WSM

WORKSHOP MANUAL

G2160,G2160-R48S,G2460G

Kubota

KiSC issued 12, 2017 A

TO THE READER

This WORKSHOP MANUAL has been prepared to provide servicing personnel with information on the mechanism, service and maintenance of KUBOTA G2160. It is divided into two parts, “MECHANISM” and “SERVICING” for each section except “ENGINE” section.

■ **MECHANISM**

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

■ **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.

December 2000

KiSC issued 12, 2017 A

Record of Revisions

For pdf, use search function {Search word} to find all the revised locations.

Last digit of the Code No.	Issue month	Main Revised Point and Corrective Measures {Search word}	Reference Page
5	2017.12	Corrected the expression of lubricants.	G-3, G-8, G-9, PG-2, QG-3

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.

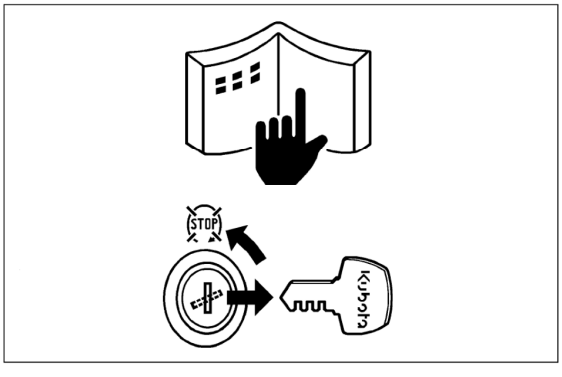
DANGER : **Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.**

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.**

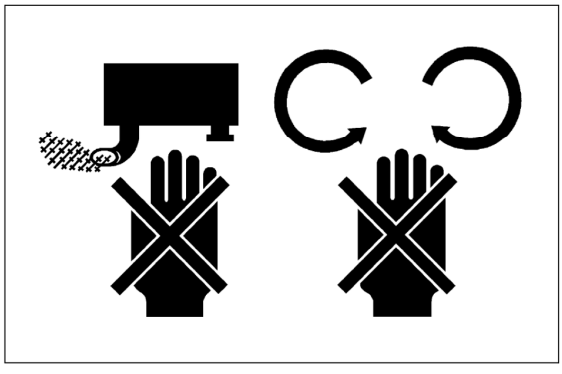


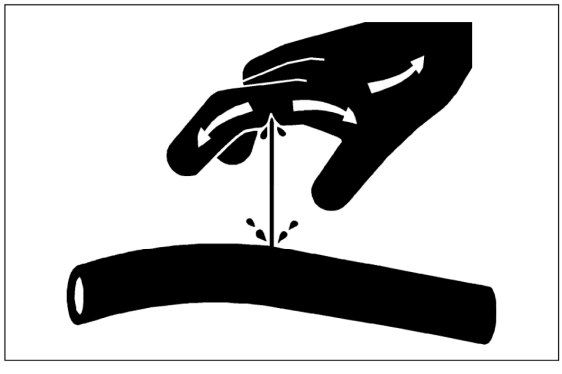
BEFORE SERVICING AND REPAIRING

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

SAFETY STARTING

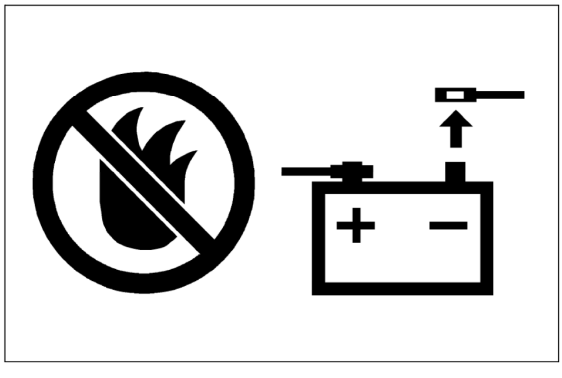
- Do not start the engine by shorting across starter terminals or bypassing the safety start switch.
- Do not alter or remove any part of machine safety system.
- Before starting the engine, make sure that all shift levers are in neutral positions or in disengaged positions.
- Never start the engine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





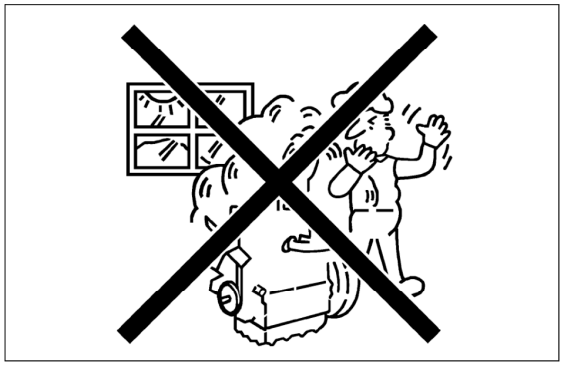
SAFETY WORKING

- Do not work on the machine while under the influence of alcohol, medication, or other substances or while fatigued.
- Wear close fitting clothing and safety equipment appropriate to the job.
- Use tools appropriate to the work. Makeshift tools, parts, and procedures are not recommended.
- When servicing is performed together by two or more persons, take care to perform all work safely.
- Do not work under the machine that is supported solely by a jack. Always support the machine by safety stands.
- Do not touch the rotating or hot parts while the engine is running.
- Never remove the radiator cap while the engine is running, or immediately after stopping. Otherwise, hot water will spout out from radiator. Only remove radiator cap when cool enough to touch with bare hands. Slowly loosen the cap to first stop to relieve pressure before removing completely.
- Escaping fluid (fuel or hydraulic oil) under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic or fuel lines. Tighten all connections before applying pressure.



