WSM

WORKSHOP MANUAL
FRONT LOADER

LA1953AU, LA2253AU

Kubota

KiSC issued 07, 2010 A

TO THE READER

This Workshop Manual tells the servicing personnel about the mechanism, servicing and maintenance of KUBOTA Front Loader LA1953AU and LA2253AU. It contains 4 parts: **"Information"**, **"General"**, **"Mechanism"** and **"Servicing"**.

■ **Information**

This section primarily contains information below.

- Safety First
- Safety Decal
- Specification
- Dimension

■ **General**

This section primarily contains information below.

- Loader Identification
- General Precautions
- Maintenance Check List
- Check and Maintenance

■ **Mechanism**

This section contains information on the structure and the function of the unit. Before you continue with the subsequent sections, make sure that you read this section.

■ **Servicing**

This section primarily contains information below.

- Troubleshooting
- Servicing Specifications
- Tightening Torques
- Checking, Disassembling and Servicing

All illustrations, photographs and specifications contained in this manual are of the newest information available at the time of publication.

KUBOTA reserves the right to change all information at any time without notice.

Since this manual includes many models, information or illustrations and photographs can show more than one model.

June, 2010

KiSC issued 07, 2010 A

I INFORMATION

INFORMATION

CONTENTS

1. SAFETY FIRST

⚠ SAFETY FIRST

- **This symbol, the industry's "Safety Alert Symbol", is used throughout this manual and on labels on the machine itself to warn of the possibility of personal injury. Read these instructions carefully.**
- **It is essential that you read the instructions and safety regulations before you attempt to repair or use this unit.**

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

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

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

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

■ NOTE
- **Gives helpful information.**

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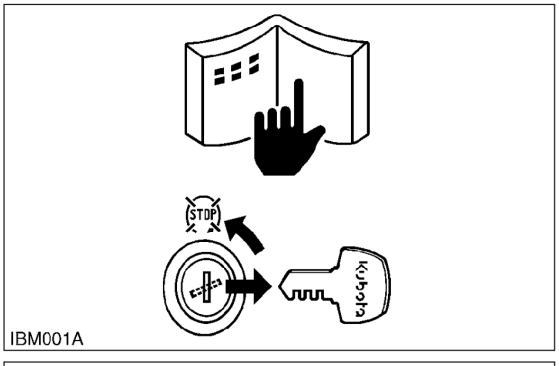

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BEFORE YOU START SERVICE

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

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START SAFELY

- Do not do the procedures below when you start the engine.
  - short across starter terminals
  - bypass the safety start switch
- Do not alter or remove any part of machine safety system.
- Before you start the engine, make sure that all shift levers are in neutral positions or in disengaged positions.
- Do not start the engine when you stay on the ground. Start the engine only from operator's seat.

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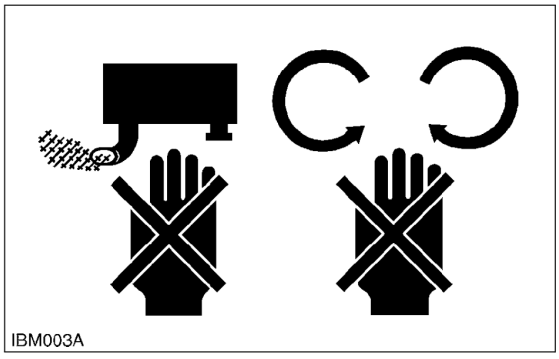
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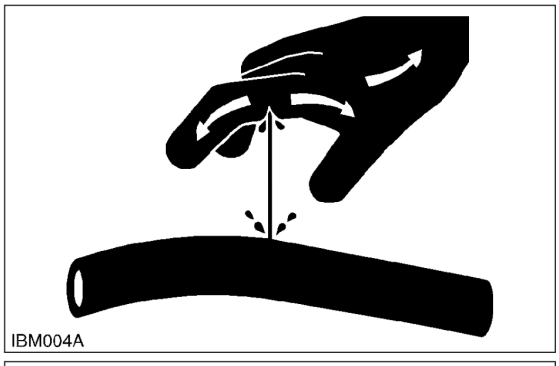
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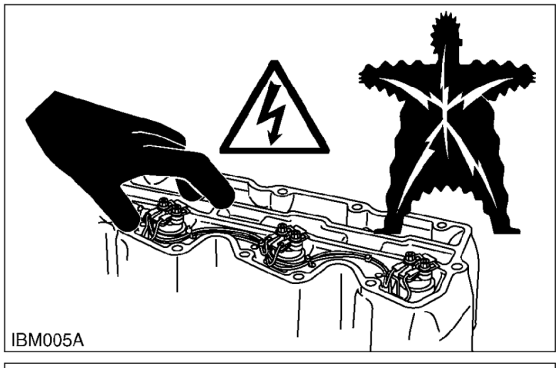
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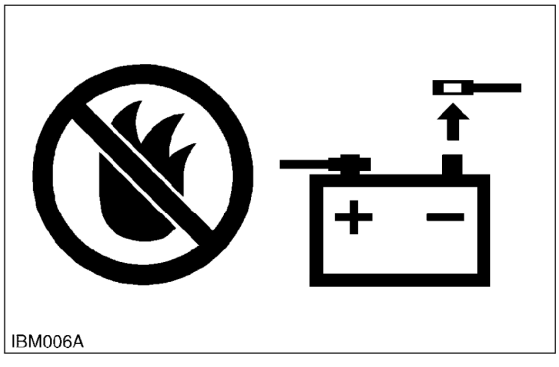
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OPERATE SAFELY

- Do not use the machine after you consume alcohol or medication or when you are tired.
- Put on applicable clothing and safety equipment.
- Use applicable tools only. Do not use alternative tools or parts.
- When 2 or more persons do servicing, make sure that you do it safely.
- Do not operate below the machine that only a jack holds. Always use a safety stand to hold the machine.
- Do not touch the hot parts or parts that turn when the engine operates.
- Do not remove the radiator cap when the engine operates, or immediately after it stops. If not, hot water can spout out from the radiator. Only remove the radiator cap when it is at a sufficiently low temperature to touch with bare hands. Slowly loosen the cap to release the pressure before you remove it fully.
- Released fluid (fuel or hydraulic oil) under pressure can cause damage to the skin and cause serious injury. Release the pressure before you disconnect hydraulic or fuel lines. Tighten all connections before you apply the pressure.
- Do not open a fuel system under high pressure. The fluid under high pressure that stays in fuel lines can cause serious injury. Do not disconnect or repair the fuel lines, sensors, or any other components between the fuel pump and injectors on engines with a common rail fuel system under high pressure.
- Put on an applicable ear protective device (earmuffs or earplugs) to prevent injury against loud noises.
- Be careful about electric shock. The engine generates a high voltage of more than DC100 V in the ECU and is applied to the injector.

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PREVENT A FIRE

- Fuel is very flammable and explosive under some conditions. Do not smoke or let flames or sparks in your work area.
- To prevent sparks from an accidental short circuit, always disconnect the battery negative cable first and connect it last.
- The battery gas can cause an explosion. Keep the sparks and open flame away from the top of battery, especially when you charge the battery.
- Make sure that you do not spill fuel on the engine.

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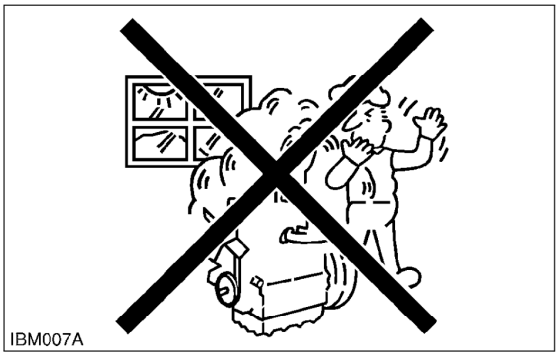
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KEEP A GOOD AIRFLOW IN THE WORK AREA

- If the engine is in operation, make sure that the area has good airflow. Do not operate the engine in a closed area. The exhaust gas contains poisonous carbon monoxide.

