

Product: Kubota WSM R320S,R320S(B) Wheel Loader Service Repair Workshop Manual

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WSM

WORKSHOP MANUAL KUBOTA WHEEL LOADER

R320S,R320S(B)

The Kubota logo is displayed in a bold, black, sans-serif font. The letters are thick and blocky, with a distinctive design for the 'K' and 'O's.

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TO THE READER

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TO THE READER

This Workshop Manual provides service personnel with information about the mechanisms, service and maintenance of the construction machinery. This Workshop Manual is divided into 3 sections, General, Mechanisms and Service.

■ General

This section contains information such as engine and equipment ID numbers, general precautions, maintenance schedules, inspections and maintenance items and special tools.

■ Mechanisms

This section describes the structure of mechanisms and explains their functions. Be sure that you fully understand this Mechanisms section prior to performing any service work, such as troubleshooting or when performing any disassembly or assembly work.

■ Service

This section contains information and procedures for performing maintenance on the backhoe, such as troubleshooting, service specification tables, torque specifications, items to be inspected and adjusted, disassembly and assembly procedures, as well as precautions, maintenance standard values and usage limits.

All of the illustrations, specifications and other information in this manual were created based on the latest model at the time of publication.

Please be aware that changes to the content may be made without prior notice.

■ NOTE

- Corresponding model list

Machine Model		Engine Model
R320S, R320S(B)	For Canada	V1305-E3-RP

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March, 2011

I INFORMATION

INFORMATION

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1. SAFETY FIRST

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

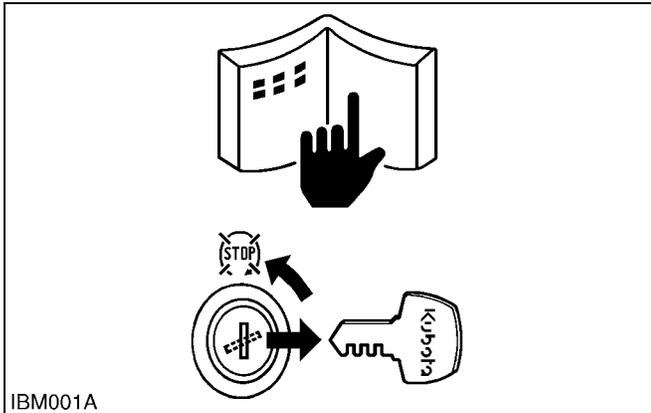
- Gives helpful information.

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2. WORK SAFETY

[1] WORKING SAFELY WITH THE EQUIPMENT MEANS ALWAYS FOLLOWING THESE INSTRUCTIONS:

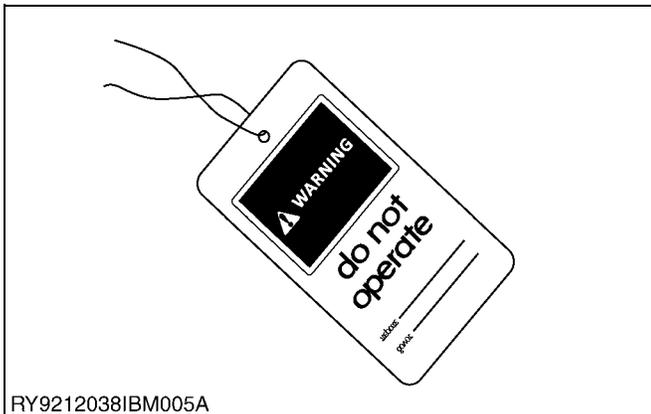
(1) Precautions before working



Before starting any service or maintenance work,

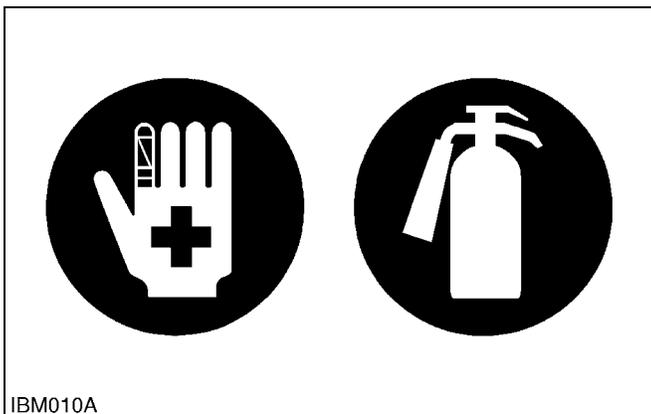
- Read all the general and safety instructions in this manual, as well as the decals on your equipment.
- Always stop the engine whenever you leave the driver's seat to inspect or clean the machine or its devices, or to inspect or adjust parts.
- Choose a safe spot for inspecting the equipment--on flat, hard ground.

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- When performing maintenance on the equipment, hang the DO NOT OPERATE sign where it will be obvious from and around the driver's seat.
- When performing maintenance or repairs, always lower attachments to the ground, stop the engine and set the brake.
- When performing maintenance on the equipment, always disconnect the negative battery cable.
- Before using tools, make sure you understand how to use them correctly and use tools in good condition and of the right size for the job.

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Be Ready for an Emergency

- Keep a first-aid kit and fire extinguisher close at hand so you can use it when needed.
- Keep emergency contact information for doctors, hospitals and ERs handy.

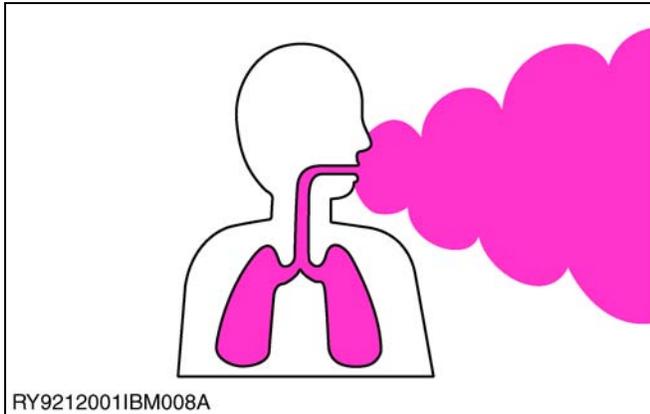
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- Wear clothes appropriate for working on equipment. Do not wear loose-fitting clothes as they may catch on the machine controls.
- When working on the equipment, use all safety gear, such as a helmet, safety glasses and shoes, that are required by law or regulation.
- Never perform maintenance while drowsy or under the influence of alcohol or drugs.

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(2) Precautions Before Working on the Equipment



- Stop the machine on a hard and level location and make sure the area around the machine is free of obstacles and hazardous materials. When parking the machine indoors, select a spot that can be properly ventilated.
- When performing work such as with a hammer, fragments may go flying, so make sure only authorized persons are around the machine.
- Before servicing the machine, clean it off so there is no mud, debris, oil or the like sticking to it.

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- Before getting on/off of the machine, clean off around the steps so there is no mud on them. Always give yourself 3-point support when getting on/off the machine.

CAUTION

- **3-point support means using both legs and one hand or both hands and one leg as you climb up/down.**

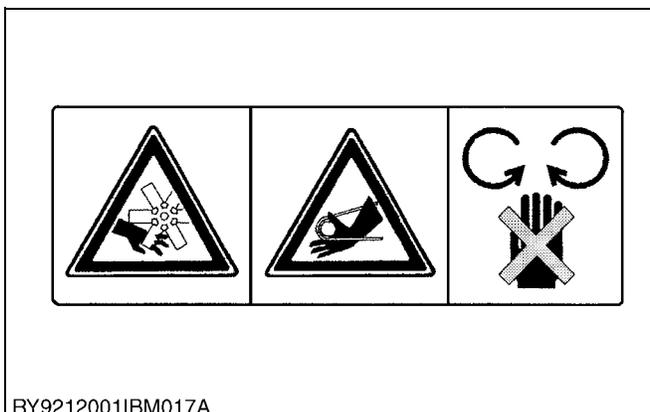
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Starting the Machine Safely

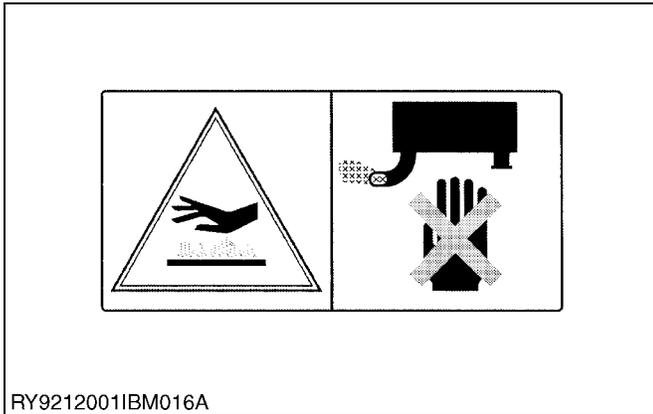
- Before starting the engine, always sit in the driver's seat and make sure the area is safe and clear.
- As it is dangerous, never start the engine from anywhere but the driver's seat.
- Always check and make sure the forward/reverse control lever(s) are not engaged before starting the engine.
- Never start the engine by hot-wiring the starter circuit. This is not only dangerous, but may damage the wheel loader.

