WSM

WORKSHOP MANUAL
TRACTOR

MX5100

Kubota

KiSC issued 03, 2009 A

TO THE READER

This Workshop Manual tells the servicing personnel about the mechanism, servicing and maintenance of the MX5100. It contains 4 parts: **"Information"**, **"General"**, **"Mechanism"** and **"Servicing"**.

■ **Information**

This section contains information below.

- Safety First
- Safety Label
- Specification
- Travelling Speed
- Dimension

■ **General**

This section contains information below.

- Engine Identification
- Model Identification
- General Precautions
- Maintenance Check List
- Check and Maintenance
- Special Tools

■ **Mechanism**

This section contains information on the structure and the function of the unit. Before you continue with the subsequent sections, make sure that you read this section.

Refer to the latest version of Workshop Manual (Code No. 9Y021-01870 / 9Y021-18200) for the diesel engine / tractor mechanism that this workshop manual does not include.

■ **Servicing**

This section contains information below.

- Troubleshooting
- Servicing Specifications
- Tightening Torques
- Checking, Disassembling and Servicing

All illustrations, photographs and specifications contained in this manual are of the newest information available at the time of publication.

KUBOTA reserves the right to change all information at any time without notice.

Since this manual includes many models, information or illustrations and photographs can show more than one model.

March, 2009

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I INFORMATION

INFORMATION

CONTENTS

1. SAFETY FIRST

⚠ SAFETY FIRST

- **This symbol, the industry's "Safety Alert Symbol", is used throughout this manual and on labels on the machine itself to warn of the possibility of personal injury. Read these instructions carefully.**
- **It is essential that you read the instructions and safety regulations before you attempt to repair or use this unit.**

⚠ DANGER
- **Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.**

⚠ WARNING
- **Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

⚠ CAUTION
- **Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.**

■ IMPORTANT
- **Indicates that equipment or property damage could result if instructions are not followed.**

■ NOTE
- **Gives helpful information.**

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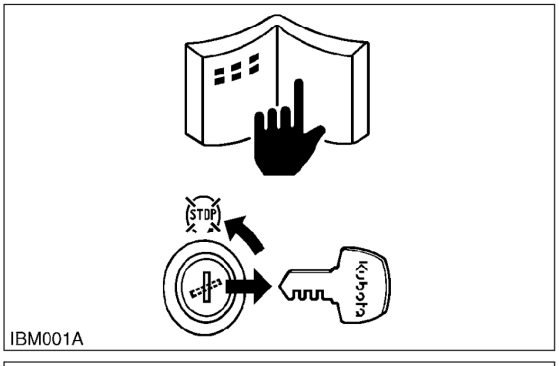

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BEFORE YOU START SERVICE

- 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 stable and level ground, and set the parking brake.
- Lower the implement to the ground.
- Stop the engine, then remove the key.
- Disconnect the battery negative cable.
- Hang a **"DO NOT OPERATE"** tag in the operator station.

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START SAFELY

- Do not do the procedures below when you start the engine.
  - short across starter terminals
  - bypass the safety start switch
- Do not alter or remove any part of machine safety system.
- Before you start the engine, make sure that all shift levers are in neutral positions or in disengaged positions.
- Do not start the engine when you stay on the ground. Start the engine only from operator's seat.

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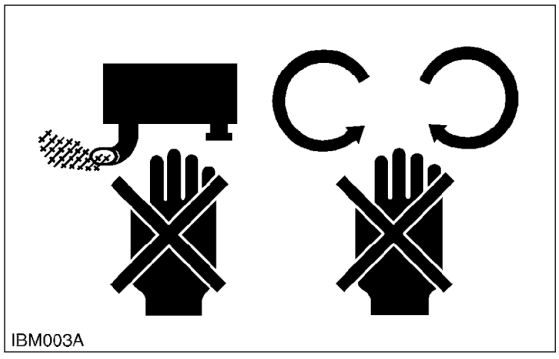
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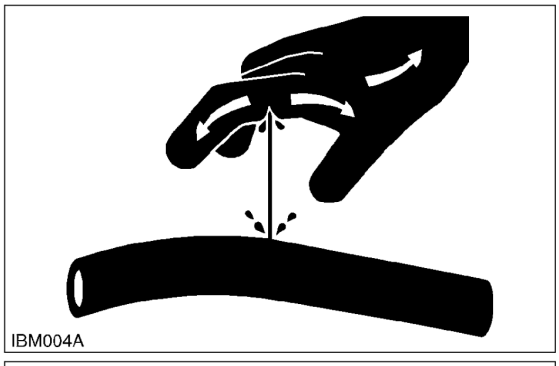
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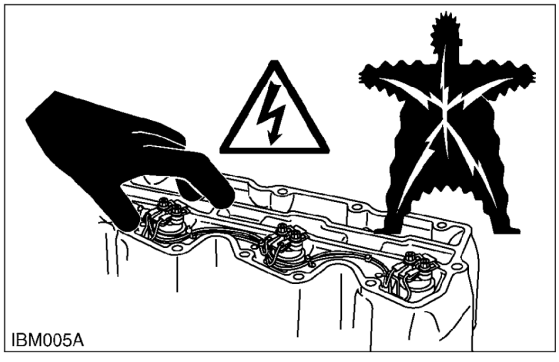
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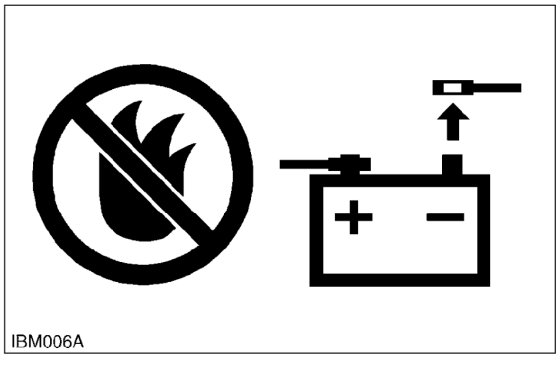
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OPERATE SAFELY

- Do not use the machine after you consume alcohol or medication or when you are tired.
- Put on applicable clothing and safety equipment.
- Use applicable tools only. Do not use alternative tools or parts.
- When 2 or more persons do servicing, make sure that you do it safely.
- Do not operate below the machine that only a jack holds. Always use a safety stand to hold the machine.
- Do not touch the hot parts or parts that turn when the engine operates.
- Do not remove the radiator cap when the engine operates, or immediately after it stops. If not, hot water can spout out from the radiator. Only remove the radiator cap when it is at a sufficiently low temperature to touch with bare hands. Slowly loosen the cap to release the pressure before you remove it fully.
- Released fluid (fuel or hydraulic oil) under pressure can cause damage to the skin and cause serious injury. Release the pressure before you disconnect hydraulic or fuel lines. Tighten all connections before you apply the pressure.
- Do not open a fuel system under high pressure. The fluid under high pressure that stays in fuel lines can cause serious injury. Do not disconnect or repair the fuel lines, sensors, or any other components between the fuel pump and injectors on engines with a common rail fuel system under high pressure.
- Put on an applicable ear protective device (earmuffs or earplugs) to prevent injury against loud noises.
- Be careful about electric shock. The engine generates a high voltage of more than DC100 V in the ECU and is applied to the injector.