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DISCARD FLUIDS CORRECTLY

- Do not discard fluids on the ground, down the drain, into a stream, pond, or lake. Obey related environmental protection regulations when you discard oil, fuel, coolant, electrolyte and other dangerous waste.

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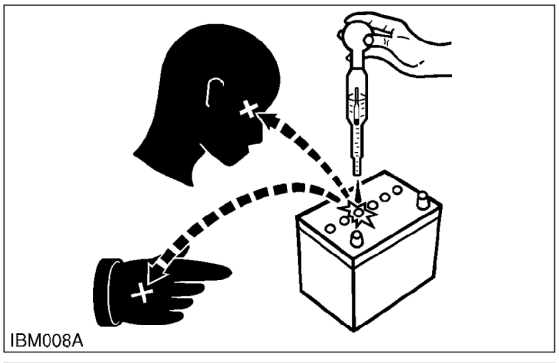
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PREVENT ACID BURNS

- Keep electrolyte away from your eyes, hands and clothing. Sulfuric acid in battery electrolyte is poisonous and it can burn your skin and clothing and cause blindness. If you spill electrolyte on yourself, clean yourself with water, and get medical aid immediately.

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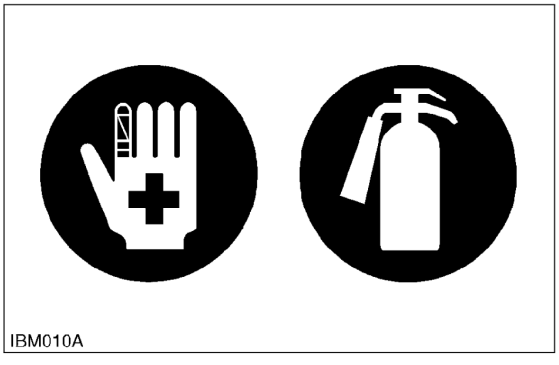
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PREPARE FOR EMERGENCIES

- Keep a first aid kit and fire extinguisher ready at all times.
- Keep the emergency contact telephone numbers near your telephone at all times.

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2. SAFETY DECALS

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

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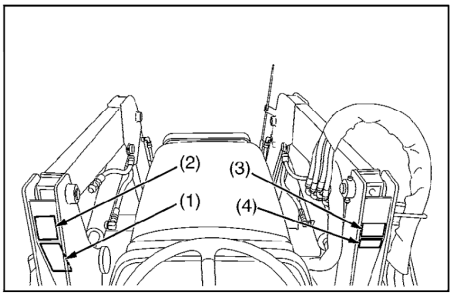
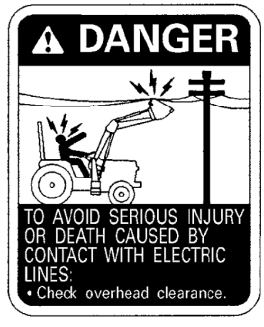


(1) Part No. 7J246-5641-1

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



(3) Part No. 7J417-7778-1

(4) Part No. 7J427-5650-1

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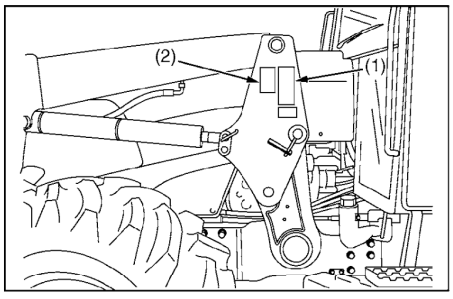
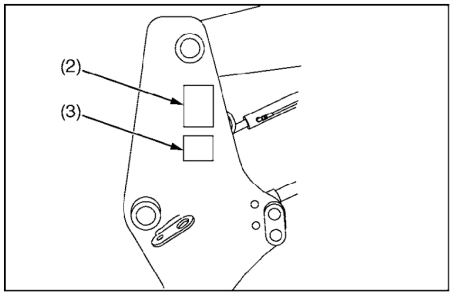
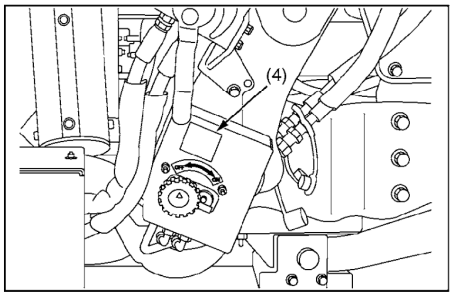




(If hydraulic accumulator is equipped)



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

CAUTION

TO AVOID PERSONAL INJURY :

1. Observe safety precautions in loader and tractor Operator's Manual.
2. Operate the loader from tractor seat only.
3. Keep children, others and livestock away when operating loader and tractor.
4. Avoid holes, loose ground, and rocks which may cause tractor / loader to tip.
5. Make sure approved bucket is attached before removing loader from tractor.
6. When parking or storing, choose flat and hard ground. Lower the bucket to the ground, set brakes and remove key before leaving tractor.
7. Before disconnecting hydraulic lines, relieve all hydraulic pressure.

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

WARNING

TO AVOID INJURY FROM FALLS OR BEING CRUSHED :

1. DO NOT stand or work under raised loader or bucket.
2. DO NOT use loader as jack for servicing.
3. DO NOT use loader as a work platform.
4. NEVER connect chain, cable or rope to loader bucket while operating loader.

(3) Part No. 7J266-5649-2

CAUTION

TO AVOID INJURY FROM CRUSHING :

1. Do not utilize the valve lock for machine maintenance or repair.
2. The valve lock is to prevent accidental actuation when implement is not in use or during transport.

(4) Part No. 7J417-9321-1 (M1866)

WARNING

TO AVOID PERSONAL INJURY :

Lower the loader to the ground before activating KUBOTA SHOCKLESS RIDE (KSR)

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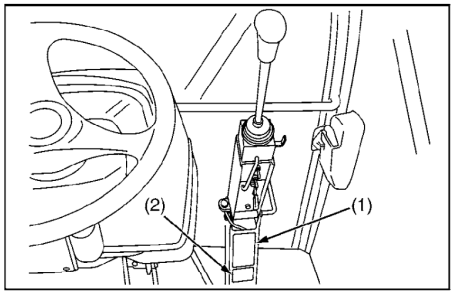
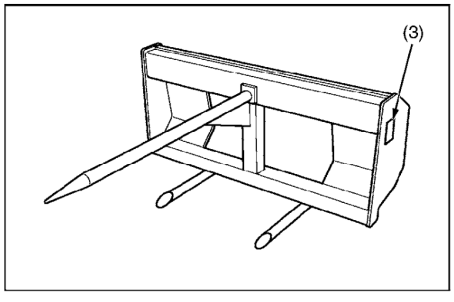


(If bale spear is equipped)



(1) Part No. 7J417-5643-1

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

(2) Part No. 7J417-7778-1

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CARE OF DANGER, WARNING AND CAUTION LABELS

1. Keep danger, warning and caution labels clean and free from obstructing material.
2. Clean danger, warning and caution labels with soap and water, dry with a soft cloth.
3. Replace damaged or missing danger, warning and caution labels with new labels.
4. If a component with danger, warning and caution label(s) affixed is replaced with new part, make sure new label(s) is (are) attached in the same location(s) as the replace component.
5. Mount new danger, warning and caution labels by applying on a clean dry surface and pressure any bubbles to outside edge.

