

Product: Kubota M90 M110 M120 Service Manual

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WSM

**WORKSHOP MANUAL
TRACTOR**

M90

M110

M120

Kubota

KISC issued 03, 2006 A

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TO THE READER

This Workshop Manual has been prepared to provide servicing personnel with information on the mechanism, service and maintenance of KUBOTA Tractors M-90, M-110 and M-120. It is divided into two parts, "Mechanism" and "Servicing" for each section.

■ Mechanism

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

■ Servicing

Under the heading "General" section comes 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 production information available at the time of publication.

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

June 2002

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SAFETY FIRST

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

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

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

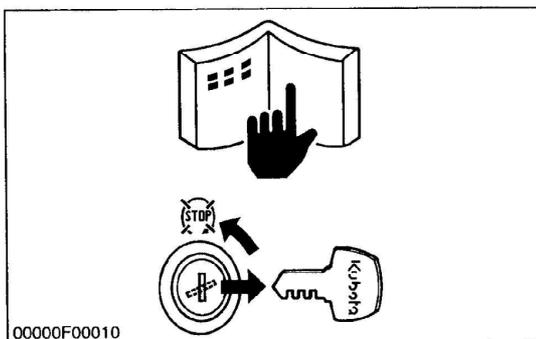
 **WARNING** : Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

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

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

 **NOTE** : Gives helpful information.

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BEFORE SERVICING AND REPAIRING

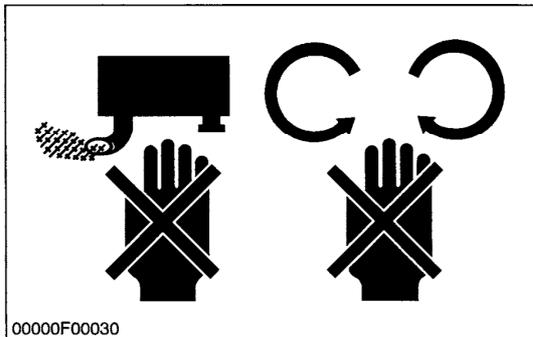
- (1) Read all instructions and safety instructions in this manual and on your machine safety decals.
- (2) Clean the work area and machine.
- (3) Park the machine on a firm and level ground, and set the parking brake.
- (4) Lower the implement to the ground.
- (5) Stop the engine, and remove the key.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

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**SAFETY STARTING**

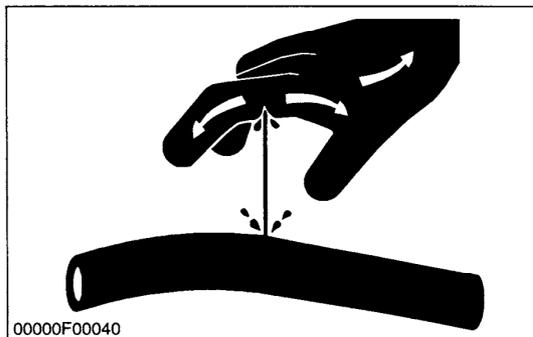
- (1) Do not start the engine by shorting across starter terminals or bypassing the safety start switch.
- (2) Do not alter or remove any part of machine safety system.
- (3) Before starting the engine, make sure that all shift levers are in neutral positions or in disengaged positions.
- (4) Never start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

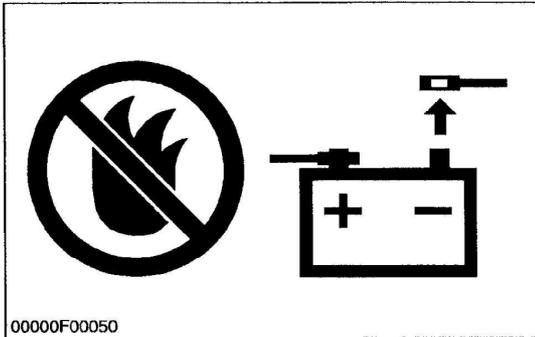
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**SAFETY WORKING**

- (1) Do not work on the machine while under the influence of alcohol, medication, or other substances or while fatigued.
- (2) Wear close fitting clothing and safety equipment appropriate to the job.
- (3) Use tools appropriate to the work. Makeshift tools, parts, and procedures are not recommended.
- (4) When servicing is performed together by two or more persons, take care to perform all work safely.
- (5) Do not work under the machine that is supported solely by a jack. Always support the machine by safety stands.
- (6) Do not touch the rotating or hot parts while the engine is running.
- (7) 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.
- (8) 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.
- (9) 4WD tractor equipped with 4WD braking system.
To avoid the possibility of personal injury or property damage from machine runaway during testing, service or repair with the rear wheels off the ground, make sure :
 - Battery is disconnected and engine is not started.
If it is necessary to run the engine, make sure :
 - Both front and rear wheels are off the ground and secured with standards before starting engine.

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**AVOID FIRES**

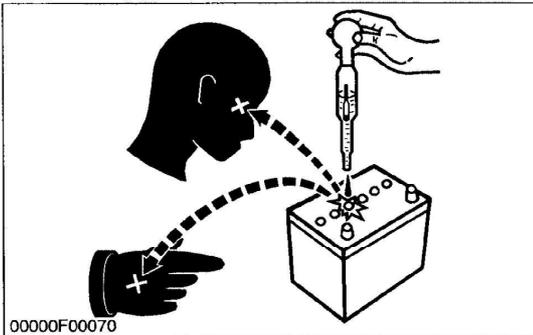
- (1) Fuel is extremely flammable and explosive under certain conditions. Do not smoke or allow flames or sparks in your working area.
- (2) To avoid sparks from an accidental short circuit, always disconnect the battery negative cable first and connect it last.
- (3) Battery gas can explode. Keep sparks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

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**VENTILATE WORK AREA**

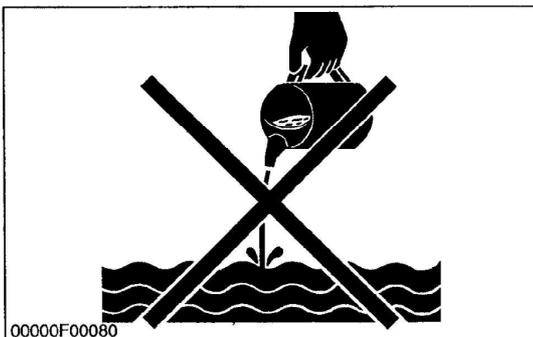
- (1) If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in a closed area. The exhaust gas contains poisonous carbon monoxide.