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PREVENT A FIRE

- Fuel is very flammable and explosive under some conditions. Do not smoke or let flames or sparks in your work area.
- To prevent sparks from an accidental short circuit, always disconnect the battery negative cable first and connect it last.
- The battery gas can cause an explosion. Keep the sparks and open flame away from the top of battery, especially when you charge the battery.
- Make sure that you do not spill fuel on the engine.

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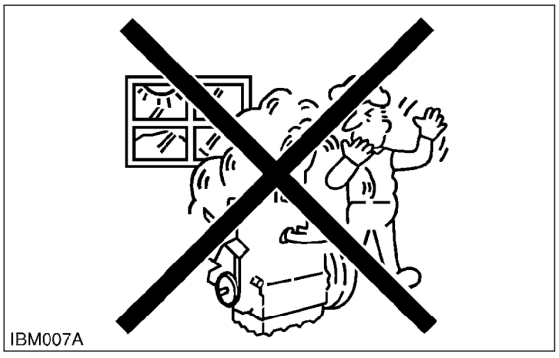
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KEEP A GOOD AIRFLOW IN THE WORK AREA

- If the engine is in operation, make sure that the area has good airflow. Do not operate the engine in a closed area. The exhaust gas contains poisonous carbon monoxide.

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DISCARD FLUIDS CORRECTLY

- Do not discard fluids on the ground, down the drain, into a stream, pond, or lake. Obey related environmental protection regulations when you discard oil, fuel, coolant, electrolyte and other dangerous waste.

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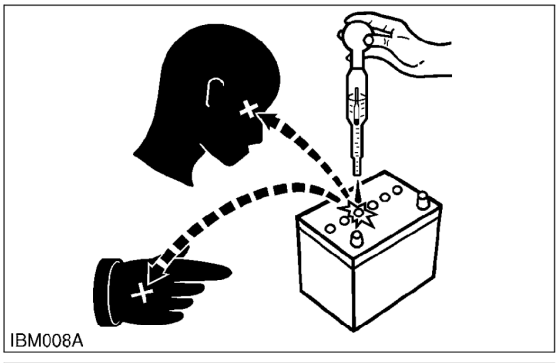
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PREVENT ACID BURNS

- Keep electrolyte away from your eyes, hands and clothing. Sulfuric acid in battery electrolyte is poisonous and it can burn your skin and clothing and cause blindness. If you spill electrolyte on yourself, clean yourself with water, and get medical aid immediately.

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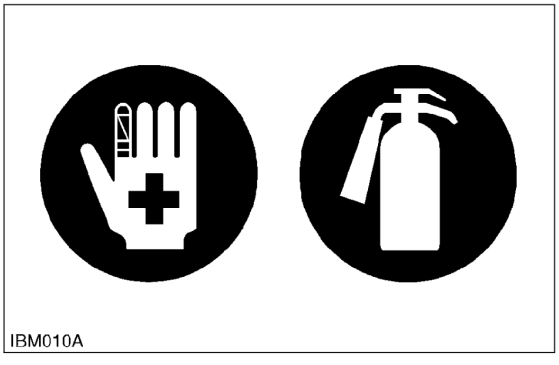
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PREPARE FOR EMERGENCIES

- Keep a first aid kit and fire extinguisher ready at all times.
- Keep the emergency contact telephone numbers near your telephone at all times.

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2. 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.

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(1) Part No. 35260-3491-4

⚠ 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. Lock the two brake pedals together before driving on the road.
8. Slow down for turns, or rough roads, or when applying individual brakes.
9. On public roads use SMV emblem and hazard lights, if required by local traffic and safety regulations.
10. Pull only from the drawbar.
11. Before dismounting, lower the implement to the ground, set the parking brake, stop the engine and remove the key.
12. Securely support tractor and implements before working underneath.

(2) Part No. TA040-4965-2

⚠ 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.

(3) Part No. 3A111-9554-1

⚠ WARNING

Never modify or repair a ROPS because welding, grinding, drilling or cutting any portion may weaken the structure.

⚠ CAUTION

TO AVOID INJURY WHEN RAISING OR FOLDING ROPS:

- Set parking brake and stop engine.
- Remove any obstruction that may prevent raising or folding of the ROPS.
- Do not allow any bystanders.
- Always perform function from a stable position at the rear of the tractor.
- Hold the top of the ROPS securely when raising or folding.
- Make sure all pins are installed and locked.

(4) Part No. 6C090-4958-2
Do not get your hands close to engine fan and fan belt.

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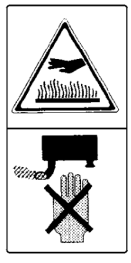
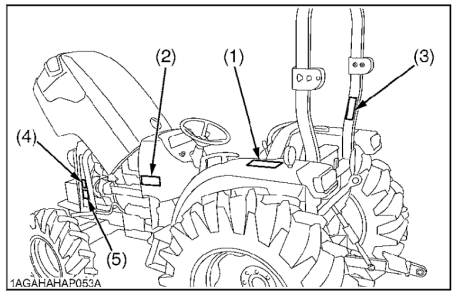
(5) Part No. TC030-4958-1
Do not touch hot surface like muffler, etc.





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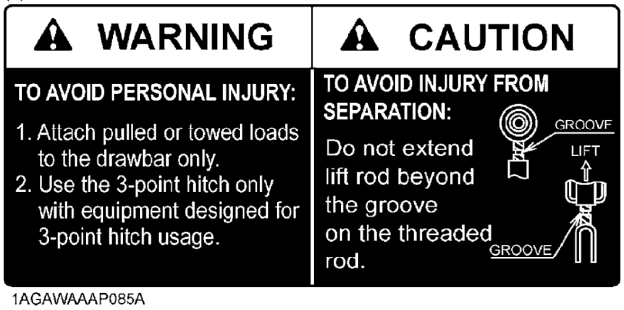
(1) Part No. TD170-4935-1



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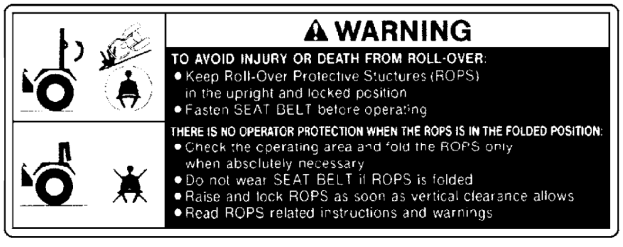
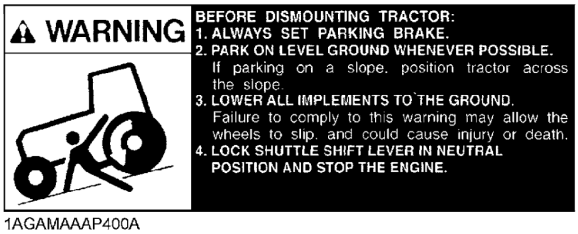
(3) Part No. TA240-9848-1



(4) Part No. TA140-4933-1



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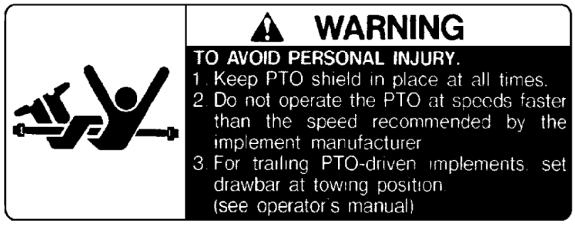
(5) Part No. TA040-4959-3



(3) Part No. TC230-4956-1
Diesel fuel only. No fire

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(6) Part No. 6C090-4958-2
Do not get your hands close to engine fan and fan belt.

