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WORKSHOP MANUAL
FRONT LOADER

LA1301,LA1601

Kubota

TO THE READER

This Workshop Manual has been prepared to provide servicing personnel with information on the mechanism, service and maintenance of KUBOTA Front Loaders LA1301 and LA1601. It is divided into two parts, "Mechanism" and "Servicing".

As for the items which are not explained in these sections, refer to Workshop Manual for LA1001 · LA1251 (Code No. 97897-12210).

■ 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.

May 1999

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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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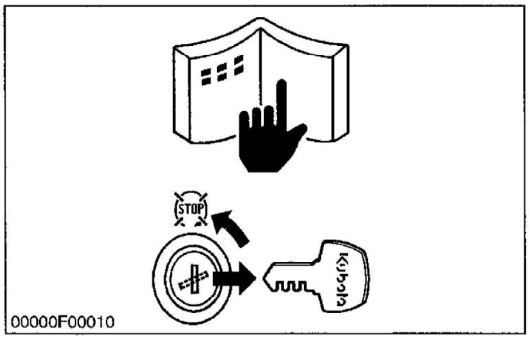

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BEFORE SERVICING AND REPAIRING

(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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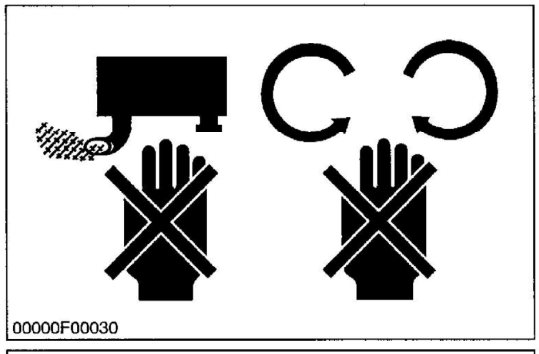
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SAFETY WORKING

(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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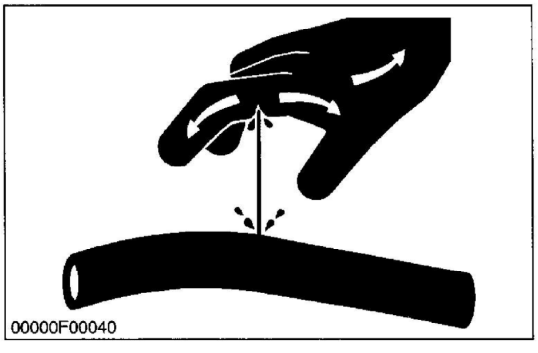
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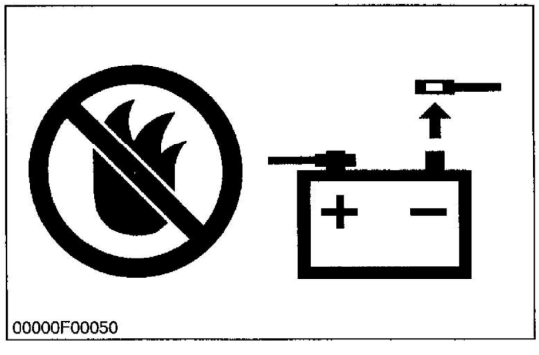
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AVOID FIRES

(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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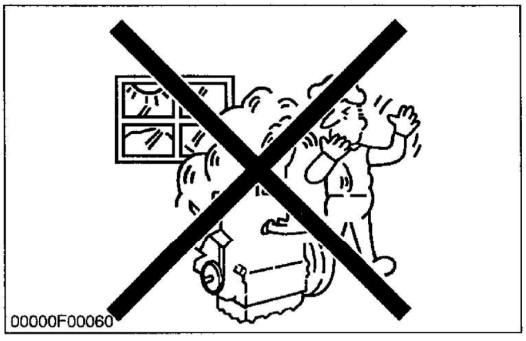