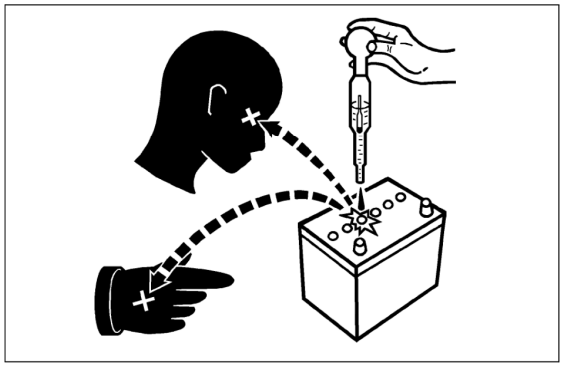
AVOID FIRES

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



VENTILATE WORK AREA

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

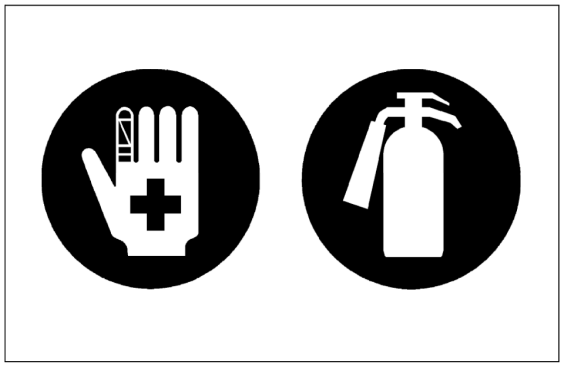


PREVENT ACID BURNS

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

DISPOSE OF FLUIDS PROPERLY

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



PREPARE FOR EMERGENCIES

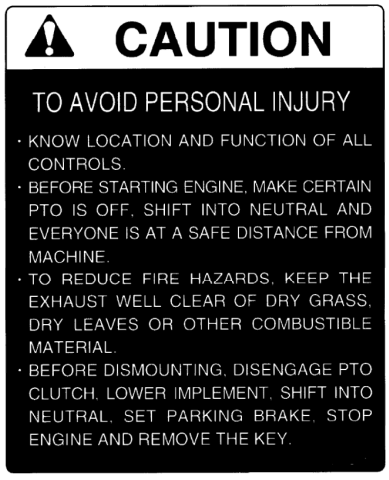
- Keep a first aid kit and fire extinguisher handy at all times.
- Keep emergency numbers for doctors, ambulance service, hospital and fire department near your telephone.

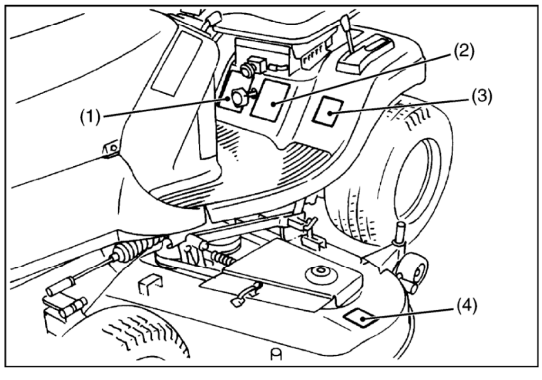
SAFETY DECALS

● **The following safety decals are installed on the machine.**
If a decal becomes damaged, illegible or is not on the machine, replace it. The decal part number is listed in the parts list.

(1) Part No. K1211-6581-1

(2) Part No. K1211-6582-1





(3) Part No. K1122-6584-2

(4) Part No. K5112-7312-2

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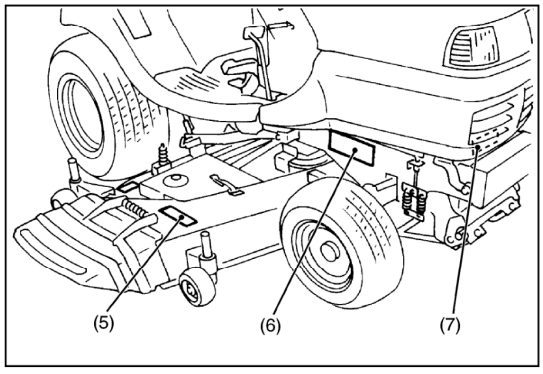
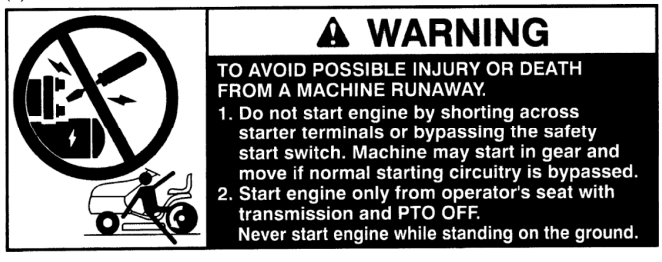
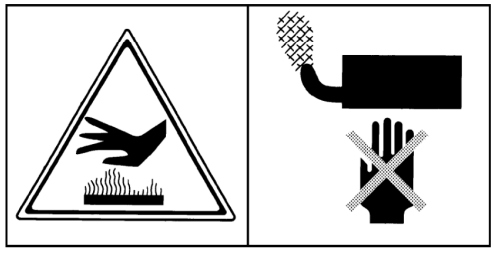


(5) Part No. K5112-7311-2

(6) Part No. K1122-6583-1



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



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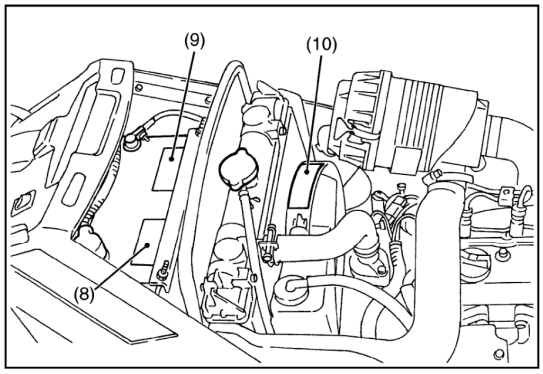
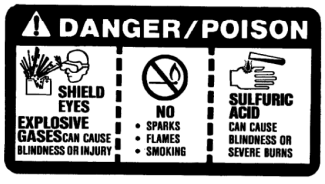
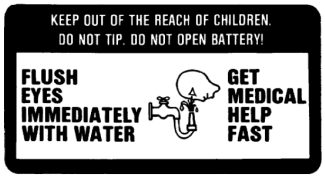