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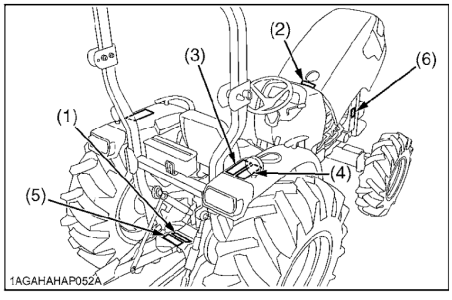

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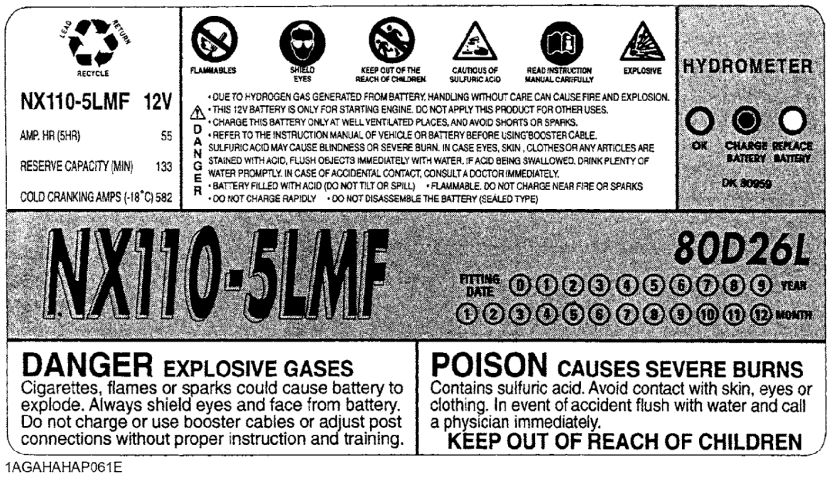
(1) Part No. TC030-3012-1



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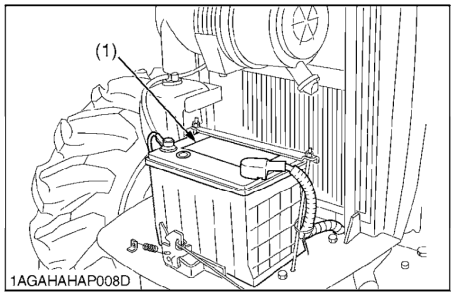

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CARE OF DANGER, WARNING AND CAUTION LABELS

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

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3. SPECIFICATIONS

Model			MX5100 2WD	MX5100 4WD
Engine	Model		V2403- M-TE3	
	Type		E-TVCS Indirect injection, water-cooled diesel	
	No. of cylinders / Aspiration		4 / Turbocharged	
	Total displacement		2.434 L (148.6 cu. in.)	
	Bore and stroke		87 × 102.4 mm (3.4 × 4.0 in.)	
	Net power		37.3 kW (50 HP)*	
	PTO power (factory observed)		32.8 kW (44 HP)* / 2700 min^{-1} (rpm)	
	Maximum torque		166.3 N·m (122.7 lbf·ft)	
	Battery capacity		12 V, RC : 133 min, OCA : 582 A	
	Fuel		Diesel fuel No. 1 [below −10 °C (14 °F)] Diesel fuel No. 2 [above −10 °C (14 °F)]	
Capacity	Fuel tank		48 L (12.7 U.S.gals, 10.6 Imp.gals)	
	Engine crankcase (with filter)		8.0 L (8.5 U.S.qts, 7.0 Imp.qts)	
	Engine coolant		7.0 L (7.4 U.S.qts, 5.8 Imp.qts)	
	Transmission case		44.0 L (11.6 U.S.qts, 9.7 Imp.qts)	
Dimensions	Overall length (without 3P)		3245 mm (127.8 in.)	3120 mm (122.8 in.)
	Overall width (min. tread)		1770 mm (69.7 in.)	
	Overall height (with ROPS)		2430 mm (95.7 in.)	
	Wheel base		1895 mm (74.6 in.)	
	Min. ground clearance		405 mm (15.9 in.)	385 mm (15.2 in.)
	Tread	Front	1280 mm (50.4 in.), 1380 mm (54.3 in.) 1480 mm (58.3 in.), 1580 mm (62.2 in.)	1325 mm (52.2 in.)
		Rear	1375 mm (54.1 in.), 1490 mm (58.7 in.)	
Weight (with ROPS)			1528 kg (3369 lbs)	1642 kg (3620 lbs)
Travelling system	Standard tire size	Front	7.5L-15	9.5-16
		Rear	14.9-26	
	Clutch		Dry type single stage	
	Steering		Hydrostatic power steering	
	Transmission		Gear shift, 8 forward and 8 reverse	
	Braking system		Wet disk type	
	Min. turning radius (with brake)		2.6 m (8.5 feet)	2.7 m (8.9 feet)
Hydraulic unit	Hydraulic control system		Position control (Standard), Draft (Option)	
	Pump capacity		35.8 L (9.5 U.S.gals)	
	Three point hitch		SAE Category I and II	
	max. lift force	At lift points	1300 kg (2870 lbs)	
		24 in. behind lift points	1050 kg (2310 lbs)	
	System pressure		18.6 MPa (190 kgf/cm^2)	
PTO	Rear PTO		SAE 1-3/8, 6 splines	
	PTO / Engine speed		540 / 2700 min^{-1} (rpm)	

■ **NOTE**

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

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4. TRAVELLING SPEEDS

Model			MX5100
Tire size (Rear)			14.9-26
	Range gear shift lever	Main gear shift lever	km/h (mph)
Forward	Low	1	1.6 (1.0)
		2	2.2 (1.4)
		3	3.6 (2.3)
		4	5.4 (3.3)
	High	1	7.6 (4.7)
		2	10.8 (6.7)
		3	17.5 (10.9)
		4	25.9 (16.0)
Reverse	Low	1	1.5 (0.9)
		2	2.1 (1.3)
		3	3.3 (2.1)
		4	4.9 (3.1)
	High	1	7.0 (4.3)
		2	9.9 (6.1)
		3	16.1 (10.0)
		4	23.7 (14.7)

