

Product: Kubota WSM B21,TL421,BT751 Tractor,Front Loader,Backhoe Service Repair Workshop Manual  
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# WSM

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## WORKSHOP MANUAL **TRACTOR,FRONT LOADER, BACKHOE**

# B21,TL421,BT751

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# Kubota

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## TO THE READER

This Workshop Manual has been prepared to provide servicing personnel with information on the mechanism, service and maintenance of KUBOTA Tractor B21, KUBOTA Front Loader TL421 and KUBOTA Backhoe BT751. 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.

December '96

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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.

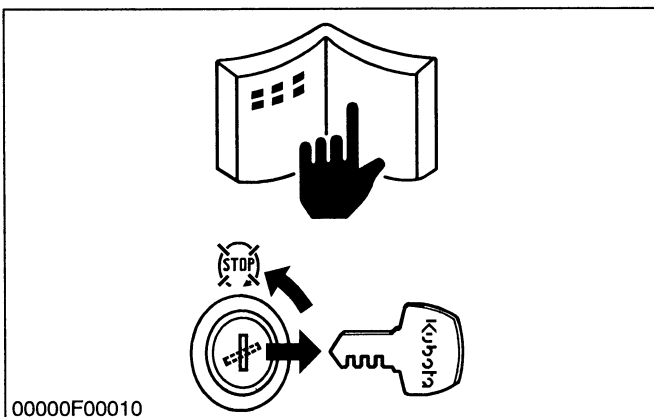


**CAUTION** : Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

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

**NOTE** : Gives helpful information.

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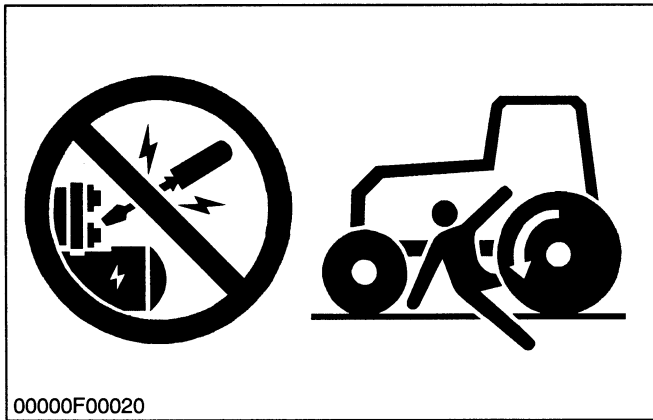


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### BEFORE SERVICING AND REPAIRING

- (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.

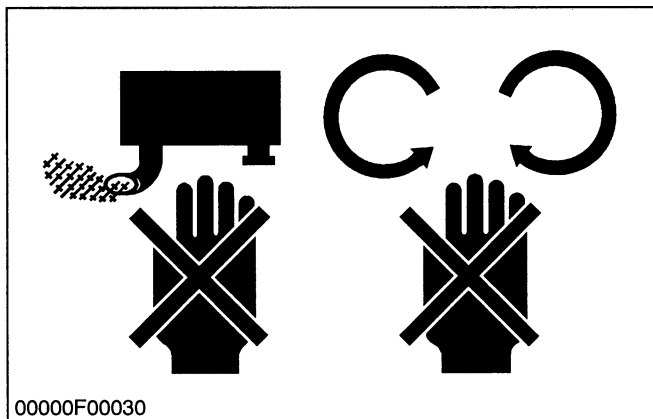
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## SAFETY STARTING

- (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.

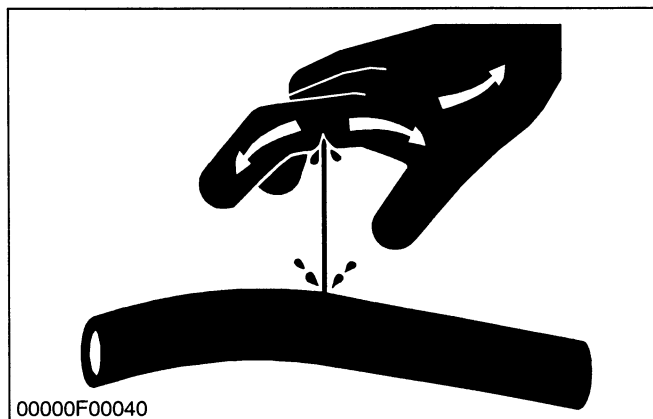
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## SAFETY WORKING

- (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.

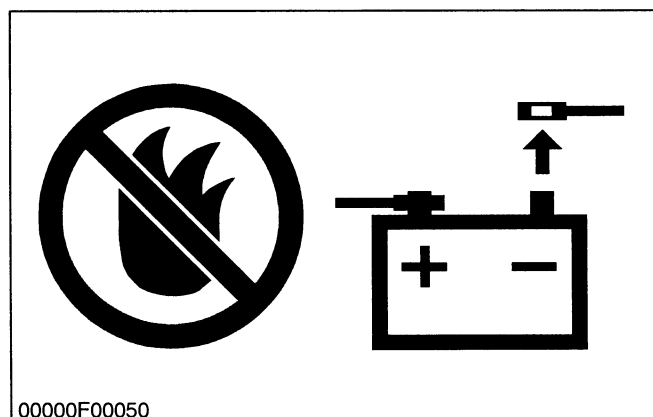
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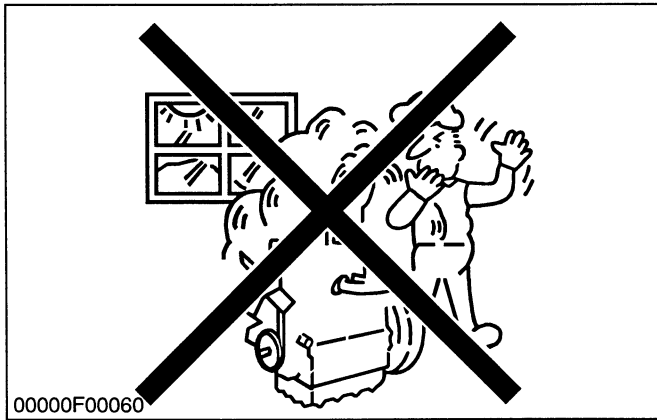


## AVOID FIRES

- (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.

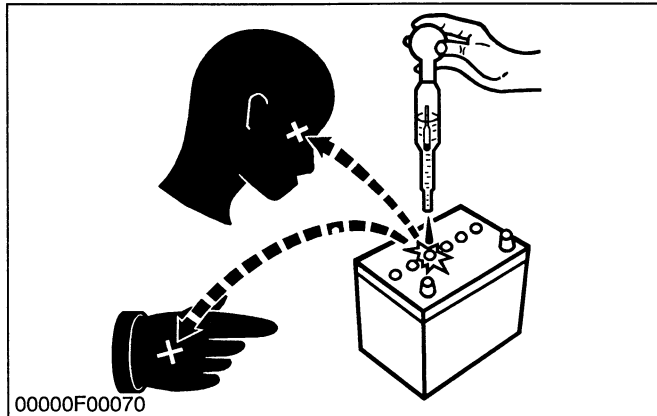
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**VENTILATE WORK AREA**

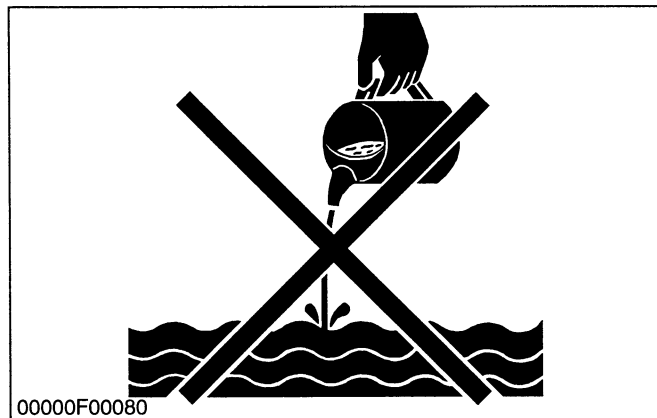
- (1) If the engine must be running to do same work, make sure the area is well ventilated. Never run the engine in a closed area. The exhaust gas contains poisonous carbon monoxide.

