

## WORKSHOP MANUAL UTILITY VEHICLE

# **RTV900**

# Kyboła

KiSC issued 03, 2008 A

## TO THE READER

This Workshop Manual has been prepared to provide servicing personnel with information on the mechanism, service and maintenance of RTV900. It is divided into three parts, "General", "Mechanism" and "Servicing".

#### General

Information on the product 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 Workshop Manual (Code No. 9Y021-01872) 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.

January 2004

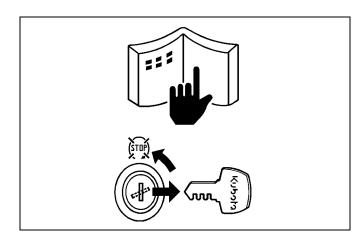
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## A SAFETY FIRST

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.

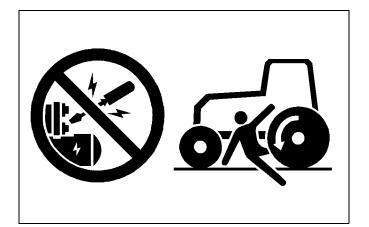
<b>DANGER</b>	: Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
	: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
■ IMPORTANT	: Indicates that equipment or property damage could result if instructions are not followed.

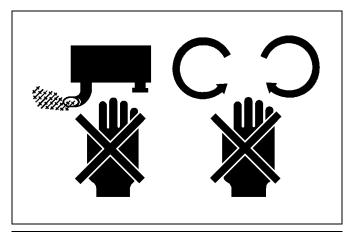
■ NOTE	: Gives helpful information.
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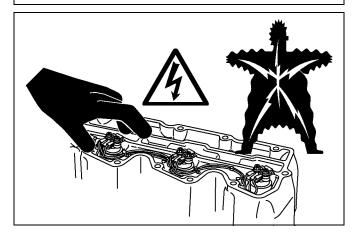
#### **BEFORE SERVICING AND REPAIRING**

- 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.









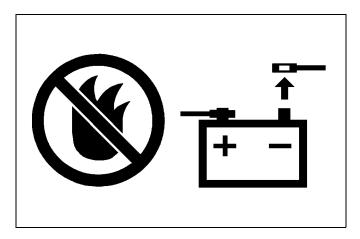
#### SAFETY STARTING

- 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.



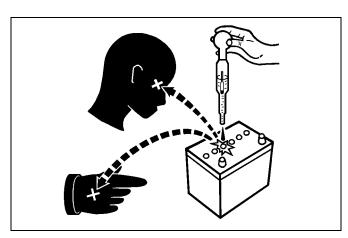
#### **AVOID FIRES**

- 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.



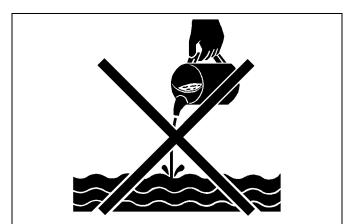
#### VENTILATE WORK AREA

• 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.



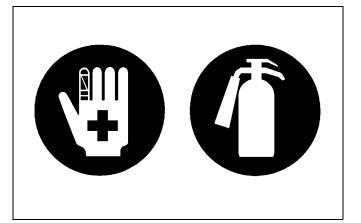
#### PREVENT ACID BURNS

 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

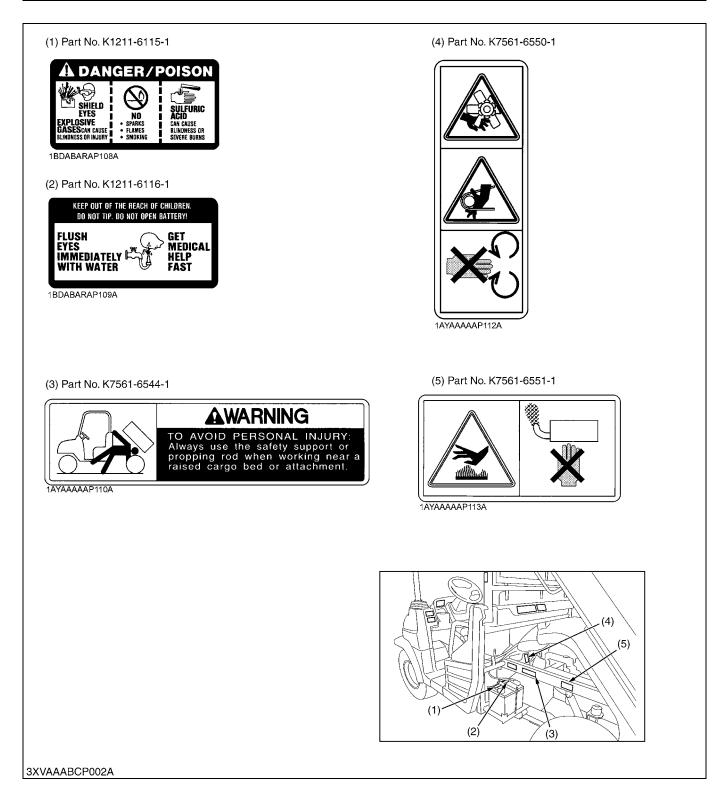
- Keep a first aid kit and fire extinguisher handy at all times.
- Keep emergency numbers for doctors, ambulance service, hospital and fire department near your telephone.

