

Product: Kubota BX1800 BX2200 Service Manual

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# WSM

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WORKSHOP MANUAL  
**TRACTOR**

**BX1800, BX2200**

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**Kubota**

KISC issued 07, 2006 A

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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 KUBOTA Tractors BX1800 and BX2200. It is divided into two parts, "Mechanism" and "Servicing" for each section.

### **Mechanism**

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

### **Servicing**

Under the heading "General" section comes general precautions, check and maintenance and special tools. Other section, there are troubleshooting, servicing specification lists, 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.

**January 2000**

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KISC issued 07, 2006 A

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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**

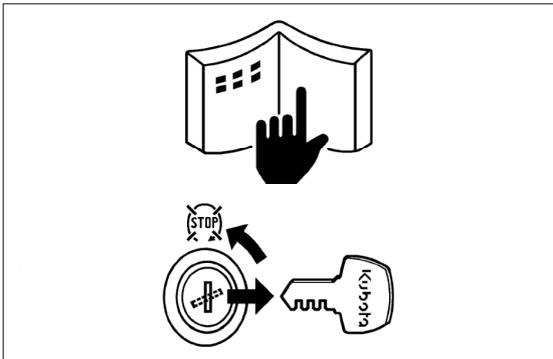
: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

**IMPORTANT**

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

**NOTE**

: Gives helpful information.



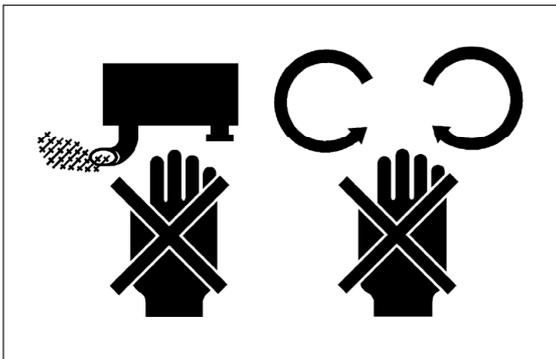
### BEFORE SERVICING AND REPAIRING

- 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.



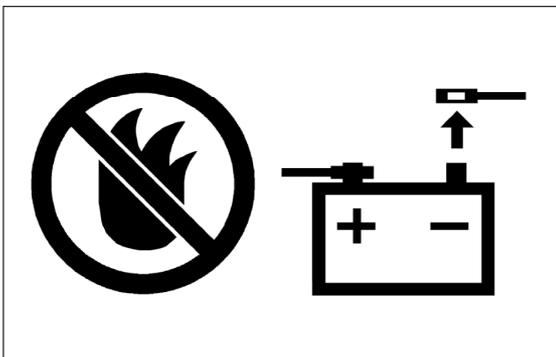
**SAFETY WORKING**

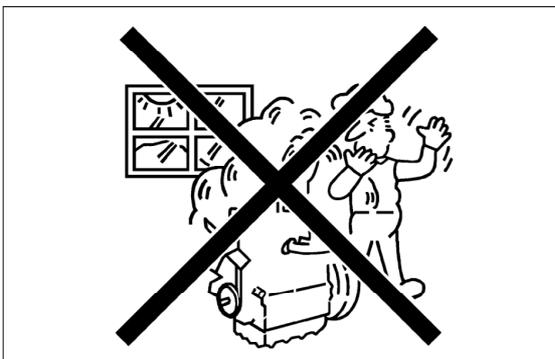
- Do not work on the machine while under the influence of alcohol, medication, or other substances or while fatigued.
- Wear close fitting clothing and safety equipment appropriate to the job.
- Use tools appropriate to the work. Makeshift tools, parts, and procedures are not recommended.
- When servicing 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.



**AVOID FIRES**

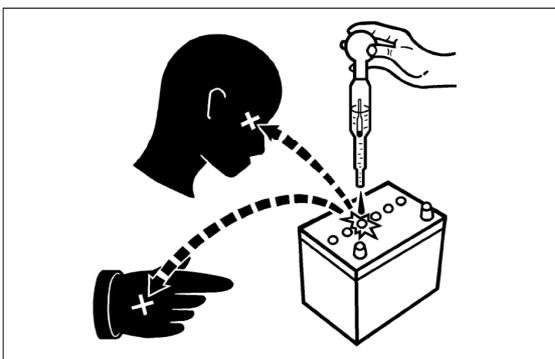
- Fuel is extremely flammable and explosive under certain conditions. Do not smoke or allow flames or sparks in your working area.
- To avoid sparks from an accidental short circuit, always disconnect the battery negative cable first and connect it last.
- Battery gas can explode. Keep sparks and open 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. K2561-6554-1



**⚠ WARNING**

**TO AVOID PERSONAL INJURY:**

- 1 Keep PTO shield in place at all times.
- 2 Do not operate the PTO at speeds faster than the speed recommended by the implement manufacturer.
- 3 For trailing PTO-driven implements, set hitch at towing position. (see operator's manual)

(2) Part No. K2561-6557-1

**⚠ WARNING**



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

1. Kubota recommends the use of a Roll-Over Protective Structures (ROPS) and seat belt in almost all applications.
2. Remove the ROPS only when it substantially interferes with operation or itself presents a safety risk. (Examples include work in orchards and vineyards) **ALWAYS REINSTALL IT BEFORE USING THE TRACTOR IN OTHER APPLICATIONS.**
3. Never use just the seat belt or just the ROPS. They must be used together. For further details consult your Operator's Manual or your local dealer.

(3) Part No. K2561-6548-1

**⚠ CAUTION**

**TO AVOID PERSONAL INJURY:**

1. Read and understand the operator's manual before operation.
2. Before starting the engine, make sure that everyone is at a safe distance from the tractor and that the PTO is OFF.
3. Do not allow passengers on the tractor at any time.
4. Before allowing other people to use the tractor, have them read the operator's manual.
5. Check the tightness of all nuts and bolts regularly.
6. Keep all shields in place and stay away from all moving parts.
7. Slow down for turns, or rough roads.
8. On public roads use SMV emblem and hazard lights, if required by local traffic and safety regulations.
9. Pull only from the hitch.
10. Before dismounting lower the implement, set the parking brake, stop the engine and remove the key.

(4) Part No. K2561-6552-2

Do not put hands under the rear fender.

