WSM

WORKSHOP MANUAL
FRONT LOADER

LA1403AU

Kubota

KiSC issued 07, 2010 A

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INFORMATION

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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.**

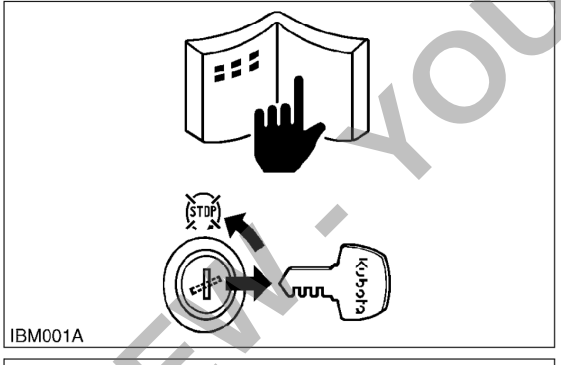
⚠ WARNING
- **Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

⚠ 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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IBM001A


IBM002A

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

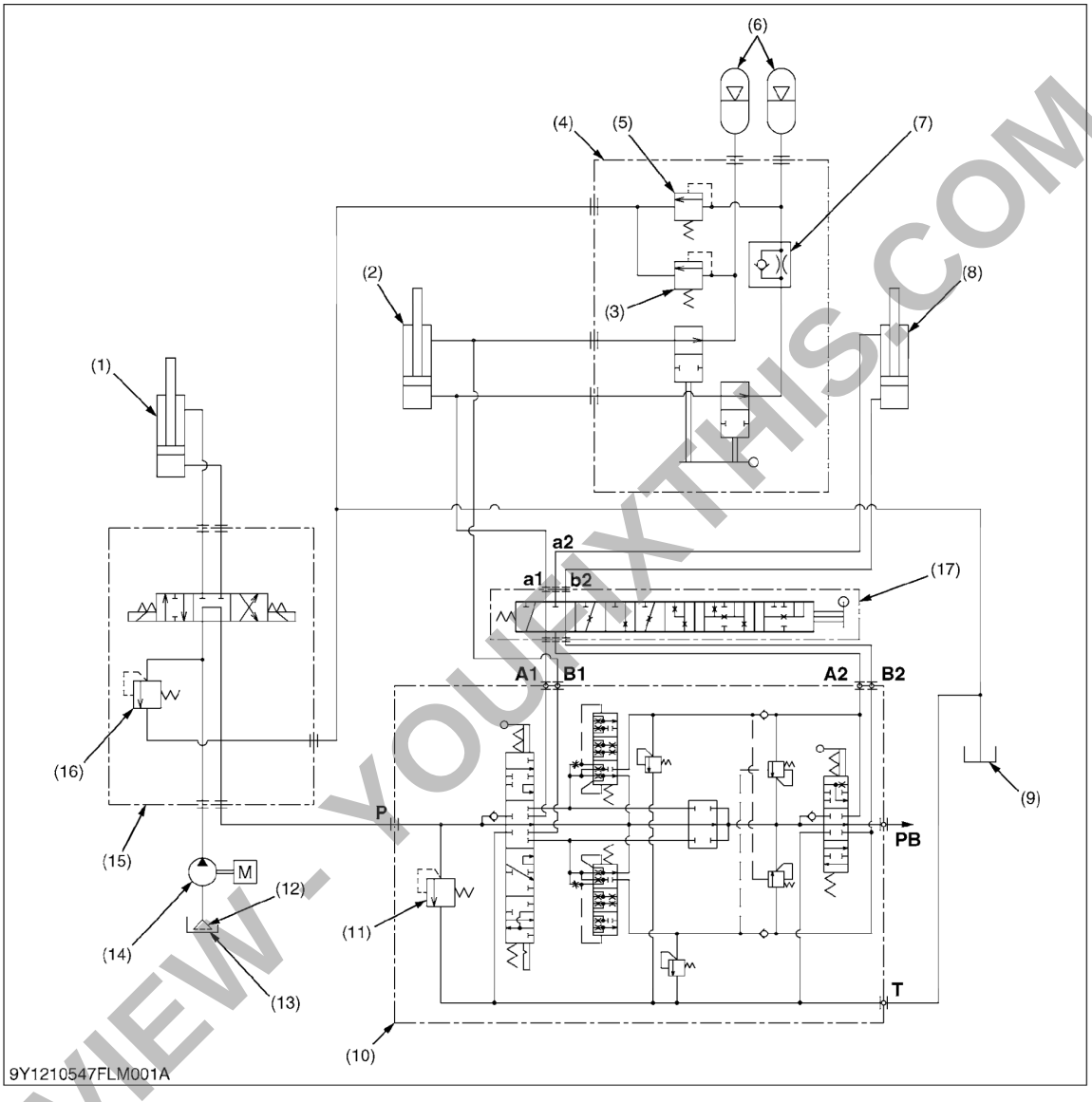
- Do not do the procedures below when you start the engine.
  - short across starter terminals
  - bypass the safety start switch
- Do not alter or remove any part of machine safety system.
- Before you start the engine, make sure that all shift levers are in neutral positions or in disengaged positions.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