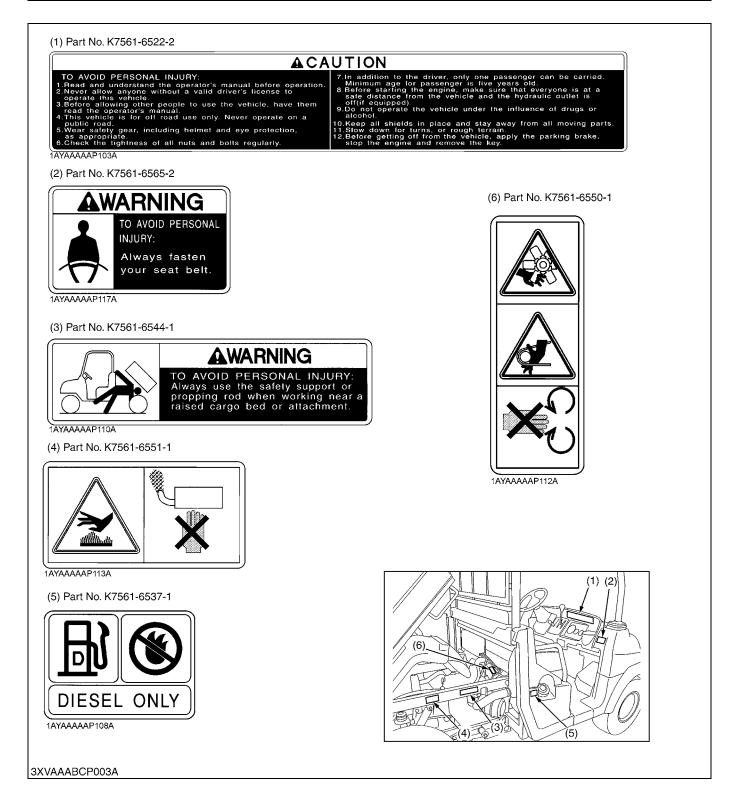
## SAFETY DECALS

The following safety decals are installed on the machine.

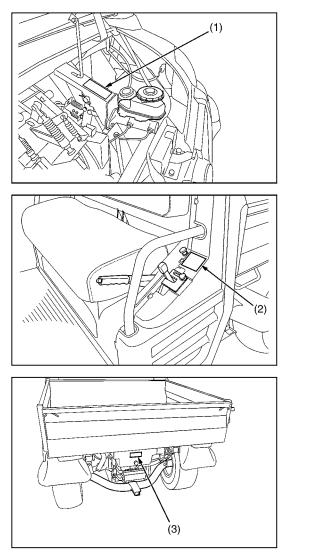
If a decal becomes damaged, illegible or is not on the machine, replace it. The decal parts number is listed in the parts list.