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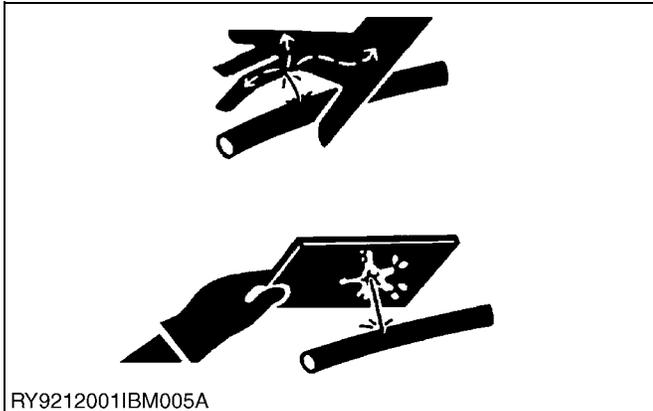
- Whenever it is necessary to open the engine covers or hood in order to service the machine, always prop them open.
- If it is absolutely necessary to run the engine while working on the machine, make sure you are clear of all rotating or moving parts. Also take care not to leave anything, such as tools or rags, near any moving parts.

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- The engine, muffler, radiator, hydraulic line, etc., have parts that remain very hot even after the engine has been stopped. Be sure to avoid these parts, as touching them can result in burns. Radiator coolant, hydraulic fluid and oil also remain hot. Therefore, do not attempt to remove caps and plugs, etc., before these fluids have sufficiently cooled.
- Make sure the coolant temperature has dropped sufficiently before opening the radiator cap. Also, since the inside of the radiator is pressurized, when removing the cap, first loosen it to release the pressure before removing the cap completely.

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- The pressure in the hydraulic circuit stays at pressure even after the engine stops. Before removing parts, such as hydraulic devices from the machine, first release the pressure. Please note that when releasing residual pressure, the machine itself and/or implements may move without warning, so be very careful when releasing the pressure.
- Oil gushing out under pressure is extremely dangerous as it may pierce your skin or your eyes. Similarly, oil leaking out of pinholes is not visible. So when checking for oil leaks, always wear safety glasses and gloves and use a piece of cardboard or a wood block to shield yourself from oil.

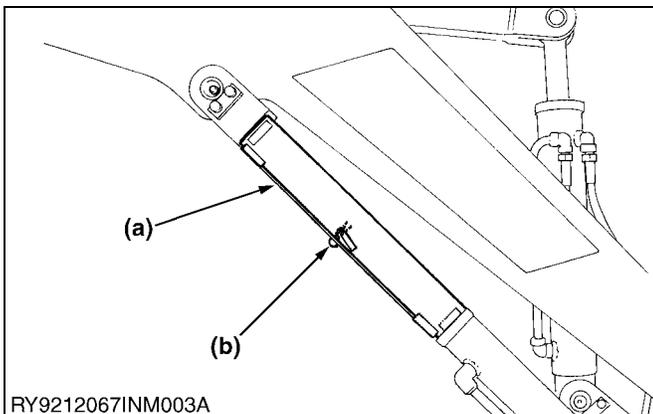
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Handling Safety Equipment



- If the body of the vehicle is lifted up by the bucket for maintenance or inspection purposes, do not get under it. If it is absolutely necessary to get under it, place safety blocks and a safety brace under it to prevent it from dropping. Also, always lock the bucket control lever.

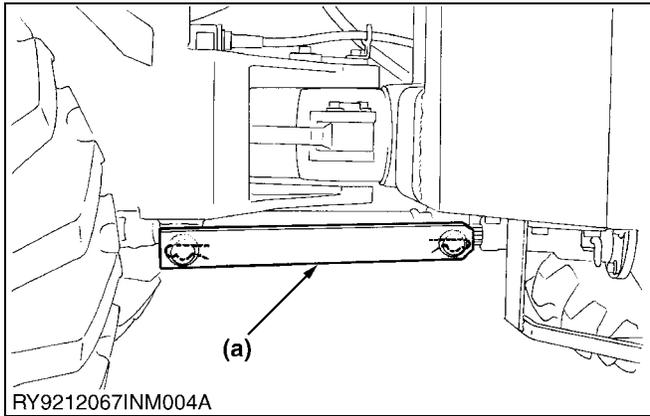
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- When performing inspections or maintenance with an implement lifted, lock the control lever and prevent the implement from dropping by supporting the lift arm with the support device.

- (a) Lift arm support device (b) Pin and beta pin

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- When performing maintenance on the middle of the vehicle, lock the front and rear frames in place with the articulation lock. Always remove and store the articulation lock prior to traveling or working with the vehicle. When the frames are locked together, the vehicle cannot swivel while moving, which can lead to personal injury.

(a) **Articulation lock**

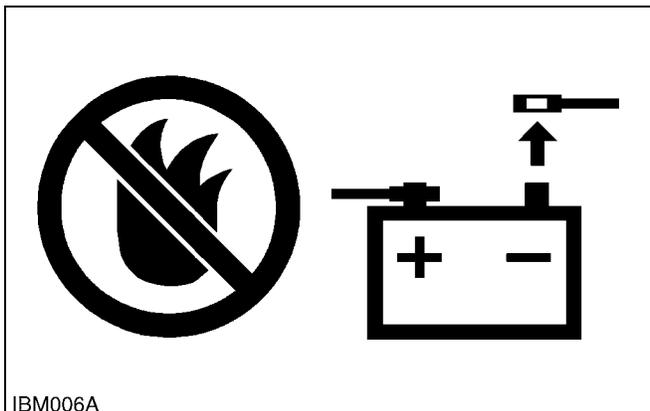
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No Smoking or Open Flames while Fueling

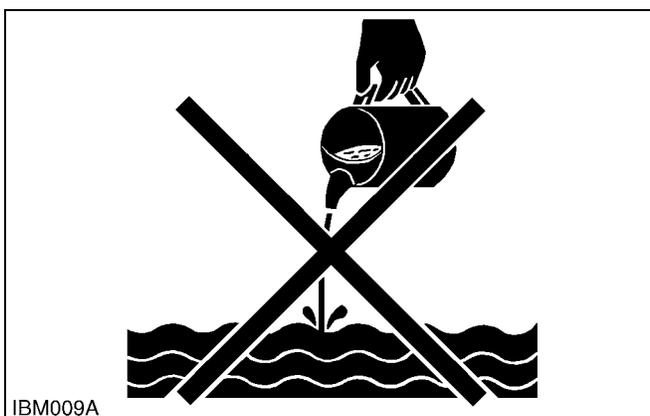
- Fuel is extremely flammable and dangerous. Never smoke near fuel. If fuel is spilled on the machine, its engine, or electrical parts, it may cause a fire. If fuel is spilled, wipe it all up immediately.
- Never smoke while filling the machine with fuel. And always tighten the fuel cap securely and wipe up any spilled fuel.

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- Always wear safety glasses and gloves when handling the battery.
- The gas generated by the battery is flammable. Never weld or use tools like a grinder near the battery. And never smoke near it.
- When disconnecting the battery, always disconnect the negative cable first. When connecting the battery, always connect the positive cable first.

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Dispose of Waste Fluids Properly

- Never dispose of waste fluids on the ground, in the gutter, a river, pond or lake. Always dispose of hazardous substances like waste oil, coolant and electrolytic fluid in accordance with the relevant environmental protection regulations.
- Keep the safety plates clean so they can be read. If a safety plate is damaged and comes off or becomes illegible, put a plate with the same warnings back in its place.

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3. SAFETY DECALS

[1] LOCATIONS

(1) Cord No. 68285-5782-3

CAUTION

TO AVOID PERSONAL INJURY:

Do not operate the machine without ROPS (Roll Over Protective Structures) and without the seat belt fastened. NEVER modify structural members of the ROPS, as you may weaken the structure. If any component is damaged, replace it. Do not attempt repairs.

1BBABBAAP083E

(2) Cord No. 68708-5745-1

WARNING

TO AVOID POSSIBLE INJURY OR DEATH FROM MACHINE RUN AWAY

- DO NOT START ENGINE BY SHORTING ACROSS STARTER TERMINALS. MACHINE MAY START AND MOVE IF NORMAL STARTING CIRCUITRY IS BYPASSED.
- START ENGINE ONLY FROM OPERATOR'S SEAT, NEVER START ENGINE WHILE STANDING ON GROUND.

1BBABBAAP082E

(3) Cord No. 68851-5793-1

WARNING

TO AVOID SERIOUS PERSONAL INJURY OR DEATH:

- ALWAYS DRIVE OR OPERATE STRAIGHT UP OR DOWN A SLOPE. DO NOT CROSS A SLOPE, OR THE MACHINE MAY SLIP SIDEWAYS AND TIP OVER.
- SLOW DOWN WHEN TURNING ON ROUGH, UNEVEN TERRAIN AND SLOPES TO AVOID TIPPING OVER.
- WHEN TRANSPORTING A LOAD, KEEP THE LOADER BUCKET AS LOW AS POSSIBLE TO AVOID TIPPING OVER. BE EXTRA CAREFUL WHEN WORKING ON INCLINES.
- NEVER PERFORM DIGGING OR SHOVELING IN THE ARTICULATED POSITION, OR THE MACHINE MAY TIP OVER.
- DO NOT USE LOADER FOR HANDLING LARGE, LOOSE OR SHIFTABLE LOADS WHICH COULD FALL OUT OF THE BUCKET OR ROLL DOWN THE LOADERS ARMS ONTO THE OPERATOR.
- WHEN THE BUCKHOE IS REMOVED, MOUNT COUNTERWEIGHTS IN PLACE OF THE BUCKHOE TO ENSURE THE STABILITY OF THE MACHINE AND TO AVOID THE DANGER OF TIPPING OVER WHILE OPERATING.
- DO NOT DIG AROUND THE OUTRIGGER OR TIRES. THE SOIL MAY COLLAPSE UNDER THE WEIGHT OF THE MACHINE AND MAY TIP OVER.