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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

	<p align="center"><b>⚠ DANGER</b></p> <p><b>TO AVOID POSSIBLE INJURY OR DEATH FROM A MACHINE RUNAWAY.</b></p> <ol style="list-style-type: none"> <li>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.</li> <li>2. Start engine only from operator's seat with transmission and PTO OFF. Never start engine while standing on the ground.</li> </ol>
---	---

(2) Part No. 32751-4921-2

<p align="center"><b>⚠ WARNING</b></p> <p><b>TO AVOID SERIOUS PERSONAL INJURY OR DEATH:</b></p> <ol style="list-style-type: none"> <li>1. Keep tractor seat in forward position except when operating backhoe.</li> <li>2. Using seat in reversed position while operating attachments other than backhoe may result in entanglement with PTO shaft or 3-point hitch.</li> </ol>
--

(3) Part No. TA040-4959-3

	<p align="center"><b>⚠ WARNING</b></p> <p><b>TO AVOID PERSONAL INJURY.</b></p> <ol style="list-style-type: none"> <li>1. Keep PTO shield in place at all times.</li> <li>2. Do not operate the PTO at speeds faster than the speed recommended by the implement manufacturer.</li> <li>3. For trailing PTO-driven implements, set drawbar at towing position. (see operator's manual)</li> </ol>
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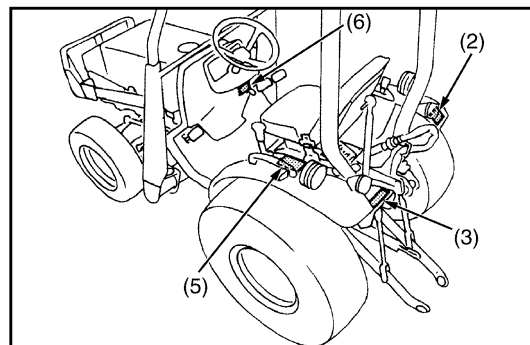
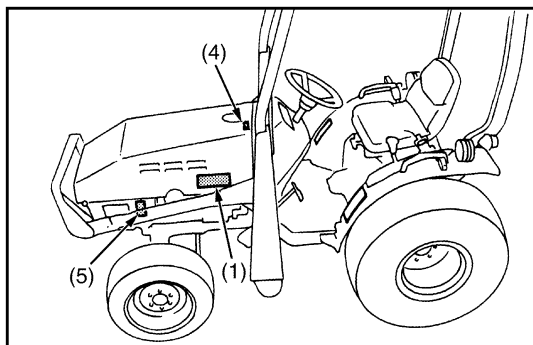
(4) Part No. TA040-4935-1

<p align="center"><b>⚠ WARNING</b></p> <p><b>TO AVOID PERSONAL INJURY:</b></p> <ol style="list-style-type: none"> <li>1. Attach pulled or towed loads to the drawbar only.</li> <li>2. Use the 3-point hitch only with equipment designed for 3-point hitch usage.</li> </ol>
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(5) Part No. TA040-4958-1  
Do not touch hot surface like muffler, etc.

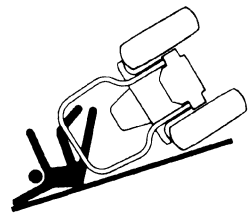
(6) Part No. 6C150-4743-1 (HST type)

<p align="center"><b>WARNING</b></p> 	<p><b>BEFORE DISMOUNTING TRACTOR:</b></p> <ol style="list-style-type: none"> <li>1. ALWAYS SET PARKING BRAKE.</li> </ol> <p>Leaving transmission in gear with the engine stopped will not prevent tractor from rolling.</p> <ol style="list-style-type: none"> <li>2. PARK ON LEVEL GROUND WHENEVER POSSIBLE. If parking on a slope, position tractor across the slope.</li> <li>3. LOWER ALL IMPLEMENTS TO THE GROUND.</li> <li>4. STOP THE ENGINE.</li> </ol>
--	---

(7) Part No. 6C040-4741-2  
No fire

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(8) Part No. 32771-4925-1

**⚠ WARNING****TO AVOID PERSONAL INJURY OR DEATH FROM ROLL-OVER :**

1. Kubota recommends the use of a Roll-Over Protective structures (ROPS) and seat belt in almost all applications.
2. To ensure ROPS protection, do not operate tractor without loader mainframe.
3. Never use just the seat belt or just the ROPS. They must be used together. For further details, consult your Operator's Manual or your local dealer.

(10) 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.

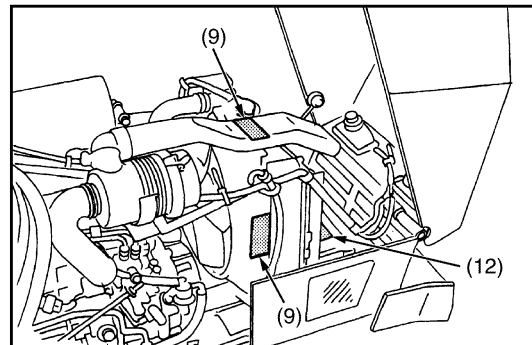
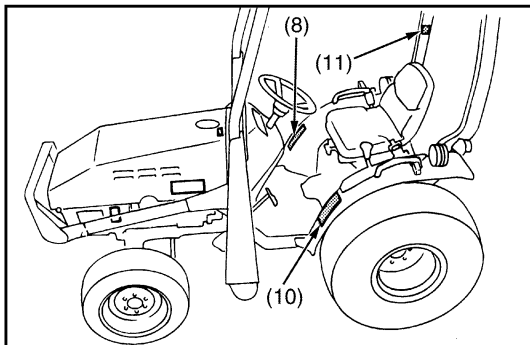
(12) Part No. 6C040-5559-1

**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**

(9) Part No. 32751-4958-1

Stay clear of engine fan and fanbelt.



(11) Part No. 6C140-4746-1

**⚠ WARNING****TO AVOID PERSONAL INJURY:**

Do not modify or repair a ROPS because welding, grinding, drilling or cutting any portion may weaken the structure.

**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 Distributor.
4. If a component with danger, warning or caution label (s) affixed is replaced with new part, make sure new label (s) is (are) attached in the same location (s) as the replaced component.
5. Mount new danger, warning and caution labels by applying on a clean dry surface and pressing any bubbles to outside edge.

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# SPECIFICATIONS

Model			B21
PTO power			10.0 kW (13.5 HP)
Engine	Maker	KUBOTA	
	Model	D1005-ETLB	
	Type	Indirect Injection. Vertical, water-cooled, 4-cycle diesel	
	Number of cylinders	3	
	Bore and stroke	76 × 73.6 mm (2.99 × 2.90 in.)	
	Total displacement	1001 cm <sup>3</sup> (61.1 cu.in.)	
	Engine net power (DIN)	15.7 kW (21.0 HP)	
	Rated revolution (min <sup>-1</sup> )	43.3 r/s (2600 rpm)	
	Maximum torque	59 N·m (44 ft-lbs)	
	Battery	12 V, RC : 79 min, CCA : 433 A	
	Starting system	Electric starting with cell starter 12 V, 1.0 kW	
	Lubricating system	Forced lubrication by trochoidal pump	
	Cooling system	Pressurized radiator, forced circulation with water pump	
	Fuel	Diesel fuel No. 2-D [above −10 °C (14 °F)], Diesel fuel No. 1 [below −10 °C (14 °F)]	
	Capacities	Fuel tank	24 L (6.3 U.S.gals, 5.3 Imp.gals)
Engine crankcase (with filter)		3.0 L (3.2 U.S.qts, 2.6 Imp.qts)	
Engine coolant		3.4 L (3.6 U.S.qts, 2.6 Imp.qts)	
Transmission case		27.5 L (7.26 U.S.gals, 6.05 Imp.gals)	
Front axle case		3.7 L (3.9 U.S.qts, 3.3 Imp.qts)	
Dimensions	Overall length (without 3P)		2495 mm (98.2 in.)
	Overall width		1365 mm (53.7 in.)
	Overall height (with ROPS / FOPS)		2260 mm (89.0 in.)
	Overall height (top of steering wheel)		1370 mm (53.9 in.)
	Wheel base		1535 mm (60.4 in.)
	Minimum ground clearance		305 mm (12.0 in.)
	Tread	Front	960 mm (37.8 in.)
Rear		1050 mm (41.3 in.)	
Weight (with ROPS, FOPS, main frame and front loader)			1296 kg (2858 lbs)
Clutch			Dry single plate
Travelling system	Tires	Front	23 × 8.50 -14R4
		Rear	12.4-16 R4
	Steering		Integral type power steering
	Transmission		Main-hydrostatic transmission, range-gear shift (3 forward and 3 reverse)
	Brake		Wet disk type
	Min. turning radius (without brake)		2.85 m (9.4 feet)
	Differential		Bevel gear
Hydraulic system	Hydraulic control system		Position Control
	Pump capacity		32 L/min (8.5 U.S.GPM, 7.0 Imp.GPM)
	Three point hitch		SAE Category I
	Max. lift force (24 in, behind lift points)		460 kg (1014 lbs)
PTO system		PTO shaft	SAE 1-3/8, 6 splines
		Revolution	540 min <sup>-1</sup> (rpm) at 2584 engine min <sup>-1</sup> (rpm)

Note : \* Manufacture's estimate the company reserves the right to change the specifications without notice.

