# WSM

## WORKSHOP MANUAL
# FRONT LOADER

# LA1954AU,LA2254AU

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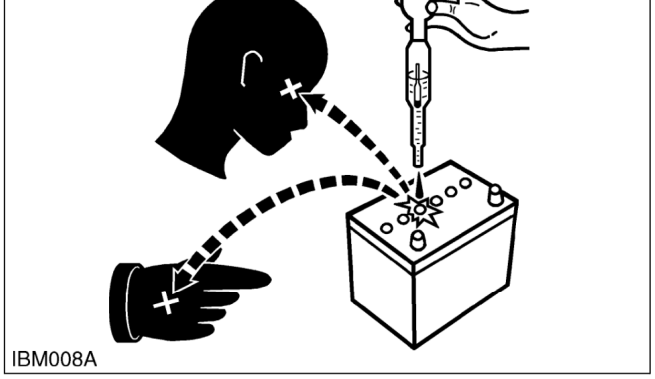

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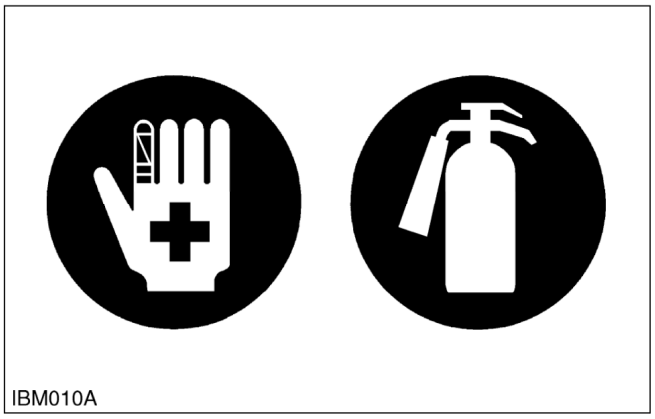
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- Keep electrolyte away from your eyes, hands and clothing. Sulfuric acid in battery electrolyte is poisonous and it can burn your skin and clothing and cause blindness. If you spill electrolyte on yourself, clean yourself with water, and get medical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

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**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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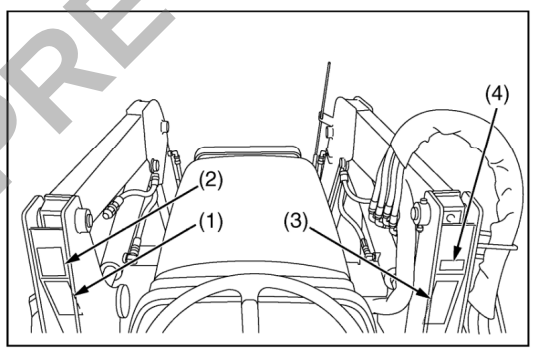
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# 2. SAFETY DECALS

**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.**

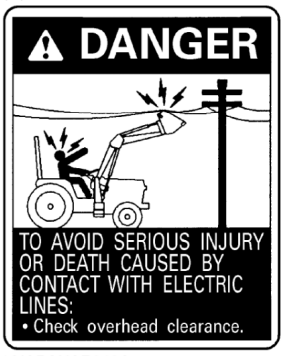
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(1) Part No. 7J246-5641-1