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**PREVENT ACID BURNS**

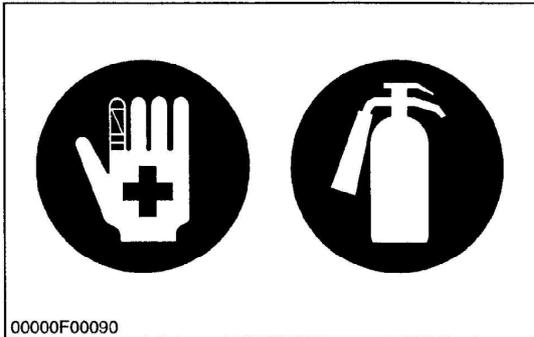
- (1) Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, clothing and cause blindness if splashed into eyes. Keep electrolyte away from eyes, hands and clothing. If you spill electrolyte on yourself, flush with water, and get medical attention immediately.

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**DISPOSE OF FLUIDS PROPERLY**

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

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PREPARE FOR EMERGENCIES

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

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SAFETY DECALS

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

① Part No. 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.

② Part No. TA040-4957-1
Stay clear of engine fan and fanbelt.



③ Part No. 33970-9898-1

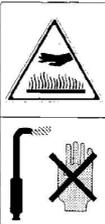
CAUTION REFRIGERANT UNDER HIGH PRESSURE

Improper service methods may cause personal injury. This air conditioning system should be serviced by your dealer or any other qualified service shop. See Repair Manual for details.

R134a <small>USE ONLY</small>	<small>Refrigerant</small> Max. 1.20kg (2.64 lbs.) Min. 1.10kg (2.42 lbs.)	<small>or</small> ND-OIL8 <small>USE ONLY</small>	<small>SAE</small> J-639
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MFD. BY NIPPONDENSO CO., LTD. JAPAN

④ Part No. 3F240-4958-1
⑤ Part No. 32310-4958-1
Do not touch hot surface like muffler, etc.



⑦ Part No.

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.

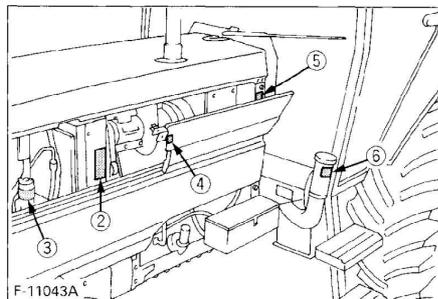
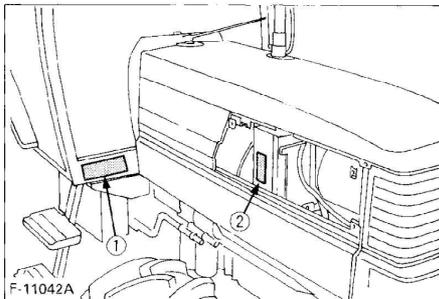
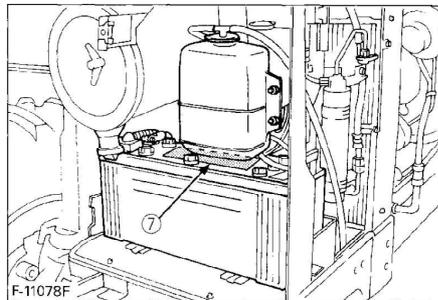
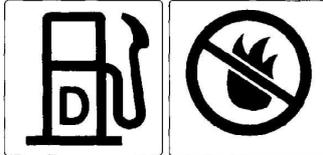
KEEP VENT CAPS TIGHT AND LEVEL

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

⑥ Part No. TA040-4956-2
Diesel fuel only. No fire



① Part No. 3F240-9857-1

⚠ WARNING

To avoid free wheeling when shifting the shuttle lever while on a slope, stop completely by using the brake and by depressing the clutch pedal. Start off after selecting shuttle direction by releasing the clutch pedal.

② Part No. 3F240-4905-2



⚠ WARNING

To avoid personal injury: Use "Bi-speed Turn" only in low gears and slow speed. Do not use "Bi-speed Turn" in high gears or road speed.

③ Part No. 35080-6528-2

⚠ CAUTION

Pull the engine stop knob back and hold it until the engine stops in case of emergency.

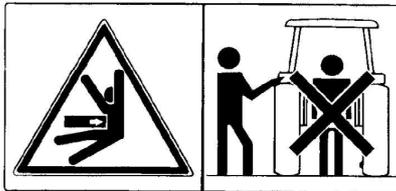
⑤ Part No. TA040-4935-1

⚠ 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.

④ Part No. 3F240-9819-1
Do not stand by IMPLEMENT or between implement and tractor while operating remote hitch switch.



⑥ Part No. 3A111-9856-3

⚠ CAUTION

TO AVOID INJURY FROM SEPARATION:

RH
DO NOT EXTEND LIFT ROD BEYOND THE POINT WHERE THREADS ARE EXPOSED.

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

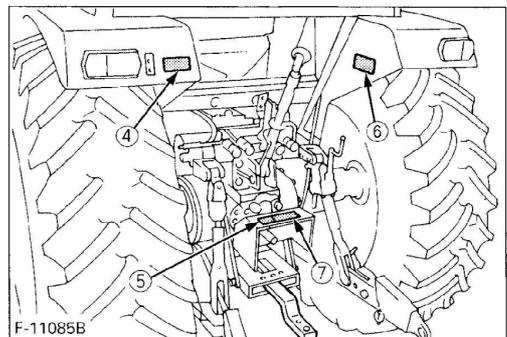
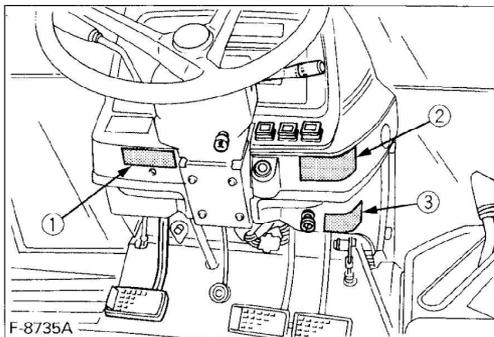
⑦ Part No. TA040-4959-3



⚠ 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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① Part No. 3F240-9836-1

CAUTION**TO AVOID PERSONAL INJURY:**

1. Read and understand the operator's manual before operation.
2. Before starting the engine, make sure that everyone is at a safe distance from tractor and 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 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, set the parking brake, stop the engine and remove the key.

② Part No. TA240-4933-2

WARNING**BEFORE DISMOUNTING TRACTOR:**

1. **ALWAYS SET PARKING BRAKE**
Leaving transmission in gear with the engine stopped will not prevent tractor from rolling.
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. **STOP THE ENGINE.**

③ Part No. TA040-4902-1

WARNING

TO AVOID INJURY OR DEATH FROM ROLL-OVER:
Always use seat belt when driving.