**⚠ WARNING**



**TO AVOID PERSONAL INJURY: KEEP HANDS AWAY FROM PINCH POINTS OF LIFT ARMS.**

K2561-65522

(5) Part No. K2561-6549-1

Diesel fuel      No fire only





(6) Part No. K2561-6556-1

**⚠ WARNING**

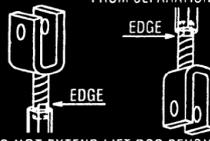
**TO AVOID PERSONAL INJURY:**

1. Attach pulled or towed loads to the hitch only.
2. Use the 3-point hitch only with equipment designed for 3-point hitch usage.

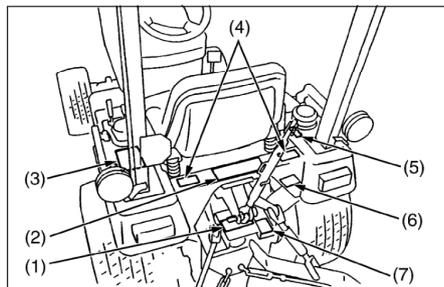
(7) Part No. K2561-6555-1

**⚠ CAUTION**

**TO AVOID PERSONAL INJURY FROM SEPARATION**



**DO NOT EXTEND LIFT ROD BEYOND THE EDGE OF FLAT FACE ON THE THREADED ROD.**



3TAAAABCP001A

(8) Part No. K2561-6541-1



**⚠ DANGER**

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

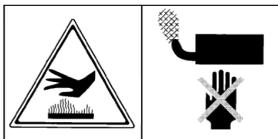
1. Do not start engine by shorting across starter terminals or bypassing the safety start switch. Machine may start in gear and move if normal starting circuitry is bypassed.
2. Start engine only from operator's seat with transmission and PTO OFF. Never start engine while standing on the ground.

(9) Part No. K2561-6543-1  
Stay clear of engine fan and fanbelt.



(10) Part No. K2561-6542-1

Do not touch hot surface like muffler, etc.



(11) Part No. K2561-6115-1

**KEEP OUT OF THE REACH OF CHILDREN.  
DO NOT TIP. DO NOT OPEN BATTERY!**

**FLUSH EYES  
IMMEDIATELY  
WITH WATER**



**GET MEDICAL  
HELP  
FAST**

(12) Part No. K2561-6116-1

**⚠ DANGER/POISON**



**SHIELD EYES**

**EXPLOSIVE GASES CAN CAUSE BLINDNESS OR INJURY**



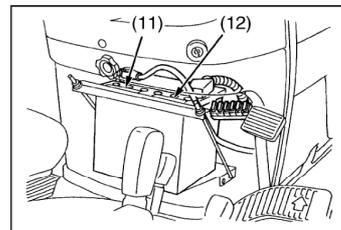
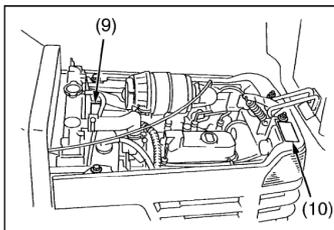
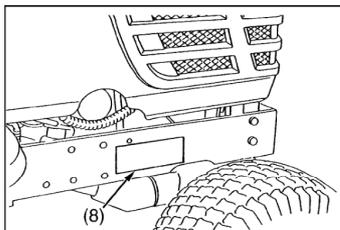
**NO**

- SPARKS
- FLAMES
- SMOKING



**SULFURIC ACID**

**CAN CAUSE BLINDNESS OR SEVERE BURNS**



**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 or 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.

3TAAAABCP002A

# SPECIFICATIONS

Model		BX1800	BX2200	
PTO power		10.2 kW (13.7 HP)*	12.4 kW (16.7 HP)*	
Engine	Maker	KUBOTA		
	Model	D722-E-BX	D905-E-BX	
	Type	Indirect Injection. Vertical, water-cooled, 4-cycle diesel		
	Number of cylinders	3		
	Bore and stroke	67 × 68 mm (2.64 × 2.68 in.)	72 × 73.6 mm (2.83 × 2.90 in.)	
	Total displacement	719 cm <sup>3</sup> (43.9 cu.in.)	898 cm <sup>3</sup> (54.8 cu.in.)	
	Engine gross power (DIN)	13.4 kW (18.0 HP)	16.4 kW (22.0 HP)	
	Rated revolution	53.3 r/s [3200 min <sup>-1</sup> (rpm)]		
	Maximum torque	41.5 N·m (4.23 kgf·m, 30.6 ft-lbs) / 36.7 to 43.3 r/s [2200 to 2600 min <sup>-1</sup> (rpm)]	54.9 N·m (5.6 kgf·m, 40.5 ft-lbs) / 36.7 to 43.3 r/s [2200 to 2600 min <sup>-1</sup> (rpm)]	
	Battery	12 V, CCA : 435 A, RC : 62 min.	12 V, CCA : 535 A, RC : 80 min.	
	Starting system	Electric starting with cell starter, 12 V, 1.4 kW		
	Lubrication system	Forced lubrication by trochoidal pump		
	Cooling system	Pressurized radiator, forced circulation with water pump		
	Fuel	Diesel fuel No. 2-D [above -10 °C (14 °F)], Diesel fuel No. 1 [below -10 °C (14 °F)]		
Capacities	Fuel tank	21 L (5.5 U.S.gals, 4.6 Imp.gals.)		
	Engine crankcase (with filter)	1.9 L (2.01 U.S.qts., 1.67 Imp.qts.)	2.5 L (2.64 U.S.qts., 2.20 Imp.qts.)	
	Engine coolant (with recovery tank)	2.9 L (3.06 U.S.qts., 2.55 Imp.qts.)	3.5 L (3.70 U.S.qts., 3.08 Imp.qts.)	
	Transmission case	10.1 L (2.7 U.S.gals, 2.2 Imp.gals.)		
	Front axle case	4.7 L (4.97 U.S.qts., 4.14 Imp.qts.)		
Dimensions	Overall length (without 3P)	2025 mm (79.7 in.)		
	Overall width	1145 mm (45.1 in.)		
	Overall height (with ROPS)	1800 mm (70.9 in.)		
	Overall height (top of steering wheel)	1200 mm (47.2 in.)		
	Wheel base	1400 mm (55.1 in.)		
	Minimum ground clearance (bottom of hitch bracket)	170 mm (6.7 in.)		
	Tread	Front	910 mm (35.8 in.)	
	Rear	820 mm (32.2 in.)		
Weight		570 kg (1257 lbs)	590 kg (1301 lbs)	
Travelling system	Tires	Front	18 × 8.50 – 8 (Turf)	
		Rear	26 × 12.00 – 12 (Turf)	
	Steering	Hydrostatic power steering		
	Transmission	Main-hydrostatic transmission, Range gear shift (2 forward and 2 reverse)		
	Brake	Wet disc type		
	Min. turning radius (without brake)	2.3 m (7.5 feet)		
Differential	Bevel gear			
Hydraulic system	Hydraulic control system	Directional control, auto-return lever system		
	Pump capacity	21.0 L/min. (5.5 U.S.gals./min., 4.6 Imp.gals./min.)		
	Three point hitch	SAE Category I		
	Max. lift force (24 in. behind lift points)	3040 N (310 kg, 684 lbs)		
PTO system	Clutch	Wet type, multiple discs		
	Mid	PTO shaft	USA No. 5 (KUBOTA 10-tooth) involute spline	
		Revolution	41.7 r/s [2500 min <sup>-1</sup> (rpm)] / engine 52.1 r/s [3125 min <sup>-1</sup> (rpm)]	
	Rear	PTO shaft	SAE 1-3/8, 6 splines	
		Revolution	9.0 r/s [540 min <sup>-1</sup> (rpm)] / engine 51.1 r/s [3068 min <sup>-1</sup> (rpm)]	