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

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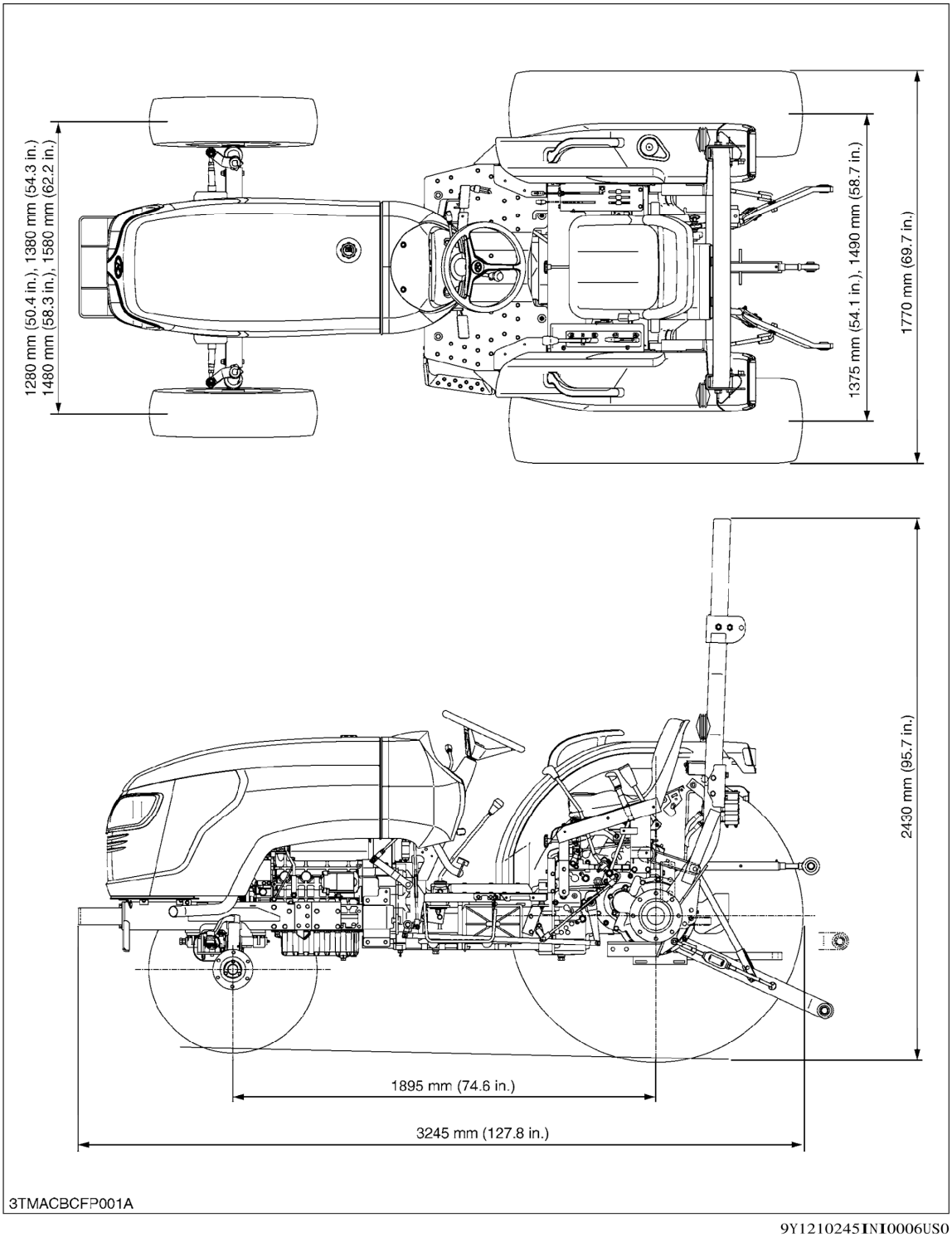
5. DIMENSIONS



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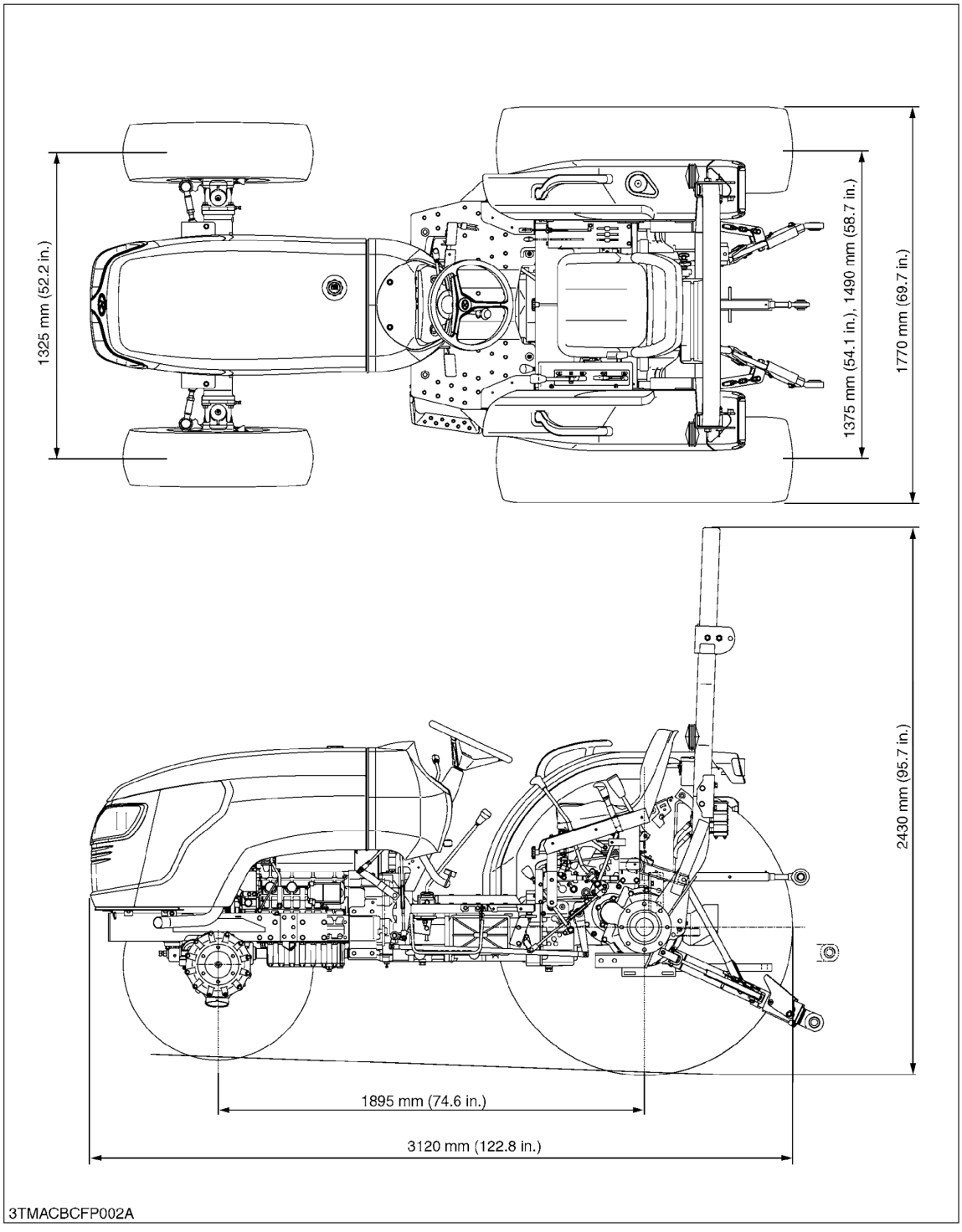