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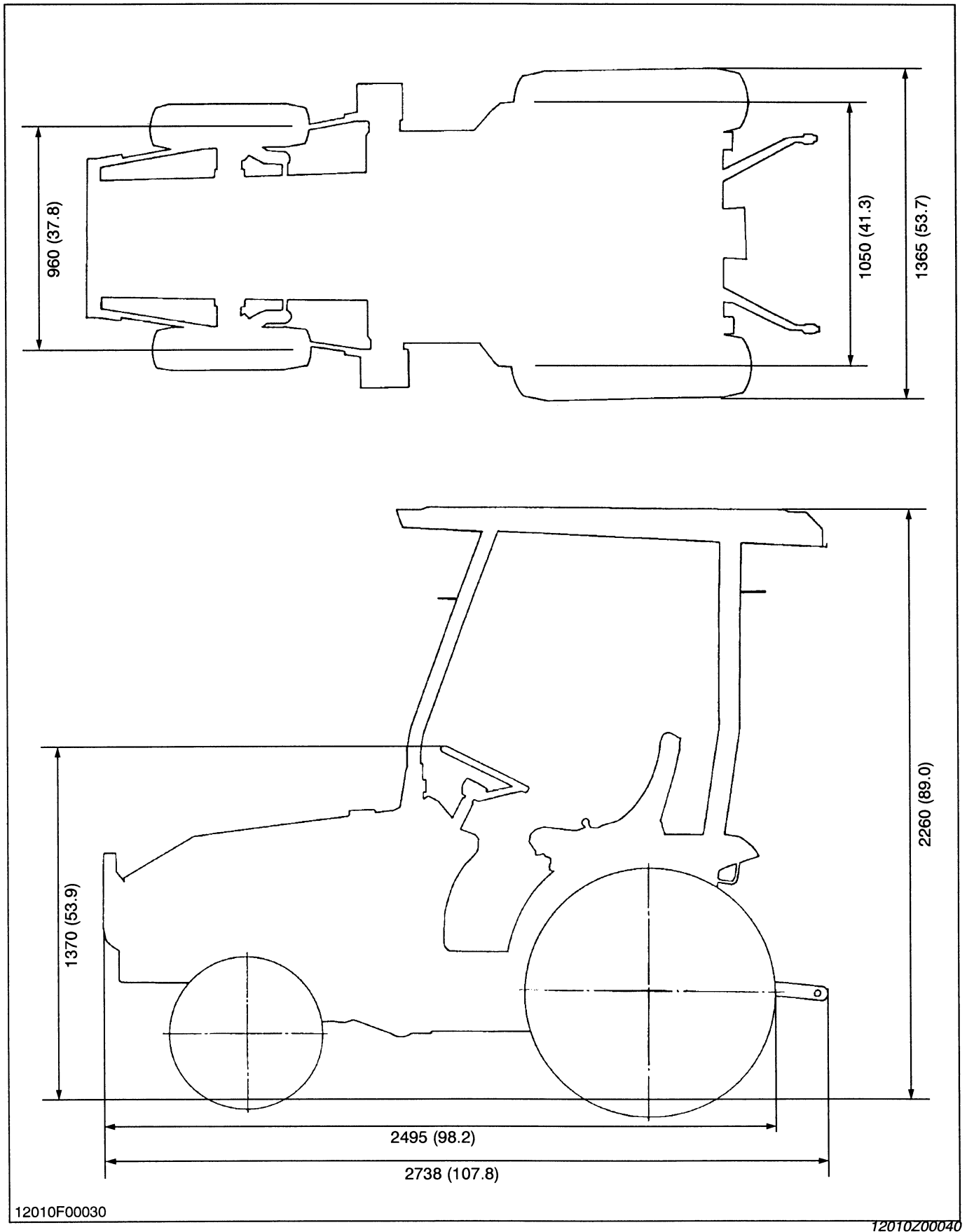
TRAVELLING SPEED

(At rated engine rpm)

Model		B21	
Tire size (Rear)		12.4-16 R4	
Range gear shift lever		km/h	mph
Forward	Low	0 to 4.7	0 to 2.9
	Middle	0 to 8.0	0 to 5.0
	High	0 to 17.8	0 to 11.1
Reverse	Low	0 to 4.0	0 to 2.5
	Middle	0 to 6.8	0 to 4.2
	High	0 to 15.1	0 to 9.4

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# DIMENSIONS



# **G GENERAL**

# GENERAL

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## [1] FEATURES



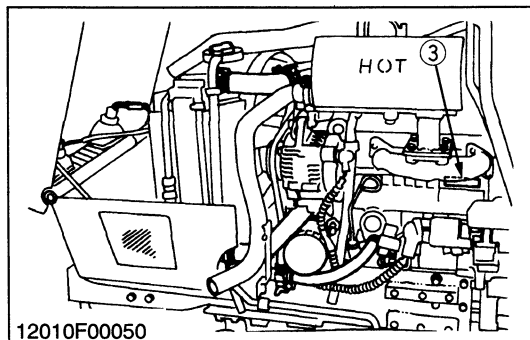
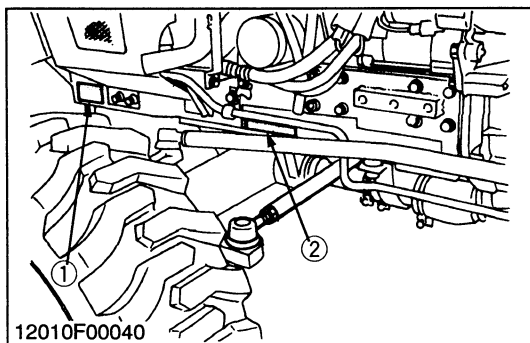
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|---|--|
| (1) Integral Power Steering                               | (8) Single-Lever Reversible High-Back Seat                         |
| (2) E-TVCS (Three Vortex Combustion System) Diesel Engine | (9) The Backhoe Quickly Attached or Detached                       |
| (3) Engine Key Shut-Off System                            | (10) The Automatic Self-Leveling Loader and Single Lever Operation |
| (4) Hydrostatic Transmission (HST)                        | (11) The 3-Point Hitch and the PTO Fitted as Standard Features     |
| (5) Wet Disc Brake  | (12) Industrial Tire   |
| (6) The Strong Integrated Frame                           | (13) 4 Post ROPS   |
| (7) The Hard-Nose Slanted Hood and Front Guard            |  |

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## [2] TRACTOR IDENTIFICATION

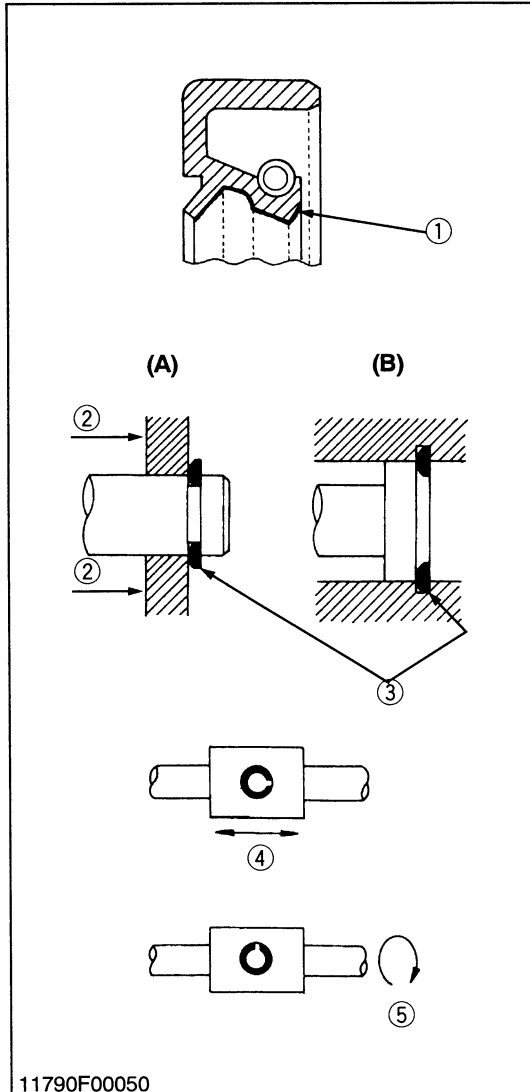
When contacting your local KUBOTA distributor, always specify engine serial number, tractor serial number and hour meter reading.

