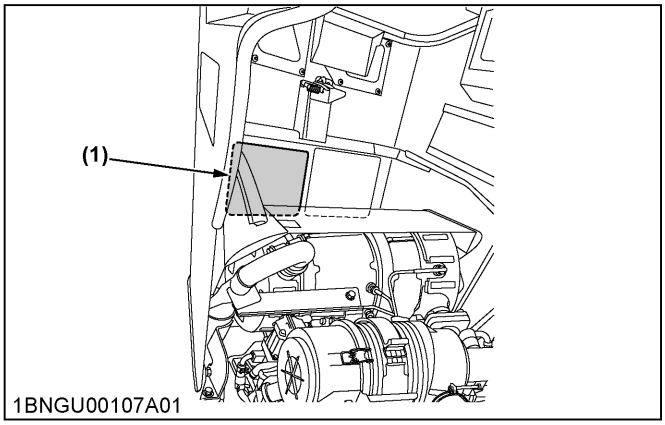
*9 Replace if any deterioration (crack, hardening, scar, or deformation) or damage occurred.

IMPORTANT :

- **The jobs indicated by ◎ are initial break-in services.**
- **The items listed above (@ marked) are registered as emission related critical parts by Kubota in the U.S.EPA non-road emission regulation. As the engine owner, you are responsible for the performance of the required maintenance on the engine according to the above instruction.**
  See the Warranty Statement in detail.
- **When using biodiesel, check the maintenance requirements of biodiesel fuel as the intervals will change in some of the items.**

PERIODIC SERVICE CHART LABEL

This label is for your quick reference. The label shows the recommended services from daily to every 4 years, including fluid capacities, tire pressure and so on.
For more details, refer to *the MAINTENANCE and PERIODIC SERVICE section of the Operator's Manual*.



1BNGU00107A01

(1) Part No. K3452-6552-3 (ENGLISH)

PERIODIC SERVICE CHART

INTERVAL		RECOMMENDED SERVICE ※
DAILY	CHECK	1. Tire pressure, wear, or damage. 2. Oil and water leakage from machine and mower. 3. Engine and transmission oil, radiator and recovery tank coolant, fuel level, and water separator (ZD1611). 4. Damage to machine body, tightness of all bolts, nuts and pins, etc. 5. Mower blades and belt for wear or damage. 6. Parking brake, speed control levers, all safety switches and easy checker functions. 7. Color of the exhaust fumes, abnormal noise and vibrations.
	CLEAN	・Radiator screen and core, panel screen, air cleaner primary element and mower deck. ★
	GREASE	・Mower U-joint (3 places) / Spindle shaft (3 places) / Belt tension pulley (1 place) / Belt tension pivot (1 place)
FIRST 50 Hr. 【BREAK-IN】 (MUST BE DONE.)	REPLACE	・Engine & HST Transmission oil filters (2 places)
	CHANGE	・Engine oil
FIRST 100 Hr. (MUST BE DONE.)	ADJUST	・Front axle pivot
FIRST 400 Hr. (MUST BE DONE.)	REPLACE	・Hydraulic oil filter
	CHANGE	・Transmission & Rear axle gear case (RH & LH) fluid

※ : See Operator's Manual in details.
☆ : Should be serviced by KUBOTA Dealer.
★ : Required more often in dusty conditions.
■ : Replace if necessary.
● : Replace for maximum of every 4 years.
▲ : Whichever comes first.

INTERVAL		RECOMMENDED SERVICE ※
EVERY	50 Hr.	CHECK ・Mower gear box oil / Engine start system / OPC system
		OIL ・Throttle cable (2 places)
		GREASE ・Front axle and wheel (5 places) / Universal joint (3 places) / Seat adjuster (2 places) / Tilt lever / Parking brake lock pedal
	100 Hr.	CHECK ・Fuel filter element (ZD1211) / Battery condition
		CLEAN ・Air cleaner primary element ★
		ADJUST ・Fan belt / Parking brake ☆
		GREASE ・Mower link bushing (6 places)
	150 Hr.	CHANGE ・Mower gear box oil
	200 Hr.	REPLACE ・Engine oil filter / HST transmission oil filter
		CHANGE ・Engine oil
		ADJUST ・Front axle pivot / Motion control lever pivot
	400 Hr.	REPLACE ・Fuel filter element ☆ / Hydraulic oil filter / Water separator (ZD1611)
		CHANGE ・Transmission & Rear axle gear case (RH & LH) fluid
	800 Hr.☆	ADJUST ・Engine valve clearance
	1500 Hr.☆	CHECK ・Fuel Injection Nozzle Injection Pressure / EGR cooler (ZD1611)
	3000 Hr.☆	CHECK ・Injection Pump / Turbo charger (ZD1611) / EGR system (ZD1611) / Supply pump (ZD1611)
	3000 - 6000Hr.☆	CLEAN ・DPF muffler (ZD1611)
	1 year	CHECK ☆■● ・Radiator hose and clamp / Hydraulic hose / Fuel line / Intake Air Line / Mower gear box oil seal / Engine breather hose / Exhaust manifold (ZD1611)
	1 year/1000Hr.▲	REPLACE ・Air cleaner both elements
	2 year/2000Hr.▲	CLEAN ・Radiator
		CHANGE ・Coolant

Approximate fluid capacities. unit : L (qts.)

	ZD1211 ZD1211L	ZD1211R ZD1211RL	ZD1611LF	ZD1611RL ZD1611RLF
Engine	3.9 (4.10)		4.3 (4.54)	
Radiator	3.5 (3.70)		4.6 (4.86)	
Transmission	12.1 (12.8)			
Reserve tank	0.25 (0.26)		0.6 (0.63)	
Mower gear box	0.5 (0.52)	0.4 (0.42)	0.5 (0.52)	0.4 (0.42)

Tire pressure and tightening torque recommendation.

Front	15 x 6.5 - 8 (NO FLAT)	NO NEED	Ensure smooth rotation of wheel. 〈Do not over tighten.〉
Rear	26 x 12.0 - 16	83 KPa (12.0 psi)	108.5 - 130.2 Nm (80.0 - 96.0 ft･lbs)

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EVERY 50 HOURS

1. Checking the engine start system

The engine start system in your machine is designed to protect you while operating. Check the engine start system periodically (daily is best) to test the function of the engine start system before operation.

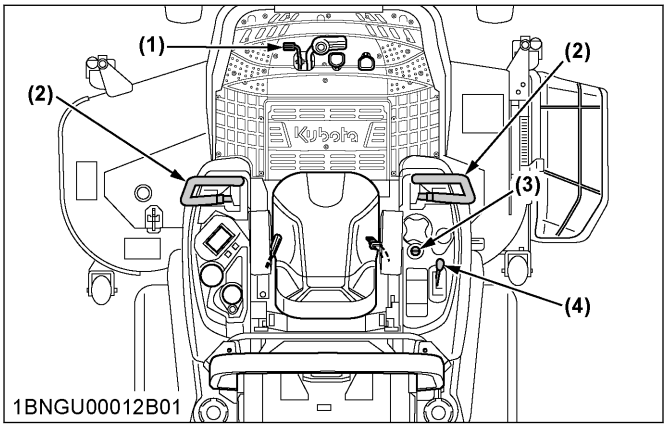
⚠ WARNING

To avoid serious injury or death:

- **Park the machine on a firm and level surface.**
- **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 the operator's seat for all tests except for test 1.**

IMPORTANT :

- **Test the following before operating the machine:**



(1) Parking brake lock pedal
(2) Motion control lever
(3) Key switch
(4) PTO lever

Test 1 (operator not on the seat)

1. Securely set the parking brake.
2. Set the PTO lever to the *"DISENGAGE"* (OFF) position.
3. Set the motion control levers to the *"NEUTRAL LOCK"* position.
4. Turn the key switch to the *"START"* position.
5. The engine must not crank.

Test 2 (operator on the seat)

1. Do not set the parking brake (release it from test 1).
2. Set the PTO lever to the *"DISENGAGE"* (OFF) position.
3. Set the motion control levers to the *"NEUTRAL LOCK"* position.
4. Turn the key switch to the *"START"* position.
5. The engine must not crank.

Test 3 (operator on the seat)

1. Securely set the parking brake.
2. Shift the PTO lever to the *"DISENGAGE"* (OFF) position.
3. Grasp the motion control levers and move them inward from the *"NEUTRAL LOCK"* position to the *"NEUTRAL"* position and then release the levers.
4. Turn the key switch to the *"START"* position.
5. The engine must not crank.

Test 4 (operator on the seat)

1. Securely set the parking brake.
2. Shift the PTO lever to the *"ENGAGE"* (ON) position.
3. Set the motion control levers to the *"NEUTRAL LOCK"* position.
4. Turn the key switch to the *"START"* position.
5. The engine must not crank.

NOTE :

- **If the engine cranks in tests 1 through 4, consult your local Kubota Dealer to have the unit checked before operation.**

Test 5 (operator on the seat)

1. Start the engine.
2. Keep the parking brake securely set.
3. Shift the PTO lever to the *"DISENGAGE"* (OFF) position.
4. Grasp the motion control levers and move them inward from the *"NEUTRAL LOCK"* position to the *"NEUTRAL"* position and then release the levers.
5. The engine must shut off after a short time delay.

IMPORTANT :

- **For this test only, the engine will shut off in a few seconds.**

NOTE :

- **If the engine keeps running in test 5, consult your local Kubota Dealer to have the unit checked before operation.**

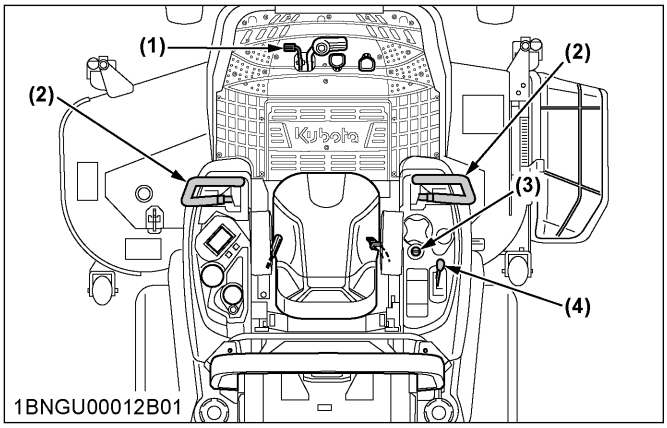
2. Checking the OPC system

The operator presence control (OPC) system in your machine is designed to protect you while operating. Check the OPC system periodically (daily is best) to test function of the OPC system before operation.

⚠ WARNING

To avoid serious injury or death:

- **Park the machine on a firm and level surface.**
- **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.**



(1) Parking brake lock pedal
(2) Motion control lever
(3) Key switch
(4) PTO lever

Test 1 (operator on the seat)
1. Start the engine.
2. Do not set the parking brake.
3. Shift the PTO lever to the *"DISENGAGE"* (OFF) position.
4. Grasp the motion control levers and move them inward from the *"NEUTRAL LOCK"* position to the *"NEUTRAL"* position and then release the levers.
5. Stand up. Do not get off the machine.
6. The engine must shut off.

Test 2 (operator on the seat)
1. Start the engine.
2. Do not set the parking brake.
3. Shift the PTO lever to the *"ENGAGE"* (ON) position.
4. Stand up. Do not get off the machine.
5. The engine must shut off.

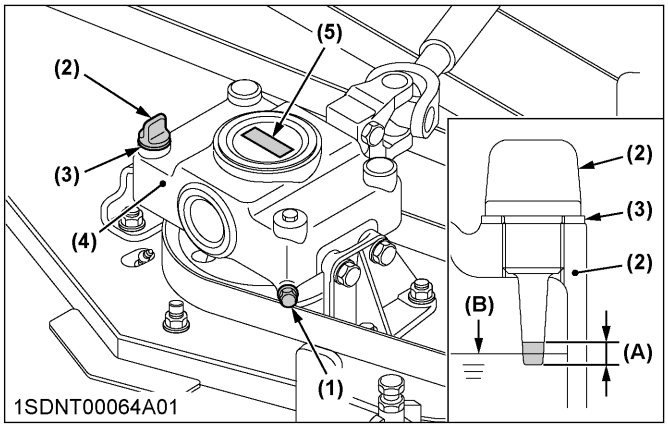
NOTE :
- **If the engine keeps running in tests 1 through 2, consult your local Kubota Dealer to have the unit checked before operation.**

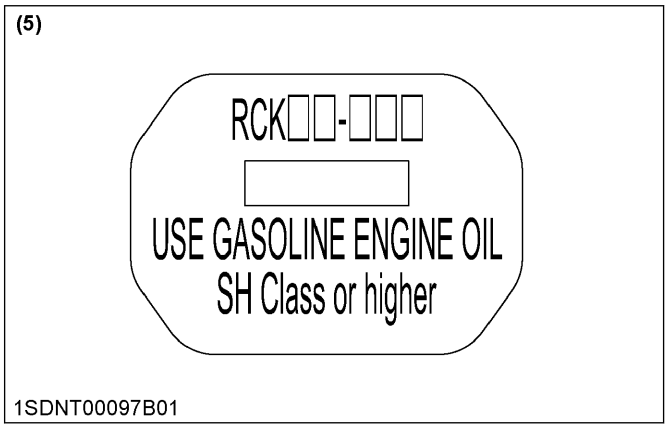
3. Checking gear box oil level

⚠ WARNING
To avoid serious injury or death:
- **Always stop the engine and remove the key before checking oil.**

1. Park the machine on a flat surface and lower the mower to the ground.
2. To check the oil level, loosen the oil inlet plug with gauge, wipe it clean, reinstall it and loosen it again. (See the following figures.)
   Check to see if the oil level is between the notch and tip.
   If the level is too low, add new oil to the prescribed level at the oil inlet.
   (See LUBRICANTS, FUEL AND COOLANT on page 74.)
3. For **RCK72P**, use gasoline engine oil: 0.5 L (0.52 U.S.qts.).
   (API Service Category: **SH** or higher, SAE 10W-30)

RCK72P





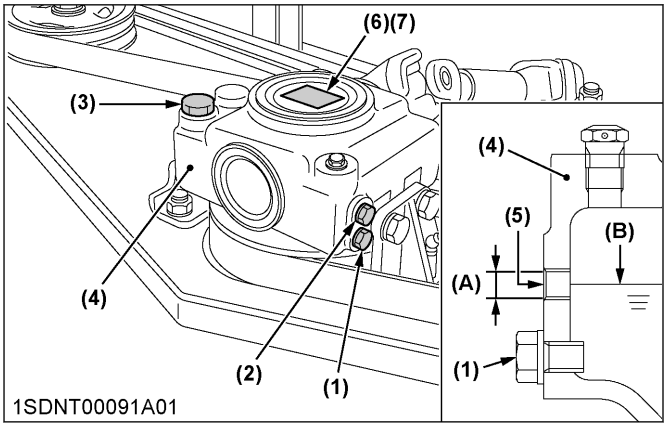
(1) Drain plug
(2) Oil inlet plug with gauge
(3) Seal washer
(4) Gear box
(5) Octagonal label
(A) Oil level is acceptable within this range.
(B) Oil level

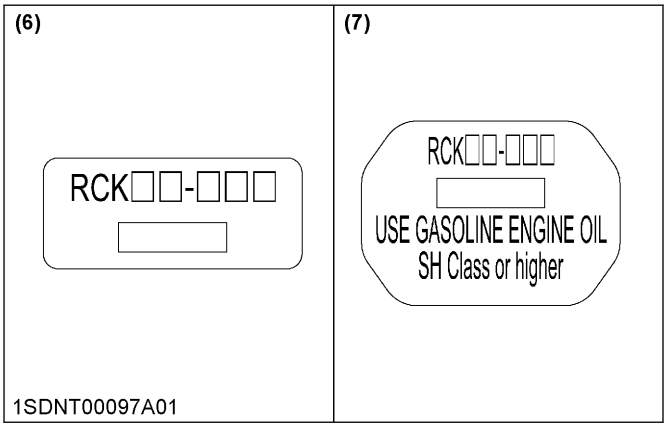
4. For (**RCK60RP**, **RCK72RP**), check the label on the gear box before adding new oil.

Label	(6)	(7)
Oil type	Gear oil	Gasoline engine oil
Capacity	0.4 L (0.42 U.S.qts.)	
SAE	SAE 90	SAE 10W-30
API Service Category	More than GL-3	**SH** or higher

IMPORTANT :
- **To prevent serious damage to gears, bearings and oil seals, do not mix different kinds of oil.**

RCK60RP, RCK72RP





(1) Drain plug
(2) Check plug
(3) Oil inlet plug
(4) Gear box
(5) Check plug port
(6) Rectangular label
(7) Octagonal label
(A) Oil level is acceptable within this range.
(B) Oil level

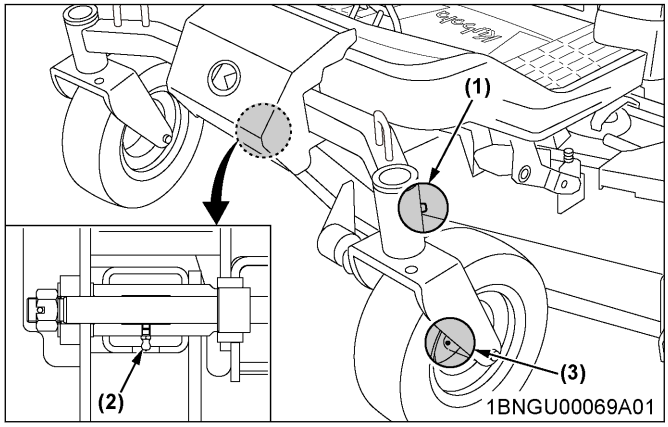
5. After checking, reinstall the oil inlet plug with gauge securely.

