

Product: Kubota LA513 LA723 LA853 Service Manual

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WSM

WORKSHOP MANUAL FRONT LOADER

LA513 • LA723 • LA853

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 Front Loader LA513, LA723 and LA853. It is divided into two parts, "Mechanism" and "Servicing" for each section.

■ Mechanism

Information on the construction and function are include. 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.

September 2002

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SAFETY FIRST

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

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



DANGER

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



WARNING

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



CAUTION

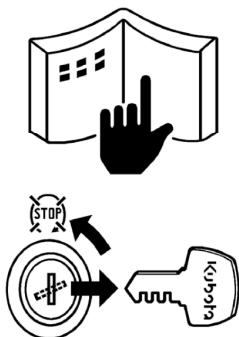
: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

■ IMPORTANT

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

■ NOTE

: Gives helpful information.



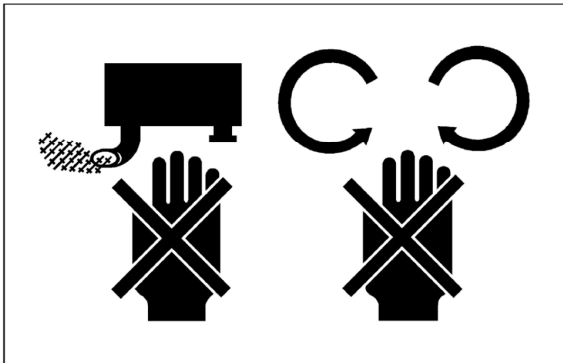
BEFORE SERVICING AND REPAIRING

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



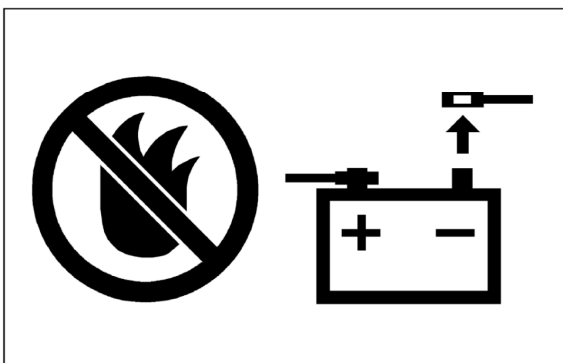
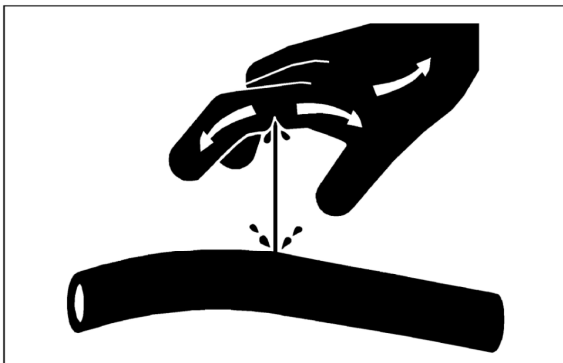
SAFETY STARTING

