

WSM

WORKSHOP MANUAL **BACKHOE**

BH92

Kubota

TO THE READER

This Workshop Manual tells the servicing personnel about the mechanism, servicing and maintenance of the KUBOTA Backhoe BH92. It contains 4 parts: **"Information"**, **"General"**, **"Mechanism"** and **"Servicing"**.

■ Information

This section contains information below.

- Safety First
- Safety Decals
- Terminology
- Specification

■ General

This section contains information below.

- Backhoe Identification
- General Precautions
- Lubricants
- Tightning Torques
- Maintenance Check List
- Check and Maintenance
- Special Tools

■ 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 contains information below.

- Troubleshooting
- Servicing Specifications
- Tightening Torques
- Dismounting and Mounting
- 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.

Record of Revisions

For pdf, use search function {Search word} to find all the revised locations.

Last digit of the Code No.	Month of Revision	Main Revised Point and Corrective Measures {Search word}	Reference Page
2	2014.08	Added new model tractors.	G-3, 1-S2, 1-S16, 1-S18, 1-S21
3	2023.01	Added new model tractors.	G-3, 1-S2, 1-S16 to 1-S21
		Adding seat mounting torque values.	1-S5, 1-S13
4	2024.09	Added information of the bolt unit M5.	G-4
		Updated pinching type adapter and tightening torques.	G-6
		Updated Specifications table.	I-7
5	2026.04	Add the check procedure for cylinder oil leaks (Boom side and stabilizer side).	1-S19, 1-S20

I INFORMATION

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 try 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, could result in minor or moderate injury.

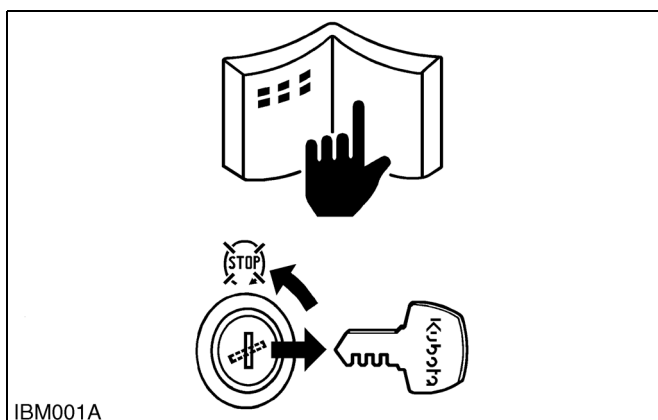
■ IMPORTANT

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

■ NOTE

- Gives helpful information.

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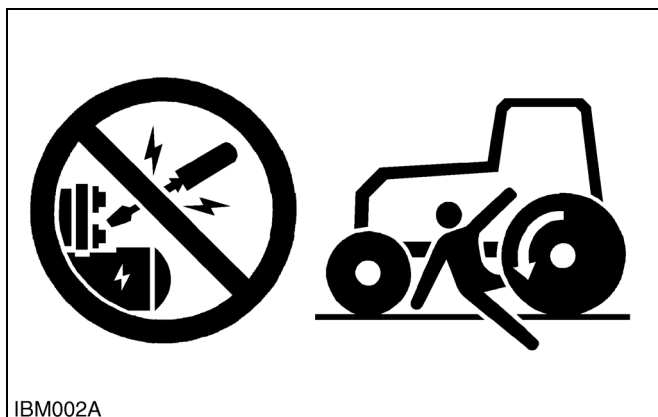