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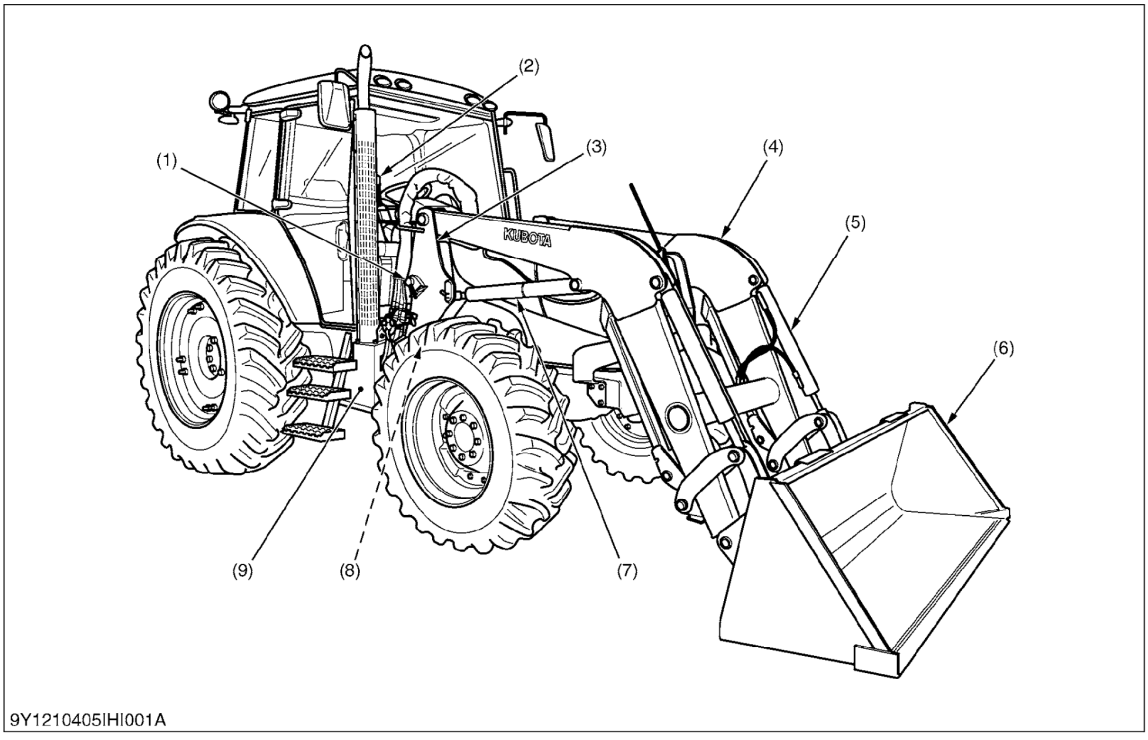
3. LOADER TERMINOLOGY



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

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4. SPECIFICATIONS

Suitable Tractor

LA1953AU: M100X, M110X
LA2253AU: M126X, M135X

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[1] LOADER SPECIFICATIONS

Loader Model		**LA1953AU**	**LA2253AU**
Tractor Model		**M100X, M110X**	**M126X, M135X**
Wheel Base		2435 mm (95.9 in.)	2690 mm (105.9 in.)
Front Tires		13.6R24	14.9R24
Rear Tires		18.4R34	18.4R38
Boom Cylinder	Bore	70 mm (2.76 in.)	75 mm (2.95 in.)
	Stroke	606 mm (23.9 in.)	680 mm (26.8 in.)
Bucket Cylinder	Bore	70 mm (2.76 in.)	75 mm (2.95 in.)
	Stroke	516.5 mm (20.3 in.)	610 mm (24 in.)
Control Valve		One Detent Float Position, Power Beyond Circuit	
Rated Flow		68.0 L/min. (18.0 U.S.gals/min., 15.0 Imp.gals/min.)	77.0 L/min. (20.3 U.S.gals/min., 16.9 Imp.gals/min.)
Maximum Pressure		20.7 MPa (211 kgf/cm^2, 3002 psi)	
Net Weight (Approximate)		898 kg (1980 lbs)	1070 kg (2359 lbs)

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[2] BUCKET SPECIFICATIONS

Loader Model		**LA1953AU, LA2253AU**			
Bucket Size		ROUND 84 in.	LIGHT MATERIAL 84 in.	SQUARE 96 in.	LIGHT MATERIAL 96 in.
Type		Quick Attach			
Width		2135 mm (84.0 in.)		2440 mm (96.0 in.)	
Depth (**L**)		650 mm (25.59 in.)	750 mm (29.53 in.)	665 mm (26.2 in.)	800 mm (31.5 in.)
Height (**M**)		665 mm (26.18 in.)	715 mm (28.15 in.)	750 mm (29.5 in.)	764 mm (30.1 in.)
Length (**N**)		900 mm (35.43 in.)	1000 mm (39.37 in.)	770 mm (30.3 in.)	910 mm (35.8 in.)
Capacity	Struck	0.52 m^3 (18.4 cu.ft.)	0.63 m^3 (22.3 cu.ft.)	0.66 m^3 (23.3 cu.ft.)	0.80 m^3 (28.3 cu.ft.)
	Heaped	0.64 m^3 (22.6 cu.ft.)	0.79 m^3 (27.9 cu.ft.)	0.75 m^3 (26.5 cu.ft.)	0.98 m^3 (34.6 cu.ft.)
Weight		235 kg (518 lbs)	255 kg (562 lbs)	275 kg (606 lbs)	316 kg (697 lbs)

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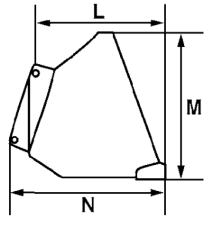

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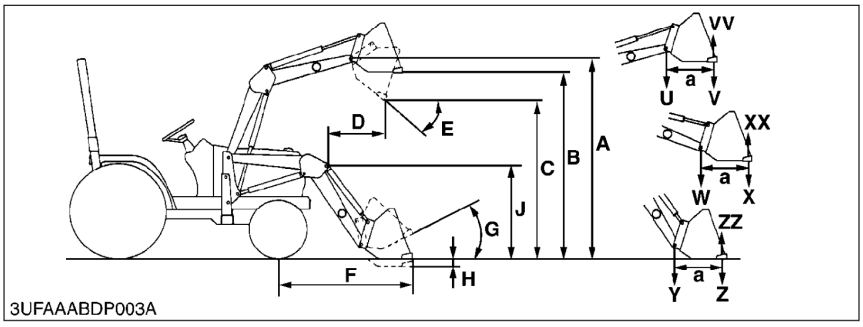
[3] DIMENSIONAL AND OPERATIONAL SPECIFICATIONS



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Dimensional Specifications

Loader Model		LA1953AU		LA2253AU	
Tractor Model		M100X, M110X		M126X, M135X	
Boom Cylinder Fulcrum Point		HEIGHT	POWER	HEIGHT	POWER
A	Maximum lift height to pivot pin	3700 mm (145.7 in.)	3370 mm (132.7 in.)	4099 mm (161.4 in.)	3764 mm (148.2 in.)
B	Maximum lift height under level bucket	3470 mm (136.6 in.)	3160 mm (124.4 in.)	3862 mm (152 in.)	3527 mm (138.9 in.)
C	Clearance with bucket dumped	2860 mm (112.6 in.)	2490 mm (98.0 in.)	3290 mm (129.5 in.)	2956 mm (116.4 in.)
D	Reach at maximum lift height (Dumping Reach)	553 mm (21.8 in.)	932 mm (36.7 in.)	589 mm (23.2 in.)	984 mm (38.7 in.)
E	Maximum dump angle	0.91 rad (52 °)	1.1 rad (63 °)	0.87 rad (50 °)	1.0 rad (60 °)
F	Reach with bucket on ground	2230 mm (87.8 in.)		2334 mm (91.9 in.)	
G	Bucket roll-back angle	0.70 rad (40 °)			
H	Digging depth	60 mm (2.4 in.)	65 mm (2.6 in.)	131 mm (5.2 in.)	133 mm (5.2 in.)
J	Overall height in carry position	1700 mm (66.9 in.)		1880 mm (74.0 in.)	
a	Length	800 mm (31.5 in.)			