ATTENTION

- Sous peine d'accident grave ou mortel:
- Toujours conduire ou opérer en ligne droite pour descendre ou monter une cote. Ne pas traverser en cote car la machine peut glisser latéralement et se renverser.
 - Ralentir dans les virages sur routes et pentes accidentées pour éviter de renverser la machine.
 - Pour le transport du chargement, laisser le godet aussi bas que possible pour éviter de renverser. Faire très attention pendant le travail sur pentes.
 - Ne jamais creuser ou pelleter en position articulée pour éviter que la machine ne se renverse.
 - Ne jamais utiliser le godet du chargeur pour transporter des charges larges ou non stables qui peuvent tomber du godet et rouler le long des bras du chargeur jusque sur l'opérateur.
 - Lorsque la rétrocaveuse est retirée, placer des contrepoids pour assurer la stabilité de la machine et pour éviter qu'elle ne se renverse pendant le service.
 - Ne pas creuser autour des stabilisateurs ou des pneus car le sol peut s'effondrer sous le poids de la machine qui peut se renverser.

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(4) Cord No. 68851-5796-1

WARNING

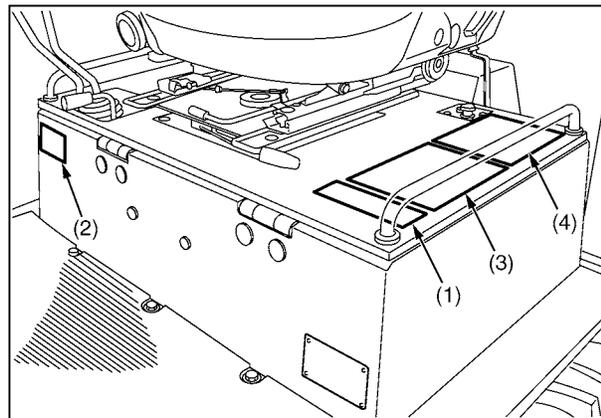
TO AVOID PERSONAL INJURY:

- READ AND UNDERSTAND THE OPERATOR'S MANUAL AND ALL LABELS ON THE MACHINE.
- KNOW HOW TO OPERATE ALL CONTROLS.
- DO NOT ALLOW ANY BYSTANDERS AROUND OR NEAR THE MACHINE.
- NEVER ALLOW PASSENGERS ON THE MACHINE.
- WHEN PARKING OR DISMOUNTING THE MACHINE, STOP THE ENGINE, SET THE PARKING BRAKE, LOWER THE BUCKET AND ATTACHMENT TO THE GROUND, LOCK ALL CONTROL LEVERS IN NEUTRAL, AND REMOVE THE KEY.
- DO NOT GET UNDER THE MACHINE WHILE IT IS BEING LIFTED WITH ONLY THE BUCKET, BACKHOE, OR OUTRIGGERS WHEN SERVICING OR CHECKING UNDERNEATH.
- SECURELY SUPPORT WITH JACKSTANDS.
- DO NOT STAND, WALK OR WORK UNDER RAISED LOADER OR ATTACHMENT UNLESS THE LIFT ARM SUPPORT DEVICE IS USED TO SECURE THE LIFT ARMS.

ATTENTION

- Sous peine d'accident grave:
- Lire attentivement le manuel d'instruction et toutes les plaques d'avertissement sur la machine.
 - Apprendre à utiliser toutes les commandes.
 - Interdire l'accès aux personnes non concernées.
 - Ne pas prendre de passagers sur la machine.
 - Pour le stationnement ou le démontage, arrêter le moteur, engager le frein de stationnement, abaisser le godet et l'accessoire au sol, bloquer tous les leviers de commande au point mort et retirer la clé.
 - Ne pas rester sous la machine pour l'entretien ou l'inspection lorsqu'elle est soulevée uniquement avec le godet, la pelle rétrocaveuse ou les stabilisateurs.
 - Faire supporter la machine sur des ctics.
 - Ne pas rester, marcher ou travailler sous la pelle ou l'accessoire soulevé ai le dispositif de support des bras de levage n'est pas utilisé pour fixer les bras.

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(1) Cord No. 68851-5794-1

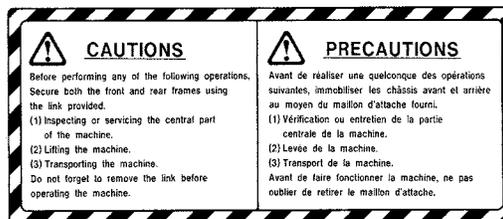


**KEEP OUT OF THIS AREA
TO AVOID SERIOUS
PERSONAL INJURY
OR DEATH**

**Ne pas pénétrer dans
cette zone sous peine
d'accident grave ou
mortel.**

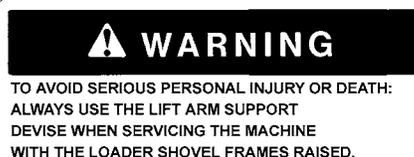
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(2) Cord No. 68818-5731-1



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(3) Cord No. 68851-5795-1



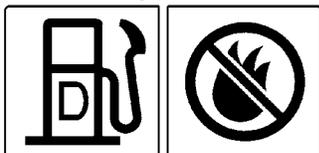
**Sous peine d'accident grave ou mortel:
Toujours utiliser le dispositif de support du bras de
levage lorsque les bâtis de la pelle rétrocaveuse sont
soulevés pour l'entretien de la machine.**

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(4) Part No. RD148-5736-1

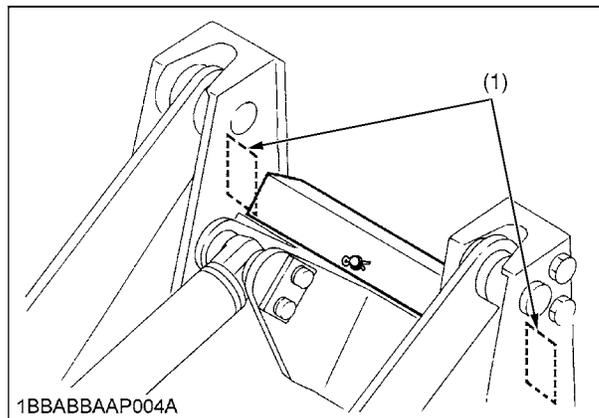
Disel fuel only

No fire

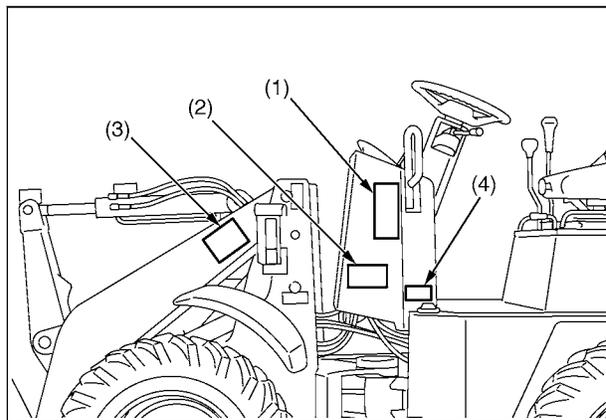


**LOW SULFUR FUEL OR
ULTRA LOW SULFUR
FUEL ONLY**

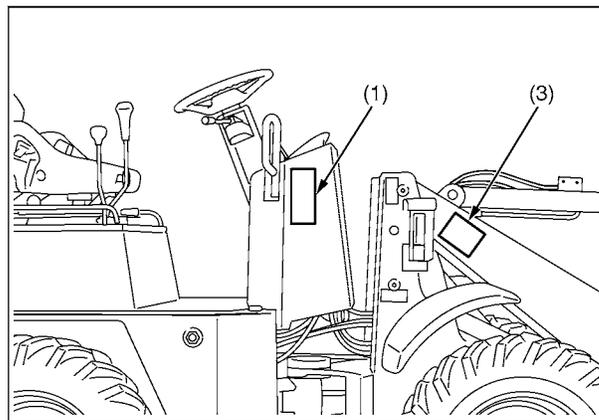
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(1) Cord No. R2411-5785-1

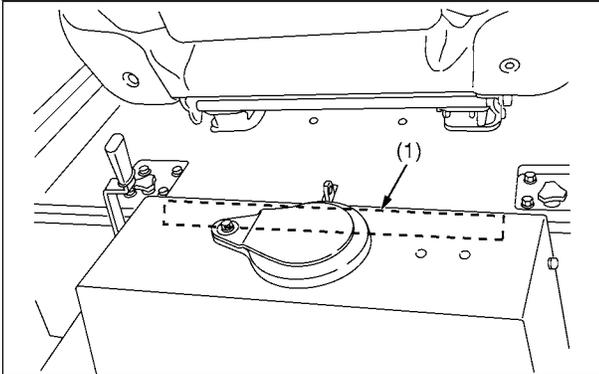


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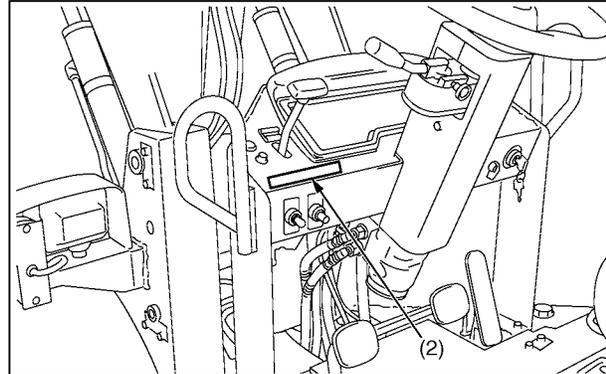
(2) Cord No. 68851-5791-1

<p>CAUTION</p>	<p>ATTENTION</p>
<p>TO AVOID PERSONAL INJURY: NEVER SHIFT THE PARKING BRAKE LEVER TO THE PARK POSITION DURING TRAVEL.</p>	<p>Sous peine d'accident grave: Ne jamais mettre le levier du frein de stationnement en position de parking pendant la conduite.</p>

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(1) Cord No. 68859-5764-3

WARNING

TO AVOID SERIOUS PERSONAL INJURY OR DEATH:

- KEEP CLEAR OF OPERATING AREA.
- OPERATE BACKHOE FROM BACKHOE OPERATOR'S SEAT ONLY.
- BEFORE MOVING THE MACHINE, ALWAYS BE IN THE SEAT (SEAT IN LOADER POSITION), RAISE THE LOADER BUCKET AND STABILIZERS SUFFICIENTLY TO CLEAR THE GROUND, AND THEN DRIVE THE MACHINE FORWARD.