④ Part No. 3F240-4966-1

CAUTION

USE [UP-DOWN] ONLY ON FARM FIELDS.
FOR ALL OTHER APPLICATIONS, USE HYDRAULIC LEVER TO MOVE ATTACHMENT.

⑤ Part No. 3F240-9818-1

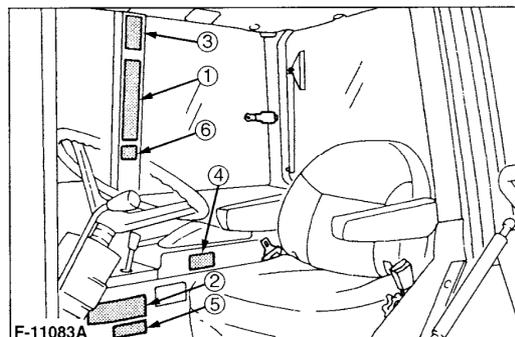
CAUTION

To avoid improper parking brake engagement:
When applying the parking brake lever, do not use right seat swivel position.

⑥ Part No. 3F240-9821-1

WARNING

TO AVOID MACHINE RUNAWAY DUE TO 4WD BRAKING SYSTEM:
Do not run engine with only rear wheels off ground.



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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 from your local KUBOTA Dealer.
4. If a component with danger, warning and caution labels (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		M-90	M-110		M-120		
		4WD	2WD	4WD	2WD	4WD	
PTO power (Factory observed)		52.6 kW (70.5 HP, 2400 rpm)	65.6 kW (88 HP, 2400rpm)		73 kW (98 HP, 2400 rpm)		
Engine	Model	V4702-TL	F5802-TEI		F5802-TE		
	Type	Direct injection, W / wastegate turbocharger, water-cooled 4 cycle diesel					
	No. of cylinders	4	5				
	Total displacement	4665 cm ³ (284.7 cu.in.)	5832 cm ³ (335.9 cu.in.)				
	Bore and stroke	109 × 125 mm (4.3 × 4.9 in.)					
	Engine rated output	66.2 kW (88.7 HP)	82.06 kW (110 HP)		89.52 kW (120 HP)		
	Rated revolution	2400 rpm					
	Maximum torque	335 N·m (34 kgf·m, 247 ft·lbs) / 1200 rpm	442 N·m (43.0 kgf·m, 311.2 ft·lbs) / 1200 rpm		461 N·m (47.0 kgf·m, 339.9 ft·lbs) / 1200 rpm		
	Battery	12 V, RC: 270 mm, CCA 916A	12 V, RC: 304 mm, CCA 1045A				
	Fuel	Diesel fuel No. 1-D [below -10 °C (14 °F)] Diesel fuel No. 2-D [above -10 °C (14 °F)]					
	Fuel tank capacity	150 L (39.7 U.S.gals., 33 Imp.gals.)			200 L (52.9 U.S.gals., 44 Imp.gals.)		
	Engine crankcase capacity	16.3 L (17.2 U.S.qts., 14.3 Imp.qts.)	20.8 L (22.0 U.S.qts., 18.3 Imp.qts.)				
	Engine coolant capacity	12.0 L (12.7 U.S.qts., 10.6 Imp.qts.)	13 L (3.4 U.S.qts., 2.86 Imp.qts.)				
Dimensions	Overall length	3930 mm (154.7 in.)	4097 mm (161.3 in.)	4223 mm (166.3 in.)	4238 mm (166.9 in.)	4365 mm (171.9 in.)	
	Overall width (Minimum tread)	1970 mm (77.6 in.)	2181 mm (85.9 in.)		2195 mm (86.4 in.)		
	Overall height (with ROPS)	2650 mm (100.8 in.)	2685 mm (105.7 in.)		2725 mm (107.3 in.)		
	Wheel base	2300 mm (90.6 in.)	2945 mm (98.2 in.)	2510 mm (98.8 in.)	2635 mm (103.7 in.)	2690 mm (105.9 in.)	
	Tread	Front	1530 mm (60.2 in.)	1520 to 2120 mm (59.8 to 83.5 in.)	1530 mm (60.2 in.) 1660 mm (63.8 in.)	1520 to 2120 mm (59.8 to 83.5 in.)	1640 mm (64.6 in.) 1740 mm (68.5 in.)
		Rear	1510 to 1990 mm (59.4 to 78.3 in.)	1520 to 2020 mm (59.8 to 79.5 in.)		1550 to 2110 mm (61.0 to 83.1 in.)	
	Minimum ground clearance	570 mm (22.4 in.)	510 mm (20.1 in.)	590 mm (23.2 in.)	560 mm (22.0 in.)	615 mm (24.2 in.)	
Weight (Std.)		3650 kg (8048 lbs)	3900 kg (8598 lbs)	4200 kg (9259 lbs)	4100 kg (9040 lbs)	4400 kg (9700 lbs)	
Travelling system	Standard tire size	Front	12.4 - 24	10.6 - 16	13.6 - 24	11.0 - 16	14.9 - 24
		Rear	16.9R - 34	18.4R - 34		18.4R - 38	
	Clutch	Multiple wet disc, electronic hydraulically operated					
	Steering	Full hydrostatic power steering					
	Transmission	Power shift, electronic shuttle, 16F / 16R (with creep speed 24F / 24R)					
	Brake	Travelling	Wet type, multiple discs (hydraulic)				
		Parking	Wet discs (mechanical)				
Differential	Bevel gears (with differential lock (hydraulic))						

SPECIFICATIONS

M110 • M120 WSM, 12261

Model		M-90	M-110		M-120	
		4WD	2WD	4WD	2WD	4WD
Hydraulic system	Hydraulic control system		Electronic draft control			
	Pump-up capacity		78 L (20.6 U.S.gals., 17.2 Imp.gals.)/min.			
	Three point hitch		Category II			
	Max. lifting force (Full Stroke)	*1	At lifting points kg	2635 kg (5809 lbs) / *3 4860 kg (10715 lbs)		
			At 610mm (24 in.) behind lifting point	2360 kg (5203 lbs) / *3 4345 kg (9579 lbs)		
	System pressure		19.12 to 19.61 MPa (195 to 200 kg/cm ² , 2773 to 2845 psi)			
PTO	Independent clutch		Wet type multiple discs			
	Live PTO	Direction of turning	Clockwise, viewed from tractor rear			
		PTO speed	6 spline shaft 540 rpm / Engine 2035 rpm 6 spline shaft 850 rpm / Engine 2400 rpm	6 spline shaft 540 rpm / Engine 2035 rpm 21 spline shaft 1000 rpm / Engine 2210 rpm		
	Tranction system		Swing drawbar, adjustable in direction			

NOTE: *1 Manufacture's estimate The company reserves the right to change the specifications without notice.