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1. HYDRAULIC CIRCUIT



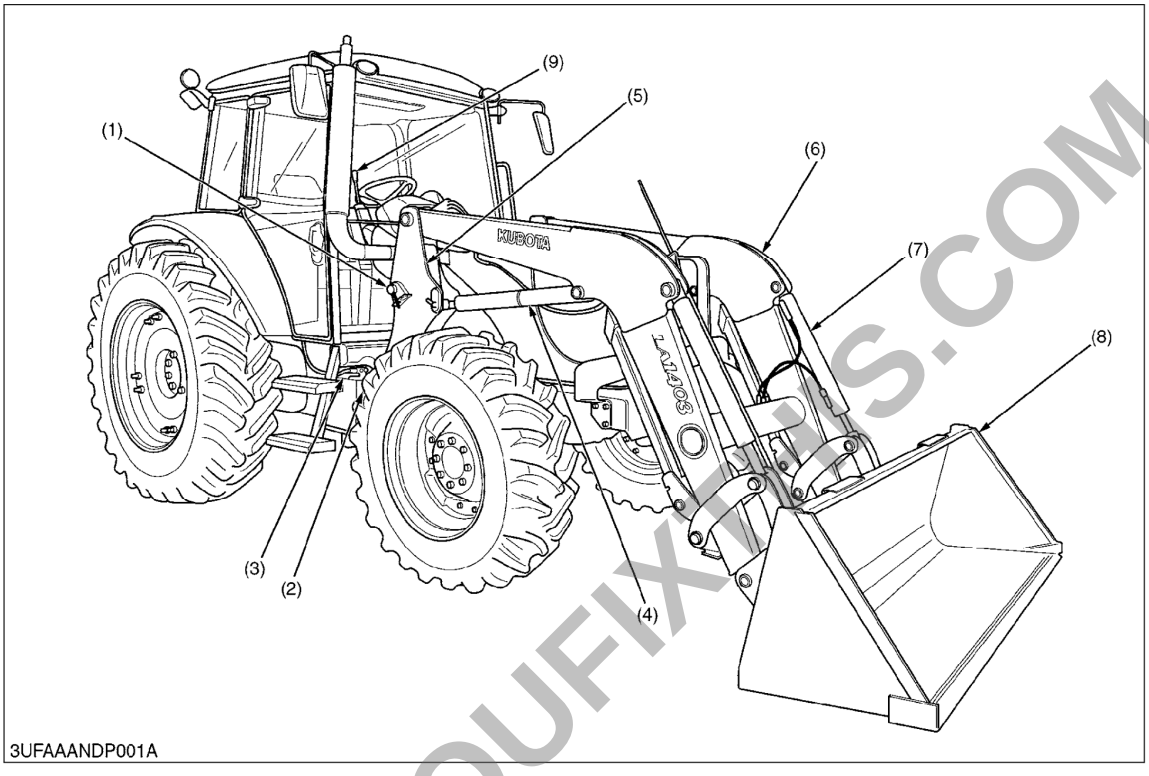
(1) 3rd Function Cylinder (Option)
(2) Boom Cylinder
(3) Relief Valve
(4) Accumulator Valve Assembly (Option)
(5) Relief Valve
(6) Accumulator (Option)
(7) Orifice
(8) Bucket Cylinder
(9) Tank
(10) Control Valve Assembly
(11) Relief Valve
(12) Oil Filter
(13) Tank
(14) Hydraulic Pump
(15) 3rd Function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



