

Product: Kubota WSM ZD321,ZD323,ZD326,ZD331,ZD326RP,ZD331RP(SUPPLEMENT) Lawn Mowers Service Repair Works
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WSM

WORKSHOP MANUAL

ZD321,ZD323,ZD326,ZD331

Kubota

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TO THE READER

This Workshop Manual has been prepared to provide servicing personnel with information on the mechanism, service and maintenance of ZD321, ZD323, ZD326 and ZD331. It is divided into three parts, "General", "Mechanism" and "Servicing".

■ General

Information on the tractor identification, the general precautions, maintenance check list, check and maintenance and special tools are described.

■ Mechanism

Information on the construction and function are included. This part should be understood before proceeding with troubleshooting, disassembling and servicing.

Refer to Diesel Engine / Tractor Mechanism Workshop Manual (Code No. 9Y021-01876 / 9Y021-18201) for the one which has not been described to this workshop manual.

■ Servicing

Information on the troubleshooting, servicing specification lists, tightening torque, checking and adjusting, disassembling and assembling, and servicing which cover procedures, precautions, factory specifications and allowable limits.

All information illustrations and specifications contained in this manual are based on the latest product information available at the time of publication.

The right is reserved to make changes in all information at any time without notice.

Due to covering many models of this manual, information or picture being used, have not been specified as one model.

November 2008

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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 repair 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, may result in minor or moderate injury.



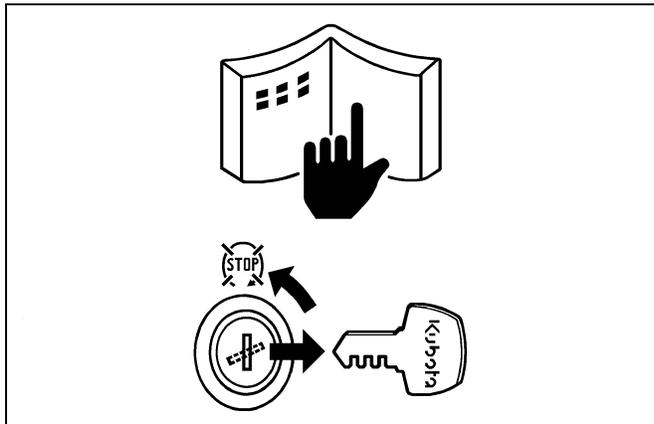
IMPORTANT

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



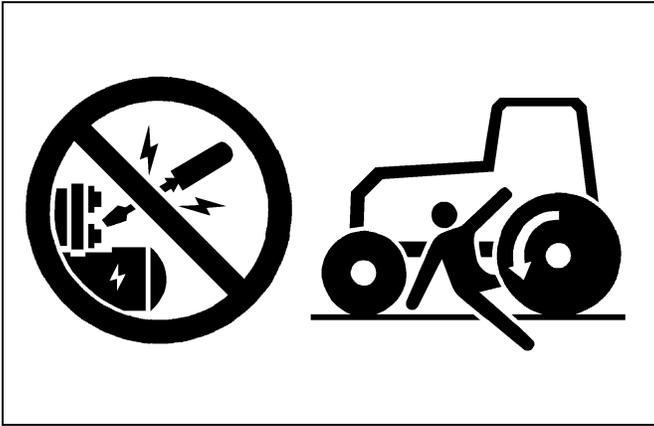
NOTE

: Gives helpful information.



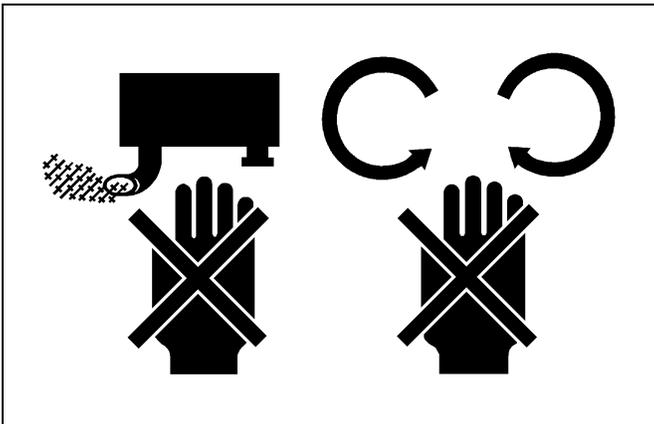
BEFORE SERVICING AND REPAIRING

- Read all instructions and safety instructions in this manual and on your machine safety decals.
- Clean the work area and machine.
- Park the machine on a firm and level ground, and set the parking brake.
- Lower the implement to the ground.
- Stop the engine, and remove the key.
- Disconnect the battery negative cable.
- Hang a "**DO NOT OPERATE**" tag in operator station.



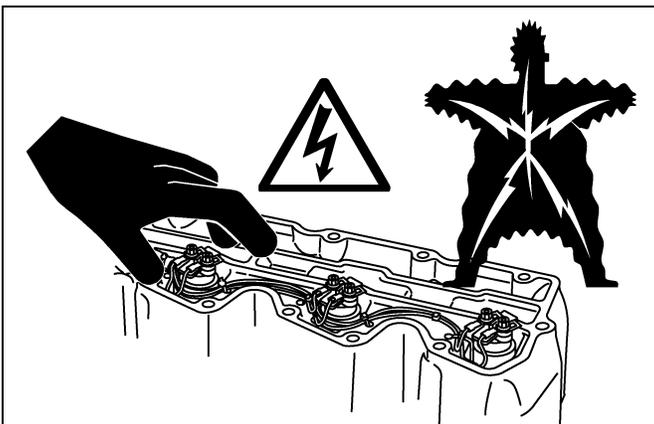
SAFETY STARTING

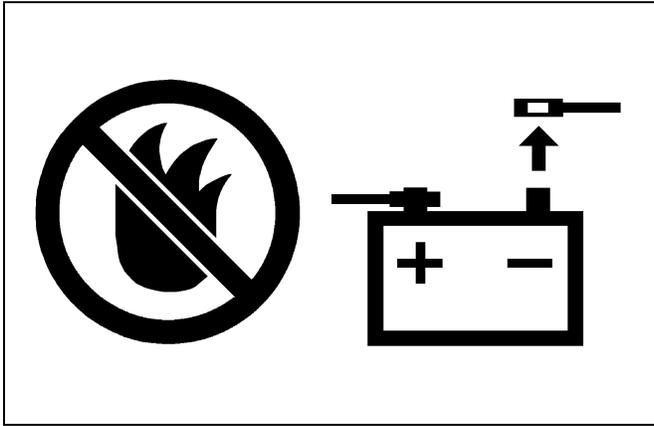
- Do not start the engine by shorting across starter terminals or bypassing the safety start switch.
- Do not alter or remove any part of machine safety system.
- Before starting the engine, make sure that all shift levers are in neutral positions or in disengaged positions.
- Never start the engine while standing on ground. Start the engine only from operator's seat.



SAFETY WORKING

- Do not work on the machine while under the influence of alcohol, medication, or other substances or while fatigued.
- Wear close fitting clothing and safety equipment appropriate to the job.
- Use tools appropriate to the work. Makeshift tools, parts, and procedures are not recommended.
- When servicing is performed together by two or more persons, take care to perform all work safely.
- Do not work under the machine that is supported solely by a jack. Always support the machine by safety stands.
- Do not touch the rotating or hot parts while the engine is running.
- Never remove the radiator cap while the engine is running, or immediately after stopping. Otherwise, hot water will spout out from radiator. Only remove radiator cap when cool enough to touch with bare hands. Slowly loosen the cap to first stop to relieve pressure before removing completely.
- Escaping fluid (fuel or hydraulic oil) under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic or fuel lines. Tighten all connections before applying pressure.
- Do not open high-pressure fuel system. High-pressure fluid remaining in fuel lines can cause serious injury. Do not disconnect or attempt repair fuel lines, sensors, or any other components between the high-pressure fuel pump and injectors on engines with high pressure common rail fuel system.
- High voltage exceeding 100 V is generated in the ECU, and is applied to the injector. Pay sufficient caution to electric shock when performing work activities.





