

Product: Kubota BX1830 BX2230 Service Manual

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**WORKSHOP MANUAL
TRACTOR**

BX1830 BX2230

Kubota

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TO THE READER

This Workshop Manual has been prepared to provide servicing personnel with information on the mechanism, service and maintenance of KUBOTA Tractor BX1830 and BX2230. 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.

Refer to Diesel engine / Tractor Mechanism Workshop Manual (Code No. 97897-01872 / 97897-18200) for the one which has not been described to this workshop manual.

■ Servicing

The heading "General" includes 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.

October 2003

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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.

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BEFORE SERVICING AND REPAIRING

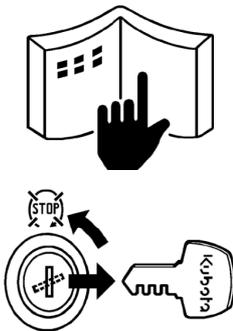
- Read all instructions and safety instructions in this manual and on your machine safety decals.
- Clean the work area and machine.
- Park the machine on a firm and level ground, and set the parking brake.
- Lower the implement to the ground.
- Stop the engine, and remove the key
- Disconnect the battery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

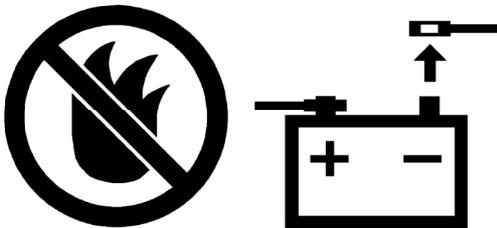
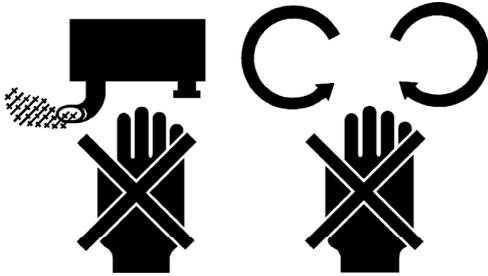
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SAFETY STARTING

- 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.

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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.

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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.

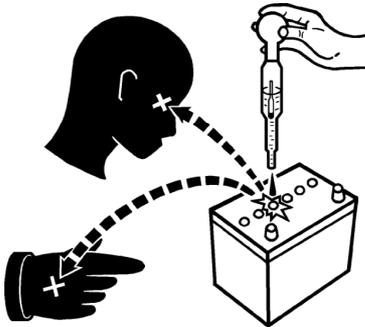
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VENTILATE WORK AREA

- 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.

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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.

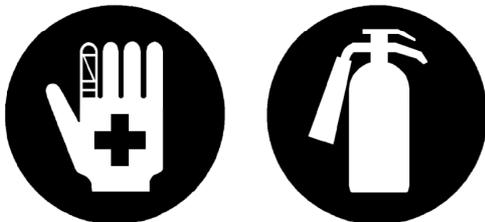
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DISPOSE OF FLUIDS PROPERLY

- 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.

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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.

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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 dismantling 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 only No fire





(6) Part No. K2561-6556-1

⚠ WARNING

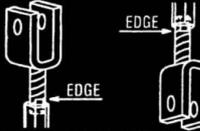
TO AVOID PERSONAL INJURY:

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.

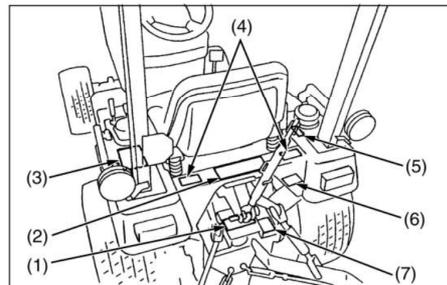
(7) Part No. K2561-6555-1

⚠ CAUTION

TO AVOID PERSONAL INJURY FROM SEPARATION



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



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(1) Part No. K2561-6541-1



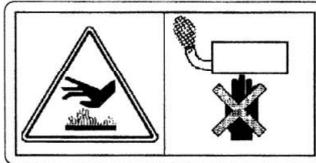
(5) Part No. K2561-6115-1



(2) Part No. K2561-6543-1
Stay clear of engine fan and belt.



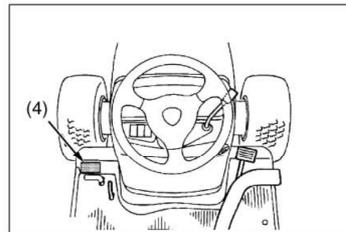
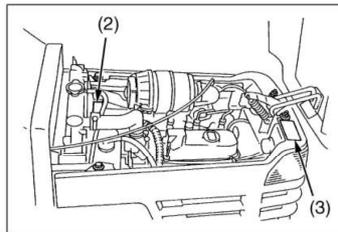
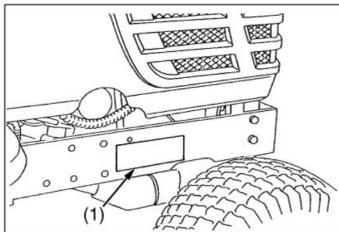
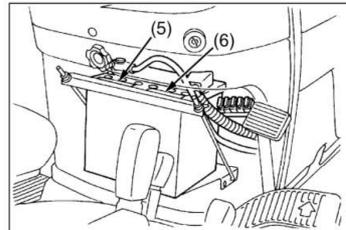
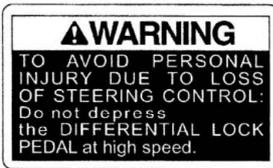
(3) Part No. K2561-6542-1
Do not touch hot surface like muffler, etc.