AFTER THE MACHINE HAS BEEN POSITION, ENGAGE THE PARKING BRAKE AND SHIFT TRANSMISSION CONTROLS TO NEUTRAL. LOWER THE LOADER BUCKET AND STABILIZERS AND LEVEL THE MACHINE.

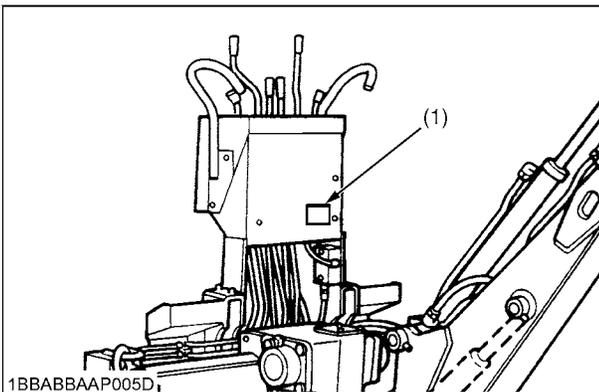
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(2) Cord No. 68859-5726-1 [Both sides]

WARNING

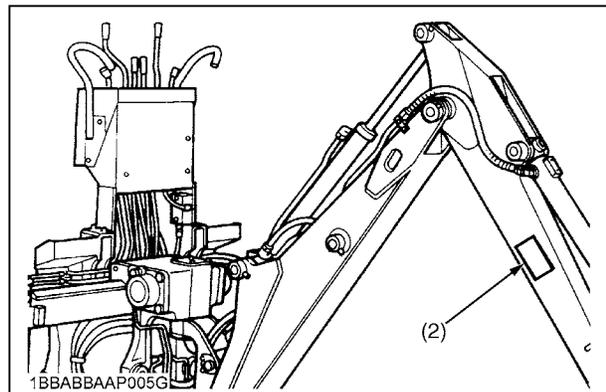
TO AVOID PERSONAL INJURY
STAY CLEAR OF OPERATING
AREA OF THE BACKHOE

1BBABBAAP07E



1BBABBAAP005D

RY9212107IC1004A



1BBABBAAP005G

RY9212107INI0006US0

(1) Cord No. 6C040-5559-1

DANGER EXPLOSIVE GASES

Cigarettes, flames or sparks could cause battery to explode. Always shield eyes and face from battery. Do not charge or use booster cables or adjust post connections without proper instruction and training.

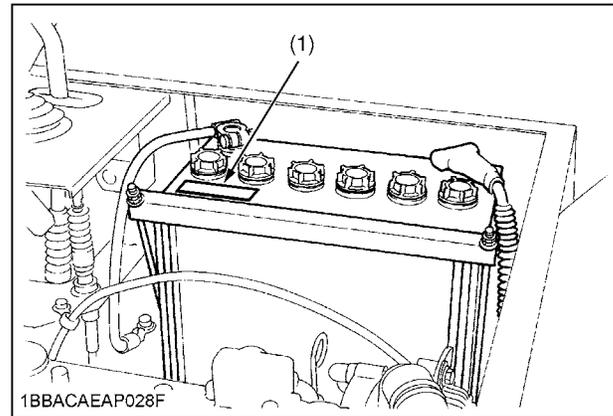
KEEP VENT CAPS TIGHT AND LEVEL

POISON CAUSES SEVERE BURNS

Contains sulfuric acid. Avoid contact with skin, eyes or clothing. In event of accident flush with water and call a physician immediately.

KEEP OUT OF REACH OF CHILDREN

1BBABACAP0110



RY9212107ICI005A

RY9212107INI0007US0

[2] CARE OF LABELS

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 from your KUBOTA dealer.
4. If a component with danger, warning and caution label(s) affixed is replaced with a new part, make sure the 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 them to a clean, dry surface and press out any bubbles to the outside edge.

RY9212007INI0015US0

4. TABLE OF MAIN SPECIFICATIONS

Specification table

Specification are subject to change without notice for the purpose of improvement.

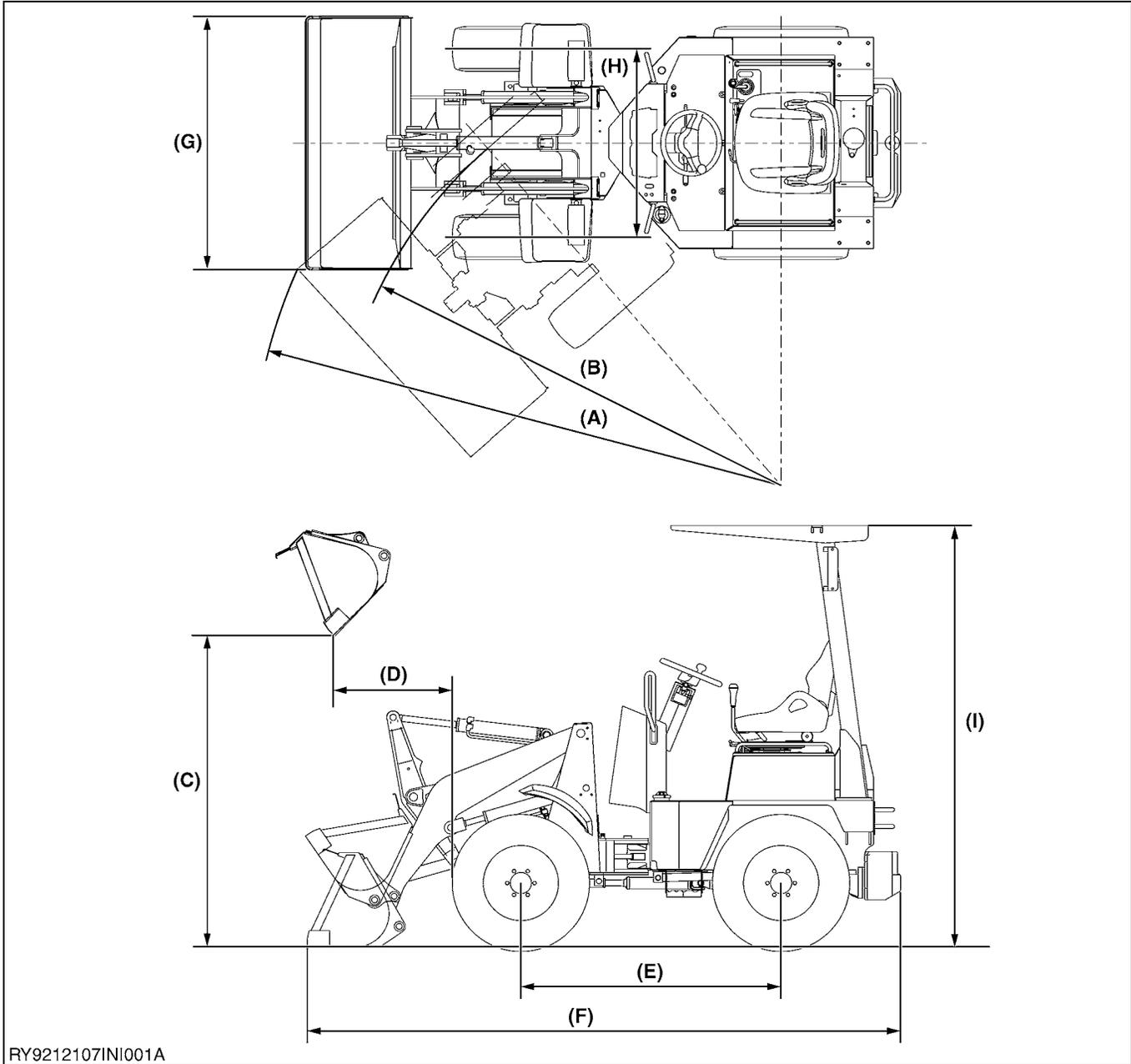
		R320S	R320S with backhoe	
Operating weight (with Rops/Fops)		2220 kg (4895 lbs.)		
Bucket capacity (SAE J742)		0.3 m ³ (0.4 cu.yds.)		
Operating load		4.9 kN (500 kgf, 1100 lbf)		
Tipping load		13.9 kN (1417 kgf, 3130 lbf)		
Engine	Manufacture	KUBOTA		
	Model	Water cooled, kubota V1305-E3-RP diesel engine		
	Horsepower (SAE gross)	18.5 kW (24.8 HP) / 2600 rpm		
	Max. torque (SAE gross)	83.4 N·m (61.5 lb-ft)		
	Number of cylinders	4		
	Displacement	1.335 L (81.4 cu.in.)		
	Starter	12 V / 1.4 kW		
	Battery	12 V / 55 Ah		
	Rated speed	2800 rpm		
	Low idle speed	1000 to 1100 rpm		
Dimensions	Overall length	3575 mm (140.7 in.)	3835 mm (151.0 in.)	
	Overall width	1420 mm (56.0 in.)		
	Overall height (with ROPS)	2360 mm (92.9 in.)		
	Min. ground clearance	230 mm (9.1 in.)		
	Wheel base	1450 mm (57.1 in.)		
	Tread	1050 mm (41.3 in.)		
	Angle of articulation	41 Deg (0.71 rad)		
Loader clearance circle	5975 mm (235.3 in.)			
Bucket	Dump height (without cutting edge)	1595 mm (62.8 in.)		
	Reach, fully raised (without cutting edge)	650 mm (25.6 in.)		
	Lift capacity to max. height	7.3 kN (1630 lbf)		
	Breakout force	18.4 kN (4135 lbf)		
Traveling mechanism	Drive system	4-wheel		
	Tire	Super wide 10-16.5-6PR		
	Traveling speed	Forward (1st)	0 to 6.3 km/h (0 to 3.9 MPH)	
		Forward (2nd)	0 to 14 km/h (0 to 8.7 MPH)	
		Reverse (1st)	0 to 6.3 km/h (0 to 3.9 MPH)	
		Reverse (2nd)	0 to 14 km/h (0 to 8.7 MPH)	
Gradability	30 Deg (0.52 rad)			
Max. tractive force	15.7 kN (3525 lbf)			