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



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### [3] GENERAL PRECAUTIONS



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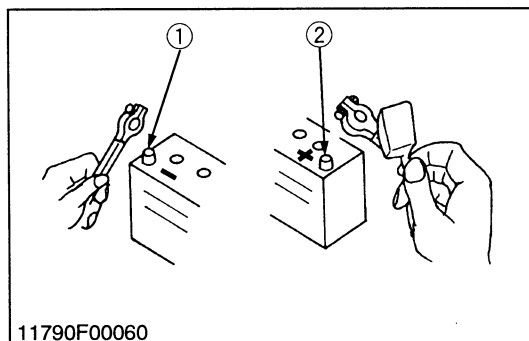
- During disassembly, carefully arrange removed parts in a clean area to prevent confusion later. Bolts and nuts should be installed in their original position to prevent reassembly errors.
- When special tools are required, use KUBOTA genuine special tools. Special tools which are not frequently used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

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### [4] HANDLING PRECAUTIONS FOR ELECTRICAL PARTS AND WIRING



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

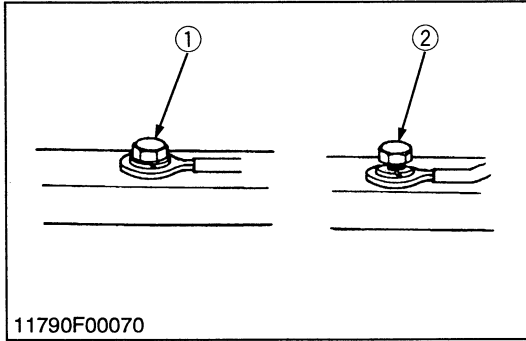
#### ■ IMPORTANT

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

- (1) Negative Terminal

- (2) Positive Terminal

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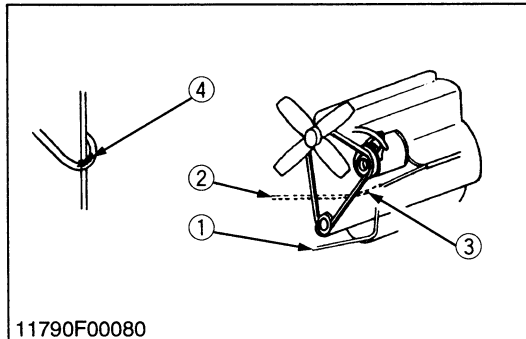
**(1) Wiring**

- Securely tighten wiring terminals.

(1) Correct  
(Securely Tighten)

(2) Incorrect  
(Loosening Leads to Faulty Contact)

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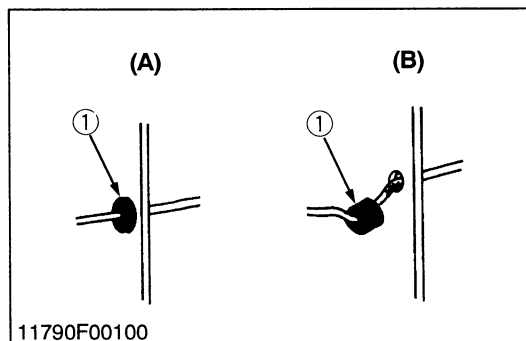


- Do not let wiring contact dangerous part.

(1) Wiring (Correct)  
(2) Wiring (Incorrect)

(3) Dangerous Part  
(4) Dangerous Part

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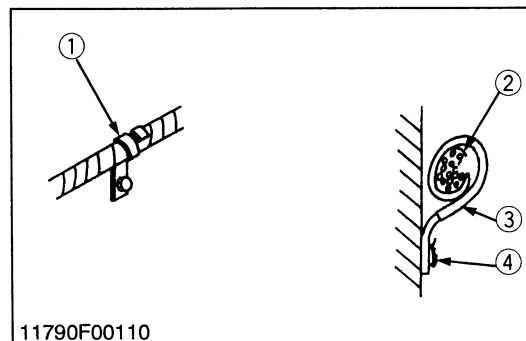


- Securely insert grommet.

(1) Grommet

(A) Correct  
(B) Incorrect

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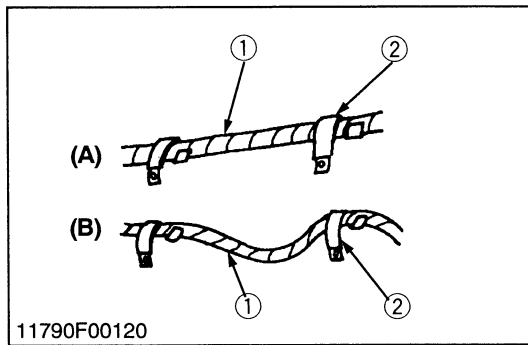
- Securely clamp, being careful not to damage wiring.

(1) Clamp  
• Wind Clamp Spirally  
(2) Wire Harness

(3) Clamp  
(4) Welding Dent

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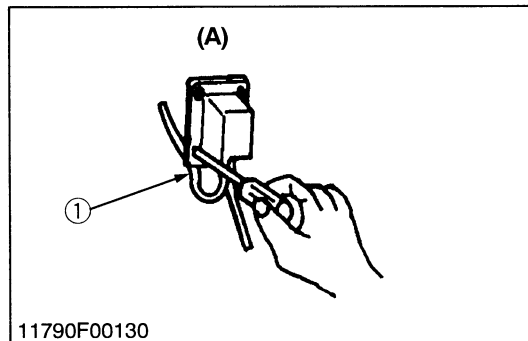


- Clamp wiring so that there is no twist, unnecessary sag, or excessive tension, except for movable part, where sag be required.

(1) Wiring  
(2) Clamp

(A) Correct  
(B) Incorrect

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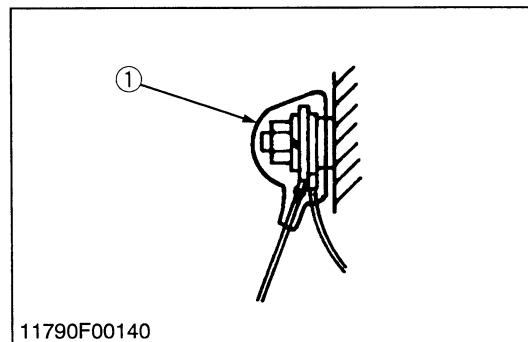


- In installing a part, take care not to get wiring caught by it.

(1) Wiring

(A) Incorrect

11790G00110

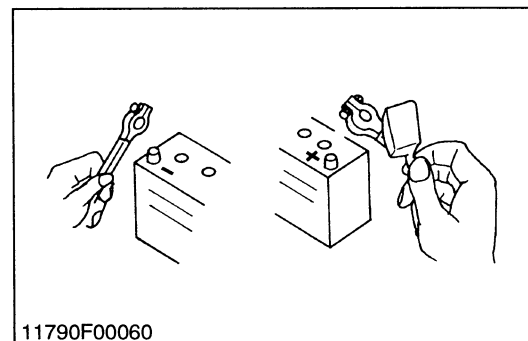


- After installing wiring, check protection of terminals and clamped condition of wiring, only then connect battery.