(6) Part No. K2561-6116-1



(4) Part No. K2561-6566-1



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.

SPECIFICATIONS

| Model | | BX1830 | BX2230 |
|--------------------|--|--|---|
| PTO power | | 10.2 kW (13.7 HP)* | 12.4 kW (16.7 HP)* |
| Engine | Maker | KUBOTA | |
| | Model | D722-E-BX | D902-E-BX |
| | Type | Indirect injection. Vertical, water-cooled, 4-cycle diesel | |
| | Number of cylinders | 3 | |
| | Bore and stroke | 67 x 68 mm (2.64 x 2.68 in.) | 72 x 73.6 mm (2.83 x 2.90 in.) |
| | Total displacement | 719 cm ³ (43.9 cu.in.) | 898 cm ³ (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 ⁻¹ (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 ⁻¹ (rpm)] | 54.9 N·m (5.6 kgf·m, 40.5 ft-lbs) / 36.7 to 43.3 r/s [2200 to 2600 min ⁻¹ (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.) | 2.8 L (2.96 U.S.qts., 2.46 Imp.qts.) |
| | Engine coolant (with recovery tank) | 2.9 L (3.06 U.S.qts., 2.55 Imp.qts.) | 3.1 L (3.27 U.S.qts., 2.73 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 seat) | 1240 mm (48.8 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 (with ROPS) | | 570 kg (1257 lbs) | 585 kg (1290 lbs) |
| Traveling system | Tires | Front | 18 x 8.50 - 8 (Turf) |
| | | Rear | 26 x 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 | |

| Model | | BX1830 | BX2230 |
|------------------|---|------------|--|
| 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 ⁻¹ (rpm)] / engine 52.1 r/s [3125 min ⁻¹ (rpm)] |
| | Rear | PTO shaft | SAE 1-3/8, 6 splines |
| | | Revolution | 9.0 r/s [540 min ⁻¹ (rpm)] / engine 51.1 r/s [3068 min ⁻¹ (rpm)] |