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

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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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4. SPECIFICATIONS

Suitable Tractor
LA1403AU: M108S

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[1] LOADER SPECIFICATIONS

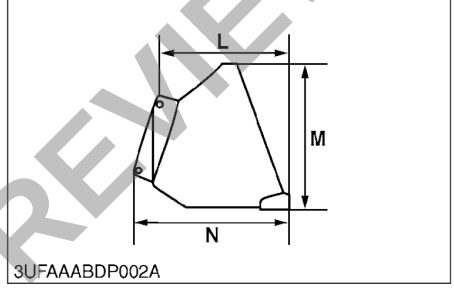
Loader Model		**LA1403AU**
Tractor Model		**M108S**
Wheel Base (WB)		2435 mm (95.9 in.)
Front Tires		13.6R24
Rear Tires		18.4R34
Boom Cylinder	Bore	70 mm (2.76 in.)
	Stroke	606 mm (23.9 in.)
Bucket Cylinder	Bore	70 mm (2.76 in.)
	Stroke	516.5 mm (20.3 in.)
Control Valve		One Detent Float Position, Power Beyond Circuit
Rated Flow		65 L/min. (17.2 U.S.gals/min., 14.3 Imp.gals/min.)
Maximum Pressure		20.7 MPa (211 kgf/cm^2, 3002 psi)
Net Weight (Approximate)		850 kg (1874 lbs)

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[2] BUCKET SPECIFICATIONS

Loader Model		**LA1403AU**				
Model		ROUND 72 in.	ROUND 84 in.	LIGHT MATERIAL 84 in.	ROUND 96 in.	LIGHT MATERIAL 96 in.
Type		Quick Attach				
Width		1830 mm (72.0 in.)	2135 mm (84.0 in.)		2440 mm (96.0 in.)	
Depth (**L**)		650 mm (25.6 in.)		750 mm (29.5 in.)	665 mm (26.2 in.)	800 mm (31.5 in.)
Height (**M**)		665 mm (26.2 in.)		715 mm (28.1 in.)	750 mm (29.5 in.)	764 mm (30.1 in.)
Length (**N**)		900 mm (35.4 in.)		1000 mm (39.37 in.)	770 mm (30.3 in.)	910 mm (35.8 in.)
Capacity	Struck	0.44 m^3 (15.5 cu.ft.)	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	0.55 m^3 (19.4 cu.ft.)	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		210 kg (463 lbs)	235 kg (518 lbs)	255 kg (562 lbs)	275 kg (606 lbs)	316 kg (697 lbs)

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5. 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	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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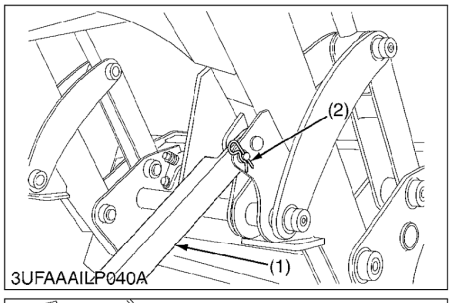
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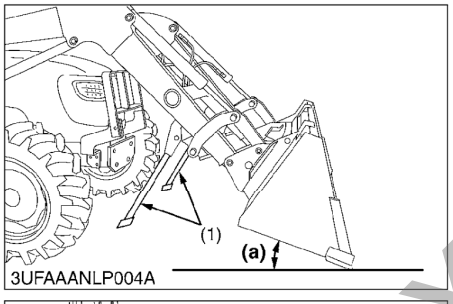
4. DISMOUNTING FRONT LOADER FROM TRACTOR

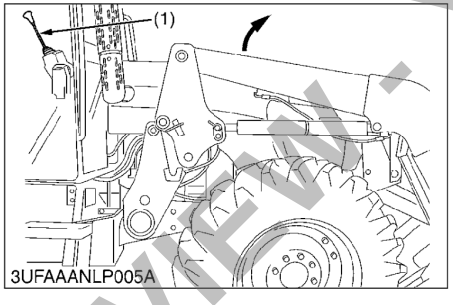
CAUTION
- **Make sure an approved bucket is attached before removing the loader from the tractor.**
- **For removing the loader, choose flat and hard ground, preferably concrete.**
- **If the ground surface is soft, place suitable planks on the ground for the bucket and stands.**
- **When starting the engine or using the hydraulic control valve, always sit in the operator's seat.**
- **Make sure the bucket and stands are at ground level.**

