WSM

WORKSHOP MANUAL
TRACTOR

M5640SU

Kubota

KiSC issued 07, 2009 A

TO THE READER

This Workshop Manual tells the servicing personnel about the mechanism, servicing and maintenance of the M5640SU and M5640DT-SU. It contains 4 parts: **"Information"**, **"General"**, **"Mechanism"** and **"Servicing"**.

■ Information

This section contains information below.

- Safety First
- Safety Label
- Specification
- 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.

July, 2009

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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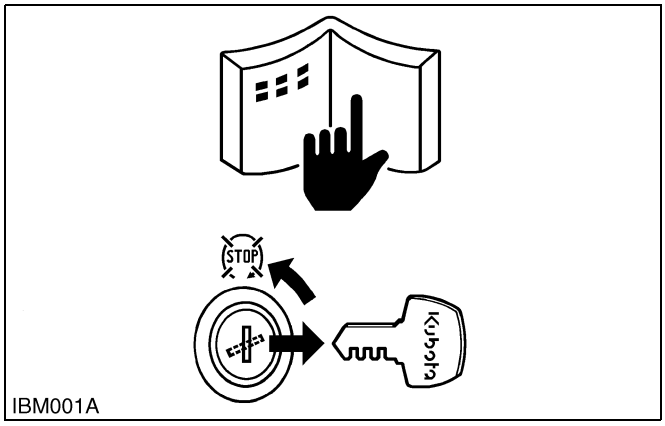

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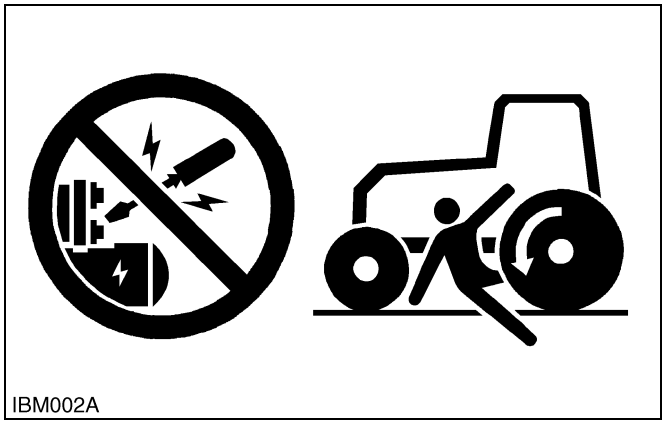
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BEFORE YOU START SERVICE

- 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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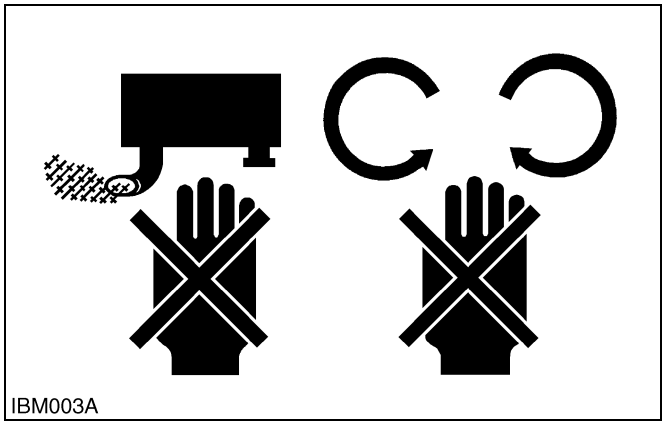
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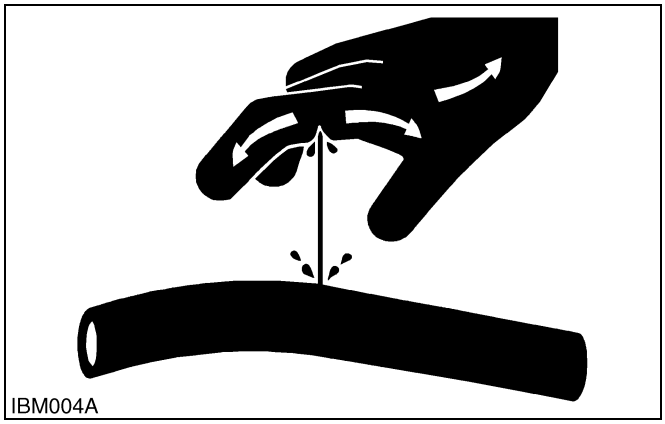
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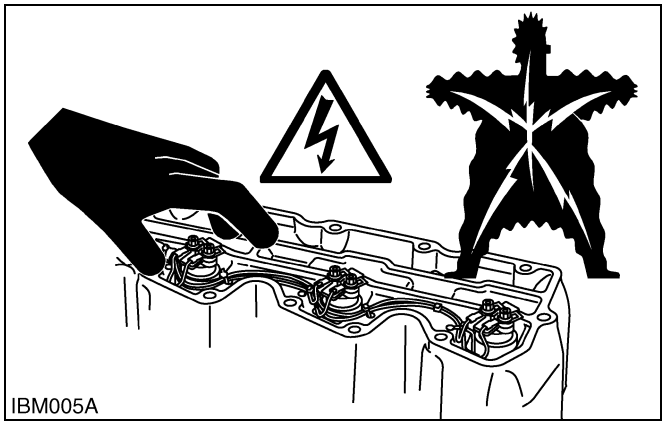
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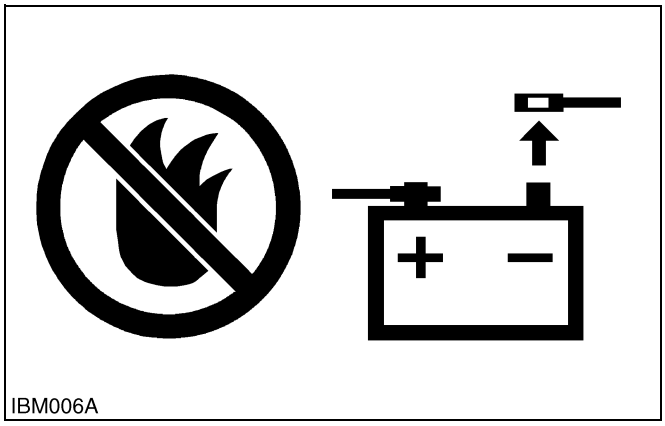
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OPERATE SAFELY

- 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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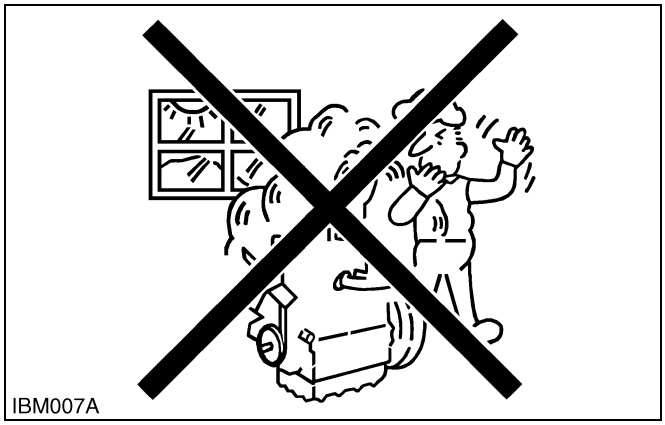
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KEEP A GOOD AIRFLOW IN THE WORK AREA