*2 Top link mounting : upper hole, lift rod length : minimum, lower link lift pt. : rear.

*3 Two assist cylinders be attached (option).

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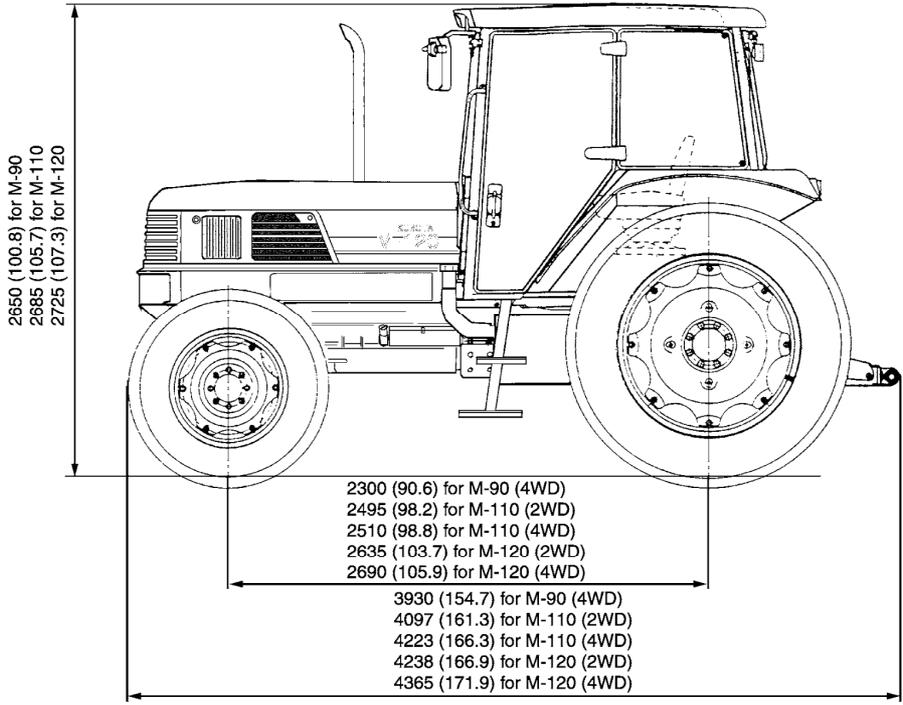
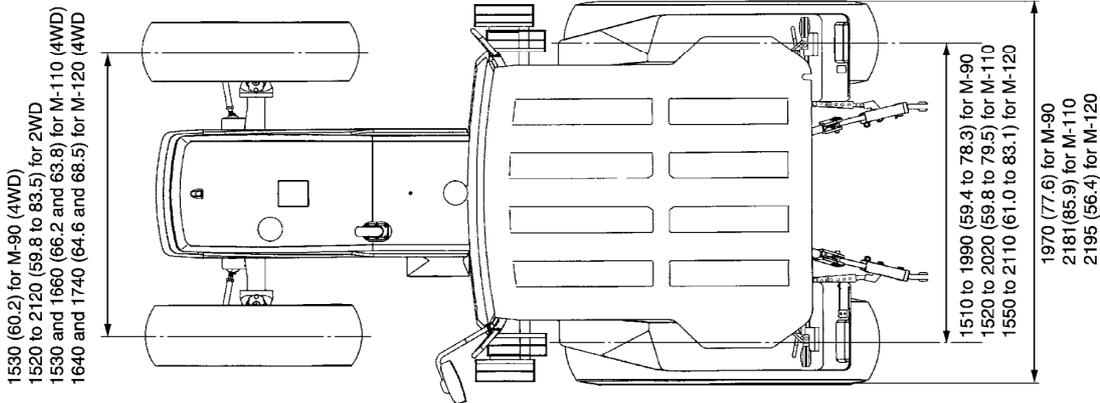
TRAVELLING SPEED

Model	M-90		M-110		M-120	
Tire size (Rear)	16.9R34		18.4R34		18.4R38	
Range	Speed (km/h)	Speed (mph)	Speed (km/h)	Speed (mph)	Speed (km/h)	Speed (mph)
C1	0.33	0.21	0.34	0.21	0.36	0.22
C2	0.40	0.25	0.42	0.26	0.45	0.28
C3	0.51	0.32	0.53	0.33	0.56	0.35
C4	0.63	0.39	0.66	0.41	0.70	0.44
C5	0.79	0.49	0.83	0.52	0.88	0.55
C6	0.99	0.61	1.03	0.64	1.09	0.68
C7	1.23	0.76	1.29	0.80	1.37	0.85
C8	1.55	0.96	1.62	1.01	1.72	1.07
1	1.81	1.12	1.89	1.18	2.00	1.24
2	2.26	1.40	2.36	1.47	2.49	1.55
3	2.82	1.75	2.95	1.83	3.12	1.94
4	3.54	2.20	3.70	2.30	3.92	2.43
5	4.43	2.75	4.63	2.88	4.90	3.05
6	5.52	3.43	5.77	3.59	6.11	3.79
7	6.90	4.28	7.22	4.49	7.64	4.75
8	8.66	5.38	9.06	5.63	9.59	5.96
9	6.33	3.93	6.62	4.11	7.00	4.35
10	7.88	4.89	8.24	5.12	8.72	5.42
11	9.86	6.12	10.31	6.40	10.90	6.77
12	12.37	7.68	12.94	8.04	13.69	8.51
13	15.48	9.61	16.19	10.06	17.13	10.64
14	19.29	11.98	20.17	12.53	21.34	13.26
15	24.12	14.98	25.22	15.67	26.68	16.58
16	32.56	20.22	34.05	21.16	36.02	22.38

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DIMENSIONS

Unit : mm (in.)