#### 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.

#### 3XVAAABCP004A

1AYAAAAAP114A

## **SPECIFICATIONS**

Model			General Purpose	Worksite	Turf	Recreational	
	Maker		KUBOTA				
	Model		D902-E-UV / D902-E2-UV				
I	Туре		Indirect Injection. Vertical, water-cooled, 4-cycle diesel				
	Number of cylir	nders		3	3		
	Bore and stroke	9		$72 \times 73.6$ mm (	2.83 × 2.90 in.)		
	Total displacem	ent		898 cm <sup>3</sup> (5	54.8 cu.in.)		
	Engine gross p	ower (DIN)	16.1 kW (21.6 HP)				
Engine	Rated revolutio	n	53.3 r/s [3200 min <sup>-1</sup> (rpm)]				
	Maximum torqu	le	54.7 N·m (5.6 kgf·m, 40.5 lbf·ft) / 30.0 to 36.7 r/s [1800 to 2200 min <sup>-1</sup> (rpm)]				
	Battery			12 V, CCA : 535	A, RC : 80 min.		
	Starting system	l	E	lectric starting with ce	ell starter, 12 V, 1.2 kV	V	
	Lubrication sys	tem		Forced lubrication I	by trochoidal pump		
	Cooling system		Pressu	rized radiator, forced	circulation with water	pump	
	Fuel			Diesel fuel No. 2-D [a Diesel fuel No. 1 [be			
	Fuel tank			28 L (7.4 U.S.ga	ls, 6.2 Imp.gals)		
	Engine crankca	se (with filter)	3.1 L (3.3 U.S.qts, 2.7 Imp.qts)				
	Engine coolant (with recovery tank)		4.0 L (4.2 U.S.qts, 3.5 Imp.qts)				
	Transmission case		10.0 L (2.6 U.S.gals, 2.2 Imp.gals)				
	Front axle case		0.6 L (0.63 U.S.qts, 0.52 Imp.qts)				
Capacities	Knuckle case		Ref. 0.1 L (0.10 U.S.qts, 0.09 Imp.qts)				
	Brake fluid (reservoir and lines)		0.4 L (0.42 U.S.qts, 0.35 Imp.qts)				
	Hydraulic lift oil (Hydraulic dumping system model)		8.0 L (2.1 U.S.gals, 1.8 Imp.gals)				
	Hydraulic lift oil (Hydraulic PTO model)		7.0 L (1.8 U.S.gals, 1.5 Imp.gals)				
	Power steering oil		5.9 L (1.6 U.S.gals, 1.3 Imp.gals)				
	Tires	Front	25 × 10 – 12 Knobby, 6PLY	25 × 10 – 12 HDWS, 6PLY	23 × 10.5 – 12 Turf, 4PLY	25 × 10 – 12 ATV, 6PLY	
		Rear	25 × 10 – 12 Knobby, 6PLY	25 × 10 – 12 HKDWS, 6PLY	23 × 10.5 – 12 Turf, 4PLY	25 × 11 – 12 ATV, 6PLY	
	Steering		Hydrostatic power				
Travelling	Transmission		Continuously variable hydro transmission (VHT)				
system	Wheels and drive		4 wheels, rear 2WD or 4WD				
	Gear selection		Hi-Med-Lo range, forward, neutral, reverse				
	Differential lock		Standard; foot operated with mechanical holder				
	Brake	Front / Rear	Wet disc type				
		Parking brake	Rear wheel, hand lever				
	Turning diameter		7.5 m (24.6 feet)				
Suspension	Front		Independent, macpherson strut-type				
Suspension	Rear		Semi-independent, devion axle with leaf springs and shock absorber				

NOTE: \* Manufacture's estimate

The company reserves the right to change the specifications without notice.

Model		General Purpose	Worksite	Recreational	Recreational			
	Overall length		2990 mm (117.7 in.)		3030 mm (119.3 in.)			
	Overall width			1520 mm (59.8 in.)				
	Overall height		2015 mm	2015 mm (79.3 in.)		2015 mm (79.3 in.)		
Dimensions	Front tread ce	enter		1150 mm (45.3 in.)				
	Rear tread ce	nter		1180 mm	(46.5 in.)			
	Wheel base			1965 mm (77.4 in.)				
	Ground	Front axle	215 mm	m (8.5 in.) 180 mm (7.5 in.)		215 mm (8.5 in.)		
	clearance	Rear axle	210 mm	(8.3 in.)	185 mm (7.3 in.)	210 mm (8.3 in.)		
Weight	•		805 kg (1775 lbs)	830 kg (1830 lbs)	850 kg (1874 lbs)	820 kg (1808 lbs)		
Max. rolling w	eight (Towing ca	pacity)		590 kg (1300 lbs)				
Payload capa	city			740 kg (1630 lbs)				
	Width			1320 mm (52.0 in.)				
	Length			1180 mm (46.7 in.)				
Cargo had	Depth			290 mm (11.4 in.)				
Cargo bed	Volume			0.455 m <sup>3</sup> (16 cu.ft.)				
	Bed height (unload)			800 mm (31.5 in.)				
	Cargo bed load			500 kg (1102 lbs)				
Sound level (operator ear)				87 db (A)				
Front deluxe guard			-	- Standard				
Body color				Orange Ca		Camo		
Bed lift			-	Stan	dard	-		
Auxiliary control valve			-	- Standard		-		
Speedometer				– Standard				