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



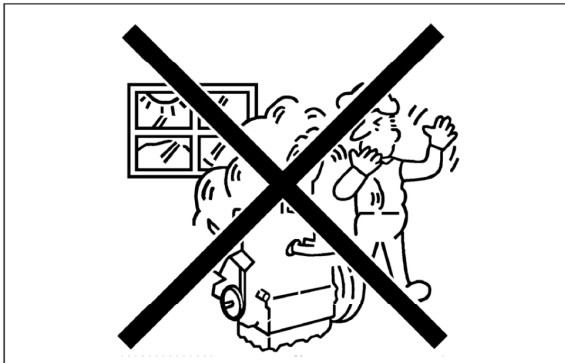
SAFETY WORKING

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



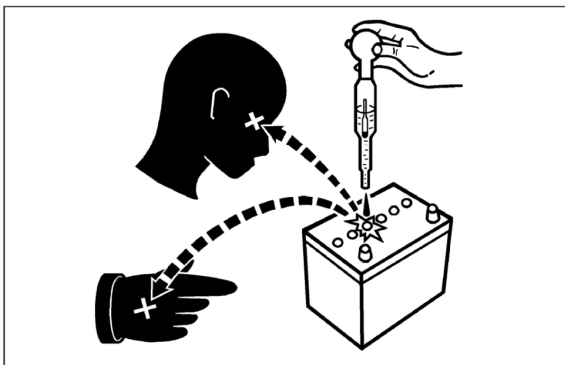
AVOID FIRES

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



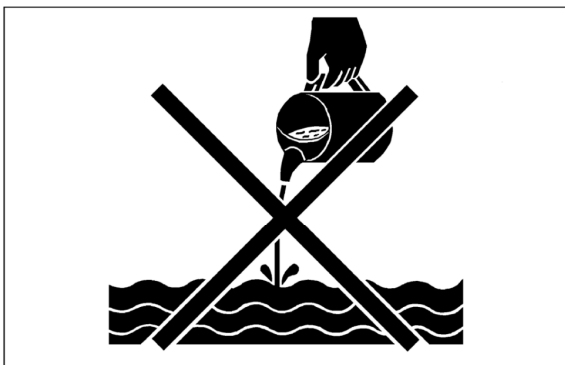
VENTILATE WORK AREA

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



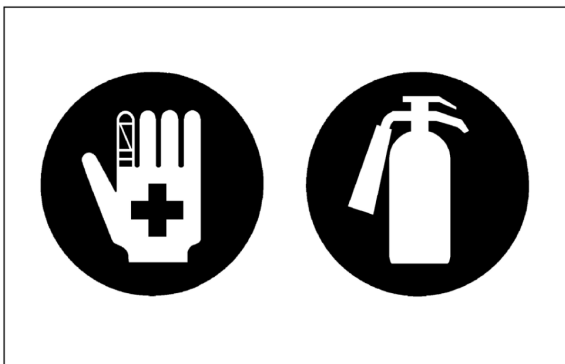
PREVENT ACID BURNS

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



DISPOSE OF FLUIDS PROPERLY

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



PREPARE FOR EMERGENCIES

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

SAFETY DECALS

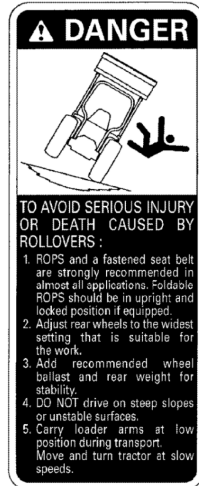
The following safety decals are installed on the machine.

If a decal becomes damaged, illegible or is not on the machine, replace it. The decal part number is listed in the parts list.

(1) Part No. 7J246-5643-1



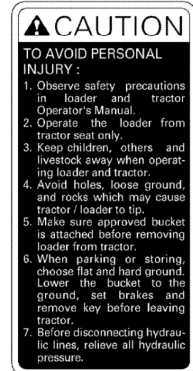
(2) Part No. 7J246-5641-1



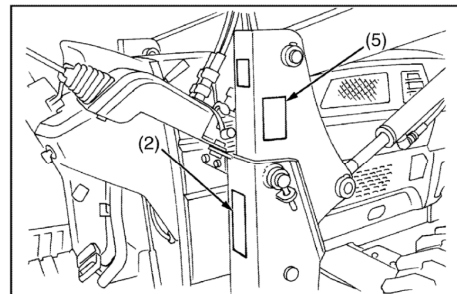
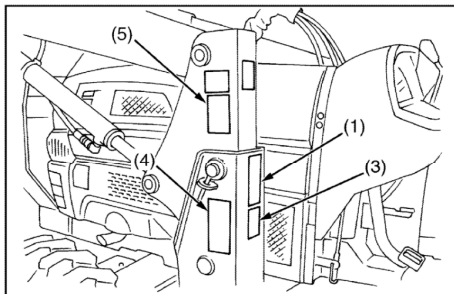
(3) Part No. 7J246-5642-1



(4) Part No. 7J246-5645-1



(5) Part No. 7J246-5644-2
(Both sides)