(8) Part No. K1211-6115-1



(9) Part No. K1211-6116-1



(10) Part No. K1213-6586-1
Stay clear of engine fan and fan belt

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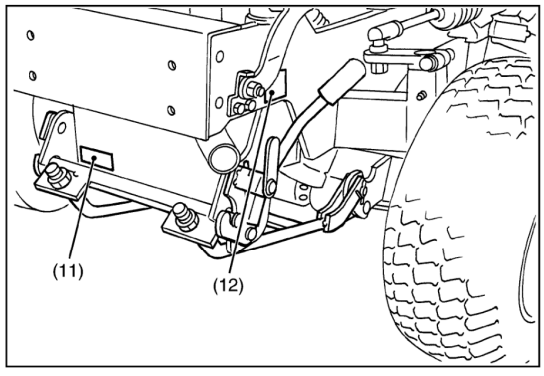

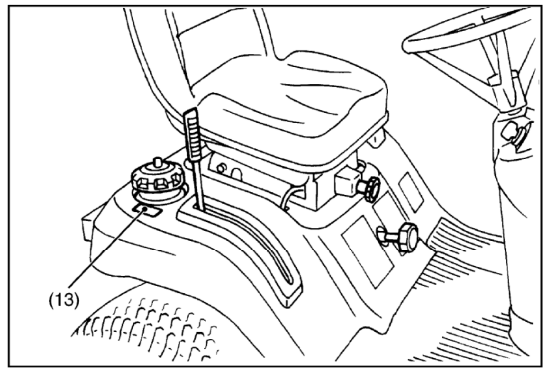

(11) Part No. K1213-6532-1
Do not touch hot surface like muffler, etc..

(13) Part No. K1211-6585-1

Diesel fuel only | No fire

(12) Part No. K2110-6574-1

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 and/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.

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SPECIFICATIONS

Model			G2160
Maximum gross power			15.6 kW (21 HP)
Engine	Model		D782-E-G21
	Type		Indirect injection, vertical, water cooled, 4-cycle diesel engine
	Number of cylinders		3
	Bore and stroke		67.0 × 73.6 mm (2.64 × 2.90 in.)
	Total displacement		778 cm^3 (47.48 cu.in.)
	Rated revolution		3000 rpm
	Combustion chamber		Spherical type (E-TVCS)
	Fuel injection pump		Bosch MD type mini pump
	Governor		Centrifugal ball mechanical governor
	Injection nozzle		Bosch throttle type
	Injection timing		0.33 to 0.37 rad. (19° to 21°) before T.D.C.
	Injection order		1-2-3
	Injection pressure		13.73 MPa (140 kgf/cm^2, 1990 psi)
	Compression ratio		23 : 1
	Lubricating system		Forced lubrication by gear pump
	Cooling system		Pressurized radiator, forced circulation with water pump
	Lubricating oil		API Service classification CCor CD, Below 0°C (32 °F) : SAE 10W or 10W-30, 0 to 25 °C (32 °F to 77 ° F) : SAE 20 or 10W-30, Above 25 °C (77 °F) : SAE 30 or 10W-30
	Starting system		Electric starter (12 V, 1.0 kW)
	Battery		51R (12V, 450CCA)
	Fuel		No.2-D Diesel fuel (ASTM D975) [No.1-D diesel fuel, if temperature is below - 10 °C (14 °F)]
Capacities	Fuel tank		22L (5.8U.S.gals., 4.8 Imp. gals.)
	Engine crankcase		2.8L (2.95 U.S.qts., 2.4 Imp.qts.)
	Engine coolant		2.1L (2.2 U.S.qts., 1.8 Imp.qts.)
	Recovery tank		0.25 L (0.26 U.S.qts., 0.22 Imp.qts.)
	Transmission (Including HST and cylinder)		4.5L (4.75 U.S.qts., 3.86 Imp.qts.)
	Mower gear case oil		0.40L (0.42 U.S.qts., 0.35 Imp.qts.)
Tires	Front		16 × 6.50-8 (4PR) Turf
	Rear		23 × 10.5-12 (4PR) Turf
Travelling speeds	Forward		0 to 15.0 km/h (0 to 9.3 mph)
	Reverse		0 to 6.0 km/h (0 to 3.8 mph)
Dimensions	Overall length		1885 mm (74.2 in.)
	Overall width (With mower)		1843 mm (72.6 in.)
	Overall height		1280 mm (50.4 in.)
	Wheel base		1290 mm (50.8 in.)
	Treads	Front	825 mm (32.5 in.)
		Rear	780 mm (30.7 in.)
Weight (Without mower deck and grass collecter)			430 kg (948 lbs)
PTO			Belt drive
PTO clutch			Belt tension
Revolution (PTO speed)			2576 rpm
PTO brake			Available

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Model		G2160	
Steering		Electric power steering (EPS)	
Transmission		Hydrostatic transmission	
Brake		Internal expanding brake	
Mower	Model	RCK54-24G	RCK60B-24G
	Total length	946 mm (37.2 in.)	992 mm (39.1 in.)
	Total width	1690 mm (66.5 in.)	1843 mm (72.5 in.)
	Total height	273 mm (10.7 in.)	
	Mounting method	Quick joint, parallel linkage	
	Adjustment of cutting height	Dial gauge	
	Cutting width	1372 mm (54 in.)	1524 mm (60 in.)
	Cutting height	25 to 102 mm (1.0 to 4.0 in.)	
	Number of blades	3	
	Weight (Approx.)	95 kg (209 lbs)	110 kg (243 lbs)
	Discharge	Right side	