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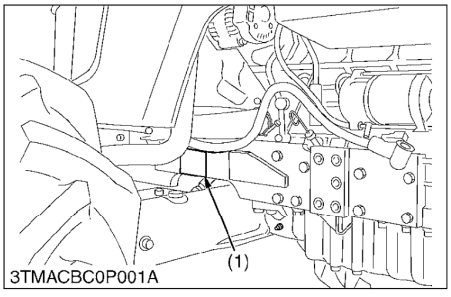
G GENERAL

GENERAL

CONTENTS

1. TRACTOR IDENTIFICATION

[1] MODEL NAME AND SERIAL NUMBER



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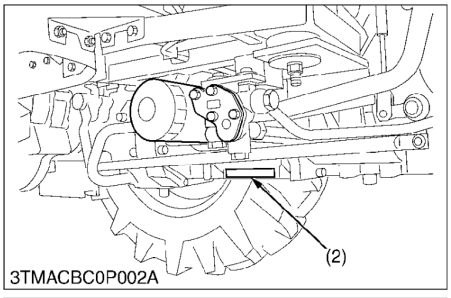

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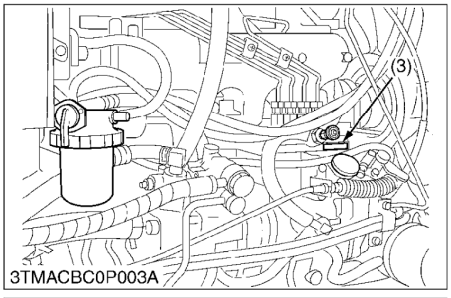

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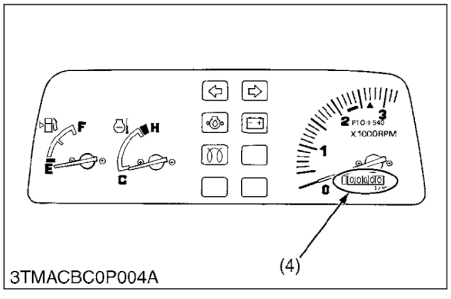

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When you contact local KUBOTA distributor, always specify the engine serial number, the tractor serial number and hour meter reading.

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

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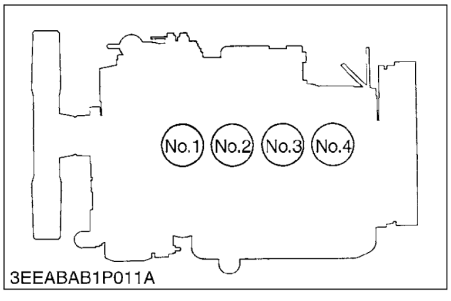
[2] CYLINDER NUMBER



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

The sequence of cylinder numbers is given as No.1, No.2, No.3 and No.4 starting from the front cover side.

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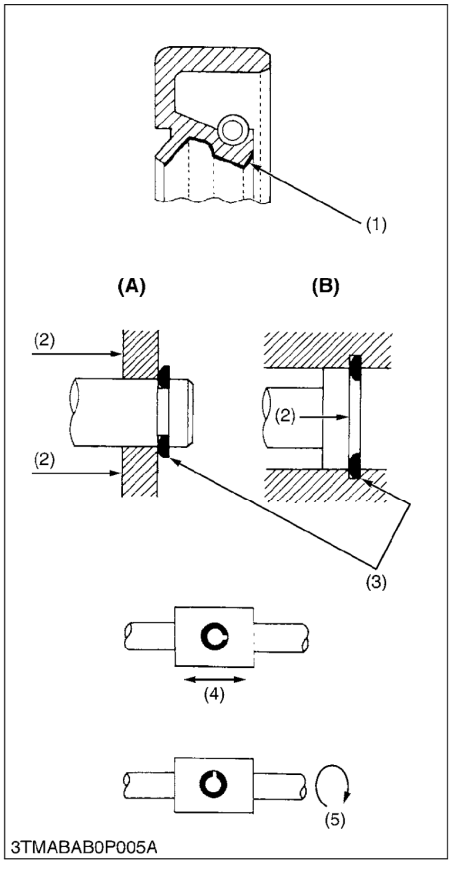
2. GENERAL PRECAUTIONS



- When you disassemble, carefully put the parts in a clean area to make it easy to find the parts. You must install the screws, bolts and nuts in their initial position to prevent the reassembly errors.
- When it is necessary to use special tools, use KUBOTA special tools. Refer to the drawings when you make special tools that you do not use frequently.
- Before you disassemble or repair machine, make sure that you always disconnect the ground cable from the battery first.
- Remove oil and dirt from parts before you measure.
- Use only KUBOTA genuine parts for replacement to keep the machine performance and to make sure of safety.
- You must replace the gaskets and O-rings when you assemble again. Apply grease (1) to new O-rings or oil seals before you assemble.
- When you assemble the external or internal snap rings, make sure that the sharp edge (3) faces against the direction from which force (2) is applied.
- 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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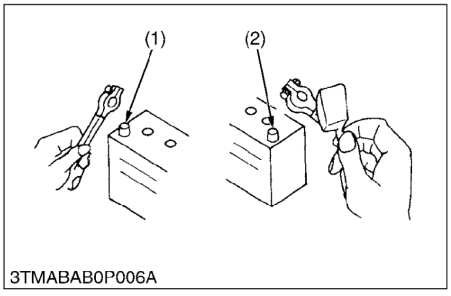
3. HANDLING PRECAUTIONS FOR ELECTRICAL PARTS AND WIRING



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

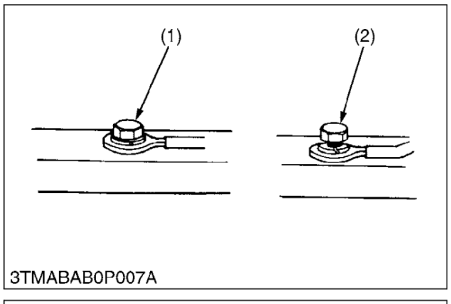
■ **IMPORTANT**

- **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

WSM000001GEG0062US0

[1] WIRING

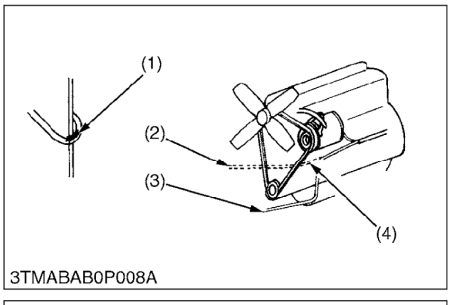


3TMABAB0P007A

- Securely tighten wiring terminals.