4. Greasing

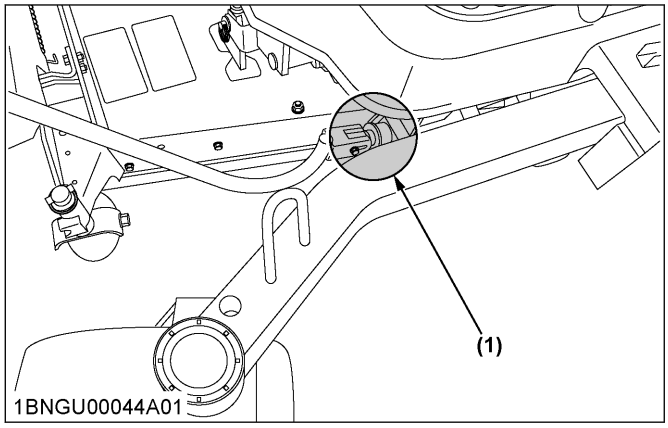
⚠ WARNING
To avoid serious injury or death:
- **Stop the engine and remove the key before greasing.**

Grease the following locations.

IMPORTANT :
- **Put grease into front wheel until grease overflows from both ends of the front wheel.**

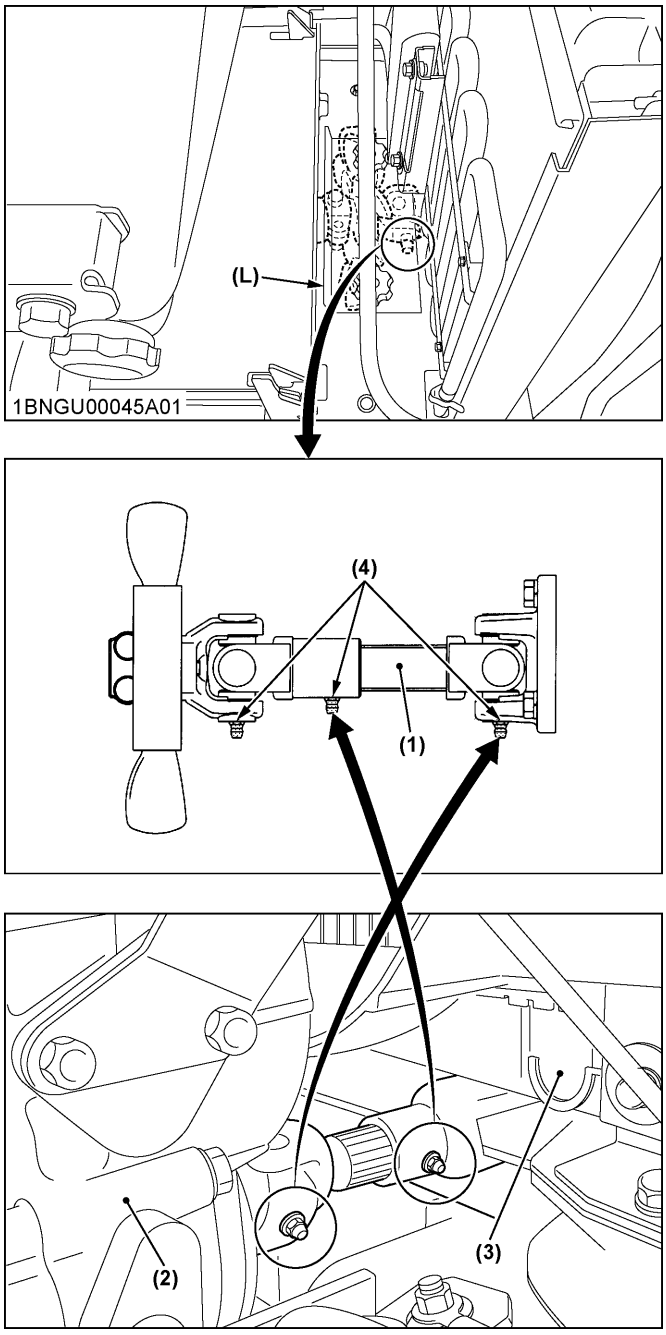


(1) King pin (LH, RH)
(2) Center pin
(3) Front wheel (LH, RH)

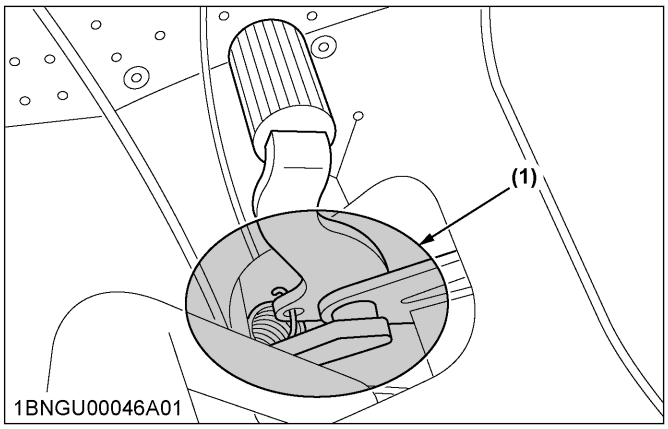


(1) Tilt lever

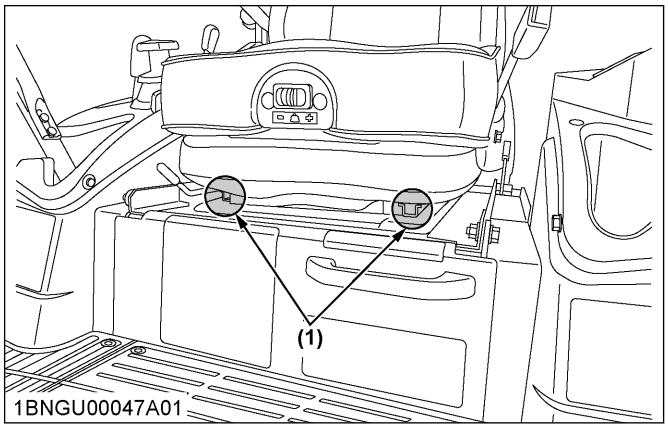
When you put grease to the machine universal joint, remove the L-plate.
When reassembling, install it in the direction shown in the figure.



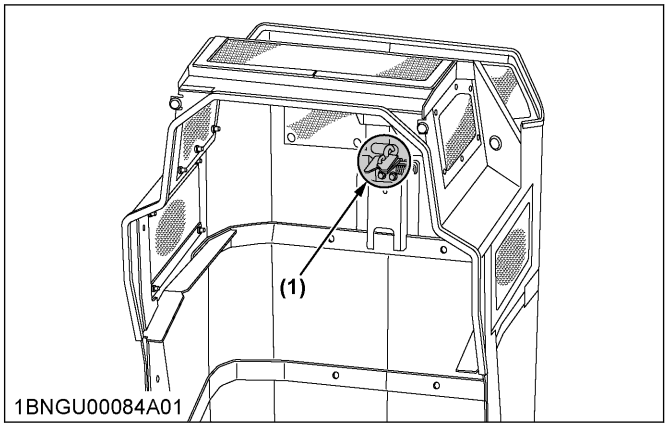
(1) Machine universal joint *(L) L-plate*
(2) Engine
(3) Radiator
(4) Grease fitting



(1) Parking brake lock pedal



(1) Seat adjuster



(1) Bonnet latch

EVERY 100 HOURS

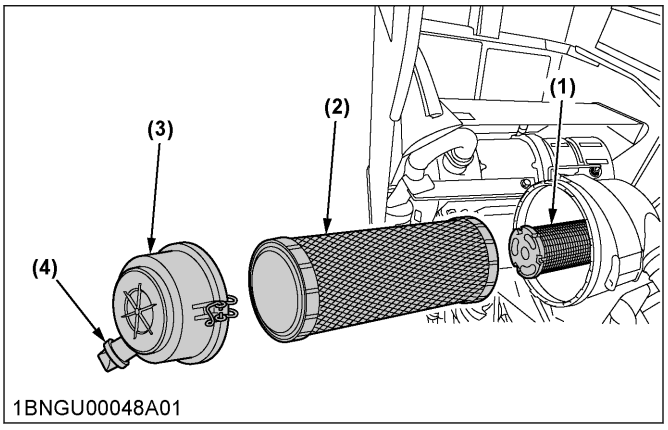
1. Cleaning air cleaner primary element

⚠ WARNING
To avoid serious injury or death:
- **Stop engine and remove the key before cleaning air cleaner element.**

1. Remove the air cleaner cover and primary element.

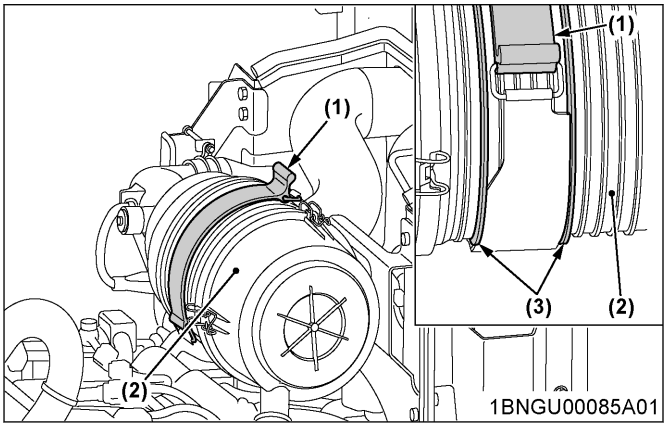
2. Clean the primary element:
   - When dry dust adheres to the element, blow compressed air from the inside, turning the element. Pressure of compressed air must be under 205 kPa (2.1 kgf/cm^2, 30 psi).
3. Replace air cleaner primary element:
   Once yearly or every 1000 hours whichever comes first.

   NOTE :
   - **Check to see if the evacuator valve is blocked with dust.**



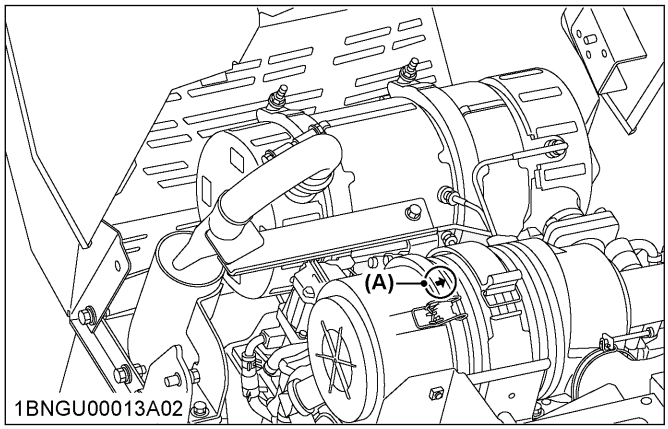
(1) Secondary element
(2) Primary element
(3) Cover
(4) Evacuator valve

4. Fit the 2 convex parts of air cleaner to the bracket end.



(1) Air cleaner band
(2) Body
(3) Convex part

NOTE :
- **The air cleaner uses a dry element, never apply oil.**
- **Do not run the engine with filter element removed.**
- **Operating in dusty conditions requires more frequent maintenance.**
- **Align the arrow marks when reinstalling the air cleaner cover.**



(A) Alignment position

- **Do not touch the secondary element except in cases where replacing is required.**
  (See Replacing air cleaner primary element and secondary element on page 101.)

Evacuator valve
Open the evacuator valve once a week under ordinary conditions - or daily when used in a dusty place - to get rid of large particles of dust and dirt.

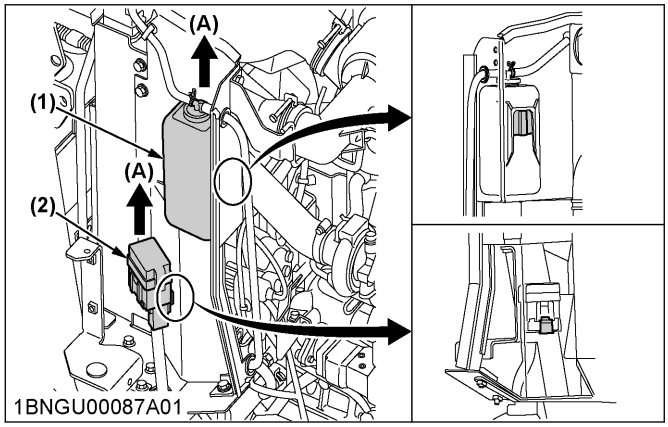
2. Adjusting fan drive belt tension

If you feel you are unable to make the following service correctly and safety, contact your local Kubota Dealer.

⚠ WARNING
To avoid serious injury or death:
- **Stop the engine and remove the key before checking belt tension.**

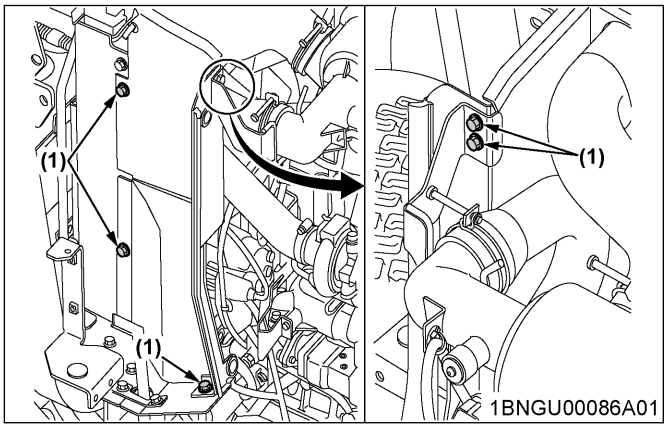
If the fan drive belt becomes loose, the engine may overheat.

1. Remove the fuse box and reserve tank.



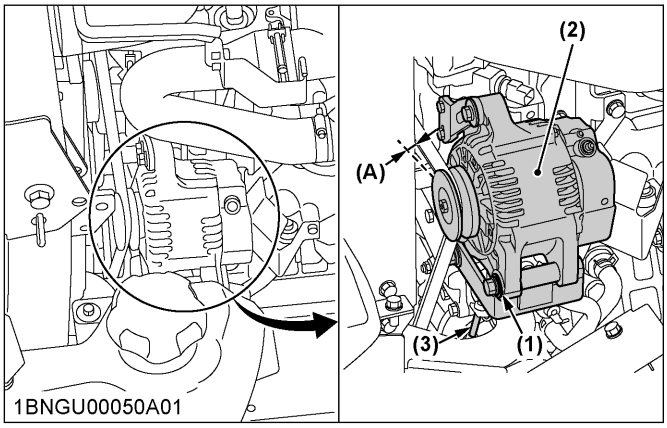
(1) Reserve tank
(2) Fuse box
(A) Remove

2. Remove the 5 bolts and remove the vertical wall of the left shroud.



(1) Bolt

3. To adjust, loosen bolts and move the alternator outward to tighten the belt. After adjustment, securely tighten the bolts.
   Moderate belt tension:
   The belt must deflect approx. 7 to 9 mm (0.28 to 0.35 in.) when the center of the belt is depressed with finger pressure of 98 N (10 kgf, 22 lbs.).



(1) Tension bolt
(2) Alternator
(3) Adjusting bolt
(A) 7 to 9 mm (0.28 to 0.35 in.)

3. Adjusting parking brake

If you feel you are unable to make the following service correctly and safely, contact your local Kubota Dealer.

⚠ WARNING

To avoid serious injury or death:

- **Park the machine on a firm and level surface.**
- **Stop the engine and chock the wheels before checking or adjusting.**

IMPORTANT :

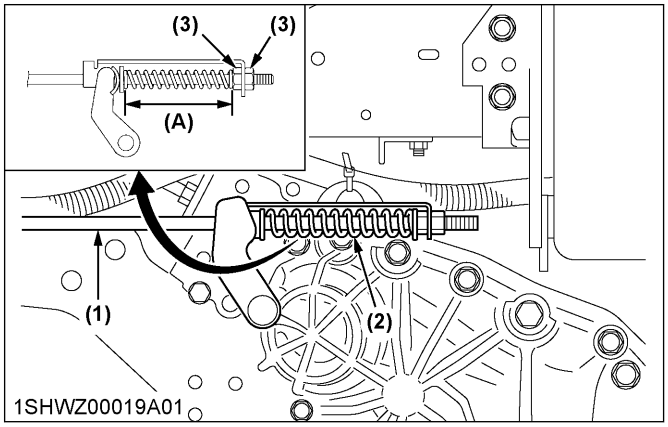
- **Wrong adjustment may cause machine damage.**

3.1 Checking brake spring

1. Place the motion control levers to the *"NEUTRAL LOCK"* position.
2. Chock the rear wheels.
3. Apply the parking brake to the lock position.
4. Check the length of the brake springs on both sides.

(A): Proper brake spring length with the brake applied to the lock position	115 to 117 mm (4.53 to 4.61 in.)

When the parking brake is locked.

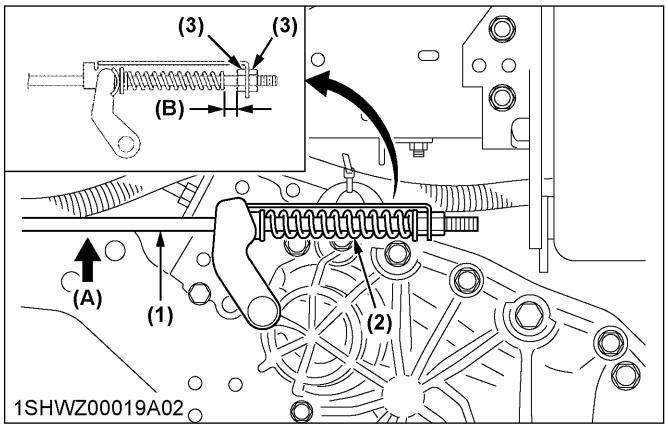


(1) Brake rod
(2) Brake spring
(3) Lock nut
(A) Parking brake spring length

5. If the length of the brake spring is not correct, adjust it.
   (See *"Adjustment of brake spring length"* as follows.)
6. Release the parking brake completely.
7. Hold the brake rod lightly.
8. Check the brake spring play.

(B): Proper brake spring play	Reference:	0.5 to 1.0 mm (0.02 to 0.04 in.)

When the parking brake is released.



(1) Brake rod
(2) Brake spring
(3) Lock nut
(A) Hold
(B) Parking brake spring play

9. If the brake spring play is not correct, adjust it.

(See *"Adjustment of brake spring play"* as follows.)