		R320S	R320S with backhoe
Backhoe	Max. digging depth	–	2100 mm (82.7 in.)
	Max. digging height	–	2800 mm (110.2 in.)
	Max. dumping height	–	1765 mm (69.5 in.)
	Max. digging radius	–	2975 mm (117.1 in.)
	Swing angle	–	180 Deg (3.14 rad)
	Width of boom slide	–	820 mm (32.3 in.)
	Bucket capacity	–	0.04 m ³ (1.34 cu.ft)
	Bucket width	–	450 mm (18 in.)

RY9212107INI0001US0

5. DIMENSIONS

Main dimensions

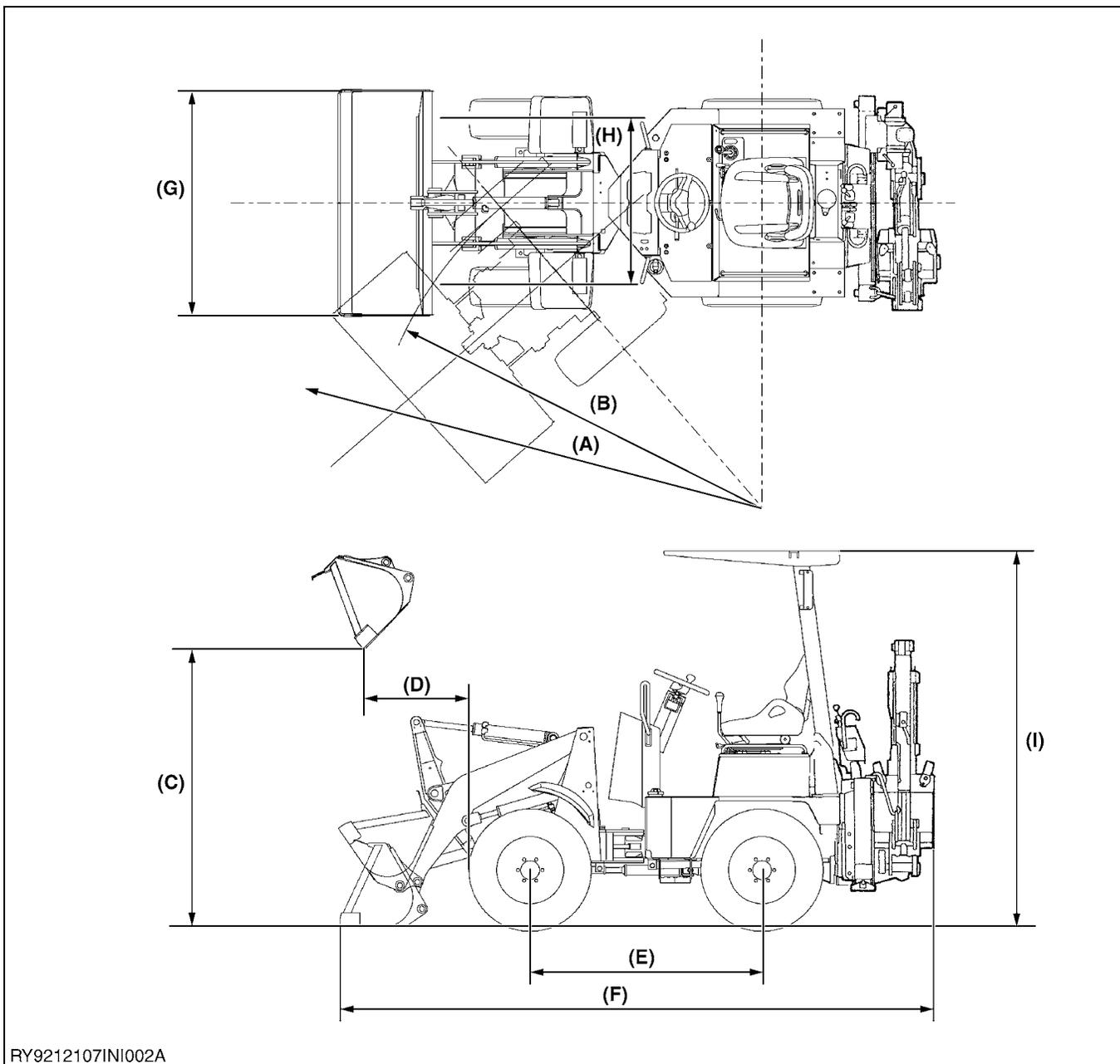


RY9212107INI001A

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
R320S	3000 mm 118.1 in.	2490 mm 98.0 in.	1595 mm 62.8 in.	650 mm 25.6 in.	1450 mm 57.1 in.	3575 mm 140.7 in.	1420 mm 56.0 in.	1050 mm 41.3 in.	2360 mm 93.0 in.

RY9212107INI0002US0

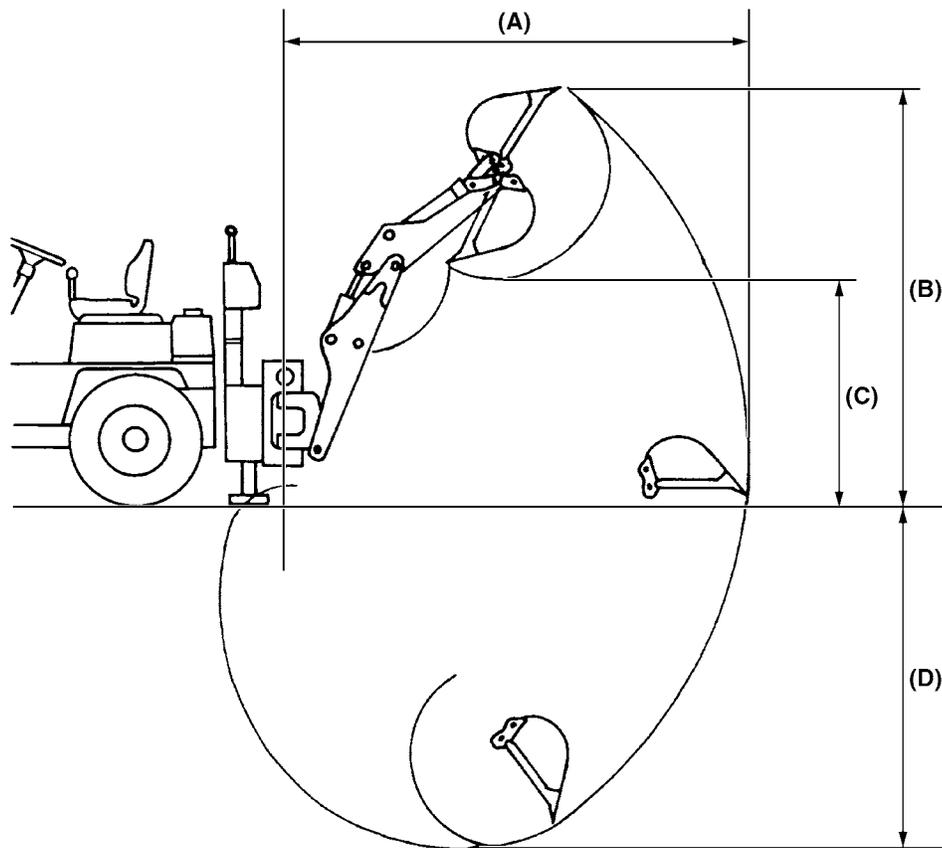
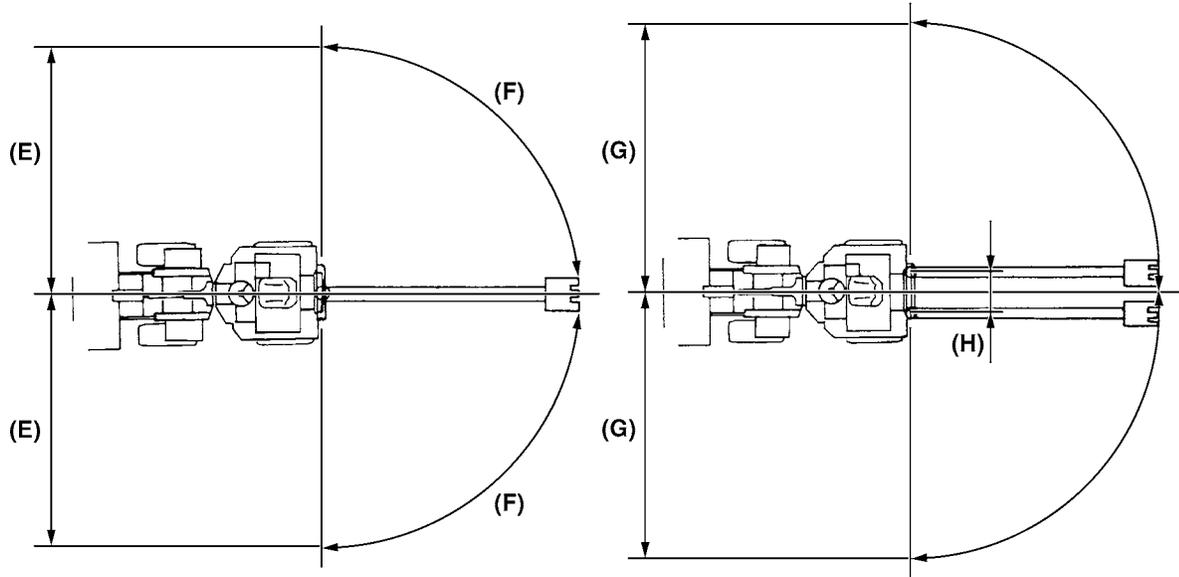
Main dimensions of Backhoe



