

Product: 2009 Kubota WSM MX4700,MX5100 Tractor Service Repair Workshop Manual
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WSM

**WORKSHOP MANUAL
TRACTOR**

MX4700, MX5100

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 MX4700 and MX5100. It is divided into three parts, "General", "Mechanism" and "Servicing".

■ General

Information on the tractor identification, the general precautions, maintenance check list, check and maintenance and special tools are described.

■ Mechanism

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

Refer to Diesel Engine / Tractor Mechanism Workshop Manual (Code No. 9Y021-01874 / 9Y021-18201) for the one which has not been described to this workshop manual.

■ Servicing

Information on the troubleshooting, servicing specification lists, tightening torque, checking and adjusting, disassembling and assembling, and servicing which cover procedures, precautions, factory specifications and allowable limits.

All information illustrations and specifications contained in this manual are based on the latest product information available at the time of publication.

The right is reserved to make changes in all information at any time without notice.

Due to covering many models of this manual, information or picture being used, have not been specified as one model.

November 2007

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SAFETY FIRST

This symbol, the industry's "Safety Alert Symbol", is used throughout this manual and on labels on the machine itself to warn of the possibility of personal injury. Read these instructions carefully.

It is essential that you read the instructions and safety regulations before you attempt to repair or use this unit.



DANGER

: Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

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



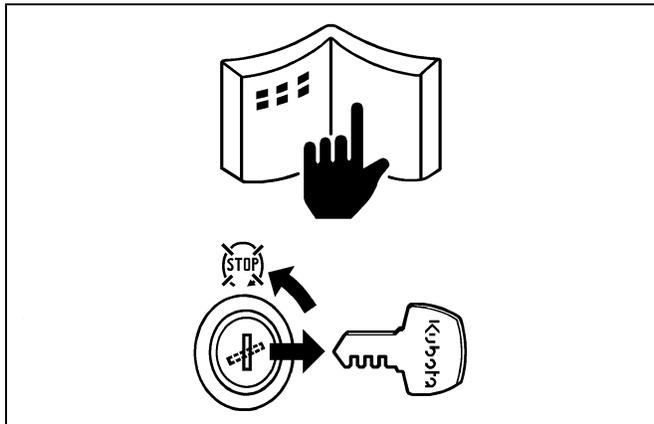
IMPORTANT

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



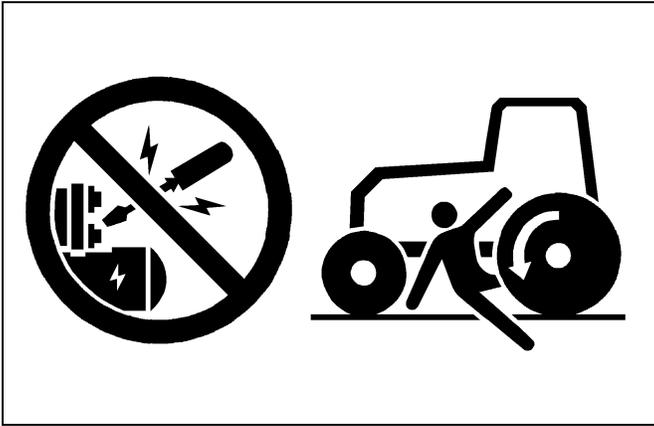
NOTE

: Gives helpful information.



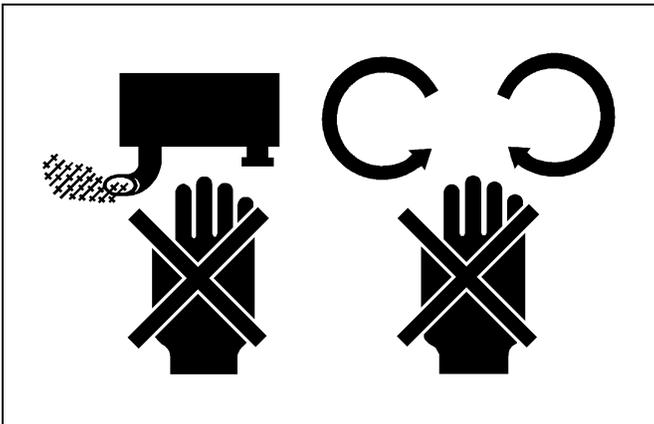
BEFORE SERVICING AND REPAIRING

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



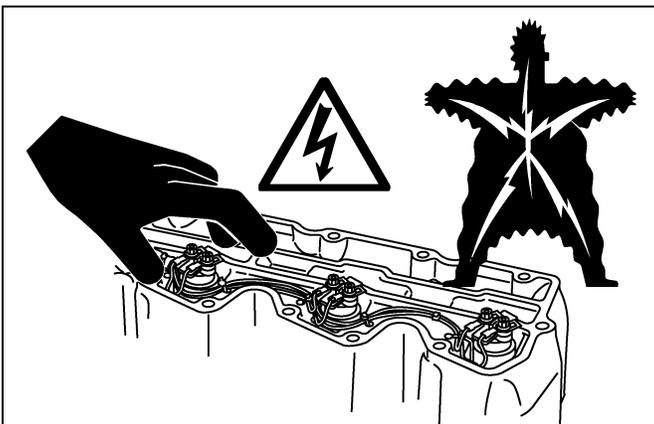
SAFETY STARTING

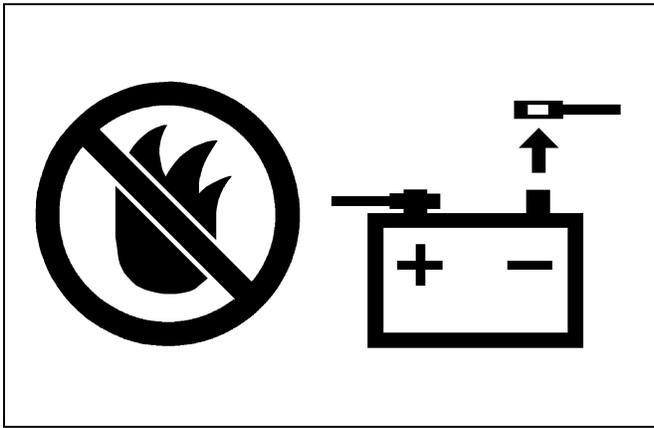
- Do not start the engine by shorting across starter terminals or bypassing the safety start switch.
- Do not alter or remove any part of machine safety system.
- Before starting the engine, make sure that all shift levers are in neutral positions or in disengaged positions.
- Never start the engine while standing on ground. Start the engine only from operator's seat.



SAFETY WORKING

- Do not work on the machine while under the influence of alcohol, medication, or other substances or while fatigued.
- Wear close fitting clothing and safety equipment appropriate to the job.
- Use tools appropriate to the work. Makeshift tools, parts, and procedures are not recommended.
- When servicing is performed together by two or more persons, take care to perform all work safely.
- Do not work under the machine that is supported solely by a jack. Always support the machine by safety stands.
- Do not touch the rotating or hot parts while the engine is running.
- Never remove the radiator cap while the engine is running, or immediately after stopping. Otherwise, hot water will spout out from radiator. Only remove radiator cap when cool enough to touch with bare hands. Slowly loosen the cap to first stop to relieve pressure before removing completely.
- Escaping fluid (fuel or hydraulic oil) under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic or fuel lines. Tighten all connections before applying pressure.
- Do not open high-pressure fuel system. High-pressure fluid remaining in fuel lines can cause serious injury. Do not disconnect or attempt repair fuel lines, sensors, or any other components between the high-pressure fuel pump and injectors on engines with high pressure common rail fuel system.
- High voltage exceeding 100 V is generated in the ECU, and is applied to the injector. Pay sufficient caution to electric shock when performing work activities.