(1) Cover  
• Securely Install Cover

11790G00120

## (2) Battery

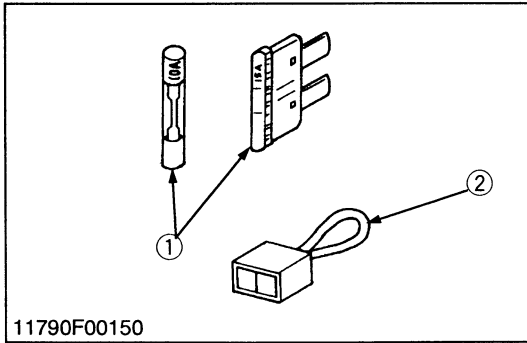


- Take care not to confuse positive and negative terminal posts.
- When removing battery cables, disconnect negative cable first. When installing battery cables, check for polarity and connect positive cable first.
- Do not install any battery with capacity other than is specified (Ah).
- After connecting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

11790G00131

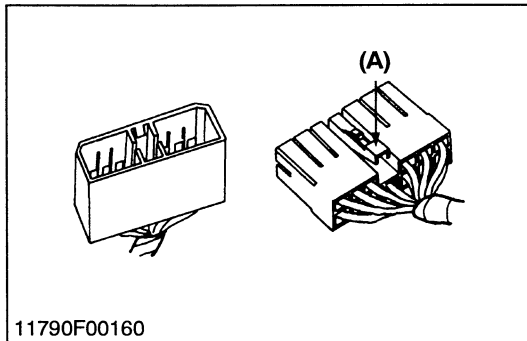
**(3) Fuse**

- 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

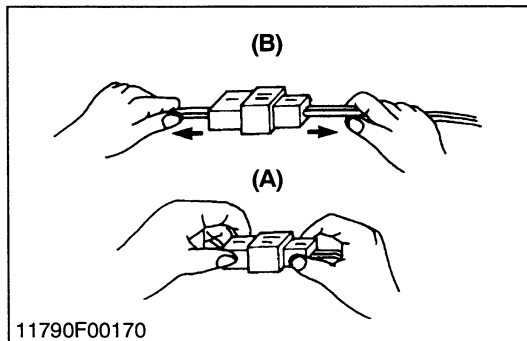
11790G00140

**(4) Connector**

- For connector with lock, push lock to separate.

(A) Push

11790G00150

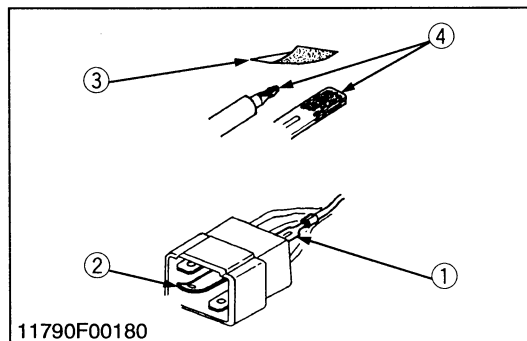


- In separating connectors, do not pull wire harnesses.
- Hold connector bodies to separate.

(A) Correct

(B) Incorrect

11790G00160



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

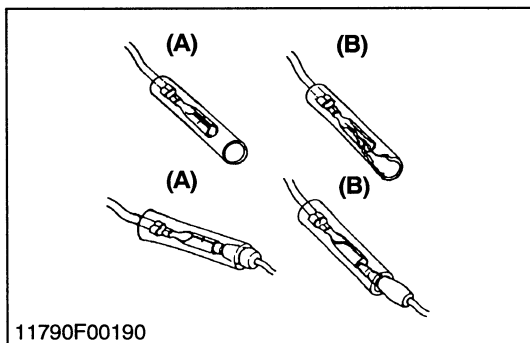
(1) Exposed Terminal

(3) Sandpaper

(2) Bend Terminal

(4) Rust

11790G00170

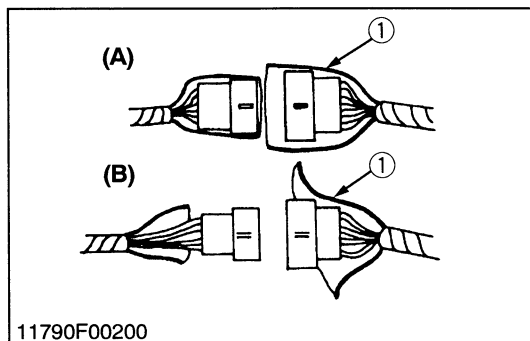


- Make certain that there is no female connector being too open.

(A) Correct

(B) Incorrect

11790G00180



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

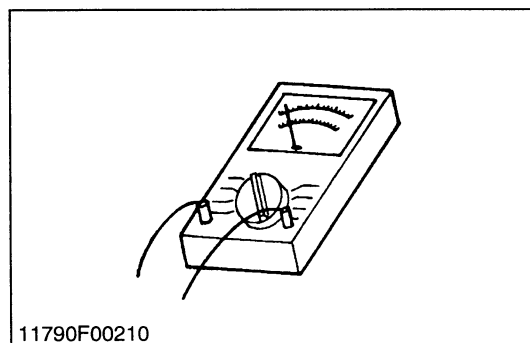
(1) Cover

(A) Correct

(B) Incorrect

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**

No.	Place	Capacity	Lubricants, fuel and cooling water	
1	Fuel tank	24 L 6.3 U.S.gals. 5.3 Imp.gals.	No. 2-D diesel fuel No. 1-D diesel fuel if temperature is below – 10 °C (14 °F)	
2	Cooling system	3.2 L 3.4 U.S.qts. 3.0 Imp.qts.	Fresh clean water with anti-freeze	
3	Engine crankspace	3.0 L 3.2 U.S.qts. 2.6 Imp.qts	Engine oil : API Service 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	27.5 L 7.26 U.S.qts. 6.05 Imp.qts.	KUBOTA SUPER UDT fluid *	
5	Front axle case	3.7 L 3.9 U.S.qts. 3.3 Imp.qts	KUBOTA SUPER UDT fluid * or SAE80, 90 gear oil	
Greasing				
No.	Place	No. of greasing point	Capacity	Type of grease
6	Speed control pedal (HST pedal)	1	Until grease overflows	Multipurpose type grease
	Battery terminal	2	Moderate amount	
	Lift rod	1		
	Seat adjuster	—		
	Seat lock pin	—		




\* KUBOTA original transmission hydraulic fluid.

12010G00030

## [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	 <b>No-grade or 4T</b>						 <b>7T</b>						 <b>9T</b>		
Material of bolt	SS400, S20C						S43C, S48C						SCr435, SCM435		
Material of opponent part	Ordinariness			Aluminum			Ordinariness			Aluminum			Ordinariness		
Unit Diameter	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs
<b>M6</b> (6 mm, 0.24 in.)	7.85 to 9.31	0.80 to 0.95	5.79 to 6.87	7.85 to 8.82	0.80 to 0.90	5.79 to 6.50	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31	7.85 to 8.82	0.80 to 0.90	5.79 to 6.50	12.3 to 14.2	1.25 to 1.45	9.05 to 10.4
<b>M8</b> (8 mm, 0.31 in.)	17.7 to 20.5	1.8 to 2.1	13.1 to 15.1	16.7 to 19.6	1.7 to 2.0	12.3 to 14.4	23.6 to 27.4	2.4 to 2.8	17.4 to 20.2	17.7 to 20.5	1.8 to 2.1	13.1 to 15.1	29.5 to 34.3	3.0 to 3.5	21.7 to 25.3
<b>M10</b> (10 mm, 0.39 in.)	39.3 to 45.1	4.0 to 4.6	29.0 to 33.2	31.4 to 34.3	3.2 to 3.5	23.2 to 25.3	48.1 to 55.8	4.9 to 5.7	35.5 to 41.2	39.3 to 44.1	4.0 to 4.5	29.0 to 32.5	60.9 to 70.6	6.2 to 7.2	44.9 to 52.0
<b>M12</b> (12 mm, 0.47 in.)	62.8 to 72.5	6.4 to 7.4	46.3 to 53.5	/			77.5 to 90.2	7.9 to 9.2	57.2 to 66.5	62.8 to 72.5	6.4 to 7.4	46.3 to 53.5	103 to 117	10.5 to 12.0	76.0 to 86.7
<b>M14</b> (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
<b>M16</b> (16 mm, 0.63 in.)	167 to 191	17.0 to 19.5	123 to 141				197 to 225	20.0 to 23.0	145 to 166				260 to 304	26.5 to 31.0	192 to 224
<b>M18</b> (18 mm, 0.71 in.)	246 to 284	25.0 to 29.0	181 to 209				275 to 318	28.0 to 32.5	203 to 235				344 to 402	35.0 to 41.0	254 to 296
<b>M20</b> (20 mm, 0.79 in.)	334 to 392	34.0 to 40.0	246 to 289				368 to 431	37.5 to 44.0	272 to 318				491 to 568	50.0 to 58.0	362 to 419

11790G00761

American standard cap screws with UNC or UNF threads.