NOTE: \* Manufacturer's estimate  
The company reserves the right to change the specifications without notice.

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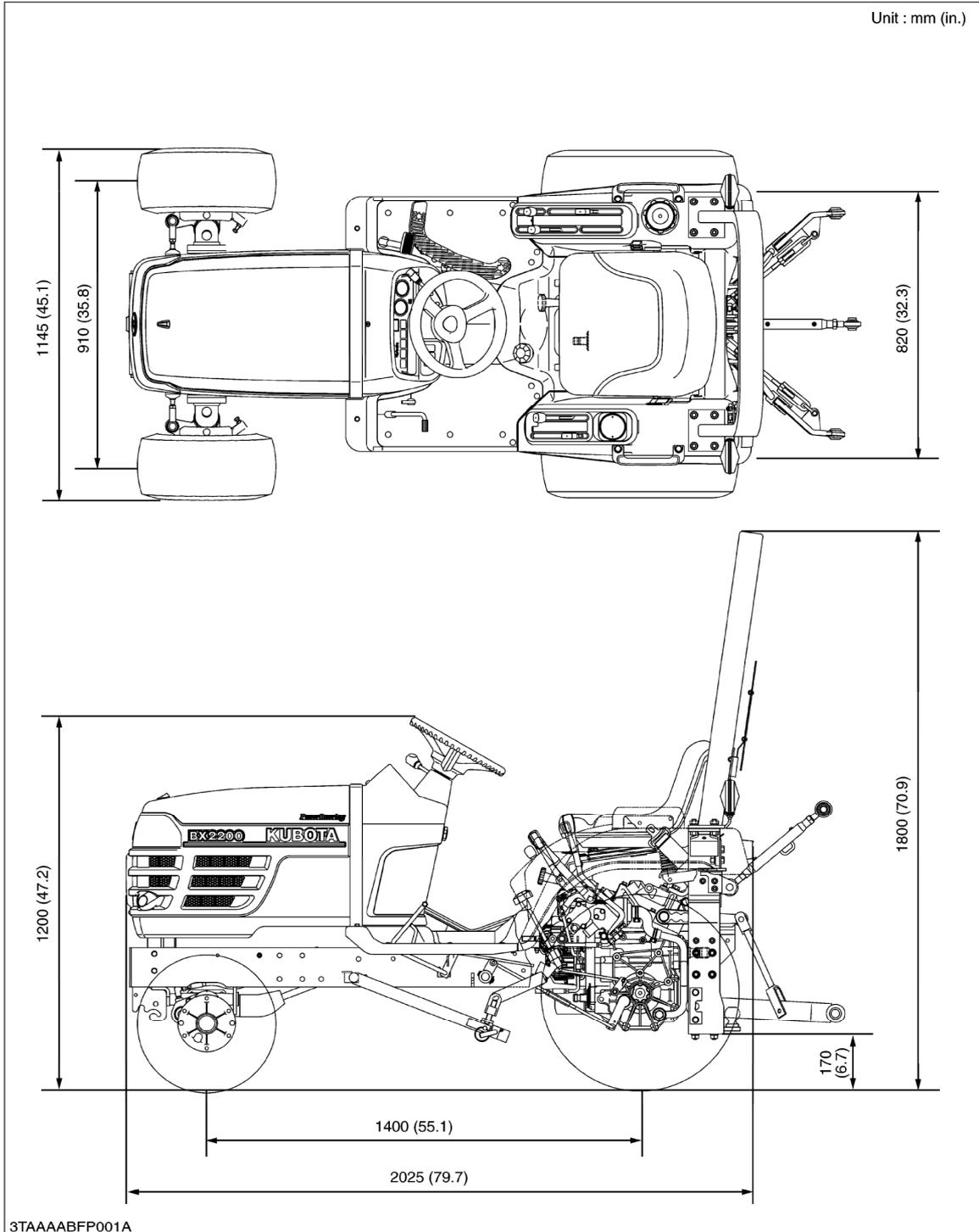
# TRAVELLING SPEEDS

Model		BX1800, BX2200	
Tire size (Rear)		26 × 12.00 – 12	
	Range gear shift lever	km/h	mile/h
Forward	Low	0 to 5.9	0 to 3.7
	High	0 to 13.0	0 to 8.1
Reverse	Low	0 to 4.5	0 to 2.8
	High	0 to 10.0	0 to 6.2

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

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# DIMENSIONS



# **G GENERAL**

# GENERAL

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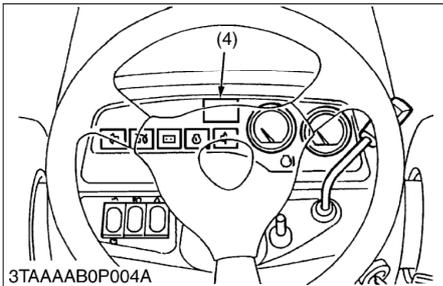
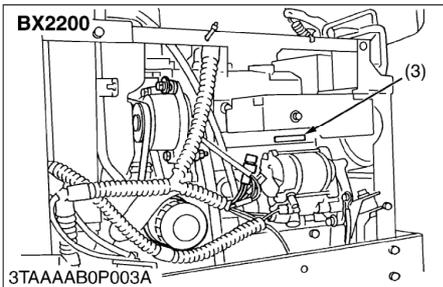
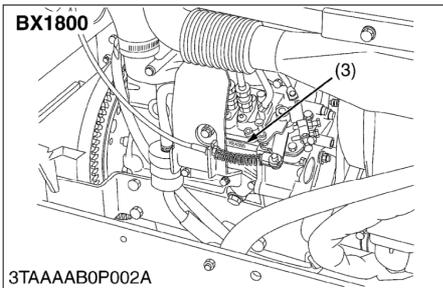
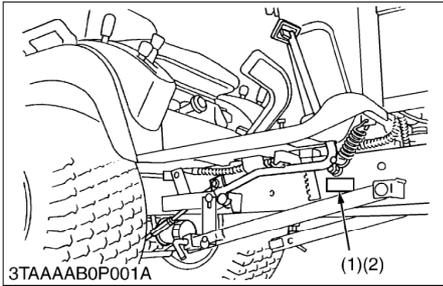
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# 1. TRACTOR IDENTIFICATION