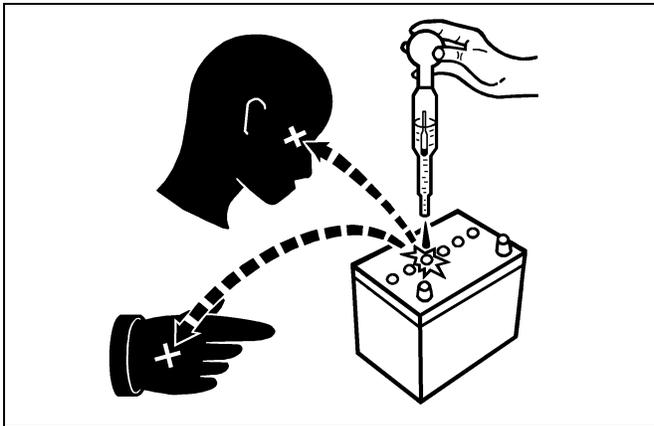
AVOID FIRES

- Fuel is extremely flammable and explosive under certain conditions. Do not smoke or allow flames or sparks in your working area.
- To avoid sparks from an accidental short circuit, always disconnect the battery negative cable first and connect it last.
- Battery gas can explode. Keep sparks and open flame away from the top of battery, especially when charging the battery.
- Make sure that no fuel has been spilled on the engine.



VENTILATE WORK AREA

- If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in a closed area. The exhaust gas contains poisonous carbon monoxide.



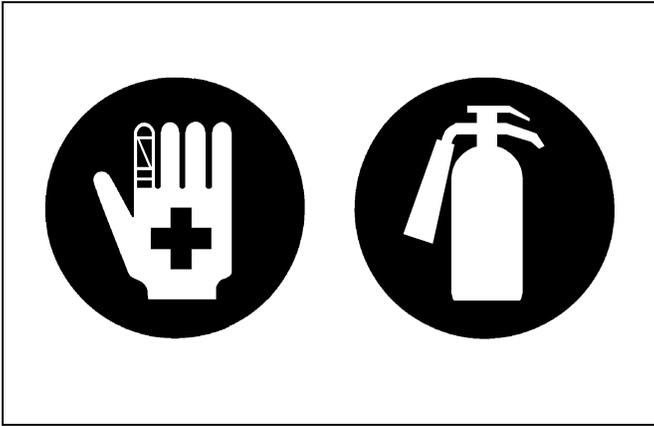
PREVENT ACID BURNS

- Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, clothing and cause blindness if splashed into eyes. Keep electrolyte away from eyes, hands and clothing. If you spill electrolyte on yourself, flush with water, and get medical attention immediately.



DISPOSE OF FLUIDS PROPERLY

- Do not pour fluids into the ground, down a drain, or into a stream, pond, or lake. Observe relevant environmental protection regulations when disposing of oil, fuel, coolant, electrolyte and other harmful waste.

**PREPARE FOR EMERGENCIES**

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

SAFETY DECALS

The following safety decals are installed on the machine.

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

(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 dismantling, 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.

(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.

(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.

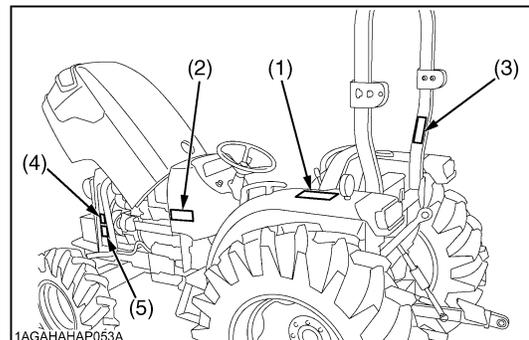
(4) Part No. 6C090-4958-2

Do not get your hands close to engine fan and fan belt.



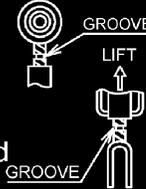
(5) Part No. TC030-4958-1

Do not touch hot surface like muffler, etc.



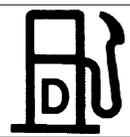
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(1) Part No. TD170-4935-1

 WARNING	 CAUTION
TO AVOID PERSONAL INJURY: <ol style="list-style-type: none"> 1. Attach pulled or towed loads to the drawbar only. 2. Use the 3-point hitch only with equipment designed for 3-point hitch usage. 	TO AVOID INJURY FROM SEPARATION:  <p>Do not extend lift rod beyond the groove on the threaded rod.</p>

1AGAWAAP085A

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

	
LOW SULFUR FUEL OR ULTRA LOW SULFUR FUEL ONLY	

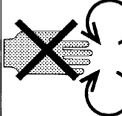
1AGAPAJAP068A

(3) Part No. TA240-9848-1

 WARNING
TO AVOID INJURY OR DEATH FROM ROLL-OVER: <ul style="list-style-type: none"> • Keep Roll-Over Protective Structures (ROPS) in the upright and locked position • Fasten SEAT BELT before operating
THERE IS NO OPERATOR PROTECTION WHEN THE ROPS IS IN THE FOLDED POSITION: <ul style="list-style-type: none"> • Check the operating area and fold the ROPS only when absolutely necessary • Do not wear SEAT BELT if ROPS is folded • Raise and lock ROPS as soon as vertical clearance allows • Read ROPS related instructions and warnings

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





1AGAECDAP0310

(7) Part No. 6C300-4744-1

 WARNING
<p>Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrester may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements.</p>

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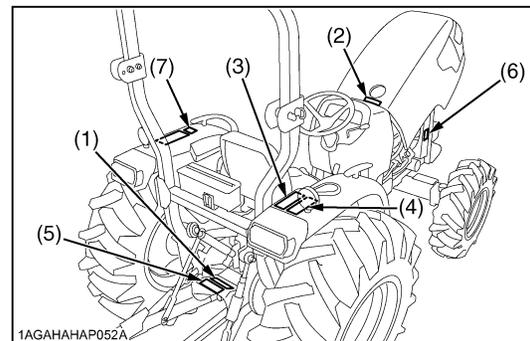
(4) Part No. TA140-4933-1

 WARNING	BEFORE DISMOUNTING TRACTOR: <ol style="list-style-type: none"> 1. ALWAYS SET PARKING BRAKE. 2. PARK ON LEVEL GROUND WHENEVER POSSIBLE. If parking on a slope, position tractor across the slope. 3. LOWER ALL IMPLEMENTS TO THE GROUND. Failure to comply to this warning may allow the wheels to slip, and could cause injury or death. 4. LOCK SHUTTLE SHIFT LEVER IN NEUTRAL POSITION AND STOP THE ENGINE.
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1AGAMAAP400A