- 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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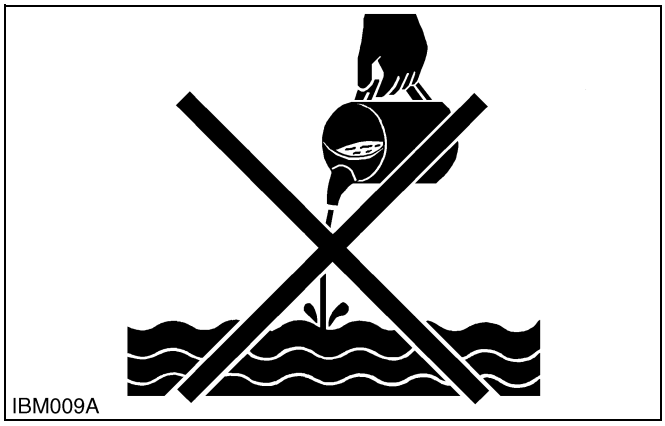
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DISCARD FLUIDS CORRECTLY

- 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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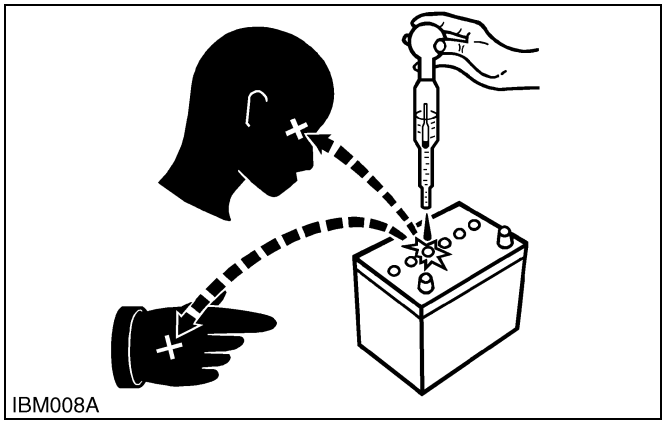
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PREVENT ACID BURNS

- 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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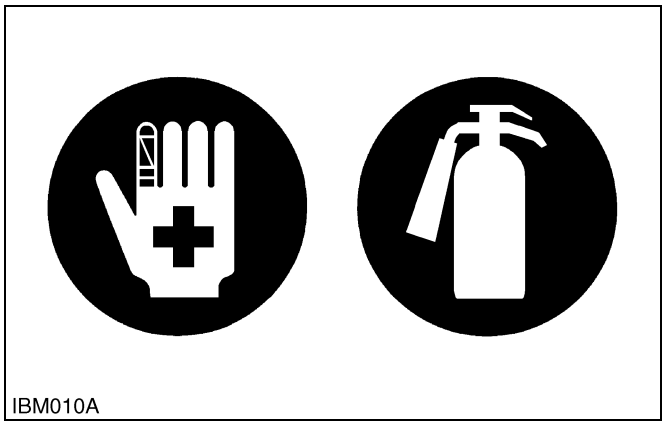
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PREPARE FOR EMERGENCIES

- 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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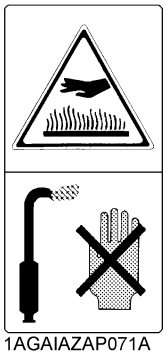
2. SAFETY DECALS

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.

WSM000001INI0013US0

(1) Part No. 32310-4958-1
Do not touch hot surface like muffler, etc.



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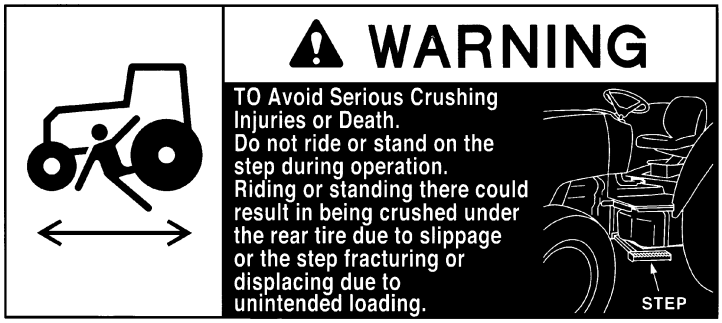
(2) Part No. 3A111-9801-1



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

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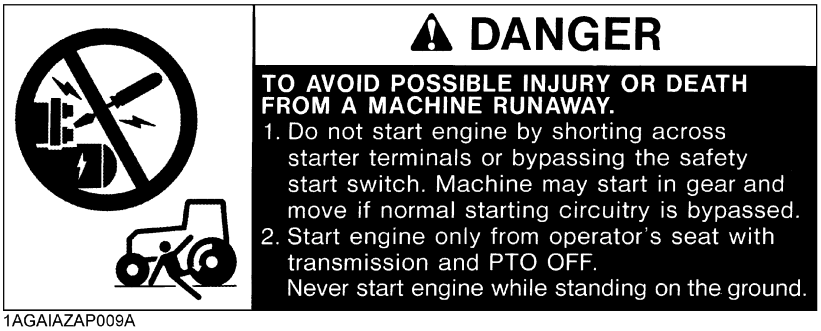
(4) Part No. TA040-4965-2



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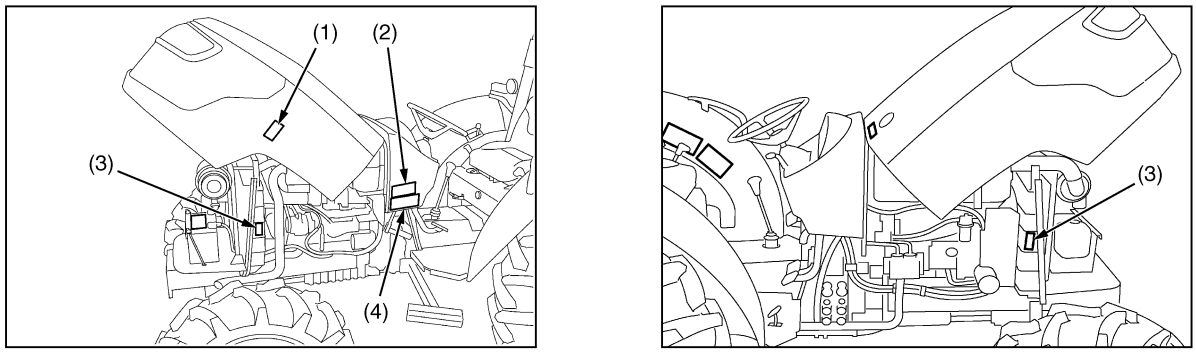

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9Y1210365INI0001US0

(1) Part No. 6C040-4742-2

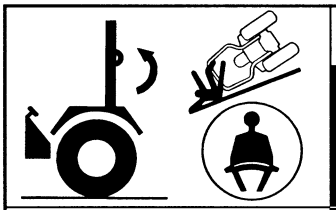
⚠CAUTION

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.

1AGAIAZAP109A

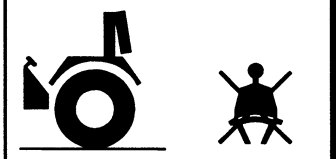
(2) Part No. 3A111-9848-2



⚠ WARNING

TO AVOID INJURY OR DEATH FROM ROLL-OVER:

- 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.

- 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.

1AGAIDCAP066E

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

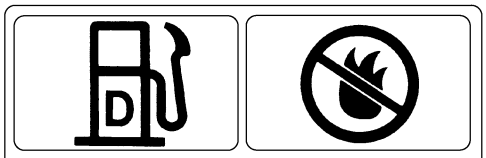
⚠WARNING

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.