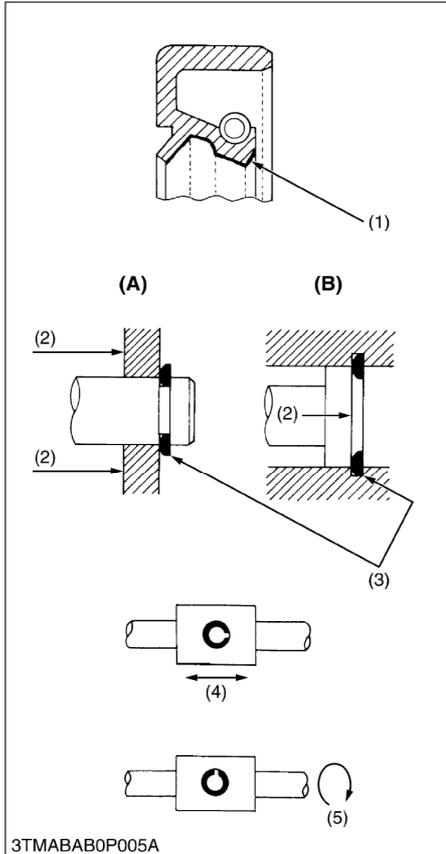
When contacting your local KUBOTA distributor, always specify engine serial number, tractor serial number and hour meter reading.

- (1) Tractor Identification Plate
- (2) Tractor Serial Number
- (3) Engine Serial Number
- (4) Hour Meter

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## 2. GENERAL PRECAUTIONS



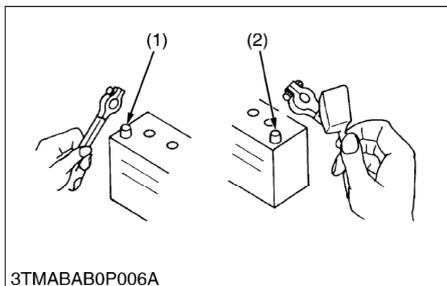
- During disassembly, carefully arrange removed parts in a clean area to prevent confusion later. Bolts and nuts should be installed in their original position to prevent reassembly errors.
- When special tools are required, use KUBOTA genuine special tools. Special tools which are not frequently used 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 tractor 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

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### 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.

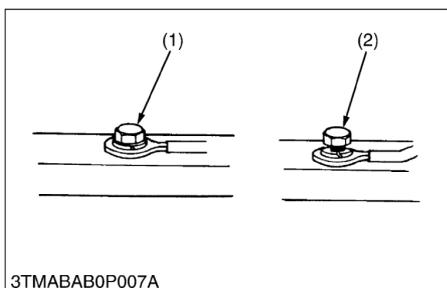
**IMPORTANT**

- 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.

(1) Negative Terminal (2) Positive Terminal

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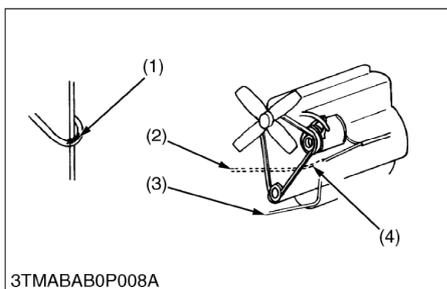
#### [1] WIRING



- Securely tighten wiring terminals.

(1) Correct (Securely Tighten) (2) Incorrect (Loosening Leads to Faulty Contact)

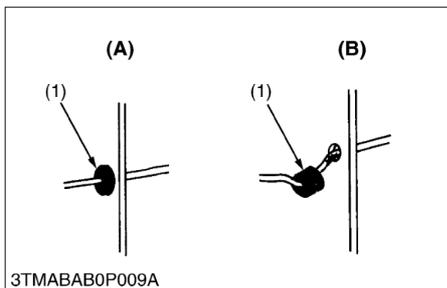
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- Do not let wiring contact dangerous part.

(1) Dangerous Part (2) Wiring (Incorrect) (3) Wiring (Correct) (4) Dangerous Part

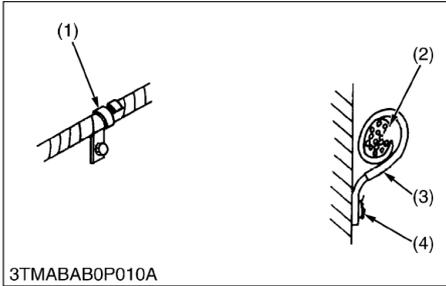
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- Securely insert grommet.

(1) Grommet (A) Correct (B) Incorrect

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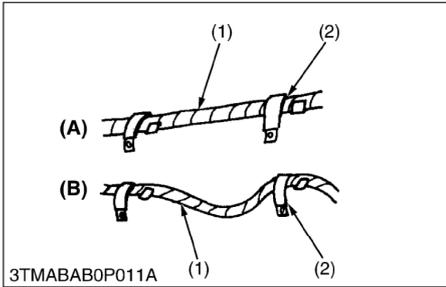


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• Securely clamp, being careful not to damage wiring.

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

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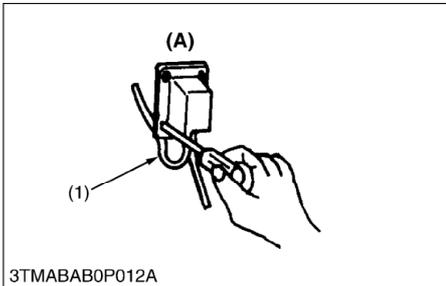


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• Clamp wiring so that there is no twist, unnecessary sag, or excessive tension, except for movable part, where sag be required.