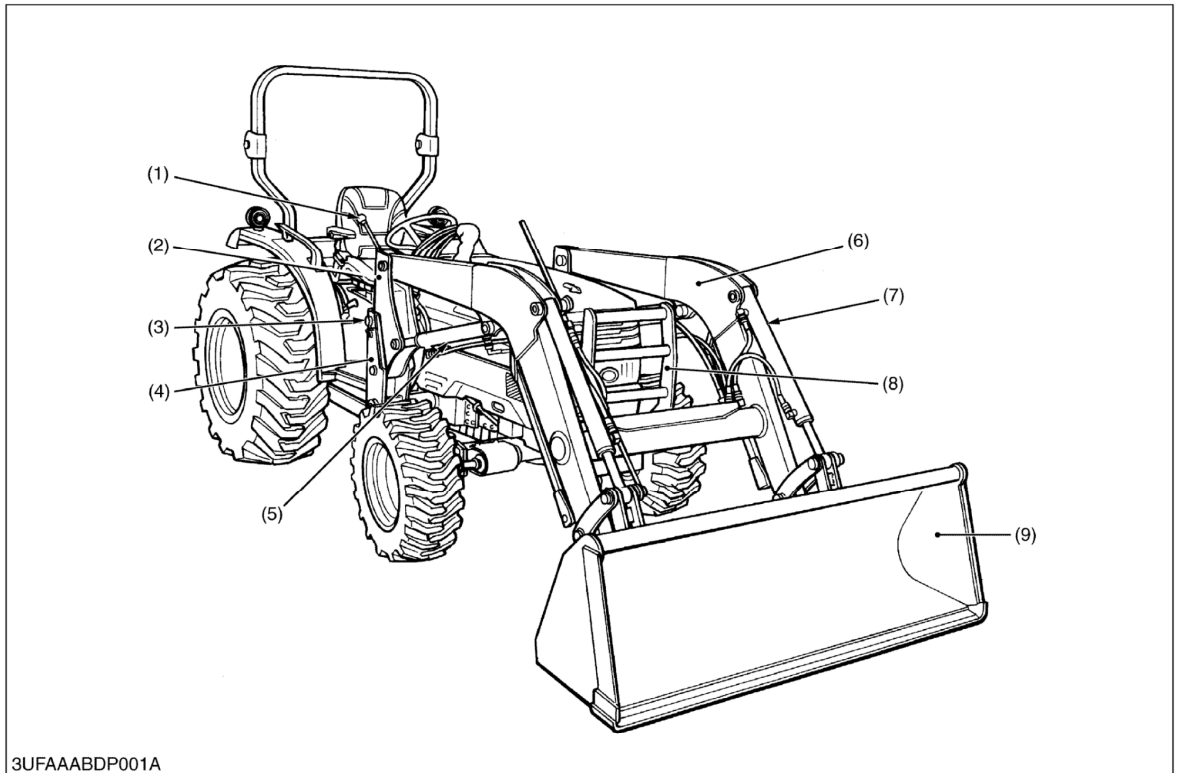


CARE OF DANGER, WARNING AND CAUTION LABELS

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.
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.

3UFAAABCP001A

LOADER TERMINOLOGY



3UFAAABDP001A

- (1) Loader Control Lever
- (2) Side Frame
- (3) Mounting Pin

- (4) Main Frame
- (5) Boom Cylinder

- (6) Boom
- (7) Bucket Cylinder

- (8) Front Guard
- (9) Bucket

SPECIFICATIONS

■ Suitable Tractor

Loader Model	LA513	LA723	LA853
Tractor Model	L3130, L3430	L3130, L3430, L3830	L4330, L4630, L5030

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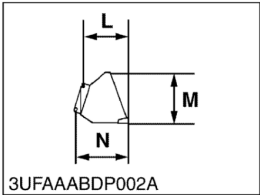
[1] LOADER SPECIFICATIONS

Loader Model		LA513	LA723	LA853
Tractor Model		L3430	L3830	L5030
Wheel Base		1805 mm (71.1 in.)	1805 to 1840 mm (71.1 to 72.4 in.)	1895 to 1915 mm (74.6 to 75.4 in.)
Front Tires		7.2-16	8.3-16	9.5-16
Rear Tires		12.4-24	12.4-24 or 14.9-24	14.9-26
Boom Cylinder	Bore	45.0 mm (1.77 in.)	50.0 mm (1.97 in.)	60.0 mm (2.36 in.)
	Stroke	476 mm (18.7 in.)	502 mm (19.8 in.)	496 mm (19.5 in.)
Bucket Cylinder	Bore	45.0 mm (1.77 in.)	50.0 mm (1.97 in.)	55.0 mm (2.17 in.)
	Stroke	476 mm (18.7 in.)	465 mm (18.3 in.)	469 mm (18.5 in.)
Control Valve	3 position bucket control type	One Detent Float Position, Power Beyond Circuit		
	3 position bucket control type	One Detent Float Position, Two Stage Bucket Dump, Power Beyond Circuit		
Rated Flow		31.5 L/min. 8.3 U.S.GPM 6.9 Imp.GPM		37.0 L/min. 9.8 U.S.GPM 8.1 Imp.GPM
Maximum Pressure		18.1 MPa 185 kgf/cm ² 2630 psi		
Net Weight (Approximate)		390 kg (860 lbs)	480 kg (1058 lbs)	525 kg (1157 lbs)

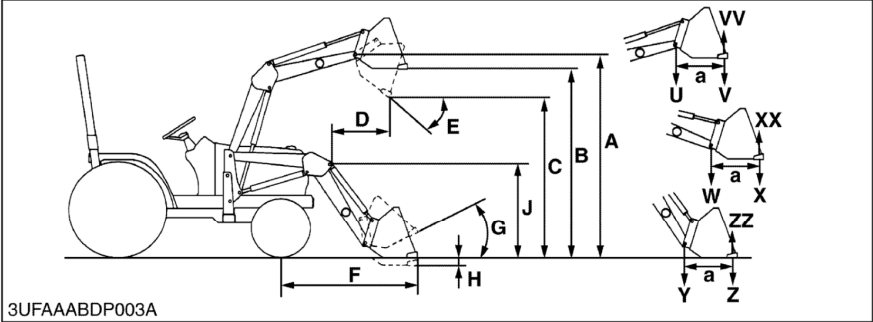
[2] BUCKET SPECIFICATIONS

Loader Model		LA513	LA723	LA853
Bucket Model		Square 66	Square 72	Square 72
Width		1675 mm (66 in.)	1830 mm (72 in.)	1830 mm (72 in.)
Depth (L)		458 mm (18 in.)	509 mm (20 in.)	547 mm (21.5 in.)
Height (M)		562 mm (22.1 in.)	562 mm (22.1 in.)	570 mm (22.4 in.)
Length (N)		502 mm (19.8 in.)	591 mm (23.3 in.)	652 mm (25.7 in.)
Capacity	Struck	0.23 m ³ (8.1 cu.ft)	0.25 m ³ (8.8 cu.ft)	0.31 m ³ (10.9 cu.ft)
	Heaped	0.28 m ³ (9.9 cu.ft)	0.31 m ³ (10.9 cu.ft)	0.37 m ³ (13.1 cu.ft)
Weight		112 kg (247 lbs)	133 kg (293 lbs)	146 kg (322 lbs)

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[3] DIMENSIONAL AND OPERATIONAL SPECIFICATIONS



a : 500 mm (19.7 in.)