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G GENERAL

GENERAL

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[11] IMPLEMENT LIMITATIONS	G-61

[1] FEATURES

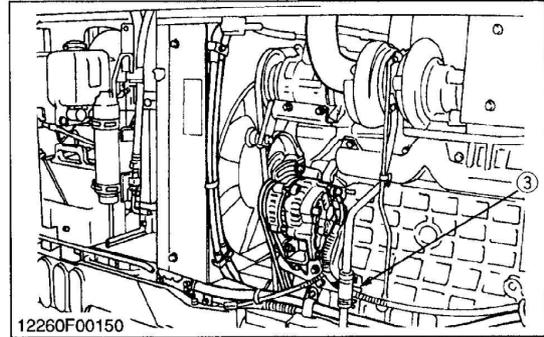
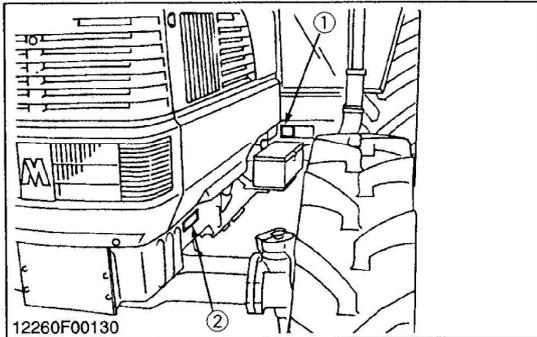


12260F00200

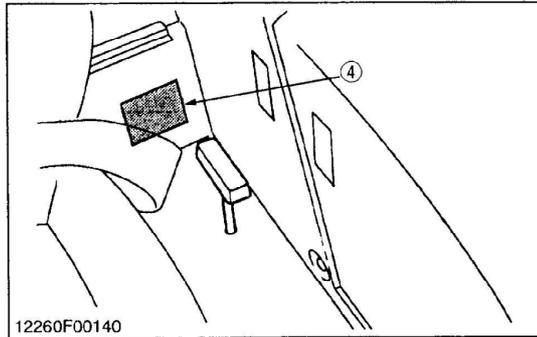
1. New Environment-Friendly Engine (V4702 and F5802)
Complying with the U.S. EPA Rules and Regulation.
Large displacement
Turbo-charger
2. Power Shift Transmission
Microcomputer-controlled hydraulic clutch
Single gear shift lever for 16 speeds
Eight-step power shift and two-step synchromesh
Electro-hydraulic shuttle mechanism
3. Newly Designed Cabin
Full-fredged in-cabin climate control in air mixing design
Full-floating type flat deck
Wider piece of curved glass
4. High-Sensitivity, High-Precision Hydraulic System
Microcomputerized mixture ratio control
Integral control panel with fingertip-control switches and levers
5. Hydraulic independent PTO
6. Full Hydrostatic Power Steering
7. Hydraulic Brake
8. Hydraulic Differential Lock
(Front and rear independently)
9. Bi-speed Turn Mechanism
10. Best-Matching Front Loader

[2] TRACTOR IDENTIFICATION

When contacting your local KUBOTA distributor, always identify engine serial number, tractor serial number, cab serial number and hourmeter reading.

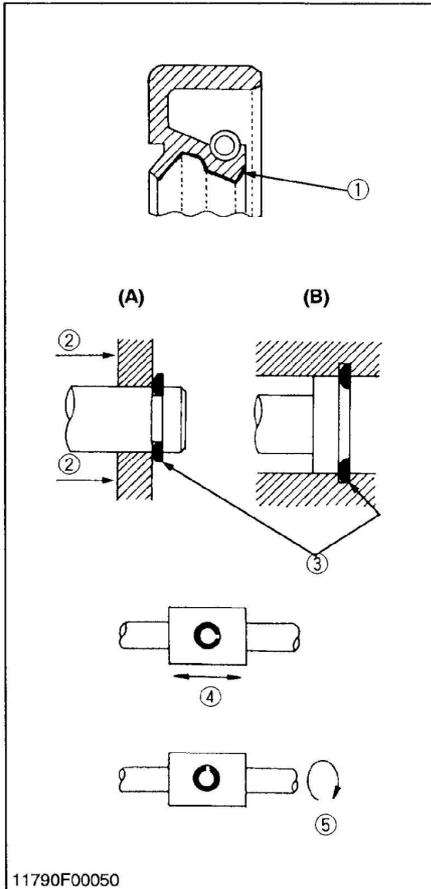


- (1) Tractor Identification Plate
- (2) Tractor Serial Number
- (3) Engine Serial Number
- (4) CAB Identification Plate (CAB Serial Number)



12260G00030

[3] GENERAL PRECAUTIONS



11790F00050

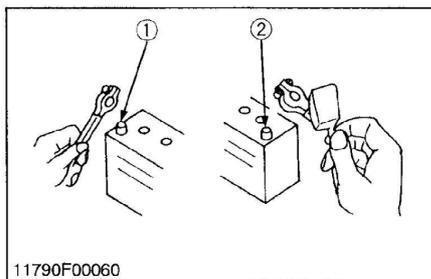
- During disassembly, carefully arrange removed parts in a clean area to prevent confusion later. Bolts and nuts should be installed in their original position to prevent reassembly errors.
- When special tools are required, use KUBOTA genuine special tools. Special tools which are not frequently used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

11790G00030

[4] HANDLING PRECAUTIONS FOR ELECTRICAL PARTS AND WIRING



11790F00060

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

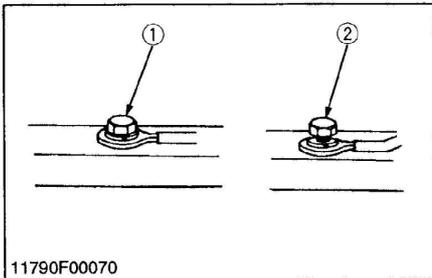
■ IMPORTANT

- 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 cord, disconnect the negative wire first. When installing the battery cord, connect the positive wire first.

- (1) Negative Terminal
- (2) Positive Terminal

11790G00040

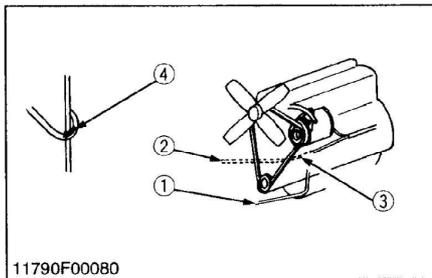
(1) Wiring



• Securely tighten wiring terminals.

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

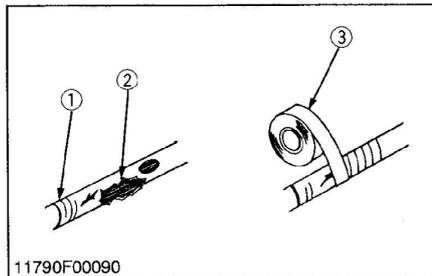
11790G00050



• Do not let wiring contact dangerous part.

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

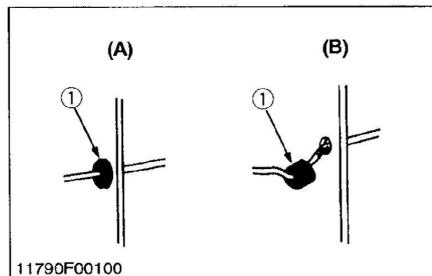
11790G00060



• Repair or change torn or aged wiring immediately.