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

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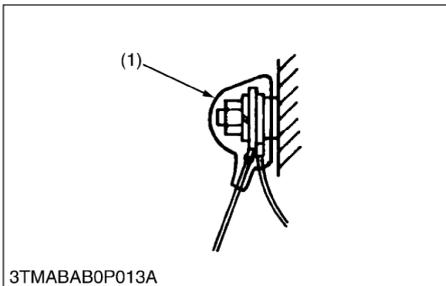


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• In installing a part, take care not to get wiring caught by it.

- (1) Wiring
- (A) Incorrect

W10116700



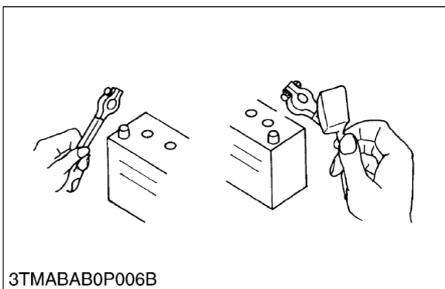
3TMABAB0P013A

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

- (1) Cover
  - Securely Install Cover

W10117350

## [2] BATTERY



3TMABAB0P006B

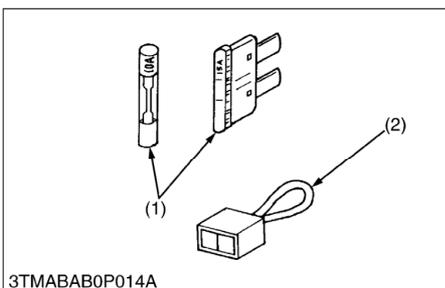
- Take care not to confuse positive and negative terminal posts.
- When removing battery cables, disconnect negative cable first. When installing battery cables, check for polarity and connect positive cable first.
- Do not install any battery with capacity other than is specified (Ah).
- After connecting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

W10118160

## [3] FUSE



3TMABAB0P014A

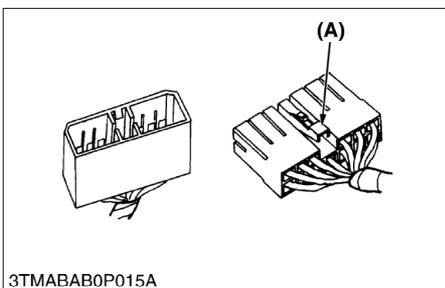
- Use fuses with specified capacity. Neither too large or small capacity fuse is acceptable.
- Never use steel or copper wire in place of fuse.
- Do not install working light, radio set, etc. on machine which is not provided with reserve power supply.
- Do not install accessories if fuse capacity of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

(1) Fuse

(2) Fusible Link

W10120920

## [4] CONNECTOR

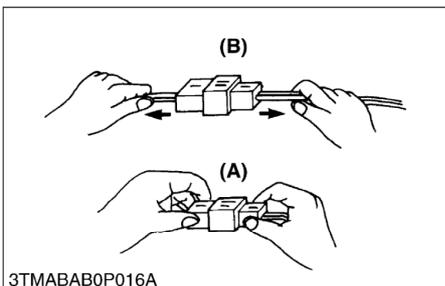


3TMABAB0P015A

- For connector with lock, push lock to separate.

(A) Push

W10122110



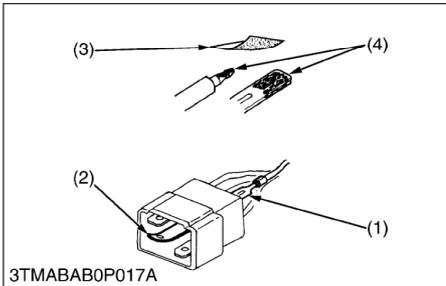
3TMABAB0P016A

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

(A) Correct

(B) Incorrect

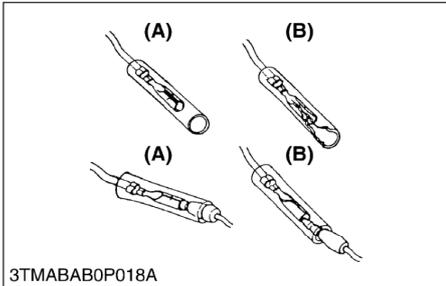
W10122720



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

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

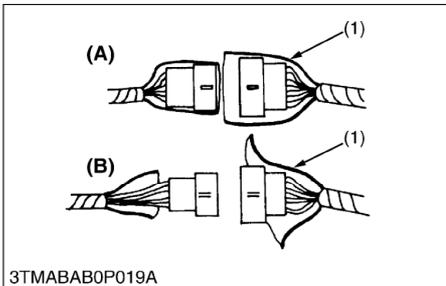
W10123460



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

(A) Correct (B) Incorrect

W10124300

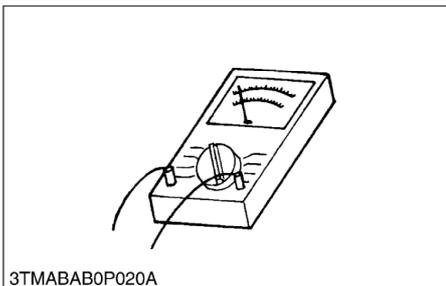


- Make certain plastic cover is large enough to cover whole connector.

(1) Cover (A) Correct (B) Incorrect

W10125190

**[5] HANDLING OF CIRCUIT TESTER**



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

W10126840

## 4. LUBRICANTS, FUEL AND COOLANT

No.	Place	Capacity		Lubricants, fuel and coolant	
		BX1800	BX2200		
1	Fuel tank	21.0 L 5.5 U.S.gals. 4.6 Imp.gals.		No. 2-D diesel fuel No. 1-D diesel fuel if temperature is below -10 °C (14 °F)	
2	Cooling system with recovery tank	2.9 L 3.06 U.S.qts. 2.55 Imp.qts.	3.5 L 3.70 U.S.qts. 3.08 Imp.qts.	Fresh clean water with anti-freeze	
3	Engine crankcase	1.9 L 2.01 U.S.qts. 1.67 Imp.qts.	2.5 L 2.64 U.S.qts. 2.20 Imp.qts.	Engine oil : API Service CC or CD 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	10.1 L 2.7 U.S.gals. 2.2 Imp.gals.		KUBOTA SUPER UDT fluid*	
5	Front axle case	4.7 L 4.97 U.S.qts. 4.14 Imp.qts.		KUBOTA SUPER UDT fluid* or SAE80, 90 gear oil	
<b>Greasing</b>					
No.	Place	No. of greasing point		Capacity	Type of grease
6	Battery terminal	2		Moderate amount	Multipurpose type grease

\* KUBOTA original transmission hydraulic fluid.