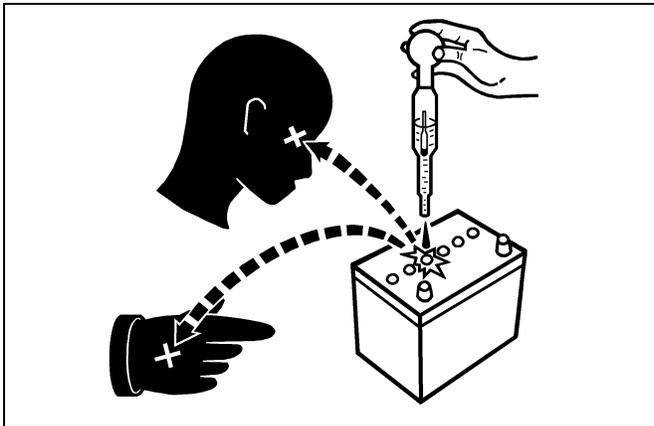
AVOID FIRES

- Fuel is extremely flammable and explosive under certain conditions. Do not smoke or allow flames or sparks in your working area.
- To avoid sparks from an accidental short circuit, always disconnect the battery negative cable first and connect it last.
- Battery gas can explode. Keep sparks and open flame away from the top of battery, especially when charging the battery.
- Make sure that no fuel has been spilled on the engine.



VENTILATE WORK AREA

- If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in a closed area. The exhaust gas contains poisonous carbon monoxide.



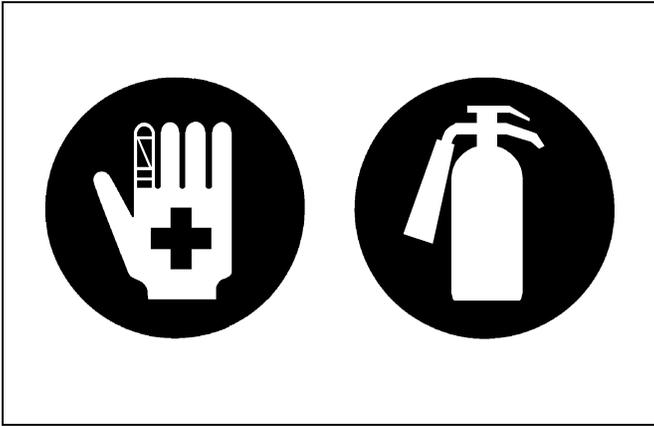
PREVENT ACID BURNS

- Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, clothing and cause blindness if splashed into eyes. Keep electrolyte away from eyes, hands and clothing. If you spill electrolyte on yourself, flush with water, and get medical attention immediately.



DISPOSE OF FLUIDS PROPERLY

- Do not pour fluids into the ground, down a drain, or into a stream, pond, or lake. Observe relevant environmental protection regulations when disposing of oil, fuel, coolant, electrolyte and other harmful waste.

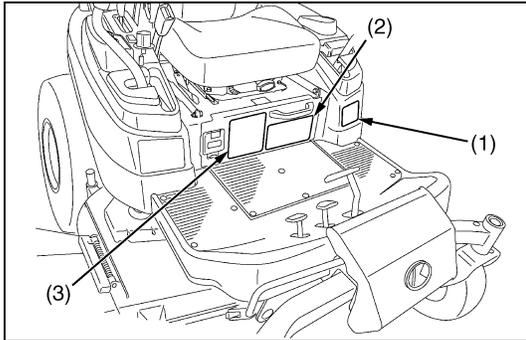
**PREPARE FOR EMERGENCIES**

- Keep a first aid kit and fire extinguisher handy at all times.
- Keep emergency numbers for doctors, ambulance service, hospital and fire department near your telephone.

SAFETY DECALS

The following safety decals are installed on the machine.

If a decal becomes damaged, illegible or is not on the machine, replace it. The decal part number is listed in the parts list.



(1) Part No. K3181-6585-1

<p>⚠ WARNING TO AVOID SERIOUS INJURY OR DEATH</p> <ol style="list-style-type: none"> 1. Park the machine on level ground. 2. If necessary to park on an incline. <ol style="list-style-type: none"> ① Stop the machine. ② Apply the parking brake. ③ Stop the engine. <p>If you stop the engine on an incline without applying the parking brake, the machine could move and runaway.</p> <ol style="list-style-type: none"> 3. If the engine stops suddenly during operation, apply the parking brake immediately to prevent machine runaway. 	<p>⚠ ADVERTENCIA PARA EVITAR LESIONES PERSONALES GRAVES O LA MUERTE</p> <ol style="list-style-type: none"> 1. Estacione la máquina en la tierra del nivel. 2. Si es necesario estacionar en una cuesta. <ol style="list-style-type: none"> ① Apagar la máquina. ② Aplique el freno de estacionamiento. ③ Luego apague el motor. <p>Si apaga el motor en una cuesta sin aplicar el freno de estacionamiento, la máquina puede moverse sin control.</p> <ol style="list-style-type: none"> 3. Si la máquina se detiene repentinamente durante la operación, enganche el freno de estacionamiento inmediatamente para evitar la pérdida de control.
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(2) Part No. K3181-6584-1

<p>⚠ WARNING TO AVOID SERIOUS INJURY OR DEATH</p> <ol style="list-style-type: none"> 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. 	<p>⚠ ADVERTENCIA PARA EVITAR LESIONES PERSONALES GRAVES O LA MUERTE</p> <ol style="list-style-type: none"> 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.
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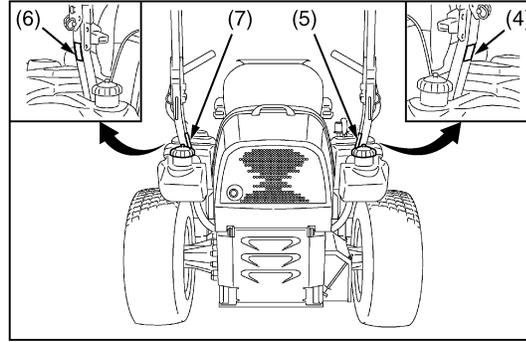
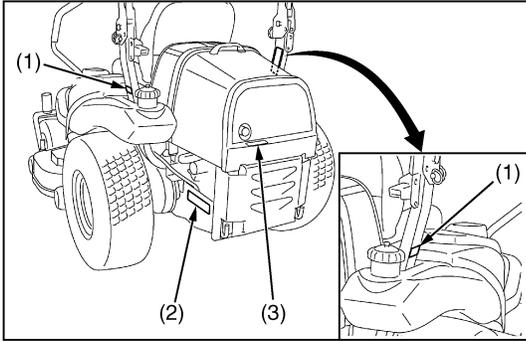
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(3) Part No. K3181-6582-1

<p>⚠ CAUTION TO AVOID PERSONAL INJURY</p> <ol style="list-style-type: none"> 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 clutch, 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. 	<p>⚠ PRECAUCIÓN PARA EVITAR LESIONES PERSONALES</p> <ol style="list-style-type: none"> 1. Lea y entienda el manual del operador antes de efectuar la operación. 2. No ponga en funcionamiento la máquina a menos que esté capacitado para hacerlo. 3. Antes de permitir que otras personas usen la máquina, indíqueles que lean el manual del operador. 4. Verifique con regularidad el apriete de todas las tuercas y pernos. 5. Antes de arrancar el motor, asegúrese de que todos estén a una distancia segura de la máquina. La toma de fuerza debe estar desactivada y las palancas de control de movimiento bloqueadas en neutro. 6. Retire los objetos que pueden ser lanzados por la cuchilla. 7. No opere la máquina cuando hayan niños u otras personas alrededor. 8. No lleve a niños ni a otras personas en la máquina en ningún momento. 9. Antes de desmontar, desenganche el embrague de la toma de fuerza, baje el implemento, cambie a neutro, aplique el freno de estacionamiento, apague el motor y retire la llave. 10. Mantenga los dispositivos de protección (guardas, barreras de protección e interruptores) en su lugar y en buen estado de funcionamiento. 11. Para reducir los riesgos de incendio, mantenga el escape exento de hierba seca, hojas secas u otros materiales combustibles. 12. Esta máquina no está diseñada para uso en calles ni carreteras. 13. Use un soporte seguro para la máquina y el implemento antes de trabajar debajo de los mismos.
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3GZAAAGCP001A



(1) Part No. K3181-6587-1
Diesel fuel No fire only



1BDABCQAP099A

(2) Part No. K3181-6583-1



⚠ DANGER

TO AVOID POSSIBLE INJURY OR DEATH FROM A MACHINE RUNAWAY:
1. Do not start engine by shorting across starter terminals or bypassing the safety start switch. Machine may start in gear and move if normal starting circuitry is bypassed.
2. Start engine only from operator's seat with motion control levers in neutral, lock position and PTO OFF. Never start engine while standing on the ground.

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⚠ PELIGRO

PARA EVITAR POSIBLES LESIONES O LA MUERTE PROVOCADAS POR UN ARRANQUE SUBITO DE LA MÁQUINA:
1. No ponga en marcha el motor con un cortocircuito en los terminales de arranque o evitando el interruptor de arranque de seguridad. La máquina puede ponerse en marcha engranada y moverse si se evita el uso de los circuitos de arranque normales.
2. Ponga en marcha el motor solo desde el asiento del operador con las balanzas de control de movimiento y la toma de fuerza apagados. Nunca ponga en marcha el motor mientras esté de pie en el suelo.