■ Dimensional Specifications

Loader Model		LA513	LA723	LA853
Tractor Model		L3130, L3430	L3830	L5030
(A)	Maximum lift height	2450 mm (96.5 in.)	2600 mm (102.4 in.)	2885 mm (113.6 in.)
(B)	Maximum lift height under level bucket	2280 mm (89.8 in.)	2400 mm (94.5 in.)	2685 mm (105.7 in.)
(C)	Clearance with bucket dumped	1995 mm (78.5 in.)	2040 mm (80.3 in.)	2280 mm (89.8 in.)
(D)	Reach at maximum lift height	525 mm (20.7 in.)	530 mm (20.9 in.)	510 mm (20.1 in.)
(E)	Maximum dump angle	40 deg.	45 deg.	45 deg.
(F)	Reach with bucket on ground	1570 mm (61.8 in.)	1750 mm (68.9 in.)	1905 mm (75 in.)
(G)	Bucket roll-back angle	30 deg.	40 deg.	40 deg.
(H)	Digging depth	125 mm (4.9 in.)	125 mm (4.9 in.)	170 mm (6.7 in.)
(J)	Overall height in carry position	1335 mm (52.6 in.)	1385 mm (54.5 in.)	1450 mm (57.1 in.)

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■ Operational Specifications

Loader Model		LA513	LA723	LA853
Tractor Model		L3130, L3430	L3830	L5030
Lift capacity to maximum height (Bucket bottom mid point)		510 kg (1124 lbs)	720 kg (1587 lbs)	850 kg (1874 lbs)
(U)	Lift capacity to maximum height at pivot pin	610 kg (1345 lbs)	848 kg (1870 lbs)	1077 kg (2374 lbs)
(V)	Lift capacity to maximum height	455 kg (1003 lbs)	635 kg (1400 lbs)	800 kg (1764 lbs)
(W)	Lift capacity to 1.5 m (59 in.) height at pivot pin	800 kg (1764 lbs)	1051 kg (2317 lbs)	1345 kg (2965 lbs)
(X)	Lift capacity to 1.5 m (59 in.) height	630 kg (1389 lbs)	840 kg (1852 lbs)	1086 kg (2394 lbs)
(Y)	Breakout force at pivot pin	12640 N (2845 lbs)	14995 N (3375 lbs)	17840 N (4015 lbs)
(Z)	Breakout force	9600 N (2160 lbs)	11575 N (2605 lbs)	13880 N (3125 lbs)
(VV)	Bucket roll-back force at Maximum height	10650 N (2395 lbs)	10330 N (2325 lbs)	10910 N (2455 lbs)
(XX)	Bucket roll-back force at 1.5 m (59 in.) lift height	13780 N (3100 lbs)	15520 N (3490 lbs)	18640 N (4190 lbs)
(ZZ)	Bucket roll-back force at ground line	11880 N (2670 lbs)	16090 N (3620 lbs)	19750 N (4440 lbs)
Raising time		2.7 sec.	3.3 sec.	4.1 sec.
Lowering time		2.2 sec.	2.2 sec.	3.1 sec.
Bucket dumping time		1.3 sec.	1.3 sec.	1.6 sec.
Bucket roll-back time		1.6 sec.	2.1 sec.	2.2 sec.

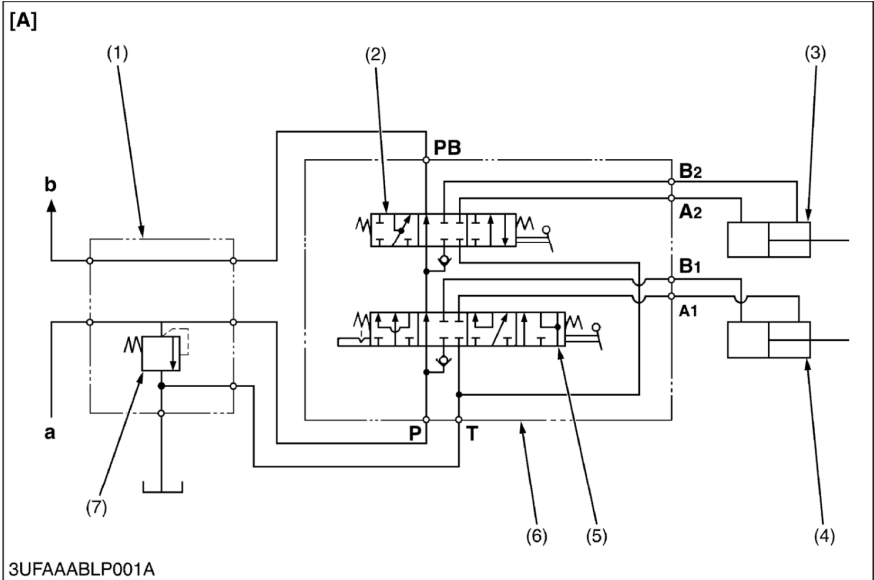
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MECHANISM