VENTILATE WORK AREA

(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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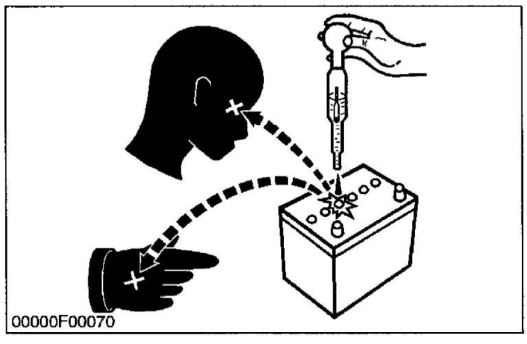

PREVENT ACID BURNS

(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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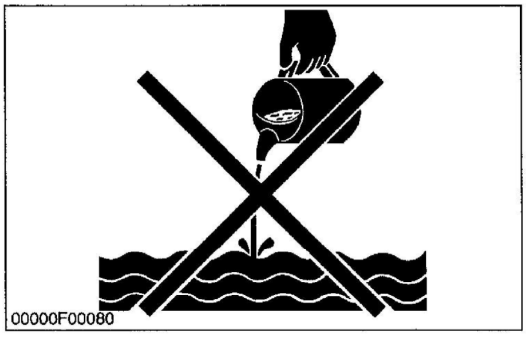

DISPOSE OF FLUIDS PROPERLY

(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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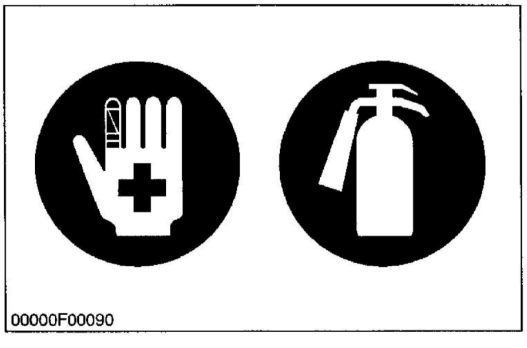

PREPARE FOR EMERGENCIES

(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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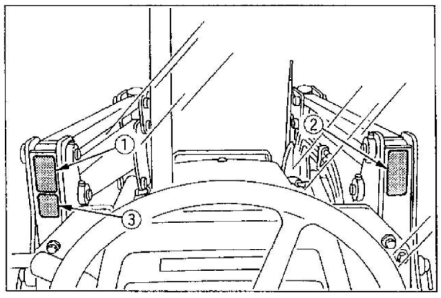
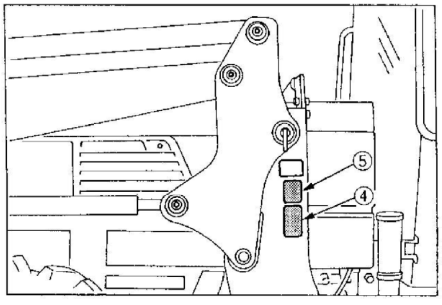
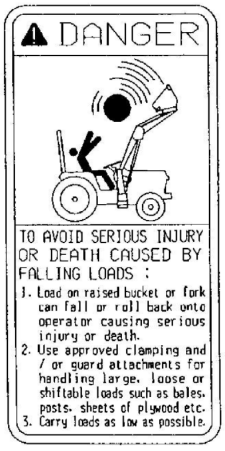
SAFETY DECALS

- **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.

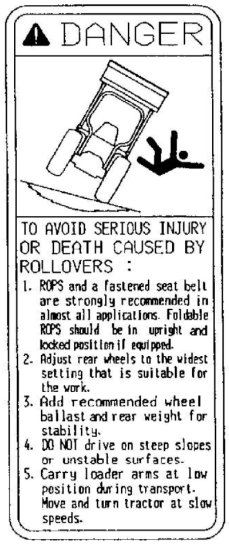




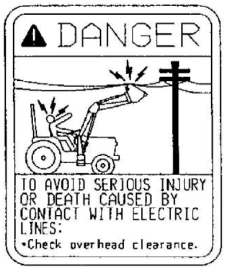
① **Part No. 75546-5643-1**



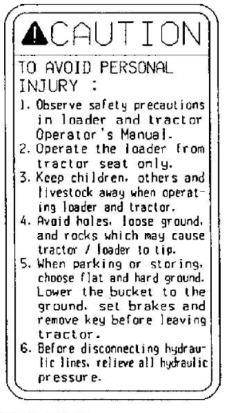
② **Part No. 75546-5641-5**



③ **Part No. 75567-5642-2**



④ **Part No. 75546-5645-1**



⑤ **Part No. 75546-5644-1**
(Both sides)