(5) Part No. TA040-4959-3

 WARNING
TO AVOID PERSONAL INJURY: <ol style="list-style-type: none"> 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 drawbar at towing position (see operator's manual)



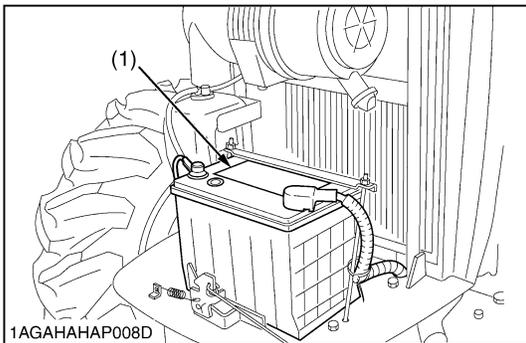
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3TMACBCCP002A

(1) Part No. TC030-3012-1

 NX110-5LMF 12V AMP. HR (5HR) 55 RESERVE CAPACITY (MIN) 133 COLD CRANKING AMPS (-18°C) 582	 FLAMMABLES  SHIELD EYES  KEEP OUT OF THE REACH OF CHILDREN  CAUTION OF SULFURIC ACID  READ INSTRUCTION MANUAL CAREFULLY  EXPLOSIVE	HYDROMETER  OK CHARGE BATTERY REPLACE BATTERY DK 80959																						
<p> • DUE TO HYDROGEN GAS GENERATED FROM BATTERY, HANDLING WITHOUT CARE CAN CAUSE FIRE AND EXPLOSION. • THIS 12V BATTERY IS ONLY FOR STARTING ENGINE. DO NOT APPLY THIS PRODUCT FOR OTHER USES. • CHARGE THIS BATTERY ONLY AT WELL VENTILATED PLACES, AND AVOID SHORTS OR SPARKS. • REFER TO THE INSTRUCTION MANUAL OF VEHICLE OR BATTERY BEFORE USING BOOSTER CABLE. • SULFURIC ACID MAY CAUSE BLINDNESS OR SEVERE BURN. IN CASE EYES, SKIN, CLOTHES OR ANY ARTICLES ARE STAINED WITH ACID, FLUSH OBJECTS IMMEDIATELY WITH WATER. IF ACID BEING SWALLOWED, DRINK PLENTY OF WATER PROMPTLY. IN CASE OF ACCIDENTAL CONTACT, CONSULT A DOCTOR IMMEDIATELY. • BATTERY FILLED WITH ACID (DO NOT TILT OR SPILL) • FLAMMABLE. DO NOT CHARGE NEAR FIRE OR SPARKS • DO NOT CHARGE RAPIDLY • DO NOT DISASSEMBLE THE BATTERY (SEALED TYPE) </p>																								
<h1 style="margin: 0;">NX110-5LMF</h1> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: right;"> <p>80D26L</p> <p>FITTING DATE</p> <table border="1" style="font-size: small;"> <tr> <td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td> </tr> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td> </tr> </table> <p>YEAR MONTH</p> </div> </div>			0	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	10	11	12
0	1	2	3	4	5	6	7	8	9															
1	2	3	4	5	6	7	8	9	10	11	12													
<p>DANGER EXPLOSIVE GASES Cigarettes, flames or sparks could cause battery to explode. Always shield eyes and face from battery. Do not charge or use booster cables or adjust post connections without proper instruction and training.</p>		<p>POISON CAUSES SEVERE BURNS Contains sulfuric acid. Avoid contact with skin, eyes or clothing. In event of accident flush with water and call a physician immediately. KEEP OUT OF REACH OF CHILDREN</p>																						

1AGAHAP061E



1AGAHAP008D

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.

3TMACBCCP003A

SPECIFICATIONS

Model		MX4700		MX5100		
		2WD	4WD	2WD	4WD	
Engine	Model	V2403-M-E3		V2403-M-TE3		
	Type	E-TVCS Indirect injection, water-cooled diesel				
	No. of cylinders / Aspiration	Natural		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	34.3 kW (46.0 HP)*		37.3 kW (50 HP)*		
	PTO power (factory observed)	29.5 kW (39.5 HP)* / 2700 min ⁻¹ (rpm)		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)]				
Capacities	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.gals, 9.7 Imp.gals)				
Dimensions	Overall length (without 3P)	3245 mm (127.8 in.)	3120 mm (122.8 in.)	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.)	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.)	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)		1525 kg (3362 lbs)	1640 kg (3616 lbs)	1528 kg (3369 lbs)	1642 kg (3620 lbs)	
Travelling system	Standard tire size	Front	7.5L-15	9.5-16	7.5L-15	
		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)	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 & II				
	Max. lift force	At lift points	1300 kg (2870 lbs)			
		24 in. behind lift points	1050 kg (2310 lbs)			
System pressure	17.7 MPa (180 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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TRAVELLING SPEEDS