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

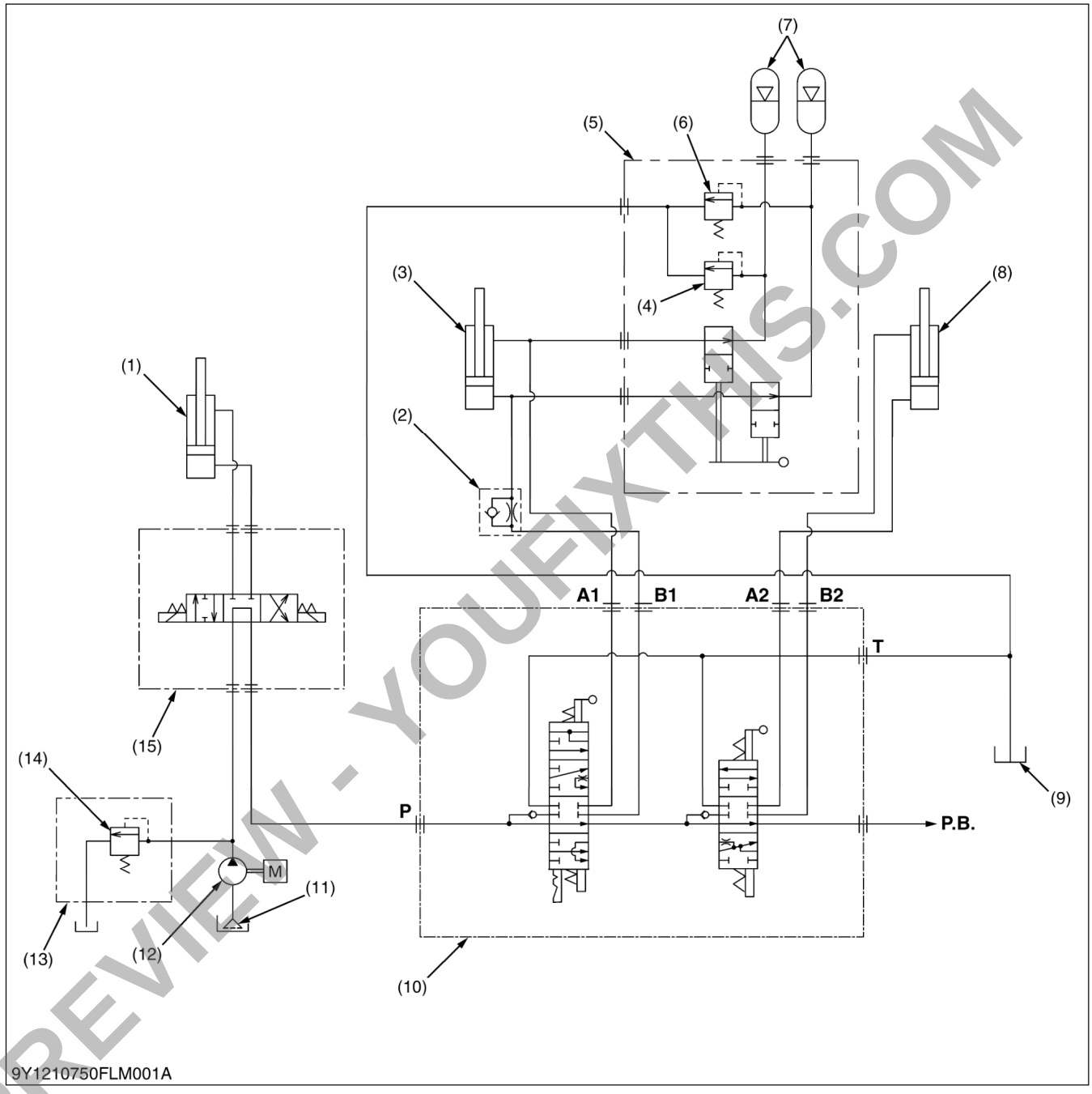



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# 1. HYDRAULIC CIRCUIT

## [1] LA1954 (STANDARD TYPE CONTROL VALVE)




(1) 3rd Function Cylinder (Option)
(2) Orifice (Standard Valve Only)
(3) Boom Cylinder
(4) Relief Valve
(5) Accumulator Valve Assembly (Option)
(6) Relief Valve
(7) Accumulator (Option)
(8) Bucket Cylinder
(9) Tank
(10) Control Valve Assembly
(11) Oil Filter
(12) Hydraulic Pump
(13) 3P Hitch Hydraulic Circuit (Tractor)
(14) Relief Valve
(15) 3rd Function Valve (Option)