Adjustment of brake spring length

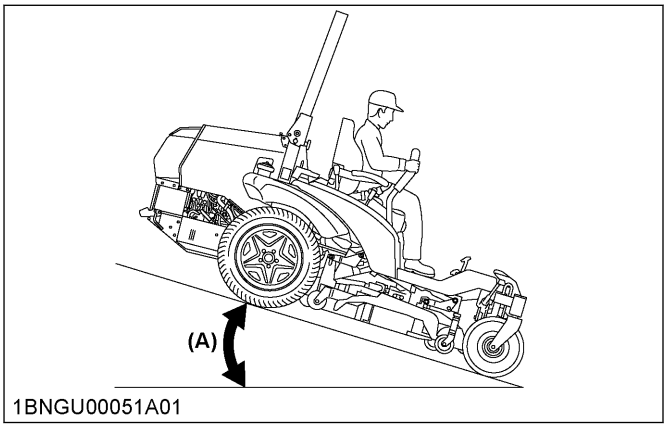
1. Place the motion control lever to the *"NEUTRAL LOCK"* position.
2. Apply the parking brake to the lock position.
3. Loosen the lock nuts.
4. Adjust the spring length to the recommendation.
5. Lock the nuts.
6. Check the brake spring play to the recommendation.
   If there is no play, adjust the brake spring play again.
   (See *"Adjustment of brake spring play"* as follows.)
7. Adjust the other side spring to the same dimension.

Adjustment of brake spring play

1. Place the motion control lever to the *"NEUTRAL LOCK"* position.
2. Chock the rear wheels.
3. Release the parking brake completely.
4. Loosen the lock nuts.
5. Hold the brake rod by hand.
6. Tighten the nut to the correct space between the end of the spring and the nut.
7. Lock the nuts.
8. Adjust the other side spring to the same dimension.

3.2 Check on the slope

1. Place the machine on a 17° ramp.
2. Apply the parking brake.
3. Place the motion control levers in *"NEUTRAL LOCK"* position and shut off the engine.
4. Check that the machine does not move.



(A) 17° ramp

NOTE :

- **For parking brake test purposes, only use 17° ramp.**

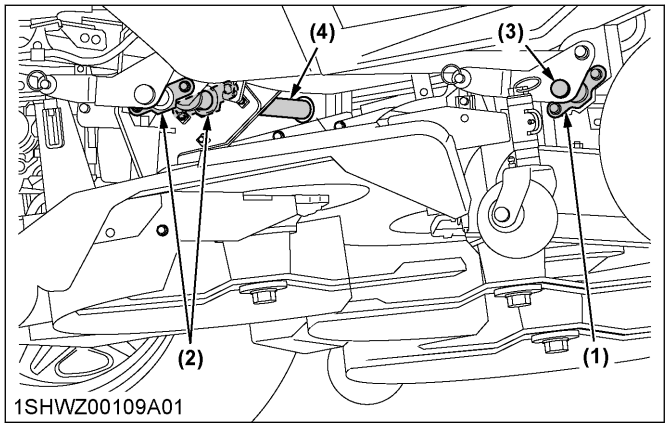
4. Greasing

⚠ WARNING

To avoid serious injury or death:

- **Stop the engine and remove the key before greasing.**

Grease the following location.
If you operated the machine in extremely wet and muddy conditions, lubricate grease fittings more often.



(1) Front mower link bushing (2 places)
(2) Rear mower link bushing (4 places)
(3) Front mower link
(4) Rear mower link

5. Checking the battery condition

⚠ DANGER

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

- **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.**
- **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 or death:

- **Batteries, battery posts, terminals and related accessories contain lead, 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 are spattered with 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 the battery.**

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

IMPORTANT :
- **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.
- **When exchanging an old battery with a new one, use a battery of equal specifications (as described in the following table).**

Battery type	Volts (V)	Reserve capacity (min)	Cold cranking amps	Normal charging rate (A)
24R	12	115	670	11.5

5.1 Non accessible maintenance free type batteries

Maintenance-free, non-accessible batteries are designed to eliminate the need to add water. Yet the volume of electrolyte above the plates may eventually become depleted due to abnormal conditions such as high heat or improper regulator settings.

5.2 Checking the battery voltage

Use LCD monitor or a voltmeter to check the state of charge.
(See the following reference chart to determine if charging is necessary.)

Battery voltage	Reference state of charge
12.6	100 % (full charge)
12.4	75 %
12.2	50 %
12.0	25 %
11.8	0 %

5.3 How to read indicator

Check the battery condition by reading the indicator.

Green	Specific gravity of electrolyte and quality of electrolyte are both in good condition.
Black	Battery needs charging.
White	Battery needs replacing.

NOTE :
- **When viewing the indicator, check from directly above by removing the air cleaner cover or using a mirror.**

5.4 Charging the battery

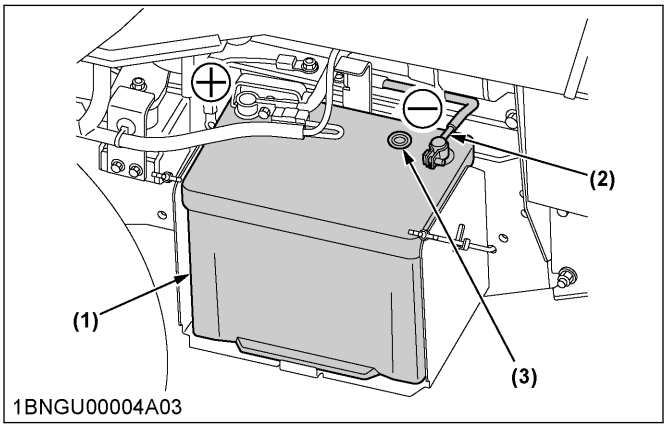
⚠ DANGER

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 or death:
- **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 the battery charge by placing a metal object across the posts.**
  Use a voltmeter or hydrometer.

IMPORTANT :
- **Make sure that the wire harness is in the cover. See the figure below.**

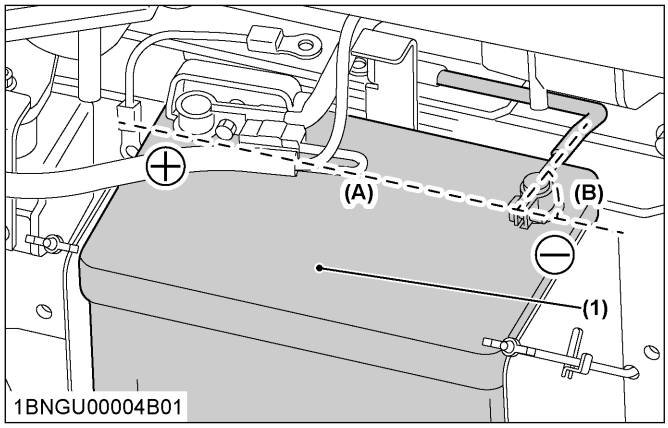


(1) Battery
(2) Ground cable
(3) Indicator
(+) Positive terminal
(-) Negative terminal

1. To slow charge the battery, connect the battery positive terminal to the charger positive terminal and the negative to the negative. Then, charge 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.

5.5 Storing the battery

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.
   When disconnecting the cables from the battery, start with the negative terminal first.
   When connecting the cables to the battery, start with the positive terminal first.
   Tighten the positive terminal to align with base line (A) and tighten the negative terminal at an angle of 90° to the base line (A) as shown in the following figure. The tightening torque should be from 3 to 5 N·m (2.2 to 3.7 lbf·ft).



(1) Battery
(A) Base line
(B) 90°
(+) Positive terminal
(-) Negative terminal

2. The battery self-discharges while it is stored. Recharge it once every 3 months in the hot season and once every 6 months in the cold season.

EVERY 150 HOURS

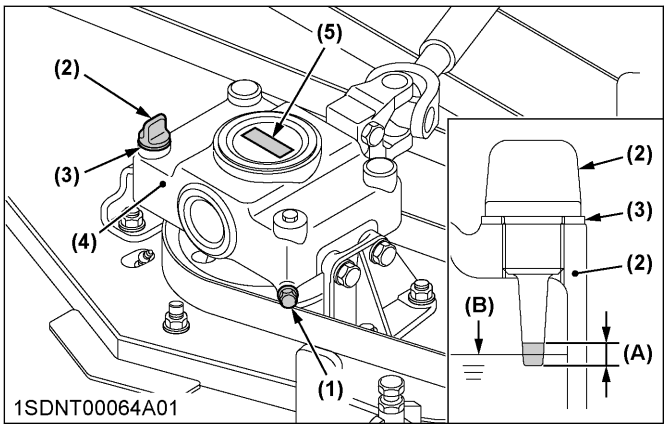
1. Changing gear box oil

⚠ WARNING
To avoid serious injury or death:
- **Always stop the engine and remove the key before checking oil.**

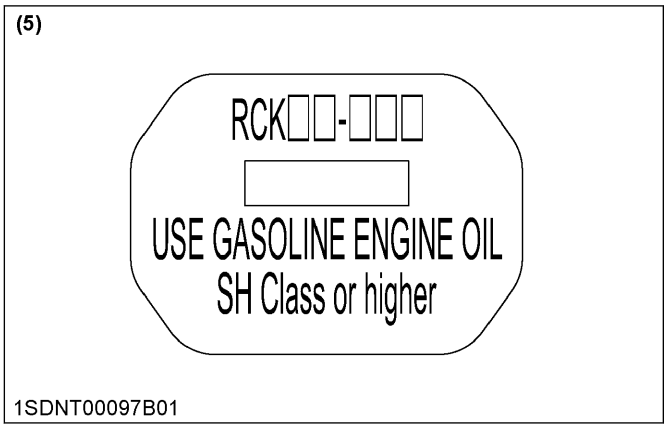
1. To drain the used oil, remove the drain plug and filler plug at the gear box and drain the oil completely into the oil pan.
2. After draining, reinstall the drain plug.
3. Remove the oil level check plug. [Only R models]
4. Fill with the new oil within range (A).
   (See LUBRICANTS, FUEL AND COOLANT on page 74.)

5. For **RCK72P**, use gasoline engine oil: 0.5 L (0.52 U.S.qts.) (API Service Category: **SH** or higher, SAE 10W-30)

RCK72P

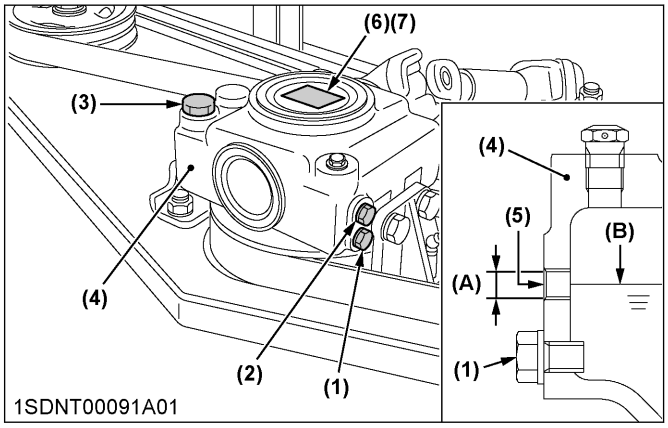


(1) Drain plug
(2) Oil inlet plug with gauge
(3) Seal washer
(4) Gear box
(5) Octagonal label
(A) Oil level is acceptable within this range.
(B) Oil level

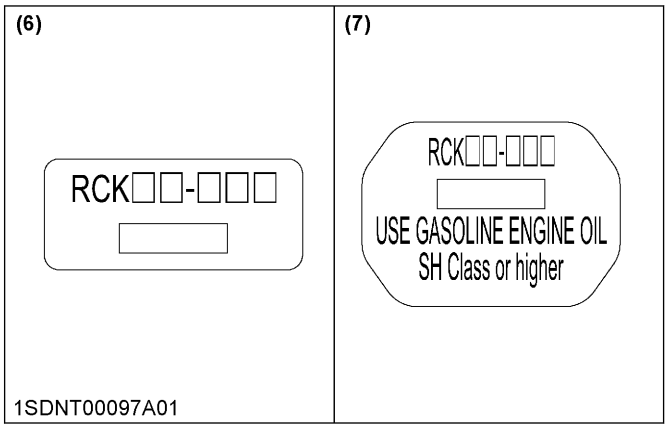


6. For rear discharge mower decks (**RCK60RP**, **RCK72RP**), check the label on the gear box to know the oil kind before adding new oil.

RCK60RP, RCK72RP



(1) Drain plug (bolt)
(2) Check plug
(3) Oil inlet plug
(4) Gear box
(5) Check plug port
(6) Rectangular label
(7) Octagonal label
(A) Oil level is acceptable within this range.
(B) Oil level



Label	(6)	(7)
Oil type	Gear oil	Gasoline engine oil
Capacity	0.4 L (0.42 U.S.qts.)	
SAE	SAE 90	SAE 10W-30
API Service Category	More than GL-3	**SH** or higher

IMPORTANT :

- **Do not fill oil over the level to reach the check plug.**
- **To prevent serious damage to gears, bearings and oil seals, do not mix different kinds of oil.**

7. After filling, reinstall the oil inlet plug with gauge.

EVERY 200 HOURS

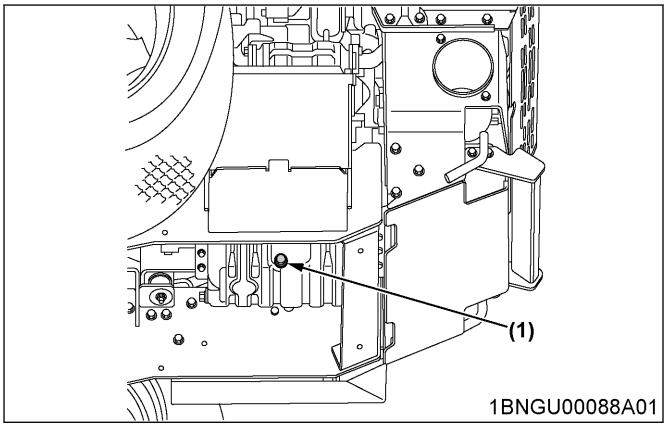
1. Changing engine oil

⚠ WARNING

To avoid serious injury or death:

- **Stop the engine and remove the key before changing the oil.**
- **Allow the engine to cool down sufficiently. Oil can be hot and may cause burns.**

1. To change the used oil, remove the drain plug at the bottom of the engine and drain the oil completely. The used oil can be drained out more easily if the engine is warm.
2. Reinstall the drain plug and fill with the new oil up to the upper notch on the dipstick.



(1) Drain plug

3. To check the oil level. Remove the dipstick, wipe it clean, insert it and draw it out again. Check to see that the oil level is between the 2 marks.

2. Replacing the engine oil filter

⚠ WARNING

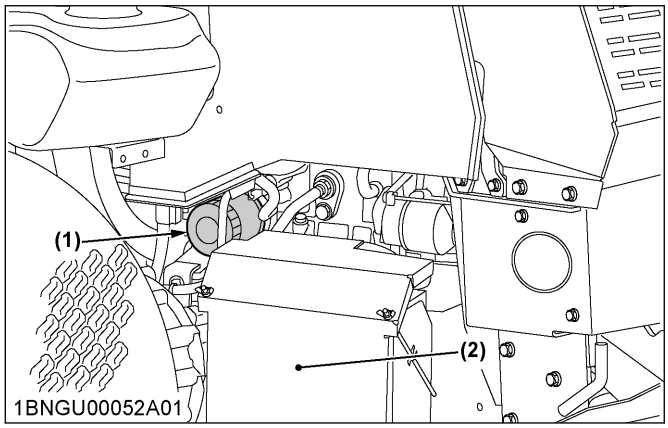
To avoid serious injury or death:

- **Stop the engine and remove the key before changing the oil and the oil filter.**
- **Allow the engine to cool down sufficiently. Oil can be hot and may cause burns.**

1. The oil filter must be changed every 200 service hours.
2. Place an oil pan underneath the oil filter. (Do not drain oil.)
3. Remove the battery cover.
4. Remove the oil filter by using the filter wrench.
5. Apply a slight coat of oil onto the rubber gasket of new filter.
6. Tighten the filter quickly until it contacts the mounting surface. Tighten filter by hand an additional 1/2 turn only.
7. After the new filter has been replaced, the engine oil level normally lowers a little. Add engine oil to proper level. Check for oil leaks around filter gasket.

NOTE :

- **To prevent serious damage to the engine, replacement element of the recommended type must be used. Use only a genuine Kubota filter or its equivalent.**
- **If the battery is exposed to engine oil, it must be cleaned up.**



(1) Engine oil filter
(2) Battery cover

3. Replacing transmission oil filter (HST)

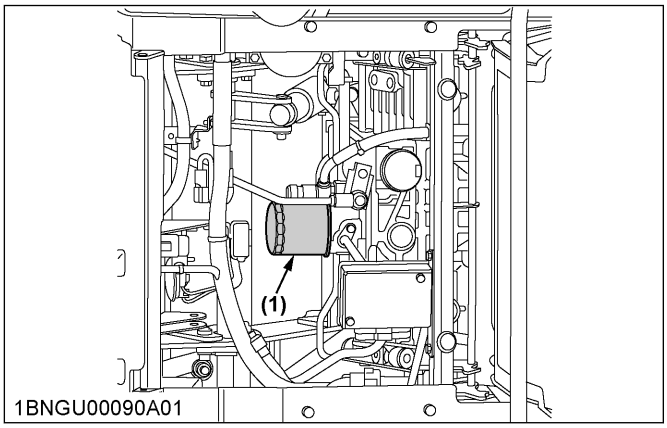
⚠ WARNING

To avoid serious injury or death:

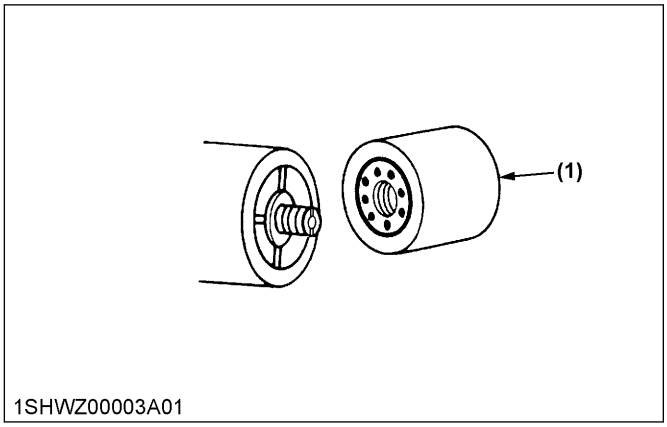
- **Stop the engine and remove the key before changing the oil filter.**
- **Allow the transmission case to cool down sufficiently, as oil can be hot and may cause burns.**

1. The oil filter must be changed every 200 service hours.
2. Place an oil pan underneath the oil filter. (Do not drain oil.)