## 5. 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		
Diameter	Unit			Unit			Unit			Unit			Unit		
	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs
M6 (6 mm, 0.24 in.)	7.85	0.80	5.79	7.85	0.80	5.79	9.81	1.00	7.24	7.85	0.80	5.79	12.3	1.25	9.05
	to	to	to	to	to	to	to	to	to	to	to	to	to	to	to
M8 (8 mm, 0.31 in.)	17.7	1.8	13.1	16.7	1.7	12.3	23.6	2.4	17.4	17.7	1.8	13.1	29.5	3.0	21.7
	to	to	to	to	to	to	to	to	to	to	to	to	to	to	to
M10 (10 mm, 0.39 in.)	39.3	4.0	29.0	31.4	3.2	23.2	48.1	4.9	35.5	39.3	4.0	29.0	60.9	6.2	44.9
	to	to	to	to	to	to	to	to	to	to	to	to	to	to	to
M12 (12 mm, 0.47 in.)	62.8	6.4	46.3	-	-	-	77.5	7.9	57.2	62.8	6.4	46.3	103	10.5	76.0
	to	to	to	-	-	-	to	to	to	to	to	to	to	to	to
M14 (14 mm, 0.55 in.)	108	11.0	79.6	-	-	-	124	12.6	91.2	-	-	-	167	17.0	123
	to	to	to	-	-	-	to	to	to	-	-	-	to	to	to
M16 (16 mm, 0.63 in.)	167	17.0	123	-	-	-	197	20.0	145	-	-	-	260	26.5	192
	to	to	to	-	-	-	to	to	to	-	-	-	to	to	to
M18 (18 mm, 0.71 in.)	246	25.0	181	-	-	-	275	28.0	203	-	-	-	344	35.0	254
	to	to	to	-	-	-	to	to	to	-	-	-	to	to	to
M20 (20 mm, 0.79 in.)	334	34.0	246	-	-	-	368	37.5	272	-	-	-	491	50.0	362
	to	to	to	-	-	-	to	to	to	-	-	-	to	to	to
	392	40.0	289				431	44.0	318				568	58.0	419

W1034542

### [2] STUD BOLTS

Material of opponent part	Ordinariness			Aluminum		
Diameter	Unit			Unit		
	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs
M8 (8 mm, 0.31 in.)	11.8	1.2	8.68	8.82	0.90	6.51
	to	to	to	to	to	to
M10 (10 mm, 0.39 in.)	24.6	2.5	18.1	19.7	2.0	14.5
	to	to	to	to	to	to
M12 (12 mm, 0.47 in.)	29.5	3.0	21.7	31.4	3.2	23.1
	to	to	to	to	to	to
	49.0	5.0	36.1			

W10481390

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

Grade Unit Nominal Diameter	SAE GR.5 			SAE GR.8 		
	N-m	kgf-m	ft-lbs	N-m	kgf-m	ft-lbs
5/16	23.1 to 27.8	2.35 to 2.84	17.0 to 20.5	32.5 to 39.3	3.31 to 4.01	24.0 to 29.0
3/8	47.5 to 57.0	4.84 to 5.82	35.0 to 42.0	61.0 to 73.2	6.22 to 7.47	45.0 to 54.0
1/2	108.5 to 130.2	11.07 to 13.29	80.0 to 96.0	149.2 to 179.0	15.22 to 18.27	110.0 to 132.0
9/16	149.2 to 179.0	15.22 to 18.27	110.0 to 132.0	217.0 to 260.4	22.14 to 26.57	160.0 to 192.0
5/8	203.4 to 244.1	20.75 to 24.91	150.0 to 180.0	298.3 to 358.0	30.44 to 36.53	220.0 to 264.0

W1022485



## 7. CHECK AND MAINTENANCE



### CAUTION

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

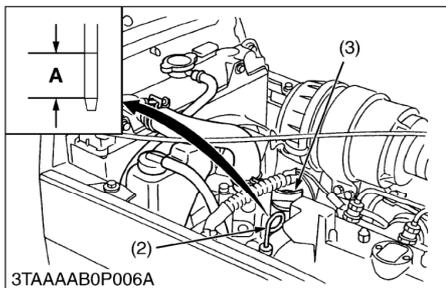
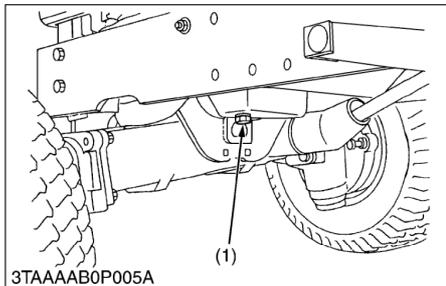
### [1] DAILY CHECK

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

#### **Checking**

- Check areas where previous trouble was experienced.
- Walk around the tractor.
  1. Check the tire pressure, and check for wear and damage.
  2. Check for oil and water leaks.
  3. Check the engine oil level.
  4. Check the transmission fluid level.
  5. Check the coolant level.
  6. Check the condition of seat belt and ROPS attaching hardware.
  7. Check and clean the radiator screen and grill.
  8. Check the bolts and nuts of tires are tight.
  9. Check the number plate or SMV emblem for damage and cleaner replace as necessary if equipped.
  10. Care of danger, warning and caution labels.
  11. Clean around the exhaust manifold and the muffler of the engine.
- While sitting in the operator's seat.
  1. Check the HST pedal and brake pedals.
  2. Check the parking brake.
  3. Check the steering wheel.
- Turning the key switch.
  1. Check the performance of the easy checker lights.
  2. Check head lights, tail lights and hazard lights. Clean if necessary.
  3. Check the performance of the meters and gauges.
- Starting the engine.
  1. Check to see that the lights on the Easy Checker go off.
  2. Check the color of the exhaust gas.
  3. Check the brakes for proper operation.

## [2] CHECK POINTS OF INITIAL 50 HOURS



### Changing Engine Oil

#### ⚠ CAUTION

- **Be sure to stop the engine before changing engine oil.**
- 1. Start and warm up the engine for approx. 5 minutes.
- 2. Place an oil pan underneath the engine.
- 3. To drain the used oil, remove the drain plug (1) at the bottom of the engine and drain the oil completely.
- 4. Screw in the drain plug (1).
- 5. Fill new oil up to upper line on the dipstick (2).