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

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TRAVELLING SPEEDS

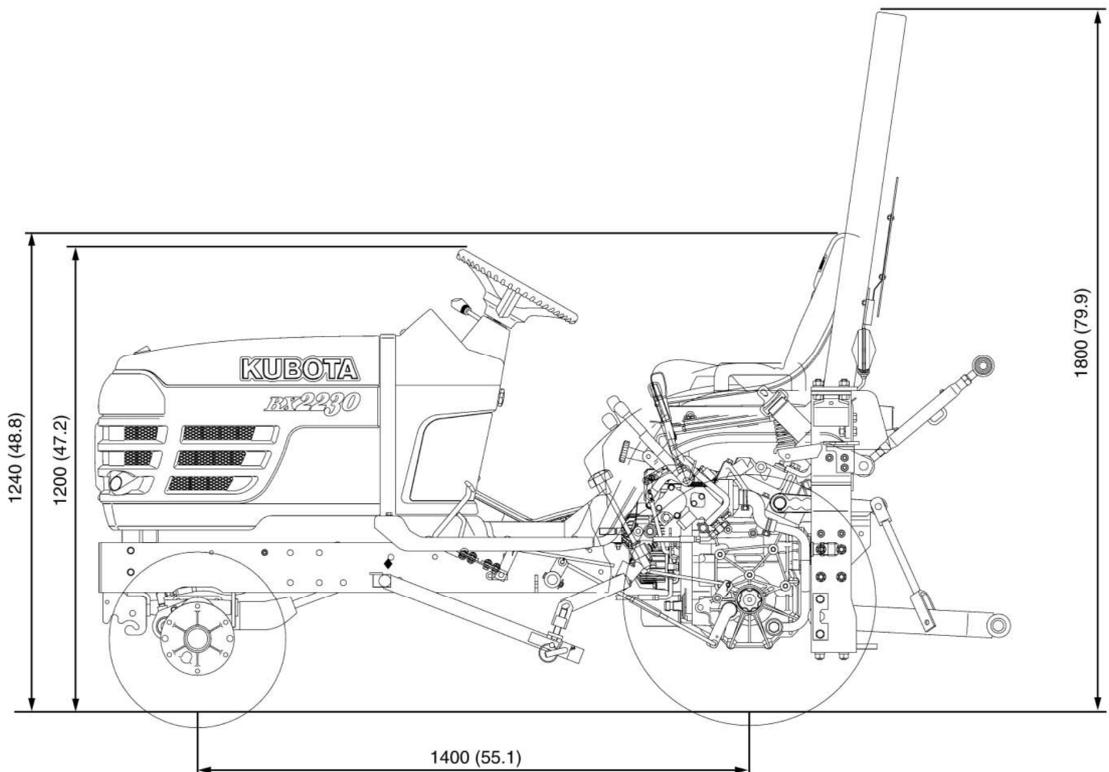
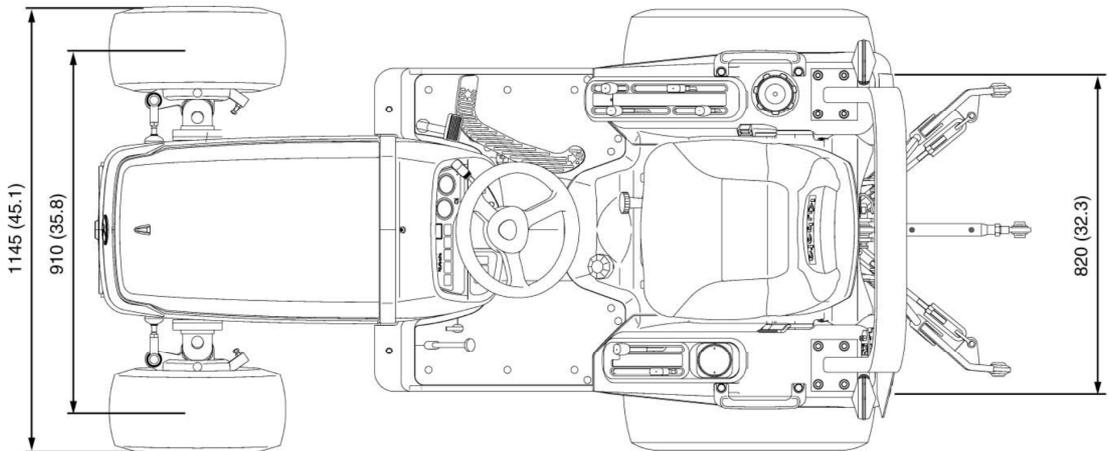
| Model | | BX1830, BX2230 | |
|------------------|------------------------|-----------------|----------|
| Tire size (Rear) | | 26 x 12.00 — 12 | |
| | Range gear shift lever | km/h | mile/h |
| Forward | Low | 0 to 5.9 | 0 to 3.7 |
| | High | 0 to 13.0 | 0 to 8.1 |
| Reverse | Low | 0 to 4.5 | 0 to 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

Unit: mm (in.)



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G GENERAL

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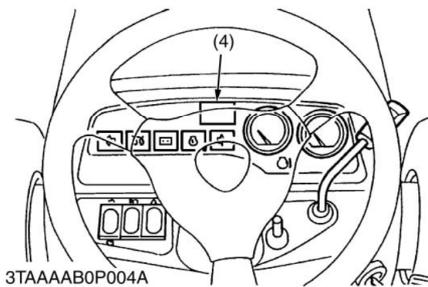
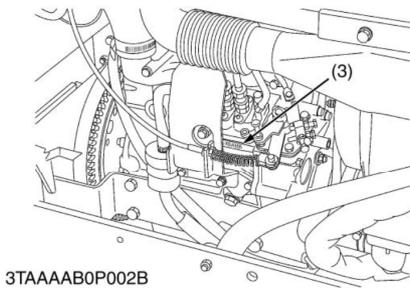
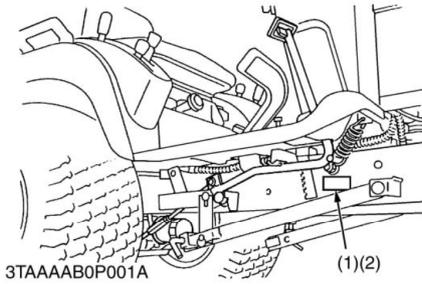
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1. TRACTOR IDENTIFICATION

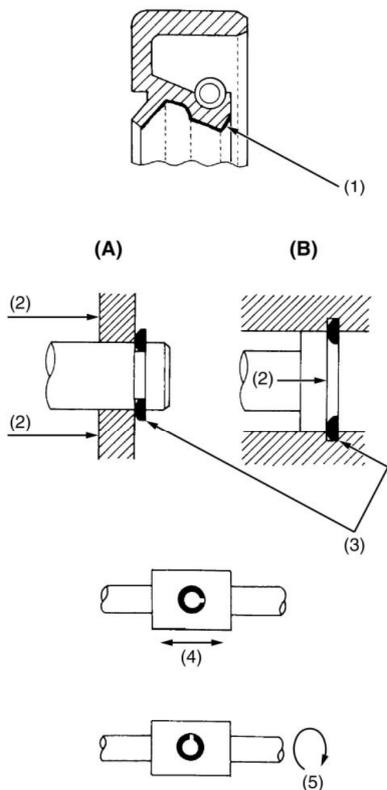
When contacting your local KUBOTA distributor, always specify engine serial number, tractor serial number and hour meter reading.