(3) Part No. K3181-6532-1



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(4) Part No. K3181-6564-1



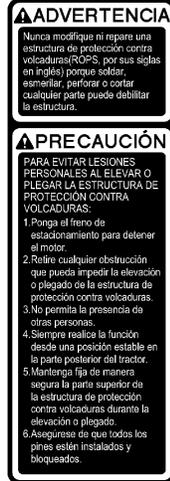
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(5) Part No. K3181-6563-1



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(6) Part No. K3181-6566-1



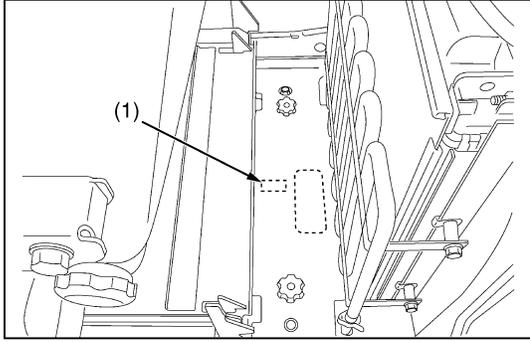
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(7) Part No. K3181-6565-1



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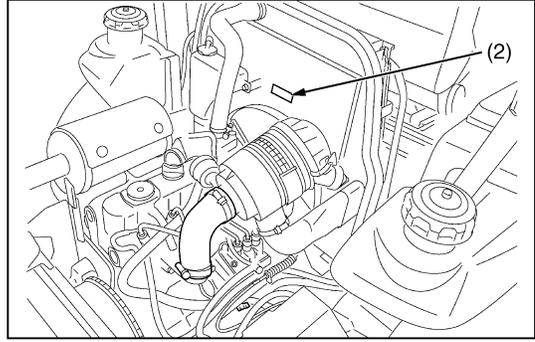
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(1) Part No. K3111-6591-1
Do not get your hands close to fan belt.



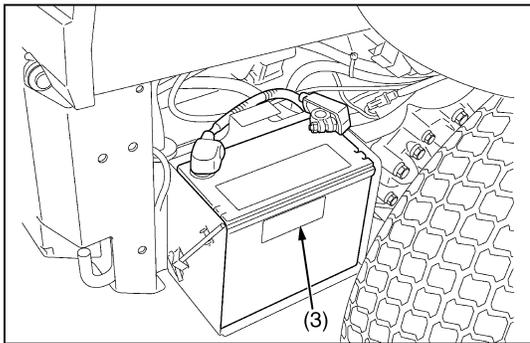
1BDABCQAP107A



(2) Part No. K3181-6586-1
Do not get your hands close to engine fan and fan belt.



1BDABCQAP108A

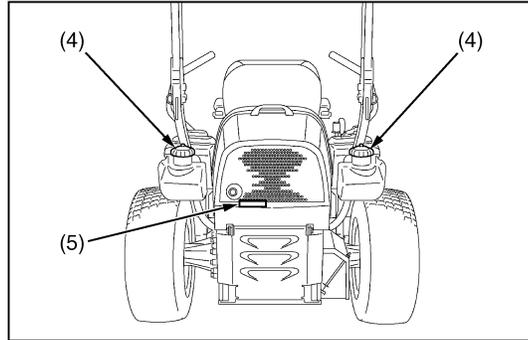
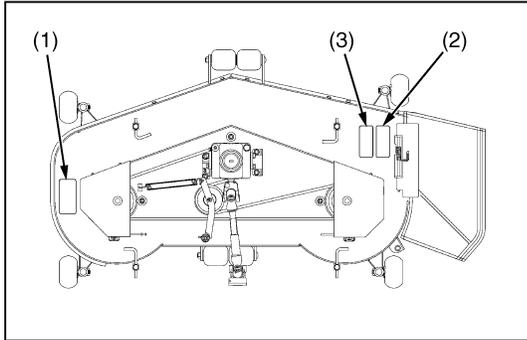


(3) Part No. K3181-6115-1

MAINTENANCE-FREE BATTERY	⚠ DANGER/POISON		PART NO.
CALIFORNIA PROPOSITION 65 WARNING: Batteries, battery packs, terminals and related accessories contain lead and lead compounds, and other chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. WASH HANDS AFTER HANDLING.	SHIELD EYES EXPLOSIVE GASES CAN CAUSE BLINDNESS OR INJURY.	NO SPARKS NO FLAMES NO SMOKING	SULFURIC ACID CAN CAUSE BLINDNESS OR SEVERE BURNS.
	FLUSH EYES IMMEDIATELY WITH WATER. GET MEDICAL HELP FAST.		KEEP OUT OF REACH OF CHILDREN. DO NOT TIP. DO NOT OPEN BATTERY.

1BDABCQAP124A

3GZAAAGCP003A



(1) Part No. K5681-7312-1



1BDACAEP015B

(2) Part No. K5681-7311-1



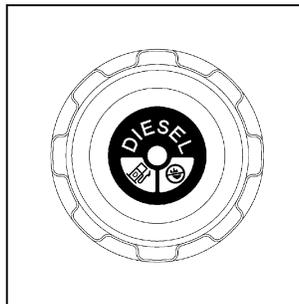
1BDACAEP016B

(3) Part No. K5681-7310-1



1BDACAEP017B

(4) Part No. K3181-2481-1



(5) Part No. K3181-6532-1



1BDABCQAP102A

CARE OF DANGER, WARNING AND CAUTION LABELS

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

3GZAAAGCP004A

SPECIFICATIONS

Model		ZD321N	ZD321	ZD323	ZD326S	ZD326P	ZD331P	ZD331LP	
Engine	Model	D782-E3-ZD		D902-E3-ZD	D1005-E3-ZD-2		D1305-E3-ZD		
	Maximum engine power (Gross)	15.7 kW (21 HP)*1		16.9 kW (23 HP)*1	19.4 kW (26 HP)*1		23.1 kW (31 HP)*1		
	Type	Liquid-cooled							
	Number of cylinders	3							
	Bore and stroke	67 x 73.6 mm (2.64 x 2.90 in.)		72 x 73.6 mm (2.83 x 2.90 in.)	76 x 73.6 mm (2.99 x 2.90 in.)		78 x 88.0 mm (3.07 x 3.46 in.)		
	Total displacement	778 cm ³ (47.5 cu.in.)		898 cm ³ (54.8 cu.in.)	1001 cm ³ (61.1 cu.in.)		1261 cm ³ (77.0 cu.in.)		
	Rated revolution	3200 min ⁻¹ (rpm)						3000 min ⁻¹ (rpm)	
	Fuel	Diesel fuel No. 1 [below – 10 °C (14 °F)] Diesel fuel No. 2 [above – 10 °C (14 °F)]							
	Starter	Electric starter with battery, glow plug, 12 V, 1.1 kW							
	Lubrication	Forced lubrication by gear pump							
	Cooling	Liquid with pressurized radiator							
	Battery	51 R (12 V, RC : 70 min, CCA : 450 A)							
Capacities	Fuel tank	49 L (13 U.S.gals, 11 Imp.gals)							
	Engine crankcase (with filter)	3.5 L (3.70 U.S.qts, 3.08 Imp.qts)		3.9 L (4.1 U.S.qts, 3.4 Imp.qts)		5.7 L (6.0 U.S.qts, 5.0 Imp.qts)			
	Engine coolant	2.7 L (2.85 U.S.qts, 2.38 Imp.qts)		3.5 L (3.70 U.S.qts, 3.08 Imp.qts)					
	Recovery tank	0.25 L (0.26 U.S.qts, 0.22 Imp.qts)							
	Transmission including rear axle gear case	12.1 L (12.8 U.S.qts, 10.6 Imp.qts)*3							
Dimensions	Overall length	2185 mm (56.0 in.)		2220 mm (87.4 in.)			2335 mm (91.9 in.)		
	Overall width Without mower deck	1365 mm (53.7 in.)	1460 mm (57.5 in.)						
	Overall height	With ROPS upright	1915 mm (75.4 in.)						
		With ROPS folded	1555 mm (61.2 in.)						
	Wheel base	1410 mm (55.5 in.)						1525 mm (60.0 in.)	
	Minimum ground clearance	130 mm (5.12 in.) with 54 in., 60 in.		130 mm (5.12 in.) with 60 in.		130 mm (5.12 in.) with 60 in., 72 in.			
	Tread	Front	975 mm (38.4 in.)						1070 mm (42.1 in.)
Rear		1100 mm (43.3 in.)	1150 mm (45.3 in.)						