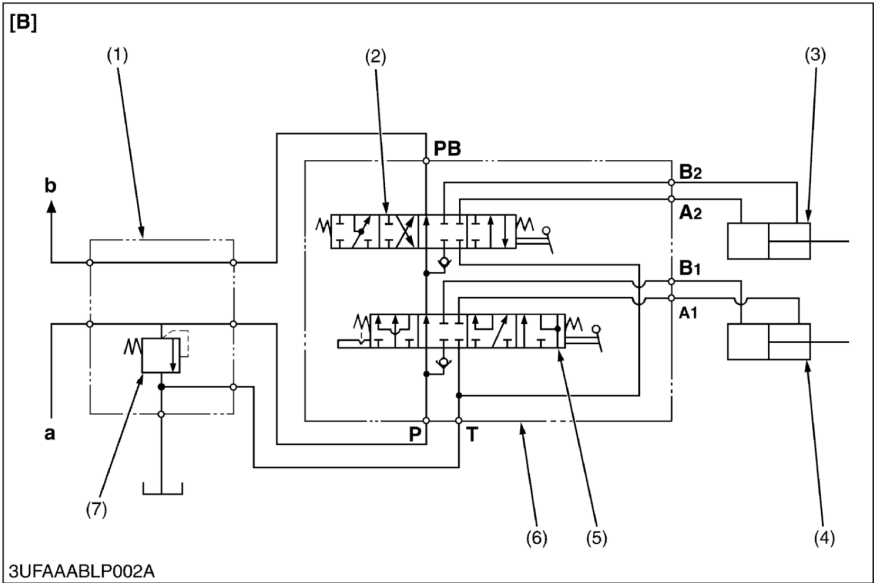
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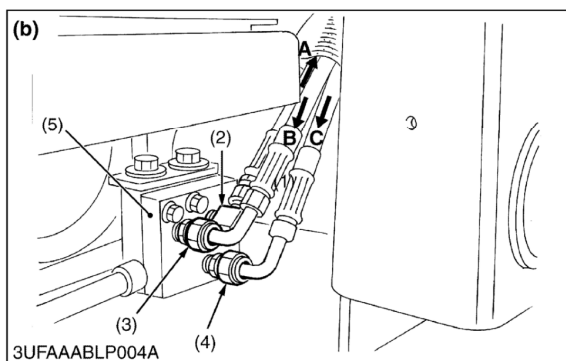
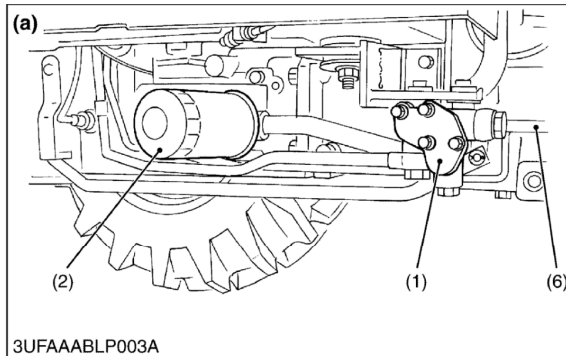
1. HYDRAULIC CIRCUIT



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2. HYDRAULIC BLOCK



A filtered oil is forced out by the hydraulic pump to the hydraulic block (5) through the delivery pipe (6).

The hydraulic block has a relief valve.

(a) When Front Loader is not Attached

1. An oil from the hydraulic pump is delivered into the hydraulic block cover (1).

(b) When Front Loader is Attached

1. An oil from the hydraulic pump is delivered into the **P** port of hydraulic block (5) through the pump port (2).
2. An oil returning from the **PB** (power beyond) port of loader control valve is delivered into the three point hydraulic system through the power beyond port (3) of the hydraulic block (5).
3. An oil returning from the **T** (tank) port of the loader control valve is delivered into the transmission case through the tank port (4).

- (1) Hydraulic Block Cover
- (2) Pump Port
- (3) Power Beyond Port
- (4) Tank Port
- (5) Hydraulic Block
- (6) Delivery Pipe

A : To Front Loader (P Port)