1AGAIHFAP069A

(3) Part No. TC230-4956-1

Diesel fuel only | No fire



LOW SULFUR FUEL OR ULTRA LOW SULFUR FUEL ONLY

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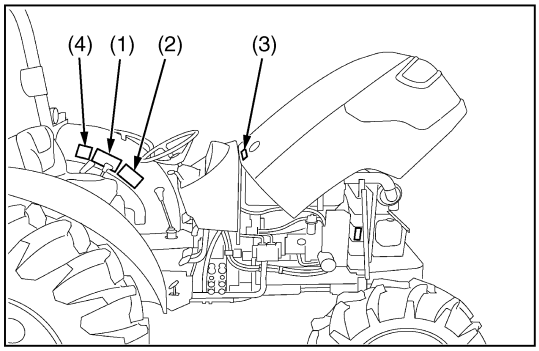

9Y1210365ICI002A

9Y1210365INI0002US0

(1) 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.

1AGAIAZAP076A

(2) Part No. 3A272-9856-1

⚠ CAUTION

TO AVOID INJURY FROM SEPARATION :

DO NOT EXTEND LIFT ROD BEYOND THE GROOVE ON THE THREADED ROD.

1AGAIBHAP077A

(3) Part No. TA040-4935-1

⚠ WARNING

TO AVOID PERSONAL INJURY:

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.

1AGAIAZAP056A

(4) Part No. TA040-4959-3

⚠ WARNING

TO AVOID PERSONAL INJURY.

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

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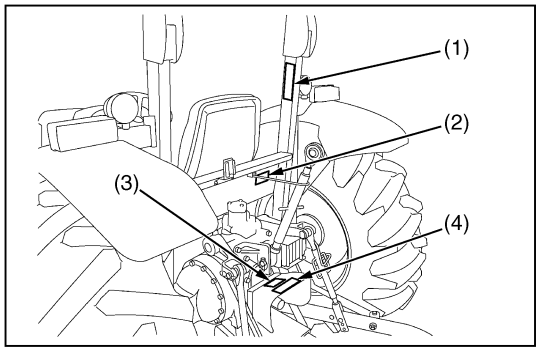

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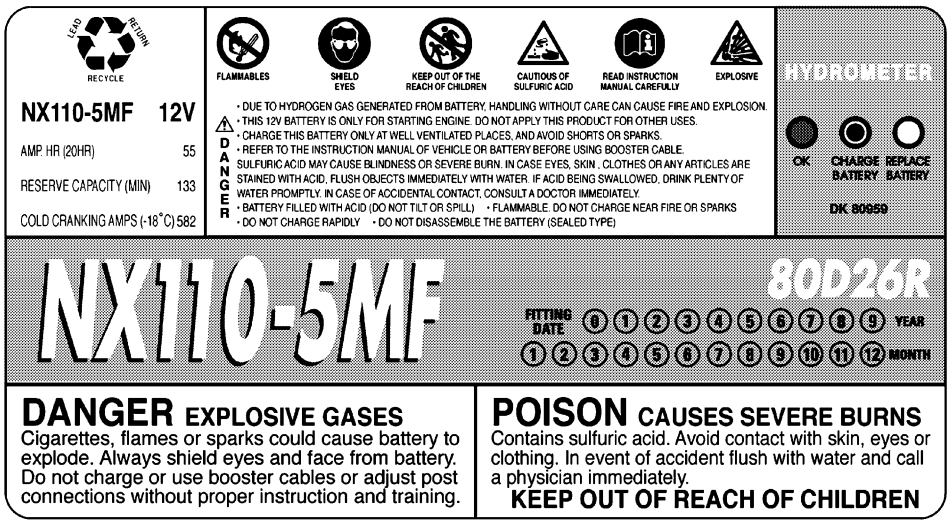
(1) Part No. TD060-3012-1



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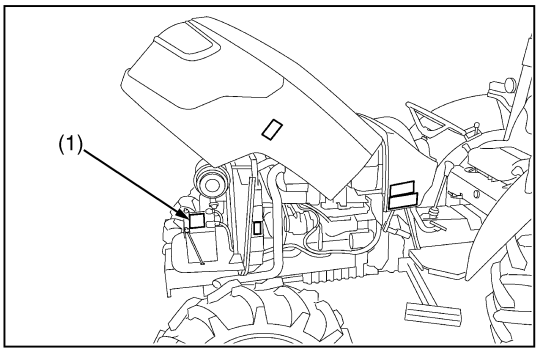

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CARE OF DANGER, WARNING AND CAUTION LABELS

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 replace with new part, make sure new label(s) is (are) attached in the same location(s) as the replace component.
5. Mount new danger, warning and caution labels by applying on a clean dry surface and pressure any bubbles to outside edge.

9Y1210365INI0005US0

3. SPECIFICATIONS

Model			M5640SU	
			2WD	4WD
Engine	Model		V2403-M-TE3	
	Type		Vertical, water-cooled, 4-cycle diesel engine	
	Number of cylinders		4	
	Total displacement		2434 cm^3 (148.6 cu.in.)	
	Bore and stroke		87 × 102.4 mm (3.4 × 4.0 in.)	
	Net power		41.1 kW (55.1 HP)*	
	PTO power (factory observed)		37.3 kW (50 HP)* / 2700 min^{-1} (rpm)	
	Maximum torque		181 N·m (133.2 lbf·ft) / 1400 to 1600min^{-1} (rpm)	
	Battery		12 V, RC : 133 min., CCA 582A	
	Fuel tank capacity		57.0 L (15.1 U.S. gals, 12.5 Imp. gals)	
	Engine crankcase capacity		7.2 L (7.6 U.S.qts, 6.3 Imp.qts)	
	Engine coolant capacity		8.0 L (8.5 U.S.qts, 7.0 Imp.qts)	
Dimensions	Overall length		3505 mm (138.0 in.)	3420 mm (134.6 in.)
	Overall width (Minimum tread)		1850 mm (72.83 in.)	
	Overall height		2360 mm (92.91 in.)	
	Wheel base		2000 mm (78.7 in.)	
	Tread	Front	1420 to 1820 mm (55.9 to 71.7 in.)	1300, 1400 mm (51.2, 55.1 in.)
		Rear	1320 to 1720 mm (52.0 to 67.7 in.)	
	Minimum ground clearance		430 mm (16.9 in.) (BRACKET DRAWBAR)	
Weight			1700 kg (3750 lbs)	1750 kg (3860 lbs)
Travelling system	Standard tire size	Front	6.5-16	8.3-24
		Rear	14.9-28	
	Clutch		Dry, Single plate	
	Steering		Hydrostatic power steering	
	Brake	Travelling	Wet type, multiple discs (mechanical)	
	Differential		Bevel gears with differential lock (Rear)	
Hydraulic system	Hydraulic control system		Position control	
	Pump-up capacity		41.6 L (11.0 U.S.gals, 9.15 Imp.gals)/min.	
	Three point hitch		Category I & II	
	Maximum lifting force		1900 kg (4189 lbs) at lower link end 1500 kg (3307 lbs) at 610 mm (24 in.) behind lifting point	
	System pressure		19.1 MPa (195 kgf/cm^2, 2773 psi)	
PTO	Independent clutch		Wet type, multiple discs	
	Live PTO	Direction of turning	Clockwise, viewed from tractor rear	
		PTO speed	6 spline : 540 min^{-1} (rpm) at 2295 engine min^{-1} (rpm)	

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

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4. TRAVELING SPEEDS

(At rated engine rpm)