Operational Specifications

Loader Model		LA1953AU		LA2253AU	
Tractor Model		M100X, M110X		M126X, M135X	
Boom Cylinder Fulcrum Point		HEIGHT	POWER	HEIGHT	POWER
U	Lift capacity (Bucket pivot pin, max. height)	1895 kg (4178 lbs)	1950 kg (4299 lbs)	2137 kg (4711 lbs)	2212 kg (4877 lbs)
V	Lift capacity (800 mm forward, max. height)	1210 kg (2668 lbs)	1350 kg (2976 lbs)	1422 kg (3135 lbs)	1577 kg (3477 lbs)
W	Lift capacity (Bucket pivot pin, 1500 mm height)	2125 kg (4685 lbs)	2380 kg (5247 lbs)	2536 kg (5591 lbs)	2803 kg (6180 lbs)
X	Lift capacity (800 mm forward, 1500 mm height)	1575 kg (3472 lbs)	1840 kg (4057 lbs)	1967 kg (4337 lbs)	2173 kg (4791 lbs)
Y	Breakout force (Bucket pivot pin)	24860 N (5589 lbf)	29250 N (6576 lbf)	29273 N (6585 lbf)	33957 N (7639 lbf)
Z	Breakout force (800 mm forward)	17190 N (3864 lbf)	22200 N (4991 lbf)	21687 N (4879 lbf)	25147 N (5657 lbf)
VV	Bucket roll-back force at maximum height	13720 N (3084 lbf)	16080 N (3615 lbf)	17627 N (3965 lbf)	20451 N (4601 lbf)
XX	Bucket roll-back force at 1.5 m (59 in.)	25860 N (5814 lbf)		28622 N (6439 lbf)	
ZZ	Bucket roll-back force at ground level	25810 N (5802 lbf)		28439 N (6398 lbf)	
Raising time		5.2 sec.		5.8 sec.	
Lowering time		5.1 sec.		6.5 sec.	
Bucket dumping time		3.6 sec.		3.8 sec.	
Bucket roll-back time		2.7 sec.		2.9 sec.	

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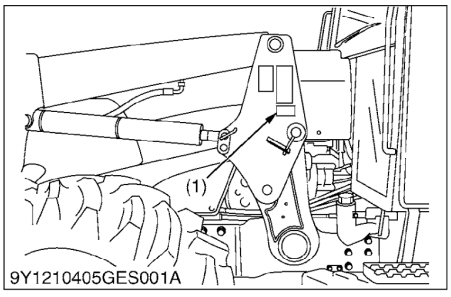
G GENERAL

GENERAL

CONTENTS

1. LOADER IDENTIFICATION



When contacting your local KUBOTA distributor, always specify front loader's serial number (1).

(1) Serial Number

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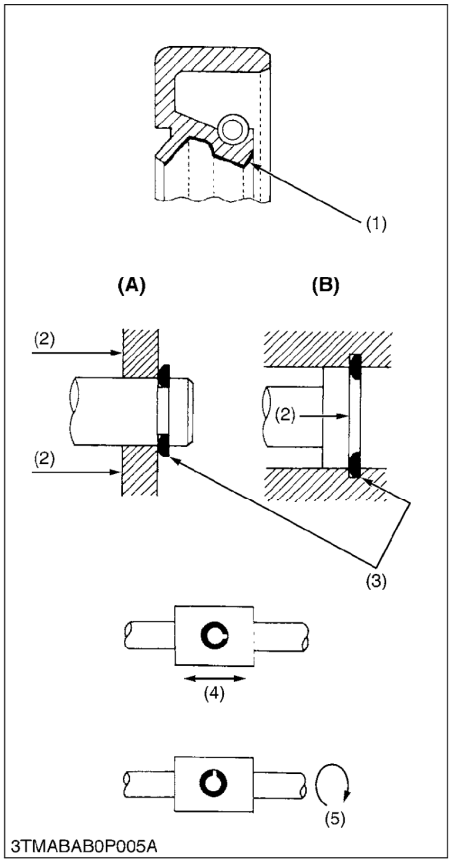
2. GENERAL PRECAUTIONS



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- When you disassemble, carefully put the parts in a clean area to make it easy to find the parts. You must install the screws, bolts and nuts in their initial position to prevent the reassembly errors.
- When it is necessary to use special tools, use KUBOTA special tools. Refer to the drawings when you make special tools that you do not use frequently.
- Before you disassemble or repair machine, make sure that you always disconnect the ground cable from the battery first.
- Remove oil and dirt from parts before you measure.
- Use only KUBOTA genuine parts for replacement to keep the machine performance and to make sure of safety.
- You must replace the gaskets and O-rings when you assemble again. Apply grease (1) to new O-rings or oil seals before you assemble.
- When you assemble the external or internal snap rings, make sure that the sharp edge (3) faces against the direction from which force (2) is applied.
- When inserting spring pins, their splits must face the direction from which a force is applied. See the figure left side.
- To prevent damage to the hydraulic system, use only specified fluid or equivalent.
- Clean the parts before you measure them.
- Tighten the nipples to the specified torque. Too much torque can cause damage to the hydraulic units or the nipples. Not sufficient torque can cause oil leakage.
- When you use a new hose or pipe, tighten the nuts to the specified torque. Then loosen (approx. by 45 °) and let them be stable before you tighten to the specified torque (This is not applied to the parts with seal tape).
- When you remove the two ends of a pipe, remove the lower end first.
- Use two pliers in removal and installation. One to hold the stable side, and the other to turn the side you remove to prevent twists.
- Make sure that the sleeves of flared connectors and taper sections of hoses are free of dust and scratches.
- After you tighten the nipples, clean the joint and apply the maximum operation pressure 2 to 3 times to examine oil leakage.

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

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

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3. LUBRICANTS

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

Place	Capacity	Lubricants, type of grease
	M100X, M110X, M126X, M135X	
Transmission case	60.0 L 15.9 U.S.gals 13.2 Imp.gals	KUBOTA UDT or SUPER UDT fluid*
Grease nipples	Until grease overflows.	Moly Ep type grease**

■ **NOTE**

- *** KUBOTA original transmission hydraulic fluid.**
- **** "Extreme pressure" and containing Molybdenum disulfide is recommended. This grease may specify "Moly Ep" on it's label.**

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4. TIGHTENING TORQUE

[1] GENERAL USE SCREWS, BOLTS AND NUTS (FOR FRONT LOADER AND BACKHOE)