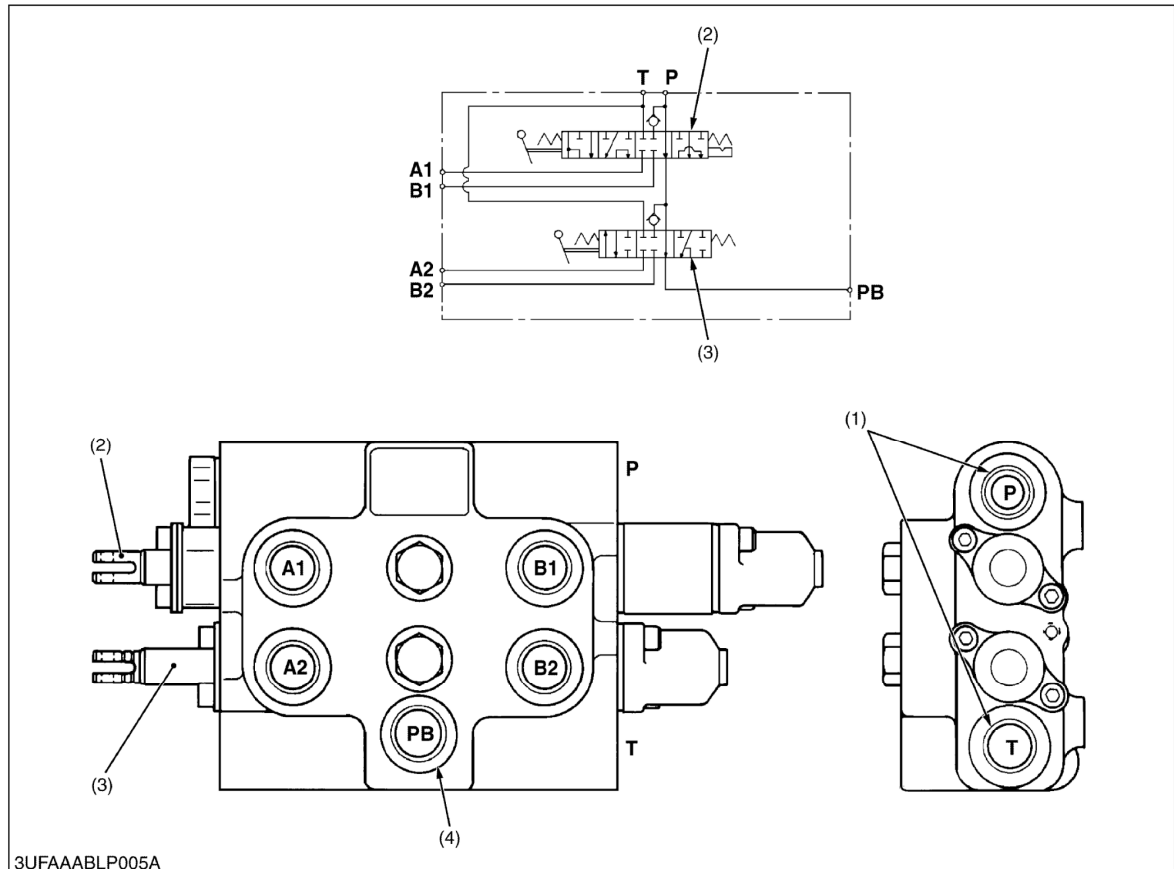
B : From Front Loader (PB Port)

C : From Front Loader (T Port)

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3. CONTROL VALVE ASSEMBLY

[1] 3 POSITION BUCKET CONTROL TYPE



- (1) Inlet and Outlet Section
 (2) Boom Control Valve
 (3) Bucket Control Valve
 (4) Power Beyond

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 one casting block and four major section as shown above.

(1) Inlet and Outlet Section

This section has **P** and **T** ports.

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 hydraulic block by the hydraulic hose.

(2) Boom Control Section

The boom control valve is of 4-position, 6-connection, detent, spring center type, consisting of a mono block 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 Section