- (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. 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

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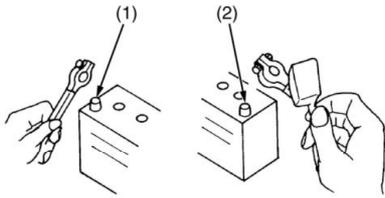
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3. HANDLING PRECAUTIONS FOR ELECTRICAL PARTS AND WIRING

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.

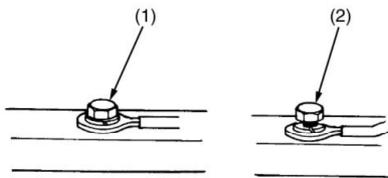


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- (1) Negative Terminal (2) Positive Terminal

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[1] WIRING

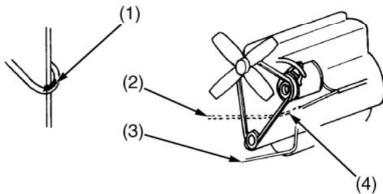


- Securely tighten wiring terminals.

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

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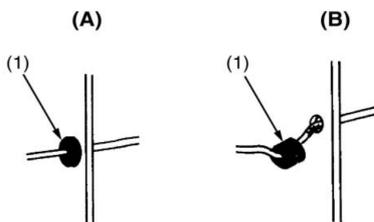


- Do not let wiring contact dangerous part.

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

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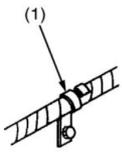


- Securely insert grommet.

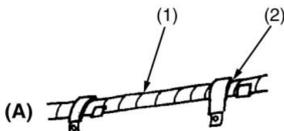
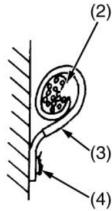
- (1) Grommet (A) Correct
 (B) Incorrect

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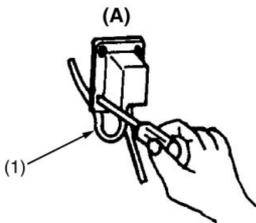
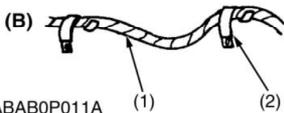
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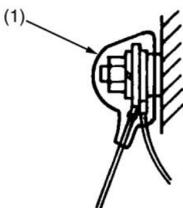
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3TMABAB0P013A

● Securely clamp, being careful not to damage wiring.

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

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

- (1) Wiring
- (A) Incorrect

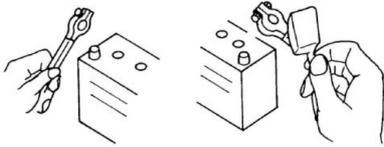
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● After installing wiring, check protection of terminals and clamped condition of wiring, only connect battery.

- (1) Cover
- *Securely Install Cover

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[2] BATTERY



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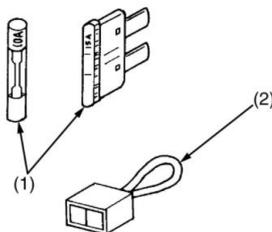
- Take care not to confuse positive and negative terminal posts.
- When removing battery cables, disconnect negative cable first. When installing battery cables, check for polarity and connect positive cable first.
- Do not install any battery with capacity other than is specified (Ah).
- After connecting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

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[3] FUSE



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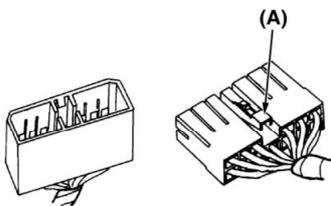
- Use fuses with specified capacity. Neither too large or small capacity fuse is acceptable.
- Never use steel or copper wire in place of fuse.
- Do not install working light, radio set, etc. on machine which is not provided with reserve power supply.
- Do not install accessories if fuse capacity of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

(1) Fuse

(2) Fusible Link

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[4] CONNECTOR

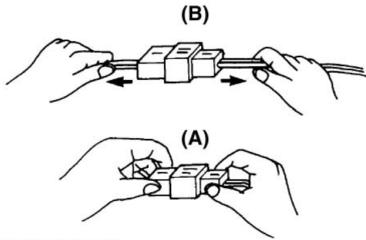


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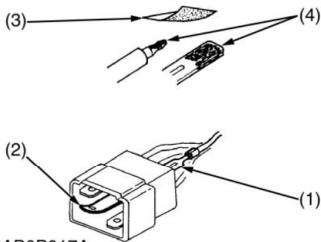
- For connector with lock, push lock to separate.