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BEFORE YOU START SERVICE

- 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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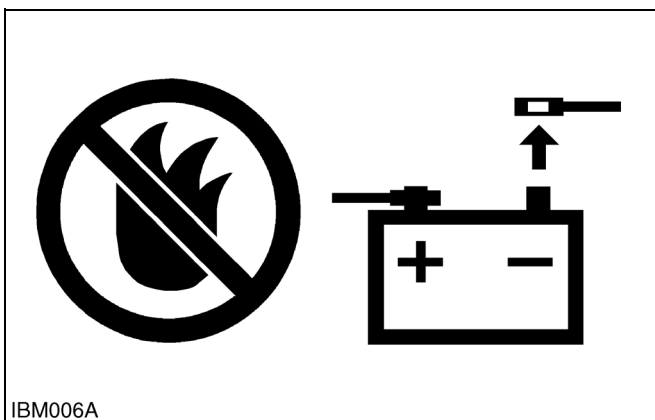
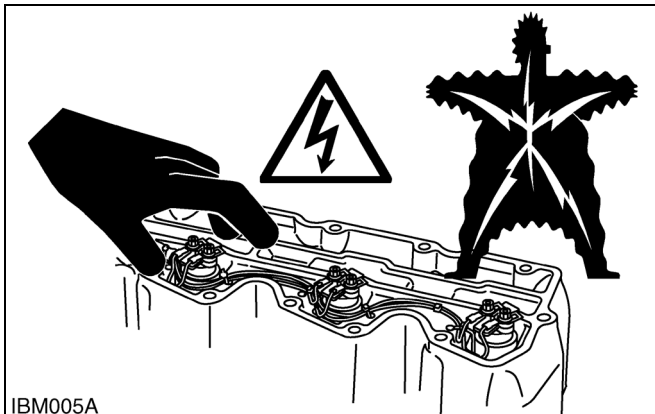
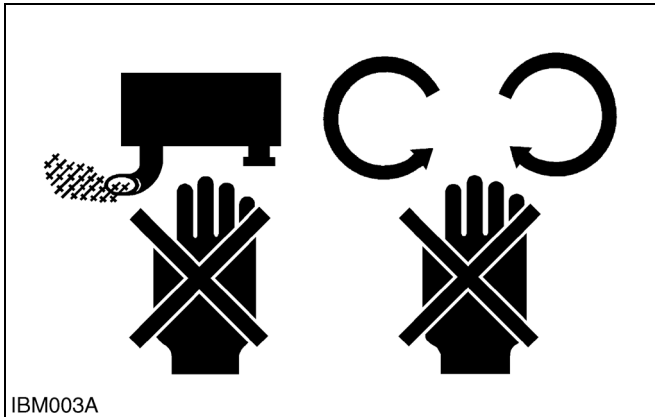


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START SAFELY

- 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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OPERATE SAFELY

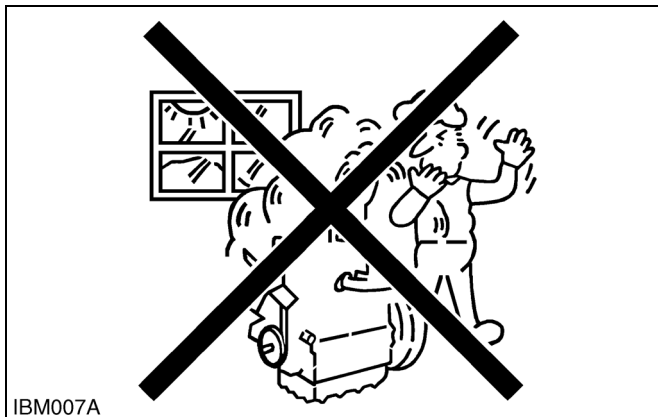
- Do not use the machine after you consume alcohol or medication or when you are tired.
- Put on applicable clothing and safety equipment.
- Use applicable tools only. Do not use alternative tools or parts.
- When 2 or more persons do servicing, make sure that you do it safely.
- Do not operate below 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.

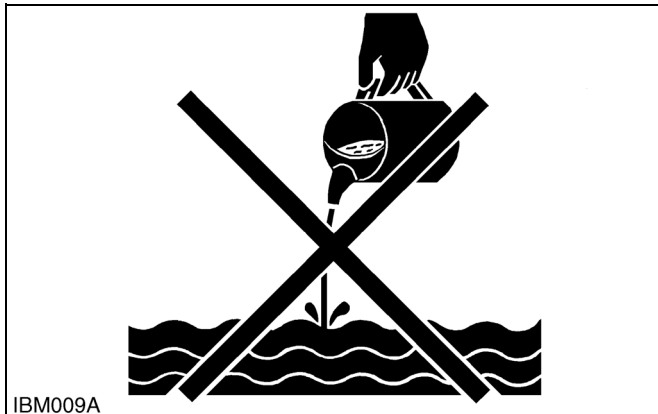
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KEEP A GOOD AIRFLOW IN THE WORK AREA

- 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.