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

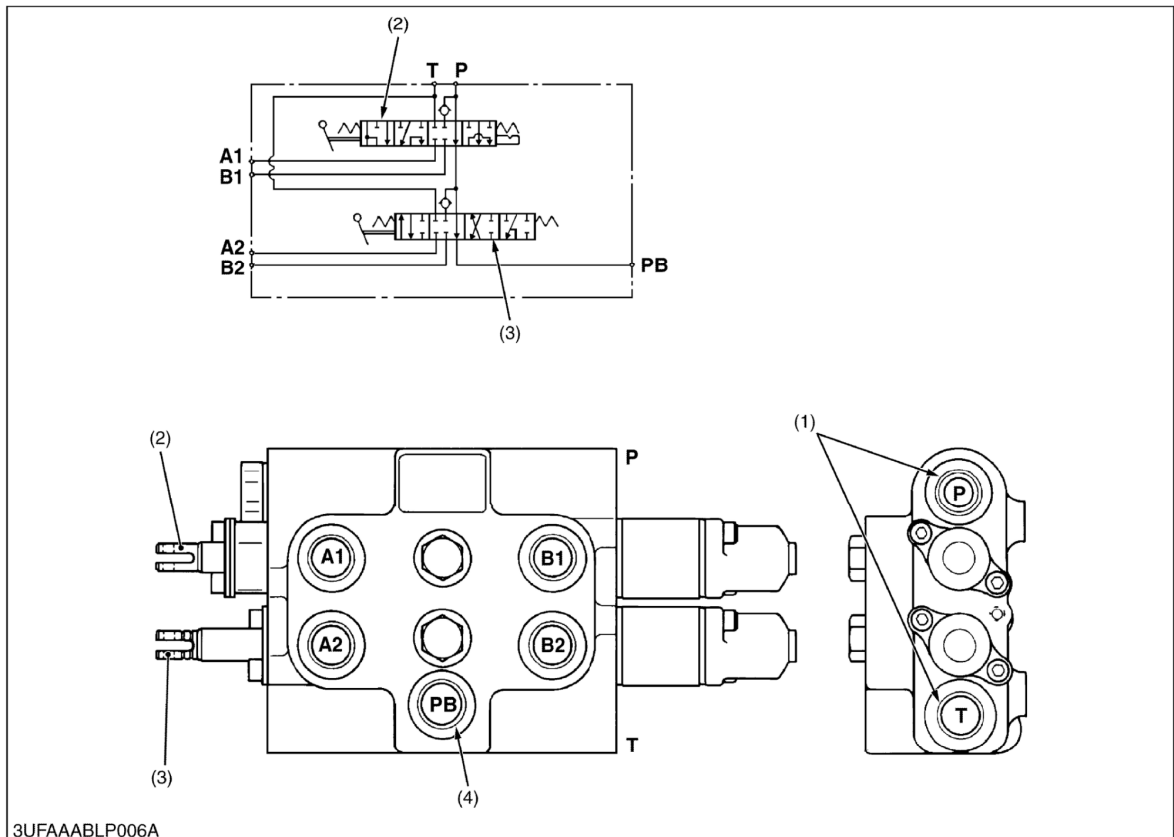
(4) Power Beyond

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.

■ NOTE

- Regarding control valve operation, refer to page F-M3 of **FRONT LOADER MECHANISM Workshop Manual**.

[2] 4 POSITION BUCKET CONTROL TYPE



- (1) Inlet and Outlet Section
 (2) Boom Control Valve
 (3) Bucket Control Valve
 (4) Power Beyond

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 one casting block and four major section as shown above.

(1) Inlet and Outlet Section

This section has **P** and **T** ports.

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 hydraulic block by the hydraulic hose.

(2) Boom Control Section

The boom control valve is of 4-position, 6-connection, detent, spring center type, consisting of a mono block 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 Section

The bucket control valve is of 4-position, 6-connection, no detent, spring center type, consisting of a mono block valve housing, spool, load check valve, etc. This valve has **A2** and **B2** ports and controls oil flow to the bucket cylinder.

(4) Power Beyond

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.

■ NOTE

- Regarding control valve operation, refer to page F-M5, F-M10, F-M12 and F-M13 of **FRONT LOADER MECHANISM Workshop Manual**.

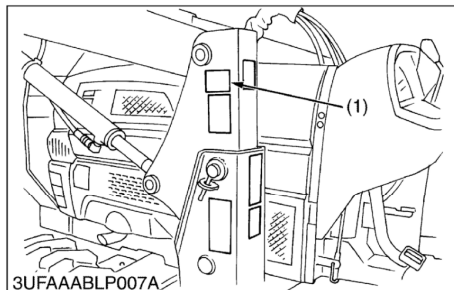
SERVICING

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1. GENERAL

[1] IDENTIFICATION

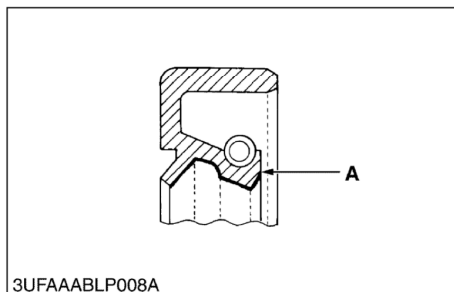


When contacting your local KUBOTA distributor, always specify front loader model and serial number.

(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-ring and oil seals must be replaced during reassembly. Apply grease to new O-rings or oil seals before reassembling.

A : Grease

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[3] LUBRICANTS

To prevent serious damage to hydraulic system, use only specified fluid or its equivalent.

Place	Capacities			Lubricants
	L3130, L3430	L3830, L4330, L4630	L5030	
Transmission Case (Front loader is not attached)	42 L 11.1 U.S.gals. 9.2 Imp.gals.	43 L 11.4 U.S.gals. 9.5 Imp.gals.	45 L 11.9 U.S.gals. 9.9 Imp.gals.	KUBOTA UDT or SUPER UDT Fluid *1
Grease fitting	Until grease overflows			Multi-purpose type grease

■ NOTE

- *1 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)	<ul style="list-style-type: none"> • Check the transmission fluid level • Check the hydraulic hoses 	S-2 S-2
Every 10 hours	<ul style="list-style-type: none"> • Grease all grease fitting • Lubricate joints of control lever linkage 	S-2 S-2

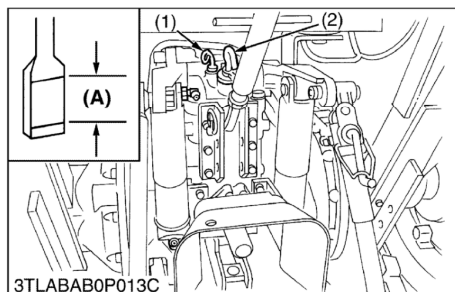
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[5] CHECK AND MAINTENANCE

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.