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	⬡ 4 No-grade or 4T						⑦ 8.8 7T or Property class 8.8						⑨ 10.9 9T or Property class 10.9		
Material of opponent part	Ordinariness			Aluminum			Ordinariness			Aluminum			Ordinariness		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M6 (6 mm, 0.24 in.)	7.9 to 9.3	0.80 to 0.95	5.8 to 6.8	7.9 to 8.8	0.80 to 0.90	5.8 to 6.5	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31	7.9 to 8.8	0.80 to 0.90	5.8 to 6.5	12.3 to 14.2	1.25 to 1.45	9.05 to 10.4
M8 (8 mm, 0.31 in.)	18 to 20	1.8 to 2.1	13 to 15	17 to 19	1.7 to 2.0	13 to 14	24 to 27	2.4 to 2.8	18 to 20	18 to 20	1.8 to 2.1	13 to 15	30 to 34	3.0 to 3.5	22 to 25
M10 (10 mm, 0.39 in.)	40 to 45	4.0 to 4.6	29 to 33	32 to 34	3.2 to 3.5	24 to 25	48 to 55	4.9 to 5.7	36 to 41	40 to 44	4.0 to 4.5	29 to 32	61 to 70	6.2 to 7.2	45 to 52
M12 (12 mm, 0.47 in.)	63 to 72	6.4 to 7.4	47 to 53	–	–	–	78 to 90	7.9 to 9.2	58 to 66	63 to 72	6.4 to 7.4	47 to 53	103 to 117	10.5 to 12.0	76.0 to 86.7
M14 (14 mm, 0.55 in.)	108 to 125	11.0 to 12.8	79.6 to 92.5	–	–	–	124 to 147	12.6 to 15.0	91.2 to 108	–	–	–	167 to 196	17.0 to 20.0	123 to 144
M16 (16 mm, 0.63 in.)	167 to 191	17.0 to 19.5	123 to 141	–	–	–	197 to 225	20.0 to 23.0	145 to 166	–	–	–	260 to 304	26.5 to 31.0	192 to 224
M18 (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
M20 (20 mm, 0.79 in.)	334 to 392	34.0 to 40.0	246 to 289	–	–	–	368 to 431	37.5 to 44.0	272 to 318	–	–	–	491 to 568	50.0 to 58.0	362 to 419

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[2] STUD BOLTS

Material of opponent part	Ordinariness			Aluminum		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M8 (8 mm, 0.31 in.)	12 to 15	1.2 to 1.6	8.7 to 11	8.9 to 11	0.90 to 1.2	6.5 to 8.6
M10 (10 mm, 0.39 in.)	25 to 31	2.5 to 3.2	18 to 23	20 to 25	2.0 to 2.6	15 to 18
M12 (12 mm, 0.47 in.)	30 to 49	3.0 to 5.0	22 to 36	31	3.2	23
M14 (14 mm, 0.55 in.)	62 to 73	6.3 to 7.5	46 to 54	–	–	–
M16 (16 mm, 0.63 in.)	98.1 to 112	10.0 to 11.5	72.4 to 83.1	–	–	–
M18 (18 mm, 0.71 in.)	172 to 201	17.5 to 20.5	127 to 148	–	–	–

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[3] AMERICAN STANDARD SCREWS, BOLTS AND NUTS WITH UNC OR UNF THREADS

Grade	SAE GR.5			SAE GR.8		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
1/4	11.7 to 15.7	1.20 to 1.60	8.63 to 11.5	16.3 to 19.7	1.67 to 2.00	12.0 to 14.6
5/16	23.1 to 27.7	2.36 to 2.82	17.0 to 20.5	33 to 39	3.4 to 3.9	25 to 28
3/8	48 to 56	4.9 to 5.7	36 to 41	61 to 73	6.3 to 7.4	45 to 53
1/2	110 to 130	11.3 to 13.2	81.2 to 95.8	150 to 178	15.3 to 18.1	111 to 131
9/16	150 to 178	15.3 to 18.1	111 to 131	217 to 260	22.2 to 26.5	160 to 191
5/8	204 to 244	20.8 to 24.8	151 to 179	299 to 357	30.5 to 36.4	221 to 263

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[4] PLUGS

Shape	Size	Material of opponent part					
		Ordinariness			Aluminum		
		N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
Tapered screw 	R1/8	13 to 21	1.3 to 2.2	9.4 to 15	13 to 19	1.3 to 2.0	9.4 to 14
	R1/4	25 to 44	2.5 to 4.5	18 to 32	25 to 34	2.5 to 3.5	18 to 25
	R3/8	49 to 88	5.0 to 9.0	37 to 65	49 to 58	5.0 to 6.0	37 to 43
	R1/2	58.9 to 107	6.00 to 11.0	43.4 to 79.5	59 to 78	6.0 to 8.0	44 to 57
Straight screw 	G1/4	25 to 34	2.5 to 3.5	18 to 25	–	–	–
	G3/8	62 to 82	6.3 to 8.4	46 to 60	–	–	–
	G1/2	49 to 88	5.0 to 9.0	37 to 65	–	–	–

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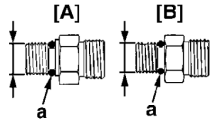
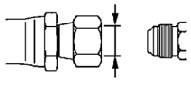
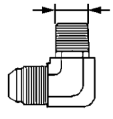
[5] HYDRAULIC FITTINGS

(1) Adaptors, Elbows and Others

Item	Shape	Thread size	Tightening torque		
			N·m	kgf·m	lbf·ft
Adjustable elbow, Adaptor (O-ring port) (UNF)	 [A] Nut Type [B] No Nut Type a : O-ring	9/16	37 to 44	3.8 to 4.4	28 to 32
		3/4	48 to 54	4.9 to 5.5	36 to 39
		7/8	77 to 85	7.9 to 8.6	57 to 62
Hose fitting, Flare nut (UNF)		9/16	22 to 25	2.3 to 2.5	17 to 18
		3/4	36 to 40	3.7 to 4.0	27 to 29
		7/8	43 to 50	4.4 to 5.0	32 to 36
Adaptor (NPT)		1/4	30 to 50	3.1 to 5.0	23 to 36
		3/8	39 to 60	4.0 to 6.1	29 to 44
		1/2	49 to 58	5.0 to 5.9	37 to 42

■ **NOTE**

- **When connecting a hose with flare nut, after tightening the nut with specified torque, return it approximately 45 degrees (0.79 rad) and re-tighten it to specified torque.**

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5. MAINTENANCE CHEK 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	G-7
	Check the hydraulic hoses	G-7
Every 10 hours	Grease all grease nipples	G-7
	Lubricate joints of control level linkage	G-7
Every 50 hours	Check the main frame mounting screws	G-8

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6. 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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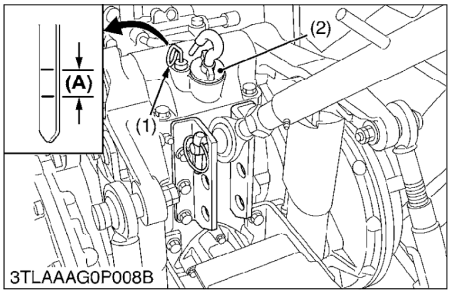
[1] CHECK POINTS OF EACH USE OR DAILY



Checking Transmission Fluid Level

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

■ **IMPORTANT**
- **Use only KUBOTA UDT or SUPER UDT fluid. Use of other oil may damage the transmission or hydraulic system. Refer to "3. LUBRICANTS".**

(1) Gauge
(2) Oil Filling Plug
(A) Oil level is acceptable within this range.