3. Remove the oil filter by using the filter wrench.



(1) Transmission oil filter (HST)



(1) Transmission oil filter (HST)

4. Apply a slight coat of oil onto the filter gasket.
5. Tighten the filter quickly until it contacts the mounting surface. Tighten filter by hand an additional 1/2 turn only.
6. After the new filter has been replaced, the transmission oil level normally lowers a little. Add fluid to proper level. Check for oil leaks around filter gasket.

IMPORTANT :

- **To prevent serious damage or premature failure to the hydraulic system, use only a Kubota genuine filter.**

4. Adjusting front axle pivot

⚠ WARNING

To avoid serious injury or death:

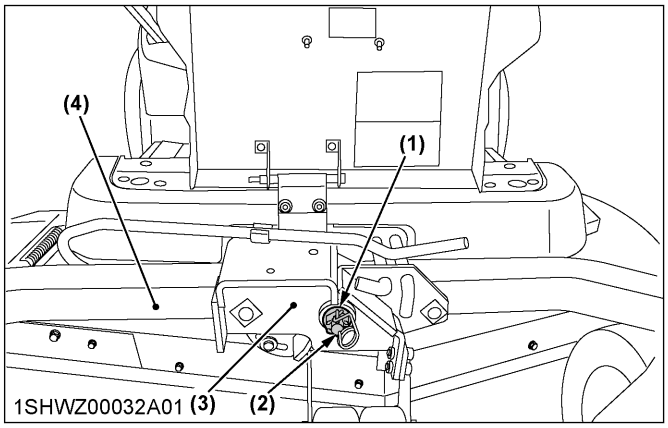
- **Stop the engine and remove the key before adjusting front axle pivot.**

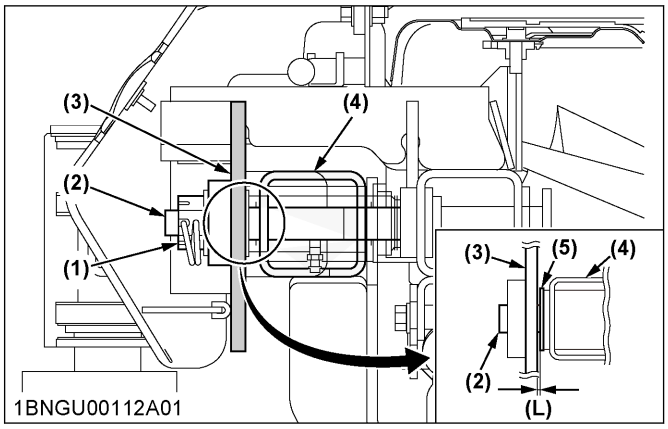
If the front axle pivot pin adjustment is not correct, vibration in the front wheel can occur.

Check and adjustment of the front axle end play

1. Lift up and securely block the front of the machine.
2. Measure the clearance (L) between the plain washer (5) and front axle support (3).
3. If the measurement exceeds the allowable limit, adjust the nut (1).

Front axle end play (L)	Factory spec.	0 to 0.2 mm (0 to 0.008 in.)
	Allowable limit	0.5 mm (0.02 in.)





(1) Nut
(2) Center pin
(3) Front axle support
(4) Front axle
(5) Plain washer
(L) Clearance

NOTE :

- **When fastening the center pin (2), tighten the nut so that the front axle can oscillate smoothly by hand.**

EVERY 400 HOURS

1. Changing transmission oil and rear axle gear case oil (RH and LH)

⚠ WARNING

To avoid serious injury or death:

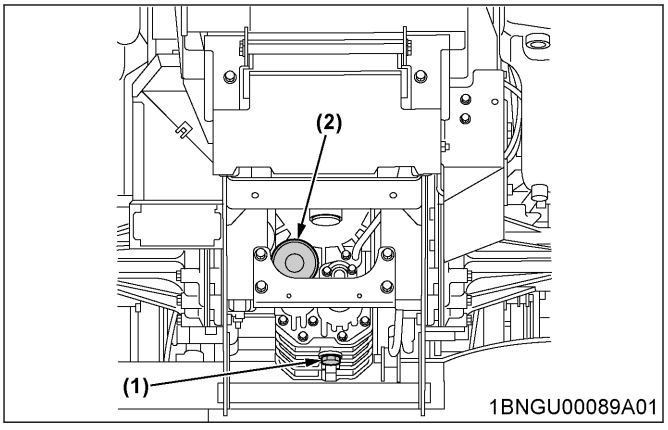
- **Stop the engine and remove the key before changing or checking the oil.**
- **Allow the transmission case to cool down sufficiently, as oil can be hot and may cause burns.**

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

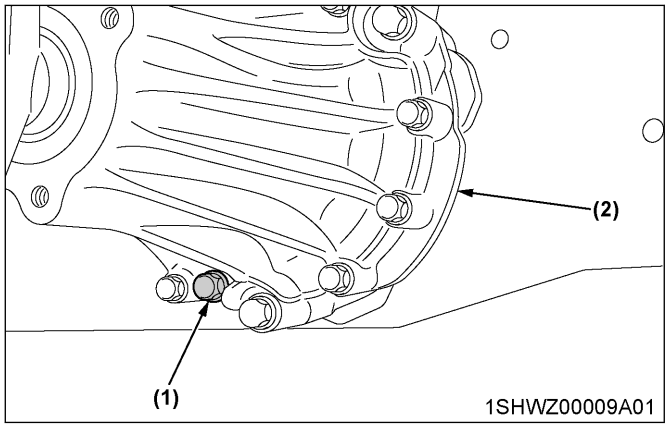
1. To drain the transmission oil, place oil pan underneath the transmission case and the rear axle gear case (RH and LH) and remove the drain plug at the bottom of the transmission case and the rear axle gear case (RH and LH).
2. After draining, reinstall the drain plugs.
3. Fill with UDT or **SUPER UDT** hydrostatic transmission oil or its equivalent up to the upper line of the gauge.

   IMPORTANT :
   - **It takes time to send the oil from the transmission case to the rear axle case (RH and LH).**
     Pour the regulated amount of oil slowly.
4. After running the engine for a few minutes, stop it and check the oil level again; add oil to the prescribed level.

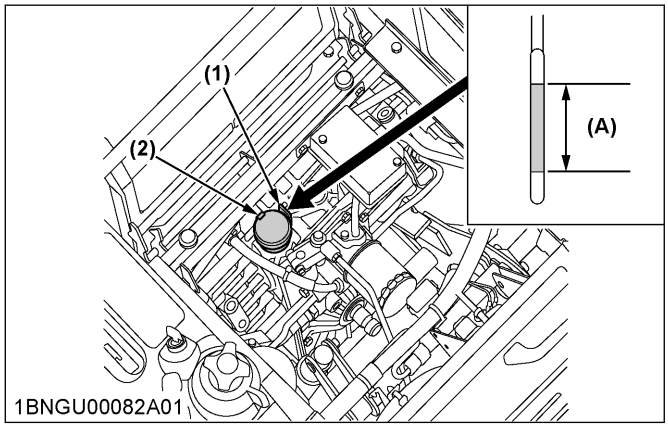
   IMPORTANT :
   - **Operate only at low rpms immediately after changing the transmission oil and filter.**
   - **Keep the engine at medium speed for a few minutes to insure proper lubrication of all parts so there is no damage to transmission.**



(1) Drain plug
(2) Hydraulic oil filter



(1) Drain plug
(2) Rear axle gear case LH



(1) Oil level dipstick
(2) Oil plug and breather cup
(A) Oil level is acceptable within this range.

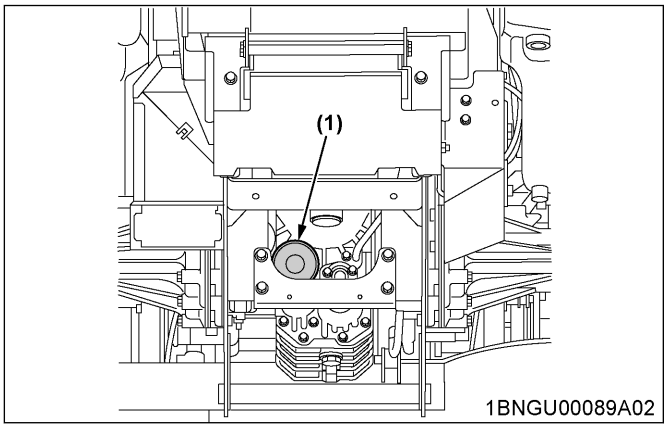
2. Replacing hydraulic oil filter

⚠ WARNING

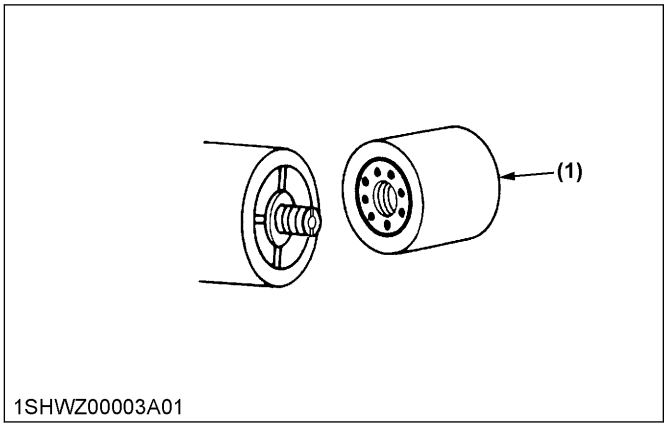
To avoid serious injury or death:

- **Stop the engine and remove the key before changing the oil filter.**
- **Allow the transmission case to cool down sufficiently, as oil can be hot and may cause burns.**

1. The oil filter must be changed every 400 service hours.



(1) Hydraulic oil filter



(1) Hydraulic oil filter

2. To drain the transmission oil, place oil pan underneath the transmission case and the rear axle gear case (RH and LH) and remove the drain plug at the bottom of the transmission case and the rear axle gear case (RH and LH).
3. After draining, reinstall the drain plugs.
4. Remove the oil filter by using the filter wrench.
5. Apply a slight coat of oil onto the filter gasket.
6. Tighten the filter quickly until it contacts the mounting surface. Tighten filter by hand an additional 1/2 turn only.
7. After the new filter has been replaced, the transmission oil level normally lowers a little. Add fluid to proper level. Check for oil leaks around filter gasket.

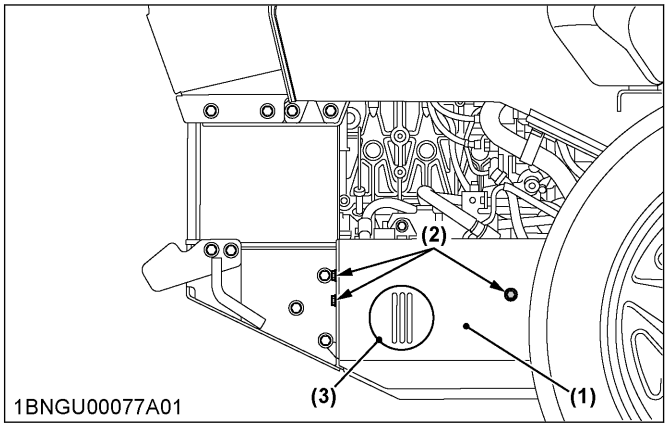
IMPORTANT :

- **To prevent serious damage or premature failure to the hydraulic system, use only a Kubota genuine filter.**

3. Replacing water separator element

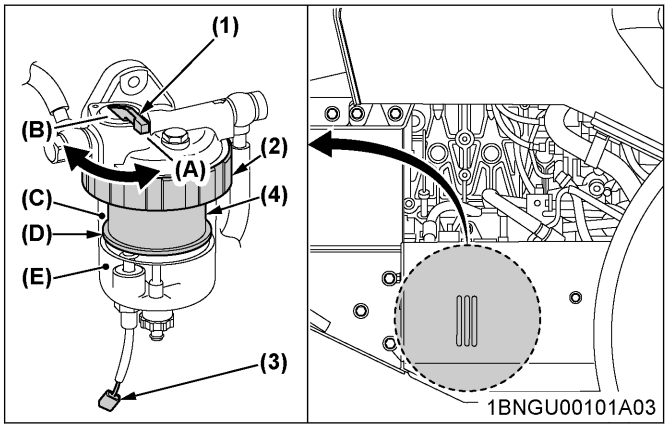
This job should not be done in the field, but in a clean environment. Prepare a tray to catch the fuel.

1. Remove the 3 bolts and the cover.



(1) Bolt
(2) Cover
(3) Panel grate

2. Disconnect the water sensor connector.
3. Close the fuel shutoff-valve.



(1) Fuel shutoff-valve
(2) Retainer ring
(3) Water sensor connector
(4) Element
(A) "OPEN"
(B) "CLOSE"
(C) "FUEL"
(D) "UPPER LIMIT"
(E) "WATER"

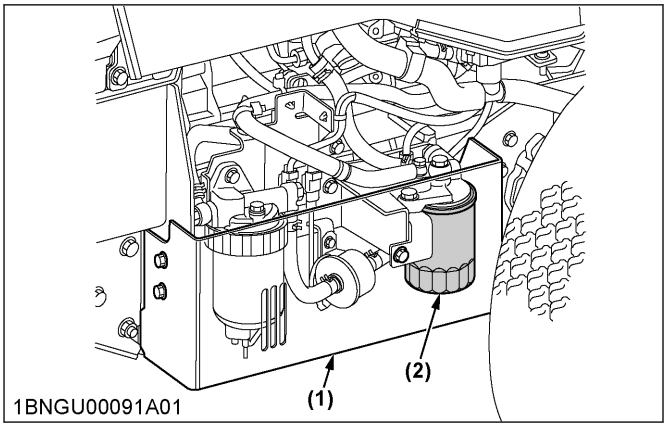
4. Remove the retainer ring and remove it, then rinse the inside with kerosene.
5. Take out the element and replace it with a new one.
6. After replacing, reassemble the water separator, keeping out dust and dirt.
   Tightening torque of the retainer ring is 30 N·m (22 lbf·ft).
7. Connect the water sensor connector.
8. Bleed the fuel system.
   (See Bleeding fuel system on page 107.)

9. Reinstall the cover.

IMPORTANT :
- **If the water separator and the fuel filter are not well maintained, the supply pump and injector may be damaged earlier than expected.**
- **The cover must be reinstalled after the replacement procedure is completed. Operating the machine without the cover can lead to damage to the fuel components.**

4. Replacing fuel filter

1. Remove the cover and the fuel filter.



(1) Cover
(2) Fuel filter

2. Put a film of clean fuel on the rubber seal of the new filter.
3. Tighten the filter quickly until it contacts the mounting surface.
   Tighten the filter by hand an additional 1/2 turn only.
4. Bleed the fuel system.
   (See Bleeding fuel system on page 107.)
5. Reinstall the cover.

IMPORTANT :
- **If the water separator and the fuel filter are not well maintained, the supply pump and injector may be damaged earlier than expected.**
- **The cover must be reinstalled after the replacement procedure is completed. Operating the machine without the cover can lead to damage to the fuel components.**

EVERY 800 HOURS

1. Adjusting engine valve clearance

Consult your local Kubota Dealer for this service.

EVERY 1000 HOURS OR EVERY 1 YEAR

Replace every 1000 hours or every 1 year whichever comes faster.

1. Replacing air cleaner primary element and secondary element

(See Cleaning air cleaner primary element on page 90.)

IMPORTANT :
- **To prevent serious damage to the engine, use only a Kubota genuine filter.**

EVERY 1500 HOURS

1. Checking fuel injection nozzle (injection pressure)

Consult your local Kubota Dealer for this service.

2. Checking EGR cooler

Consult your local Kubota Dealer for this service.

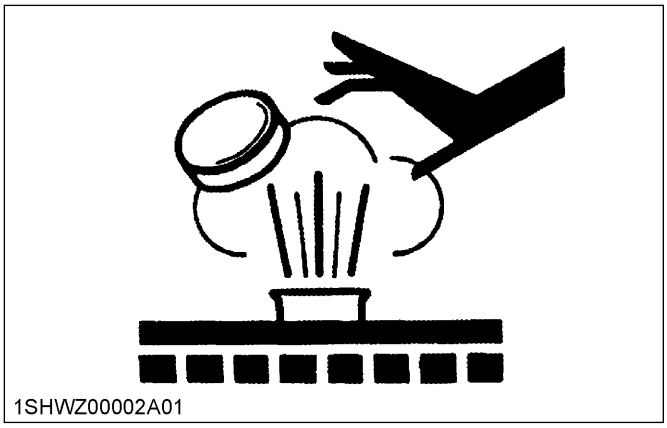
EVERY 2000 HOURS OR EVERY 2 YEARS

Do the following service once every 2000 hours or every 2 years whichever comes faster.