Model		M5640SU	
Tire size (Rear)		14.9-28	
Range gear Shift lever	Main gear Shift lever	km/h	mph
L (Low)	1	2.4	1.5
	2	3.3	2.0
	3	5.0	3.1
	4	7.4	4.6
H (High)	1	8.9	5.5
	2	12.0	7.5
	3	18.3	11.4
	4	27.3	16.9
R (Reverse)	1	3.1	1.9
	2	4.2	2.6
	3	6.4	4.0
	4	9.5	5.9

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

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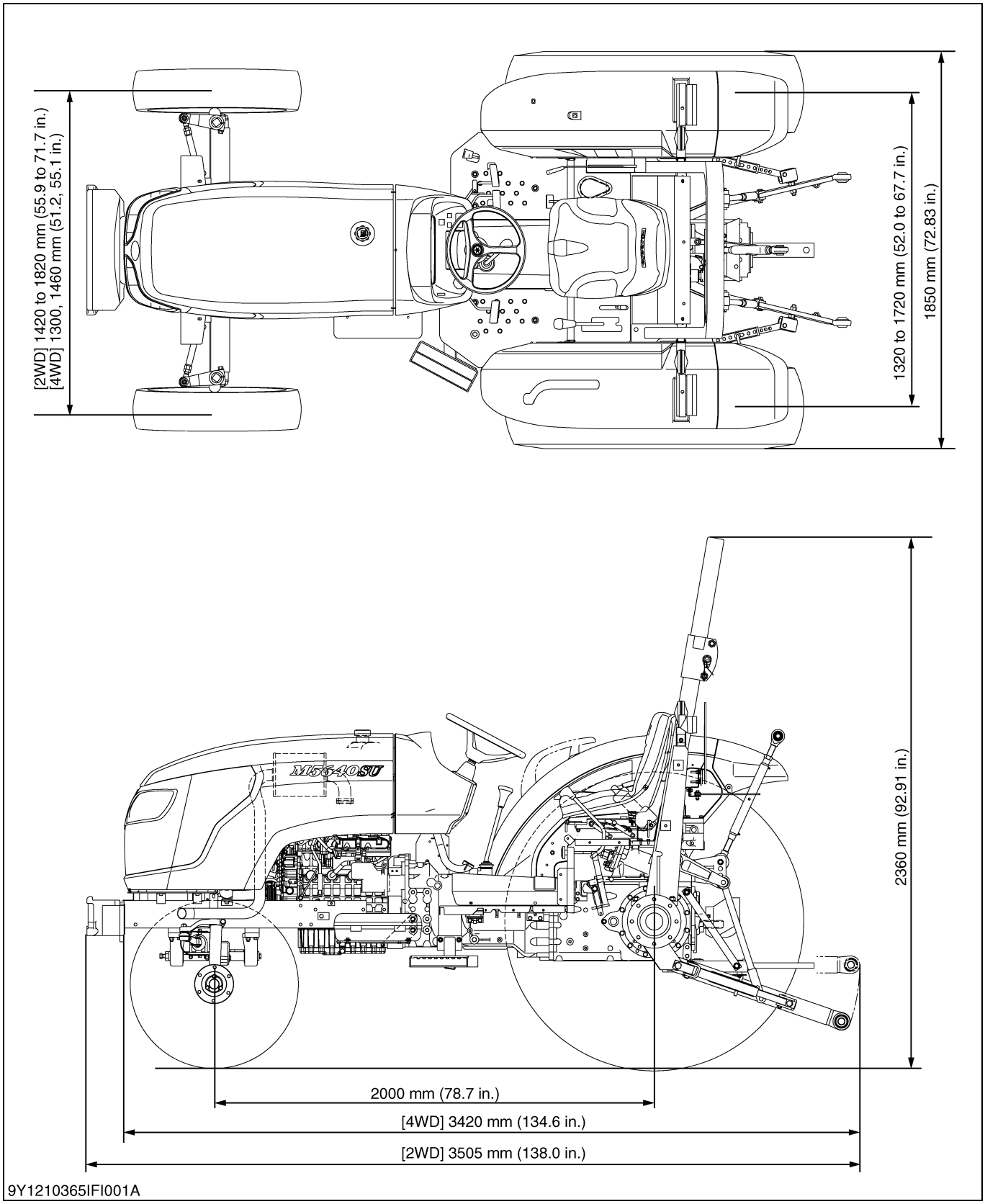
5. DIMENSIONS



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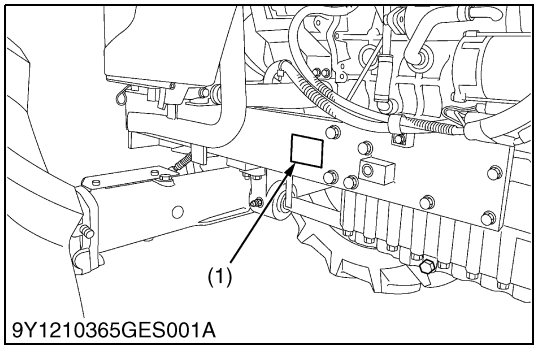
G GENERAL

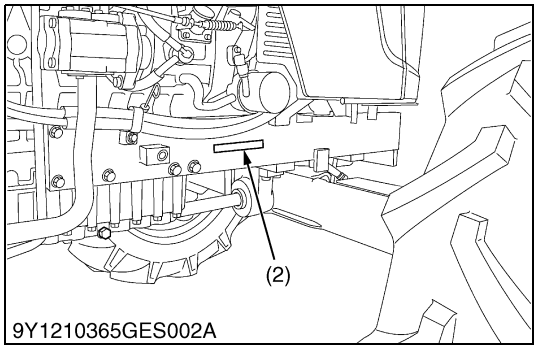
GENERAL

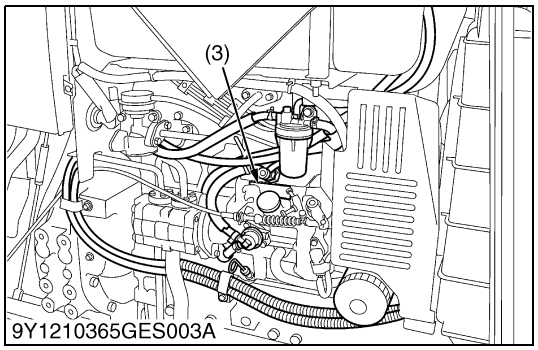
CONTENTS

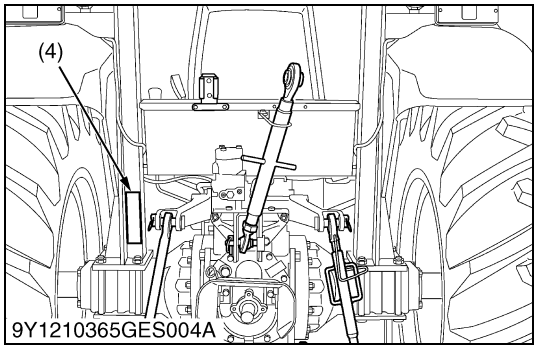
1. TRACTOR IDENTIFICATION

[1] MODEL NAME AND SERIAL NUMBERS





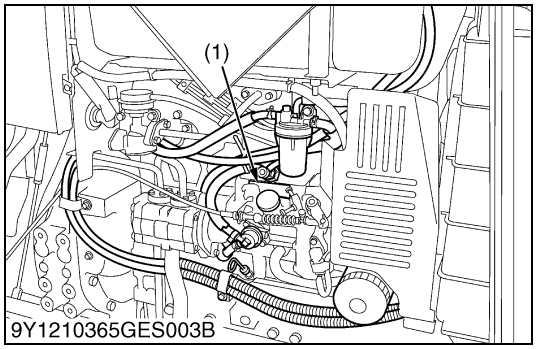




When contracting your local KUBOTA distributor, always specify engine serial number, tractor serial number and hourmeter reading.