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

WSM000001GEG0063US0

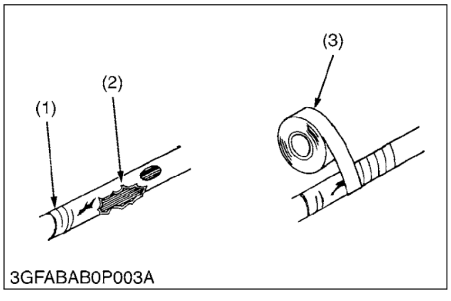


3TMABAB0P008A

- Do not let wiring contact dangerous part.

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

WSM000001GEG0064US0

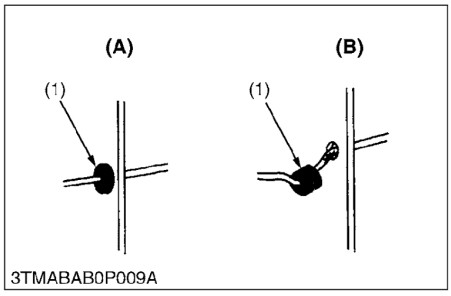


3GFABAB0P003A

- Repair or change torn or aged wiring immediately.

(1) Aged (3) Insulating Vinyl Tape
(2) Torn

WSM000001GEG0065US0



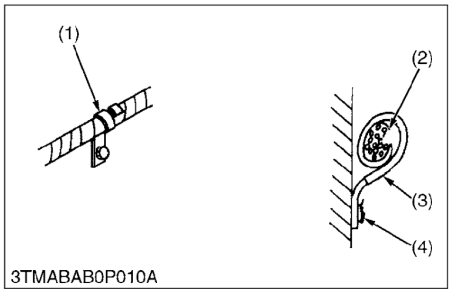
3TMABAB0P009A

- Securely insert grommet.

(1) Grommet

(A) Correct
(B) Incorrect

WSM000001GEG0066US0

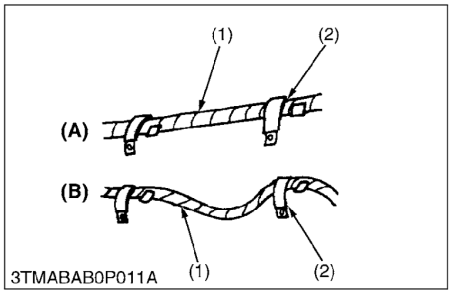


3TMABAB0P010A

- Securely clamp, being careful not to damage wiring.

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

WSM000001GEG0067US0



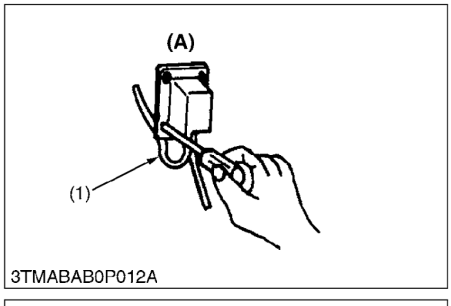
3TMABAB0P011A

- 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

WSM000001GEG0068US0



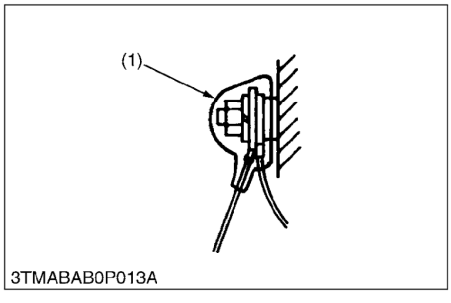
3TMABAB0P012A

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

(1) Wiring

(A) Incorrect

WSM000001GEG0069US0



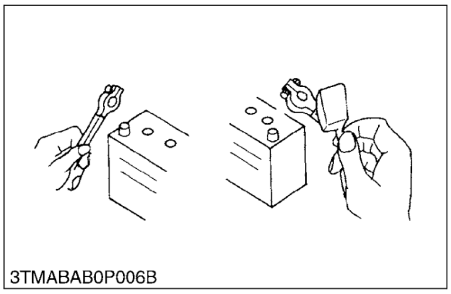
3TMABAB0P013A

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

(1) Cover
(Securely Install Cover)

WSM000001GEG0070US0

[2] BATTERY


3TMABAB0P006B

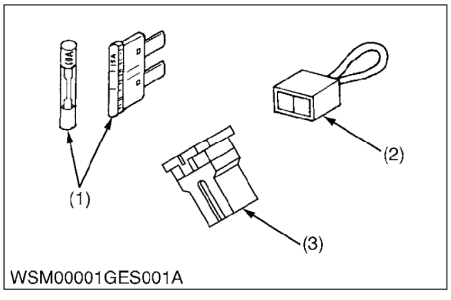
- Take care not to confuse positive and negative terminal posts.
- When removing battery cables, disconnect negative cable first. When installing battery cables, check for polarity and connect positive cable first.
- Do not install any battery with capacity other than is specified (Ah).
- After connecting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

WSM000001GEG0071US0

[3] FUSE



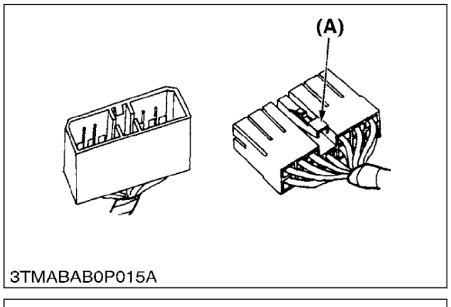
WSM00001GES001A

- 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
(3) Slow Blow Fuse

WSM000001GEG0072US0

[4] CONNECTOR

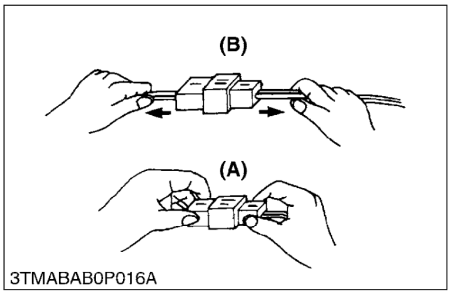


3TMABAB0P015A

- For connector with lock, push lock to separate.

(A) Push

WSM000001GEG0073US0

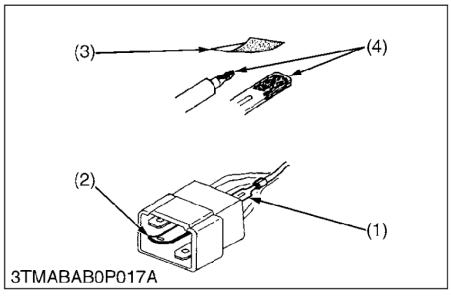


3TMABAB0P016A

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

(A) Correct **(B) Incorrect**

WSM000001GEG0074US0

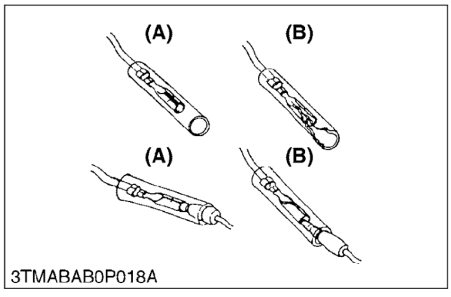


3TMABAB0P017A

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

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

WSM000001GEG0075US0



3TMABAB0P018A

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

(A) Correct
(B) Incorrect

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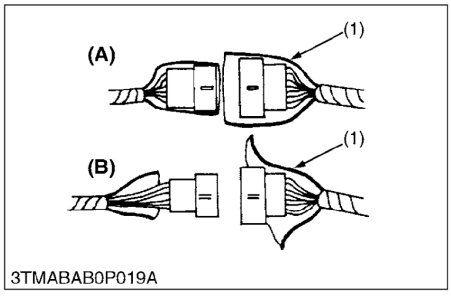


3TMABAB0P019A

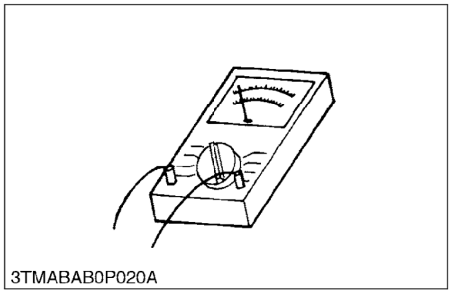
- Make certain plastic cover is large enough to cover whole connector.