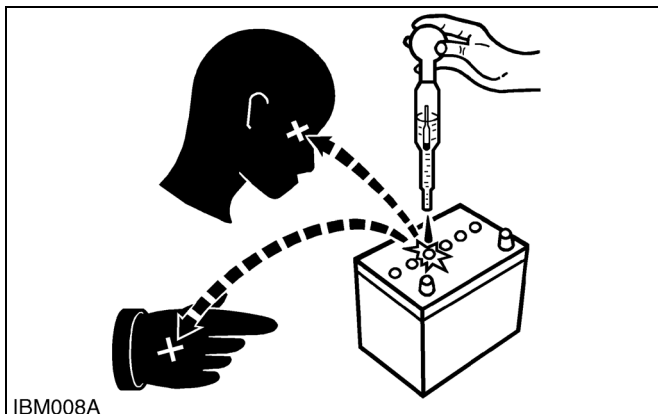
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DISCARD FLUIDS CORRECTLY

- 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.

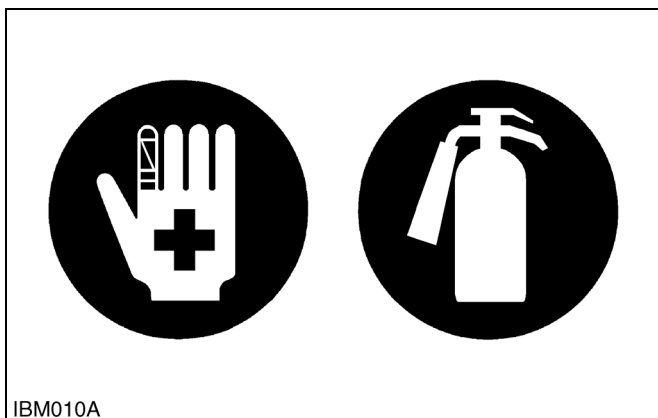
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PREVENT ACID BURNS

- 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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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

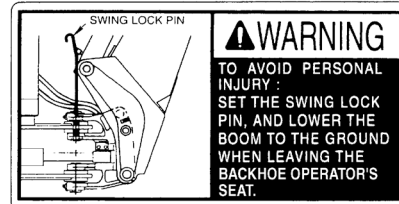
The following safety decals are installed on the machine. If a decal becomes damaged, illegible or is not on the machine, replace it. The decal part number is listed in the parts list.

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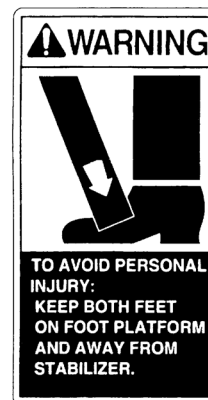
(1) Part No. 75597-7528-0