#### IMPORTANT

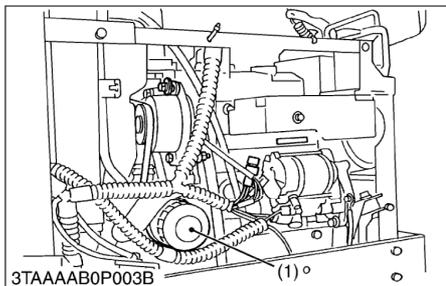
- **When using an oil of different manufacture or viscosity from the previous one, remove all of the old oil.**
- **Never mix two different types of oil.**
- **Use the proper SAE Engine Oil according to ambient temperatures.**
- **Refer to “LUBRICANTS, FUEL AND COOLANT”.** (See page G-7.)

Engine oil capacity	BX1800	1.9 L 2.01 U.S.qts. 1.67 Imp.qts.
	BX2200	2.5 L 2.64 U.S.qts. 2.20 Imp.qts.

- (1) Drain Plug  
(2) Dipstick  
(3) Oil Inlet

**A : Oil level is acceptable within this range.**

W1014065



### Replacing Engine Oil Filter Cartridge

#### ⚠ CAUTION

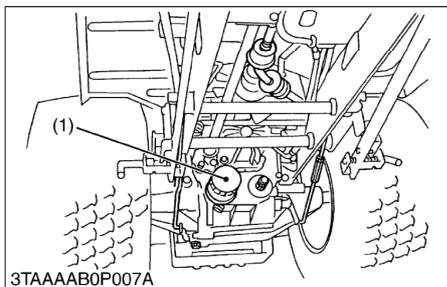
- **Be sure to stop the engine before changing oil filter cartridge.**
- 1. Remove the oil filter cartridge with the filter wrench.
- 2. Apply a slight coat of oil onto the cartridge gasket.
- 3. To install the new cartridge, screw it in by hand. Over tightening may cause deformation of rubber gasket.
- 4. After the new cartridge has been replaced, the engine oil normally decrease a little. Thus see that the engine oil does not leak through the seal and be sure to read the oil level on the dipstick. Then, replenish the engine oil up to the specified level.

#### IMPORTANT

- **To prevent serious damage to the engine, replacement element must be highly efficient. Use only a KUBOTA genuine filter or its equivalent.**

- (1) Engine Oil Filter Cartridge

W1014316



### Replacing Transmission Oil Filter Cartridge

**CAUTION**

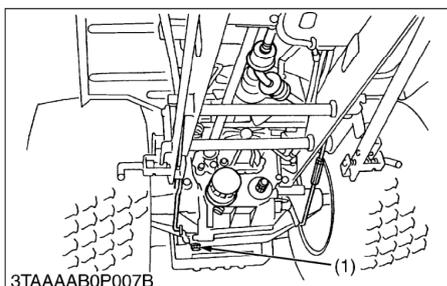
- **Be sure to stop the engine before changing the oil filters.**
1. Remove the oil filter cartridge by using a filter wrench.
  2. Apply a slight coat of oil onto the cartridge gasket.
  3. To install the new cartridge, screw it in by hand. Over tightening may cause deformation of rubber gasket.
  4. After the new cartridge has been replaced, the transmission fluid level will normally decrease slightly. Make sure that the transmission fluid does not leak through the seal. Check the fluid level.

**IMPORTANT**

- **To prevent serious damage to the hydraulic system. Use only a genuine KUBOTA filter or its equivalents.**

(1) Transmission Oil Filter Cartridge

W1014458



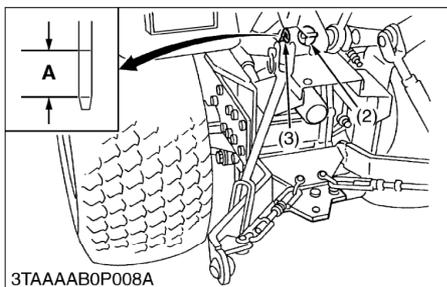
### Changing Transmission Fluid

**CAUTION**

- **Be sure to stop the engine before changing the transmission fluid.**
1. Place an oil pan under the tractor.
  2. Remove the drain plugs (1) at the bottom of the transmission case and drain the oil completely.
  3. After draining, screw in the drain plug.
  4. Fill new oil from filling port after removing the filling plug (2) up to the upper notch on the dipstick.
  5. After running the engine for a few minutes, stop it and check the oil level again, if low, add oil to prescribed level.

**IMPORTANT**

- **Use only multi-grade transmission oil. Use of other oils may damage the transmission or hydraulic system. Refer to "LUBRICANTS, FUEL AND COOLANT". (See page G-7.)**
- **Never work the tractor immediately after changing the transmission oil. Keeping the engine at medium speed for a few minutes to prevents damage to the transmission.**
- **Do not mix different brands oil together.**



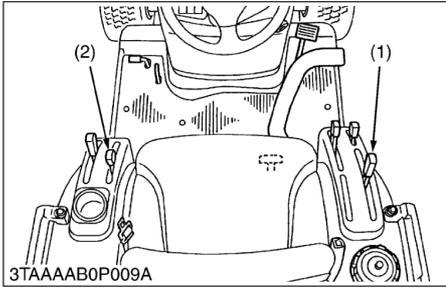
Transmission fluid capacity	10.1 L 2.7 U.S.gals. 2.2 Imp.gals.
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- (1) Drain Plug
- (2) Filling Plug
- (3) Dipstick

**A : Oil level is acceptable within this range.**

W1014665

### [3] CHECK POINTS OF EVERY 50 HOURS



#### Checking Engine Start System

##### **CAUTION**

- Do not allow anyone near the tractor while testing.
- If the tractor does not pass the test do not operate the tractor.

##### Preparation before testing.

1. Sit on operator's seat.
2. Set the parking brake and stop the engine.
3. Shift the range gear shift lever in "**NEUTRAL**" position.
4. Shift the PTO clutch lever to "**OFF**" position.

##### Test 1 : Safety switch on the range gear shift linkage

1. Shift the range gear shift lever to "**LOW**" or "**HIGH**" position.
2. Turn the key to "**START**" position.
3. The engine must not crank.

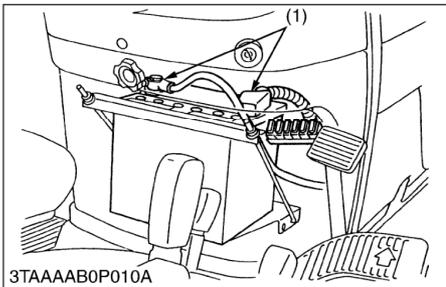
##### Test 2 : Safety switch on the PTO clutch lever

1. Shift the range gear shift lever to "**NEUTRAL**" position.
2. Shift the PTO clutch lever to "**ON**" position.
3. Turn the key to "**START**" position.
4. The engine must not crank.