(A) Push

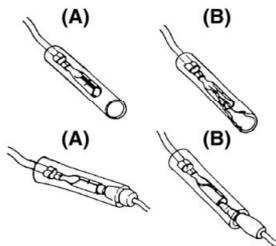
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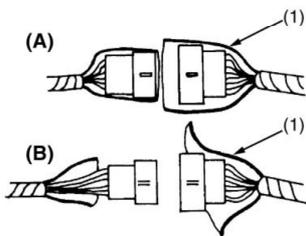
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3TMABAB0P017A



3TMABAB0P018A



3TMABAB0P019A

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

(A) Correct

(B) Incorrect

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- 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) Deformed Terminal

(4) Rust

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

(A) Correct

(B) Incorrect

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

(1) Cover

(A) Correct

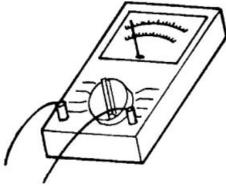
(B) Incorrect

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[5] HANDLING OF CIRCUIT TESTER

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

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4. LUBRICANTS, FUEL AND COOLANT

| No. | Place | Capacity | | Lubricants, fuel and coolant |
|----------|-----------------------------------|--|---|--|
| | | BX1830 | BX2230 | |
| 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. | 3.1 L 3.27 U.S.qts. 2.73 Imp.qts. | Fresh clean water with anti-freeze |
| 3 | Engine crankcase | 1.9 L 2.01 U.S.qts. 1.67 Imp.qts. | 2.8 L 2.96 U.S.qts. 2.46 Imp.qts. | Engine oil: API service CD, CE 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 | 10.1 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 |
| Greasing | | | | |
| No. | Place | No. of greasing point | Capacity | Type of grease |
| 6 | Battery terminal | 2 | Moderate amount | Multipurpose type grease |
| 7 | Speed control pedal | 1 | Until grease overflow | |

*KUBOTA original transmission hydraulic fluid.

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5. TIGHTENING TORQUES

[1] GENERAL USE SCREWS, BOLT AND NUTS

Screws, bolt and nuts whose tightening torque 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 | N-m | kgf-m | ft-lbs |
| M6 (6 mm, 0.24 in.) | 7.85 to 9.31 | 0.80 to 0.95 | 5.79 to 6.87 | 7.85 to 8.82 | 0.80 to 0.90 | 5.79 to 6.50 | 9.81 to 11.2 | 1.00 to 1.15 | 7.24 to 8.31 | 7.85 to 8.82 | 0.80 to 0.90 | 5.79 to 6.50 | 12.3 to 14.2 | 1.25 to 1.45 | 9.05 to 10.4 |
| M8 (8 mm, 0.31 in.) | 17.7 to 20.5 | 1.8 to 2.1 | 13.1 to 15.1 | 16.7 to 19.6 | 1.7 to 2.0 | 12.3 to 14.4 | 23.6 to 27.4 | 2.4 to 2.8 | 17.4 to 20.2 | 17.7 to 20.5 | 1.8 to 2.1 | 13.1 to 15.1 | 29.5 to 34.3 | 3.0 to 3.5 | 21.7 to 25.3 |
| M10 (10 mm, 0.39 in.) | 39.3 to 45.1 | 4.0 to 4.6 | 29.0 to 33.2 | 31.4 to 34.3 | 3.2 to 3.5 | 23.2 to 25.3 | 48.1 to 55.8 | 4.9 to 5.7 | 35.5 to 41.2 | 39.3 to 44.1 | 4.0 to 4.5 | 29.0 to 32.5 | 60.9 to 70.6 | 6.2 to 7.2 | 44.9 to 52.0 |
| M12 (12 mm, 0.47 in.) | 62.8 to 72.5 | 6.4 to 7.4 | 46.3 to 53.5 | - | - | - | 77.5 to 90.2 | 7.9 to 9.2 | 57.2 to 66.5 | 62.8 to 72.5 | 6.4 to 7.4 | 46.3 to 53.5 | 103 to 117 | 10.5 to 12.0 | 76.0 to 86.7 |
| M14 (14 mm, 0.55 in.) | 108 to 125 | 11.0 to 12.8 | 79.6 to 92.5 | - | - | - | 124 to 147 | 12.6 to 15.0 | 91.2 to 108 | - | - | - | 167 to 196 | 17.0 to 20.0 | 123 to 144 |
| M16 (16 mm, 0.63 in.) | 167 to 191 | 17.0 to 19.5 | 123 to 141 | - | - | - | 197 to 225 | 20.0 to 23.0 | 145 to 166 | - | - | - | 260 to 304 | 26.5 to 31.0 | 192 to 224 |
| M18 (18 mm, 0.71 in.) | 246 to 284 | 25.0 to 29.0 | 181 to 209 | - | - | - | 275 to 318 | 28.0 to 32.5 | 203 to 235 | - | - | - | 344 to 402 | 35.0 to 41.0 | 254 to 296 |
| M20 (20 mm, 0.79 in.) | 334 to 392 | 34.0 to 40.0 | 246 to 289 | - | - | - | 368 to 431 | 37.5 to 44.0 | 272 to 318 | - | - | - | 491 to 568 | 50.0 to 58.0 | 362 to 419 |