Grade	SAE grade 5 or 8		
Unit Size	N·m	kgf·m	ft-lbs
1/4	9.8 to 11.7	1.0 to 1.2	7.2 to 8.6
5/16	19.0 to 23.1	1.9 to 2.4	14 to 17
3/8	33.9 to 40.7	3.5 to 4.2	25 to 30
1/2	88.1 to 105.8	9.0 to 10.8	65 to 78
9/16	122.0 to 146.4	12.4 to 14.9	90 to 108
5/8	176.3 to 211.5	18.0 to 21.6	130 to 156

12010G00040

**(2) Stud Bolts**

Material of opponent part  Unit Diameter	Ordinariness			Aluminum		
	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs
M8 (8 mm, 0.31 in.)	11.8 to 15.6	1.2 to 1.6	8.68 to 11.5	8.82 to 11.8	0.90 to 1.2	6.51 to 8.67
M10 (10 mm, 0.39 in.)	24.6 to 31.3	2.5 to 3.2	18.1 to 23.1	19.7 to 25.4	2.0 to 2.6	14.5 to 18.8
M12 (12 mm, 0.47 in.)	29.5 to 49.0	3.0 to 5.0	21.7 to 36.1	31.4	3.2	23.1

11790G00762

**(3) Hydraulic Hoses Fitting**

Item	Thread size	Tightening torque		
		N·m	kgf·m	ft-lbs
Adjustable elbow	9/16	37 to 44	3.7 to 4.6	27 to 33
	3/4	47 to 54	4.8 to 5.5	35 to 40
Hose fitting and flare nut	9/16	22 to 25	2.2 to 2.6	16 to 19
	3/4	35 to 41	3.6 to 4.1	26 to 30
Adaptor (NPT)	3/8	39 to 44	3.9 to 4.4	28 to 32
	1/2	49 to 58	5.0 to 5.9	36 to 43

**NOTE :** When connecting a hose with flare nut, after tightening the nut with specified torque, return it approximately 45 degrees and re-tighten it to specified torque.

12010G00050

## [7] MAINTENANCE

No.	Item		Period	Indication on hour meter																After purchase		Reference page
				50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	1 year	2 years	
1	Engine oil		Change	★	☆		☆		☆		☆		☆		☆		☆		☆			G-13
2	Engine oil filter		Replace	★			☆				☆				☆				☆			G-13
3	Transmission fluid		Change	★					☆						☆							G-15
4	Hydraulic oil filter		Replace	★			☆				☆				☆				☆			G-14
5	Hydraulic oil filter for HST		Replace	★			☆				☆				☆				☆			G-14
6	Oil strainer for HST		Clean	★					☆						☆							G-15
7	Front axle case oil		Change						☆						☆							G-25
8	Front axle pivot		Adjust								☆								☆			G-25
9	Engine start system		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆			G-18
10	Greasing		–	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆			G-17
11	Wheel bolt torque		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆			G-19
12	Battery condition		Check	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆			G-19
13	Air cleaner element [Double type]	Primary element	Clean		☆		☆		☆		☆		☆		☆		☆		☆			G-21
			Replace																	☆		G-21
		Secondary element	Replace																	☆		G-21
14	Fuel filter element		Clean		☆		☆		☆		☆		☆		☆		☆		☆			G-21
			Replace								☆								☆			G-25
15	Fan belt		Adjust		☆		☆		☆		☆		☆		☆		☆		☆			G-22
16	Clutch		Adjust	★	☆		☆		☆		☆		☆		☆		☆		☆			G-16
17	Brake		Adjust		☆		☆		☆		☆		☆		☆		☆		☆			G-22
18	Fuel line		Check		☆		☆		☆		☆		☆		☆		☆		☆			G-23
			Replace																	☆		G-23
19	Radistor hose and clamp		Check				☆				☆				☆				☆			G-24
			Replace																	☆		G-24
20	Toe-in		Adjust				☆				☆				☆				☆			G-24
21	Engine valve clearance		Adjust																☆			G-25
22	Cooling system		Flush																	☆		G-26
23	Coolant		Change																	☆		G-26
24	Fuel system		Bleed																	Service as required		G-27
25	Fuse		Replace																			G-28
26	Light bulb		Replace																			G-28

### 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.

\*\* Consult your local KUBOTA dealer for this service.

12010G00060

## [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.

11790G00210

### (1) Daily Check

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

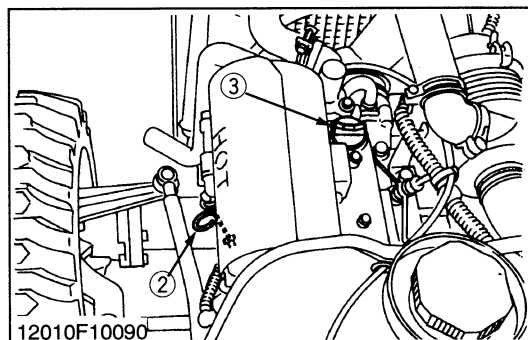
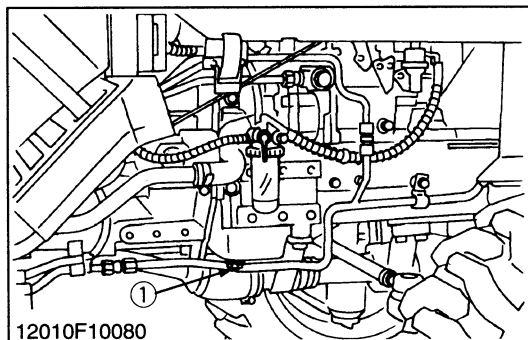
#### Checking

- Check areas where previous trouble was experienced.
  - Walk around the tractor.
- 1) Check the tire pressure, and check for wear and damage.
  - 2) Check for oil and water leaks.
  - 3) Check the engine oil level.
  - 4) Check the transmission fluid level.
  - 5) Check the coolant level.
  - 6) Check the condition of seat belt and ROPS/FOPS attaching hardware..
  - 7) Check and clean the radiator screen and grill.
  - 8) Check the bolts and nuts of the tires are tight.
  - 9) Check the number plate or SMV emblem for damage and cleaner replace as necessary if equipped.
  - 10) Care of danger, warning and caution labels.
  - 11) Clean around the exhaust manifold and the muffler of the engine.
- While sitting in the operator's seat.
- 1) Check the HST pedal, brake pedals and clutch pedal.
  - 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 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 gas.
  - 3) Check the brakes for proper operation.

12010G00070



## (2) Check Points of Initial 50 Hours



### Changing Engine Oil

#### ⚠ CAUTION

- **Before changing oil, be sure to stop the engine.**
1. Start and warm up the engine for approx. 5 minutes.
  2. Place an oil pan underneath the engine.
  3. To drain the used oil, remove the drain plug (1) at the bottom of the engine and drain the oil completely.
  4. Screw in the drain plug (1).
  5. Fill new oil up to upper line on the dipstick (2).

#### ■ IMPORTANT

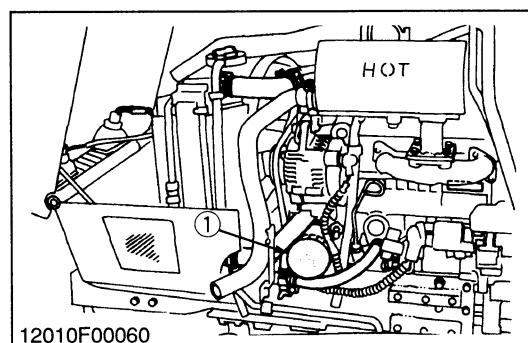
- **When using an oil of different manufacture or viscosity from the previous one, remove all of the old oil.**
- **Never mix two different types of oil.**
- **Use the proper SAE Engine Oil according to ambient temperatures.**
- **Refer to "LUBRICANTS, FUEL AND COOLING WATER". (See page G-8.)**

Engine oil capacity	3.0 L 3.2 U.S.qts 2.6 Imp.qts
---------------------	-------------------------------------

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

(A) Oil level is acceptable within this range.