(1) Check Points of Each Use or Daily



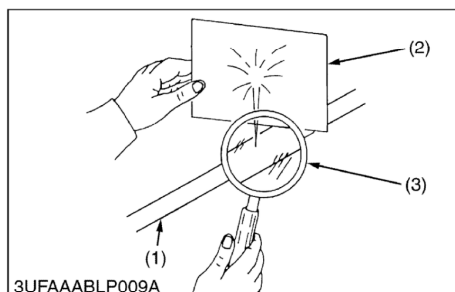
Checking Transmission Fluid Level

1. Check the oil level at the gauge (1).
2. If the level is too low, add new oil to the prescribed level at the oil.

- (1) Gauge
(2) Oil Filling Plug

(A) Oil level is acceptable within this range.

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Checking Hydraulic Hoses

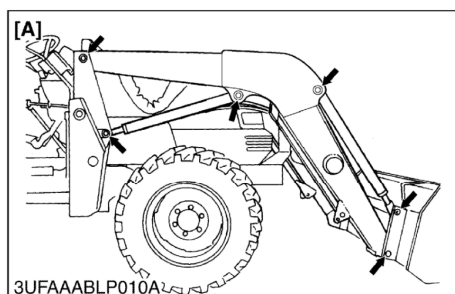
1. With the engine off and bucket on the ground, check all hydraulic hoses (1) for cuts or wear.
2. Check for signs of leaks and make sure all fittings are tight.
3. If defects are found, replace them.

- (1) Hydraulic Hose
(2) Cardboard

(3) Magnifying Glass

W1011064

(2) Check Points of Every 10 Hours



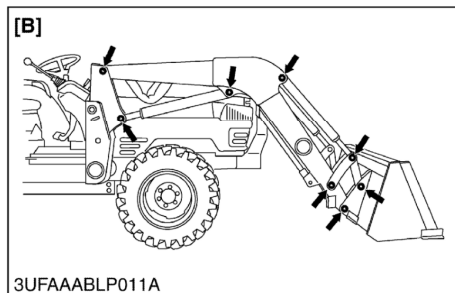
Greasing

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

[A] LA513

[B] LA723, LA853

W1011132



Lubricating

1. Lubricate joints of control lever linkage.

W1011274

2. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Boom Does Not Rise	<ul style="list-style-type: none"> Control valve malfunctioning Boom cylinder defective Control lever linkage defective Hydraulic pump malfunctioning Oil filter clogged Relief valve spring damaged Hydraulic hose damaged Relief valve dirty or stuck 	Repair or replace Repair or replace Repair or replace Repair or replace Clean or replace Replace Replace Clean	S-12,13,14 S-17 S-11,12,15 – – – – –
Boom Does Not Lower	<ul style="list-style-type: none"> Control valve malfunctioning Control lever linkage defective 	Repair or replace Repair or replace	S-12,13,14 S-11,12,15
Insufficient Boom Speed	<ul style="list-style-type: none"> Boom cylinder tube worn or damaged Boom cylinder piston ring (piston seal and O-ring) worn or damaged Oil leaks from tube joints Relief valve setting pressure too low Insufficient transmission fluid Dirty relief valve 	Replace Replace Repair Adjust Refill Clean	S-18 S-18 – – S-2 –
Bucket Does Not Move	<ul style="list-style-type: none"> Control valve malfunctioning Bucket cylinder defective Control lever linkage defective Hydraulic pump malfunctioning Oil filter clogged Relief valve spring damaged Hydraulic hose damaged Dirty relief valve 	Repair or replace Repair or replace Repair or replace Repair or replace Clean or replace Replace Replace Clean	S-12,13,14 S-16 S-11,12,15 – – – – –
Insufficient Bucket Speed	<ul style="list-style-type: none"> Bucket cylinder tube worn or damaged Bucket cylinder piston ring (piston seal and O-ring) worn or damaged Oil leaks from tube joints Relief valve setting pressure too low Insufficient transmission fluid Dirty relief valve 	Replace Replace Repair Adjust Refill Clean	S-17 S-18 – – S-2 –
Front End Loader Drops by Its Weight	<ul style="list-style-type: none"> Boom cylinder tube worn or damaged Boom cylinder piston ring (piston seal and O-ring) worn or damaged Oil leaks from tube joints Control valve malfunctioning 	Replace Replace Repair Repair or replace	S-18 S-18 – S-12,13,14

W1014322

3. SERVICING SPECIFICATIONS

Item		Factory Specification	Allowable Limit
Relief Valve Condition <ul style="list-style-type: none"> Engine Speed..... Approx. 2700 min⁻¹ (rpm) (Except L4330) Approx. 2600 min⁻¹ (rpm) (L4330) Oil Temperature..... 40 to 60 °C 104 to 140 °F 	Setting Pressure	(3130, L3430, L3830) 17.1 to 18.1 MPa 174.4 to 184.6 kgf/cm ² 2480 to 2625 psi (L4330, L4630, L5030) 18.1 to 19.1 MPa 184.6 to 194.8 kgf/cm ² 2625 to 2770 psi	—
Piston Rod	Bend	—	0.25 mm 0.0098 in.

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