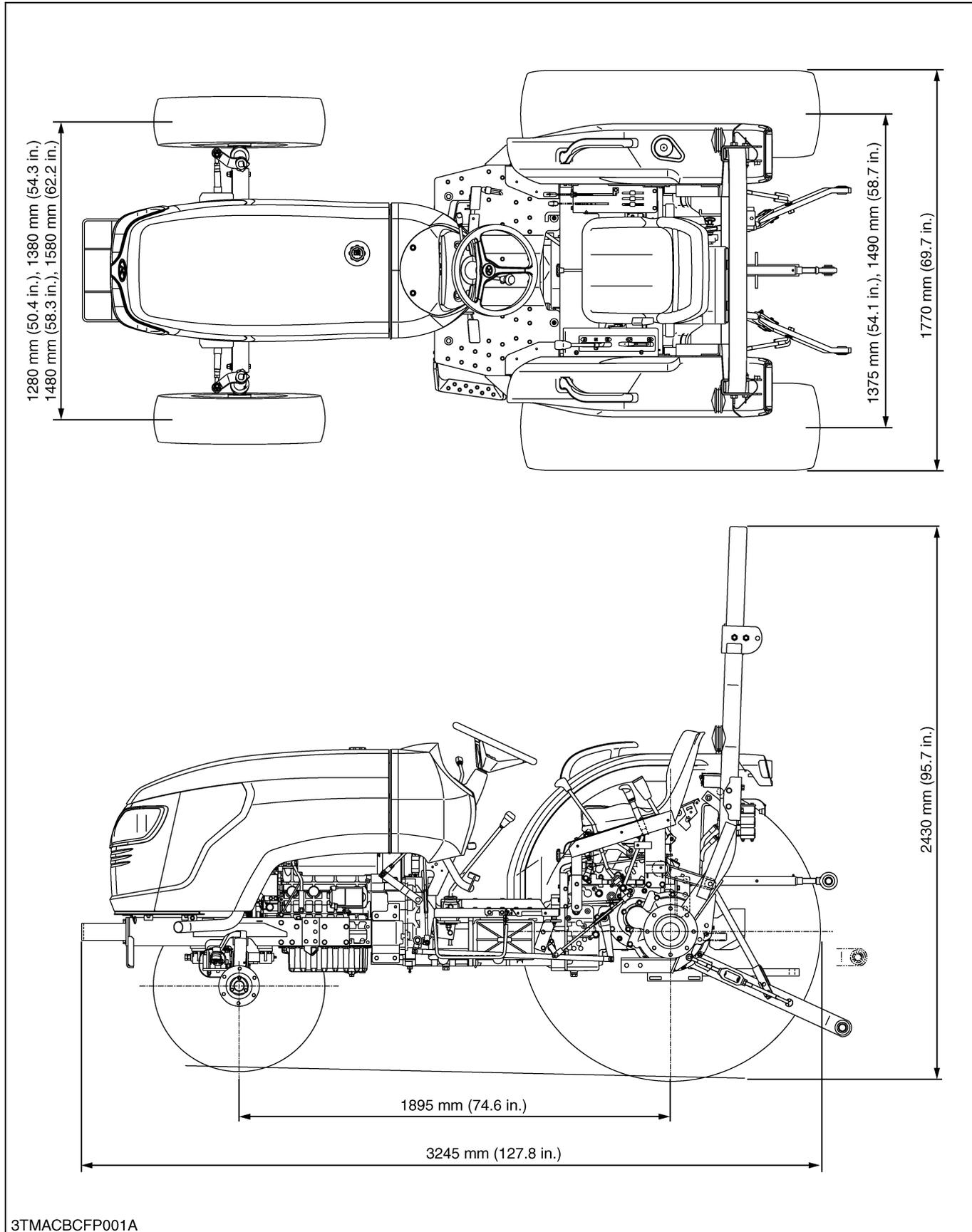
Model			MX4700, MX5100
Tire size (Rear)			14.9-26
	Range gear shift lever	Main gear shift lever	km/h (mph)
Forward	Low	1	1.6 (1.0)
		2	2.2 (1.4)
		3	3.6 (2.3)
		4	5.4 (3.3)
	High	1	7.6 (4.7)
		2	10.8 (6.7)
		3	17.5 (10.9)
		4	25.9 (16.0)
Reverse	Low	1	1.5 (0.9)
		2	2.1 (1.3)
		3	3.3 (2.1)
		4	4.9 (3.1)
	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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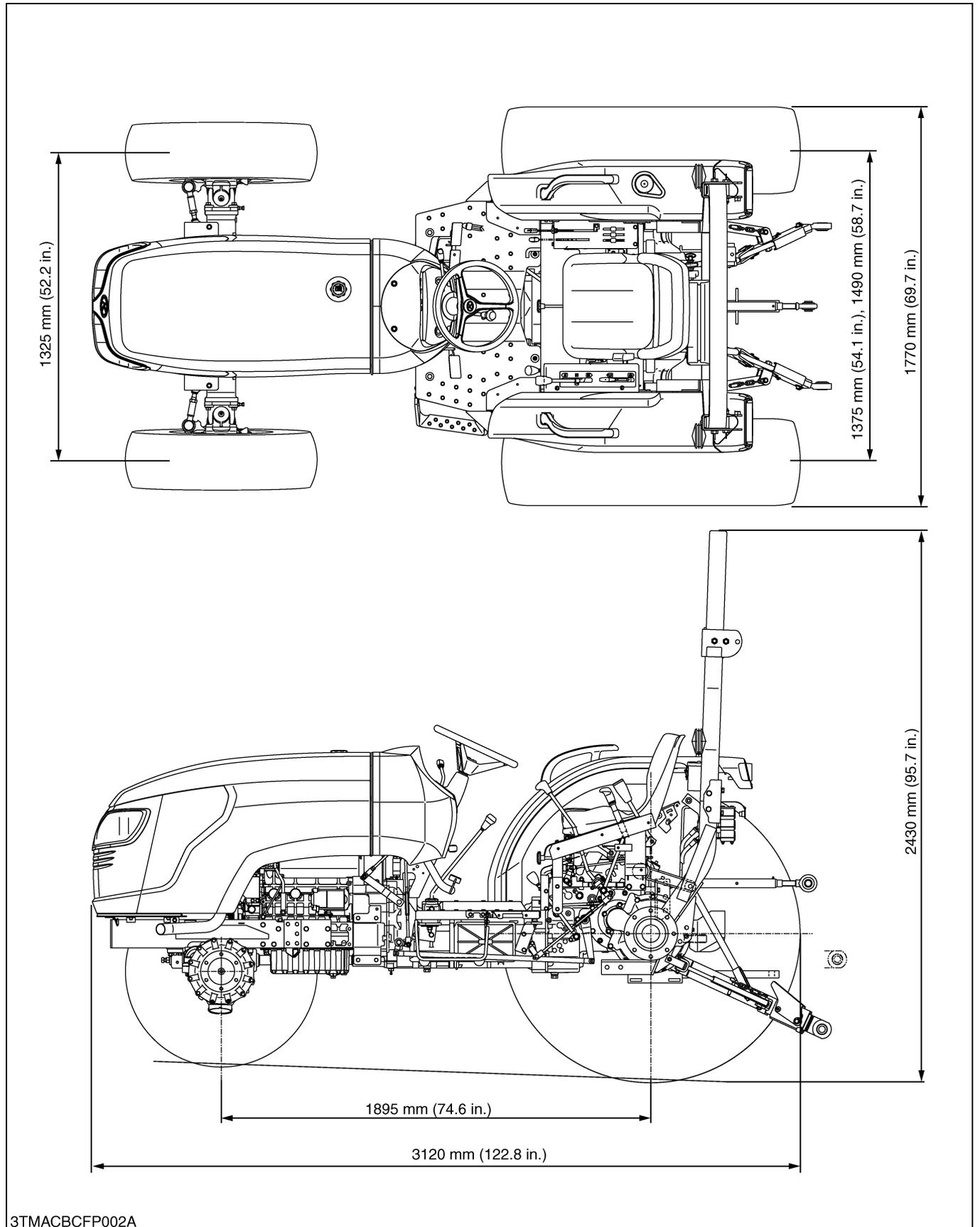
DIMENSIONS

[2WD]



3TMACBCFP001A

[4WD]