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

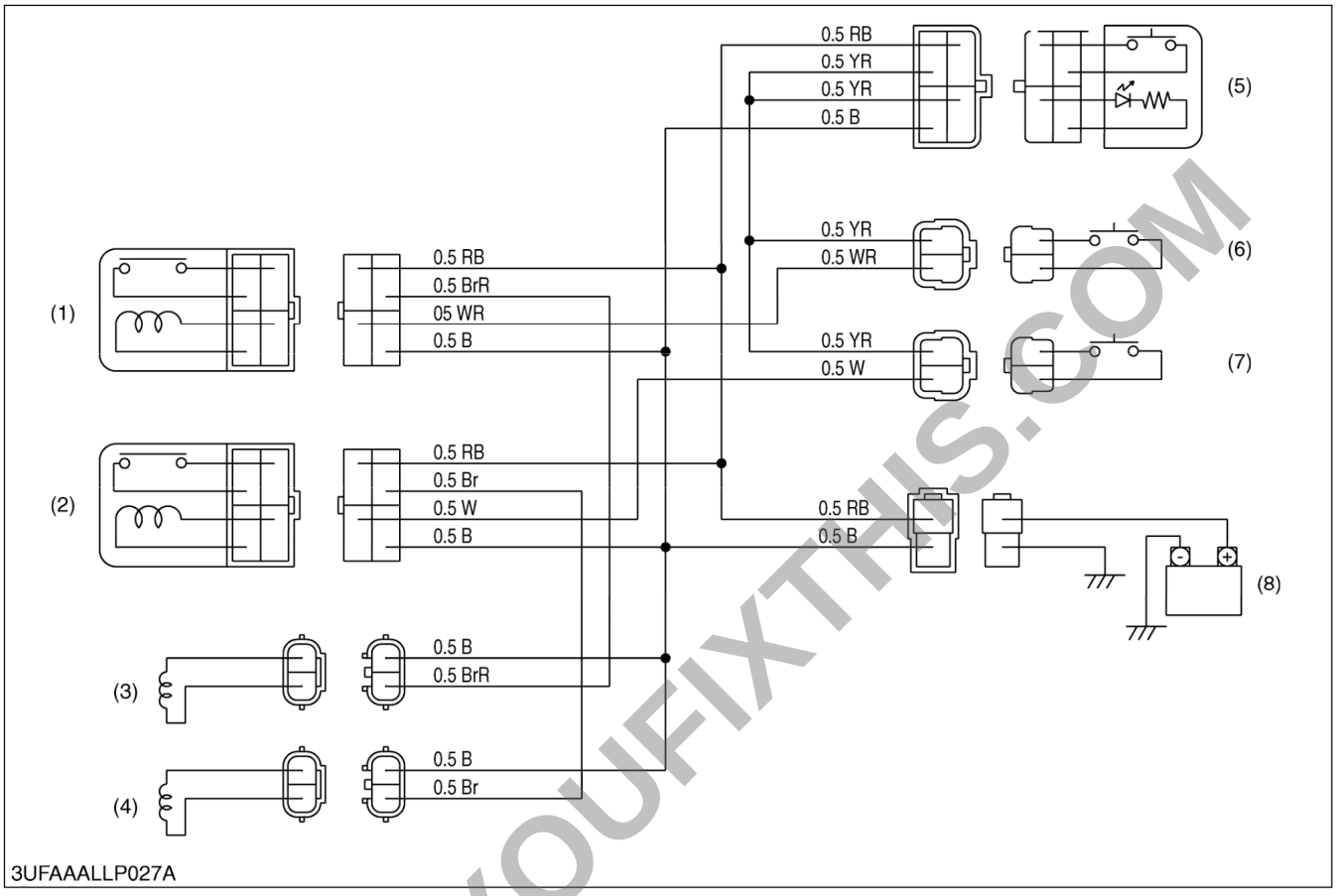
(10) is control valve assembly. Options such as accumulator valve assembly (5) and 3rd function valve (15) are also shown. Orifice (2) for boom cylinder is for only standard valve. Hydraulic hoses to the accumulators (7) comes from T-joints of boom ports **A1**, **B1**.