NOTE: Specifications and design subject to change without notice.

N : Narrow tread

S : Special

P : Semi-pneumatic Non Flat Tire

LP : Long wheel base and equipped with 72 in. mower.

*1 : Manufacturer's estimate

*2 : At 3200 min⁻¹ (rpm) [ZD321, ZD323, ZD326]

At 3000 min⁻¹ (rpm) [ZD331]

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

Model			ZD321N	ZD321	ZD323	ZD326S	ZD326P	ZD331P	ZD331LP
Weight (with Mower Deck)			730 kg (1609 lbs) with 54 in.	755 kg (1664 lbs) with 60 in.	788 kg (1738 lbs) with 60 in.	798 kg (1759 lbs) with 60 in.	813 kg (1792 lbs) with 60 in.	820 kg (1808 lbs) with 60 in.	845 kg (1863 lbs) with 72 in.
Travelling system	Tires	Front	15 x 6.0-6 (4PR) Rib				15 x 6.0-6 (Semi-pneumatic Non Flat Tire) Rib		
		Rear	26 x 10.5-12 (4PR) Turf	26 x 12.0-12 (4PR) Turf					
	Travelling speeds	Forward	0 to 15.0 km/h (0 to 9.3 mph) ^{*2}				0 to 17.0 km/h (0 to 10.6 mph) ^{*2}		
		Reverse	0 to 8.3 km/h (0 to 5.2 mph) ^{*2}				0 to 8.5 km/h (0 to 5.3 mph) ^{*2}		
	Steering		2-Hand levers						
	Transmission		2-Hydrostatic transmission with gear						
	Parking brake		Wet multi disc / foot applied, released						
	Min. turning radius		0 mm (0 in.)						
PTO	Revolution		1 speed (2530 rpm at 3200 engine rpm)				1 speed (2538 rpm at 3000 engine rpm)		
	Drive system		Shaft drive, KUBOTA 10 tooth in involute spline						
	Clutch type		Wet multi discs						
	PTO brake		Wet single disc						

NOTE: Specifications and design subject to change without notice.

N : Narrow tread

S : Special

P : Semi-pneumatic Non Flat Tire

LP : Long wheel base and equipped with 72 in. mower.

*1 : Manufacturer's estimate

*2 : At 3200 min⁻¹ (rpm) [ZD321, ZD323, ZD326]

At 3000 min⁻¹ (rpm) [ZD331]

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

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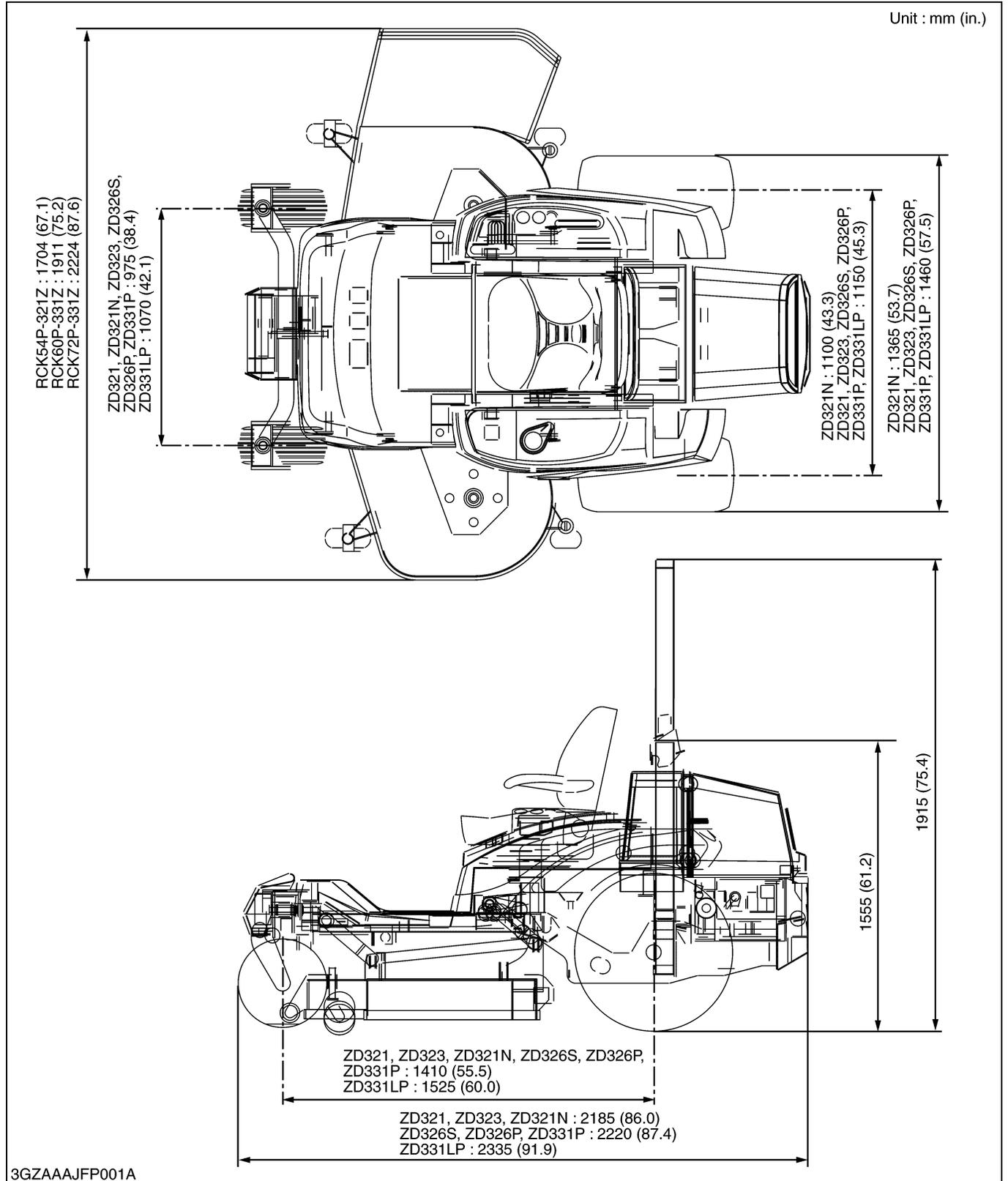
Model			RCK54P-321Z	RCK60P-331Z	RCK72P-331Z
PRO commercial deck (fabricated deck)	Suitable machine		ZD321N	ZD321, ZD323, ZD326S, ZD326P, ZD331P	ZD331LP
	Mounting method		Quick joint, parallel linkage		
	Adjustment of cutting height		Dial gauge		
	Cutting width		1375 mm (54 in.)	1524 mm (60.0 in.)	1829 mm (72.0 in.)
	Cutting height		25 to 127 mm (1.0 to 5.0 in.)		
	Weight (approx.)		128 kg (281 lbs)	148 kg (327 lbs)	169 kg (373 lbs)
	Blade spindle speed		58.8 r/s (3530 min ⁻¹ (rpm)) ^{*1}	56.0 r/s (3360 min ⁻¹ (rpm)) ^{*1}	47.2 r/s (2830 min ⁻¹ (rpm)) ^{*1}
	Blade tip velocity		87.8 m/s (17300 fpm) ^{*1}	92.0 m/s (18100 fpm) ^{*1}	92.6 m/s (18200 fpm) ^{*1}
	Blade length		475 mm (18.7 in.)	523 mm (20.6 in.)	625 mm (24.6 in.)
	Number of blades		3		
	Dimensions	Total length	940 mm (37.0 in.)	1002 mm (39.4 in.)	1170 mm (46.1 in.)
Total width		1704 mm (67.1 in.)	1911 mm (75.2 in.)	2224 mm (87.6 in.)	
Total height		353 mm (13.9 in.)	358 mm (14.1 in.)		

NOTE: Specifications and design subject to change without notice.

*1 : Engine max. revolution.