- (1) Damaged
- (2) Torn
- (3) Insulating Vinyl Tape

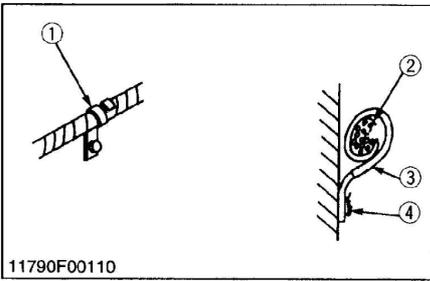
11790G00070



• Securely insert grommet.

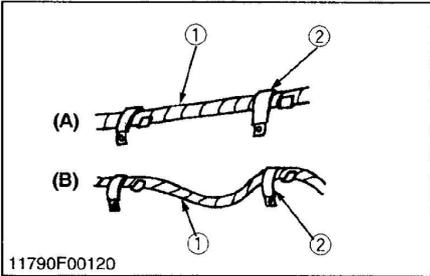
- (1) Grommet
- (A) Correct
- (B) Incorrect

11790G00080



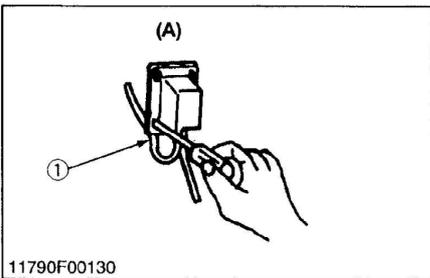
- Securely clamp, being careful not to damage wiring.
- | | |
|-----------------------|------------------|
| (1) Clamp | (3) Clamp |
| • Wind Clamp Spirally | (4) Welding Dent |
| (2) Wire Harness | |

11790G00090



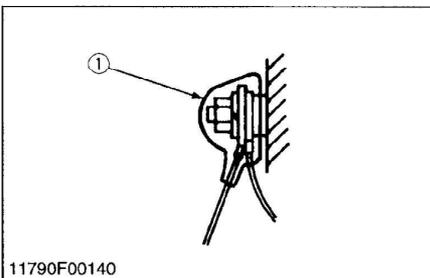
- Clamp wiring so that there is no twist, unnecessary sag, or excessive tension, except for movable part, where sag be required.
- | | |
|------------|---------------|
| (1) Wiring | (A) Correct |
| (2) Clamp | (B) Incorrect |

11790G00100



- In installing a part, take care not to get wiring caught by it.
- | | |
|------------|---------------|
| (1) Wiring | (A) Incorrect |
|------------|---------------|

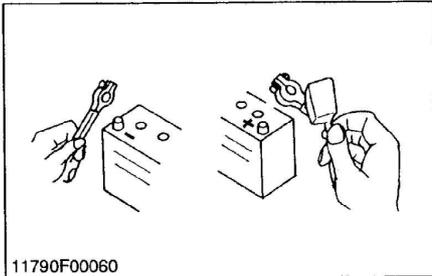
11790G00110



- After installing wiring, check protection of terminals and clamped condition of wiring, only connect battery.
- | |
|--------------------------|
| (1) Cover |
| • Securely Install Cover |

11790G00120

(2) Battery



11790F00060

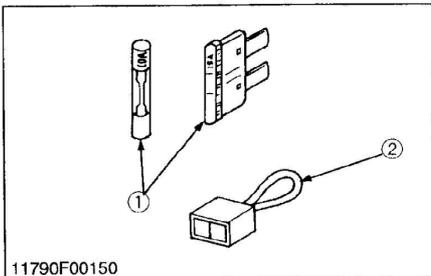
- Take care not to confuse positive and negative terminals.
- When removing battery cord, disconnect negative wire first. When installing battery cord, check for polarity and connect positive wire first.
- Do not install any battery with capacity other than is specified (Ah).
- After connecting cord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

11790G00130

(3) Fuse



11790F00150

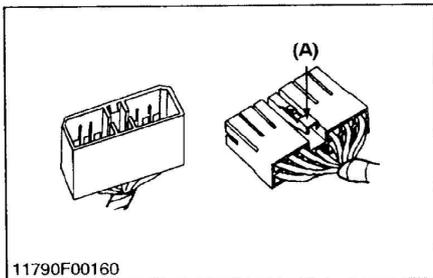
- Use fuses with specified capacity. Neither too large or small capacity fuse is acceptable.
- Never use steel or copper wire in place of fuse.
- Do not install working light, radio set, etc. on machine which is not provided with reserve power supply.
- Do not install accessories if fuse capacity of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

(1) Fuse

(2) Fusible Link

11790G00140

(4) Connector

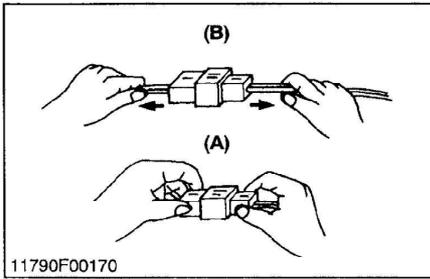


11790F00160

- For connector with lock, push lock to separate.