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

9Y1210365GEG0001US0



Engine Serial Number

The engine serial number is an identified number for the engine. It is marked after the engine model number.

It indicates month and year of manufacture as follows.

Year of manufacture

Alphabet or Number	Year	Alphabet or Number	Year
1	2001	F	2015
2	2002	G	2016
3	2003	H	2017
4	2004	J	2018
5	2005	K	2019
6	2006	L	2020
7	2007	M	2021
8	2008	N	2022
9	2009	P	2023
A	2010	R	2024
B	2011	S	2025
C	2012	T	2026
D	2013	V	2027
E	2014		

Month of manufacture

Month	Engine Lot Number	
	0001 ~ 9999	**10000 ~**
January	A0001 ~ A9999	B0001 ~
February	C0001 ~ C9999	D0001 ~
March	E0001 ~ E9999	F0001 ~
April	G0001 ~ G9999	H0001 ~
May	J0001 ~ J9999	K0001 ~
June	L0001 ~ L9999	M0001 ~
July	N0001 ~ N9999	P0001 ~
August	Q0001 ~ Q9999	R0001 ~
September	S0001 ~ S9999	T0001 ~
October	U0001 ~ U9999	V0001 ~
November	W0001 ~ W9999	X0001 ~
December	Y0001 ~ Y9999	Z0001 ~

e.g. V2403-M-TE3-9E0001

"9" indicates 2009 and "E" indicates March.

So, 9E indicates that the engine was manufactured on March, 2009.

(1) Engine Model and Serial Number

9Y1210365GEG0002US0

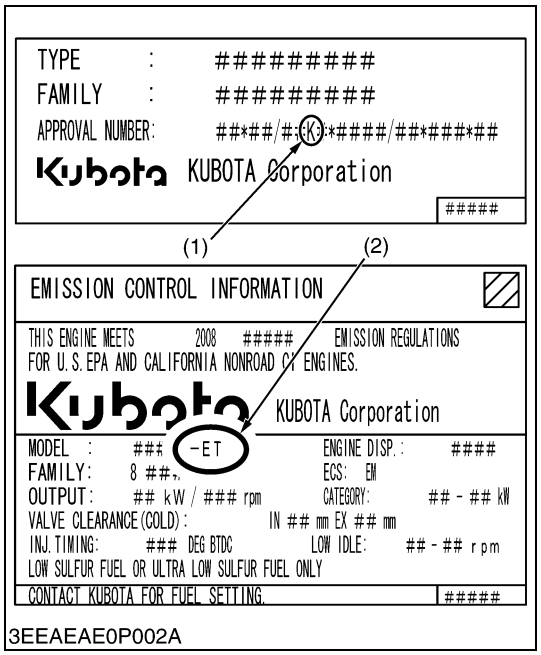
[2] E3B ENGINE

[Example : Engine Model Name V2403-M-T**E3**]

The emission controls previously implemented in various countries to prevent air pollution will be stepped up as Non-Road Emission Standards continue to change. The timing or applicable date of the specific Non-Road Emission regulations depends on the engine output classification.

Over the past several years, Kubota has been supplying diesel engines that comply with regulations in the respective countries affected by Non-Road Emission regulations. For Kubota Engines, E3 will be the designation that identifies engine models affected by the next emission phase (See the table below).

When servicing or repairing engine, use only replacement parts for that specific E3 engine, designated by the appropriate E3 Kubota Parts List and perform all maintenance services listed in the appropriate Kubota Operator's Manual or in the appropriate E3 Kubota Workshop Manual. Use of incorrect replacement parts or replacement parts from other emission level engines (for example: E2 engines), may result in emission levels out of compliance with the original E3 design and EPA or other applicable regulations. Please refer to the emission label located on the engine head cover to identify Output classification and Emission Control Information. E3 engines are identified with "ET" at the end of the Model designation, on the US EPA label. Please note : E3 is not marked on the engine.



3EEAEAE0P002A

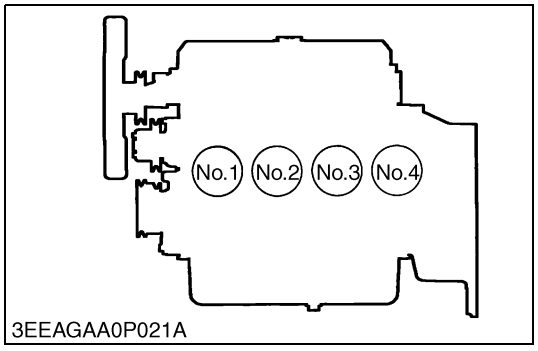
Category (1)	Engine output classification	EU regulation
K	From 19 to less than 37 kW	STAGE IIIA
J	From 37 to less than 75 kW	STAGE IIIA
I	From 75 to less than 130 kW	STAGE IIIA

Category (2)	Engine output classification	EPA regulation
ET	Less than 19kW	Tier 4
	From 19 to less than 56 kW	Interim Tier 4
	From 56 to less than 75 kW	Tier 3
	From 75 to less than 130 kW	Tier 3

(1) EU regulation engine output classification category
(2) "E3B" engines are identified with "ET" at the end of the Model designation, on the US EPA label.
"E3B" designates Tier 3 and some Interim Tier 4 / Tier 4 models, depending on engine output classification.

9Y1210365GEG0076US0

[3] CYLINDER NUMBER



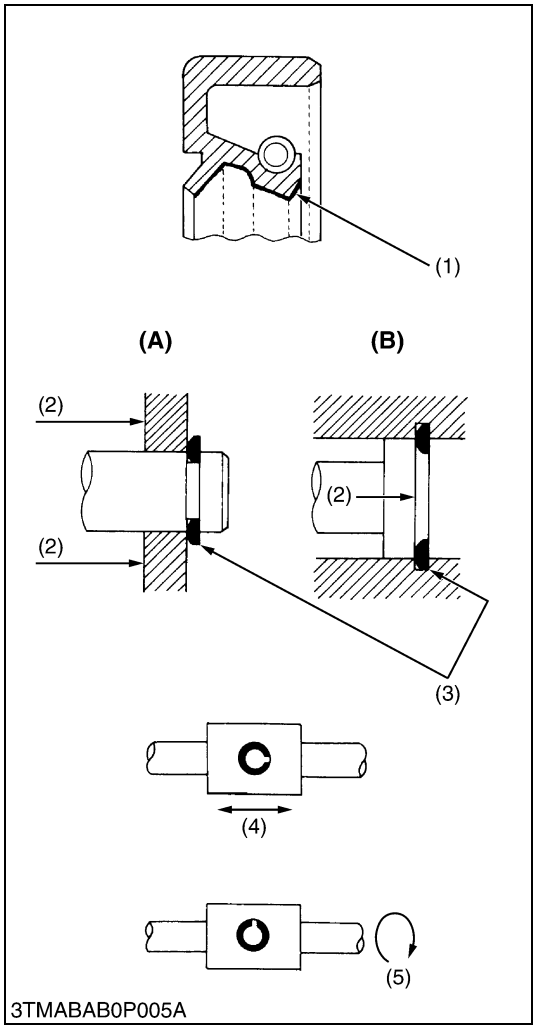
3EEAGAA0P021A

The cylinder numbers of V2403-M-TE3 diesel engine are 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 **gear case side**.