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# [2] ELECTRICAL CIRCUIT




(1) Relay 1
(2) Relay 2
(3) Coil A
(4) Coil B
(5) **ON - OFF** Switch (For 3rd Function Kit)
(6) Activation Switch A
(7) Activation Switch B
(8) Battery

**Color of Wiring**

| | | |
|---|---|---|
| B ..... Black | BrR ..... Brown / Red | WR ..... White / Red |
| W ..... White | RB ..... Red / Black | YR ..... Yellow / Red |
| Br ..... Brown | | |

When you push the activation switch A (6), relay 1 (1) operates. Then the coil A (3) operates.

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(2) Port Relief Valve
(3) Boom Cylinder
(4) Accumulator Valve Assembly (Option)
(5) Relief Valve
(7) Orifice
(8) Bucket Cylinder
(9) Tank
(10) Control Valve Assembly
(12) Hydraulic Pump
(13) 3P Hitch Hydraulic Circuit (Tractor)
(14) Relief Valve
(15) 3rd Function Valve (Option)

**System**
**P: From Pump**
**T: To Tank**
**A1: A1 Port**
**A2: A2 Port**
**B1: B1 Port**
**B2: B2 Port**

(10) is control valve assembly. Options such as accumulator valve assembly (5) and 3rd function valve (15) are also shown. Port relief valve (2) is added to LA1954AU model. Orifice (7) is added to the oil passage from rod side of the boom cylinder to the accumulator (6), R.H.. Hydraulic hoses to the accumulators (6) comes from T-joints of boom ports **A1**, **B1**.

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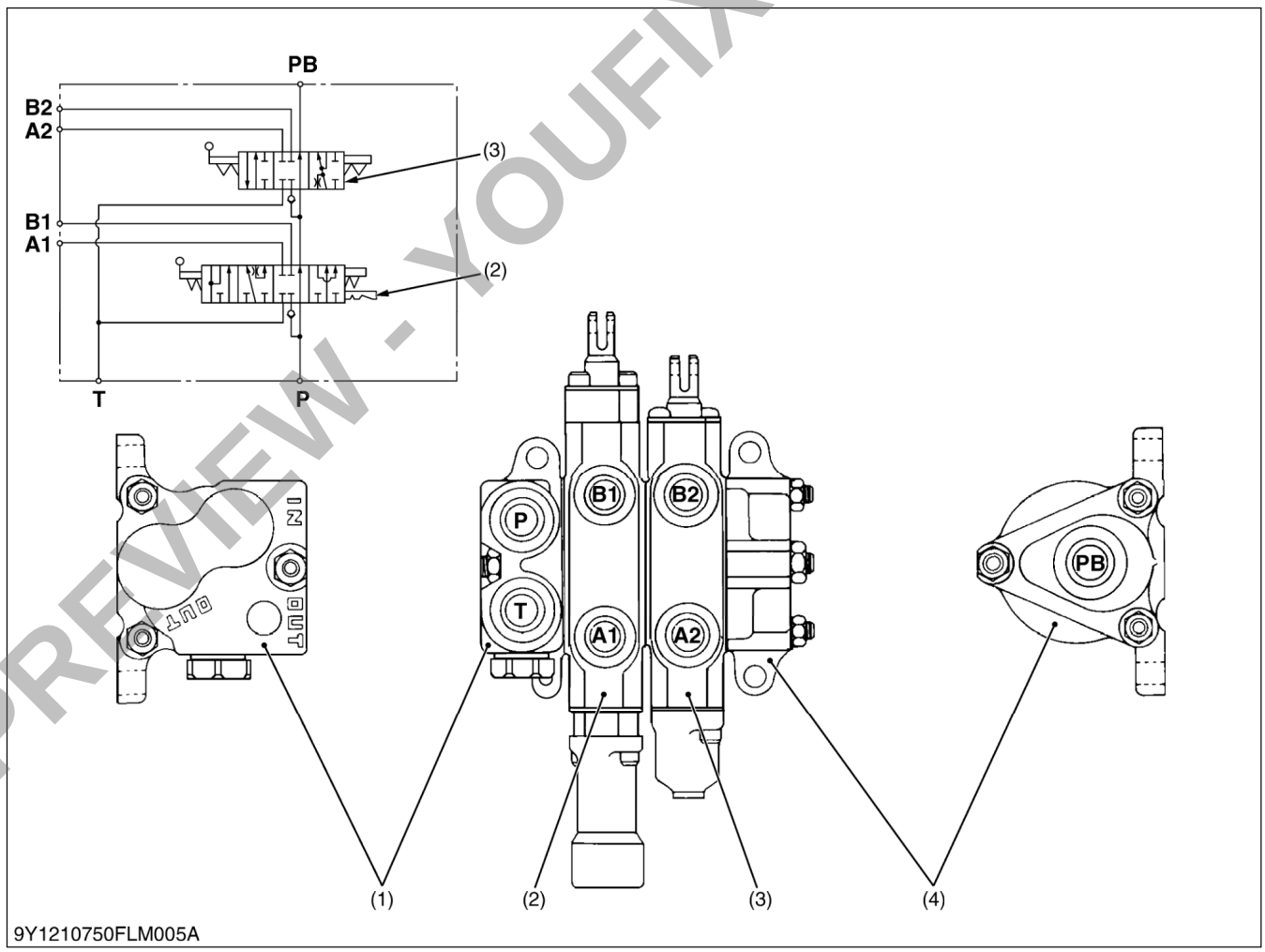