RY9212107INI002A

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
R320S(B)	3000 mm 118.1 in.	2490 mm 98.0 in.	1595 mm 62.8 in.	650 mm 25.6 in.	1450 mm 57.1 in.	3835 mm 151.0 in.	1420 mm 56.0 in.	1050 mm 41.3 in.	2360 mm 93.0 in.

RY9212107INI0008US0



RY9212107INI003A

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
R320S(B)	2975 mm 117.1 in.	2800 mm 110.2 in.	1765 mm 69.5 in.	2100 mm 82.7 in.	2975 mm 117.1 in.	180 °	3385 mm 133.3 in.	820 mm 32.3 in.

RY9212107INI0009US0

G GENERAL

GENERAL

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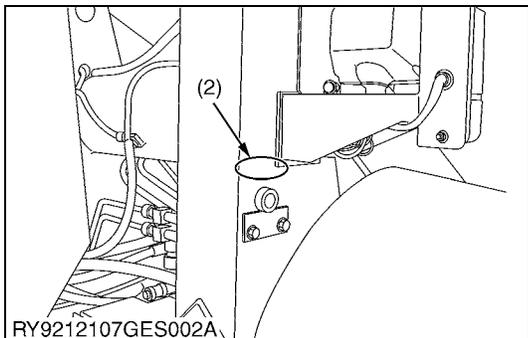
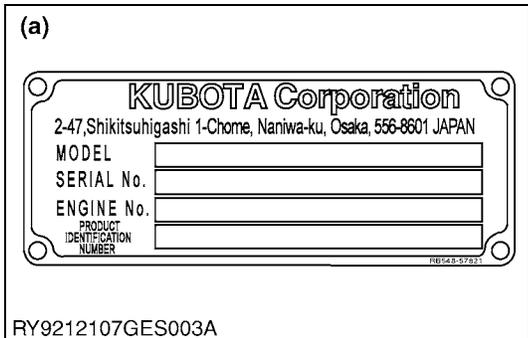
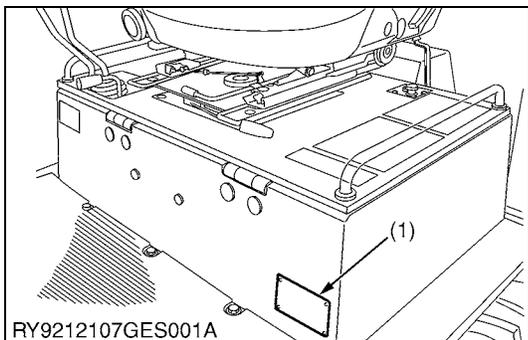
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1. MACHINE IDENTIFICATION

When consulting about this wheel loader, please provide the model of the wheel loader, its frame and engine numbers and the number of hours on the hour meter.

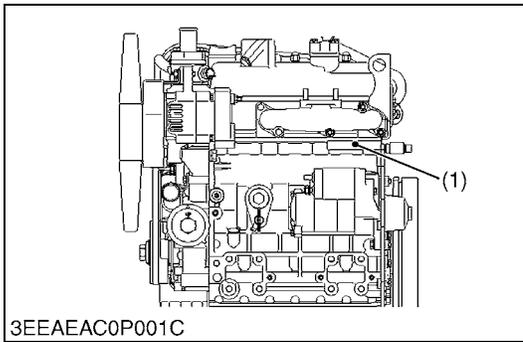
- (1) Wheel loader Nameplate (a) Model Nameplate (Model, frame number, engine number)
- (2) Frame Number
- (3) Engine Number

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2. ENGINE IDENTIFICATION

[1] MODEL NAME AND SERIAL NUMBER



Be sure to check the engine nameplate and serial number when you wish to consult about the engine.

The model and serial number of the engine need to be checked prior to servicing the engine or replacing any of its parts.

■ Engine Serial No.

The engine serial number is the numerical ID of the engine and is printed after the engine's model number.

The year and month of manufacture are indicated as follows.

Year Manufactured

Letter or Number	Year	Letter or Number	Year
1	2001	F	2015
2	2002	G	2016
3	2003	H	2017
4	2004	J	2018
5	2005	K	2019
6	2006	L	2020
7	2007	M	2021
8	2008	N	2022
9	2009	P	2023
A	2010	R	2024
B	2011	S	2025
C	2012	T	2026
D	2013	V	2027
E	2014		

*The letters **I**, **O**, **Q**, **U** and **Z** are not used.

Month Manufactured

Month	Lot Number	
January	A0001 to A9999	B0001 to BZ999
February	C0001 to C9999	D0001 to DZ999
March	E0001 to E9999	F0001 to FZ999
April	G0001 to G9999	H0001 to HZ999
May	J0001 to J9999	K0001 to KZ999
June	L0001 to L9999	M0001 to MZ999
July	N0001 to N9999	P0001 to PZ999
August	Q0001 to Q9999	R0001 to RZ999
September	S0001 to S9999	T0001 to TZ999
October	U0001 to U9999	V0001 to VZ999
November	W0001 to W9999	X0001 to XZ999
December	Y0001 to Y9999	Z0001 to ZZ999

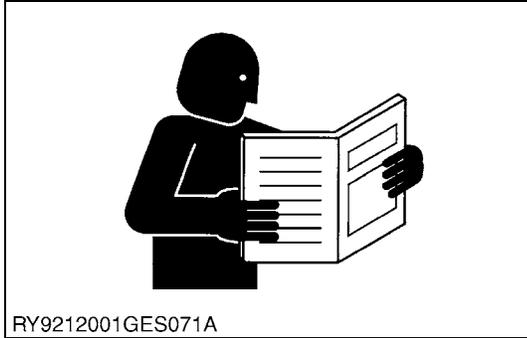
*The letter **I** and **O** are not used.

(a) (b)(c) (d)
e.g. V1305 - 8 HA001

- (a) Engine Model : **V1305**
- (b) Year Manufactured : The **8** indicates **2008**.
- (c) Month : April is indicated by either **G** or **H**.
- (d) Lot Number : (Either **0001 to 9999** or **A001 to Z999**)

- (1) Engine Model and Serial Number

3. GENERAL PRECAUTIONS



Whenever performing maintenance on the machine, always read the Safety Precautions in this manual and the Operator's Manual carefully, become familiar with them and perform the work safely.

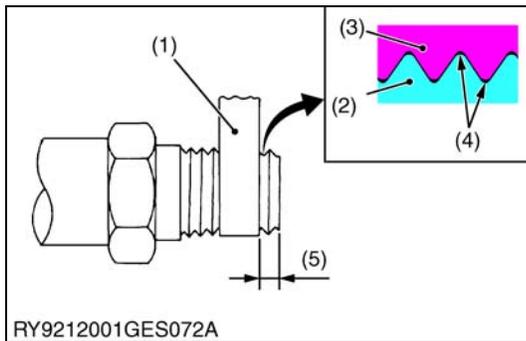
Before performing any maintenance on the machine, make sure it is sufficiently clean and choose a sufficiently clean location to perform any disassembly.

Before performing maintenance on the machine, always disconnect the negative battery cable first.

Whenever a special tool is required, use the special tool that KUBOTA recommends. Make any special tools that are not used very frequently according to the diagrams in this manual.

Always use genuine KUBOTA parts to maintain the performance and safety characteristics of the machine.