NOTE: \* Manufacture's estimate

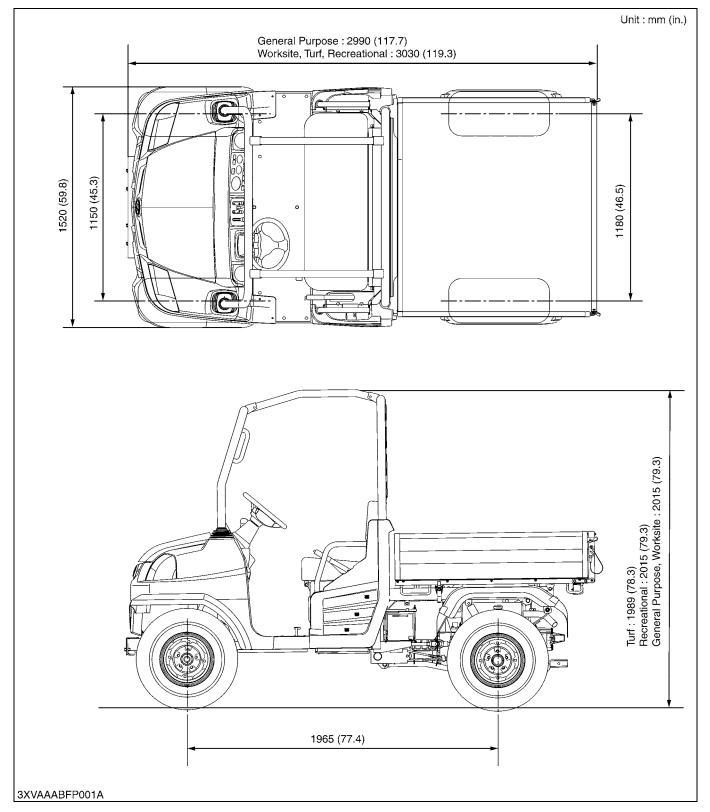
The company reserves the right to change the specifications without notice.

## **TRAVELLING SPEEDS**

Model	General Purpose			Worksite	Turf	Recreational
Tire size (Rear)	25 × 10 – 12 Knobby	25 × 10 – 12 HDWS	25 × 10.5 – 12 Turf	25 × 10 – 12 HDWS	23 × 10.5 – 12 Turf	25 × 11 – 12 ATV
Range gear shift lever	km/h (mph)			km/h (mph)	km/h (mph)	km/h (mph)
Low	16 (10)	16 (10)	14 (8)	16 (10)	14 (8)	15 (9)
Medium	29 (18)	29 (18)	26 (16)	29 (18)	26 (16)	29 (18)
High	40 (25)	40 (25)	36 (22)	40 (25)	36 (22)	40 (25)
Reverse	24 (15)	24 (15)	21 (13)	24 (15)	21 (13)	22 (14)

The company reserves the right to change the specifications without notice.

## DIMENSIONS



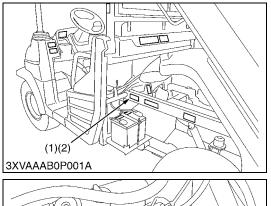
## **G** GENERAL

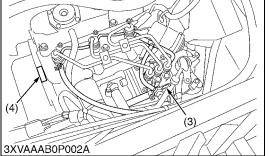
## GENERAL

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## **1. PRODUCT IDENTIFICATION**

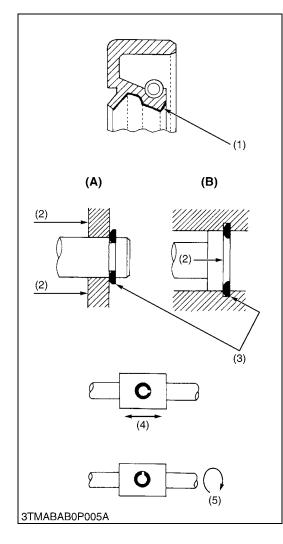




When contacting your local KUBOTA distributor, always specify engine serial number, product serial number and hour meter reading.