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 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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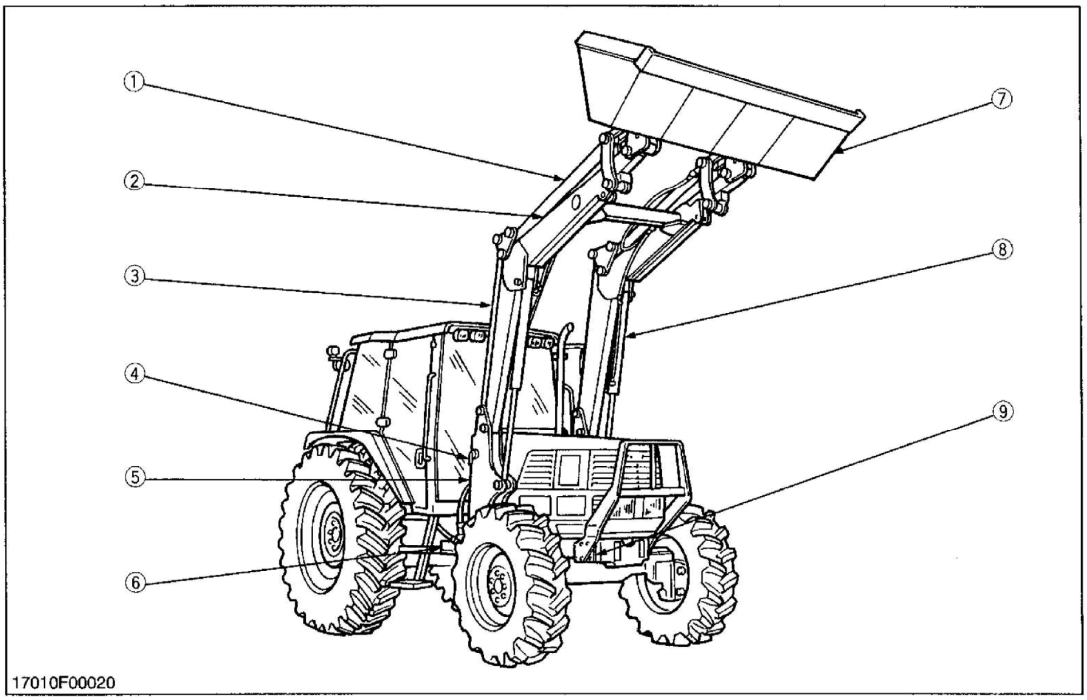

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(1) Bucket Cylinder
(2) Boom
(3) Mechanical Self Leveling Linkage
(4) Mounting Pin
(5) Side Frame
(6) Hydraulic Control Valve
(7) Bucket
(8) Boom Cylinder
(9) Main Frame

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SPECIFICATIONS

LOADER SPECIFICATIONS

Model		LA1301	LA1601
ASAE Rated Lift Capacity		1300 kg (2865 lbs.)	1600 kg (3525 lbs.)
ASAE Rated Brakeout Force		17670 N (3975 lbs.)	21890 N (4920 lbs.)
Boom Cylinder	Bore	64.0 mm (2.50 in.)	70.0 mm (2.75 in.)
	Stroke	652 mm (25.67 in.)	
Bucket Cylinder	Bore	70.0 mm (2.75 in.)	76.0 mm (3.00 in.)
	Stroke	532 mm (20.94 in.)	
Control Valve	Remote valve type	One Detent Float Position, Regenerative Bucket Dump, Power Beyond Circuit	
Net Weight (Approx.)		1030 kg (2270 lbs.)	1060 kg (2337 lbs.)