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DIMENSIONS



G GENERAL

GENERAL

CONTENTS

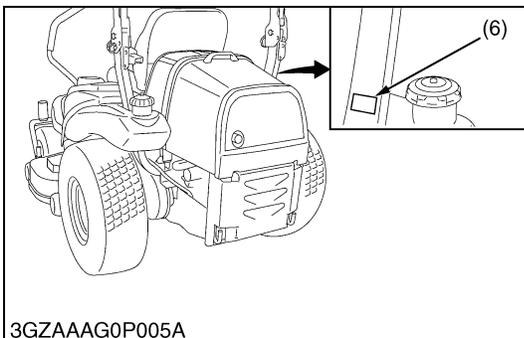
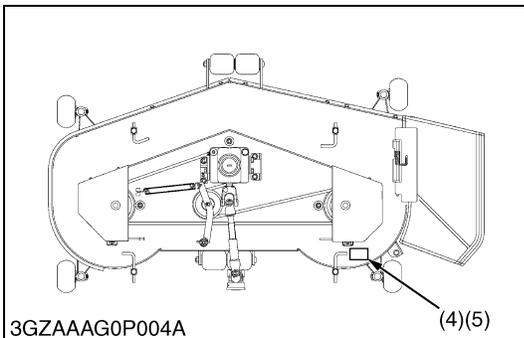
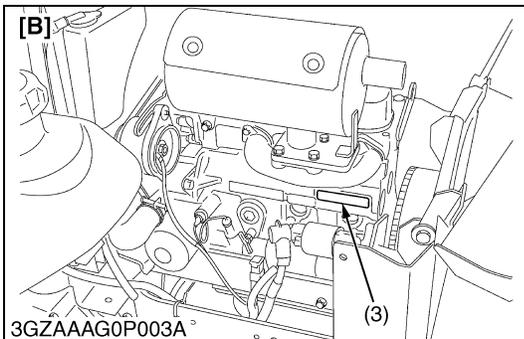
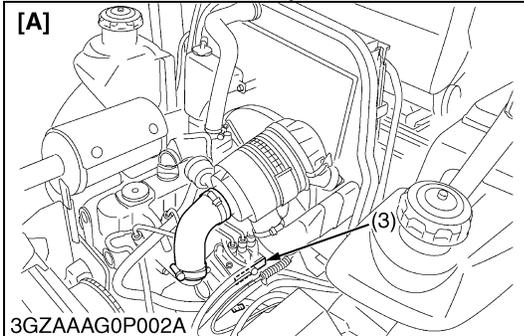
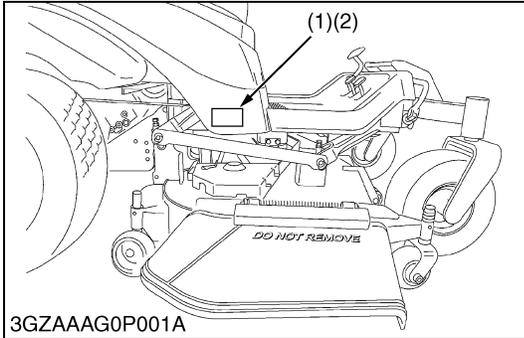
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1. IDENTIFICATION

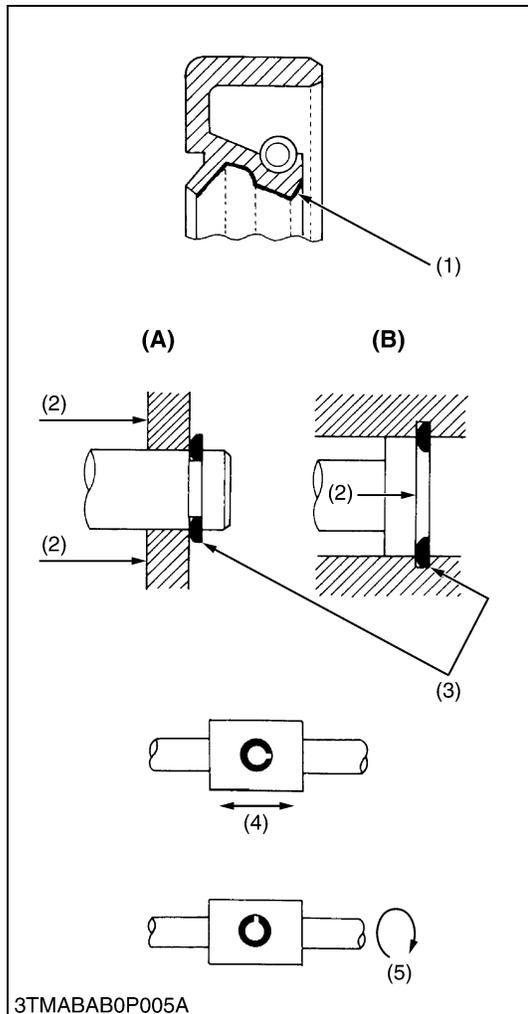
When contacting your local KUBOTA distributor, always specify engine serial number (3), machine serial number (2), mower serial number (4) and hour meter reading.

- (1) Machine Identification Plate **[A] ZD321, ZD323**
- (2) Machine Serial Number **[B] ZD326, ZD331**
- (3) Engine Serial Number
- (4) Mower Serial Number
- (5) Mower Identification Plate
- (6) ROPS Serial Number

W1010714



2. GENERAL PRECAUTIONS



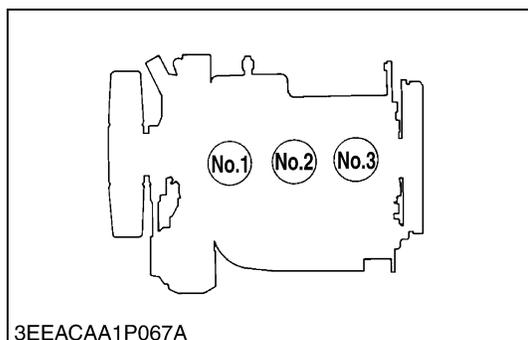
- During disassembly, carefully arrange removed parts in a clean area to prevent confusion later. Screws, bolts and nuts should be installed in their original position to prevent reassembly errors.
- When special tools are required, use KUBOTA genuine special tools. Special tools which are not frequently used should be made according to the drawings provided.
- Before disassembling or servicing electrical wires, always disconnect the ground cable from the battery first.
- Remove oil and dirt from parts before measuring.
- Use only KUBOTA genuine parts for parts replacement to maintain machine performance and to assure safety.
- Gaskets and O-rings must be replaced during reassembly. Apply grease to new O-rings or oil seals before assembling. See the figure left side.
- When reassembling external snap rings or internal snap rings, they must be positioned so that sharp edge faces against the direction from which a force is applied. See the figure left side.
- When inserting spring pins, their splits must face the direction from which a force is applied. See the figure left side.
- To prevent damage to the hydraulic system, use only specified fluid or equivalent.

- (1) Grease
 (2) Force
 (3) Sharp Edge
 (4) Axial Force
 (5) Rotating Movement

- (A) External Snap Ring
 (B) Internal Snap Ring

W1010904

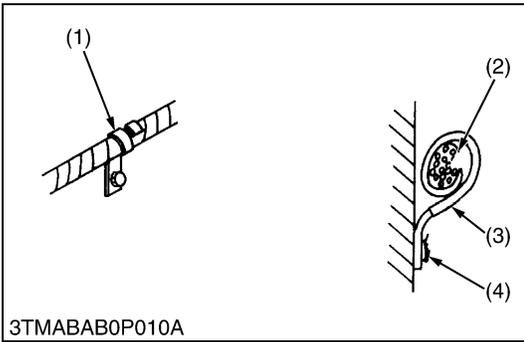
3. CYLINDER NUMBER



The cylinder numbers of KUBOTA diesel engine are designated as shown in the figure.

The sequence of cylinder numbers is given as No.1, No.2 and No.3 starting from the gear case side.

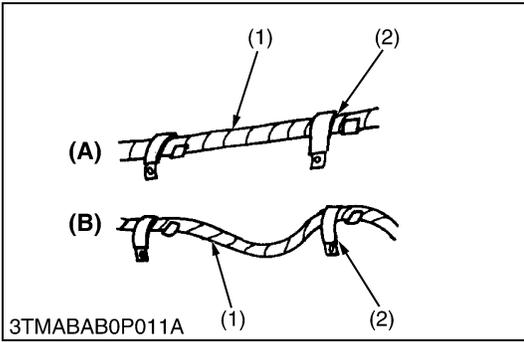
W1011077



- Securely clamp, being careful not to damage wiring.

- (1) Clamp
 - Wind Clamp Spirally
- (2) Wire Harness
- (3) Clamp
- (4) Welding Dent

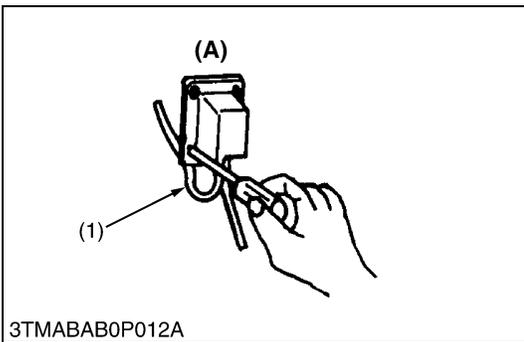
W1011458



- Clamp wiring so that there is no twist, unnecessary sag, or excessive tension, except for movable part, where sag be required.