(1) Range Gear Shift Lever

(2) PTO Clutch Lever

W1014904



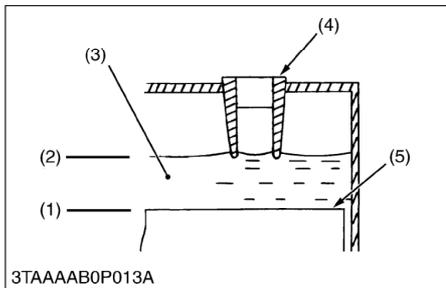
#### Greasing

1. Apply a small amount of grease to the battery terminals (1).

(1) Battery Terminal

W1015242





**Battery Charging**

**CAUTION**

- When the battery is being activated, hydrogen and oxygen gases in the battery are extremely explosive. Keep open sparks and flames away from the battery at all times, especially when charging the battery.
- When charging the battery, ensure the vent caps are securely in place (if equipped).
- When disconnecting the cable from the battery, start with the negative terminal first. When connecting the cable to the battery, start with the positive terminal first.
- Never check battery charge by placing a metal object across the posts.

**Use a voltmeter or hydrometer.**

1. Make sure each electrolyte level is to the bottom of vent wells, if necessary add distilled water in a well-ventilated area.
2. The water in the electrolyte evaporates during recharging. Liquid shortage damages the battery. Excessive liquid spills over and damages the tractor body.
3. To slow charge the battery, connect the battery positive terminal to the charger positive terminal and the negative to the negative, then recharge in the standard fashion.
4. A boost charge is only for emergencies. It will partially charges the battery at a high rate and in a short time. When using a boost-charged battery, it is necessary to recharge the battery as early as possible. Failure to do this will shorten the battery's service life.
5. When the specific gravity of electrolyte become between 1.27 and 1.29 charge has completed.
6. When exchanging an old battery into new one, use battery of equal specification shown in table 1.

**Table 1**

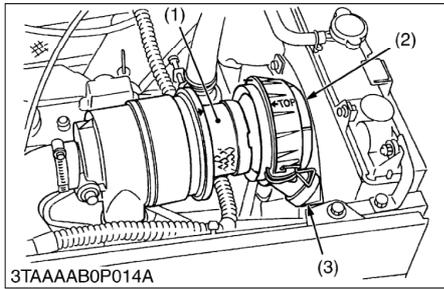
Tractor Type	Battery Type	Volts (V)	Reserve Capacity (min.)	Cold Cranking Amps
BX1800	26/26R	12	62	435
BX2200	526RA	12	80	535

**Direction for Storage**

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

- (1) Lowest Level
- (2) Highest Level
- (2) Electrolyte
- (4) Vent Well
- (5) Separator

W1019057



### **Cleaning Air Cleaner Element**

1. Remove the air cleaner cover (2) and element (1).
2. Clean the element if:
  - When dry dust adheres to the element, blow compressed air from the inside, turning the element. Pressure of compressed air must be under 205 kPa (2.1 kgf/cm<sup>2</sup>, 30 psi).
  - When carbon or oil adheres to the element, soak the element in detergent for 15 minutes then wash it several times in water, rinse with clean water and dry it naturally. After element is fully dried, inspect inside of the element with a light and check if it is damaged or not.
3. Replace the element (1) once a year or after every six times of cleaning, whichever comes first.

### **IMPORTANT**

- **The air cleaner uses a dry element, never apply oil.**
- **Do not run the engine with filter element removed.**
- **Be sure to refit the dust cup with the arrow ↑ upright. If the dust cup is improperly fitted, evacuator valve will not function and dust will adhere to the element.**

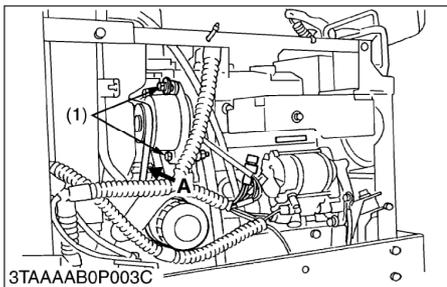
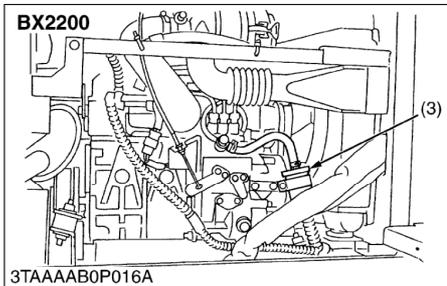
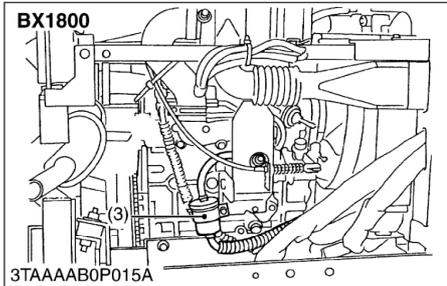
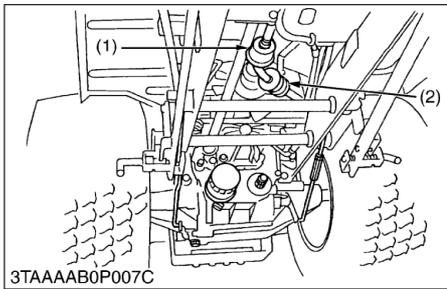
### **Evacuator Valve**

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

(1) Element  
(2) Cover

(3) Evacuator Valve

W1017166



**Checking Fuel Lines and Fuel Filter**

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

**IMPORTANT**

- When the fuel line is disconnected for maintenance or repair, plug both ends of the fuel line with a clean plug of suitable size to prevent dust and dirt from entering. Particular care must be taken not to admit dust and dirt into the fuel system. Entrance of dust and dirt causes malfunction of the fuel pump.

**NOTE**

- If the fuel line is removed, be sure to properly bleed the fuel system (see page G-25).

- (1) Fuel Pump (2) Fuel Filter (3) Fuel Filter

W1017546

**Checking Fan Belt Tension**

**CAUTION**

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

Fan belt tension	Factory spec.	A deflection of between 7 to 9 mm (0.28 to 0.34 in.) when the belt is pressed in the middle of the span.
------------------	---------------	--

(1) Mounting Bolt

**A : Check the belt tension**

W1017708