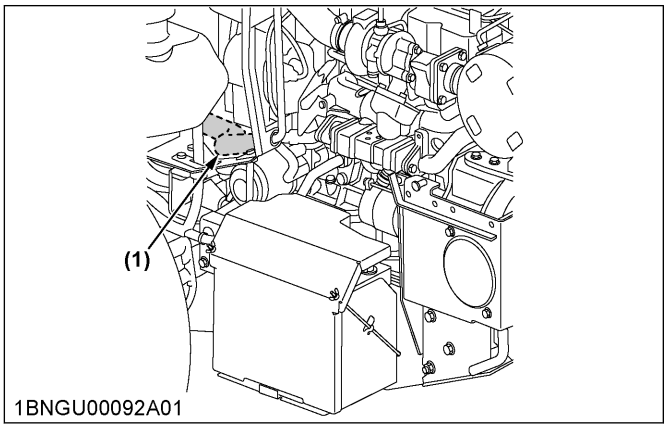
1. Flushing cooling system and changing coolant

⚠ WARNING
To avoid serious injury or death:
- **Do not remove the radiator cap when the engine is hot. When cool, loosen cap slightly to the stop to relieve any excess pressure before removing cap completely.**

IMPORTANT :
- **Do not start engine without coolant.**
- **Start engine with the hood closed.**
- **Use clean, distilled water and antifreeze to fill the radiator and recovery tank.**
- **When the antifreeze is mixed with water, the antifreeze mixing ratio must be less than 50 %.**
- **Securely tighten radiator cap. If the cap is loose or improperly fitted, water may leak out and the engine could overheat.**


1SHWZ00002A01

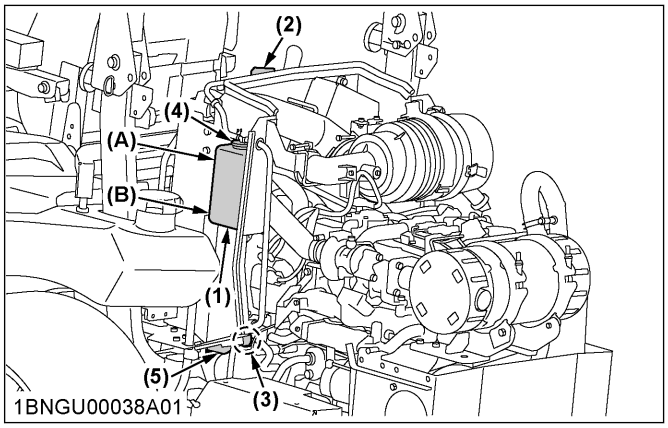
1. Stop the engine and let cool down.
2. To drain the coolant, remove radiator cap, disconnect the lower hose and drain the coolant. The radiator cap must be removed to completely drain the coolant.



1BNGU00092A01

(1) Lower hose

3. After all coolant is drained, close the drain valve and 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 antifreeze 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.



1BNGU00038A01

(1) Recovery tank
(2) Radiator cap
(3) Lower hose band
(4) Recovery tank cap
(5) Radiator hose
*(A) **[FULL]***
*(B) **[LOW]***

8. Start and operate the engine for a few minutes.
9. Stop the engine and let cool.
10. Check coolant level of recovery tank, add coolant if necessary.

2. Antifreeze

⚠ WARNING

To avoid serious injury or death:

- **When using antifreeze, put on some protection such as rubber gloves. (Antifreeze contains poison.)**
- **If someone drank antifreeze, seek immediate medical help. Do not make the person throw up unless you are 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 antifreeze comes in contact with the skin or clothing, wash it off immediately.**
- **Do not mix different types of antifreeze. The mixture can produce chemical reaction causing harmful substances.**
- **Antifreeze is extremely flammable and explosive under certain conditions. Keep fire and children away from antifreeze.**
- **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 antifreeze.**

Always use a 50/50 mix of antifreeze and clean soft water in Kubota engines.
Consult your local Kubota Dealer concerning coolant for extreme conditions.

1. Coolant comes in several types. Use ethylene glycol (EG) type for this engine.
2. Before employing the 50/50 mix, 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 coolant
   Premix 50 % antifreeze 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 antifreeze differs according to the make of the antifreeze and the ambient temperature. Refer to SAE J1034 standard, more specifically also to SAE J814c.

   IMPORTANT :
   - **When mixing the antifreeze with water, the antifreeze mixing ratio is 50 %.**

Vol% Antifreeze	Freezing point		Boiling point*	
	℃	℉	℃	℉
50	-37	-34	108	226

* **At 1.013 × 10^5 Pa (760 mmHg) 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 coolant
   a. Add only water if the coolant level reduces in the cooling system by evaporation.
   b. If there is a mixture leak, add the antifreeze of the same manufacturer and type in a 50/50 mixing ratio.

   IMPORTANT :
   - **Never mix different brands of coolant. (Different brands may have different additive components, and the engine may fail to perform as specified.)**
6. When the coolant is mixed, do not use any radiator cleaning agent. The antifreeze contains an anticorrosive 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. Change the coolant every 2000 hours or every 2 years whichever comes faster.

   NOTE :
   - **The above data represent industry standards that necessitate a minimum glycol content in the concentrated antifreeze.**

EVERY 3000 HOURS

1. Checking injection pump

Consult your local Kubota Dealer for this service.

2. Checking turbo charger

Consult your local Kubota Dealer for this service.

3. Checking EGR system

Consult your local Kubota Dealer for this service.

4. Checking supply pump

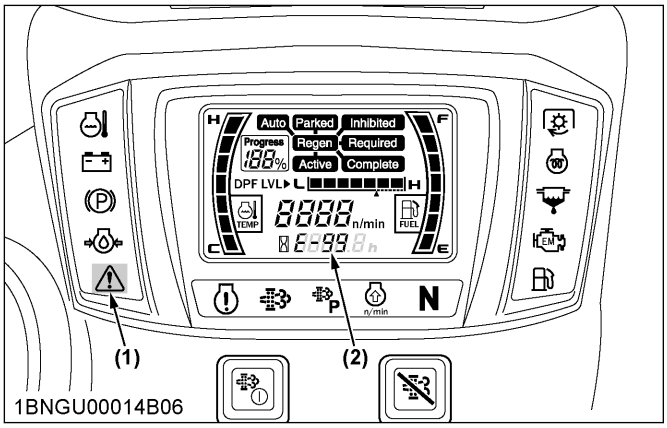
Consult your local Kubota Dealer for this service.

EVERY 3000 HOURS TO 6000 HOURS

1. Cleaning DPF muffler

Removal of ash
The longer the DPF operates, the more ash (burnt residue) is collected in the filter. Too much ash build-up adversely affects the DPF performance.

- Ash cleaning notification
  After every 3000 hours to 6000 hours on the hour meter, the master system warning indicator lights up and when the code shown in the following is displayed on the liquid crystal display, DPF needs to be cleaned.
  The clean-up intervals depend on the engine's operating conditions and other factors.



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

Consult your local Kubota Dealer to clean the filter.

IMPORTANT :

- **The DPF needs to be cleaned with a specific cleaning device. Do not disassemble the DPF for cleaning or try to clean it yourself. Consult your local Kubota Dealer.**

EVERY 1 YEAR

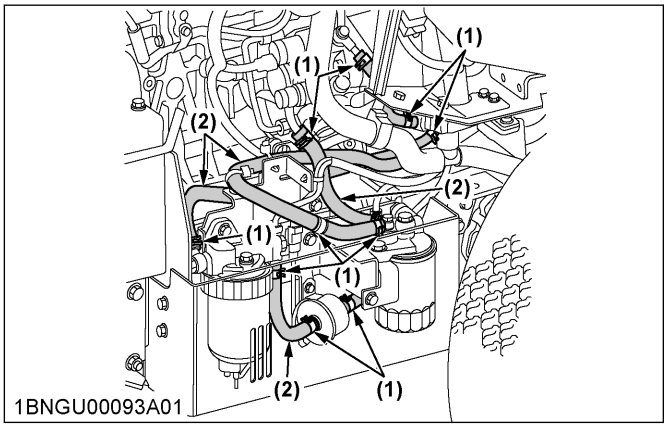
1. Checking exhaust manifold

Consult your local Kubota Dealer for this service.

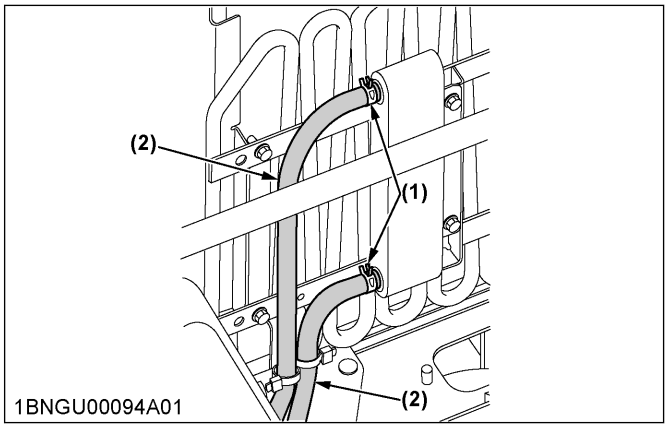
2. Checking fuel lines

If you feel you are unable to make the following service correctly and safely, contact your local Kubota Dealer. (See Replacing fuel filter on page 101.)

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



(1) Hose band
(2) Fuel hose



(1) Hose band
(2) Fuel hose

3. Checking radiator hose and clamp

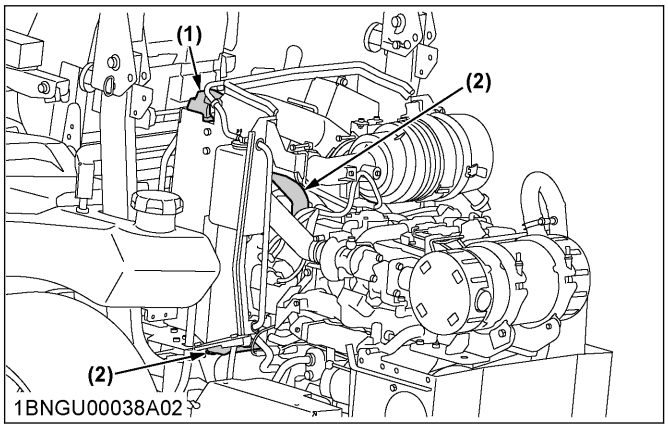
⚠ WARNING

To avoid serious injury or death:

- **Stop the engine and remove the key before checking radiator hose and clamps.**

If you feel you are unable to make the following service correctly and safely, contact your local Kubota Dealer.

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, replace them immediately.



(1) Radiator core
(2) Radiator hose

4. Checking hydraulic hoses

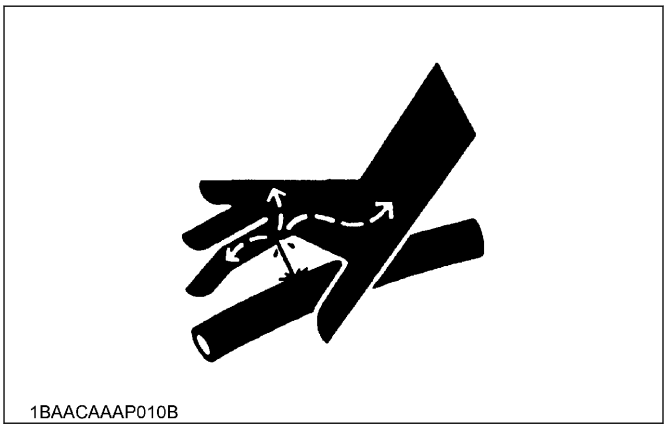
⚠ WARNING

To avoid serious injury or death:

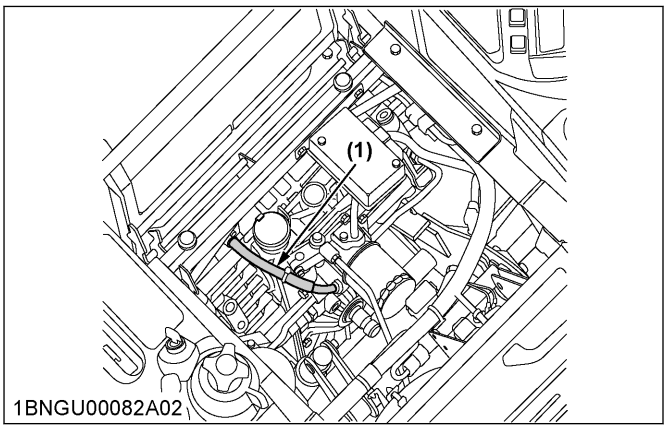
- **Stop the engine and remove the key before checking and replacing the hydraulic hose.**

- **Allow the transmission case to cool down sufficiently as oil can be hot and may cause burns.**
- **Escaping hydraulic fluid under pressure has sufficient force to penetrate the skin causing serious personal injury. Before disconnecting lines, relieve all pressure.**
- **Before applying pressure to the system, make sure all connections are tight and that lines, pipes, and hoses are not damaged.**

If you feel you are unable to make the following service correctly and safely, contact your local Kubota Dealer.



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) Mower lift cylinder hose

5. Checking intake air line

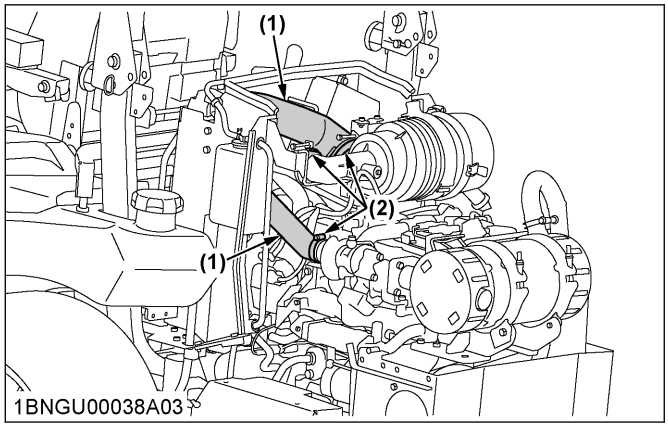
WARNING

To avoid serious injury or death:

- **Stop the engine and remove the key before checking intake air line.**

If you feel you are unable to make the following service correctly and safely, contact your local Kubota Dealer.

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

6. Checking engine breather hose

Consult your local Kubota Dealer for this service.

7. Checking mower gear box oil seal

Consult your local Kubota Dealer for this service.

EVERY 4 YEARS

1. Replacing hydraulic hoses

Consult your local Kubota Dealer for this service.

2. Replacing the fuel lines

Consult your local Kubota Dealer for this service.

3. Replacing engine breather hose

Consult your local Kubota Dealer for this service.

4. Replacing radiator hose

If you feel you are unable to make the following service correctly and safely, contact your local Kubota Dealer.
(See Checking radiator hose and clamp on page 104.)

5. Replacing mower gear box oil seal

Consult your local Kubota Dealer for this service.

6. Replacing intake air line

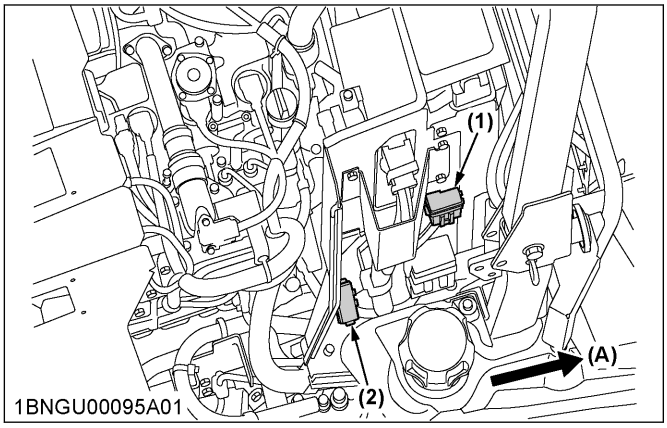
If you feel you are unable to make the following service correctly and safely, contact your local Kubota Dealer.

(See Checking intake air line on page 105.)

SERVICE AS REQUIRED

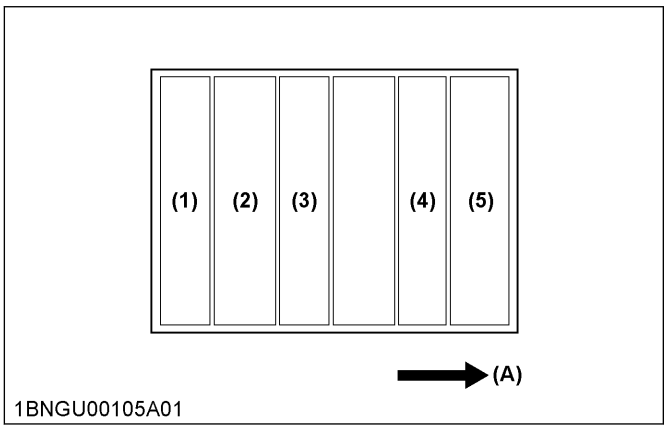
1. Replacing fuses

1. Open the hood and seat.
2. Remove the blown fuse.
3. Place a new fuse of the same capacity in position.



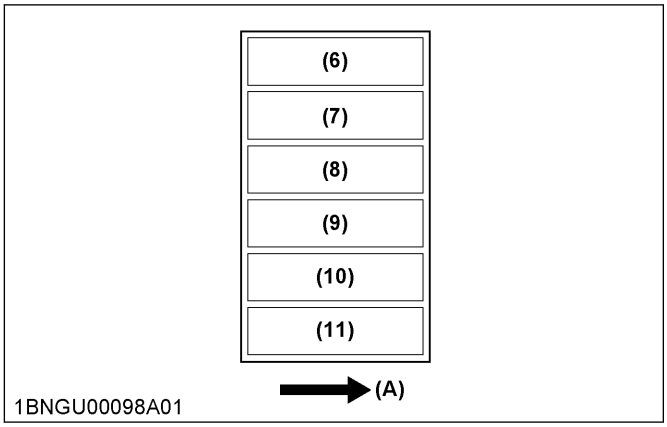
(1) Fuse box 1 location (A) Front
(2) Fuse box 2 location