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[2] STUD BOLTS

| Material of opponent part | Ordinariness | | | Aluminum | | |
|---------------------------------|--------------------|------------------|--------------------|--------------------|-------------------|--------------------|
| Diameter \ Unit | N-m | kgf-m | ft-lbs | N-m | kgf-m | ft-lbs |
| M8 (8 mm, 0.31 in.) | 11.8 to 15.6 | 1.2 to 1.6 | 8.68 to 11.5 | 8.82 to 11.8 | 0.90 to 1.2 | 6.51 to 8.67 |
| M10 (10 mm, 0.39 in.) | 24.6 to 31.3 | 2.5 to 3.2 | 18.1 to 23.1 | 19.7 to 25.4 | 2.0 to 2.6 | 14.5 to 18.8 |
| M12 (12 mm, 0.47 in.) | 29.5 to 49.0 | 3.0 to 5.0 | 21.7 to 36.1 | 31.4 | 3.2 | 23.1 |

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

| Grade | SAE GR.5  | | | SAE GR.8  | | | |
|-------------|---|----------------|----------------|---|----------------|----------------|----------------|
| | Unit | 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 |

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6. MAINTENANCE

| No. | Item | Period | Indication on hour meter | | | | | | | | | | Impor- tant | Refer- ence page | |
|-----|--|---------|--------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------|------------------------|------|
| | | | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | | | |
| 1 | Engine oil | Change | ★ | ☆ | | ☆ | | ☆ | | ☆ | | ☆ | | | G-15 |
| 2 | Engine oil filter | Replace | ★ | | | ☆ | | | | ☆ | | | | | G-15 |
| 3 | Transmission oil filter | Replace | ★ | | | | | | ☆ | | | | | | G-16 |
| 4 | Transmission fluid | Change | ★ | | | | | | ☆ | | | | | | G-16 |
| 5 | Transmission strainer | Clean | | | | | | | ☆ | | | | | | G-26 |
| 6 | Front axle case oil | Change | | | | | | | ☆ | | | | | | G-26 |
| 7 | Front axle pivot | Adjust | | | | | | | | ☆ | | | | | G-27 |
| 8 | Engine start system | Check | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | G-17 |
| 9 | Greasing | - | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | G-17 |
| 10 | Wheel bolt torque | Check | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | G-18 |
| 11 | Battery condition | Check | | ☆ | | ☆ | | ☆ | | ☆ | | ☆ | *4 | | G-19 |
| 12 | Air cleaner element | Clean | | ☆ | | ☆ | | ☆ | | ☆ | | ☆ | *1 | @ | G-21 |
| | | Replace | | | | | | | | | | | *2 | | G-28 |
| 13 | Fuel filter element | Check | | ☆ | | ☆ | | ☆ | | ☆ | | ☆ | | @ | G-21 |
| | | Replace | | | | | | | | | | ☆ | | | G-27 |
| 14 | Fan belt | Adjust | | ☆ | | ☆ | | ☆ | | ☆ | | ☆ | | | G-22 |
| 15 | HST neutral spring | Adjust | | ☆ | | ☆ | | ☆ | | ☆ | | ☆ | | | G-22 |
| 16 | Brake | Adjust | | ☆ | | ☆ | | ☆ | | ☆ | | ☆ | | | G-23 |
| 17 | Radiator hose and clamp | Check | | | | ☆ | | | | ☆ | | | | | G-24 |
| | | Replace | | | | | | | | | | | | | G-28 |
| 18 | Power steering oil line | Check | | | | ☆ | | | | ☆ | | | | | G-24 |
| | | Replace | | | | | | | | | | | | | G-28 |
| 19 | Fuel line | Check | | ☆ | | ☆ | | ☆ | | ☆ | | ☆ | | @ | G-21 |
| | | Replace | | | | | | | | | | | | | G-28 |
| 20 | Intake air line | Check | | | | ☆ | | | | ☆ | | | | @ | G-25 |
| | | Replace | | | | | | | | | | | *3 | | G-28 |
| 21 | Toe-in | Adjust | | | | ☆ | | | | ☆ | | | | | G-25 |
| 22 | Engine valve clearance | Adjust | | | | | | | | | | | | | G-28 |
| 23 | Fuel injection nozzle injection pressure | Check | | | | | | | | | | | | @ | G-28 |
| 24 | Injection pump | Check | | | | | | | | | | | | @ | G-28 |
| 25 | Cooling system | Flush | | | | | | | | | | | | | G-29 |
| 26 | Coolant | Change | | | | | | | | | | | | | G-29 |
| 27 | Fuel system | Bleed | | | | | | | | | | | | | G-31 |
| 28 | Fuse | Replace | | | | | | | | | | | | | G-31 |
| 29 | Light bulb | Replace | | | | | | | | | | | | | G-32 |