- (1) Wiring
- (2) Clamp
- (A) Correct
- (B) Incorrect

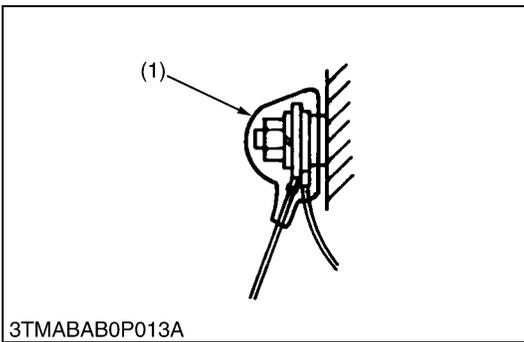
W1011587



- In installing a part, take care not to get wiring caught by it.

- (1) Wiring
- (A) Incorrect

W1011670

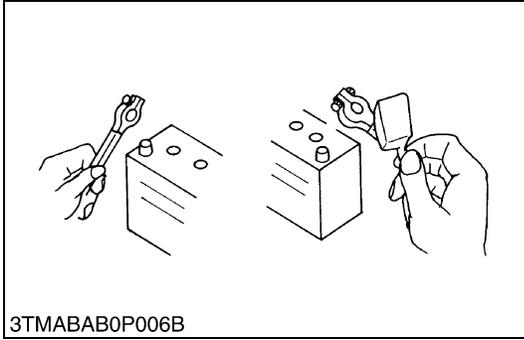


- After installing wiring, check protection of terminals and clamped condition of wiring, only connect battery.

- (1) Cover
 - Securely Install Cover

W1011735

[2] BATTERY



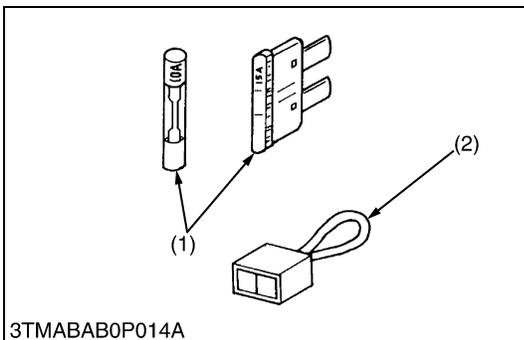
- Take care not to confuse positive and negative terminal posts.
- When removing battery cables, disconnect negative cable first. When installing battery cables, check for polarity and connect positive cable first.
- Do not install any battery with capacity other than is specified (Ah).
- After connecting cables to battery terminal posts, apply high temperature grease to them and securely install terminal covers on them.
- Do not allow dirt and dust to collect on battery.

CAUTION

- Take care not to let battery liquid spill on your skin and clothes. If contaminated, wash it off with water immediately.
- Before recharging the battery, remove it from the machine.
- Before recharging, remove cell caps.
- Do recharging in a well-ventilated place where there is no open flame nearby, as hydrogen gas and oxygen are formed.

W1011816

[3] FUSE



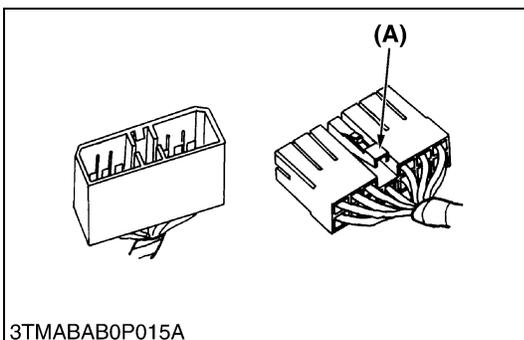
- Use fuses with specified capacity. Neither too large or small capacity fuse is acceptable.
- Never use steel or copper wire in place of fuse.
- Do not install working light, radio set, etc. on machine which is not provided with reserve power supply.
- Do not install accessories if fuse capacity of reserve power supply is exceeded.

(1) Fuse

(2) Slow Blow Fuse

W1012092

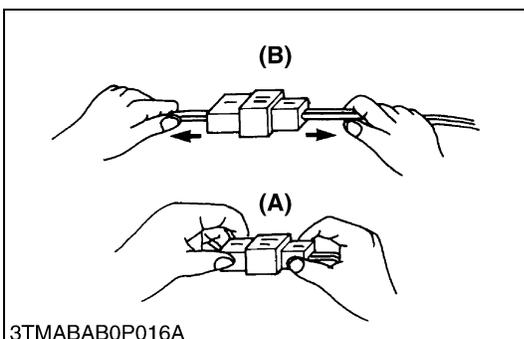
[4] CONNECTOR



- For connector with lock, push lock to separate.

(A) Push

W1012211

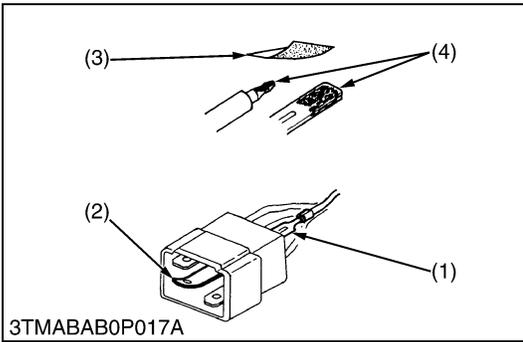


- In separating connectors, do not pull wire harnesses.
- Hold connector bodies to separate.

(A) Correct

(B) Incorrect

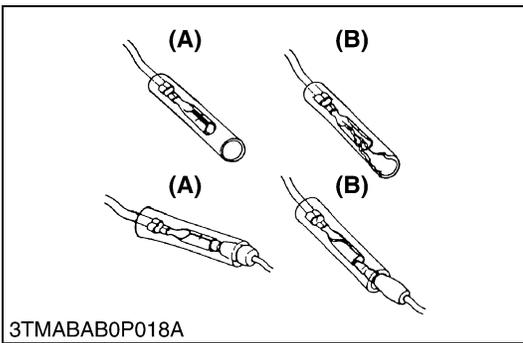
W1012272



- Use sandpaper to remove rust from terminals.
- Repair deformed terminal. Make certain there is no terminal being exposed or displaced.

- (1) Exposed Terminal
- (2) Bend Terminal
- (3) Sandpaper
- (4) Rust

W1012346

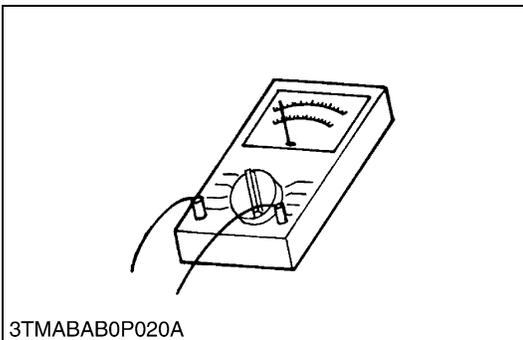


- Make certain that there is no female connector being too open.

- (A) Correct
- (B) Incorrect

W1012430

[5] HANDLING OF CIRCUIT TESTER



- Use tester correctly following manual provided with tester.
- Check for polarity and range.

W1012684

5. LUBRICANTS, FUEL AND COOLANT

No.	Place		Capacity				Lubricants, fuel and coolant
			ZD321	ZD323	ZD326	ZD331	
1	Fuel		49 L 13 U.S.gals 11 Imp.gals				No. 2-D diesel fuel No. 1-D diesel fuel if temperature is below -10 °C (14 °F)
2	Coolant	Cooling system	2.7 L 2.85 U.S.qts 2.38 Imp.qts		3.5 L 3.70 U.S.qts 3.08 Imp.qts	Fresh clean water (soft water) with anti-freeze	
		Recovery tank	0.25 L 0.26 U.S.qts 0.22 Imp.qts				
3	Engine crankcase		3.5 L* 3.70 U.S.qts 3.08 Imp.qts	3.9 L* 4.1 U.S.qts 3.4 Imp.qts	5.7 L* 6.0 U.S.qts 5.0 Imp.qts	Engine oil : Refer to page G-9. Below 0 °C (32 °F) : SAE30, SAE10W-30 or 15W-40 0 to 25 °C (32 to 77 °F) : SAE20, SAE10W-30 or 15W-40 Above 25 °C (77 °F) : SAE10W, SAE10W-30 or 15W-40	
4	Transmission case with filter, hose and rear axle gear case (RH and LH)		12.1 L 12.8 U.S.qts 10.6 Imp.qts				KUBOTA UDT or SUPER UDT fluid**
5	Mower gear case		0.4 L 0.4 U.S.qts 0.4 Imp.qts				SAE 90 gear oil (API service classification : more than GL-3)

■ **NOTE**

- * Oil amount when the oil level is the upper of the oil level gauge.
- ** KUBOTA original transmission hydraulic fluid.