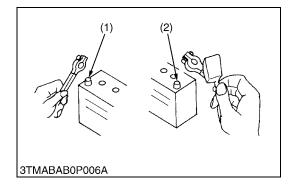
- (1) Vehicle Identification Plate
- (2) Product Identification Number
- (3) Engine Serial Number D902-E-UV : up tp 4Z9999 D902-E2-UV : from 5A0001
- (4) Transmission Assembly Serial Number

## 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

## 3. HANDLING PRECAUTIONS FOR ELECTRICAL PARTS AND WIRING



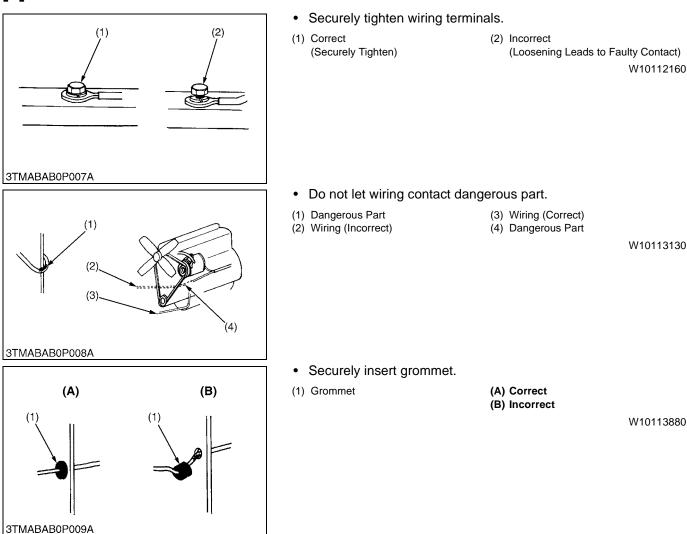
To ensure safety and prevent damage to the machine and surrounding equipment, heed the following precautions in handling electrical parts and wiring.

- IMPORTANT
- Check electrical wiring for damage and loosened connection every year. To this end, educate the customer to do his or her own check and at the same time recommend the dealer to perform periodic check for a fee.
- Do not attempt to modify or remodel any electrical parts and wiring.
- When removing the battery cables, disconnect the negative cable first. When installing the battery cables, connect the positive cable first.

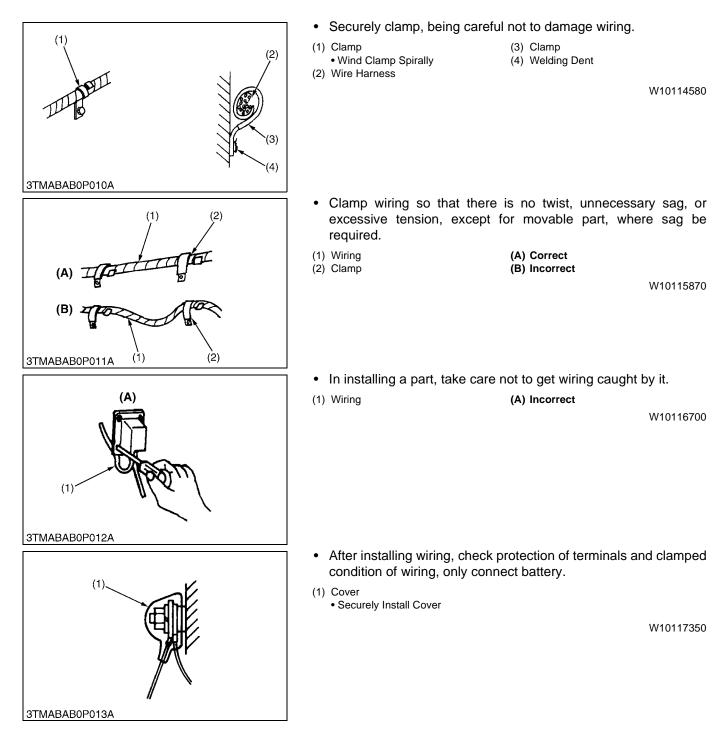
(2) Positive Terminal

(1) Negative Terminal

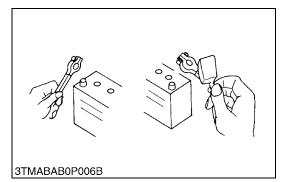
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#### [1] WIRING



### [2] BATTERY



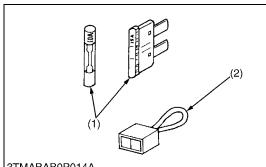
- Take care not to confuse positive and negative terminal posts.
- When removing battery cables, disconnect negative cable first. When installing battery cables, check for polarity and connect positive cable first.
- Do not install any battery with capacity other than is specified (Ah).
- After connecting 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.

#### 

- 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.