BUCKET SPECIFICATIONS

Model		LA1301, LA1601	
Type		84" Quick Bucket	96" Quick Bucket
Width		2135 mm (84.0 in.)	2440 mm (96.0 in.)
Length		685 mm (27.0 in.)	730 mm (28.8 in.)
Height		745 mm (29.4 in.)	770 mm (30.3 in.)
Capacity	Struck	0.58 m^3 (20.5 cu.ft.)	0.70 m^3 (24.7 cu.ft.)
	Heaped	0.72 m^3 (25.4 cu.ft.)	0.90 m^3 (31.7 cu.ft.)
Weight		226 kg (498 lbs.)	276 kg (608 lbs.)

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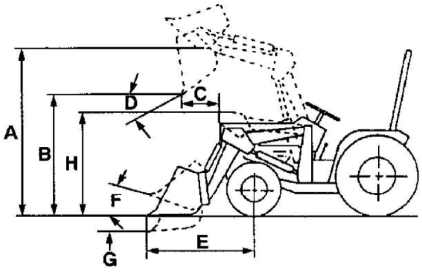
OPERATING DIMENSIONS

Item \ Model		LA1301	LA1601
		M-120 2WD	M-120 4WD
Maximum Lifting Height	(A)	3685 mm (145.1 in.)	
Clearance with Bucket Dumped	(B)	2780 mm (109.4 in.)	
Reach at Maximum Height	(C)	525 mm (20.7 in.)	
Maximum Dump Angle	(D)	1.05 rad. (60 deg.)	
Reach with Bucket on Ground	(E)	2335 mm (91.9 in.)	2280 mm (89.8 in.)
Bucket Roll-back Angle	(F)	0.70 rad. (40 deg.)	
Digging Depth	(G)	160 mm (6.3 in.)	
Overall Height in Carrying Position	(H)	1960 mm (77.2 in.)	

M-120 (2WD) with 11.00 – 16 Front Tires and 18.4 – 38 Rear Tires.
M-120 (4WD) with 14.9 – 24 Front Tires and 18.4 – 38 Rear Tires.



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PERFORMANCE RATINGS (NO LOAD)

Item \ Model	LA1301	LA1601
Raise to Full Height	3.8 sec.	4.1 sec.
Lowering Time	2.8 sec.	3.5 sec.
Attachment Roll-back Time	2.1 sec.	2.5 sec.
Attachment Dump Time	1.7 sec.	2.1 sec.

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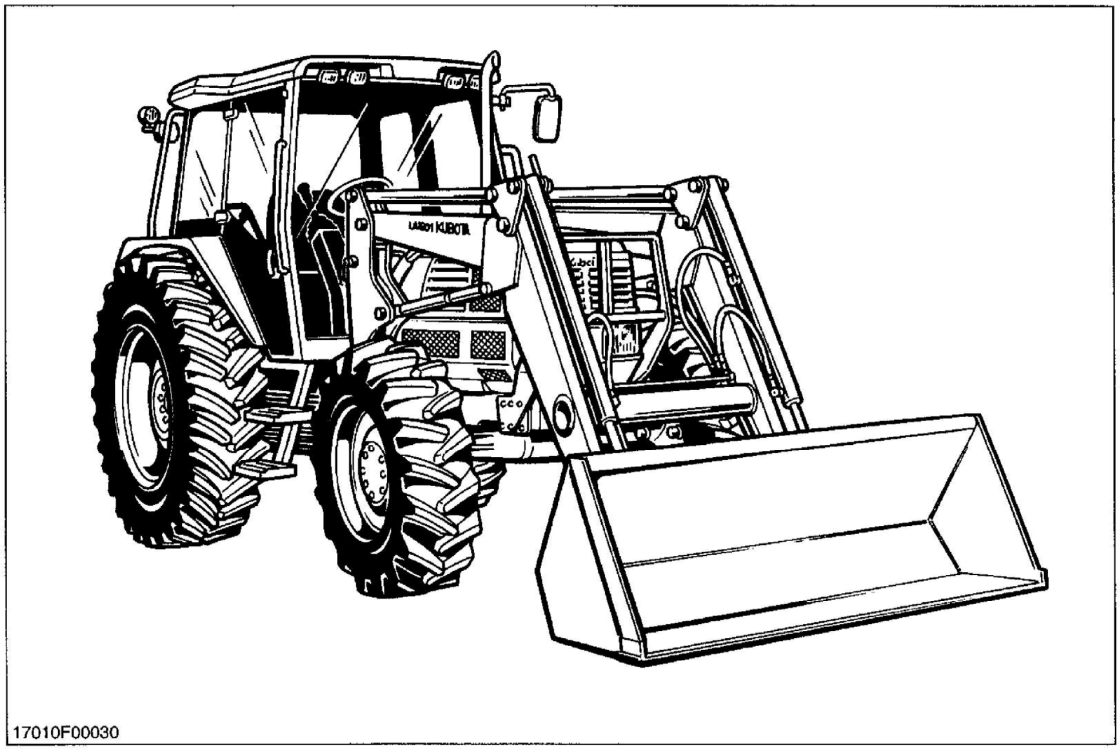
MECHANISM