G GENERAL

GENERAL

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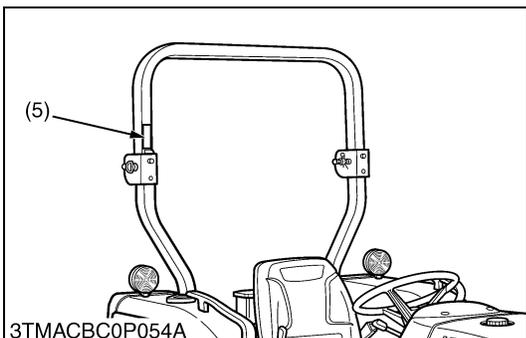
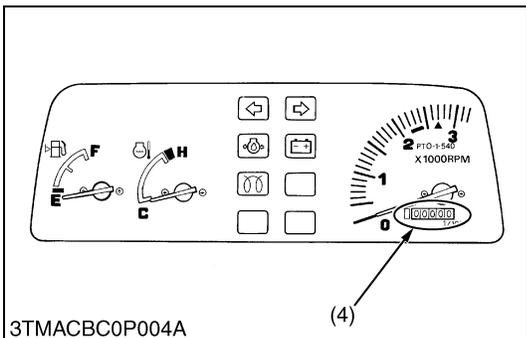
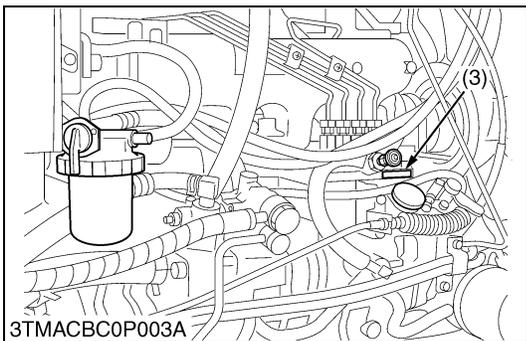
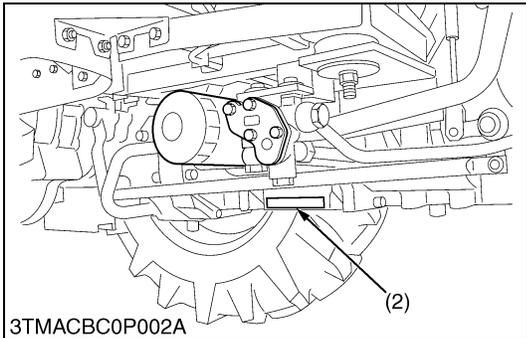
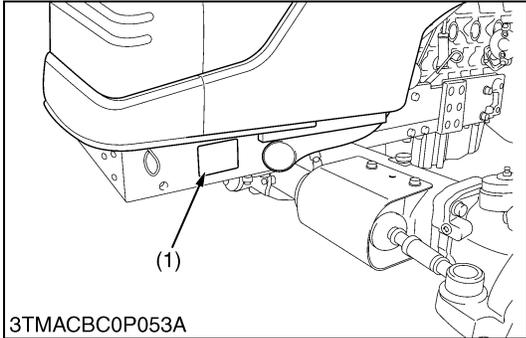
1. TRACTOR IDENTIFICATION

[1] MODEL NAME AND SERIAL NUMBER

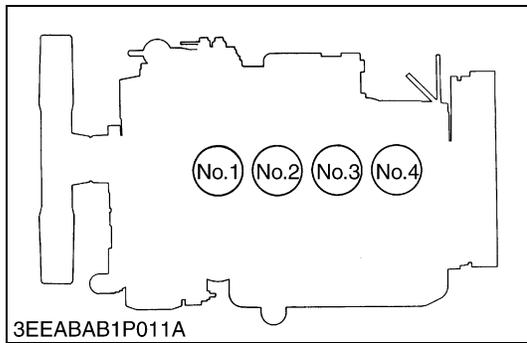
When you contact local KUBOTA distributor, always specify the engine serial number, the tractor serial number and hour meter reading.

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

W10106000



[2] CYLINDER NUMBER

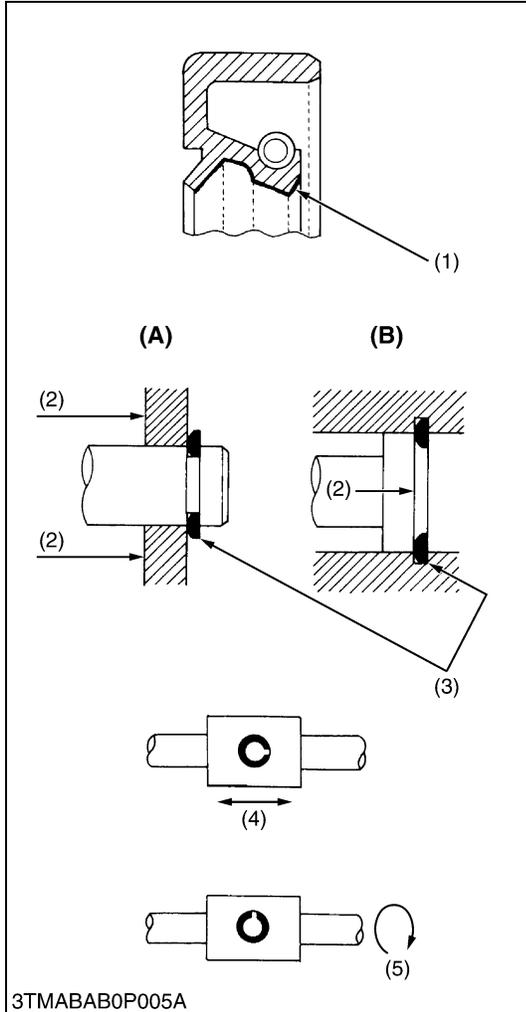


The cylinder numbers of KUBOTA diesel engine is designated as shown in the figure.

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

W1011077

2. GENERAL PRECAUTIONS



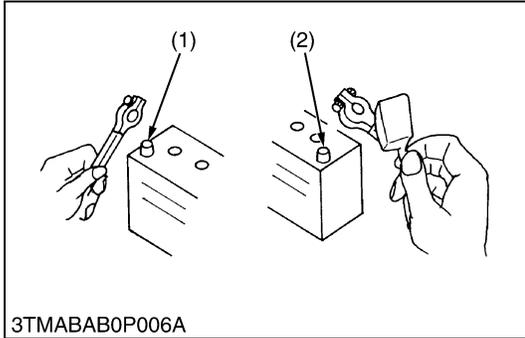
- During disassembly, carefully arrange removed parts in a clean area to prevent confusion later. Screws, bolts and nuts should be installed in their original position to prevent reassembly errors.
- When special tools are required, use KUBOTA genuine special tools. Special tools which are not frequently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

W10109040

3. HANDLING PRECAUTIONS FOR ELECTRICAL PARTS AND WIRING



3TMABAB0P006A

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

■ IMPORTANT

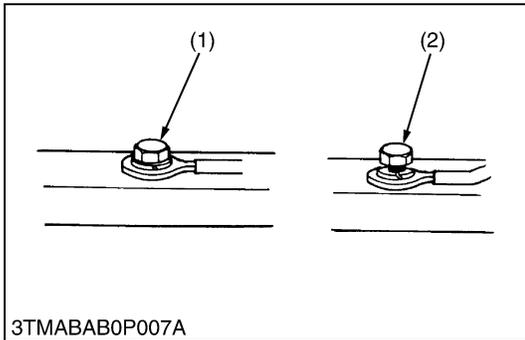
- Check electrical wiring for damage and loosened connection every year. To this end, educate the customer to do his or her own check and at the same time recommend the dealer to perform periodic check for a fee.
- Do not attempt to modify or remodel any electrical parts and wiring.
- When removing the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

(1) Negative Terminal

(2) Positive Terminal

W1012221

[1] WIRING



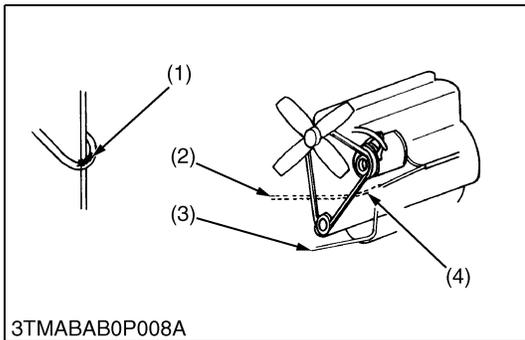
3TMABAB0P007A

- Securely tighten wiring terminals.