(1) Cover

(A) Correct
(B) Incorrect

WSM000001GEG0077US0

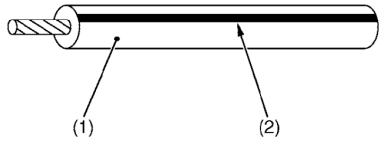
[5] HANDLING OF CIRCUIT TESTER


3TMABAB0P020A

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

WSM000001GEG0078US0

[6] COLOR OF WIRING



WSM00001GES002A

- Colors of wire are specified to the color codes.
- This symbol of "/" shows color with stripe(s).

(An example)

Red stripes on white color : W/R

Color of wiring	Color code
Black	B
Brown	Br
Green	G
Gray	Gy or Gr
Blue	L
Light Green	Lg
Orange	Or
Pink	P
Purple	Pu or V
Red	R
Sky Blue	Sb
White	W
Yellow	Y

(1) Wire Color (2) Stripe

WSM000001GEG0079US0

4. LUBRICANTS, FUEL AND COOLANT

No.	Place	Capacity	Lubricants, fuel and coolant
		MX5100	
1	Fuel tank	48.0 L 12.7 U.S.gals 10.6 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	7.0 L 7.4 U.S.qts 5.8 Imp.qts	Fresh clean water with anti-freeze
3	Engine crankcase (with filter)	8.0 L 8.5 U.S.qts 7.0 Imp.qts	**Engine oil** API Service Classification CF or better. Refer to next page. • Above 25 °C (77 °F) SAE30W, 10W-30 or 15W-40 • 0 to 25 °C (32 to 77 °F) SAE20, 10W-30 or 15W-40 • Below 0 °C (32 °F) SAE10, 10W-30 or 15W-40
4	Transmission case	44.0 L 11.6 U.S.qts 9.7 Imp.qts	KUBOTA UDT fluid or KUBOTA SUPER UDT fluid*
5	Front axle case (4WD)	9.0 L 9.5 U.S.qts 7.5 Imp.qts	KUBOTA UDT fluid, KUBOTA SUPER UDT fluid*, SAE80 or SAE90 gear oil

Greasing				
No.	**Place**	**No. of greasing point**	**Capacity**	**Type of grease**
6	Front wheel hub (2WD)	2	Moderate amount	Multipurpose grease NLGI-2 or NLGI-1 (GC-LB)
	Knuckle shaft (2WD)	2	Until grease overflows	
	Front wheel case support (4WD)	2		
	Front axle support (4WD)	2		
	Top link	2		
	Top link bracket	2 (with draft control if equipped)		
	Lift rod	1		
	Battery terminals	2	Moderate amount	

■ **NOTE**
- *** KUBOTA original transmission hydraulic fluid.**

9Y1210245GEG0004US0

■ **NOTE**

Engine Oil

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

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

EGR : Exhaust Gas Re-circulation

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

	Without EGR
Model	MX5100

Fuel

- **Cetane number of 45 minimum. Cetane number greater then 50 is preferred, especially for temperatures below −20 °C (−4 °F) or elevations above 1500 m (5000 ft).**
- **If diesel fuel with sulfur content greater than 0.5 % sulfur content in used, reduce the service interval for engine oil and filter by 50%.**
- **DO NOT use diesel fuel with sulfur content greater than 1.0 %.**
- **Diesel fuels specified to EN 590 or ASTM D975 are recommended.**
- **No.2-D is a distillate fuel of lower volatility for engine in industrial and heavy mobile service. (SAE J313 JUB87)**
- **Since this engine adopts EPA Tier 4 and Interim Tier 4 standards, the use of low sulfur fuel or ultra low sulfur fuel is mandatory in EPA regulated area (North America). Therefore, please use No.2-D S500 or S15 diesel fuel as an alternative to No.2-D, or use No.1-D S500 or S15 diesel fuel as an alternative to No.1-D if outside air temperature is below −10 °C (14 °F).**

Transmission oil

- **The oil used to lubricate the transmission is also used as hydraulic fluid. To insure proper operation of the hydraulic system and to complete lubrication of the transmission, it is important that a multi-grade transmission fluid is used in this system. We recommend the use of KUBOTA UDT or SUPER UDT fluid for optimum protection and performance.**
  Do not mix different brands together.

■ **Indicated capacities of water and oil are manufacturer's estimate.**

9Y1210245GEG0005US0

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		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M6 (6 mm, 0.24 in.)	7.9 to 9.3	0.80 to 0.95	5.8 to 6.8	7.9 to 8.8	0.80 to 0.90	5.8 to 6.5	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31	7.9 to 8.8	0.80 to 0.90	5.8 to 6.5	12.3 to 14.2	1.25 to 1.45	9.05 to 10.4
M8 (8 mm, 0.31 in.)	18 to 20	1.8 to 2.1	13 to 15	17 to 19	1.7 to 2.0	13 to 14	24 to 27	2.4 to 2.8	18 to 20	18 to 20	1.8 to 2.1	13 to 15	30 to 34	3.0 to 3.5	22 to 25
M10 (10 mm, 0.39 in.)	40 to 45	4.0 to 4.6	29 to 33	32 to 34	3.2 to 3.5	24 to 25	48 to 55	4.9 to 5.7	36 to 41	40 to 44	4.0 to 4.5	29 to 32	61 to 70	6.2 to 7.2	45 to 52
M12 (12 mm, 0.47 in.)	63 to 72	6.4 to 7.4	47 to 53	–	–	–	78 to 90	7.9 to 9.2	58 to 66	63 to 72	6.4 to 7.4	47 to 53	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		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M8 (8 mm, 0.31 in.)	12 to 15	1.2 to 1.6	8.7 to 11	8.9 to 11	0.90 to 1.2	6.5 to 8.6
M10 (10 mm, 0.39 in.)	25 to 31	2.5 to 3.2	18 to 23	20 to 25	2.0 to 2.6	15 to 18
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
M14 (14 mm, 0.55 in.)	62 to 73	6.3 to 7.5	46 to 54	–	–	–
M16 (16 mm, 0.63 in.)	98.1 to 112	10.0 to 11.5	72.4 to 83.1	–	–	–
M18 (18 mm, 0.71 in.)	172 to 201	17.5 to 20.5	127 to 148	–	–	–