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

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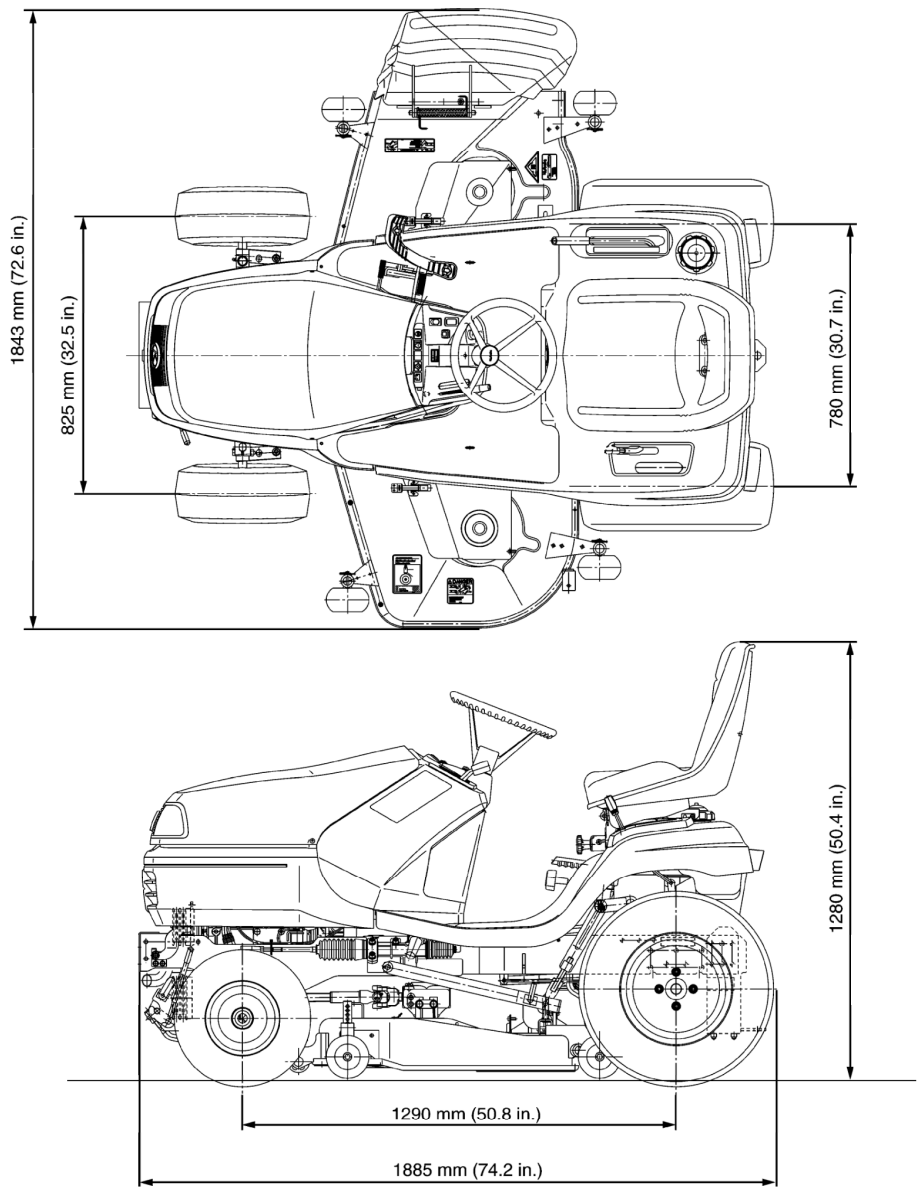
DIMENSIONS



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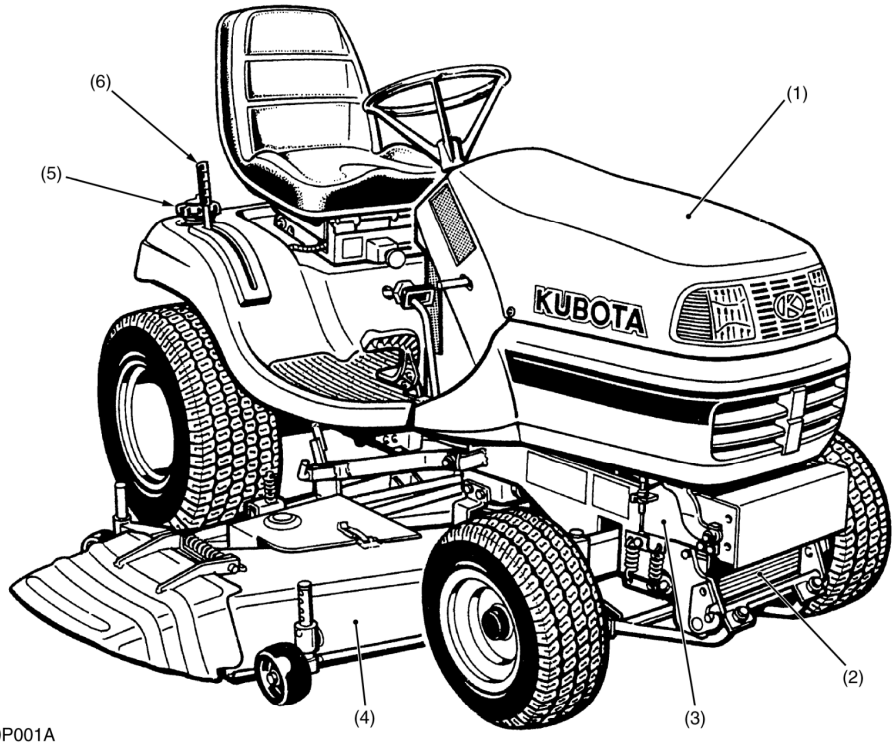
G GENERAL