CONTENTS

[1] FEATURES



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(1) Parallel link mechanism for easy lifting and lowering.
(2) Tiltable remote control stand for the easy-to-operate lever position in cabin.
(3) Series circuit for simultaneous operation, and bucket confluence circuit for quick dumping.
(4) Detachable pin and stand for easy mounting and dismounting.
(5) Bucket link for greater scooping and dumping angles.
(6) Readily attachable with front weight bracket.
(7) Standard equipped with quick attachment hitch.
(8) One-lever operation.

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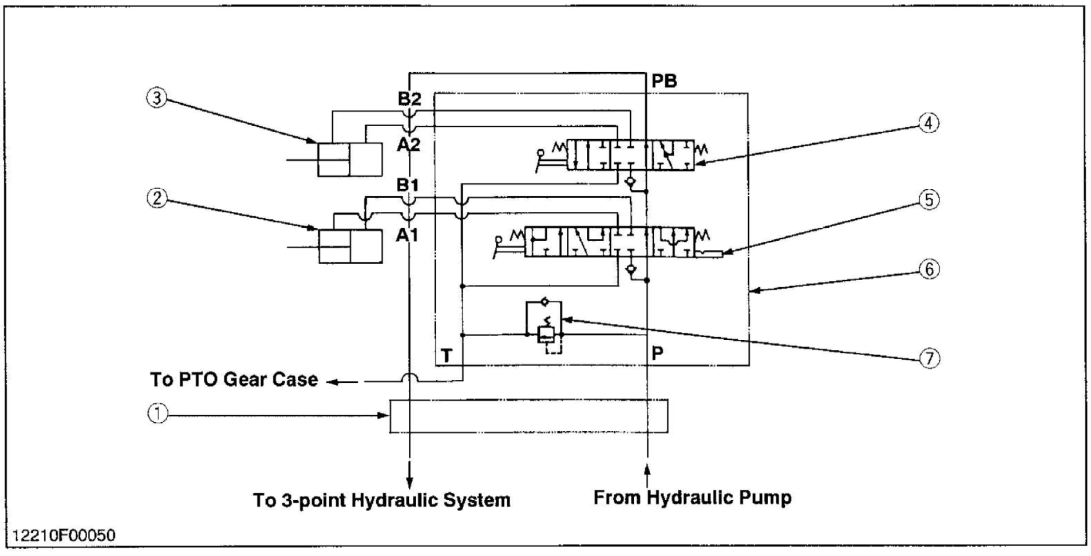
[2] HYDRAULIC CIRCUIT



(1) Hydraulic Block
(2) Boom Cylinder
(3) Bucket Cylinder
(4) Bucket Control Valve
(5) Boom Control Valve
(6) Control Vavle Assembly
(7) Relief Valve