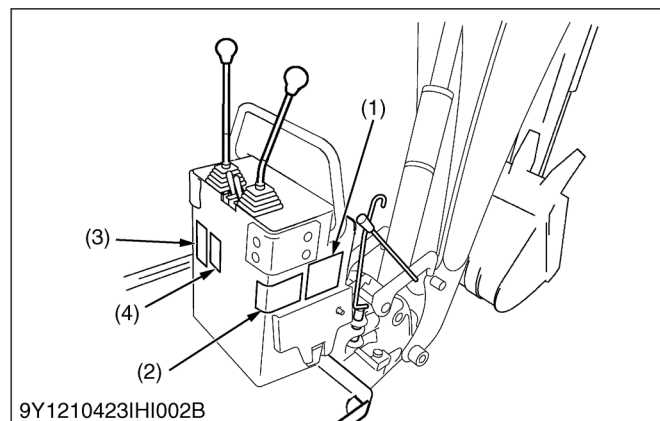
(2) Part No. 7K500-7529-0



(4) Part No. 75595-7524-0



(3) Part No. 7K500-7532-0



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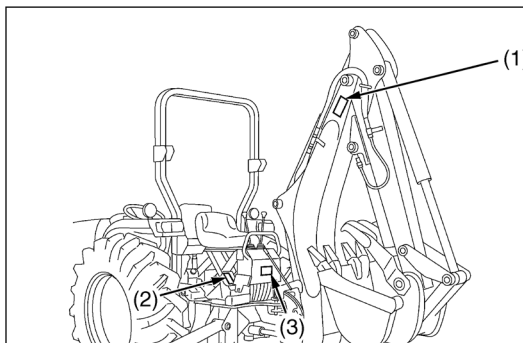
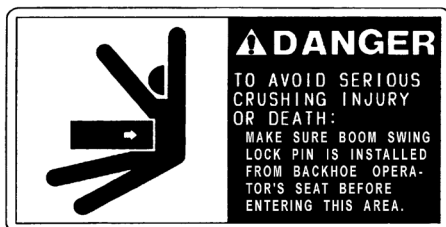
(1) Part No. 75595-7517-0 (Both sides)



(2) Part No. 7K500-7531-0



(3) Part No. 7K500-7517-0



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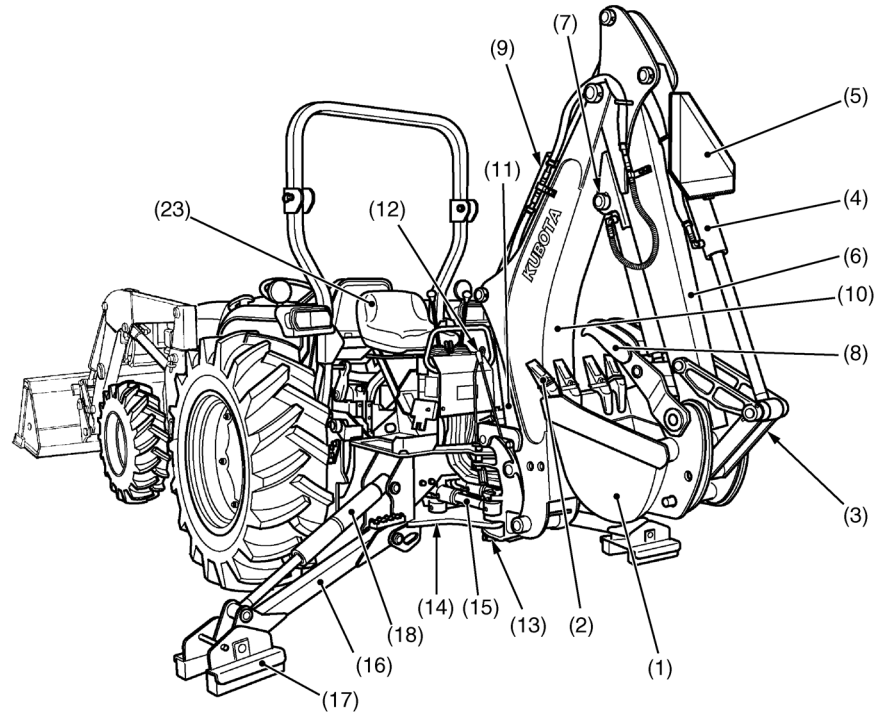
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CARE OF DANGER, WARNING AND CAUTION LABELS