Fuse box 1

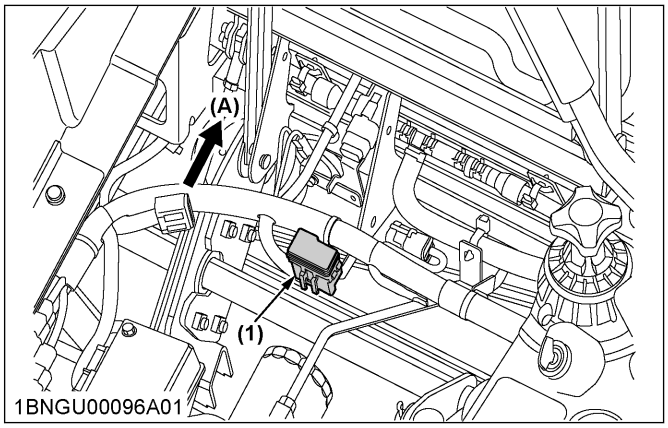


(A) Front

Fuse box 2

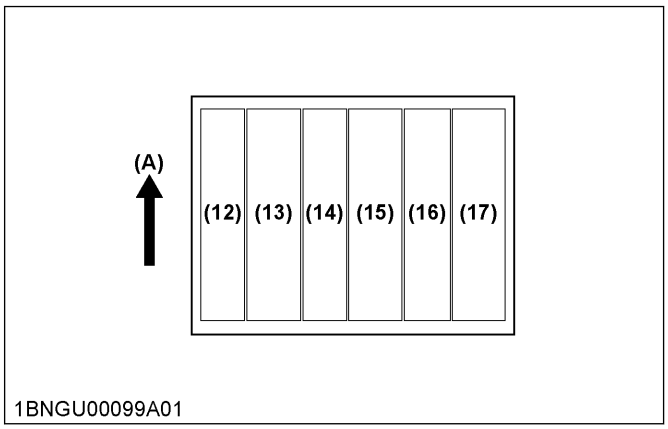


(A) Front

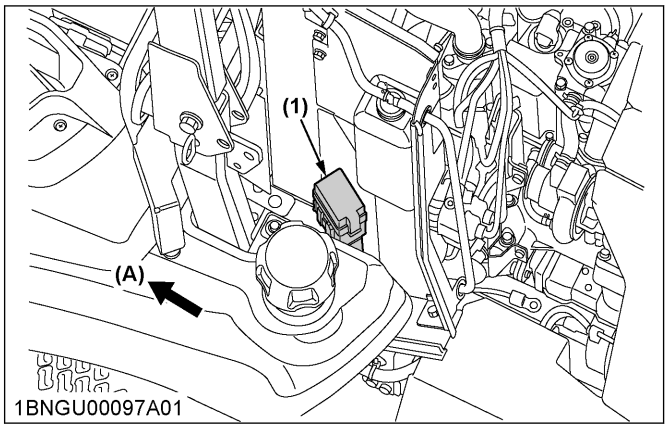


(1) Fuse box 3 location (A) Front

Fuse box 3

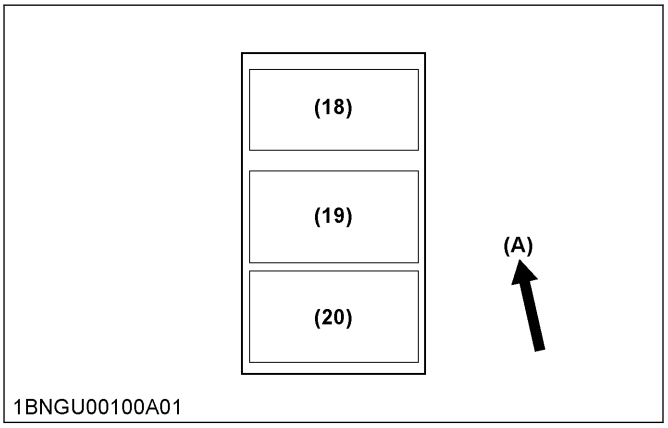


(A) Front



(1) Slow blow fuse box (A) Front

Slow blow fuse box 4



(A) Front

Fuse box No.	Fuse No.	Capacity	Name on the label	Protected Circuit
1	(1)	5 A	EGR_VALVE	EGR valve
	(2)	5 A	AIR_FLOW	Air flow sensor
	(3)	5 A	FUEL_PUMP	Fuel pump
	(4)	5 A	SEVICE_RESET	Service reset
	(5)	5 A	STARTER_SW	EFI ECU, MAIN ECU
2	(6)	5 A	HORN	Horn
	(7)	5 A	IGNSW (MAIN_ECU)	MAIN ECU
	(8)	5 A	IGNSW (ENG_ECU)	EFI ECU
	(9)	30 A	STARTER (+B)	Starter
	(10)	20 A	+B (ENG)	Separator
				Heater relay
				EGR valve
				Air flow sensor
				Fuel pump
				EFI ECU
	(11)	5 A	+B (MAIN-ECU)	MAIN ECU, Alternator
3	(12)	20 A	WORK LAMP	Work light
				12 V Outlet
	(13)	5 A	IGN (BODY)	Alternator
				Meter
	(14)	5 A	OPC	Safety switches
	(15)	30 A	MAIN POWER	Key switch
	(16)	5 A	+B (BODY)	Meter
	(17)	10 A	AIR SUS SEAT	Seat (Air suspension)
4	(18)	50 A	HEATER	Air heater
	(19)	50 A	MAIN_POWER	Fuse (9) (10) (11) (15) (16) (17)
	(20)	80 A	ALT	Alternator

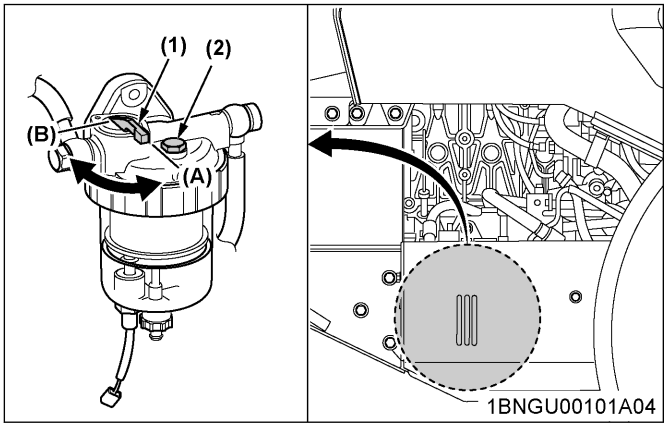
2. Bleeding fuel system

Air must be removed:

- When the fuel filter or lines are removed.
- When the water is drained from the water separator.
- When tank is completely empty.
- After the machine has not been used for a long period of time.

Bleeding procedure is as follows:

1. Park the machine on level ground before starting work.
2. Remove 3 bolts and the cover.
3. Fill the fuel tank with fuel, and open the fuel shutoff-valve.
4. Loosen the air vent plug until the liquid level rises.



(1) Fuel shutoff-valve
(2) Air vent plug
(A) "OPEN"
(B) "CLOSE"

5. Wait until air in the tank is removed.
   Turn on the key when the increase of liquid level is slow.
6. Set the accelerator lever at the minimum speed position, turn the key switch to the *"START"* position.
   If the engine does not start, try it several times at 30-second intervals.

   IMPORTANT :
   - **Do not hold the key switch at the engine *"START"* position for more than 10 seconds continuously. If more engine cranking is needed, try again after 30 seconds.**
7. Accelerate the engine to remove the small portion of air left in the fuel system.
8. If air still remains and the engine stops, repeat the previous steps.
9. Tighten the air vent plug.
10. Reinstall the cover.

    IMPORTANT :
    - **The cover must be reinstalled after the replacement procedure is completed. Operating the machine without the cover can lead to damage to the fuel components.**

3. Checking and replacing blades

⚠ WARNING

To avoid serious injury or death:

- **Stop the engine and remove the key.**
- **Blades may be sharp. When you handle blades, wear heavy gloves or wrap the end of the blades with a rag.**

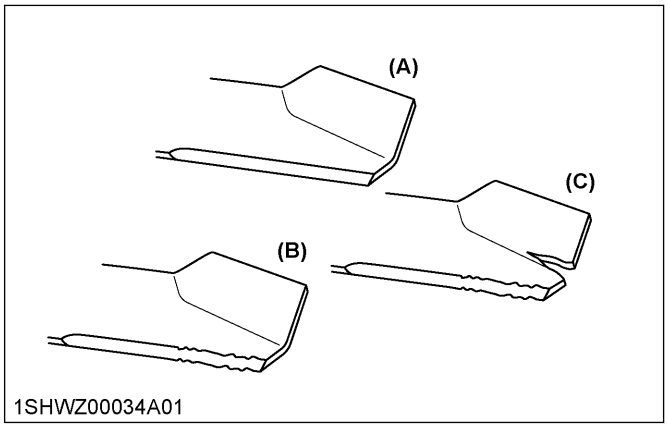
NOTE :

- **Before checking or replacing the blades, wipe grass and mud off the top and inside of the mower.**
  Especially, clean up inside the belt cover, because otherwise the belt life will be reduced.

Checking the blade

The blade cutting edges should be kept sharp at all times.

1. Sharpen the cutting edges if they look like the blade (B).
2. Replace the blades if they look like the blade (C).



(A) New blade
(B) Worn blade
(C) Cracked blade

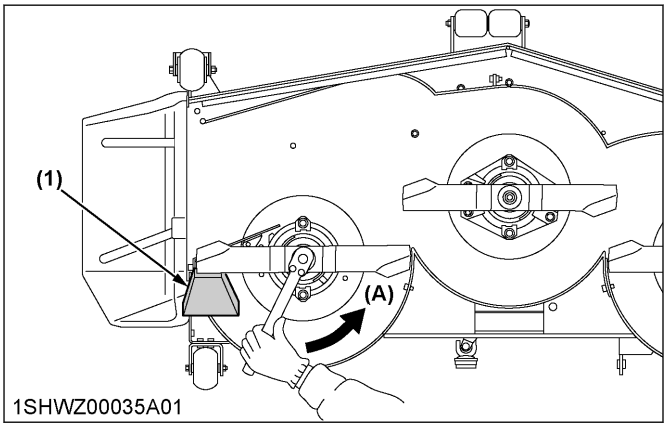
Replacing

1. Tilt up the mower deck.
   (See TILTING UP THE MACHINE on page 71.)
2. **RCK72P**
   To prevent the spindle from rotating while removing the blade bolts, perform one of the following methods:
   - Wedge a block of wood between the blade and mower housing.
   - Use a box wrench over the pulley nut. Then, loosen the blade bolt as illustrated.

   RCK60RP, **RCK72RP**
   To prevent the spindle from rotating while removing the blade bolts, perform one of the following methods:
   - Set the pipe between the blade and the next blade.
   - Use a box wrench over the pulley nut. Then, loosen the blade bolt as illustrated.

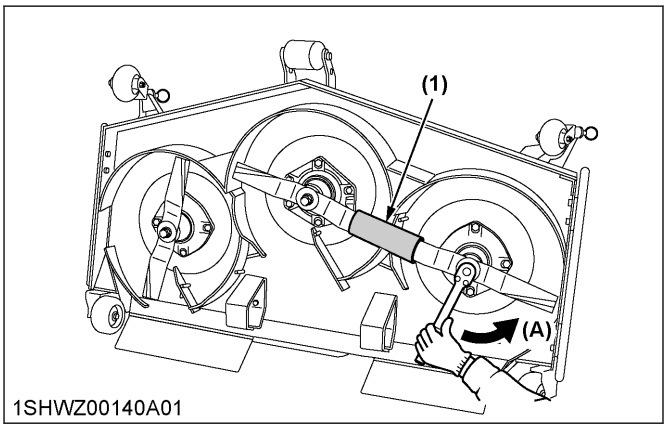
   IMPORTANT :
   - **Use the proper metric size box or socket wrench to tighten or loosen the blade mounting bolt.**

RCK72P



(1) Block *(A) "LOOSEN"*

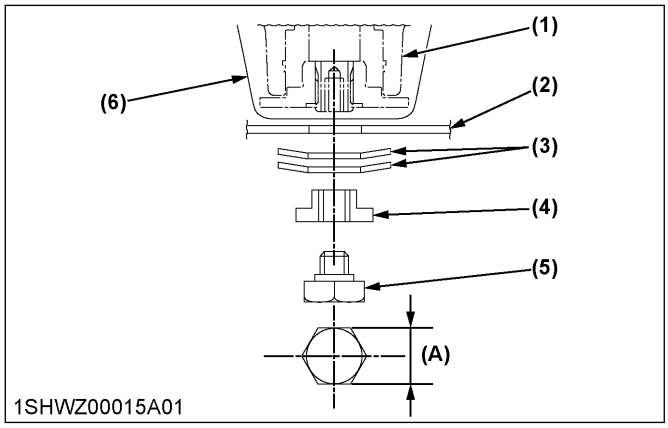
RCK60RP, RCK72RP



(1) Pipe *(A) "LOOSEN"*

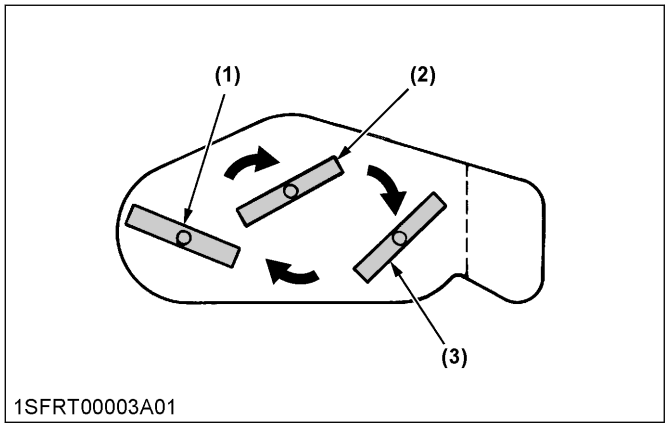
3. To sharpen the blades yourself, clamp the blade securely in a vise.
   Use a large mill file and file along the original bevel until sharp.
4. To check the blade for balance, place a small rod through the center hole. If the blade is not balanced, file the heavy side of the blade until balance is achieved.
5. Pass the spline boss through the blade and 2 cup washers, and tighten the bolt.

   NOTE :
   - **Make sure that the cup washer is not flattened out or worn; this will cause blade to slip excessively.**
     Replace the 2 cup washers if either is damaged.



(1) Spindle holder *(A) 30 mm*
(2) Blade
(3) 2-Cup washers
(4) Lock washer
(5) Bolt
(6) Spindle guard

IMPORTANT :
- **Tighten the 3 blade bolts to 102.9 to 117.6 N·m (10.5 to 12 kgf·m, 75.9 to 87 lbf·ft) of torque.**
- **The blade bolts have right hand threads. Turn them counterclockwise to loosen.**
- **To prolong the service life of the blades, reposition them as shown in the following figure periodically.**



(1) LH blade
(2) Center blade
(3) RH blade

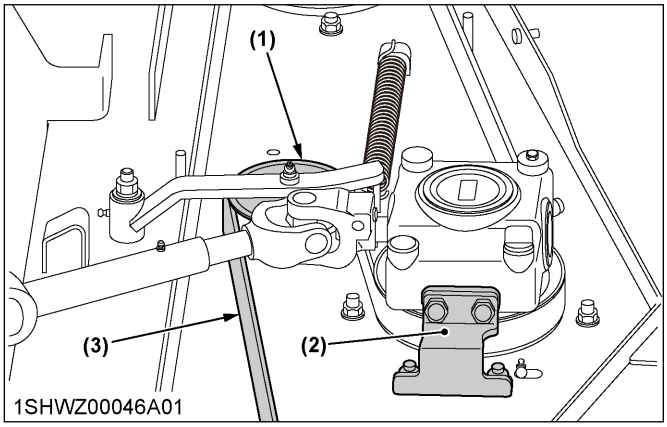
4. Replacing the mower belt

1. Remove the mower deck from the machine.
   (See DISMOUNTING THE MOWER DECK on page 29.)
2. Remove the left and right hand shield from the mower deck.
3. Clean around the gear box.
4. Remove the belt from the tension pulley.

5. Remove the right hand bracket which mounts the gear box to the mower deck and slip the belt over the top of the gear box.
6. To install a new belt, reverse the previous procedure.

NOTE :

- **Tighten bracket bolts securely 77.5 to 90.2 N·m (8.0 to 9.2 kgf·m, 57.1 to 66.5 lbf·ft).**



(1) Tension pulley
(2) Bracket (RH)
(3) Belt

ADJUSTMENT

MOTION CONTROL LEVER

⚠ WARNING

To avoid serious injury or death:

- **Park the machine on a firm and level surface.**
- **If it is necessary to run the engine indoors, use a gas tight exhaust pipe extension to remove the fumes.**
- **Always try to work in a well-ventilated area.**
- **Lift up and secure with jack stands or by blocking the rear of the machine. Do not run the machine while adjusting.**
  Remove the rear wheels.
- **Do not make only one of the following adjustments (except *"MOTION CONTROL LEVER ALIGNMENT"*).**
  They are interlinked.
- **If you feel you are unable to make the following adjustments correctly and safely, contact your local Kubota Dealer.**

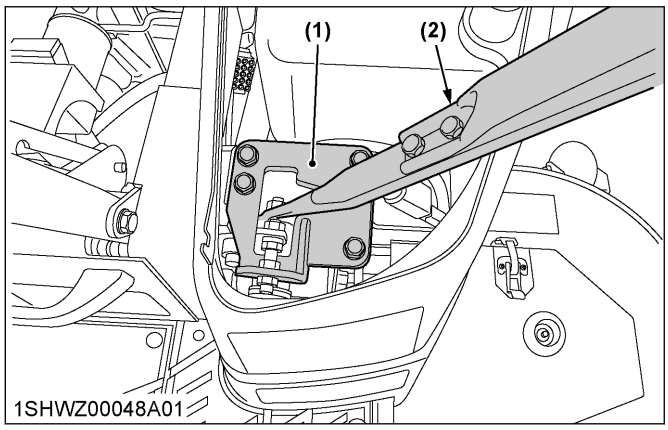
Details regarding motion control lever alignment can be found in a different section.
(See Motion control lever alignment on page 112.)

IMPORTANT :

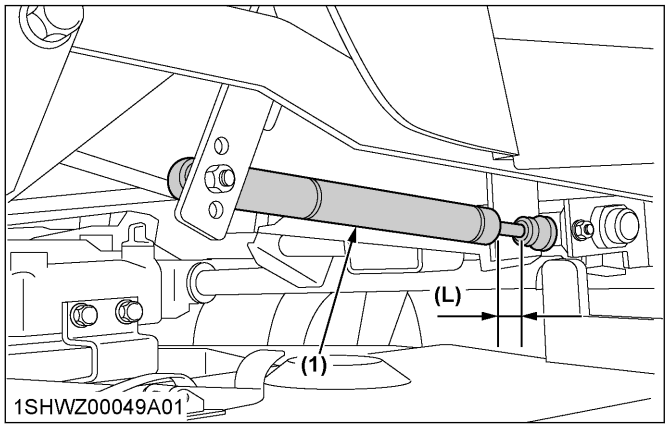
- **Right and left motion control levers can be adjusted independently.**

1. HST neutral

1. Lift up and secure with jack stands or by blocking the rear of the machine frame.
2. Remove both rear wheels.
3. Set the engine speed to maximum.
4. Place the motion control lever in the *"NEUTRAL LOCK"* position.
5. After forward and backward operation, tighten the guide control at the position when wheel axis stops.
6. Adjust the rod length L of the damper 28 to 32 mm (1.1 to 1.3 in.) and tighten.