12010G00080



### Replacing Engine Oil Filter Cartridge

#### ⚠ CAUTION

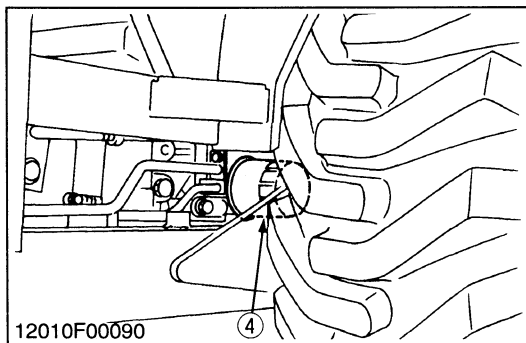
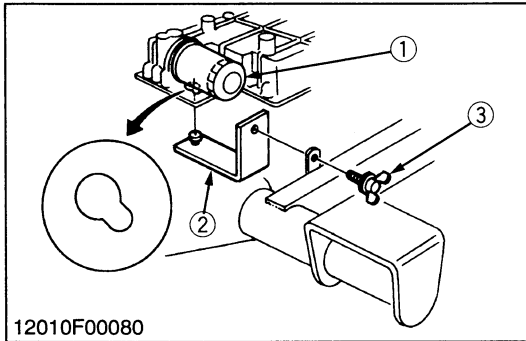
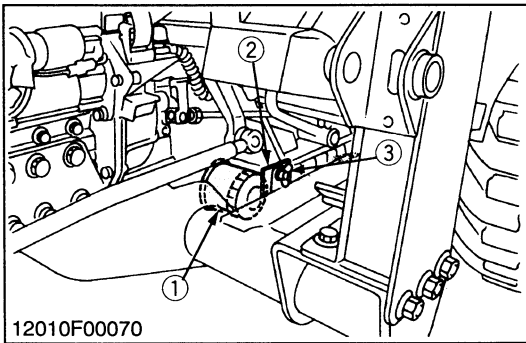
- **Be sure to stop the engine before changing oil filter cartridge.**
1. Remove the oil filter cartridge with the filter wrench.
  2. Apply a slight coat of oil onto the cartridge gasket.
  3. To install the new cartridge, screw it in by hand. Over tightening may cause deformation of rubber gasket.
  4. After the new cartridge has been replaced, the engine oil normally decrease a little. Thus see that the engine oil does not leak through the seal and be sure to read the oil level on the dipstick. Then, replenish the engine oil up to the specified level.

#### ■ IMPORTANT

- **To prevent serious damage to the engine, replacement element must be highly efficient. Use only a KUBOTA genuine filter or its equivalent.**

- (1) Engine Oil Filter

12010G00090



## Replacing Hydraulic Oil Filter Cartridge

### ⚠ CAUTION

- **Be sure to stop the engine before changing the oil filters.**

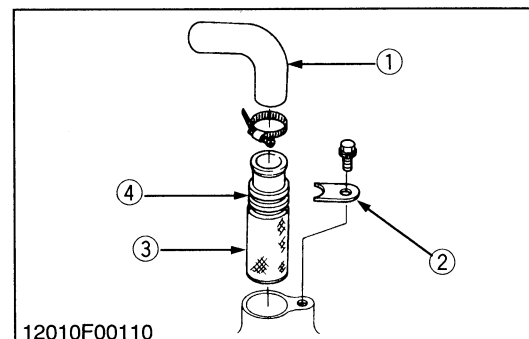
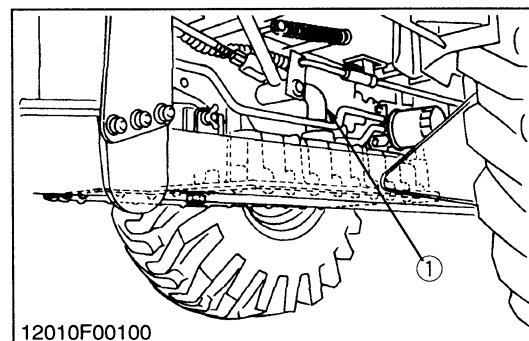
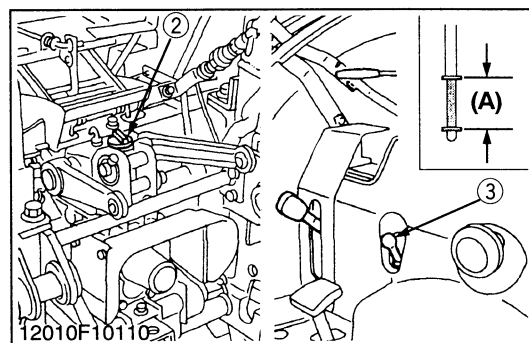
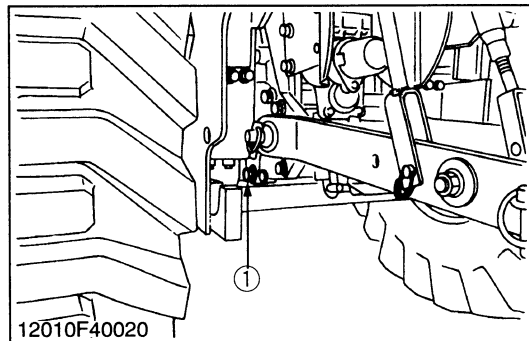
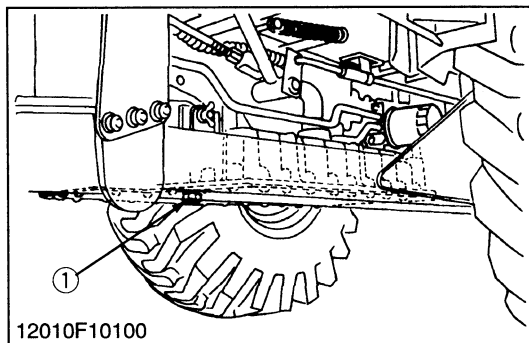
1. Drain the transmission fluid.
2. Remove the protect cover (2) of hydraulic oil filter.  
(Filter for main hydraulic circuit)
2. Remove the seat under cover.  
(Filter for HST circuit)
3. Remove the oil filter cartridge by using a filter wrench.
4. Apply a slight coat of oil onto the cartridge gasket.
5. To install the new cartridge, screw it in by hand. Over tightening may cause deformation of rubber gasket.
6. After the new cartridge has been replaced, the transmission fluid level will normally decrease slightly. Make sure that the transmission fluid does not leak through the seal. Check the fluid level.

### ■ IMPORTANT

- **To prevent serious damage to the hydraulic system, the replacement filter must be a highly efficient, 60  $\mu$ m filter for main filter and 10  $\mu$ m filter for HST. Use only a genuine KUBOTA filter or its equivalents.**
- **When using the auxiliary hydraulics, replace the transmission oil filter cartridge after initial 50 service hours.**

- |   |  |
|---|--|
| (1) Hydraulic Oil Filter (for Main Circuit) | (3) Wing Bolt                              |
| (2) Protect Cover                           | (4) Hydraulic Oil Filter (for HST Circuit) |

12010G00100



## Changing Transmission Fluid

### ⚠ CAUTION

- **Be sure to stop the engine checking and changing the transmission fluid.**
1. Place an oil pan under the tractor.
  2. Remove the drain plugs (1) at the bottom of the rear axle cases and oil tank.
  3. Drain the transmission fluid.
  4. After draining, screw in the three drain plugs.
  5. Fill new oil from filling port after removing the filling plug (2) up to the upper notch on the dipstick.
  6. After running the engine for a few minutes, stop it and check the oil level again, if low, add oil prescribed level.

### ■ IMPORTANT

- **Use only multi-grade transmission oil. Use of other oils may damage the transmission or hydraulic system. Refer to "LUBRICANTS AND FLUID" (See page G-8).**
- **Never work the tractor immediately after changing the transmission oil. Keeping the engine at medium speed for a few minutes to prevents damage to the transmission.**
- **Do not mix different brands oil together.**

Transmission fluid capacity	27.5 L 7.26 U.S.gals. 6.05 Imp.gals.
-----------------------------	--

- (1) Drain Plug  
(2) Filling Plug  
(3) Dipstick

(A) Oil level acceptable within this range.