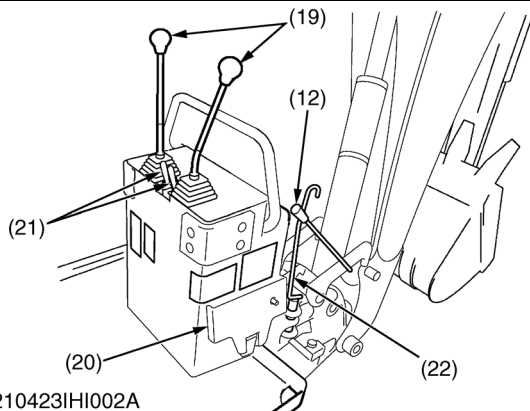
1. Keep danger, warning and caution labels clean and free from obstructing material.
2. Clean danger, warning and caution labels with soap and water, dry with a soft cloth.
3. Replace damaged or missing danger, warning and caution labels with new labels.
4. If a component with danger, warning and caution label(s) affixed is replaced with new part, make sure new label(s) is (are) attached in the same location(s) as the replaced 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. TERMINOLOGY



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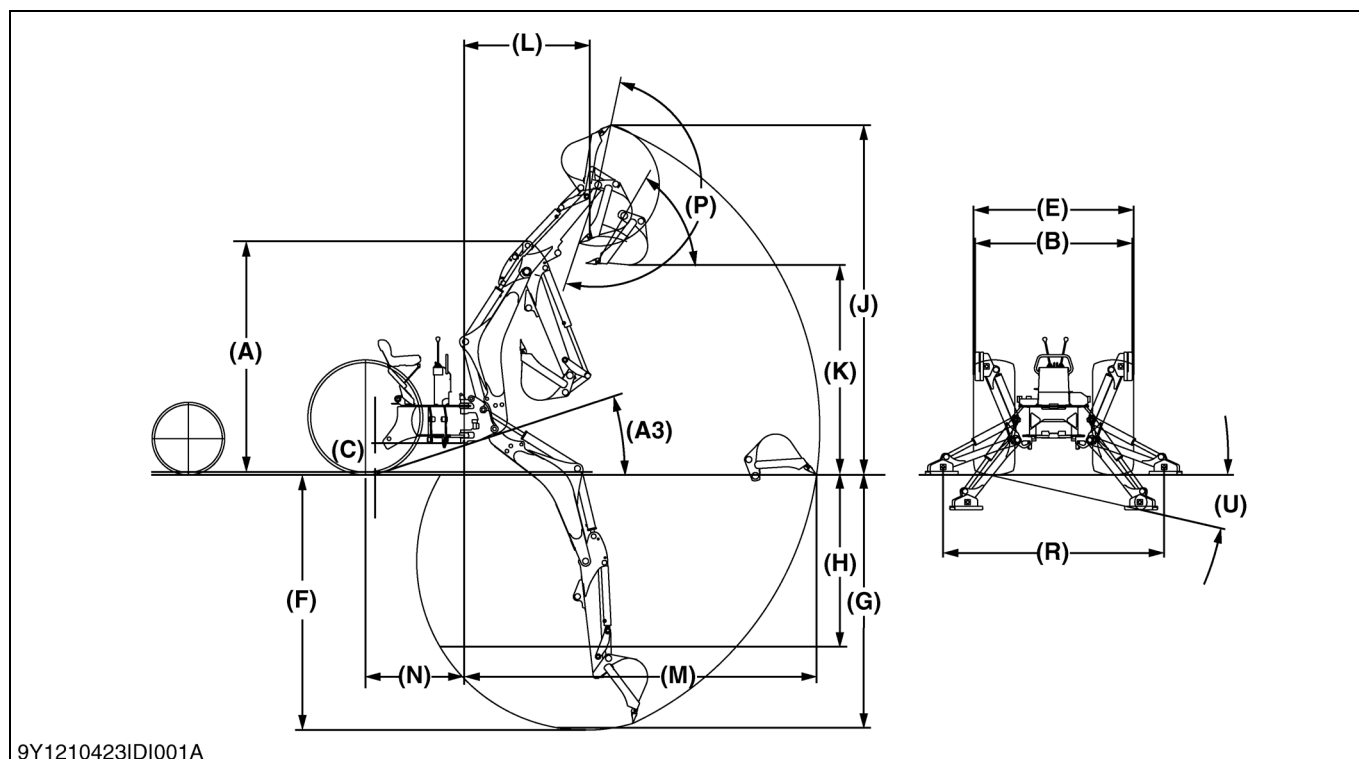
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- | | |
|--|--|
| (1) Backhoe Bucket
(Quick Bucket: Option) | (13) Swing Frame |
| (2) Bucket Teeth | (14) Main Frame |
| (3) Link, Bucket | (15) Cylinder, Swing |
| (4) Cylinder, Bucket | (16) Stabilizer |
| (5) SMV Emblem | (17) Stabilizer Pad |
| (6) Dipperstick | (18) Cylinder, Stabilizer |
| (7) Thumb Bracket | (19) Joystick Control |
| (8) Thumb (Option) | (20) Auxiliary Hydraulic Valve
Pedal (Option) |
| (9) Cylinder, Dipperstick | (21) Stabilizer Control |
| (10) Boom | (22) Swing Lock Pin |
| (11) Cylinder, Boom | (23) Seat |
| (12) Boom Lock Lever | |