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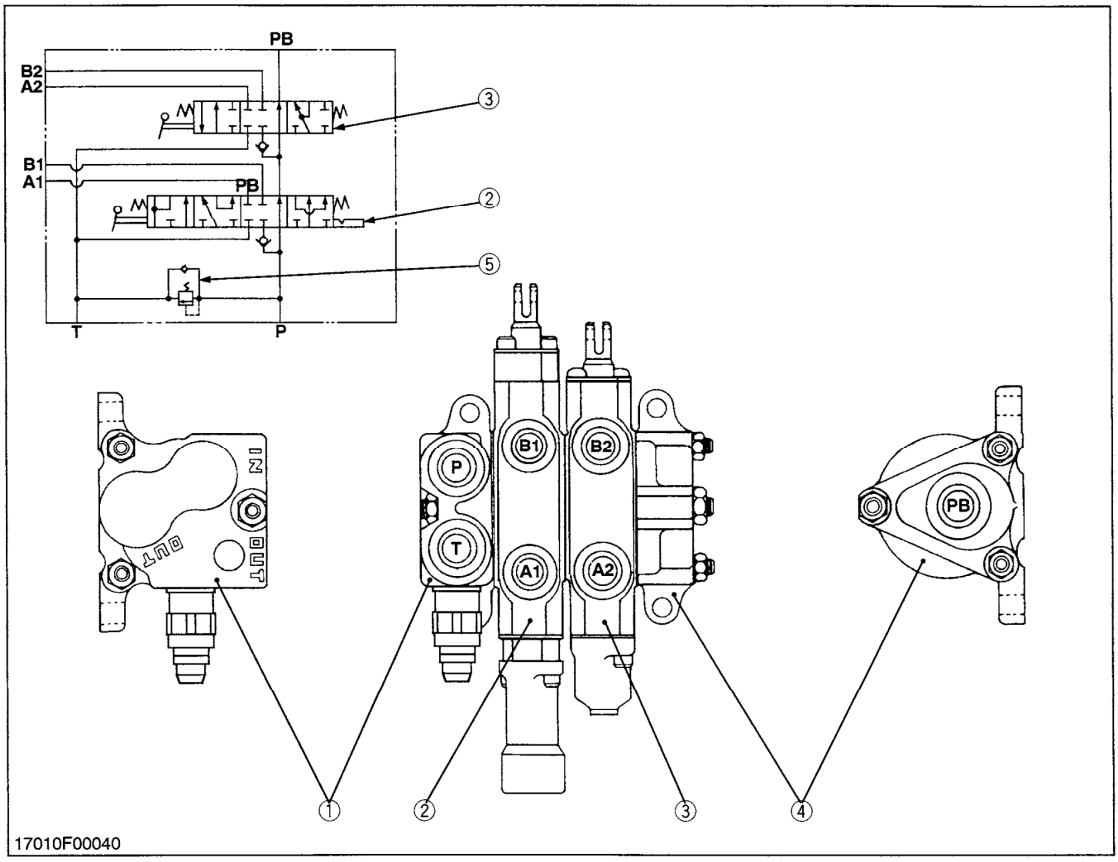
[3] CONTROL VALVE ASSEMBLY AND RELIEF VALVE



(1) Inlet Section
(2) Boom Control Valve
(3) Bucket Control Valve
(4) Outlet Section
(5) Relief Valve

P : **P** Port
T : **T** Port
A1 : **A1** Port
A2 : **A2** Port
B1 : **B1** Port
B2 : **B2** Port
PB : **PB** Port

The control valve assembly is composed of four major sections as shown above.

(1) Inlet Section

This section has **P** and **T** ports.
And the relief valve is installed on this valve.
The **P** port is connected to the **OUTLET** port of hydraulic block by the hydraulic hose.
The **T** port is connected to the **TANK** port of PTO gear case by the hydraulic hose.

(2) Boom Control Valve

The boom control valve is of 4-position, 6-connection, detent, spring center type, consisting of a valve housing, spool, load check valve, etc. This valve has **A1** and **B1** ports and controls oil flow to the boom cylinder.

(3) Bucket Control Valve

The bucket control valve is of 3-position, 6-connection, no detent, spring center type, consisting of a valve housing, spool, load check valve, etc. This valve has **A2** and **B2** ports and controls oil flow to the bucket cylinder.

(4) Outlet Section

This section has **PB** port which is connected to the **INLET** port of hydraulic block by the hydraulic hose, and feeds oil to the three point hydraulic control valve.

As for mechanism of the control valve and the relief valve, refer to Workshop Manual for LA1001 LA1251 (Code No. 97897-12210).