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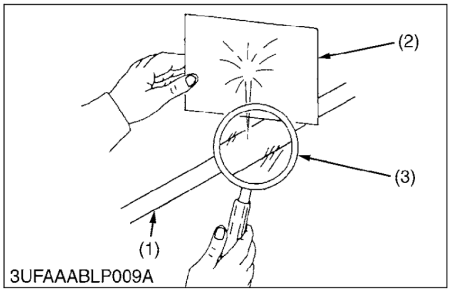

Checking Hydraulic Hoses

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

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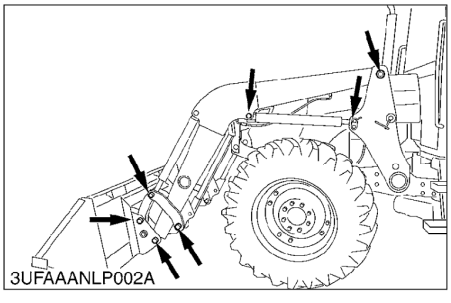
[2] CHECK POINTS OF EVERY 10 HOURS



Greasing

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

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Lubricating

1. Lubricate joints of control lever linkage.

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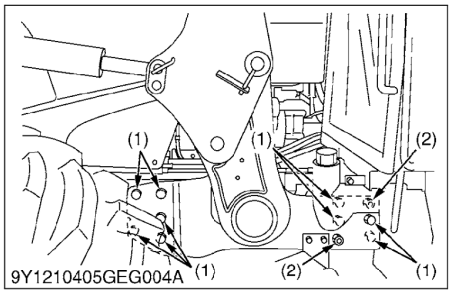
[3] CHECK POINT OF EVERY 50 HOURS



Checking Main Frame Mounting Screws

CAUTION

- **Never operate front loader with a loose main frame.**
- **Any time bolts are loosened, retighten to specified torque.**
- **Check all bolts frequently and keep them tight.**

1. Check the main frame screws and nuts regularly especially when new. If they are loose, tighten them as follows.

Tightening torque	Main frame mounting screw (M18)	319 N·m 32.5 kgf·m 235 lbf·ft
	Main frame mounting screw (M20)	368 N·m 37.5 kgf·m 271 lbf·ft

(1) Main frame mounting screw (M18) (2) Main frame mounting screw (M20)

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1 FRONT LOADER

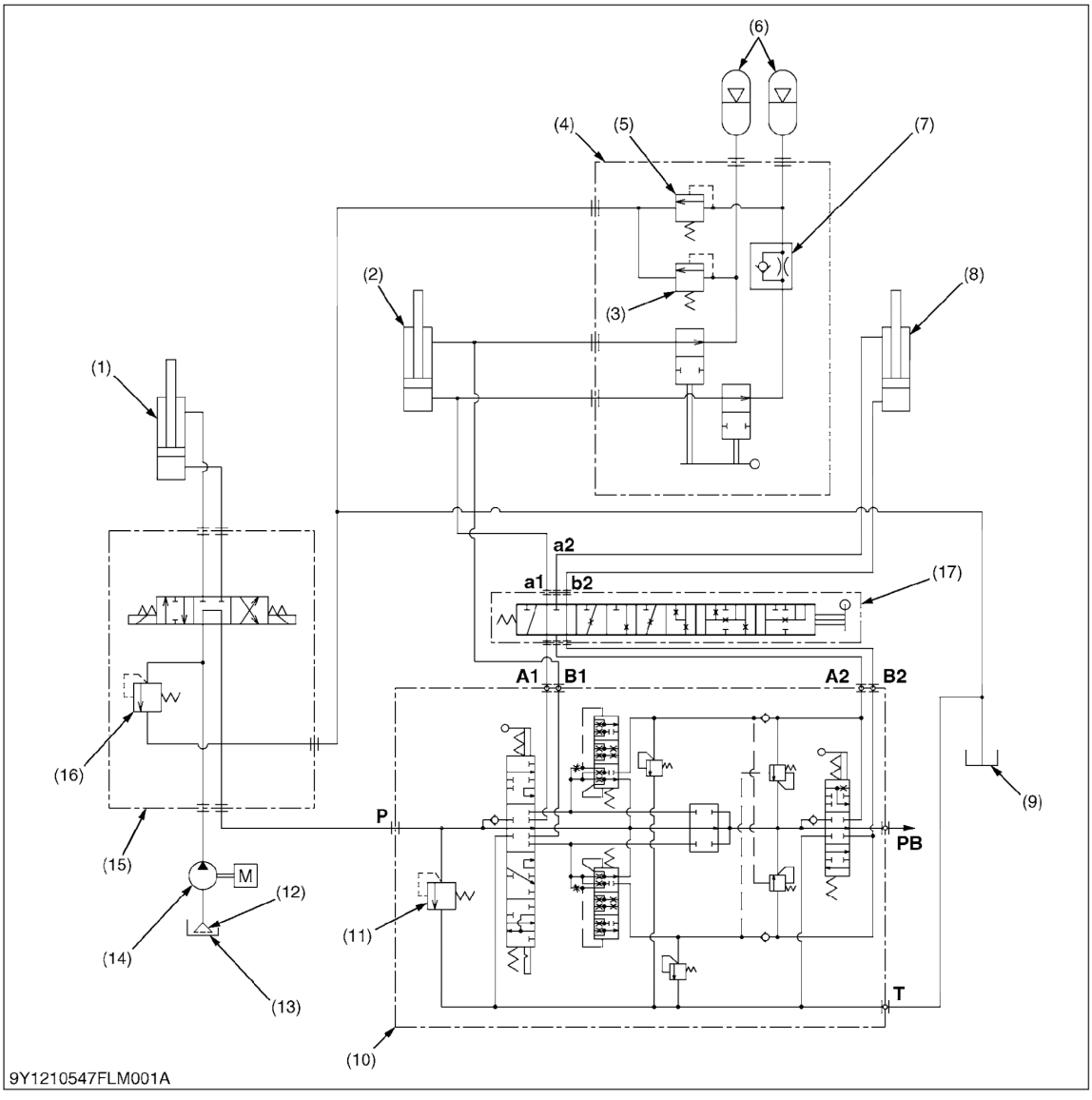
MECHANISM

CONTENTS

KiSC issued 07, 2010 A

1. HYDRAULIC CIRCUIT

[1] LA1953AU



(1) 3rd Function Cylinder (Option)
(2) Boom Cylinder
(3) Relief Valve
(4) Accumulator Valve Assembly (Option)
(5) Relief Valve
(6) Accumulator (Option)
(7) Orifice
(8) Bucket Cylinder
(9) Tank
(10) Control Valve Assembly
(11) Relief Valve
(12) Oil Filter
(13) Tank
(14) Hydraulic Pump
(15) 3rd Function Valve (Option)
(16) Relief Valve
(17) Spill Guard Valve

PB : To 3-Point Hydraulic System
P : From Pump
T : To Tank
A1 : A1 Port
A2 : A2 Port
B1 : B1 Port
B2 : B2 Port
a1 : a1 Port
a2 : a2 Port
b2 : b2 Port