(A) Push

11790G00150

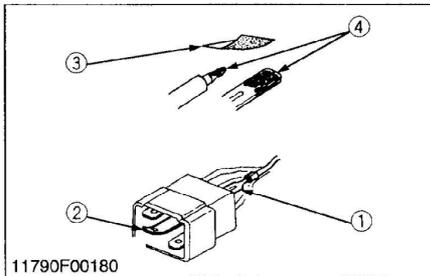


11790F00170

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

(A) Correct

(B) Incorrect



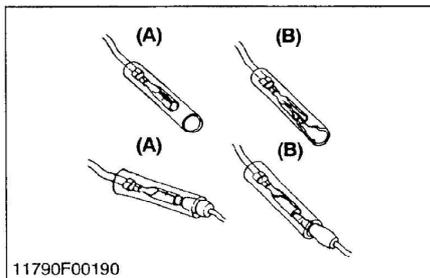
11790F00180

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

- (1) Exposed Terminal
- (2) Bend Terminal

- (3) Sandpaper
- (4) Rust

11790G00160



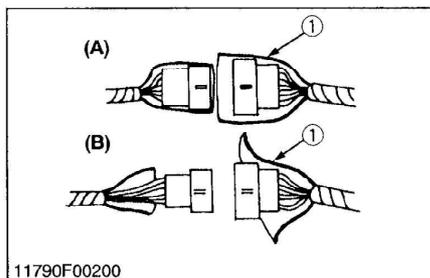
11790F00190

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

(A) Correct

(B) Incorrect

11790G00170



11790F00200

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

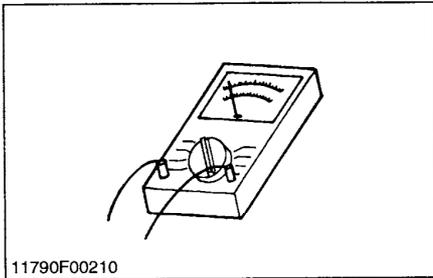
(1) Cover

(A) Correct
(B) Incorrect

11790G00180

11790G00190

(5) Handling of Circuit Tester



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

11790G00200

[5] LUBRICANTS, FUEL AND COOLING WATER

	Place	Capacity			Lubricants, fuel and cooling water
		M-90	M-110	M-120	
1	Fuel	150 L 39.6 U.S.gals. 33 Imp.gals.		200 L 52.8 U.S.gals. 44 Imp.gals.	No. 2-D diesel fuel No. 1-D diesel fuel if temperature is below -10 °C (14 °F)
2	Coolant (Engine block radiator)	12.0 L 12.7 U.S.qts. 10.6 Imp.qts.	13.0 L 13.7 U.S.qts. 11.4 Imp.qts.		Fresh clean water with anti-freeze
	Coolant (Reserve tank)	1.5 L 1.6 U.S.qts. 1.3 Imp.qts.			
3	Engine crankcase	16.3 L 17.2 U.S.qts. 14.3 Imp.qts.	20.8 L 22.0 U.S.qts. 18.3 Imp.qts.		Engine oil : API Service Classification CD Below -23 °C (-10 °F): SAE5W or 5W-30 -23 to 0 °C (-10 to 32 °F) SAE10W or 10W-30 0 to 25 °C (32 to 77 °F) SAE20 or 10W-30 Above 25 °C (77 °F) SAE30 or 10W-30
4	Transmission case	55 L 58.1 U.S.qts. 48.4 Imp.qts.		58 L 61.3 U.S.qts. 51.0 Imp.qts.	KUBOTA UDT or SUPER UDT fluid*
5	Front axle differential case	6 L 6.3 U.S.qts. 5.3 Imp.qts.	7 L 7.4 U.S.qts. 6.2 Imp.qts.	12 L 12.7 U.S.qts. 10.6 Imp.qts.	KUBOTA UDT or SUPER UDT fluid* or SAE80, SAE90 gear oil
6	Front axle gear case for each side	3.5 L 3.7 U.S.qts. 3.1 Imp.qts.		4.6 L 4.9 U.S.qts. 4.0 Imp.qts.	
7	Brake oil	0.3 L 0.3 U.S.qts. 0.3 Imp.qts.			KUBOTA UDT or SUPER UDT fluid* or Turbine oil 32 (See below) (regular type, multipurpose) straight mineral oil Mobil DTE Oil #32 TEXACO Regal Oil #32 CHEVRON-GST Oil #32 TERESSO Oil #32 Never use automotive brake oil
8	Washer liquid	1.3 L 1.4 U.S.qts. 1.1 Imp.qts.			Automobil washer liquid

* KUBOTA original transmission hydraulic fluid.

Greasing					
	Place		No. of greasing point	Capacity	Type of grease
9	Steering joint shaft		1	Until grease overflows	Multipurpose type grease
	Front axle support		2		
	Front axle gear case support (4WD)		2		
	Top link		1		
	Lift rod (Upper right, lower right, lower left)		3		
	Front wheel hub (2WD)		2		
	Knuckle shaft (2WD)		2		
	Assist cylinder (if equipped)		2		
	Battery terminal		2	A small amount	
10	Air conditioner compressor	Piston type compressor	180 to 195 cc 0.190 to 0.206 U.S.qts.	Compressor oil : NIPPONDENSO Suniso ND-OIL8 <*PAG OIL>	
		Scroll type compressor	60 to 100 cc 0.063 to 0.106 U.S.qts.		
	Refrigerant		1.1 kg 2.43 lbs	Refrigerant R-143a	

* PAG : Polyalky lenegy col (Synthetic oil).

■ 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 above.
- **Transmission Oil** : The oil used to lubricate the transmission is also used as hydraulic fluid. To insure proper operation of the hydraulic system and complete lubrication of the transmission, it is important that a multi-grade transmission fluid be used in this system. We recommend the use of KUBOTA SUPER UDT fluid for optimum protection and performance.
- Do not mix different brands together.
- Indicated capacity of water and oil are manufacture'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	 No-grade or 4T						 7T						 9T		
Material of bolt	SS400, S20C						S43C, S48C						SCr435, SCM435		
Material of opponent part	Ordinariness			Aluminum			Ordinariness			Aluminum			Ordinariness		
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.)	7.84 to 9.31	0.80 to 0.95	5.79 to 6.87	7.84 to 8.83	0.80 to 0.90	5.79 to 6.51	9.80 to 11.2	1.00 to 1.15	7.24 to 8.32	7.84 to 8.83	0.80 to 0.90	5.79 to 6.51	12.3 to 14.2	1.25 to 1.45	9.05 to 10.5
M8 (8 mm, 0.31 in.)	17.7 to 20.5	1.8 to 2.1	13.0 to 15.2	16.7 to 19.6	1.7 to 2.0	12.3 to 14.5	23.6 to 27.4	2.4 to 2.8	17.4 to 20.2	17.7 to 20.6	1.8 to 2.1	13.0 to 15.2	29.4 to 34.3	3.0 to 3.5	21.7 to 25.3
M10 (10 mm, 0.39 in.)	39.2 to 45.0	4.0 to 4.6	29.0 to 33.2	31.4 to 34.3	3.2 to 3.5	23.1 to 25.3	48.1 to 55.8	4.9 to 5.7	35.5 to 41.2	39.2 to 44.1	4.0 to 4.5	28.9 to 32.5	60.8 to 70.5	6.2 to 7.2	44.9 to 52.1
M12 (12 mm, 0.47 in.)	62.8 to 72.5	6.4 to 7.4	46.3 to 53.5				77.5 to 90.1	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 86.8
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				196 to 225	20.0 to 23.0	145 to 166				260 to 303	26.5 to 31.0	192 to 224
M18 (18 mm, 0.71 in.)	245 to 284	25.0 to 29.0	181 to 210				275 to 318	28.0 to 32.5	203 to 235				343 to 401	35.0 to 41.0	254 to 297
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				490 to 568	50.0 to 58.0	362 to 420

11790G00760

(2) Hydraulic Fittings**■ Hydraulic Hose Fittings**

Hose size	Thread size	Tightening torque		
		N·m	kgf·m	ft-lbs
02	1/8	13.7 to 15.7	1.4 to 1.6	10.1 to 11.6
03	1/4	22.6 to 27.5	2.3 to 2.8	16.6 to 20.3
04				
05	3/8	45.1 to 53.0	4.6 to 5.4	33.3 to 39.0
06				