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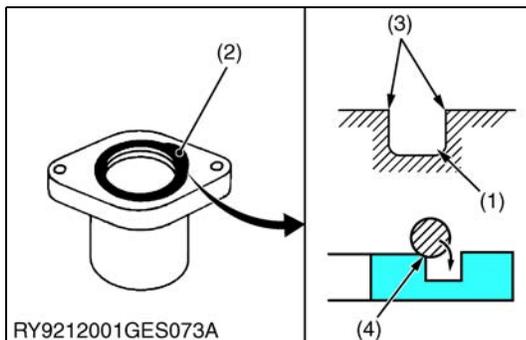


Plumber's Tape

- Wrap plumber's tape on the threads before tightening taper couplings. After wrapping (2 wraps) the plumber's tape, tighten to the specified torque. Once the coupling is tightened, do not loosen it as this will cause an oil leak.

- | | |
|---------------------|--------------------------|
| (1) Plumber's Tape | (4) Gap |
| (2) External Thread | (5) Leave 1 to 2 threads |
| (3) Internal Thread | |

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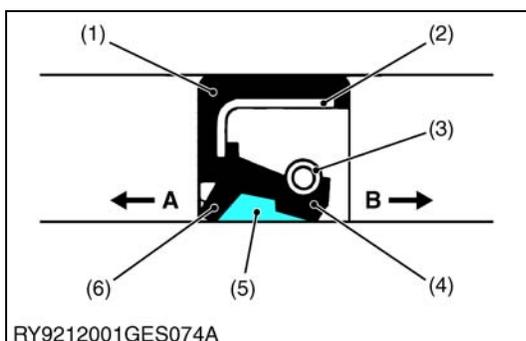


O-Ring

- Clean the groove the O-ring goes in and remove any burrs. Apply grease on the O-ring when inserting it in the groove. (Except floating seals)
- When putting the O-ring in the groove, be careful as it is easy at the very end to twist the O-ring against the inside of the groove. If it gets twisted, roll it gently with your fingertip to untwist it.

- | | |
|---------------------|--|
| (1) O-ring Groove | (4) If the ring touches this corner, it will twist |
| (2) O-ring | |
| (3) Check for burrs | |

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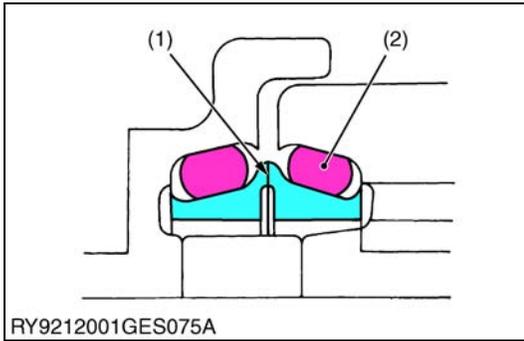


Oil Seal

- Do not face the lip of the oil seal in the wrong direction. Face the main lip toward the material to be sealed.
- After oil seals are replaced, apply grease to the moving parts around the lip to prevent the dry surfaces from wearing against each other when the engine is started. If the seal has a dust lip, fill the gap between the lips with grease.
- As a general rule, use a press to insert the oil seal in place. If that is not possible, use an appropriate tool to gently and evenly tap it into place, taking care that it does not go in at a slant. Press the seal all the way so it seats in the boss.

- | | |
|----------------|---------------------------------------|
| (1) Gasket | A : Air (outside) |
| (2) Metal Ring | B : Hydraulic chamber (inside) |
| (3) Spring | |
| (4) Main Lip | |
| (5) Grease | |
| (6) Dust Lip | |

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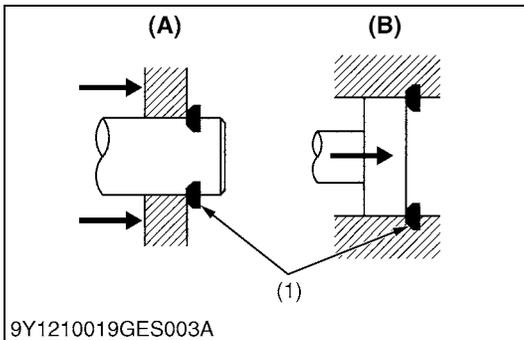
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Floating Seal

- Be sure to wipe off any oil from the O-ring or surfaces that touch the O-ring. (For wheel motors, apply a light film)
- When putting an O-ring into a floating seal, make sure the O-ring does not twist.
- Apply a light film of oil to surrounding surfaces when working to get the floating seal with O-ring in place; take care that the surrounding surfaces, O-ring and housing are parallel with each other.
- After getting the seal in place, turn the engine over 2 or 3 revolutions, to both create a film of oil on surrounding surfaces and to properly seat the face of the seal.

(1) Surrounding Surfaces (2) O-ring

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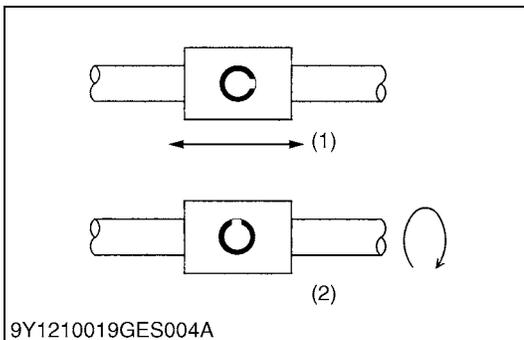
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Snap Ring Related

- When installing external or internal snap rings, orient them as shown in the diagram so the angled side faces the direction of force.

(1) Position so the angled part receives the force (A) External (B) Internal

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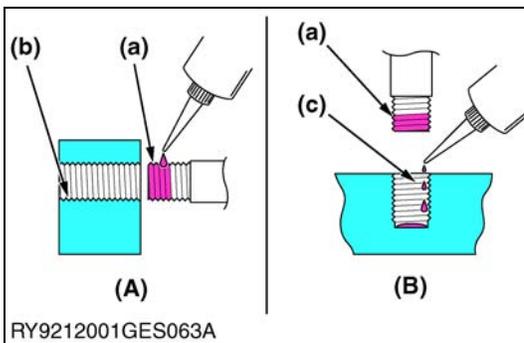
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Spring Pins

- When driving a spring pin, face the split in the direction that receives the force, as shown in the diagram.

(1) With lateral movement (2) With rotational movement

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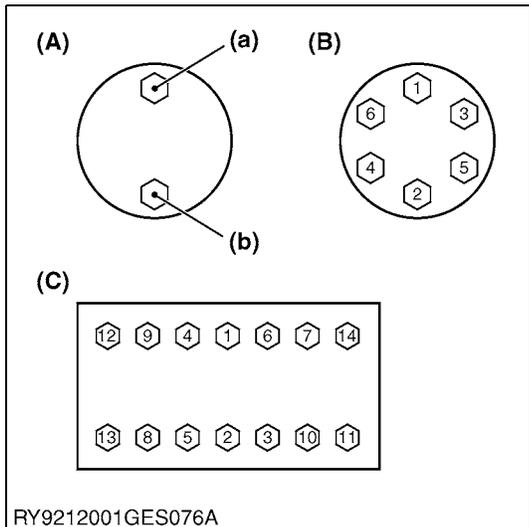
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Adhesive

- Clean and dry the area where adhesive will be applied with a solvent so it is free of moisture, oil and dirt.
- Apply adhesive all around the threads of the bolt except the first set of threads at the tip and fill the grooves between the threads. If the threads or the grooves are large, adjust the amount of adhesive accordingly and apply it all around the bolt hole as well.

(A) Bolt Through-hole (nut) (a) Apply here
 (B) Pocket Bolt Hold (b) Do not apply
 (capsule shape, etc.) (c) Drip on

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Tightening Bolts and Nuts

- Tighten bolts and nuts to their specified torque.
- Tighten nuts and bolts alternately top/bottom **(a) (b)**, left/right so the torque is distributed evenly.

(A) Top/bottom alternately (C) Diagonally across the center
 (B) Across diagonally

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Assembling Hydraulic Hoses

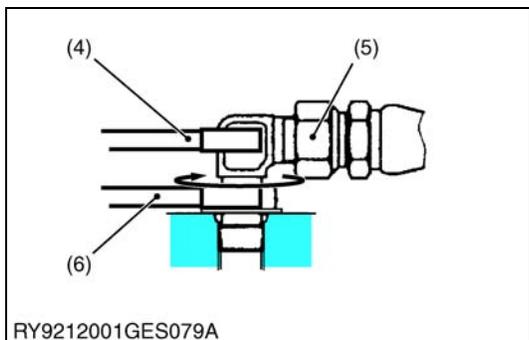
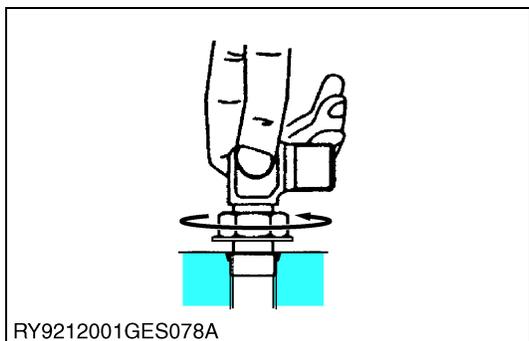
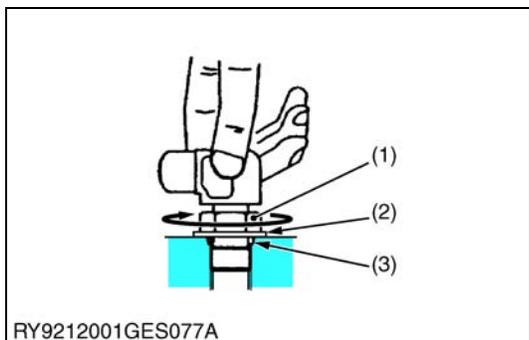
- Tighten to their specified torque.
- Before assembling, wipe the inside of metal fittings clean of any dirt.
- After assembly, put the fitting under normal pressure and check that it does not leak.