GENERAL

CONTENTS

1. FEATURES



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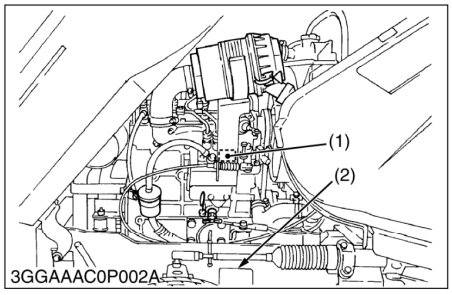
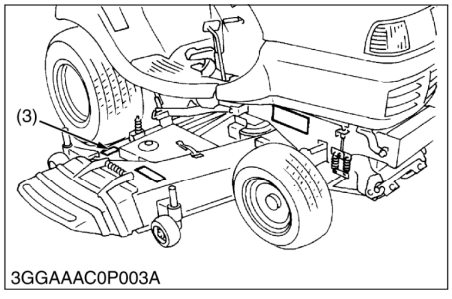
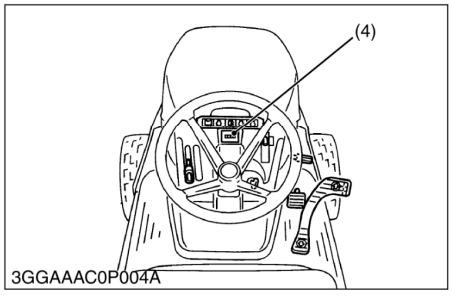
1. E-TVCS engine
2. Front PTO (option)
3. Rugged ladder type chassis
4. Low-noise, high-performance mower
5. Large-capacity fuel tank
6. Hydraulic mower lift

2. IDENTIFICATION







When contacting your local KUBOTA distributor, always specify engine serial number (1), machine serial number (2), mower serial number (3) and hour meter reading.

(1) Engine Serial Number
(2) Machine Serial Number
(3) Mower Serial Number
(4) Hour Meter

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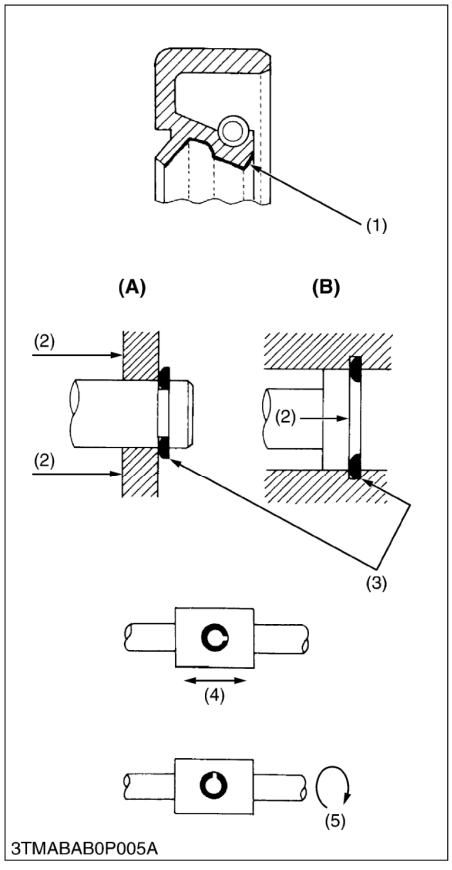
3. GENERAL PRECAUTIONS



- 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.
- We recommend the use 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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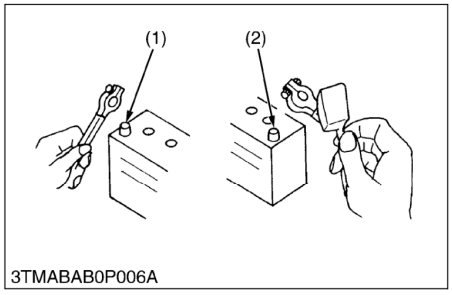
4. HANDLING PRECAUTIONS FOR ELECTRICAL PARTS AND WIRING



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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

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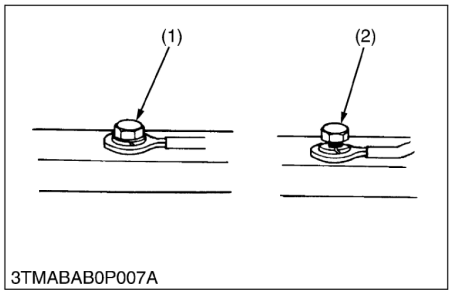
[1] WIRING



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- Securely tighten wiring terminals.

(1) Correct (Securely tighten) (2) Incorrect (Loosening leads to faulty contact)

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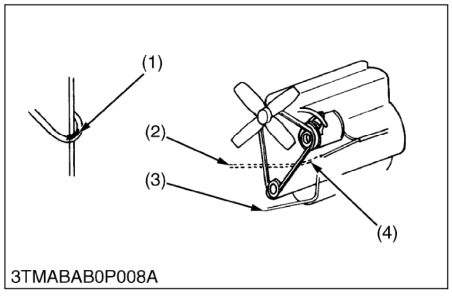

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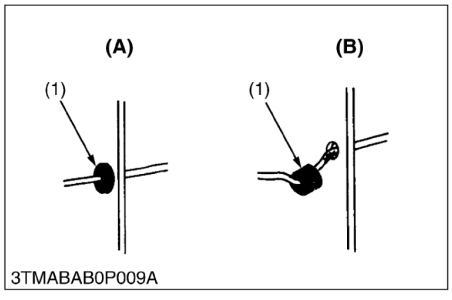
- Do not let wiring contact dangerous part.

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

W1011313



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- Securely insert grommet.