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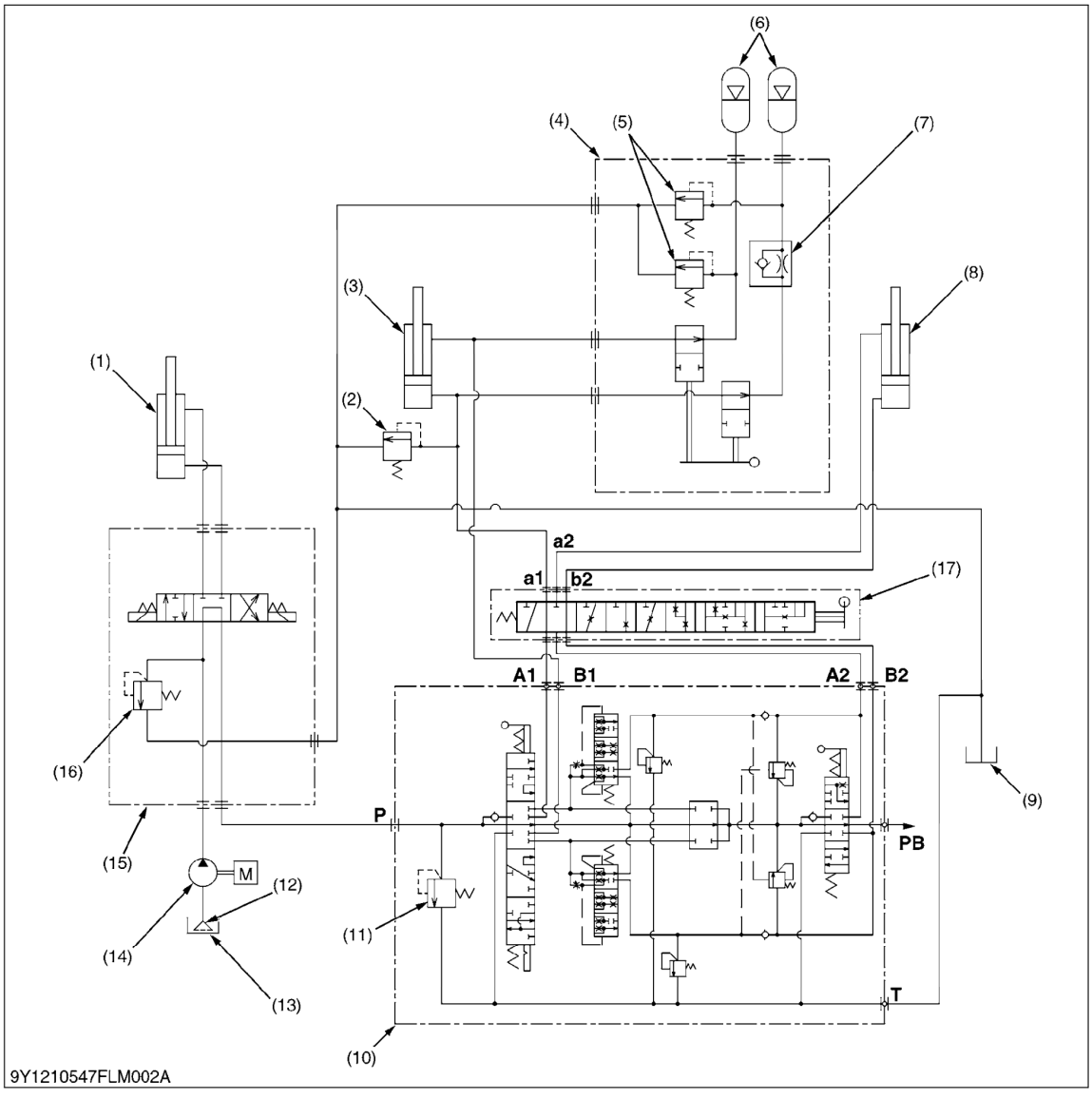
[2] LA2253AU



(1) 3rd Function Cylinder (Option)
(2) Port Relief Valve
(3) Boom Cylinder
(4) Accumulator Valve Assembly (Option)
(5) Relief Valve
(6) Accumulator (Option)
(7) Orifice
(8) Bucket Cylinder
(9) Tank
(10) Control Valve Assembly
(11) Relief Valve
(12) Oil Filter
(13) Tank
(14) Hydraulic Pump
(15) 3rd Function Valve (Option)
(16) Relief Valve
(17) Spill Guard Valve

PB : To 3-Point Hydraulic System
P : From Pump
T : To Tank
A1 : A1 Port
A2 : A2 Port
B1 : B1 Port
B2 : B2 Port

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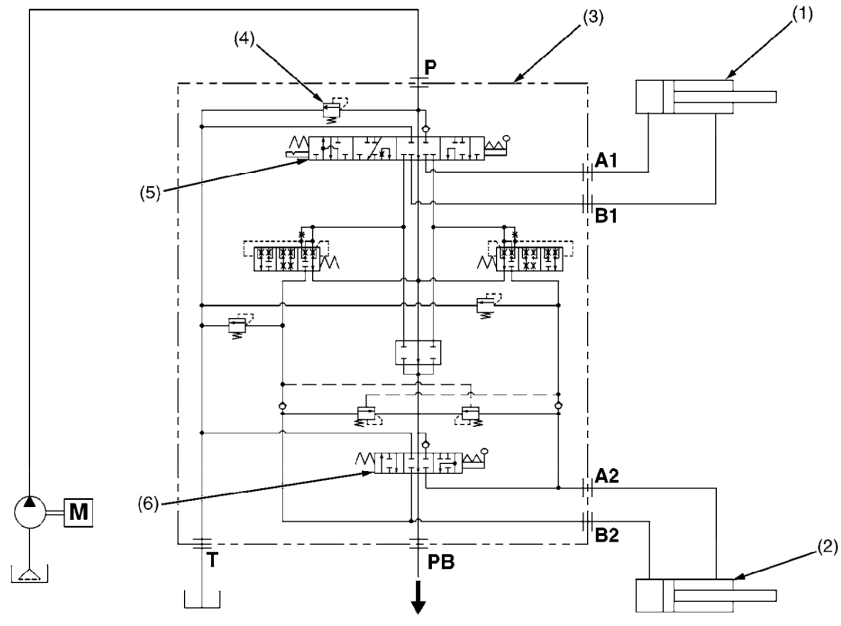
2. CONTROL VALVE ASSEMBLY

[1] HYDRAULIC CIRCUIT



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(1) Boom Cylinder	(4) Relief Valve	**P : From Pump**	**A1 : A1 Port**
(2) Bucket Cylinder	(5) Boom Control Valve	**T : To Tank**	**A2 : A2 Port**
(3) Control Valve Assembly	(6) Bucket Control Valve	**PB : To 3-Point Hydraulic System**	**B1 : B1 Port**
			B2 : B2 Port

To operate the front loader, the hydraulic oil pressurized by the hydraulic pump flows from **P** port through the control valve assembly (3) to **PB** port or **T** port. The oil flow in control valve assembly (3) functions as to maintain a **"HORIZONTAL"** position of bucket.

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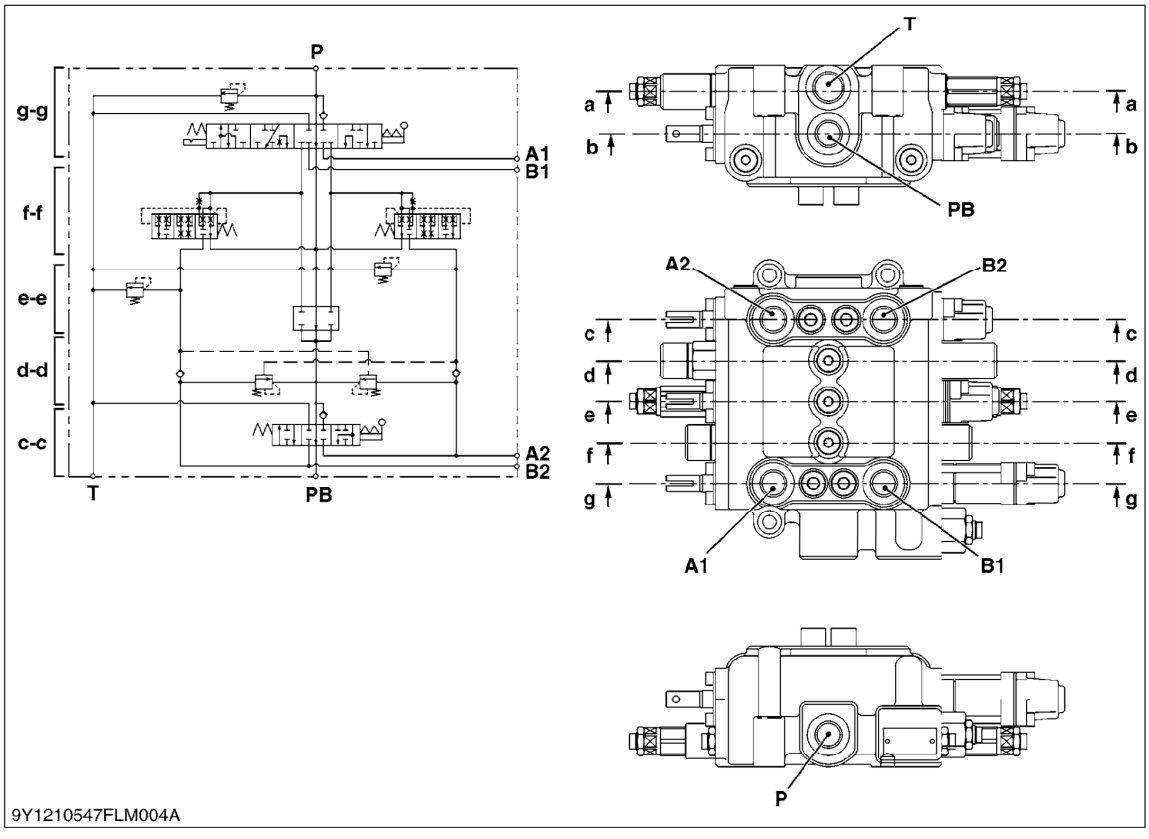
[2] STRUCTURE