9Y1210365GEG0077US0

2. GENERAL PRECAUTIONS



3TMABAB0P005A

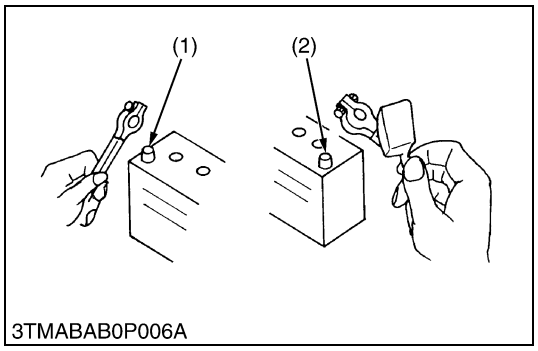
- When you disassemble, carefully put the parts in a clean area to make it easy to find the parts. You must install the screws, bolts and nuts in their initial position to prevent the reassembly errors.
- When it is necessary to use special tools, use KUBOTA special tools. Refer to the drawings when 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.
- Clean the parts before you measure them.
- Tighten the nipples to the specified torque. Too much torque can cause damage to the hydraulic units or the nipples. Not sufficient torque can cause oil leakage.
- When you use a new hose or pipe, tighten the nuts to the specified torque. Then loosen (approx. by 45 °) and let them be stable before you tighten to the specified torque (This is not applied to the parts with seal tape).
- When you remove the two ends of a pipe, remove the lower end first.
- Use two pliers in removal and installation. One to hold the stable side, and the other to turn the side you remove to prevent twists.
- Make sure that the sleeves of fearless connectors and taper sections of hoses are free of dust and scratches.
- After you tighten the nipples, clean the joint and apply the maximum operation pressure 2 to 3 times to examine oil leakage.

(1) Grease
(2) Force
(3) Sharp Edge
(4) Axial Force
(5) Rotating Movement

(A) External Snap Ring
(B) Internal Snap Ring

WSM000001GEG0106US1

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.

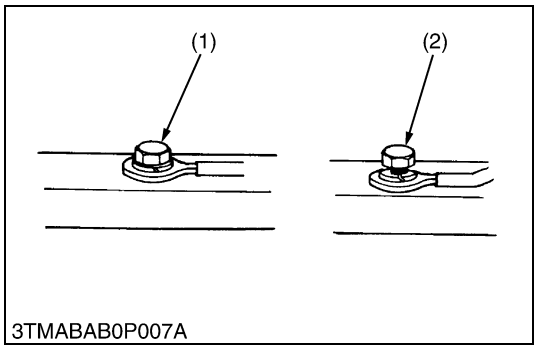
■ **IMPORTANT**

- **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

WSM000001GEG0062US1

[1] WIRING

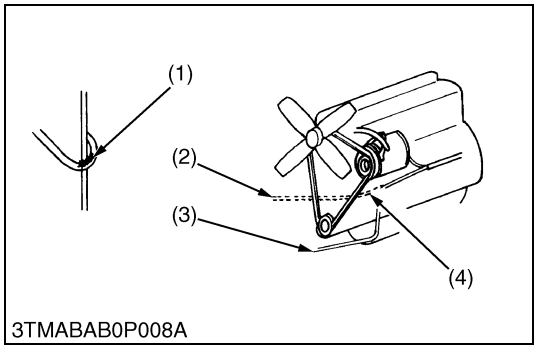


3TMABAB0P007A

- Securely tighten wiring terminals.

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

WSM000001GEG0063US1

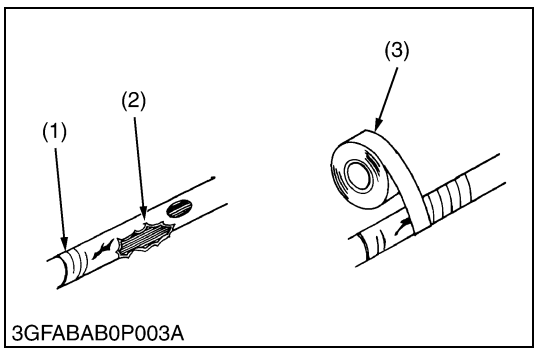


3TMABAB0P008A

- Do not let wiring contact dangerous part.

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

WSM000001GEG0064US1

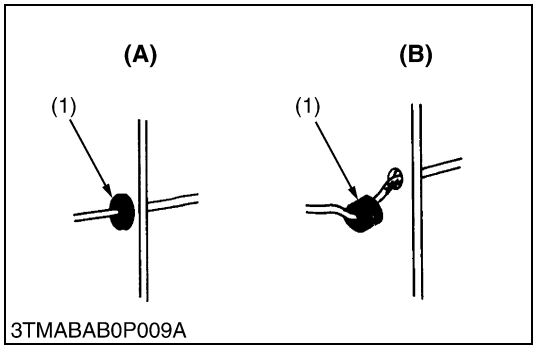


3GFABAB0P003A

- Repair or change torn or aged wiring immediately.

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

WSM000001GEG0065US1



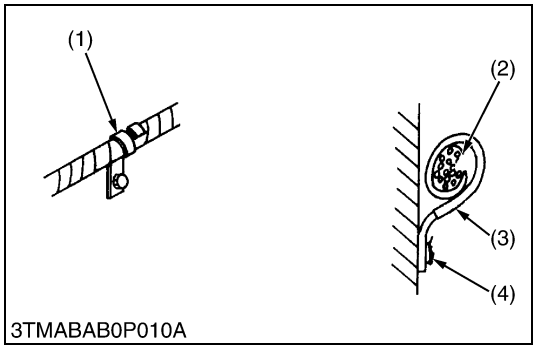
3TMABAB0P009A

- Securely insert grommet.

(1) Grommet

(A) Correct
(B) Incorrect

WSM000001GEG0066US1

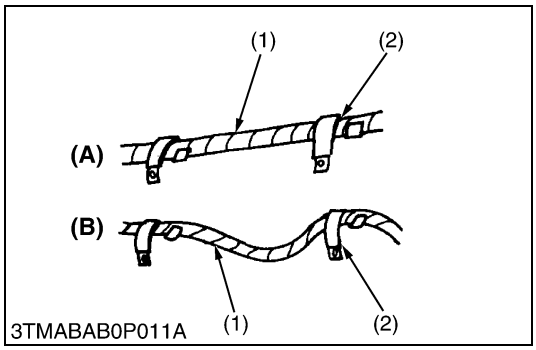


3TMABAB0P010A

- Securely clamp, being careful not to damage wiring.