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

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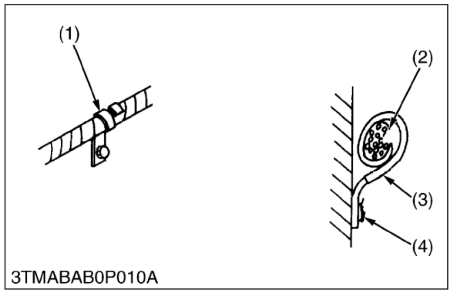
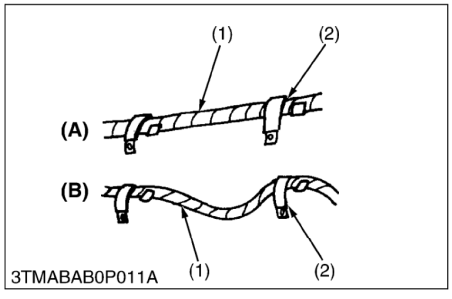


- Securely clamp, being careful not to damage wiring.

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

W1011458



- 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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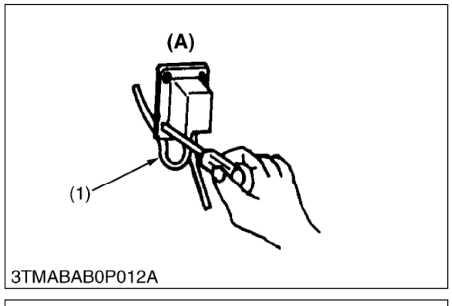

- In installing a part, take care not to get wiring caught by it.

(1) Wiring
(A) Incorrect

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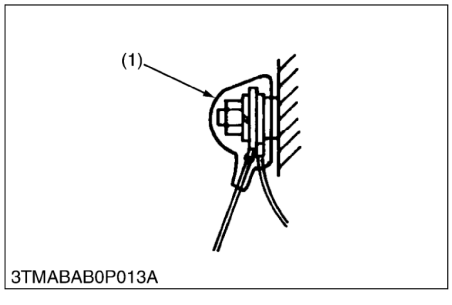

- After installing wiring, check protection of terminals and clamped condition of wiring, only connect battery.

(1) Cover
  • Securely Install Cover

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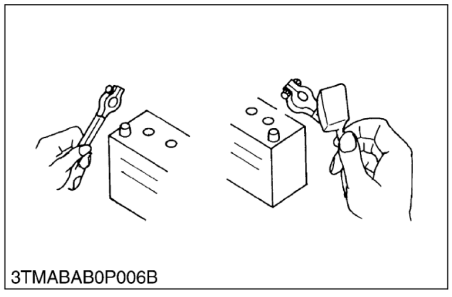
[2] BATTERY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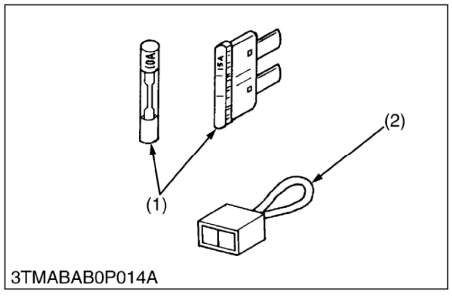
- Take care not to confuse positive and negative terminal posts.
- When removing battery cables, disconnect negative cable first. When installing battery cables, check for polarity and connect positive cable first.
- Do not install any battery with capacity other than is specified (Ah).
- After connecting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

W1011816

[3] FUSE



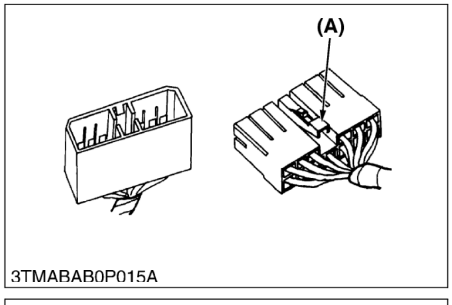
3TMABAB0P014A

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

(1) Fuse (2) Slow Blow Fuse

W1012092

[4] CONNECTOR

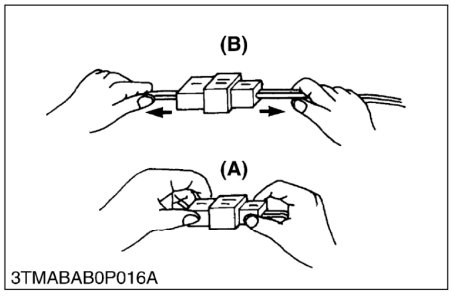


3TMABAB0P015A

- For connector with lock, push lock to separate.