■ **IMPORTANT**

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

Greasing, oiling (Machine)				
No.	Place	No. of greasing point	Capacity	Type of grease
6	Motion control lever pivot bushing and contact position	6	Until grease overflows.	SAE multi-purpose type grease NLG1-2 or NLG1-1 (GC-LB)
7	Center pin	1		
8	King pin	2		
9	Front wheel	2		
10	Front lift arm	2		
11	Universal joint	3		
12	Seat adjuster	2		
13	Throttle cable	2	Moderate amount	Engine oil
Greasing (Mower)				
14	Universal joint	3	Until grease overflows.	SAE multi-purpose type grease NLG1-2 or NLG1-1 (GC-LB)
15	Three spindle shafts	3		
16	Belt tension pulley	1		
17	Belt tension pivot	1		
18	Front anti-scalp roller	2		
19	Front anti-scalp roller pivot boss	2		

■ NOTE

Engine Oil :

- Oil used in the engine should have an American Petroleum Institute (API) service classification and Proper SAE Engine Oil according to the ambient temperatures as shown above:
- With the emission control now in effect, the CF-4 and CG-4 lubricating oils have been developed for use of a low-sulfur fuel on on-road vehicle engines. When an off-road vehicle engine runs on a high-sulfur fuel, it is advisable to employ the “CF or better” lubricating oil with a high Total Base Number (TBN of 10 minimum).
- Refer to the following table for the suitable API classification of engine oil according to the Fuel : (Low Sulfur or High Sulfur Fuels).

Fuel used	Engine oil classification (API classification)
High Sulfur Fuel (≥ 500 ppm)	CF (If the "CF-4, CG-4, CH-4, or CI-4" lubricating oil is used with a high-sulfur fuel, change the lubricating oil at shorter intervals. (approximately half))
Low Sulfur Fuel (< 500 ppm) or Ultra Low Sulfur Fuel (< 15 ppm)	CF, CF-4, CG-4, CH-4 or CI-4

- The CJ-4 engine oil is intended for DPF (Diesel Particulate Filter) type engines, and cannot be used on this tractor.

Fuel :

- Cetane number of 45 minimum. Cetane number greater than 50 is preferred, especially for temperatures below $-20\text{ }^{\circ}\text{C}$ ($-4\text{ }^{\circ}\text{F}$) or elevations above 1500 m (5000 ft).
- If diesel sulfur content greater than 0.5 % sulfur content is used, reduce the service interval for engine oil and filter by 50 %.
- DO NOT use diesel fuel with sulfur content greater than 1.0 %.
- 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)
- Since this engine adopts EPA Tier 4 and Interim Tier 4 standards, the use of low sulfur fuel or ultra low sulfur fuel is mandatory in EPA regulated area (North America). Therefore, please use No.2-D S500 or S15 diesel fuel as an alternative to No.2-D, or use No.1-D S500 or S15 diesel fuel as an alternative to No.1-D if outside air temperature is below $-10\text{ }^{\circ}\text{C}$ ($14\text{ }^{\circ}\text{F}$).

Transmission Oil :

The oil used to lubricate the transmission is also used as hydraulic fluid. To insure proper operation of the hydraulic system and to complete lubrication of the transmission, it is important that a multi-grade transmission fluid is used in this system. We recommend the use of KUBOTA UDT or SUPER UDT fluid for optimum protection and performance. (Consult your local KUBOTA Dealer for further detail.)

Do not mix different brands together.

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

6. TIGHTENING TORQUES

[1] GENERAL USE SCREWS, BOLTS AND NUTS

Screws, bolts, and nuts whose tightening torques are not specified in this Workshop Manual should be tightened according to the table below.

Indication on top of bolt	4 No-grade or 4T						7 7T						9 9T		
Material of bolt	SS400, S20C						S43C, S48C						SCr435, SCM435		
Material of opponent part	Ordinariness			Aluminum			Ordinariness			Aluminum			Ordinariness		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
Diameter															
M6 (6 mm, 0.24 in.)	7.9	0.80	5.8	7.9	0.80	5.8	9.81	1.00	7.24	7.9	0.80	5.8	12.3	1.25	9.05
	to 9.3	to 0.95	to 6.8	to 8.8	to 0.90	to 6.5	to 11.2	to 1.15	to 8.31	to 8.8	to 0.90	to 6.5	to 14.2	to 1.45	to 10.4
M8 (8 mm, 0.31 in.)	18	1.8	13	17	1.7	13	24	2.4	18	18	1.8	13	30	3.0	22
	to 20	to 2.1	to 15	to 19	to 2.0	to 14	to 27	to 2.8	to 20	to 20	to 2.1	to 15	to 34	to 3.5	to 25
M10 (10 mm, 0.39 in.)	40	4.0	29	32	3.2	24	48	4.9	36	40	4.0	29	61	6.2	45
	to 45	to 4.6	to 33	to 34	to 3.5	to 25	to 55	to 5.7	to 41	to 44	to 4.5	to 32	to 70	to 7.2	to 52
M12 (12 mm, 0.47 in.)	63	6.4	47	–	–	–	78	7.9	58	63	6.4	47	103	10.5	76.0
	to 72	to 7.4	to 53				to 90	to 9.2	to 66	to 72	to 7.4	to 53	to 117	to 12.0	to 86.7
M14 (14 mm, 0.55 in.)	108	11.0	79.6	–	–	–	124	12.6	91.2	–	–	–	167	17.0	123
	to 125	to 12.8	to 92.5				to 147	to 15.0	to 108				to 196	to 20.0	to 144
M16 (16 mm, 0.63 in.)	167	17.0	123	–	–	–	197	20.0	145	–	–	–	260	26.5	192
	to 191	to 19.5	to 141				to 225	to 23.0	to 166				to 304	to 31.0	to 224
M18 (18 mm, 0.71 in.)	246	25.0	181	–	–	–	275	28.0	203	–	–	–	344	35.0	254
	to 284	to 29.0	to 209				to 318	to 32.5	to 235				to 402	to 41.0	to 296
M20 (20 mm, 0.79 in.)	334	34.0	246	–	–	–	368	37.5	272	–	–	–	491	50.0	362
	to 392	to 40.0	to 289				to 431	to 44.0	to 318				to 568	to 58.0	to 419

W1034542

[2] STUD BOLTS

Material of opponent part	Ordinariness			Aluminum		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
Diameter						
M8 (8 mm, 0.31 in.)	12	1.2	8.7	8.9	0.90	6.5
	to 15	to 1.6	to 11	to 11	to 1.2	to 8.6
M10 (10 mm, 0.39 in.)	25	2.5	18	20	2.0	15
	to 31	to 3.2	to 23	to 25	to 2.6	to 18
M12 (12 mm, 0.47 in.)	29.5	3.0	21.7	31.4	3.2	23.1
	to 49.0	to 5.0	to 36.1			
M14 (14 mm, 0.55 in.)	62	6.3	46	–	–	–
	to 73	to 7.5	to 54			
M16 (16 mm, 0.63 in.)	98.1	10.0	72.4	–	–	–
	to 112	to 11.5	to 83.1			
M18 (18 mm, 0.71 in.)	172	17.5	127	–	–	–
	to 201	to 20.5	to 148			

W1048139

[3] METRIC SCREWS, BOLTS AND NUTS

Grade	Property class 8.8 			Property class 10.9 			
	Unit	N-m	kgf-m	lbf-ft	N-m	kgf-m	lbf-ft
Nominal Diameter							
M8		24 to 27	2.4 to 2.8	18 to 20	30 to 34	3.0 to 3.5	22 to 25
M10		48 to 55	4.9 to 5.7	36 to 41	61 to 70	6.2 to 7.2	45 to 52
M12		78 to 90	7.9 to 9.2	58 to 66	103 to 117	10.5 to 12.0	76 to 86.7
M14		124 to 147	12.6 to 15.0	91.2 to 108	167 to 196	17.0 to 20.0	123 to 144
M16		197 to 225	20.0 to 23.0	145 to 166	260 to 304	26.5 to 31.0	192 to 224