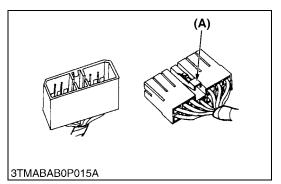
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### [3] FUSE



#### 3TMABAB0P014A

#### [4] CONNECTOR



• 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.

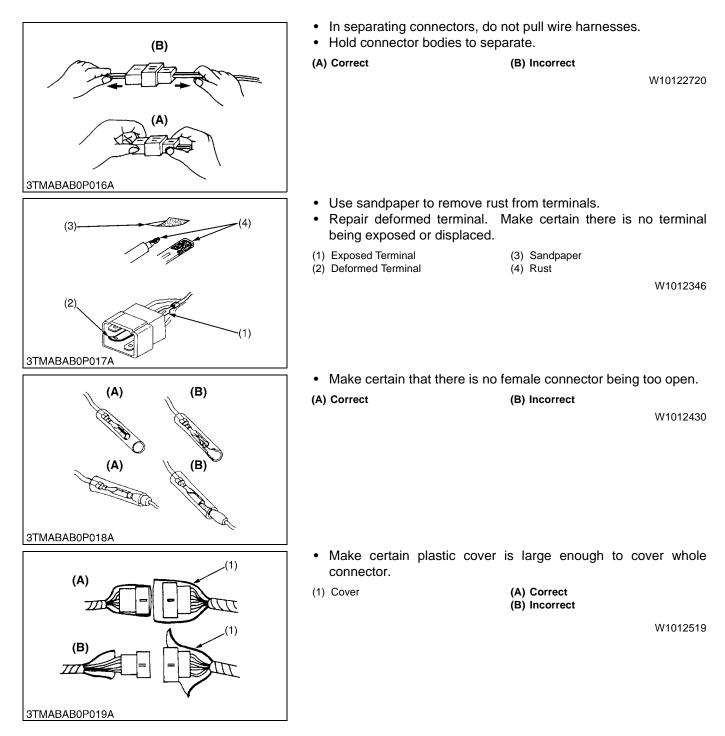
(1) Fuse

(2) Fusible Link

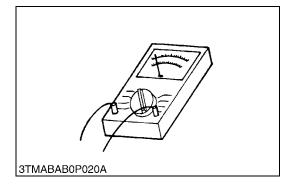
W10120920

• For connector with lock, push lock to separate.

(A) Push



#### [5] HANDLING OF CIRCUIT TESTER



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

## 4. LUBRICANTS, FUEL AND COOLANT

No.	Place	Capacity	Lubricants, fuel and coolant
1	Fuel tank	28.0 L 7.4 U.S.gals 6.2 Imp.gals	No. 2-D diesel fuel No. 1-D diesel fuel if temperature is below –10 °C (14 °F)
2	Cooling system4.0 Lwith recovery tank4.2 U.S.qts3.5 Imp.qts		Fresh clean water with anti-freeze
3	Engine crankcase with oil filter	(Oil filter exchanged) 3.1 L 3.3 U.S.qts 2.7 Imp.qts (Oil filter non-exchanged) 2.7 L 2.9 U.S.qts 2.4 Imp.qts	Engine oil : API Service CC, CD or CF Below 0 °C (32 °F) : SAE10W, 10W-30 or 10W-40 0 to 25 °C (32 to 77 °F): SAE20, 10W-30 or 10W-40 Above 25 °C (77 °F): SAE30, 10W-30 or 10W-40
4	Transmission case	10.0 L 2.6 U.S.qts 2.2 Imp.qts	KUBOTA UDT or SUPER UDT fluid*
5	Front axle case	0.6 L 0.63 U.S.qts 0.52 Imp.qts	KUBOTA UDT or SUPER UDT fluid*
6	Knuckle case	Ref. 0.15 L Ref. 0.16 U.S.qts Ref. 0.13 Imp.qts	KUBOTA UDT or SUPER UDT fluid*
7	Brake fluid (reservoir and lines)	0.4 L 0.42 U.S.qts 0.35 Imp.qts	KUBOTA DOT3 GENUINE BRAKE FLUID
8	Hydraulic lift oil (Hydraulic dumping system model)	8.0 L 2.1 U.S.gals 1.8 Imp.gals	
0	Hydraulic lift oil (Hydraulic PTO model)	7.0 L 1.8 U.S.gals 1.5 Imp.gals	KUBOTA UDT or SUPER UDT fluid*
9	Power steering oil	5.9 L 1.6 U.S.gals 1.3 Imp.gals	

\* KUBOTA original transmission hydraulic fluid.

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