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

WSM000001GEG0067US1



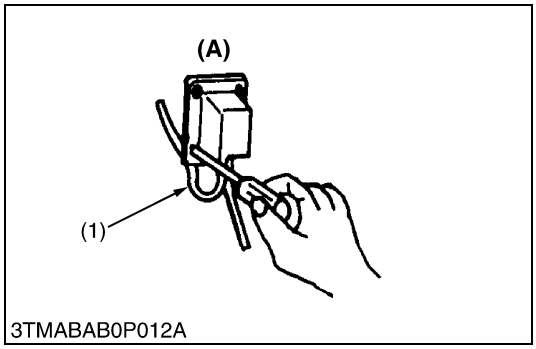
3TMABAB0P011A

- 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

WSM000001GEG0068US1



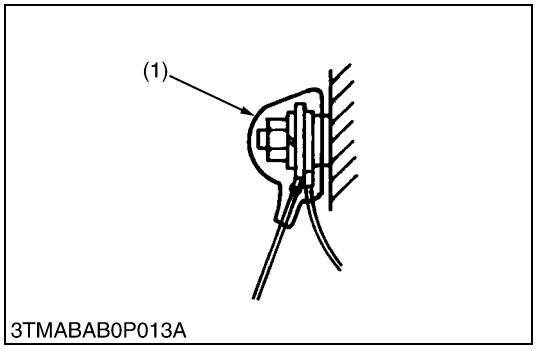
3TMABAB0P012A

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

(1) Wiring

(A) Incorrect

WSM000001GEG0069US1



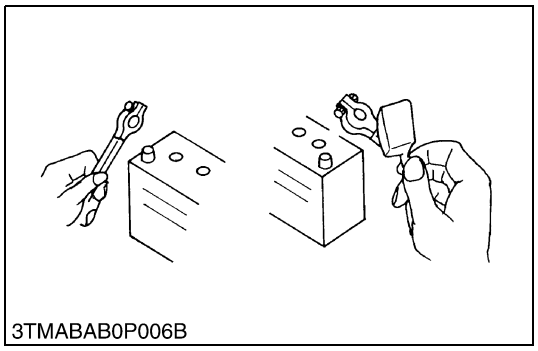
3TMABAB0P013A

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

(1) Cover
(Securely Install Cover)

WSM000001GEG0070US1

[2] BATTERY

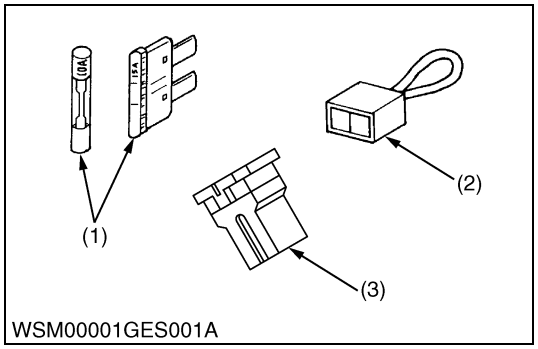

3TMABAB0P006B

- 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.**

WSM000001GEG0071US1

[3] FUSE



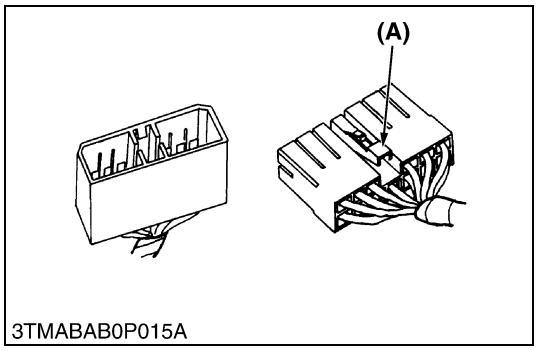
WSM00001GES001A

- 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

WSM000001GEG0072US1

[4] CONNECTOR

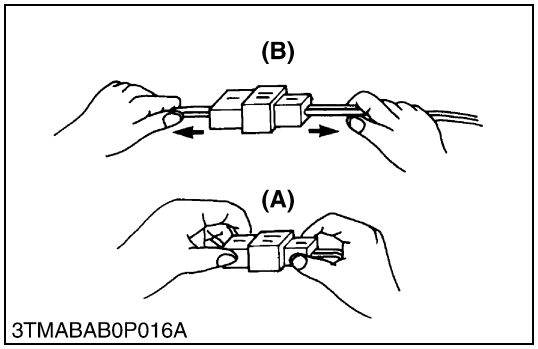


3TMABAB0P015A

- For connector with lock, push lock to separate.

(A) Push

WSM000001GEG0073US1

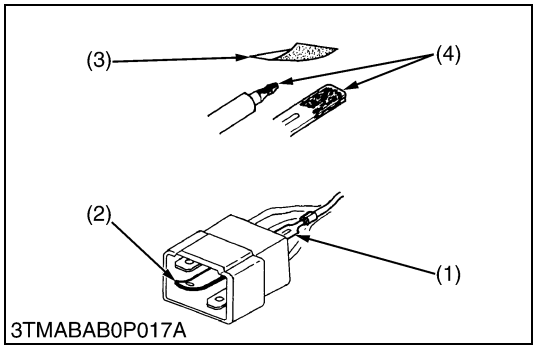


3TMABAB0P016A

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

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

WSM000001GEG0074US1

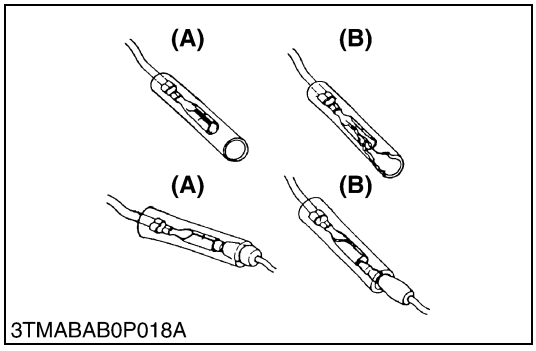


3TMABAB0P017A

- 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

WSM000001GEG0075US1

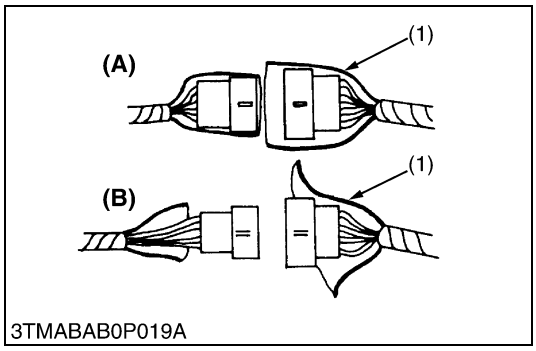


3TMABAB0P018A

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

(A) Correct
(B) Incorrect

WSM000001GEG0076US1



3TMABAB0P019A

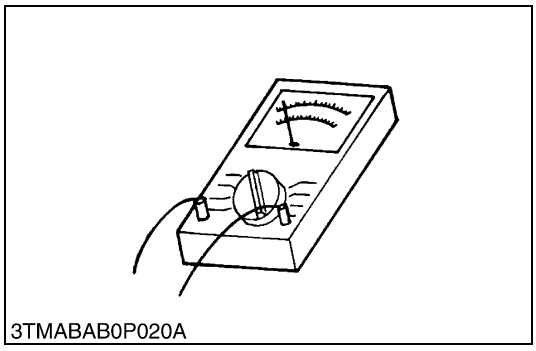
- Make certain plastic cover is large enough to cover whole connector.