12010G00110

## Cleaning Oil Strainer for HST Charge Pump

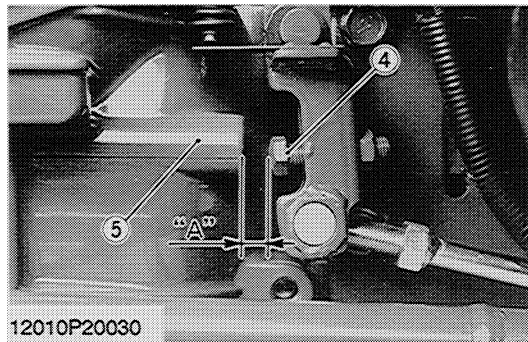
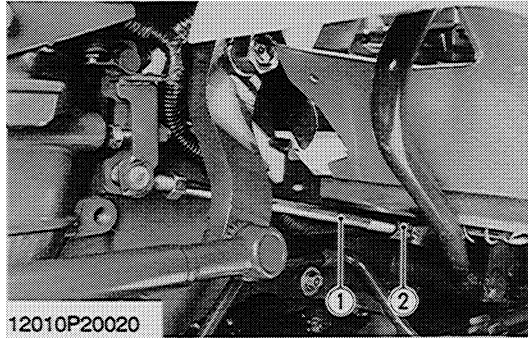
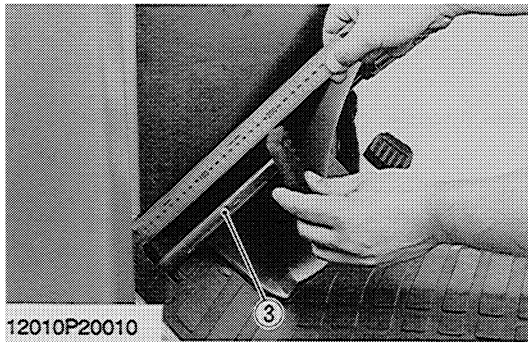
1. Disconnect the suction hose (1) from strainer (3).
2. Remove the lock plate (2) and then pull out the strainer from oil tank.
3. Clean the strainer with nonflammable solvent.

### ■ NOTE

- **When changing the transmission fluid, disassemble and rinse the strainer with nonflammable solvent to completely clean off fillings.**
- **When reassembling, be careful not to damage the parts.**
- **Since the fine fillings in the oil could impair the component parts of the hydraulic system precision built to withstand high pressure, the suction line end is provided with an oil strainer.**

- (1) Suction Hose  
(2) Lock Plate  
(3) Strainer  
(4) O-ring

12010G00120



### Checking Clutch Pedal Free Travel

#### ⚠ CAUTION

- When checking, park the tractor on flat ground, apply the parking brake, stop the engine and remove the key.
1. Slightly depress the clutch pedal (3) and measure free travel at top of pedal stroke.
  2. If the measurement is not within the factory specifications, loosen the lock nut (2) and adjust the clutch rod (1) length.
  3. After adjusting it, be sure to keep the following distance for clutch pedal stopper bolt (4).
  4. After adjusting them, try to start engine. If no start, check the safety switch setting position.

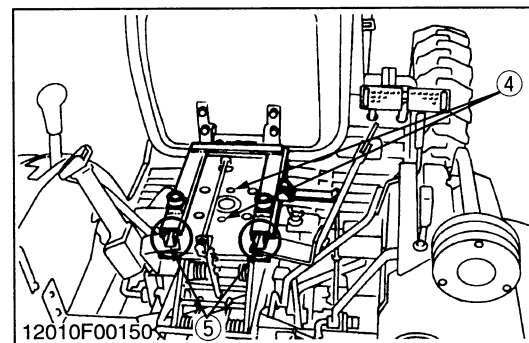
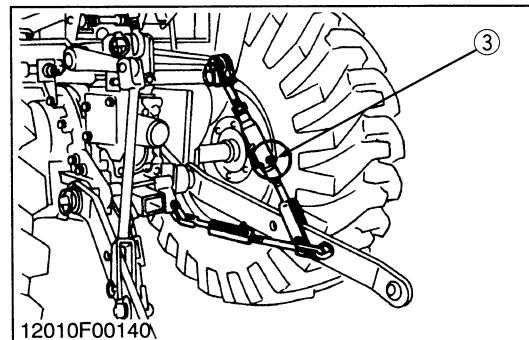
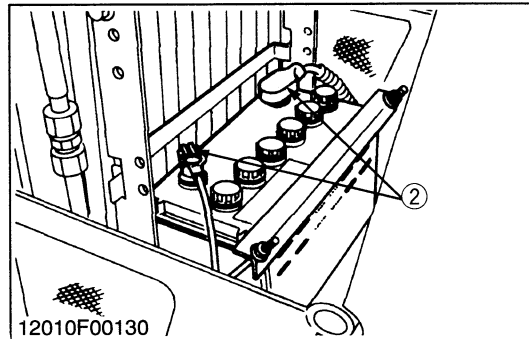
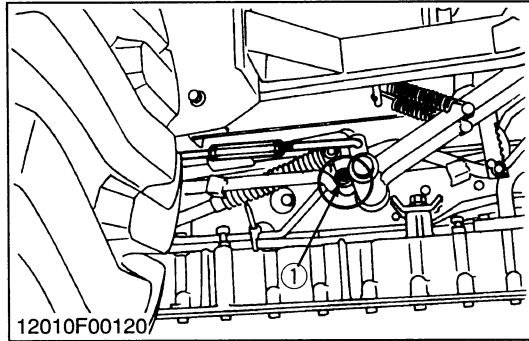
Clutch pedal free travel	Factory spec.	20 to 30 mm 0.8 to 1.2 in.
Stopper bolt distance : "A"	Factory spec.	8.5 mm 0.3 in.

- (1) Clutch Rod  
(2) Lock Nut  
(3) Clutch Pedal

- (4) Clutch Pedal Stopper Bolt  
(5) Clutch Housing

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### (3) Check Points of Every 50 Hours

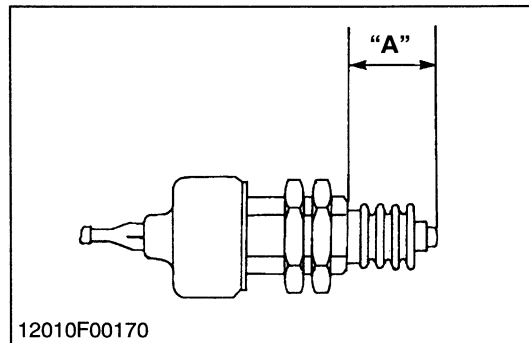
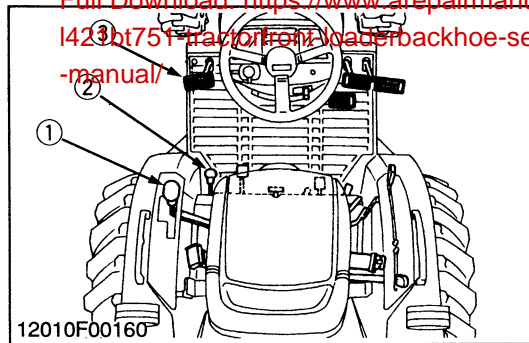


#### Greasing

1. Apply a grease to the following position as figures.

- |                                     |                   |
|-------------------------------------|-------------------|
| (1) Grease Fitting (HST Pedal)      | (4) Seat Lock Pin |
| (2) Battery Terminals               | (5) Seat Adjuster |
| (3) Grease Fitting (Lifting Rod RH) |                   |

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**Checking Engine Start System Tractor****(Serial No.60970 and below)****CAUTION**

- Do not allow anyone near the tractor while testing.
- If the tractor does not pass the test do not operate the tractor.

**Preparation before testing**

1. Sit on operator's seat.
2. Set the parking brake and stop the engine.
3. Shift the range gear shift lever in "**NEUTRAL**" position.
4. Shift the PTO gear shift lever to "**OFF**" position.
5. Fully depress the clutch pedal.

**Test 1 : for safety switch on the clutch linkage**

1. Release the clutch pedal.
2. Turn the key to "**START**" position.
3. The engine must not crank.

**Test 2 : for safety switch on the range gear shift linkage**

1. Fully depress the clutch pedal again.
2. Shift the range gear shift lever to "Desired" position.
3. Turn the key to "**START**" position.
4. The engine must not crank.

**Test 3 : for safety switch on the PTO gear shift linkage**

1. Shift the range gear shift lever to "**NEUTRAL**" position.
2. Shift the PTO gear shift lever to "**ON**" position.
3. Turn the key to "**START**" position.
4. The engine must not crank.

**After testing :If crank any test of the above, adjust or replace the required safety switch.**

When adjusting the safety switches keep the each linkage at condition indicated below.

1. Clutch pedal linkage → Fully depress the clutch pedal.
2. Range gear shift linkage → Shift the range gear shift lever to "**NEUTRAL**" position.
3. PTO gear shift linkage → Shift PTO gear shift lever to "**OFF**" position.

Safety switch distance "A"	Factory spec.	19 to 21 mm 0.75 to 0.83 in.
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Tightening torque	Safety switch mounting nut	15 to 18 N·m 1.5 to 1.8 kgf·m 11.1 to 13.3 ft·lbs
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- (1) Range Gear Shift Lever
- (2) PTO Gear Shift Lever

- (3) Clutch Pedal

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