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4. SPECIFICATIONS

Operating Dimensions



	Model	BH92
(A)	Transport Height	2542 mm (100.1 in.)
(B)	Stabilizer Spread Transport	1803 mm (70.99 in.)
(C)	Ground Clearance	323 mm (12.7 in.)
(E)	Overall Width	1810 mm (71.26 in.)
(F)	Maximum Digging Depth	2816 mm (110.9 in.)
(G)	Digging Depth 2 ft. Flat Bottom	2789 mm (109.8 in.)
(H)	Digging Depth 8 ft. Flat Bottom	2312 mm (91.0 in.)
(J)	Operating Height Fully Raised	3775 mm (148.6 in.)
(K)	Loading Height	2141 mm (84.3 in.)
(L)	Loading Reach	1360 mm (53.5 in.)
(M)	Reach from Swing Pivot	3819 mm (150.4 in.)
(N)	Swing Pivot to Rear Axle Center Line	1069 mm (42.09 in.)
(P)	Bucket Rotation	180 deg.
(R)	Stabilizer Spread-Operation	2336 mm (91.97 in.)
(A3)	Angle of Departure per SAE J1234	20.6 deg.
(U)	Levelling angle	10.6 deg.
	Swing Arc	180 deg.

NOTE

- The specifications are taken with KUBOTA L5740-3 tractor with foldable ROPS. (Tire size: Front 9.5-16, Rear 14.9-26)

Digging Force (Per SAE J49)

With bucket cylinder	20230 N (4548 lbf)
With dipperstick cylinder	12000 N (2698 lbf)

Cycle Time (Seconds)

Boom cylinder, extend	2.1
Boom cylinder, retract	1.8
Swing cylinder, from 90 ° to center	1.8
Dipperstick cylinder, extend	3.7
Dipperstick cylinder, retract	2.7
Bucket cylinder, extend	2.9
Bucket cylinder, retract	1.9
Stabilizer cylinder, max. height to ground	1.5
Stabilizer cylinder, ground to max. height	1.2