(1) Cover

(A) Correct
(B) Incorrect

WSM000001GEG0077US1

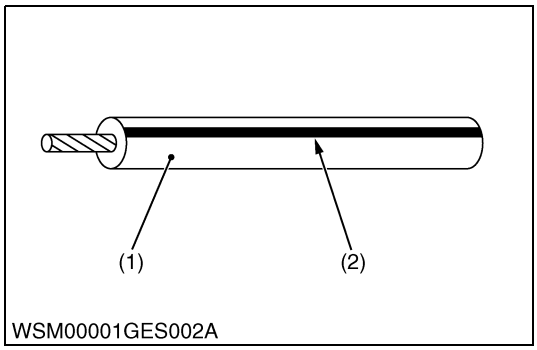
[5] HANDLING OF CIRCUIT TESTER


3TMABAB0P020A

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

WSM000001GEG0078US1

[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 stripe 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

	Place	Capacity		Lubricants, fuel and coolant
		M5640SU	M5640SUD	
1	Fuel tank	57.0 L 15.1 U.S. gals 12.5 Imp. gals		• No. 2-D diesel fuel • No. 1-D diesel fuel if temperature is below −10 °C (14 °F)
2	Coolant	8.0 L 8.5 U.S.qts 7.0 Imp.qts		Fresh clean water with anti-freeze
3	Engine crankcase (with filter)	7.2 L 7.6 U.S.qts 6.3 Imp.qts		**Engine oil** API Service Classification CC or CD • Below 0 °C (32 °F) SAE10W, 10W-30 or 10W-40 • 0 to 25 °C (32 to 77 °F) SAE20, 10W-30 or 10W-40 • Above 25 °C (77 °F) SAE30, 10W-30 or 10W-40
4	Transmission case	40.0 L 42.3 U.S.qts 35.2 Imp.qts		KUBOTA UDT or SUPER UDT fluid*
5	Front axle case	–	8.0 L 8.5 U.S.qts 7.0 Imp.qts	KUBOTA UDT or SUPER UDT fluid* or SAE80, SAE90 gear oil

Greasing

	Place	No. of greasing point		Capacity	Type of grease
6	Top link	2		Until grease overflows	Multipurpose type grease NLGI-2 or NLGI-1 (GC-LB)
	Lift rod	1			
	Front axle gear case support	–	2		
	Front axle support	2			
	Front wheel hub	2	–		
	Knuckle shaft	2	–		
	Battery terminal	2		Moderate amount	

* KUBOTA original transmission hydraulic fluid.

9Y1210365GEG0003US0

■ **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	Oil class of engines with 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**	**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

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

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.

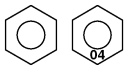
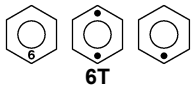
■ **Indicated capacities of water and oil are manufacturer's estimate.**

9Y1210365GEG0004US0

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			7 7T			9 9T		
Indication on top of nut	 No-grade or 4T						 6T		
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	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	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	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	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	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	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	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	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

WSM000001GEG0001US1

[2] STUD BOLTS

Material of opponent part	Ordinariness			Aluminum		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M8	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	25 to 31	2.5 to 3.2	18 to 23	20 to 25	2.0 to 2.6	15 to 18
M12	30 to 49	3.0 to 5.0	22 to 36	31	3.2	23
M14	62 to 73	6.3 to 7.5	46 to 54	–	–	–
M16	98.1 to 112	10.0 to 11.5	72.4 to 83.1	–	–	–
M18	172 to 201	17.5 to 20.5	127 to 148	–	–	–

WSM000001GEG0002US1

[3] HYDRAULIC FITTINGS

(1) Hydraulic Hose Fitting

Hose size	Thread side	Tightening torque		
		N·m	kfg·m	lbf·ft
02	1/8	13.8 to 15.6	1.40 to 1.60	10.2 to 11.5
03	1/4	22.6 to 27.4	2.30 to 2.80	16.7 to 20.2
04				
05	3/8	45.2 to 52.9	4.60 to 5.40	33.3 to 39.0
06				

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(2) Hydraulic PIpe Cap Nuts

Pipe size	Tightening torque		
	N·m	kfg·m	lbf·ft
ϕ4 × t1.0	19.7 to 29.4	2.00 to 3.00	14.5 to 21.6
ϕ6 × t1.0	24.6 to 34.3	2.50 to 3.50	18.1 to 25.3
ϕ8 × t1.0	29.5 to 39.2	3.00 to 4.00	21.7 to 28.9
ϕ10 × t1.0	39.3 to 49.0	4.00 to 5.00	29.0 to 36.1
ϕ12 × t1.5	49.1 to 68.6	5.00 to 7.00	36.2 to 50.6
ϕ15 × t1.6	108 to 117	11.0 to 12.0	79.6 to 86.7
ϕ18 × t1.6	108 to 117	11.0 to 12.0	79.6 to 86.7

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(3) Adaptors, Elbows and Others

Item	Thread side	Tightening torque		
		N·m	kfg·m	lbf·ft
POA-PF (Nipple with O-ring)	PF 1/8	45 to 53	4.5 to 5.5	33 to 39
	PF 1/4	74 to 83	7.5 to 8.5	55 to 61
	PF 3/8	93.2 to 102	9.50 to 10.5	68.8 to 75.9
	PF 1/2	113 to 122	11.5 to 12.5	83.2 to 90.4
POB-PF (Elbow with O-ring and no nut)	PF 1/8	23 to 26	2.3 to 2.7	17 to 19
	PF 1/4	36 to 43	3.6 to 4.4	26 to 31
	PF 3/8	54 to 63	5.5 to 6.5	40 to 47
	PF 1/2	73 to 83	7.4 to 8.5	54 to 61
Adaptor (NPT)	PF 1/8	9.8 to 14	1.0 to 1.5	7.3 to 10
	PF 1/4	30 to 34	3.0 to 3.5	22 to 25
	PF 3/8	49 to 68	5.0 to 7.0	37 to 50
	PF 1/2	69 to 88	7.0 to 9.0	51 to 65

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6. MAINTENANCE

No.	Item			Service Interval														Since then	Important		Reference page
				50	100	150	200	250	300	350	400	450	500	550	600	650	700				
1	Engine start system		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr			G-20
2	Wheel bolt torque		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	every 50 Hr			G-20
3	Battery condition		Check		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	*4		G-26
4	Greasing		–		☆		☆		☆		☆		☆		☆		☆	every 100 Hr			G-21
5	Fan belt		Adjust		☆		☆		☆		☆		☆		☆		☆	every 100 Hr			G-23
6	Brake pedal		Adjust		☆		☆		☆		☆		☆		☆		☆	every 100 Hr			G-24
7	Clutch pedal		Adjust	★	☆		☆		☆		☆		☆		☆		☆	every 100 Hr			G-19
8	Fuel filter		Clean		☆		☆		☆		☆		☆		☆		☆	every 100 Hr		@	G-22
			Replace								☆							every 400 Hr			G-28
9	Air cleaner element	Primary element	Clean		☆		☆		☆		☆		☆		☆		☆	every 100 Hr	*1	@	G-22
			Replace															every 1 year	*2		G-30
		Secondary element	Replace															every 1 year			G-30
10	Fuel line		Check		☆		☆		☆		☆		☆		☆		☆	every 100 Hr		@	G-23
			Replace															every 2 years	*3		G-33
11	Toe-in		Adjust				☆				☆				☆			every 200 Hr			G-28
12	Power steering oil line		Check				☆				☆				☆			every 200 Hr			G-27
			Replace															every 2 years			G-33
13	Radiator hose and clamp		Check				☆				☆				☆			every 200 Hr			G-27
			Replace															every 2 years			G-33
14	Intake air line		Check				☆				☆				☆			every 200 Hr		@	G-23
			Replace															every 2 years			G-33
15	Hydraulic oil filter		Replace	★					☆						☆			every 300 Hr			G-18
16	Engine oil		Change	★							☆							every 400 Hr			G-17
17	Greasing (2WD front wheel hub)		–								☆							every 400 Hr			G-29
18	Engine oil filter		Replace	★							☆							every 400 Hr			G-17
19	Transmission fluid		Change	★											☆			every 600 Hr			G-19
20	Front axle case oil		Change												☆			every 600 Hr			G-29
21	Front axle pivot		Adjust												☆			every 600 Hr			G-29
22	Engine valve clearance		Adjust															every 800 Hr			G-29
23	Fuel injection nozzle injection pressure		Check															every 1500 Hr		@	G-30