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[3] METRIC SCREWS, BOLTS AND NUTS

Grade	8.8 Property class 8.8			10.9 Property class 10.9		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M8	24 to 27	2.4 to 2.8	18 to 20	30 to 34	3.0 to 3.5	22 to 25
M10	48 to 55	4.9 to 5.7	36 to 41	61 to 70	6.2 to 7.2	45 to 52
M12	78 to 90	7.9 to 9.2	58 to 66	103 to 117	10.5 to 12.0	76.0 to 86.7
M14	124 to 147	12.6 to 15.0	91.2 to 108	167 to 196	17.0 to 20.0	123 to 144
M16	197 to 225	20.0 to 23.0	145 to 166	260 to 304	26.5 to 31.0	192 to 224

WSM000001GEG0003US0

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

Grade	SAE GR.5			SAE GR.8		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
1/4	11.7 to 15.7	1.19 to 1.61	8.61 to 11.6	16.3 to 19.7	1.66 to 2.01	12.0 to 14.6
5/16	23.1 to 27.7	2.35 to 2.83	17.0 to 20.5	33 to 39	3.4 to 4.0	24 to 29
3/8	48 to 56	4.9 to 5.8	35.0 to 42.0	61 to 73	6.3 to 7.4	45 to 54
1/2	110 to 130	11 to 13	80 to 96	150 to 178	15.2 to 18.2	110 to 132
9/16	150 to 178	15.2 to 18.2	110 to 132	217 to 260	22.2 to 26.5	160 to 192
5/8	204 to 244	20.8 to 24.8	150 to 180	299 to 357	30.5 to 36.4	220 to 264

WSM000001GEG0086US0

[5] PLUGS

Shape	Size	Material of opponent part					
		Ordinariness			Aluminum		
		N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
Tapered screw 	R1/8	13 to 21	1.3 to 2.2	9.4 to 15	13 to 21	1.3 to 2.0	9.4 to 15
	R1/4	25 to 44	2.5 to 4.5	18 to 32	25 to 34	2.5 to 3.5	18 to 25
	R3/8	49 to 88	5.0 to 9.0	37 to 65	49 to 58	5.0 to 6.0	37 to 43
	R1/2	58.9 to 107	6.00 to 11.0	43.4 to 79.5	59 to 78	6.0 to 8.0	44 to 57
Straight screw 	G1/4	25 to 34	2.5 to 3.5	18 to 25	–	–	–
	G3/8	62 to 82	6.3 to 8.4	46 to 60	–	–	–
	G1/2	49 to 88	5.0 to 9.0	37 to 65	–	–	–

WSM000001GEG0005US0

6. MAINTENANCE

No.	Item			Indication on hour meter													Interval	Reference page	Important	
				50	100	150	200	250	300	350	400	450	500	550	600	650	700				
1	Greasing		–	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-21		
2	Engine start system		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-22		
3	Wheel bolt torque		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr	G-22		
4	Battery condition		Check		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-23	*4	
5	Fan belt		Adjust		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-25		
6	Clutch pedal free travel		Adjust	★	☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-25		
7	Brake pedal free travel		Adjust		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-25		
8	Fuel filter element		Clean		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-26		@
			Replace								☆							every 400 Hr	G-32		
9	Air cleaner element [Double type]	Primary element	Clean		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-26	*1	
			Replace															every 1 year	G-37	*2	@
		Secondary element	Replace															every 1 year	G-37		
10	Fuel line		Check		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	G-27		@
			Replace															every 2 years	G-40		
11	Engine oil		Change	★			☆				☆				☆			every 200 Hr	G-19		
12	Engine oil filter		Replace	★			☆				☆				☆			every 200 Hr	G-19		
13	Toe-in		Adjust				☆				☆				☆			every 200 Hr	G-29		
14	Radiator hose and clamp		Check				☆				☆				☆			every 200 Hr	G-30		
			Replace															every 2 years	G-40		
15	Power steering oil line		Check				☆				☆				☆			every 200 Hr	G-30		
			Replace															every 2 years	G-40		
16	Intake air line		Check				☆				☆				☆			every 200 Hr	G-30		@
			Replace															every 2 years	G-40		
17	Hydraulic oil filter		Replace	★							☆							every 400 Hr	G-20		
18	Transmission fluid		Change								☆							every 400 Hr	G-31		
19	Front axle case oil (4WD)		Change								☆							every 400 Hr	G-31		
20	Greasing (2WD front wheel hub)		–								☆							every 400 Hr	G-32		
21	Front axle pivot		Adjust												☆			every 600 Hr	G-32		
22	Engine valve clearance		Adjust															every 800 Hr	G-33		
23	Fuel injection nozzle injection pressure		Check															every 1500 Hr	G-34		@

No.	Item		Indication on hour meter														Interval	Reference page	Important	
			50	100	150	200	250	300	350	400	450	500	550	600	650	700				
24	Injection pump	Check															every 3000 Hr	G-36		@
25	Turbocharger	Check															every 3000 Hr	G-37		@
26	Cooling system	Flush															every 2 years	G-38		
27	Coolant	Change															every 2 years	G-38		
28	Fuel system	Bleed															Service as required	G-41		
29	Clutch housing water	Drain																G-41		
30	Fuse	Replace																G-42		
31	Light bulb	Replace																G-42		

■ **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 by reading the indicator 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.

9Y1210245GEG0006US0

7. CHECK AND MAINTENANCE

CAUTION
- **Be sure to check and service the tractor on a flat place with engine shut off, and apply 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.

9Y1210245GEG0008US0

Walk around Inspection

Look around and under the tractor for such items as loose bolts, trash build-up, oil coolant leaks, broken or worn parts.

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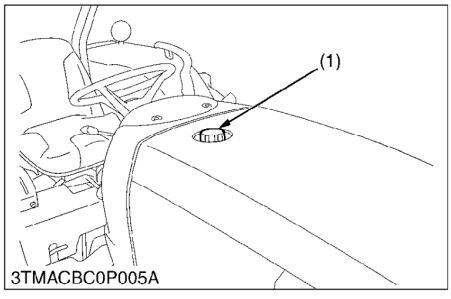
Checking and Refueling



CAUTION
- **Do not smoke while refueling.**
- **Be sure to stop the engine before refueling.**

1. Turn the key switch to "ON", check the amount of fuel by fuel gauge.
2. Fill fuel tank when fuel gauge shows 1/4 or less fuel in tank.

Fuel tank capacity	48.0 L 12.7 U.S.gals 10.6 Imp.gals

■ **IMPORTANT**
- **Do not permit dirt or trash to get into the fuel system.**
- **Be careful not to let the fuel tank become empty, otherwise air will enter the fuel system, necessitating bleeding before next engine start.**
- **Be careful not to spill during refueling. If should spill, wipe it off at once, or it may cause a fire.**
- **To prevent condensation (water) accumulation in the fuel tank, fill the tank before parking overnight.**

(1) Fuel Tank Cap

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