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# 2. CONTROL VALVE ASSEMBLY (STANDARD TYPE)

## [1] STRUCTURE




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(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**
**P.B.: P.B. Port**

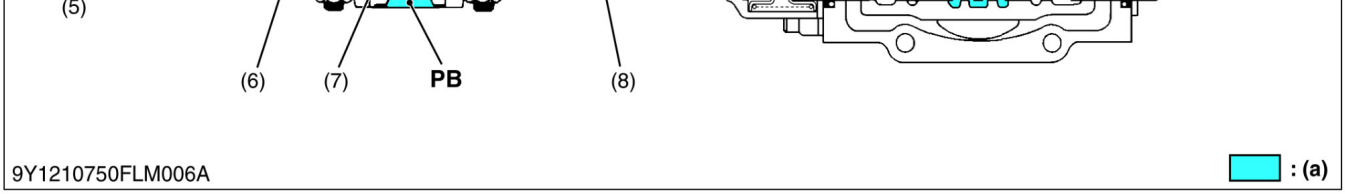
The control valve assembly is composed of one casting block and four major sections as shown above.

**(1) Inlet and Outlet Section**

There are **P** and **T** port in this section.

The **P** port is connected to the **OUTLET** port of tractor hydraulic block by the hydraulic hose.

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(1) Boom Control Valve
(2) Inlet Section
(3) **P.B.** Passage 1
(4) Spool
(5) Bucket Control Valve
(6) Outlet Section
(7) **P.B.** Passage 2
(8) Spool
(9) Load Check Valve
(10) Load Check Valve

**P:** **P Port**
**T:** **T Port**
**A1:** **A1 Port**
**A2:** **A2 Port**
**B1:** **B1 Port**
**B2:** **B2 Port**
**P.B.:** **P.B. Port**
**(a)** **Low Pressure**

1. Pressure-fed oil from the hydraulic pump is delivered into **P** port in the inlet section (2).
2. As the load check valve (9), (10) are closed in the neutral position, oil flows along the notched section of the spools (4), (8) to the **P.B.** port through the **P.B.** passage 1 (3) and 2 (7).
3. Then the oil is fed to the 3-Point hydraulic system from the **P.B.** port.