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[1] STAND AND SIDE FRAME







Stand

1. Raise the boom until the stands (1) can be rotated.
2. Stop the engine.
3. Remove the spring pins (2) holding the stands (1) to the boom.
4. Rotate the stands (1) until the pin on the stand and hole in the boom are aligned.
   Then slide the stands (1) outward and insert the spring pin (2) as shown.
5. Start the engine and run at idle.
6. Dump the bucket approximately 0.35 rad (20 °).
7. Lower the boom and raise the front wheels slightly.

■ **IMPORTANT**
- **Lift the weight off the front wheels with the bucket. Do not attempt to lift them with the stands (1).**

8. Stop the engine.

(1) Stand
(2) Spring Pin
(a) 0.35 rad (20 °)

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Side Frame

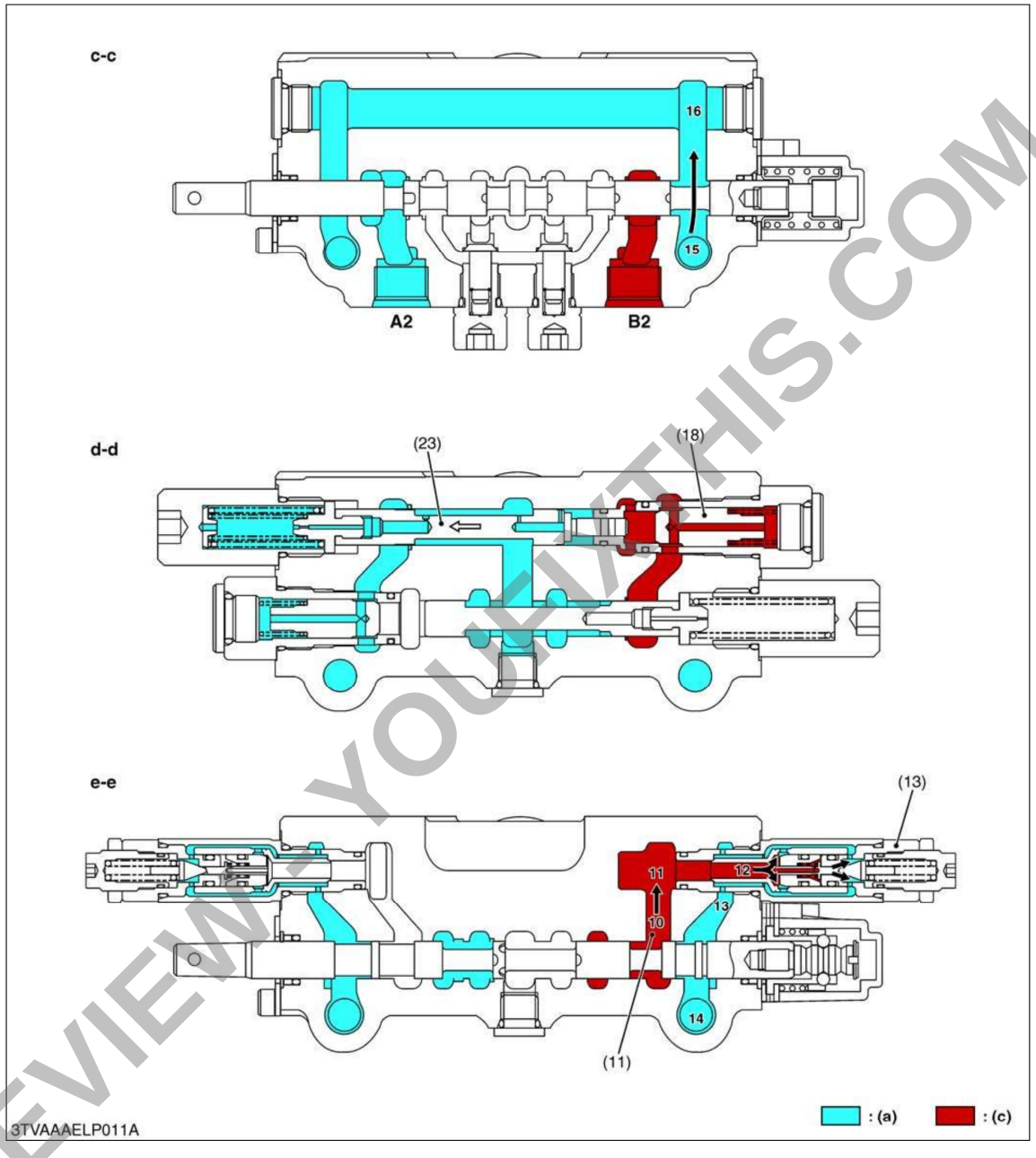
1. Remove the mounting pins from the loader main frame and hold them on boom.
2. Start the engine and run at idle.
3. Slowly move the hydraulic control lever to rollback position to raise the loader side frames up and out of the receivers of the main frames as shown.
4. Stop the engine.