(A) Push

W1012211

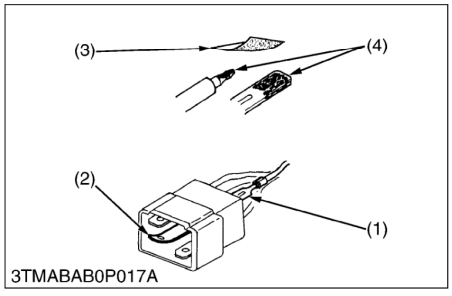


3TMABAB0P016A

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

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

W1012272

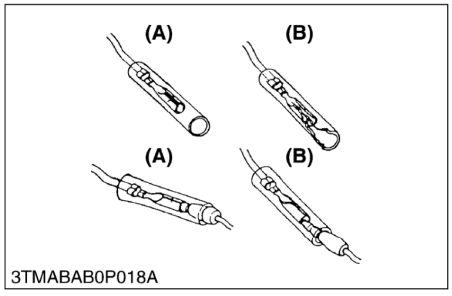


3TMABAB0P017A

- 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

W1012346

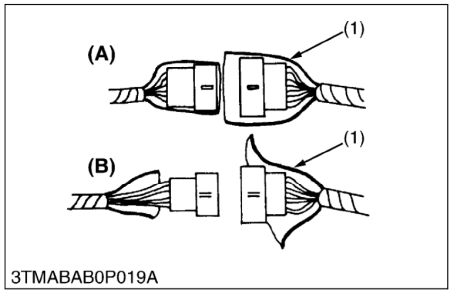


3TMABAB0P018A

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

(A) Correct
(B) Incorrect

W1012430



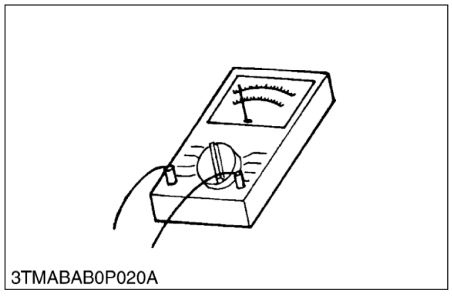
3TMABAB0P019A

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

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

W1054624

[5] HANDLING OF CIRCUIT TESTER


3TMABAB0P020A

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

W1012684

5. LUBRICANTS, FUEL AND COOLANT

	Place		Capacity	Lubricants
			G2160	
1	Fuel		22 L 5.8 U.S.gals 4.8 Imp.gals	[ASTM D975] No. 2-D diesel fuel No. 1-D diesel fuel if temperature is below −10 °C (14 °F)
2	Coolant	Cooling system	2.1 L 2.2 U.S.qts 1.8 Imp.qts	Fresh clean water (soft water) with anti-freeze
		Recovery tank	0.25 L 0.26 U.S.qts 0.22 Imp.qts	
3	Engine crankcase *1		2.8 L 2.95 U.S.qts 2.4 Imp.qts	Engine oil: API Service classification CF (or better) Above 25 °C (77 °F): SAE30, SAE10W-30 or 15W-40 0 to 25 °C (32 to 77 °F): SAE20, SAE10W-30 or 15W-40 Below 0 °C (32 °F): SAE10W, SAE10W-30 or 15W-40
4	Transmission (Including HST & cylinder)		4.5 L 4.75 U.S.qts 3.86 Imp.qts	KUBOTA UDT or SUPER UDT, SUPER UDT-2 fluid *2
5	Mower gear case		0.40 L 0.42 U.S.qts 0.35 Imp.qts	SAE #90 gear oil
6	King pin (Left and right)		Until grease overflows	Multipurpose EP2 grease (NLGI grade No.2)
	Center pin			
	PTO tension arm			
	Universal joint			
	Side blade shaft			
	Center blade shaft			
	Mower tension arm			
7	Speed control pedal shaft		Moderate amount	Oil or spray type grease
	Lift lever shaft			
	Brake pedal shaft			
	PTO lever fulcrum			
	Anti-scalp roller			
	Speed control link			
	Accelerator cable			

*1 Oil amount when the oil level is at the upper level of the oil level gauge.
*2 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 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 lowsulfur 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 *	Oil class of engines with external EGR *
High Sulfur Fuel [≥ 0.05 % (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 [< 0.05 % (500 ppm)] or Ultra Low Sulfur Fuel [< 0.0015 % (15 ppm)]	**CF**, **CF-4**, **CG-4**, **CH-4** or **CI-4**	**CF** or **CI-4** (Class **CF-4**, **CG-4** and **CH-4** engine oils cannot be used on EGR type engines.)

* EGR: Exhaust Gas Re-circulation

Fuel:

- Cetane number of 45 is minimum. Cetane number greater than 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 % (5000 ppm) sulfur content is used, reduce the service interval for engine oil and filter by 50 %.
- Never use diesel fuel with sulfur content greater than 0.05 % (500 ppm) for external EGR type engine.
- Do not use diesel fuel with sulfur content greater than 1.0 % (10000 ppm).
- Diesel fuels 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)

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**, **SUPER UDT-2** fluid for optimum protection and performance.
  Do not mix different brands together.
- Indicated capacities of water and oil are manufacturer's estimate.

6. 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 / Diameter	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs
M6 (6 mm, 0.24 in.)	7.85 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

W1034542

[2] METRIC SCREWS, BOLTS AND NUTS

Grade / Unit / Nominal Diameter	Property class 8.8 (8.8)			Property class 10.9 (10.9)		
	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs
M 8	23.6 to 27.4	2.4 to 2.8	17.4 to 20.2	29.4 to 34.3	3.0 to 3.5	21.7 to 25.3
M 10	48.1 to 55.8	4.9 to 5.7	35.5 to 41.2	60.8 to 70.5	6.2 to 7.2	44.9 to 52.1
M 12	77.5 to 90.1	7.9 to 9.2	57.2 to 66.5	103.0 to 117.0	10.5 to 12.0	76.0 to 86.8
M 14	124.0 to 147.0	12.6 to 15.0	91.2 to 108.0	167.0 to 196.0	17.0 to 20.0	123.0 to 144.0
M 16	196.0 to 225.0	20.0 to 23.0	145.0 to 166.0	260.0 to 303.0	26.5 to 31.0	192.0 to 224.0