(1) Correct
(Securely Tighten)

(2) Incorrect
(Loosening Leads to Faulty Contact)

W1012391



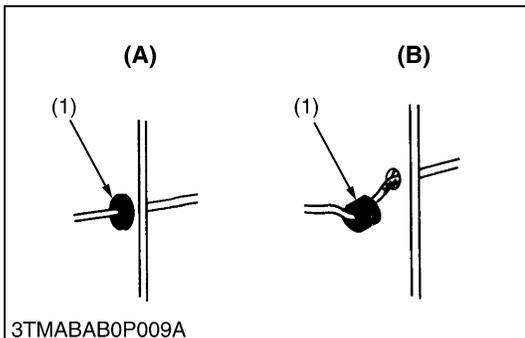
3TMABAB0P008A

- Do not let wiring contact dangerous part.

(1) Dangerous Part (Sharp Edge)
(2) Wiring (Incorrect)

(3) Wiring (Correct)
(4) Dangerous Part

W1012525



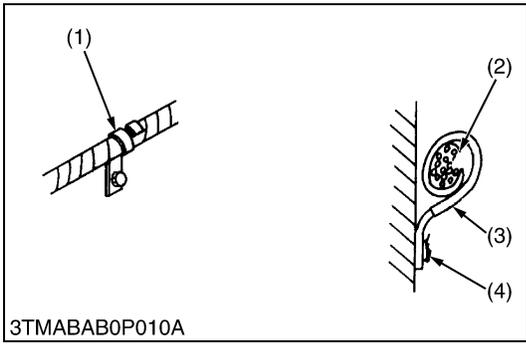
3TMABAB0P009A

- Securely insert grommet.

(1) Grommet

(A) Correct
(B) Incorrect

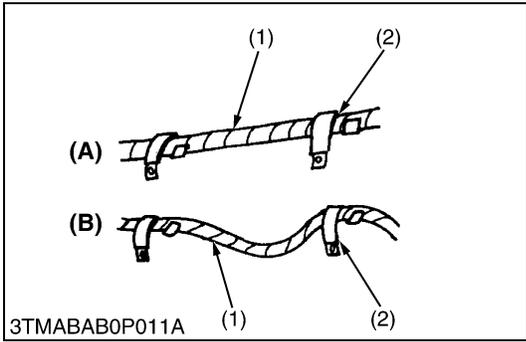
W1012644



• Securely clamp, being careful not to damage wiring.

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

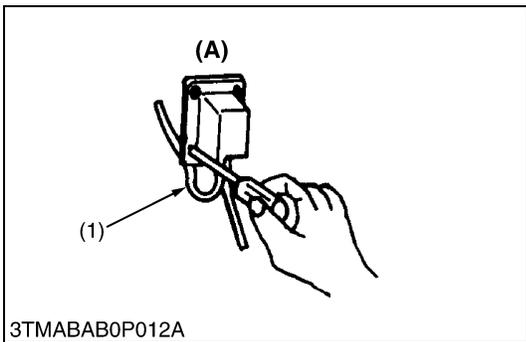
W1012764



• 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

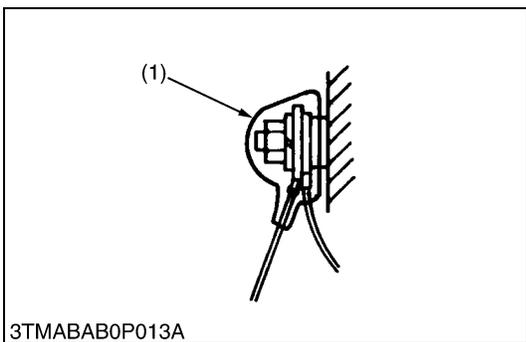
W1012924



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

- (1) Wiring
- (A) Incorrect

W1013028

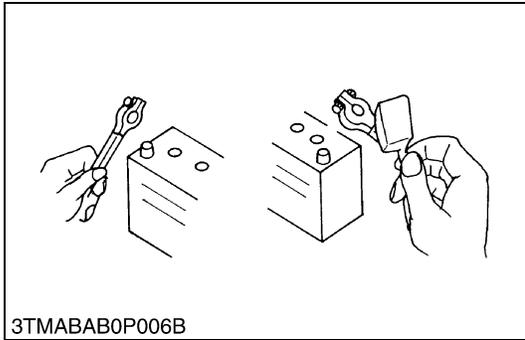


• After installing wiring, check protection of terminals and clamped condition of wiring, only connect battery.

- (1) Cover
 - Securely Install Cover

W1013126

[2] BATTERY



3TMABAB0P006B

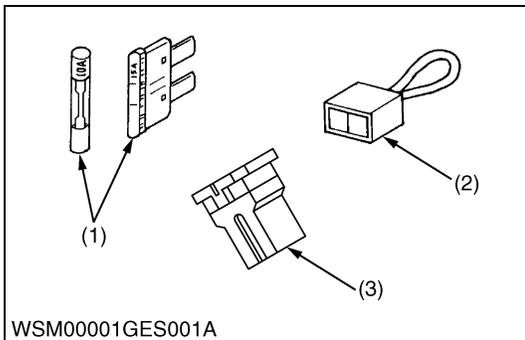
- Take care not to confuse positive and negative terminal posts.
- When removing battery cables, disconnect negative cable first. When installing battery cables, check for polarity and connect positive cable first.
- Do not install any battery with capacity other than is specified (Ah).
- After connecting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

W1013215

[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.

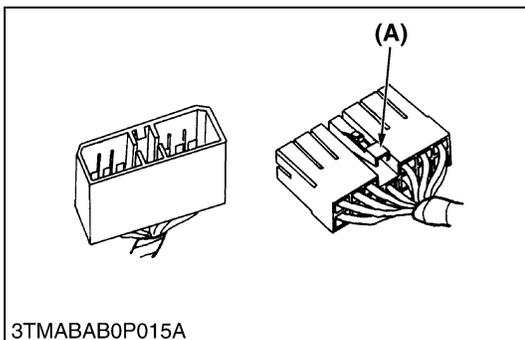
(1) Fuse

(3) Slow Blow Fuse

(2) Fusible Link

W1013444

[4] CONNECTOR

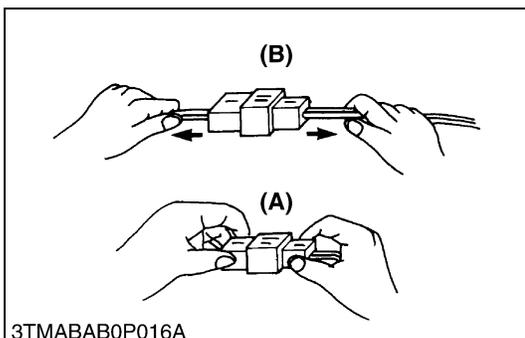


3TMABAB0P015A

- For connector with lock, push lock to separate.