(1) Hydraulic Control Lever

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Boom Up with Bucket Cylinder Extended (Figure 3)



(11) Passage **C**
(13) Raising Overload Relief Valve
(18) Check Valve
(23) Raising Sequence Spool

A2 : A2 Port (Connected Bucket Cylinder Rod Side)
B2 : B2 Port (Connected Bucket Cylinder Bottom Side)

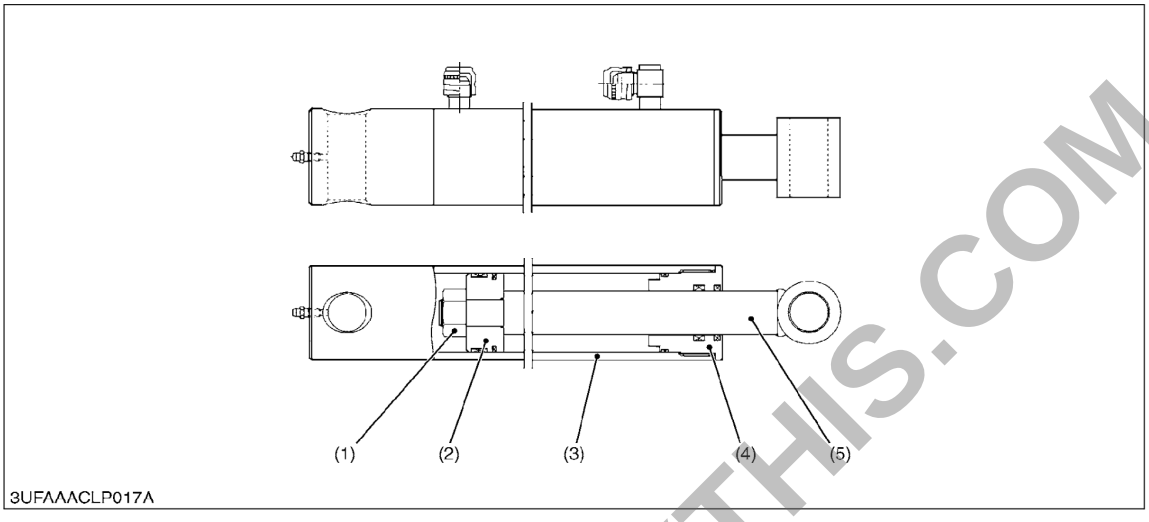
c-c : Bucket Section
d-d : Sequence Section
e-e : Self-leveling Section

(a) Low Pressure
(c) High Pressure
1 to 17 : Oil Flow

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4. BOOM CYLINDER AND BUCKET CYLINDER



(1) Nut
(2) Piston
(3) Cylinder Tube
(4) Head
(5) Piston Rod

Both boom cylinder and bucket cylinder consist of 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 cylinder in which the reciprocating motion of the piston is controlled by hydraulic force applied to both of its ends.

Cylinder Specifications

		LA1953AU	LA2253AU
Boom Cylinder	Cylinder I.D.	70 mm (2.76 in.)	75 mm (2.95 in.)
	Rod O.D.	40 mm (1.57 in.)	45 mm (1.77 in.)
	Stroke	606 mm (23.9 in.)	680 mm (26.8 in.)
Bucket Cylinder	Cylinder I.D.	65 mm (2.56 in.)	75 mm (2.95 in.)
	Rod O.D.	40 mm (1.57 in.)	45 mm (1.77 in.)
	Stroke	516 mm (20.31 in.)	610 mm (24.0 in.)

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