W1016172

[4] AMERICAN STANDARD SCREWS, BOLTS AND NUTS WITH UNC OR UNF THREADS

Grade	SAE GR.5 			SAE GR.8 			
	Unit	N-m	kgf-m	lbf-ft	N-m	kgf-m	lbf-ft
Nominal Diameter							
5/16		23.1 to 27.7	2.35 to 2.83	17.0 to 20.5	32.6 to 39.3	3.32 to 4.00	24.0 to 29.0
3/8		48 to 56	4.9 to 5.8	35.0 to 42.0	61.1 to 73.2	6.23 to 7.46	45.0 to 54.0
1/2		109 to 130	11.1 to 13.2	80.0 to 96.0	149.2 to 178.9	15.21 to 18.24	110.0 to 132.0
9/16		149.2 to 178.9	15.21 to 18.24	110.0 to 132.0	217.0 to 260.3	22.12 to 26.54	160.0 to 192.0
5/8		203.4 to 244	20.74 to 24.88	150.0 to 180.0	298.3 to 357.9	30.42 to 36.49	220.0 to 264.0

W1022485

[5] PLUGS

Shape	Size	Material of opponent part					
		Ordinariness			Aluminum		
		N-m	kgf-m	lbf-ft	N-m	kgf-m	lbf-ft
Tapered screw 	R1/8	13 to 21	1.3 to 2.2	9.4 to 15	13 to 21	1.3 to 2.0	9.4 to 15
	R1/4	25 to 44	2.5 to 4.5	18 to 32	25 to 34	2.5 to 3.5	18 to 25
	R3/8	49 to 88	5.0 to 9.0	37 to 65	49.0 to 58	5.0 to 6.0	37 to 43
	R1/2	59 to 107	6.0 to 11.0	44 to 79.5	59 to 78	6.0 to 8.0	44 to 57
Straight screw 	G1/4	25 to 34	2.5 to 3.5	18 to 25	–	–	–
	G3/8	62 to 82	6.3 to 8.4	46 to 60	–	–	–
	G1/2	49 to 88	5.0 to 9.0	37 to 65	–	–	–

000001666E

7. MAINTENANCE CHECK LIST

No.	Items	Period	Service interval												After since	Reference page		
			50	100	150	200	250	300	350	400	450	500	550	600				
1	Engine oil	Change	★	☆		☆		☆		☆		☆		☆	every 100 Hr	G-18		
2	Engine oil filter	Replace	★			☆				☆				☆	every 200 Hr	G-18		
3	Transmission fluid and rear axle gear case (RH and LH) fluid	Change								★					every 400 Hr	G-21		
4-1	HST transmission oil filter	Replace	★			☆				☆				☆	every 200 Hr	G-19		
4-2	Hydraulic oil filter	Replace	★							☆					every 400 Hr	G-19		
5	Front axle pivot	Adjust		★		☆				☆				☆	every 200 Hr	G-20		
6	Safety device	Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-22		
7	Greasing (without mower)	-	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-24		
8	Mower gear box oil	Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-26		
		Change			☆			☆			☆			☆	every 150 Hr	G-30		
9	Air cleaner primary element	Clean		☆		☆		☆		☆		☆		☆	every 100 Hr	G-25	*1	@
		Replace													every 1 year	G-32		
10	Battery condition	Check		☆		☆		☆		☆		☆		☆	every 100 Hr	G-26		
11	Fan belt	Adjust		☆		☆		☆		☆		☆		☆	every 100 Hr	G-28		
12	Parking brake	Adjust		☆		☆		☆		☆		☆		☆	every 100 Hr	G-29	*2	
13	Fuel filter element	Check		☆		☆		☆		☆		☆		☆	every 100 Hr	G-28		@
		Replace								☆					every 400 Hr	G-32	*2	
14	Fuel line	Check		☆		☆		☆		☆		☆		☆	every 100 Hr	G-28		@
		Replace													every 2 years	G-35	*2	
15	Radiator hose and clamp	Check				☆				☆				☆	every 200 Hr	G-30		
		Replace													every 2 years	G-35	*2	
16	Hydraulic hose	Check				☆				☆				☆	every 200 Hr	G-31		
		Replace													every 2 years	G-35	*2	

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No.	Items	Period	Service interval												After since	Reference page		
			50	100	150	200	250	300	350	400	450	500	550	600				
17	Motion control lever pivot	Adjust				☆				☆				☆	every 200 Hr	G-31		
18	Intake air line	Check				☆				☆				☆	every 200 Hr	G-31		@
		Replace													every 2 years	G-35	*3	
19	Throttle cable	Oil	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-25		
20	Fuel injection nozzle injection pressure	Check													every 1500 Hr	-		@
21	Injection pump	Check													every 3000 Hr	-		@
22	Radiator	Clean													every 1 year	G-33		
23	Coolant	Change													every 1 year	G-33		
24	Mower gear box oil seal	Replace													every 2 years	G-35	*2	
25	Fuel system	Bleed																
26	Fuse	Replace																
27	Blade	Replace																
28	Mower belt	Replace																

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■ IMPORTANT

- The jobs indicated by ★ must be done initially.
 - *1 This maintenance should be done daily more often in dusty condition than in normal conditions. Suggested cleaning interval is every 100 hours in normal conditions.
 - *2 These items should be serviced by an authorized KUBOTA Dealer, unless the owner has the proper tools and is mechanically proficient.
- 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. Please see the Warranty Statement in detail.

8. CHECK AND MAINTENANCE



CAUTION

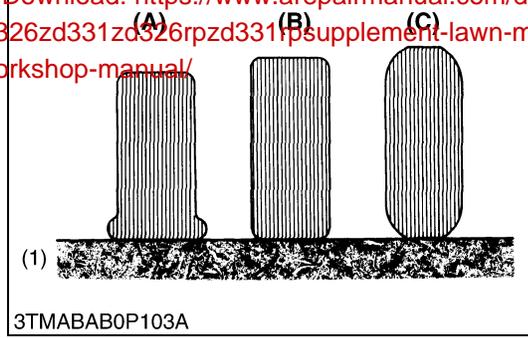
- **Be sure to check and service the machine on a flat place with engine shut off, the parking brake on and chock the wheels.**

[1] DAILY CHECK

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

Checking

- Check areas where previous trouble was experienced.
- Walk around the machine.
 1. Tire pressure, wear and damage
 2. Oil and water leak
 3. Engine oil level
 4. Transmission fluid level
 5. Coolant level in the recovery tank
 6. Damage of machine body, tightness of all bolts and nuts
 7. Radiator screen
 8. Bonnet screen
 9. Brake play
 10. Air cleaner primary element
 11. Fuel level
 12. Oiling
- Mower
 1. Oil leak
 2. Make sure blade cap screws are tight.
 3. Check blades for wear or damage.
 4. Check all hardware.
 5. Make sure all pins are in place.
 6. Mower deck cleaning
 7. Greasing
- While sitting in the operator's seat,
 1. Motion control lever
 2. Parking brake
- Turning the key switch "**ON**"
 1. Performance of the easy checker light
- Starting the engine,
 1. Color of the exhaust fumes
 2. Safety start switch, seat safety control and another safety control and another safety devices.
 3. Check for abnormal noise and vibration.
- Others
 1. Check the areas where previous trouble was experienced.



Checking Tire Pressure

WARNING

To avoid personal injury:

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

IMPORTANT

- Do not use tires larger than specified.

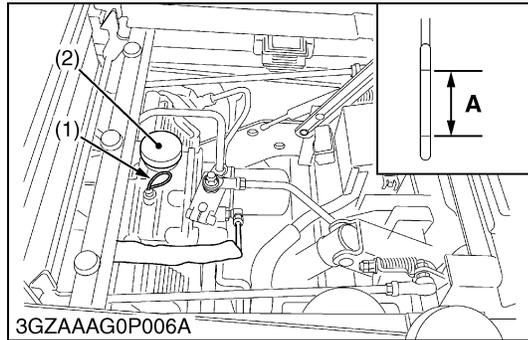
Inflation Pressure

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

	Tire Sizes	Recommended Inflation Pressure
Front	15 × 6.0-6 (Semi-pneumatic Non Flat Tire)	-
	15 × 6.0-6, 4PR Rib	160 kPa (1.6 kgf/cm ² , 23 psi)
Rear	26 × 10.5-12, 4PR Turf	120 kPa (1.2 kgf/cm ² , 17 psi)
	26 × 12.0-12, 4PR Turf	120 kPa (1.2 kgf/cm ² , 17 psi)

- (1) Ground
 (A) Insufficient
 (B) Normal
 (C) Excessive

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Checking Transmission Fluid Level

1. Park the machine on a flat surface, lower the implement to the ground and shut off engine and remove the key.
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 two notches. If the level is too low, add new oil to the prescribed level at the oil inlet. (See page G-7.)

IMPORTANT

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

- (1) Oil Level Dipstick
 (2) Oil Plug and Breather Cup
 (A) Oil level is acceptable within this range.

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