12260G00780

■ Hydraulic Pipe Cap Nuts

Pipe size	Tightening torque		
	N·m	kgf·m	ft-lbs
Ø4 × t1.0	19.6 to 29.4	2.0 to 3.0	14.5 to 21.7
Ø6 × t1.0	24.5 to 34.3	2.5 to 3.5	18.1 to 25.3
Ø8 × t1.0	29.4 to 39.2	3.0 to 4.0	21.7 to 28.9
Ø10 × t1.0	39.2 to 49.0	4.0 to 5.0	28.9 to 36.1
Ø12 × t1.5	68.6 to 78.5	7.0 to 8.0	50.6 to 57.9
Ø15 × t1.6	107.9 to 117.7	11.0 to 12.0	79.6 to 86.8
Ø18 × t1.6			

12260G00790

■ Adaptors, Elbows and Nipples

Items	Thread size	Tightening torque		
		N·m	kgf·m	ft-lbs
POA-PF (Nipple with O-ring)	PF 1/8	44.1 to 53.9	4.5 to 5.5	32.5 to 39.8
	PF 1/4	73.5 to 83.4	7.5 to 8.5	54.2 to 61.5
	PF 3/8	93.2 to 103.0	9.5 to 10.5	68.7 to 75.9
	PF 1/2	112.8 to 122.6	11.5 to 12.5	83.2 to 90.4
POB-PF (Elbow with O-ring and no nut)	PF 1/8	22.6 to 26.5	2.3 to 2.7	16.6 to 19.5
	PF 1/4	35.3 to 43.1	3.6 to 4.4	26.0 to 31.8
	PF 3/8	53.9 to 63.7	5.5 to 6.5	39.8 to 47.0
	PF 1/2	73.5 to 83.4	7.5 to 8.5	54.2 to 61.5
Adaptor (NPT)	PF 1/8	9.8 to 14.7	1.0 to 1.5	7.2 to 10.8
	PF 1/4	29.4 to 34.3	3.0 to 3.5	21.7 to 25.3
	PF 3/8	49.0 to 68.6	5.0 to 7.0	36.2 to 50.6
	PF 1/2	68.6 to 88.3	7.0 to 9.0	50.6 to 65.1

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No.	Item	Period	Indication on hour meter																Since then every	Reference page
			50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800		
35	Parking brake cable	Replace																2 years	5-S14	
36	Brake hose	Replace																2 years	G-36	
37	Clutch hose	Replace																2 years	G-36	
38	Differential lock hose	Replace																2 years	G-36	
39	Master cylinder kit	Replace																2 years	5-S8	
40	Equalizer kit	Replace																2 years	5-S8	
41	Brake seal 1 and 2	Replace																2 years	5-S11	
42	Fuel system	Bleed																service as require	G-38, 39	
43	Brake system	Bleed																	5-S6	
44	Clutch housing water	Drain																	G-39	
45	Fuse	Replace																	G-40	
46	Light bulb	Replace																	G-41	

W1034716

1	Air filter (cabin)	Clean				☆				☆							☆	200 Hr	G-28
2	Air conditioner condenser	Clean				☆				☆							☆	200 Hr	G-28
3	Air conditioner belt tension	Adjust				☆				☆							☆	200 Hr	G-29
4	Air conditioner pipe and hoses	Check																1 year	G-35
5	CAB isolation cushion	Check																1 year	G-35
6	Washer liquid	Refill																service as require	G-41
7	Refrigerant (gas)	Check																	G-41

■ IMPORTANT

- The jobs indicated by ☆ must be done after the first 50 hours of operation.
- * : Air cleaner should be cleaned more often in dusty conditions than in normal conditions.
- ** : After 6 times of cleaning.
- *** : Replace only if necessary.
- 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.

W1037840

[8] CHECK AND MAINTENANCE

CAUTION

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

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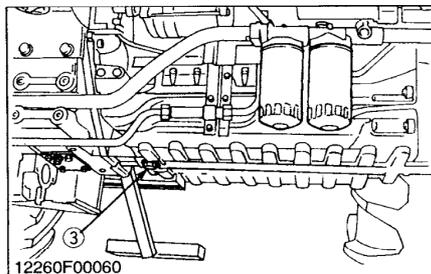
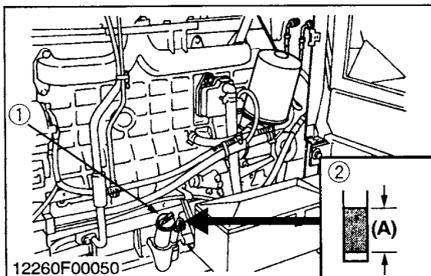
(1) Daily Check

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

- Check areas where previous trouble was experienced.
- Walk around the tractor.
 - 1) Check the tire pressure, and check wear and damage.
 - 2) Check the bolts and nuts of the tires are tight.
 - 3) Check water separator.
 - 4) Check for oil and water leaks.
 - 5) Check the engine oil level.
 - 6) Check the transmission fluid level.
 - 7) Check the brake oil level.
 - 8) Check and clean the radiator screen and grille.
 - 9) Check and clean the precleaner if equipped.
 - 10) Check the evacuator valve.
 - 11) Check the number plate or SMV emblem for damage and cleaner replace as necessary if equipped.
 - 12) Care of danger, warning and caution labels.
 - 13) Clean around the exhaust manifold and the muffler of the engine.
 - 14) Check and clean head lights, tail lights, flasher lights and hazard lights.
- While sitting in the operator's seat.
 - 1) Check the throttle pedal, brake pedals.
 - 2) Check the parking brake.
 - 3) Check the steering wheel.
- Turning the key switch.
 - 1) Check the performance of the Easy Checker lights.
 - 2) Check head lights, tail lights, flasher lights and hazard lights.
Clean if necessary.
 - 3) Check the performance of the meters and gauges.
- Starting the engine.
 - 1) Check to see that the lights on the Easy Checker go off.
 - 2) Check the color of the exhaust.
 - 3) Check the brakes for proper operation.

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(2) Check Points of Initial 50 Hours



Changing Engine Oil

CAUTION

- Before changing oil, be sure to stop the engine.
- Allow engine to cool down sufficiently, oil can be hot and can burn.

1. To drain the used oil, remove the drain plug at the bottom of the engine and drain the oil completely into the oil pan. All the used oil can be drained out easily when the engine is still warm.
2. After draining reinstall the drain plug.
3. Fill with the new oil up to the upper notch on the dipstick. Refer to "LUBRICANTS, FUEL AND COOLING WATER". (See page G-9.)

Oil capacity with filter	M-90	16.3 L 17.2 U.S.qts. 14.3 imp.qts.
	M-110 M-120	20.8 L 22.0 U.S.qts. 18.3 imp.qts.

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

(A) Oil level is acceptable within this range.