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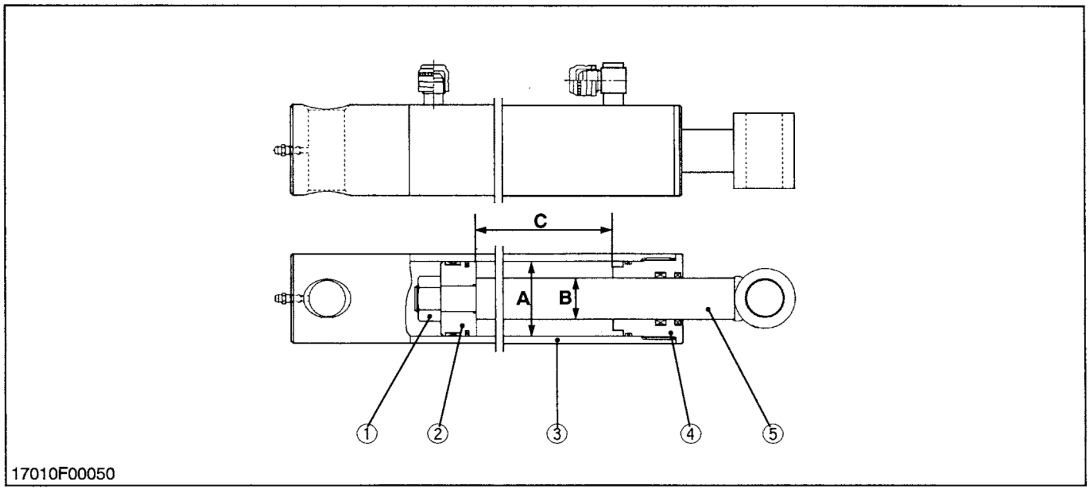
[4] BOOM CYLINDER AND BUCKET CYLINDER



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(1) Nut
(2) Piston
(3) Cylinder Tube
(4) Head
(5) Piston Rod
A : Cylinder I.D.
B : Rod O.D.
C : Stroke

Both boom cylinder and bucket cylinder consist of a head (4), cylinder tube (3), piston rod (5), piston (2), and other parts as shown in the figure above.

They are single-rod double acting cylinders in which the reciprocating motion of the piston is controlled by hydraulic force applied to both of its ends.

Cylinder Specifications

		LA1301	LA1601
Boom Cylinder	Cylinder I.D. (A)	64.0 mm (2.50 in.)	70.0 mm (2.75 in.)
	Rod O.D. (B)	34.9 mm (1.37 in.)	44.5 mm (1.75 in.)
	Stroke (C)	652.0 mm (25.67 in.)	
Bucket Cylinder	Cylinder I.D. (A)	70.0 mm (2.75 in.)	76.0 mm (3.00 in.)
	Rod O.D. (B)	38.1 mm (1.50 in.)	38.1 mm (1.50 in.)
	Stroke (C)	532.0 mm (20.94 in.)	

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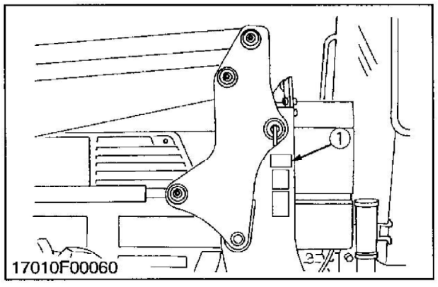
SERVICING

CONTENTS

GENERAL

[1] IDENTIFICATION



When contacting your local KUBOTA distributor, always specify front loader model and serial number.