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| No. | Item | Period | Indication on hour meter | | | | | | | After purchase | | Important | Reference page | | | |
|-----|--|---------|--------------------------|-----|-----|-----|-----|-----|------|----------------|--------|-----------|----------------|---------|------|------|
| | | | 550 | 600 | 650 | 700 | 750 | 800 | 1500 | 3000 | 1 year | | | 2 years | | |
| 1 | Engine oil | Change | | ☆ | | ☆ | | ☆ | | | | | | | G-15 | |
| 2 | Engine oil filter | Replace | | ☆ | | | | ☆ | | | | | | | G-15 | |
| 3 | Transmission oil filter | Replace | | ☆ | | | | | | | | | | | G-16 | |
| 4 | Transmission fluid | Change | | ☆ | | | | | | | | | | | G-16 | |
| 5 | Transmission strainer | Clean | | ☆ | | | | | | | | | | | G-26 | |
| 6 | Front axle case oil | Change | | ☆ | | | | | | | | | | | G-26 | |
| 7 | Front axle pivot | Adjust | | | | | | ☆ | | | | | | | G-27 | |
| 8 | Engine start system | Check | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | | | | | G-17 | |
| 9 | Greasing | - | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | | | | | G-17 | |
| 10 | Wheel bolt torque | Check | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | | | | | G-18 | |
| 11 | Battery condition | Check | | ☆ | | ☆ | | ☆ | | | | | | *4 | G-19 | |
| 12 | Air cleaner element | Clean | | ☆ | | ☆ | | ☆ | | | | | | *1 | @ | G-21 |
| | | Replace | | | | | | | | ☆ | | | | *2 | | G-28 |
| 13 | Fuel filter element | Check | | ☆ | | ☆ | | ☆ | | | | | | | @ | G-21 |
| | | Replace | | | | | | | | | | | | | | G-27 |
| 14 | Fan belt | Adjust | | ☆ | | ☆ | | ☆ | | | | | | | | G-22 |
| 15 | HST neutral spring | Adjust | | ☆ | | ☆ | | ☆ | | | | | | | | G-22 |
| 16 | Brake | Adjust | | ☆ | | ☆ | | ☆ | | | | | | | | G-23 |
| 17 | Radiator hose and clamp | Check | | ☆ | | | | ☆ | | | | | | | | G-24 |
| | | Replace | | | | | | | | | ☆ | | | | | G-28 |
| 18 | Power steering oil line | Check | | ☆ | | | | ☆ | | | | | | | | G-24 |
| | | Replace | | | | | | | | | ☆ | | | | | G-28 |
| 19 | Fuel line | Check | | ☆ | | ☆ | | ☆ | | | | | | | @ | G-21 |
| | | Replace | | | | | | | | | ☆ | | | | | G-28 |
| 20 | Intake air line | Check | | ☆ | | | | ☆ | | | | | | | @ | G-25 |
| | | Replace | | | | | | | | | ☆ | | *3 | | @ | G-28 |
| 21 | Toe-in | Adjust | | ☆ | | | | ☆ | | | | | | | | G-25 |
| 22 | Engine valve clearance | Adjust | | | | | | ☆ | | | | | | | | G-28 |
| 23 | Fuel injection nozzle injection pressure | Check | | | | | | | ☆ | ☆ | | | | | @ | G-28 |
| 24 | Injection pump | Check | | | | | | | | ☆ | | | | | @ | G-28 |
| 25 | Cooling system | Flush | | | | | | | | | ☆ | | | | | G-29 |
| 26 | Coolant | Change | | | | | | | | | ☆ | | | | | G-29 |
| 27 | Fuel system | Bleed | | | | | | | | | | | | | | G-31 |
| 28 | Fuse | Replace | | | | | | | | | | | | | | G-31 |
| 29 | Light bulb | Replace | | | | | | | | | | | | | | G-32 |

■ IMPORTANT

- The jobs indicated by ★ must be done after the first 50 hours of operation.
- *1 : Air cleaner should be cleaned more often in dusty conditions than in normal conditions.
- *2 : Every year or every 6 times of cleaning.
- *3 : Replace only if necessary.
- *4 : When the battery is used for less than 100 hours per year, check the battery condition annually.
- The items listed above (@ marked) are registered as emission related critical parts by KUBOTA in the U.S.EPA nonroad emission regulation. As the engine owner, you are responsible for the performance of the required maintenance on the engine according to the above instruction.
Please see the Warranty Statement in detail.

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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.

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[1] DAILY CHECK

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

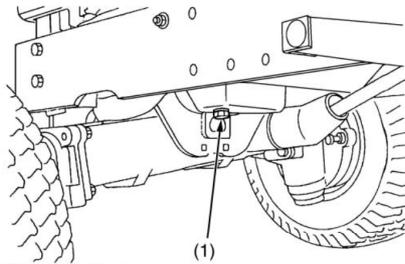
Checking

- 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 leak.
 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 nuts of tires are tight.
 9. Check the number plate or SMV emblem for damage and 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 pedal.
 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 the head lights, turn signal lights, hazard lights and other light equipment. 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.