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Elbow with Male Seat Assembly Procedure

When assembling an elbow with male seat, adhere to the following procedures to prevent deformation of O-rings and leaks.

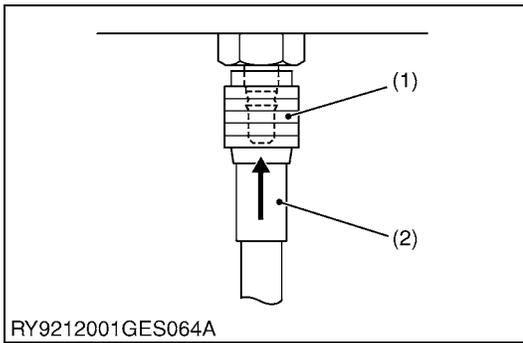
1. Connecting to Valves
 - Clean the blow with male seat and the surface of the seal opposite and mount with the lock-nut on top.
 - Finger tighten till it touches the washer.
2. Positioning
 - Turn the mouth of the elbow back so it faces the right direction. (not back over 1 turn)



3. Fasten
 - Tighten the lock-nut to the specified torque with a wrench.

(1) Lock-nut (4) Wrench for holding
 (2) Washer (5) Hose
 (3) Seal (O-ring) (6) Torque wrench for tightening

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Installing and Removing Quick Couplings

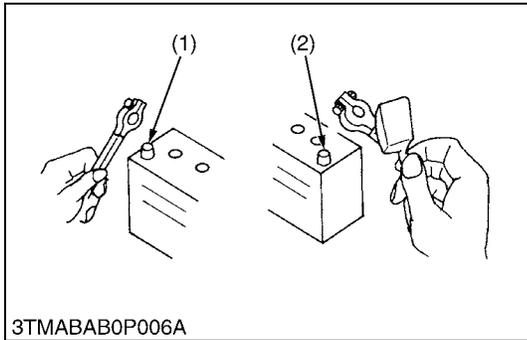
- To remove a quick hose coupling, push the fitting (2) in the direction of the arrow and pull on the plastic part (1) in the opposite direction.
- To attach a quick coupler, push it in firmly in the direction of the arrow. Then check that it will not pull off.

(1) Plastic part

(2) Fitting

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4. HANDLING PRECAUTIONS FOR ELECTRICAL PARTS AND WIRING



Follow the precautions below for handling electrical parts and wiring to ensure safety and prevent damage to the machine and nearby equipment.

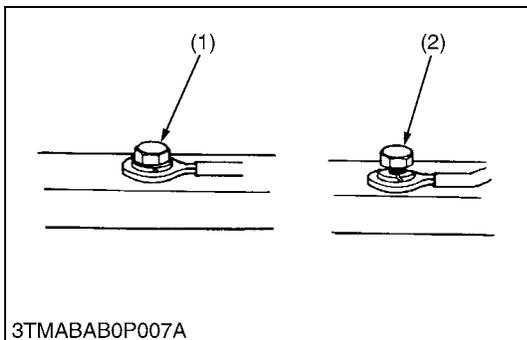
■ IMPORTANT

- **Inspect electrical wiring for damage and/or loose connections.**
- **Do not alter or rewire any electrical parts or wiring.**
- **Always remove the negative battery cable first when disconnecting the battery and attach the positive cable first when connecting it.**

(1) Battery Cable (-) Side (2) Battery Cable (+) Side

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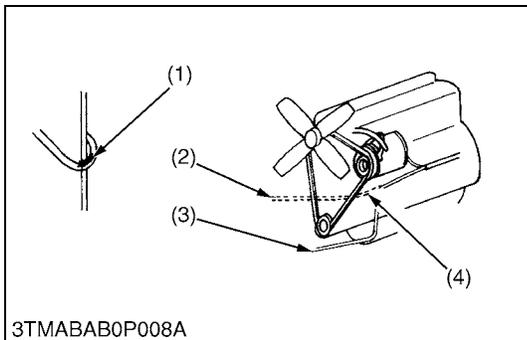
[1] WIRING



- Tighten wiring terminals securely.

(1) Correct (Tightened securely) (2) Incorrect (Poor contact if loose)

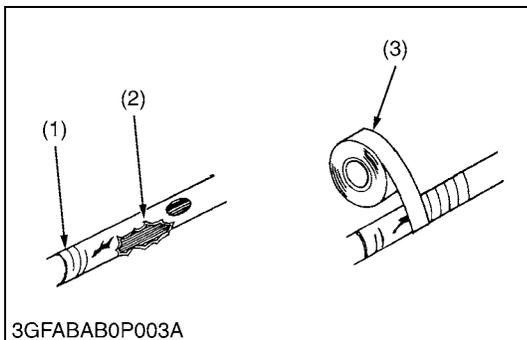
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- Keep wiring away from hazards.

(1) Hazardous Positioning (3) Wiring Position (right)
 (2) Wiring Position (wrong) (4) Hazardous Position

RY9212001GEG0025US0



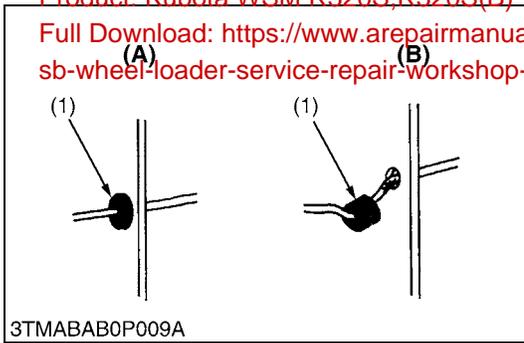
- Immediately repair or replace old or damaged wiring.

(1) Damaged (3) Electrical Tape
 (2) Torn

RY9212001GEG0026US0

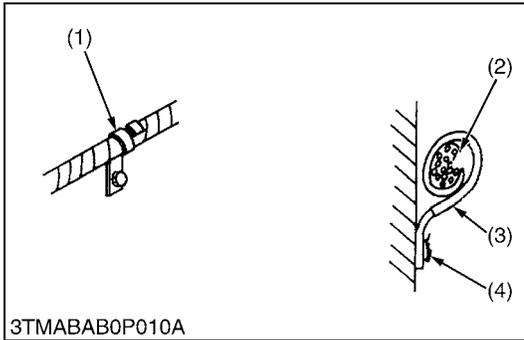
Product: Kubota WSM R320S,R320S(B) Wheel Loader Service Repair Workshop Manual

Full Download: <https://www.aresairmanual.com/downloads/kubota-wsm-r320sr320sb-wheel-loader-service-repair-workshop-manual/>



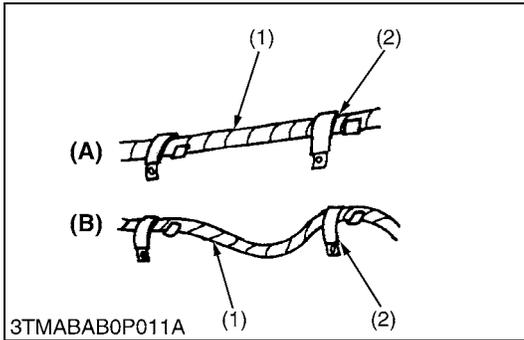
- Insert grommet securely.
- (A) Correct
(B) Incorrect

RY9212001GEG0027US0



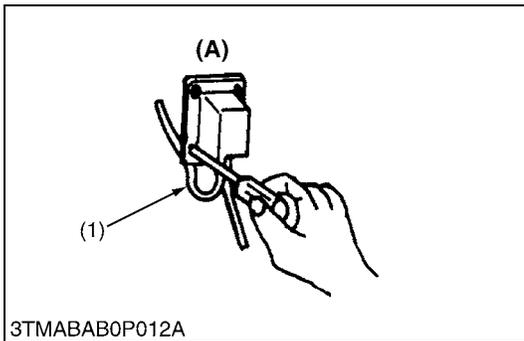
- Clamp wiring securely but do not damage wires with the clamp.

RY9212001GEG0028US0



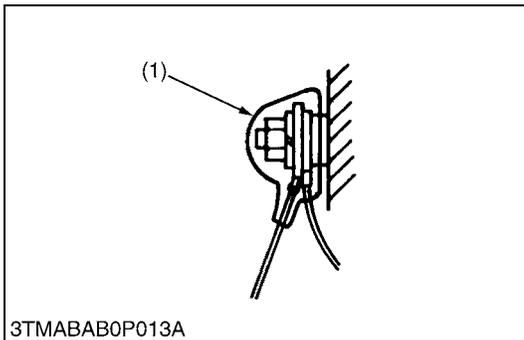
- Clamp wiring so it is not twisted, pulled too tight or sag too much. However, moving parts may require play in the wiring.

RY9212001GEG0029US0



- Do not pinch or bind wiring when installing parts.

RY9212001GEG0030US0



- After wiring, double-check terminal protectors and clamps before connecting battery cables.

RY9212001GEG0031US0

Sample of manual. Download All 381 pages at:

<https://www.aresairmanual.com/downloads/kubota-wsm-r320sr320sb-wheel-loader-service-repair-workshop-manual/>