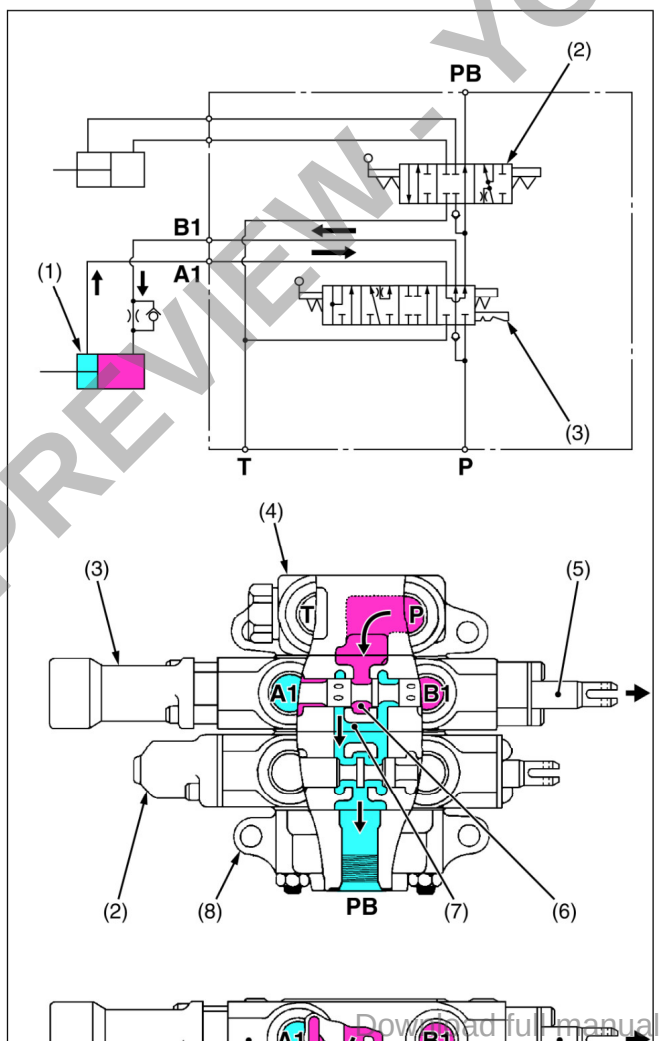
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## (2) Boom Up




### Control Lever at "UP" Position

1. When the hydraulic control lever is set to the **"UP"** position, the spool (5) of the boom control valve (3) moves to the right, which forms oil passages between passage 1 (9) and **B1** port, also between **A1** port and **P.B.** passage 1 (7).
2. As the oil passage from the neutral passage 1 (6) to the **P.B.** passage 1 (7) is closed by the spool (5), the pressure-fed oil from the **P** port opens the load check valve (10) and flows through the notched section of the spool (5) and **B1** port to extend the boom cylinder (1).
3. Return oil from the boom cylinder flows from the **A1** port through the passage in the spool (5) and **P.B.** passage 1 (7) to bucket control valve (2).

(1) Boom Cylinder
(2) Bucket Control Valve
(3) Boom Control Valve
(4) Inlet section
(5) Spool
(6) Neutral Passage 1
(7) **P.B.** Passage 1
(8) Outlet Section
(9) Passage 1
(10) Load Check Valve

**P:** **P Port**
**T:** **T Port**
**A1:** **A1 Port**
**(From Boom Cylinder)**
**B1:** **B1 Port**
**(To Boom Cylinder)**
**P.B.:** **P.B. Port**
**(a)** **Low Pressure**
**(b)** **High Pressure**

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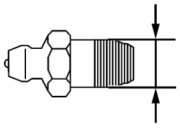


# 1. TROUBLESHOOTING

| Symptom | Probable Cause | Solution | Reference Page |
|---|---|---|---|
| **Boom Does Not Rise Boom Does Not Lower** | Control valve malfunctioning | Repair or replace | 1-S14, 1-S17 |
| | Boom cylinder defective | Repair or replace | 1-S30 |
| | Control lever cable defective | Repair or replace | 1-S24 |
| | Hydraulic pump malfunctioning | Repair or replace | Tractor WSM |
| | Oil filter clogged | Clean or replace | – |
| | Relief valve spring damaged | Replace | 1-S9 |
| | Hydraulic hose damaged | Replace | 1-S6, 1-S14, 1-S17, 1-S30 |
| | Relief valve dirty or stuck (open) | Clean | 1-S9 |
| **Insufficient Boom Speed** | Boom cylinder tube worn or damaged | Replace | 1-S30 |
| | Boom cylinder piston ring (piston seal and O-ring) worn or damaged | Replace | 1-S32 |
| | Oil leaks from tube joints | Repair | – |
| | Relief valve setting pressure too low | Adjust | 1-S9 |
| | Insufficient transmission fluid | Refill | G-3 |
| | Dirty relief valve | Clean | 1-S9 |
| **Bucket Does Not Move** | Control valve malfunctioning | Repair or replace | 1-S14, 1-S17 |
| | Bucket cylinder defective | Repair or replace | 1-S30 |
| | Control lever cable defective | Repair or replace | 1-S24 |
| | Hydraulic pump malfunctioning | Repair or replace | Tractor WSM |
| | Oil filter clogged | Clean or replace | – |