(A) Push

W1013524



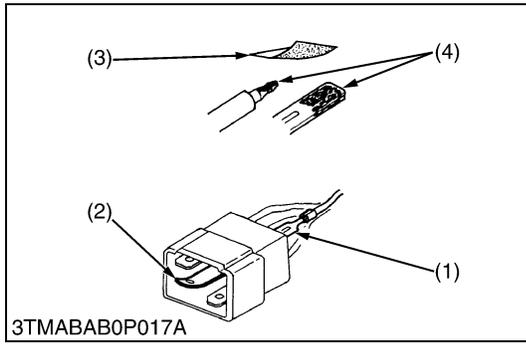
3TMABAB0P016A

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

(A) Correct

(B) Incorrect

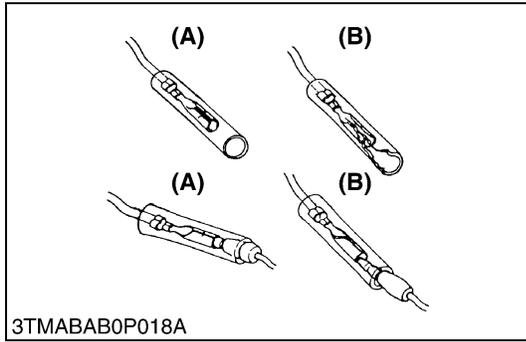
W1013712



- 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

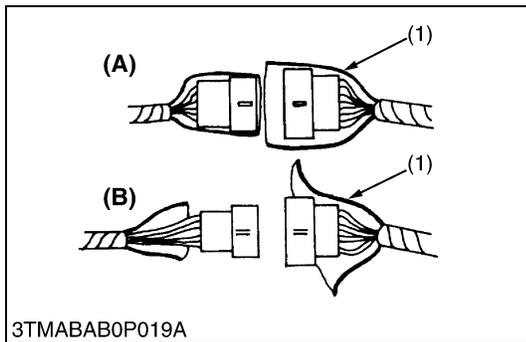
W1013819



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

(A) Correct (B) Incorrect

W1013985

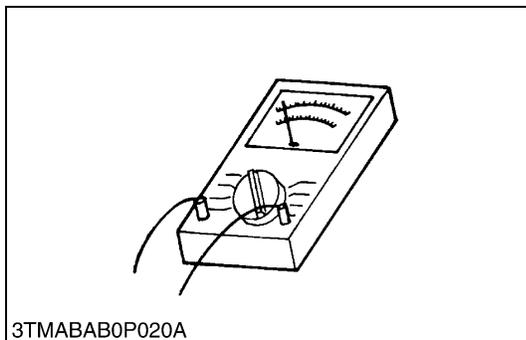


- Make certain plastic cover is large enough to cover whole connector.

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

W1014110

[5] HANDLING OF CIRCUIT TESTER



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

W1014209

4. LUBRICANTS, FUEL AND COOLANT

	Place	Capacity	Lubricants, fuel and coolant	
		MX4700, 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 CF or better. Refer to next page. Below 0 °C (32 °F) : SAE10W, 10W-30 or 15W-40 0 to 25 °C (32 to 77 °F): SAE20, 10W-30 or 15W-40 Above 25 °C (77 °F): SAE30, 10W-30 or 15W-40	
4	Transmission case	44.0 L 11.6 U.S.gals 9.7 Imp.gals	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				
	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	

* KUBOTA original transmission hydraulic fluid.

■ 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 temperature as shown in the table.
- 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).
- Lubricating oil recommended when a low-sulfur or high-sulfur fuel is employed.

- Recommended API categorization

All models meeting Third Stage Exhaust Emission Regulations Specification.

Fuel used	Engine oil classification
	Oil grade of engines with no 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

W1049928

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	MX4700 / MX5100

W1051422

■ Fuel

- Cetane number of 45 minimum. Cetane number greater than 50 is preferred, especially for temperature below $-20\text{ }^{\circ}\text{C}$ ($-4\text{ }^{\circ}\text{F}$) or elevations above 1500 m (5000 ft).
- If diesel fuel with sulfur content greater than 0.5 % sulfur content is 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 fuel specified to EN 590 or ASTM D975 are recommended.
- No. 2-D is a distillate fuel of lower volatility for engines in industrial and heavy mobile service. (SAE J313 JUN87)
- 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 $-10\text{ }^{\circ}\text{C}$ ($14\text{ }^{\circ}\text{F}$).

■ 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 recommended 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 manufacture's estimate.

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	  No-grade or 4T						  7T or Property class 8.8						  9T or Property class 10.9		
	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
Diameter															
M6 (6 mm, 0.24 in.)	7.9	0.80	5.8	7.9	0.80	5.8	9.81	1.00	7.24	7.9	0.80	5.8	12.3	1.25	9.05
	to 9.3	to 0.95	to 6.8	to 8.8	to 0.90	to 6.5	to 11.2	to 1.15	to 8.31	to 8.8	to 0.90	to 6.5	to 14.2	to 1.45	to 10.4
M8 (8 mm, 0.31 in.)	18	1.8	13	17	1.7	13	24	2.4	18	18	1.8	13	30	3.0	22
	to 20	to 2.1	to 15	to 19	to 2.0	to 14	to 27	to 2.8	to 20	to 20	to 2.1	to 15	to 34	to 3.5	to 25
M10 (10 mm, 0.39 in.)	40	4.0	29	32	3.2	24	48	4.9	36	40	4.0	29	61	6.2	45
	to 45	to 4.6	to 33	to 34	to 3.5	to 25	to 55	to 5.7	to 41	to 44	to 4.5	to 32	to 70	to 7.2	to 52
M12 (12 mm, 0.47 in.)	63	6.4	47	–	–	–	78	7.9	58	63	6.4	47	103	10.5	76.0
	to 72	to 7.4	to 53	–	–	–	to 90	to 9.2	to 66	to 72	to 7.4	to 53	to 117	to 12.0	to 86.7
M14 (14 mm, 0.55 in.)	108	11.0	79.6	–	–	–	124	12.6	91.2	–	–	–	167	17.0	123
	to 125	to 12.8	to 92.5	–	–	–	to 147	to 15.0	to 108	–	–	–	to 196	to 20.0	to 144
M16 (16 mm, 0.63 in.)	167	17.0	123	–	–	–	197	20.0	145	–	–	–	260	26.5	192
	to 191	to 19.5	to 141	–	–	–	to 225	to 23.0	to 166	–	–	–	to 304	to 31.0	to 224
M18 (18 mm, 0.71 in.)	246	25.0	181	–	–	–	275	28.0	203	–	–	–	344	35.0	254
	to 284	to 29.0	to 209	–	–	–	to 318	to 32.5	to 235	–	–	–	to 402	to 41.0	to 296
M20 (20 mm, 0.79 in.)	334	34.0	246	–	–	–	368	37.5	272	–	–	–	491	50.0	362
	to 392	to 40.0	to 289	–	–	–	to 431	to 44.0	to 318	–	–	–	to 568	to 58.0	to 419