(1) Model / Serial Number

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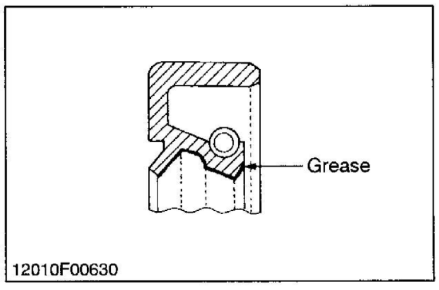
[2] GENERAL PRECAUTION



- During disassembly, carefully arrange removed parts in a clean area to prevent later confusion. Screws, bolts and nuts should be replaced in their original positions to prevent reassembly errors.
- When special tools are required, use genuine KUBOTA tools. Special tools which are not used frequently should be made according to the drawings provided.
- Clean parts before measuring them.
- Use only genuine KUBOTA parts for parts replacement to maintain loader performance and to assure safety.
- O-rings and oil seals must be replaced during reassembly. Apply grease to new O-rings or oil seals before reassembling.

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[3] LUBRICANTS

To prevent serious damage to hydarulic systems, use only specified fluid or its equivalent.

Place	Capacities		Lubricants
	M-110	M-120	
Transmission Case (Front loader is not attached)	55.0 L 58.1 U.S.qts. 48.4 Imp.qts.	58.0 L 61.3 U.S.qts. 51.0 Imp.qts.	KUBOTA UDT or SUPER UDT Fluid *
Grease fittings	Until grease overflows		Multi-purpose type grease

NOTE :

* KUBOTA UDT or SUPER UDT Fluid ..... KUBOTA original transmission hydraulic fluid

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[4] MAINTENANCE CHECK LIST

To keep the machine working in good condition as well as to avoid any accident and trouble, carry out periodic inspection and maintenance. Check the following points before use.

Service Interval	Check Points	Reference Page
Daily (Each use)	• Check the transmission fluid level • Check the hydraulic hoses	S-2 S-2
Every 10 hours	• Grease all grease fittings • Lubricate joints of control lever linkage	S-3 S-3

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[5] CHECK AND MAINTENANCE

⚠ CAUTION

- **When checking and repairing, park the tractor on flat ground and apply the parking brake.**
- **When checking and repairing, lower the bucket and stop the engine.**

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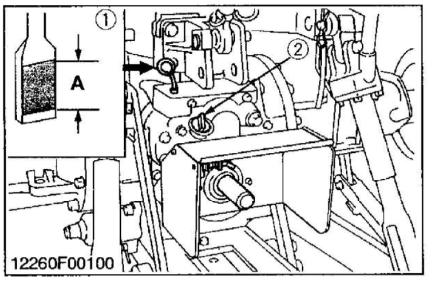
(1) Check Points of Each Use or Daily



Checking Transmission Fluid Level

1. To check the oil level, draw out the dipstick, wipe it clean, replace it, and draw it out again. Check to see that the oil level lies between the two notches.
2. If the level is too low, add new oil to the prescribed level at the oil inlet.

■ IMPORTANT

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

Transmission fluid capacity (Front loader is not attached)	M-110	55.0 L 58.1 U.S.qts. 48.4 Imp.qts.
	M-120	58.0 L 61.3 U.S.qts. 51.0 Imp.qts.

(1) Dipstick
(2) Oil Filling Plug

A: Oil level is acceptable within this range.

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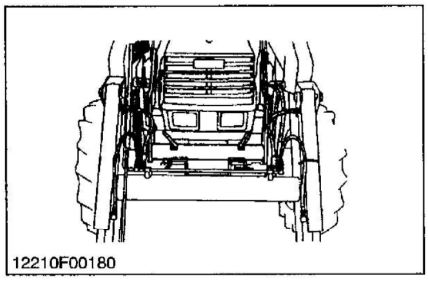

Checking Hydraulic Hoses

1. Check all hydraulic hoses for cuts or wear.
2. If defects are found, replace them.

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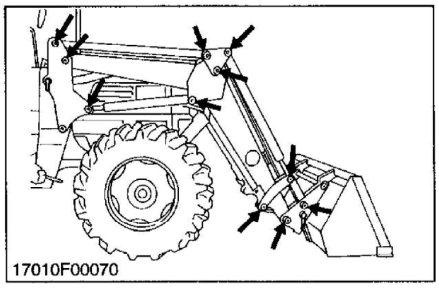
(2) Check Points of Every 10 Hours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Greasing

1. Inject grease in all grease fittings with a hand grease gun.

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Lubricating

1. Lubricate joints of control lever linkage.

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