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| | | | | | |
|---|---|---|---|---|---|
| |  | 1/2 | 49.0 to 58.0 | 5.00 to 5.91 | 36.2 to 42.7 |
| Grease Fitting |  | 1/8 | 4.1 to 6.7 | 0.42 to 0.68 | 3.1 to 4.9 |
| | | 1/4 | 4.1 to 6.7 | 0.42 to 0.68 | 3.1 to 4.9 |

■ **NOTE**

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

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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-8 |
| | Check the hydraulic hoses | G-8 |
| Every week | Grease the latching pins of quick attach coupler | G-9 |
| Every 10 hours | Grease all grease fittings | G-9 |
| | Lubricate joints of control level linkage | G-9 |
| Initial 20 to 30 hours | Re-tightening of hardware | G-9 |
| Every 50 hours | Check the main frame mounting bolts | G-9 |

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# [1] LOADER SPECIFICATIONS

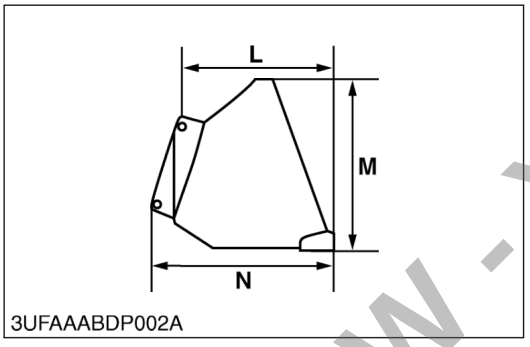
| Loader Model | | LA1954AU | LA2254AU |
|---|---|---|---|
| **Tractor Model** | | **M100GX, M110GX** | **M126GX, M135GX** |
| Wheel Base | | 2435 mm (95.9 in.) | 2690 mm (105.9 in.) |
| Front Tires | | 13.6R24 | 14.9R24 |
| Rear Tires | | 18.4R34 | 18.4R38 |
| Boom Cylinder | Bore | 70 mm (2.76 in.) | 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 | | LA1954AU, LA2254AU | | | |
|---|---|---|---|---|---|
| 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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# [3] DIMENSIONAL AND OPERATIONAL SPECIFICATIONS

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| | | | |
|---|---|---|---|
| Boom and bucket cylinder piston mounting nut (LA2254AU) | 520 to 550 | 53.1 to 56.0 | 384 to 405 |
| Front guard mounting screw (M16) | 197 to 225 | 20.0 to 23.0 | 145 to 166 |
| Main frame mounting screw (M18) | 318.5 | 32.5 | 235 |
| Main frame mounting screw (M20) | 368 | 37.5 | 272 |
| Hydraulic hose | 40 to 59 | 4.0 to 6.0 | 29 to 44 |
| Coupler | 49 to 58 | 5.0 to 5.9 | 36 to 43 |

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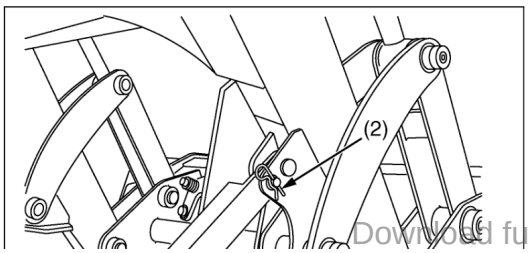
# 4. DISMOUNTING FRONT LOADER FROM TRACTOR

**⚠ 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.

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