P : P Port (Pump Port)
T : T Port (Tank Port)
PB : PB Port (Power Beyond Port)
A1 : A1 Port (Connected Boom Cylinder Bottom Side)
A2 : A2 Port (Connected Bucket Cylinder Rod Side)
B1 : B1 Port (Connected Boom Cylinder Rod Side)
B2 : B2 Port (Connected Bucket Cylinder Bottom Side)
a-a : Section a-a
b-b : Section b-b
c-c : Bucket Section
d-d : Sequence Section
e-e : Self-leveling Section
f-f : Divider Section
g-g : Boom Section

The control valve assembly is composed of three major sections.

(1) Boom Control Valve

The boom control valve consists of 4-position, 8-connection, detent, spring center type spool, a valve housing, load check valve, etc.. This valve connects to **A1** and **B1** port and controls oil flow to the boom cylinder.

(2) Self-leveling Valve

The self-leveling control valve consists of 2-position, 6-connection, detent type spool, a valve housing, etc.. The self-leveling valve controls and maintains a **"HORIZONTAL"** position of the bucket while raising or lowering the boom.

(3) Bucket Control Valve

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

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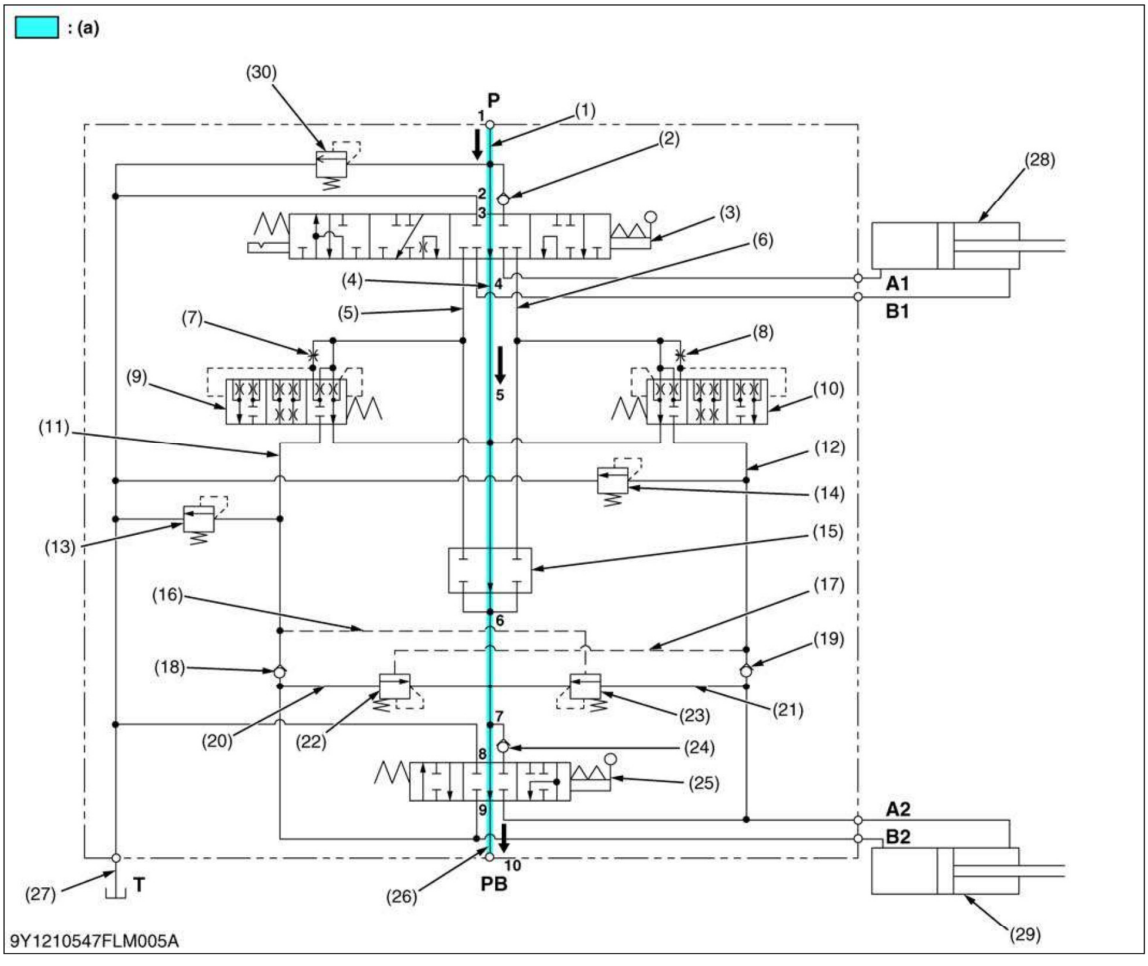
[3] OPERATION

(1) Neutral

Control Lever at "NEUTRAL" Position (Figure 1)



(1) **P** Port
(2) Load Check Valve
(3) Boom Spool
(4) Center By-pass Passage
(5) Passage **A**
(6) Passage **B**
(7) Raising Adjuster
(8) Lowering Adjuster
(9) Raising Divider Spool
(10) Lowering Divider Spool
(11) Passage **C**
(12) Passage **D**
(13) Raising Overload Relief Valve
(14) Lowering Overload Relief Valve
(15) Self-leveling Spool
(16) Passage **E**
(17) Passage **F**
(18) Check Valve
(19) Check Valve
(20) Passage **G**
(21) Passage **H**
(22) Lowering Sequence Spool
(23) Raising Sequence Spool
(24) Load Check Valve
(25) Bucket Spool
(26) **PB** Port
(27) **T** Port
(28) Boom Cylinder
(29) Bucket Cylinder
(30) Main Relief Valve

P : P Port (Pump Port)
PB : PB Port (Power Beyond Port)
T : T Port (Tank Port)
A1 : A1 Port (Connected Boom Cylinder Bottom Side)
A2 : A2 Port (Connected Bucket Cylinder Rod Side)
B1 : B1 Port (Connected Boom CylinderRod Side)
B2 : B2 Port (Connected Bucket Cylinder Bottom Side)
1 to 10 : Oil Flow
(a) Low Pressure

The following section explains illustration **figure 1, 2, 3** and **4**.

The oil discharged from the hydraulic pump flows into the valve through **P** port (1). When each spool is in neutral condition, the center by-pass passage (4) can not be shut off with spool. The incoming oil goes through the center by-pass passage (4) in the boom section, divider section, self-leveling section, sequence section and the center by-pass passage of bucket spool (25), then is discharged through **PB** port (26).

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