W1041934

[2] STUD BOLTS

Material of opponent part	Ordinariness			Aluminum		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
Diameter						
M8 (8 mm, 0.31 in.)	12	1.2	8.7	8.9	0.9	6.5
	to 15	to 1.6	to 11	to 11	to 1.2	to 8.6
M10 (10 mm, 0.39 in.)	25	2.5	18	20	2.0	15
	to 31	to 3.2	to 23	to 25	to 2.6	to 18
M12 (12 mm, 0.47 in.)	29.5	3.0	21.7	31.4	3.2	23.1
	to 49.0	to 5.0	to 36.1			
M14 (14 mm, 0.55 in.)	62	6.3	46	–	–	–
	to 73	to 7.5	to 54	–	–	–
M16 (16 mm, 0.63 in.)	98.1	10.0	72.4	–	–	–
	to 112	to 11.5	to 83.1	–	–	–
M18 (18 mm, 0.71 in.)	172	17.5	127	–	–	–
	to 201	to 20.5	to 148	–	–	–

W1043910

[3] METRIC SCREWS, BOLTS AND NUTS

Grade	Property class 8.8 			Property class 10.9 			
	Unit	N-m	kgf-m	lbf-ft	N-m	kgf-m	lbf-ft
Nominal Diameter							
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 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

W1016172

[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
Nominal Diameter							
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

W1014585

[5] PLUGS

Shape	Size	Material of opponent part					
		Ordinariness			Aluminum		
		N-m	kgf-m	lbf-ft	N-m	kgf-m	lbf-ft
	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
	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	–	–	–

000001666E

No.	Item		Service Interval														Since then	Reference page	Important		
			50	100	150	200	250	300	350	400	450	500	550	600	650	700					
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		@
24	Injection pump	Check																every 3000 Hr	G-36		@
25	Turbocharger (MX5100)	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				

W1028983

■ 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.

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.

[1] DAILY CHECK

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

Walk around Inspection

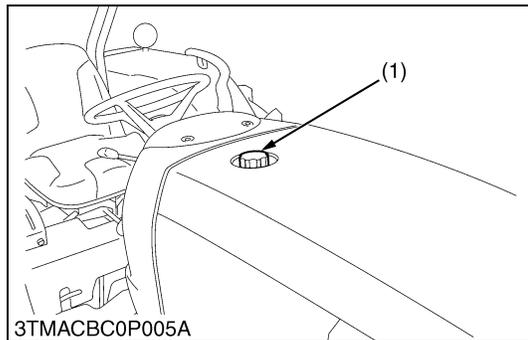
Look around and under the tractor for such items as loose bolts, trash build-up, oil coolant leaks, broken or worn parts.

W10650620

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
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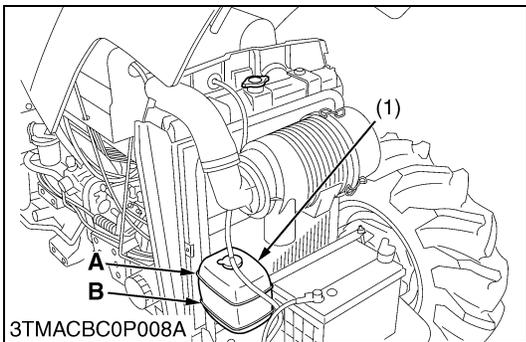
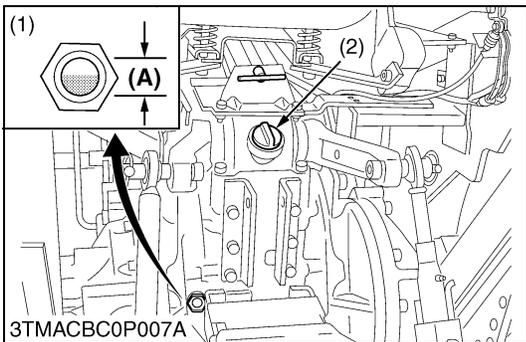
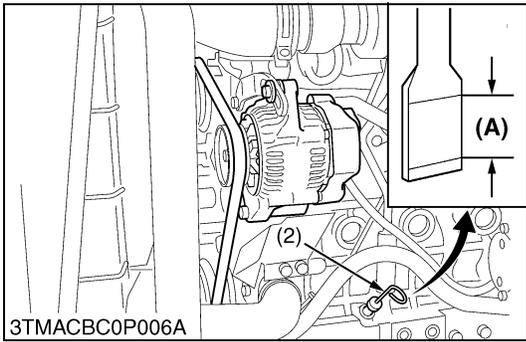
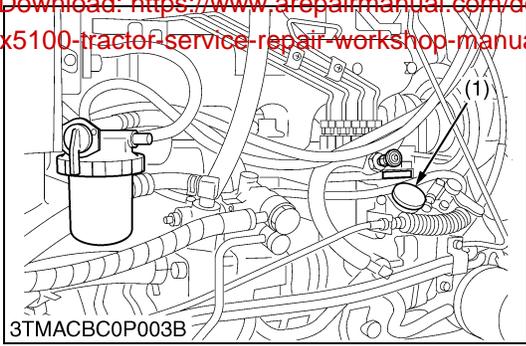
■ IMPORTANT

- 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

W10662230

Checking Engine Oil Level



CAUTION

- **Be sure to stop the engine before checking the oil level.**
1. Park the machine on a flat surface.
 2. Check engine oil before starting the engine or 5 minutes or more after the engine has stopped.
 3. To check the oil level, draw out the dipstick, wipe it clean, replace it, and draw it out again. Check to see that the oil level lies between the two notches.
If the level is too low, add new oil to the prescribed level at the oil inlet. (See page G-8.)

IMPORTANT

- **When using an oil of different maker or viscosity from the previous one, remove all of the old oil. Never mix two different types of oil.**
- **If oil level is low, do not run the engine.**

(1) Oil Inlet (A) Oil level is acceptable within this range.
(2) Dipstick

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Checking Transmission Fluid Level

1. Park the machine on a flat surface, lower the implement and shut off the engine.
2. View the fluid level through the fluid level gauge.
If the level is too low, add new oil to the prescribed level at the oil inlet. (See page G-8.)

IMPORTANT

- **If oil level is low, do not run the engine.**

(1) Gauge (A) Oil level is acceptable within this range.
(2) Oil Inlet

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Checking Coolant Level

CAUTION

- **Do not remove radiator cap while coolant is hot. When cool, slowly rotate cap to the first stop and allow sufficient time for excess pressure to escape before removing the cap completely.**
1. Check to see that the coolant level is between the “FULL” and “LOW” marks of recovery tank.
 2. When the coolant level drops due to evaporation, add water only up to the full level.
In case of leakage, add anti-freeze and water in the specified mixing ratio up to the full level.
(See “Flush Cooling System and Changing Coolant” in “CHECK POINTS OF EVERY 2 YEARS”.)

IMPORTANT

- **If the radiator cap has to be removed, follow the caution above and securely retighten the cap.**
- **Use clean, fresh water and anti-freeze to fill the recovery tank.**
- **If water should leak, stop the water leaking.**

(1) Recovery Tank A : FULL
B : LOW

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