(1) Guide control
(2) Motion control lever



(1) Damper *(L) 28 to 32 mm (1.1 to 1.3 in.)*

2. Maximum speed (forward)

Consult your local Kubota Dealer for this service.

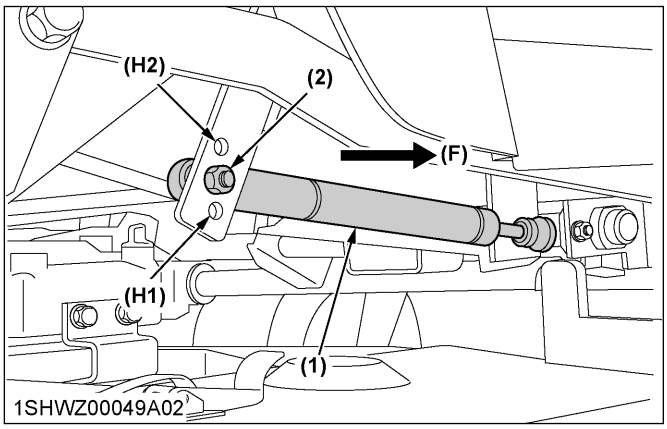
3. Adjusting the motion control lever operating strength

The strength required to move the motion control levers can be adjusted to 3 levels depending on operator preference.

NOTE :

- **Adjust the dampers after adjusting HST neutral.**
- **Adjusting the motion control lever strength will affect the maneuverability.**
- **For adjustment of LH and RH, use the same hole location.**

1. Change the rear side of the damper to the desired hole location.
   Tighten the rear side damper nut.



(1) Damper
(2) Damper nut
(F) Front
(H1) Hole for lighter setting
(H2) Hole for heavier setting

4. Motion control lever alignment

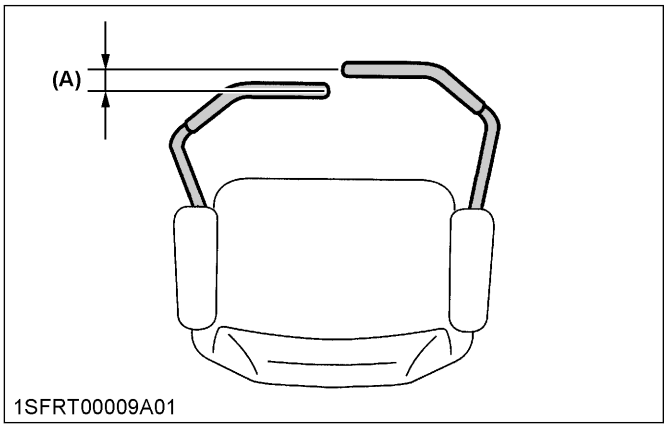
⚠ WARNING
To avoid serious injury or death:
- **Park the machine on a firm and level surface.**
- **Stop the engine, remove the key and apply the parking brake.**

4.1 Checking the alignment

1. Check the gap and space between the levers at the maximum forward position.

Recommended gap:	0 to 4 mm 0 to 0.16 in.

If the positions of the motion control levers are unequal, adjustment is necessary.

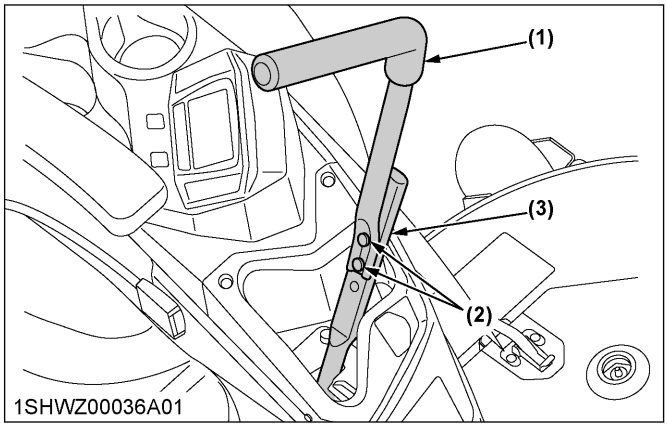


(A) "GAP"

4.2 Aligning the motion control levers

1. Stop the engine and apply the parking brake.

Lever position (high or low)
1. Remove the nut and select the motion control lever position, high or low.
2. Tighten the nut.



(1) Motion control lever
(2) Bolt
(3) Nut, washer

Lever alignment (forward and rearward)
1. Loosen the nut.
2. Slide both levers forward or rearward to the desired position within tab slots until the levers are aligned.
3. Tighten the nut.

NOTE :
- **If the ends of the levers strike against each other while in the *"NEUTRAL"* position, move the levers outward to the *"NEUTRAL LOCK"* position and carefully bend them outward.**
  Move them back to the *"NEUTRAL"* position and check for the recommended space.

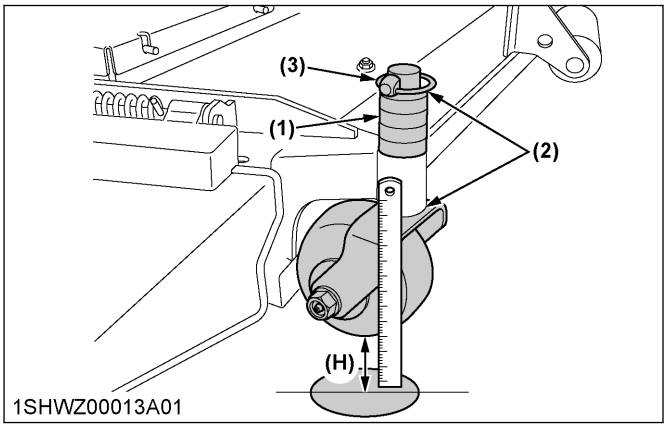
MOWER DECK LEVEL

1. Anti-scalp rollers

⚠ WARNING
To avoid serious injury or death:
- **Park the machine on a firm and level surface.**
- **Apply the parking brake.**
- **Stop the engine and remove the key.**
- **Wait for all moving parts to stop.**

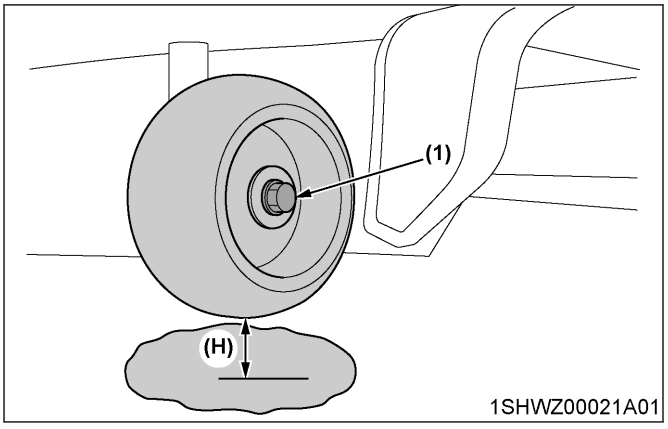
NOTE :
- **The flattest cut can be achieved by having the anti-scalp rollers adjusted off the ground.**
  Check the anti-scalp roller adjustments each time the mower deck cutting height is changed.
  It is recommended that all the anti-scalp rollers be kept off the ground to minimize scuffing.

1. Check the machine tire pressure.
   Inflate tires to the correct pressure.
   (See TIRES AND WHEELS on page 68.)
2. Start the engine.
3. Raise up the mower deck to the transport position (the top end of the lift).
4. Turn the cutting height control dial to adjust the height.
5. Lower the mower deck.
6. Adjust height of the anti-scalp roller.
   a. **Front side anti-scalp roller**
      Adjust height of the front side anti-scalp roller by replacing the collar (collar is raised and lowered) or shifting the pin to approximately 19 mm (0.75 in.) between rollers and ground.
      Adjust both side rollers to the same height.



(1) Collar
(2) Washer
(3) Set pin
(H) 19 mm (0.75 in.)

   b. **Rear side anti-scalp roller**
      Adjust height of the rear side anti-scalp roller by shifting the pin or the bolt to approximately 19 mm (0.75 in.) between rollers and ground.
      Adjust both side rollers to the same height.



(1) Bolt
(H) 19 mm (0.75 in.)

2. Leveling the mower deck (side-to-side)

⚠ WARNING
To avoid serious injury or death:
- **Park the machine on a firm and level surface.**
- **Apply the parking brake.**
- **Disengage the PTO (OFF).**
- **Stop the engine, remove the key and remove the mower universal joint while checking or adjusting the level of the mower deck.**

IMPORTANT :
- **Check the machine tire pressure.**
  Inflate the tires to the correct pressure.
  (See TIRES AND WHEELS on page 68.)

2.1 Checking the level (side-to-side)

NOTE :
- **The mower deck anti-scalp rollers should not contact the ground.**

RCK72P
1. Raise the mower deck to the transport position (the top end).
2. Turn the cutting height set dial to the 3 in. cutting height position.
3. Lower the mower deck.
4. Position the right mower blade in the side-to-side position.
5. Measure from outside the blade tip to the level surface with a short ruler or leveling gauge.

Reference

Height of the blade at the flat surface	76 mm (3 in.)

NOTE :
- **There is a difference of blade height between flat surface and ground measurements.**

6. Check that the left side blade has the same height.
   The difference between both measurements is less than 3 mm (0.12 in.).
7. If the side-to-side adjustment is not within the given tolerance, adjustment is necessary.

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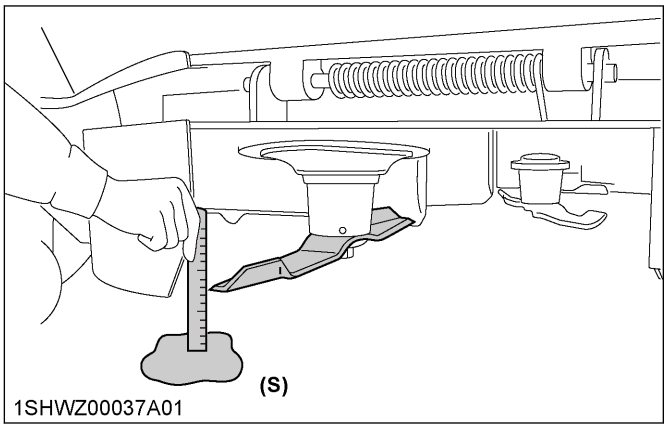
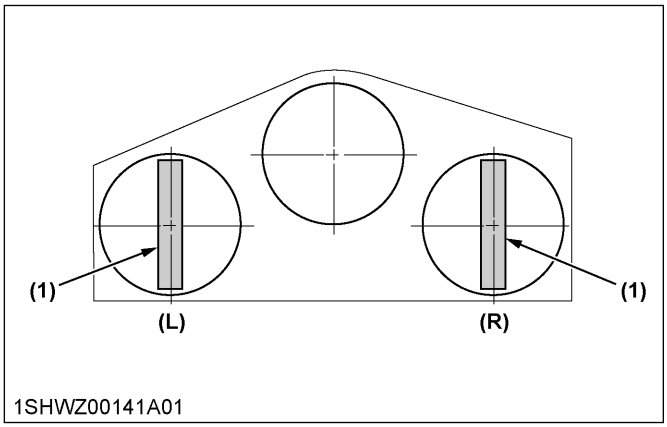


(S) Side

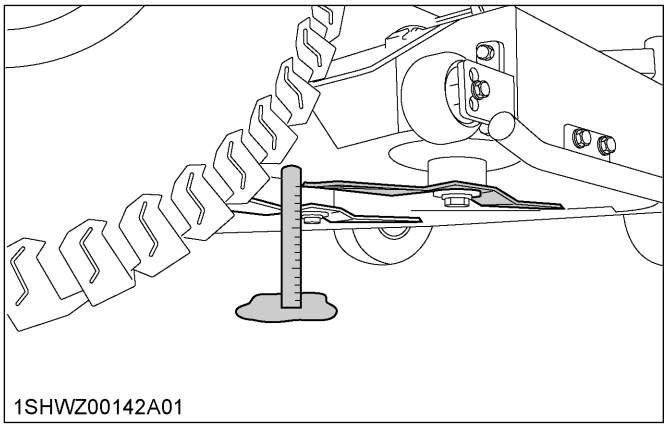
RCK60RP, RCK72RP

1. Raise the mower deck to the transport position. (Also the top end.)
2. Turn the cutting height set dial to the 3 in. cutting height position.
3. Lower the mower deck.
4. Turn left blade by hand parallel to machine and turn right blade parallel to machine to measure from the outside blade tip at (L) and (R) to the level surface. The difference between measurements should be less than 3 mm (0.12 in.).



(1) Blade

RCK60RP, RCK72RP



Reference

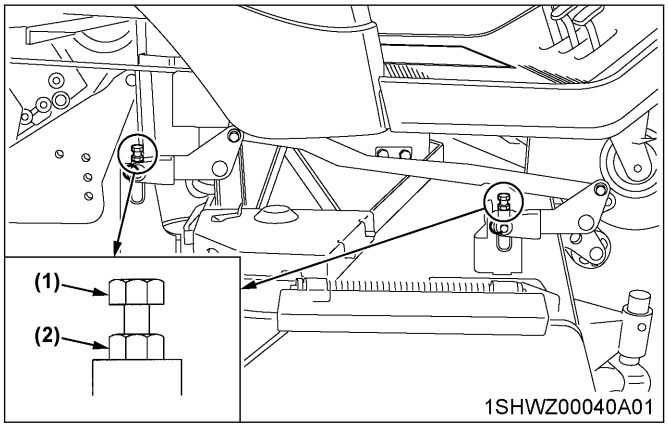
Height of the blade at the concrete surface	76 mm (3 in.)

NOTE :
- **There is a difference of the blade height between on the concrete and ground.**

5. If the side-to-side adjustment is not within the given tolerance, adjustment is necessary.

2.2 Adjusting the level (side-to-side)

1. Raise up the mower deck to the transport position (the top end).
2. Turn the cutting height set dial to the 3 in. cutting height position.
3. Place 51 mm (2 in.) height wood blocks under each side of the mower deck.
   Anti-scalp rollers must not rest on the wood block.
4. Lower the mower deck.
5. Position the mower blade in the side-to-side position.
6. Loosen the lock nuts of the right side of the machine.
7. Adjust the cutting height fine tuning bolts to set 76 mm (3 in.) blade height.
   Front and rear side bolts must be adjusted.
8. Lock the nuts.
9. Adjust the left side equally.
10. Check the side-to-side level. If it is not level, adjustment is necessary.



(1) Cutting height fine tuning bolt
(2) Lock nut

3. Leveling the mower deck (front-to-rear)

⚠ WARNING

To avoid serious injury or death:
- **Park the machine on a firm and level surface.**
- **Engage the parking brake.**

- **Disengage the PTO.**
- **Stop the engine, remove the key and remove the mower universal joint while checking or adjusting the level of the mower deck.**

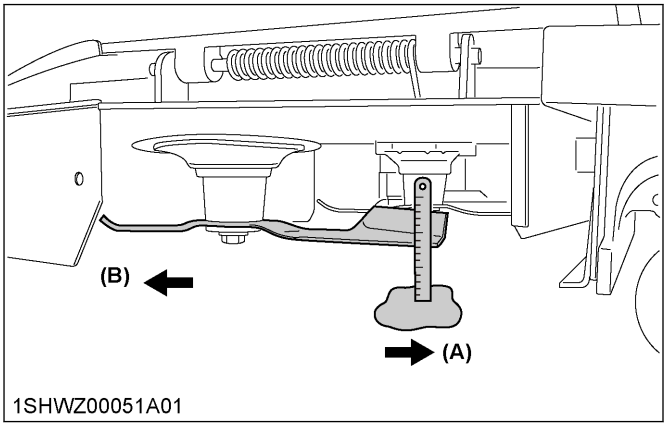
IMPORTANT :
- **Check the machine tire pressure.**
  Inflate the tires to the correct pressure.
  (See TIRES AND WHEELS on page 68.)

3.1 Checking level (front-to-rear)

NOTE :
- **The mower deck anti-scalp rollers should not contact the ground.**

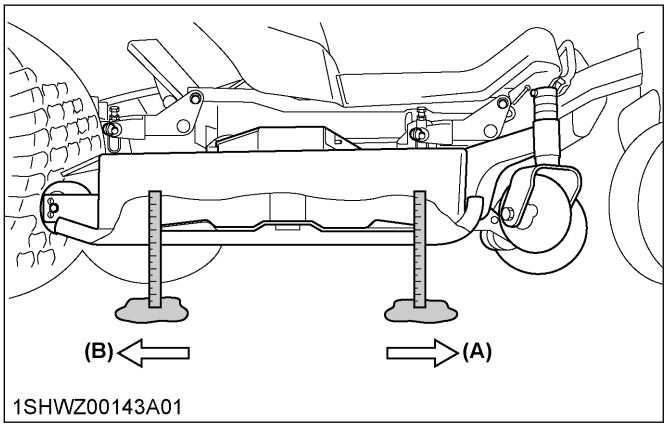
1. Raise the mower deck to the transport position (the top end).
2. Turn the cutting height set dial to the 3 in. cutting height position.
3. Lower the mower deck.
4. Position the right mower blade in the front-to-rear position.
5. Measure from the right front blade tip to the level surface with a short ruler or leveling gauge.
6. Turn the blade 180° and measure from the right rear blade tip to the level surface.
7. Check that the left side blade has the same dimensions. The difference between both measurements should be less than 6 mm (0.24 in.). The front side must be lower than the rear side.
8. If the front-to-rear adjustment is not within the given tolerance, adjustment is necessary.