W1016172

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

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

W1022485

7. MAINTENANCE CHECK LIST

No.	Item	Period	Every 50 Hr	Hour meter reading									Reference page
				50	100	150	200	300	400	450	500	After	
1	Tires	Check	☆									Every 50 Hr	G-20
2	Battery condition	Check			☆		☆	☆	☆		☆	Every 100 Hr	G-25
3	Engine oil	Change		★	☆		☆	☆	☆		☆	Every 100 Hr	G-18
4	Engine oil filter cartridge	Change		★			☆		☆			Every 200 Hr	G-19
5	Transmission fluid	Change					☆				☆	Every 300 Hr	G-27
6	Transmission oil filter cartridge	Replace		★			☆				☆	Every 300 Hr	G-19
7	Transmission oil strainer	Clean					☆				☆	Every 300 Hr	G-28
8	Hydraulic hose	Check					☆		☆			Every 200 Hr	G-27
		Replace										Every 2 Years*	G-31
9	Fuel lines	Check			☆		☆	☆	☆		☆	Every 100 Hr	G-24
		Replace[1]										Every 2 Years*	G-31
10	Fuel filter	Check			☆		☆	☆	☆		☆	Every 100 Hr	G-24
		Replace[1]									☆	Every 500 Hr	G-28
11	Radiator hose and clamp	Check					☆		☆			Every 200 Hr	G-26
		Replace[1]										Every 2 Years*	G-31
12	Radiator core	Clean			☆		☆	☆	☆		☆	Every 100 Hr**	G-24
13	Cooling system	Clean										Every 1 Year	G-29
14	Coolant	Change										Every 1 Year	G-29
15	Air cleaner element	Clean	☆**										G-22
		Replace										Every 1 Year**	G-29
16	Fan belt tension	Adjust	☆										G-21
17	Front PTO belt tension	Adjust	☆***										G-23
18	Brake play	Adjust[1]	☆										G-20
19	Greasing	–	☆										G-21
20	Mower gear box oil	Change		★		☆		☆		☆		Every 150 Hr	G-19
21	Mower gear box oil seal	Replace										Every 2 Years*	G-32

■ IMPORTANT

★ : The maintenance indicated by ★ must be done initially.
*** : Replace only if necessary.**
**** : This maintenance should be done more often in dusty conditions than in normal conditions.**
***** : Initial elongation of the front PTO belt may occur prior to 25 hours. Adjust the tension spring length as needed to maintain belt tension.**
[1] : These items should be serviced by an authorized KUBOTA Dealer, unless the owner has the proper tools and is mechanically proficient.

W1035769

8. CHECK AND MAINTENANCE

CAUTION

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

[1] DAILY CHECK

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

Checking

- Check areas where previous trouble was experienced.
- Walk around the machine.

1. Oil and water leak
2. Engine oil level
3. Coolant level in the recovery tank
4. Damage of machine body, tightness of all bolts and nuts
5. Radiator screen
6. Panel screen
7. Air cleaner
8. Oiling

- Mower

1. Make sure blade bolts are tight.
2. Check blades for wear or damage.
3. Check all hardware.
4. Make sure all pins are in place.

- While sitting in the operator's seat,

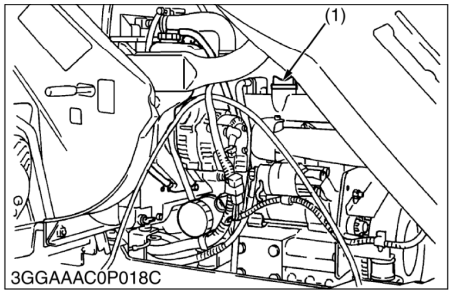
1. Speed control pedal
2. Brake pedal
3. Parking brake

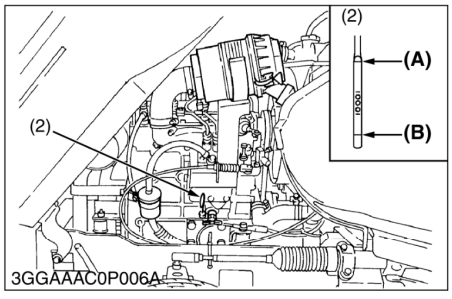
- Turning the key switch "**ON**"

1. Head lights

- Starting the engine,

1. Color of the exhaust fumes
2. If either of safety start switch and seat safety control do not operate properly, contact your KUBOTA Dealer immediately.
3. Check for abnormal noise and vibration.
4. Check Easy checker™.





Checking Engine Oil Level

CAUTION

- **To avoid personal injury : Always stop the engine and remove the key before checking oil.**

1. Check engine oil before starting and 5 minutes or more after the engine has stopped.
2. Wipe dipstick area clean.
3. To check the oil level, remove the dipstick (2), wipe it clean, replace it, and draw it out again. Check to see that the oil level is between the two notches.
4. Add new oil to the prescribed level at the oil port if necessary.

■ **IMPORTANT**

- **Use the specified engine oil.**
  Refer to "LUBRICANTS, FUEL AND COOLING WATER". (See page G-8)
- **When using new oil of a different maker or viscosity from the previous one, drain all used oil.**
  Never mix two different types of oil.

(1) Oil Inlet Plug
(2) Dipstick
(A) Upper Level
(B) Lower Level

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Checking Amount of Fuel and Refueling

CAUTION

- **Handle fuel carefully. If the engine is running, do not fill the fuel tank. If engine is hot, let engine cool several minutes before adding fuel. Do not smoke while filling the fuel tank or servicing the fuel system. Fill fuel tank only to bottom of filler neck.**

1. Check the fuel level.
2. Take care that the fuel tank does not become empty.

Fuel tank capacity	22 L (5.8 U.S.gal.)

■ **IMPORTANT**

- **Use diesel fuel only**

1. Use No.2 diesel fuel.
2. Use No.1 diesel fuel if the temperature is below –10 °C (14 °F).
3. Always use a strainer when refueling to prevent fuel injection pump contamination.

■ **NOTE**

- **No.2-D is a distillate fuel of lower volatility for engines in industrial and heavy mobile service.**
  (SAE J313 JUN87)
  Grade of diesel fuel oil according to ASTM D975

Flash Point °C (°F)	Water and Sediment, volume %	Carbon Residue on, 10 percent Residuum, %	Ash, weight %
Min	Max	Max	Max
52 (125)	0.05	0.35	0.01

Distillation Temperatures °C (°F) 90 % Point		Viscosity Kinematic cSt or mm^2/s at 40 °C		Viscosity saybolt, SUS at 100 °F		Sulfur, weight %	Copper strip Corrsion	Catane Number
Min	Max	Min	Max	Min	Max	Max	Max	Min
282 (540)	338 (640)	1.9	4.1	32.6	40.1	0.50	No.3	40

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