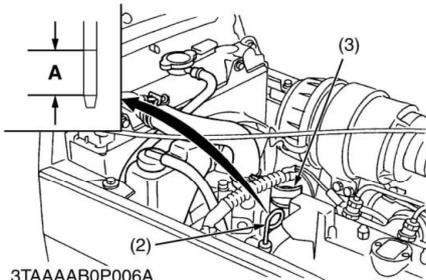
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[2] CHECK POINTS OF INITIAL 50 HOURS

Changing Engine Oil



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⚠ 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 both 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-8.)**

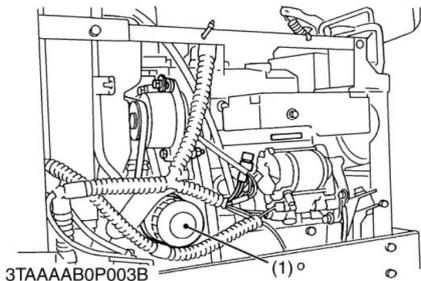
| | | |
|---------------------|--------|--|
| Engine oil capacity | BX1830 | 1.9 L 2.01 U.S.qts. 1.67 Imp.qts |
| | BX2230 | 2.8 L 2.96 U.S.qts. 2.46 Imp.qts |

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

(A) Oil level is acceptable within this range

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Replacing Engine Oil Filter Cartridge



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⚠ CAUTION

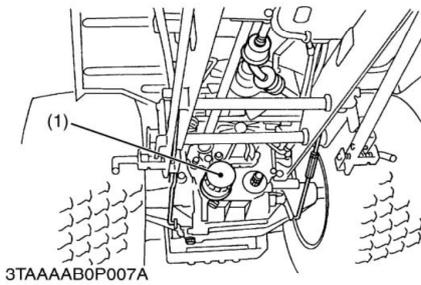
- **Be sure to stop the engine before changing oil filter cartridge.**
- 1. Remove the oil filter cartridge with the filter wrench.
- 2. Apply a slight coat of oil onto the new cartridge.
- 3. To install the new cartridge, screw it in by hand. Over tightening may cause deformation of rubber gasket.
- 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

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Replacing Transmission Oil Filter Cartridge

⚠ CAUTION

- **Be sure to stop the engine before changing the oil filter.**
- 1. Remove the oil filter cartridge by using a filter wrench.
- 2. Apply a slight coat of oil onto the new 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

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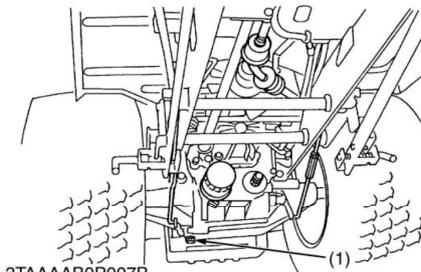
Changing Transmission Fluid

⚠ CAUTION

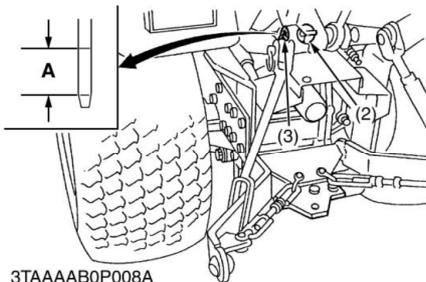
- **Be sure to stop the engine before changing the transmission fluid.**
- 1. Place an oil pan under the tractor.
- 2. Remove the drain plug (1) at the bottom of the transmission case and drain the oil completely.
- 3. After draining, screw in the drain plug.
- 4. Fill new oil from filling port after 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 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-8.)**
- **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.**



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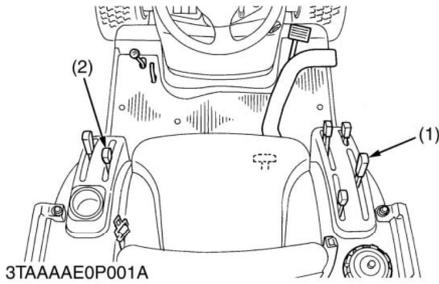
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| | |
|-----------------------------|---|
| Transmission fluid capacity | 10.1 L 2.7 U.S.gals. 2.2 Imp.gals |
|-----------------------------|---|

- (1) Drain Plug
- (2) Filling Plug
- (3) Dipstick

A : Oil level is acceptable within this range.

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[3] CHECK POINTS OF EVERY 50 HOURSChecking 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 the 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.

■ Test 3 : Safety switch for the operator's seat and the range gear shift lever.

1. Sit on the operator's seat.
2. Start the engine.
3. Shift the range gear shift lever to "HIGH" or "LOW" position.
4. Stand up. (Do not get off the machine.)
5. The engine must shut off after approximately 1 second.

■ Test 4 : Safety switches for the operator's seat and the PTO clutch lever.

1. Sit on the operator's seat.
2. Start the engine.
3. Engage the PTO clutch lever.
4. Stand up. (Do not get off the machine.)
5. The engine must shut off after approximately 1 second.

(1) Range Gear Shift Lever

(2) PTO Clutch Lever

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