RCK72P



(A) Front
(B) Rear

RCK60RP, RCK72RP



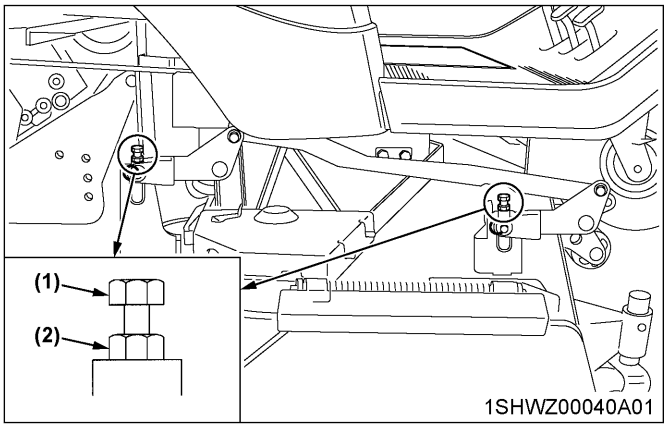
(A) Front
(B) Rear

3.2 Adjusting the level (front-to-rear)

1. Raise up the mower deck to the transport position (the top end).
2. Turn the cutting height set dial to the 3 in. cutting height position.
3. Place 51 mm (2 in.) height wood blocks under each side of the mower deck.
   Anti-scalp rollers must not rest on the wood block.
4. Lower the mower deck.
5. Loosen the lock nuts of the front side of the machine.
6. Adjust the cutting height fine tuning bolts to set 76 mm (3 in.) blade height.
   Both front side bolts must be adjusted.
7. Lock the nuts.
8. Adjust the other side equally.

IMPORTANT :
- **The difference between both measurements should be less than 6 mm (0.24 in.).**
  The front side must be lower than the rear side.

9. Check the front-to-rear level. If it is not level, adjustment is necessary.



(1) Cutting height fine tuning bolt
(2) Lock nut

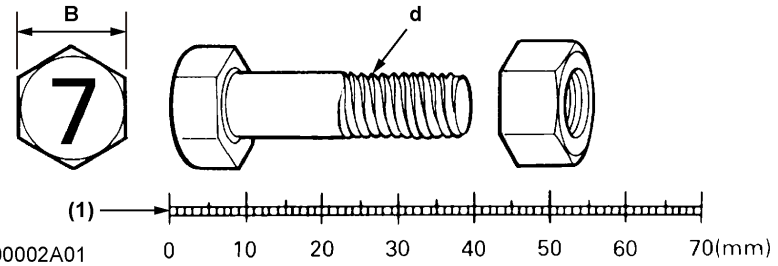
GENERAL TIGHTENING TORQUE SPECIFICATION

American standard cap screws with UNC or UNF threads				Metric cap screws			
SAE grade no.		GR.5	GR.8	Property class		Class 8.8 (8.8)	Class 10.9 (10.9)
1/4	(lbf·ft) (N·m) (kgf·m)	8-9.6 10.7-12.9 1.11-1.33	12-14.4 16.1-19.3 1.66-1.99	M6	(lbf·ft) (N·m) (kgf·m)	7.2-8.3 9.81-11.3 1.0-1.15	
5/16	(lbf·ft) (N·m) (kgf·m)	17-20.5 23.1-27.8 2.35-2.84	24-29 32.5-39.3 3.31-4.01	M8	(lbf·ft) (N·m) (kgf·m)	17.4-20.2 23.6-27.4 2.4-2.8	21.7-25.3 29.4-34.3 3.0-3.5
3/8	(lbf·ft) (N·m) (kgf·m)	35-42 47.5-57.0 4.84-5.82	45-54 61.0-73.2 6.22-7.47	M10	(lbf·ft) (N·m) (kgf·m)	35.5-41.2 48.1-55.8 4.9-5.7	44.9-52.1 60.8-70.5 6.2-7.2
1/2	(lbf·ft) (N·m) (kgf·m)	80-96 108.5-130.2 11.07-13.29	110-132 149.2-179.0 15.22-18.27	M12	(lbf·ft) (N·m) (kgf·m)	57.2-66.5 77.5-90.1 7.9-9.2	76.0-86.8 103-117 10.5-12.0
9/16	(lbf·ft) (N·m) (kgf·m)	110-132 149.2-179.0 15.22-18.27	160-192 217.0-260.4 22.14-26.57	M14	(lbf·ft) (N·m) (kgf·m)	91.2-108 124-147 12.6-15.0	123-144 167-196 17.0-20.0
5/8	(lbf·ft) (N·m) (kgf·m)	150-180 203.4-244.1 20.75-24.91	220-264 298.3-358.0 30.44-36.53	M16	(lbf·ft) (N·m) (kgf·m)	145-166 196-225 20.0-23.0	192-224 260-303 26.5-31.0

Thread size d (mm)	Hex. bolt head size B (mm)	No mark			7T		
		lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m
M8	12 or 13	13.0-15.2 (14.1 ± 1.1)	17.8-20.6 (19.2 ± 1.4)	1.9-2.1 (2.0 ± 0.1)	17.5-20.3 (18.9 ± 1.4)	23.5-27.5 (25.5 ± 2.0)	2.4-2.8 (2.6 ± 0.2)
M10	14 or 17	28.9-33.3 (31.1 ± 2.2)	39.3-45.1 (42.2 ± 2.9)	4.0-4.6 (4.3 ± 0.3)	35.4-41.2 (38.3 ± 2.9)	48.1-55.9 (52.0 ± 3.9)	4.9-5.7 (5.3 ± 0.4)
M12	17 or 19	46.3-53.5 (49.9 ± 3.6)	62.8-72.6 (67.7 ± 4.9)	6.4-7.4 (6.9 ± 0.5)	57.1-66.5 (61.8 ± 4.7)	77.6-90.2 (83.9 ± 6.3)	8.0-9.2 (8.6 ± 0.6)
M14	19 or 22	79.6-92.6 (86.1 ± 6.5)	107.9-125.5 (116.7 ± 8.8)	11.0-12.8 (11.9 ± 0.9)	91.1-108.5 (99.8 ± 8.7)	123.6-147.0 (135.3 ± 11.7)	12.6-15.0 (13.8 ± 1.2)

NOTE :

- **Figure [7] on the top of the bolt indicates that the bolt is made of special material.**
- **Before tightening, check the figure on top of the bolt.**



1SFRT00002A01

(1) Scale

STORAGE

⚠ WARNING

To avoid serious injury or death:

- **Do not clean the machine with the engine running.**
- **To avoid the danger of exhaust fume poisoning, do not operate the engine in a closed building without proper ventilation.**
- **When storing, remove the key to avoid unauthorized persons from operating the machine and getting injured.**

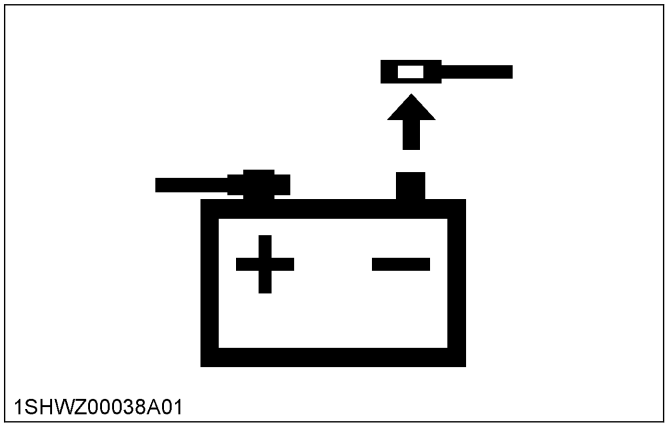
STORING THE MACHINE

IMPORTANT :

- **When washing the machine, 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.**

If you intend to store your machine for an extended period of time, follow the procedures outlined below. These procedures will insure that the machine is ready to operate with minimum preparation when it is removed from storage,

1. Check for loose bolts and nuts, and tighten if necessary.
2. Apply grease to machine areas where bare metal will rust also to pivot areas.
3. Inflate the tires to a pressure a little higher than usual.
4. Change the engine oil and run the engine to circulate oil throughout the engine block and internal moving parts for about 5 minutes.
5. Shut off the fuel valves below the fuel tanks while storing.
6. With all implements lowered to the ground, coat any exposed hydraulic cylinder piston rods with grease.
7. Remove the battery from the machine, adjust the electrolyte to the proper level and store in a dry place out of direct sunlight.
   When disconnecting the cables from the battery, start with the negative terminal first. When connecting the cables to the battery, start with the positive terminal first. (See Storing the battery on page 95.)



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8. Keep the machine in a dry place where the machine is sheltered from rain. Cover the machine.
9. Store the machine indoors in a dry area that is protected from sunlight and excessive heat. If the machine must be stored outdoors, cover it with a waterproof tarpaulin.
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.

REMOVING THE MACHINE 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. Check all coolant, hydraulic and fuel hoses for cracks, hardening, bubbles and leaks.
7. Check all control levers and the brake for proper function, repair or lubricate as necessary.
8. Start the engine. Observe all gauges. If all gauges are functioning properly and reading normal, move the machine outside.
9. Once outside, park the machine securely set the parking brake, place the control levers in the *“NEUTRAL LOCK”* position and let the engine idle for at least 5 minutes.

10. Shut the engine off and walk around machine and make a visual inspection looking for evidence of oil or water leaks.
11. 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 following table for the cause and its corrective measure.

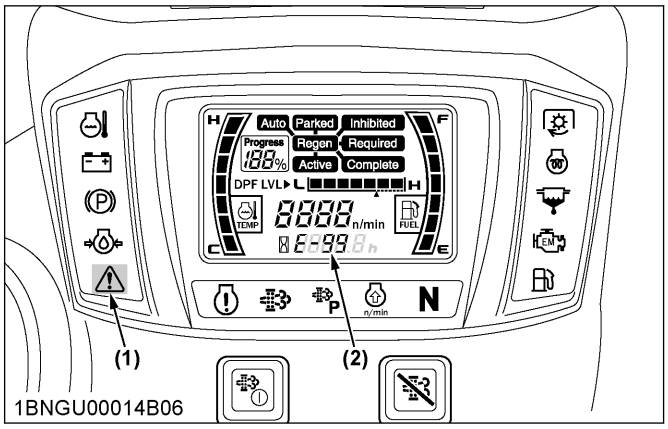
Symptom (if)		Cause	Remedy
The engine is difficult to start or will not start.		• No fuel flow.	• Check the fuel tank and the fuel filter. Replace filter if necessary. • Check the fuel valve position.
		• Air or water is in the fuel system.	• Check to see if the fuel line coupler bolt and nut are tight. • Bleed the fuel system. (See SERVICE AS REQUIRED on page 106.)
		• In winter, oil viscosity increases, and engine revolution is slow.	• Use oils of different viscosities, depending on ambient temperatures.
		• The battery becomes weak and the engine does not turn over quick enough.	• Clean battery cables and terminals.
			• Charge the battery.
			• 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.
Insufficient engine power.		• Insufficient or dirty fuel.	• Check the fuel valve position. • Check the fuel system.
		• Air cleaner clogged.	• Clean the element.
		• The output is limited due to high water temperature.	• Remove load and allow the coolant to cool.
The engine stops suddenly.		• Insufficient fuel.	• Check the fuel valve position. • Refuel. • Bleed the fuel system if necessary.
Exhaust fumes are colored.	Black	• Fuel quality is poor. • Too much oil. • Engine is overloaded.	• Change the fuel and fuel filter. • Check the proper amount of oil. • Reduce engine load.
	Blue white	• The inside of exhaust muffler is damp from fuel. • Injection nozzle trouble. • Fuel quality is poor. • Ambient temperature is low.	• Heat the muffler by applying load to the engine. • Check the injection nozzle. • Change the fuel and fuel filter. • Turn the engine on and wait for the engine to warm-up.
Engine overheats.		• Engine overloaded.	• Lower speed or reduce load.
		• Low coolant level.	• Fill cooling system to the correct level; check radiator and hoses for loose connections or leaks.
		• Loose or damaged fan belt.	• Adjust or replace fan belt.
		• Dirty radiator core or grille screens.	• Remove all trash.
		• Coolant flow route corroded.	• Flush cooling system.

Trouble	Operator's action
Engine not overheated, but engine warning indicator on.	Stop the engine and get it restarted. If the engine fails to restart or the indicator stays on, immediately contact your local Kubota Dealer.
Engine warning indicator is turned on repeatedly.	Immediately contact your local Kubota Dealer.

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 in the following table is displayed on the LCD. The error code indicates 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
"E-84"	Throttle sensor trouble	Contact your local Kubota Dealer.
"E-93"	Starter relay trouble	
"E-94"	OPC output trouble	
"E-21" "Err21"	CAN communication trouble	
"E-40"	Sensor supply trouble	
"E-30"	Accelerator adjustment trouble	
"E-99"	Require to clean DPF muffler	

BATTERY TROUBLESHOOTING

Symptom (if)	Cause	Remedy	Preventive measure
The starter does not function.	• Battery overuse, dim lights.	• Charge the battery sufficiently. • Adjust the fan belt.	• Charge the battery properly.
	• The battery has not been recharged.		
	• Poor terminal connection.	• Clean the terminal and tighten securely.	• Keep the terminal clean and tight. Apply grease and treat with anti-corrosives.
	• The battery life has expired.	• Replace the battery.	
The starter does not function from the beginning, and lights soon become dim.	• Insufficient charging.	• Charge the battery sufficiently.	• The battery must be serviced properly before initial use.
When viewed from the top, the top of the plates look whitish.	• The battery was used with an insufficient amount of electrolyte.	• Add distilled water and charge the battery.	• Regularly check the electrolyte level.
	• The battery was used too much without recharging.	• Charge the battery sufficiently.	• Charge the battery properly.
Recharging is impossible.	• The battery life has expired.	• Replace the battery.	
Terminals are severely corroded and heated up.	• Poor terminal connection.	• Clean the terminal and tighten securely.	• Keep the terminal clean and tight. Apply grease and treat with anti-corrosives.
The battery electrolyte level drops rapidly.	• There is a crack or pin holes in the electrolytic cells.	• Replace the battery.	
	• Charging system trouble.	• Contact your local Kubota Dealer.	

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

MACHINE TROUBLESHOOTING

Symptom (if)	Cause	Remedy
The machine operation is not smooth.	• The hydrostatic transmission oil is insufficient.	• Fill with oil.
	• The transmission oil filter is clogged.	• Replace the filter.
Noise from transmission loss of power	• The transmission oil level is insufficient.	• Fill with oil
The machine does not move while the engine is running.	• The parking brake is on.	• Release the parking brake.
	• The transmission oil level is insufficient.	• Fill with oil.
The machine moves when the motion control levers are in the *"NEUTRAL LOCK"* position (operating the engine).	• The hydrostatic lever linkage is not correctly adjusted.	• Consult your dealer for hydrostatic lever linkage adjustment or pressure adjustment.
	• The control linkage pivots are sticking.	• Pull up and lubricate linkage.
Mower does not rise	• The transmission oil level is insufficient.	• Fill with oil
Fuel decreases uneven in LH and RH tanks.	• Fuel valve is closed.	• Open the fuel valve.
	• Check valve is clogged.	• Replace check valve.
	• Bypass hose kink in the pipe between LH and RH tanks.	• Remove the kink or replace the pipe.
Master system warning indicator flashes.	• Fuel sensor is disconnected.	• Check wire harness.
	• Coolant temperature sensor is disconnected.	• Check wire harness.
	• LCD monitor malfunction.	• Replace LCD monitor.
All electrical equipment do not operate.	• Slow blow fuse blown.	• Replace the slow blow fuse.

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

MOWER TROUBLESHOOTING

Symptom (if)	Cause	Remedy
Discharge deflector plugged.	• Grass too wet.	• Wait for grass to dry.
	• Grass too long.	• Raise the cutting height and cut grass twice.
	• Cutting too low.	• Raise the cutting height.
	• Engine rpm too low.	• Mow at full throttle.
	• Ground speed too fast.	• Slow down.
Streaking of grass uncut.	• Ground speed too fast.	• Slow down.
	• Engine rpm too low.	• Mow at full throttle, check and reset the engine rpm.
	• Grass too long.	• Cut grass twice.
	• Blades dull or damaged.	• Replace blades or have blades sharpened.
	• Debris in mower deck.	• Clean the mower deck.
Uneven cut.	• Mower deck not level.	• Level the mower deck.
	• Ground speed too fast.	• Slow down.
	• Blades dull.	• Have blades sharpened.
	• Blades worn or damaged.	• Replace the blades.
	• Low tire inflation.	• Add air to correct pressure.
	• Anti-scalp rollers not adjusted correctly.	• Adjust the anti-scalp rollers.
	• Wheels pressure not adjusted correctly.	• Set both tire pressure to the correct pressure. (See TIRES on page 68.)
Blades scalping grass.	• Cutting height too low.	• Raise the cutting height.
	• Turning speed too fast.	• Reduce speed on turns.
	• Ridges in terrain.	• Change the mowing pattern.
	• Rough or uneven terrain.	• Adjust wheels pressure and anti-scalp rollers.
	• Anti-scalp rollers not adjusted correctly.	• Adjust wheels pressure and anti-scalp rollers.
	• Bent blade(s).	• Replace blade(s).
Mower belt slipping.	• Mower deck plugged.	• Unplug and clean the mower deck.
	• Debris in pulleys.	• Clean.
	• Worn mower belt.	• Replace.
Excessive vibration.	• Debris on mower deck or in pulleys.	• Clean the mower deck and pulleys.
	• Damaged mower belt.	• Replace the mower belt.
	• Damaged pulleys.	• Replace pulleys.
	• Pulleys out of alignment.	• Consult your local Kubota Dealer.
	• Blades out of balance.	• Have blades balanced.
Mower loads down machine.	• Engine rpm too low.	• Mow at full throttle, check and reset the engine rpm.
	• Ground speed too fast.	• Slow down.
	• Debris wrapped around mower spindles.	• Clean the mower.
	• Front of deck too low.	• Adjust the mower deck. (See MOWER DECK LEVEL on page 112.)

(Continued)

Symptom (if)	Cause	Remedy
Mower loads down machine.	• The output is limited due to high water temperature.	• Remove load and allow the coolant to cool.

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

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