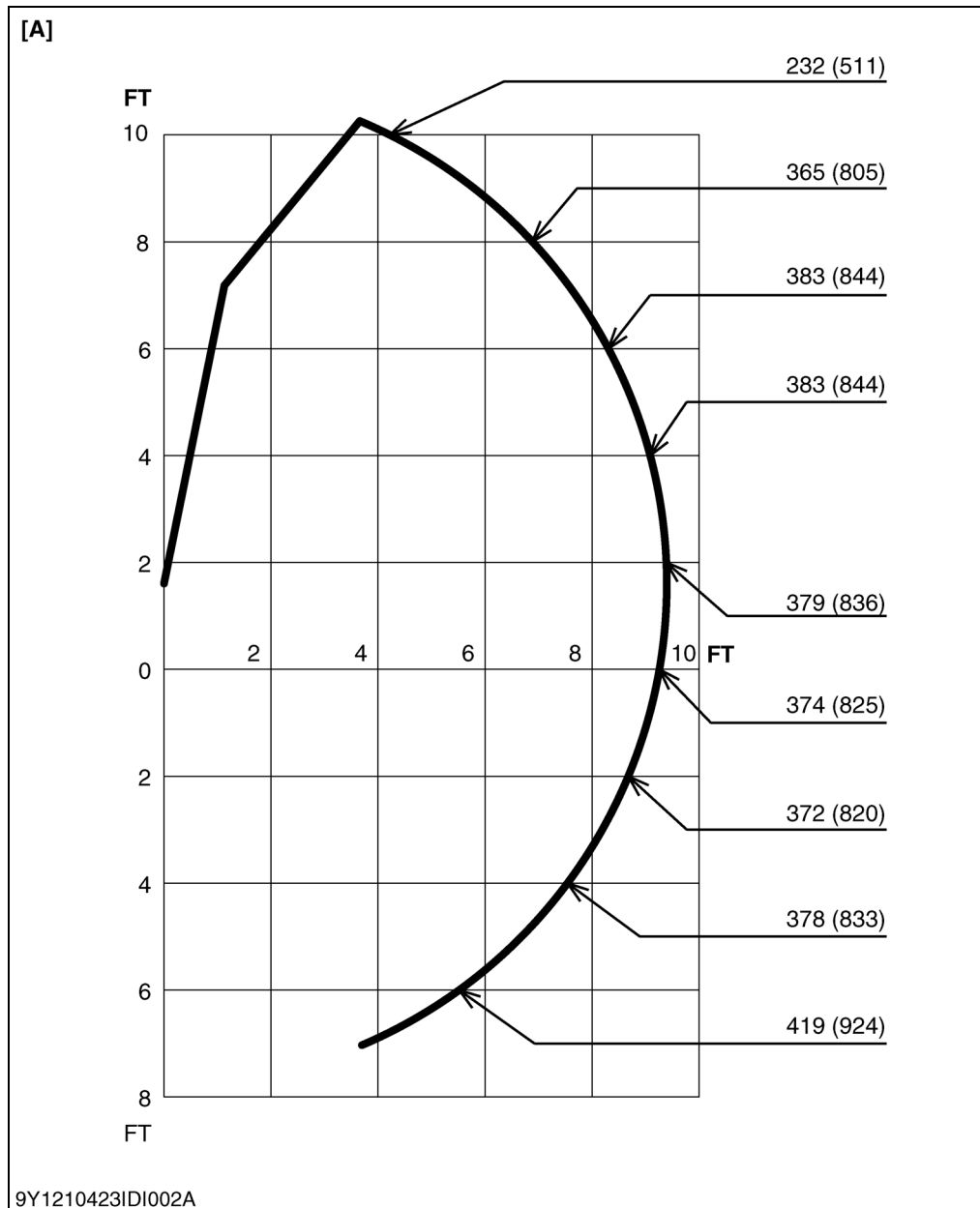
Hydraulic Cylinders

	Boom cm (in.)	Dipperstick cm (in.)	Bucket cm (in.)	Stabilizer cm (in.)	Swing cm (in.)
Rod diameter	4.0 (1.6)	4.0 (1.6)	4.0 (1.6)	4.0 (1.6)	3.5 (1.4)
Cylinder bore	8.0 (3.1)	7.5 (3.0)	6.5 (2.6)	7.0 (2.8)	6.0 (2.4)

Bucket Size

	Width cm (in.)	SAE Struck Capacity m ³ (cu-ft)	SAE Heaped Capacity m ³ (cu-ft)	Number of Teeth	Weight kg (lb)
Trenching 12"	30.5 (12.0)	0.034 (1.2)	0.042 (1.5)	3	54.0 (119)
Trenching 16"	40.6 (16.0)	0.047 (1.7)	0.061 (2.2)	4	66.0 (146)
Trenching 18"	45.7 (18.0)	0.054 (1.9)	0.071 (2.5)	4	69.0 (152)
Trenching 24"	61.0 (24.0)	0.074 (2.6)	0.102 (3.60)	5	80.0 (176)
Trenching 30"	76.2 (30.0)	0.095 (3.4)	0.133 (4.70)	6	92.0 (203)
Trenching 36"	91.4 (36.0)	0.115 (4.06)	0.164 (5.79)	7	104 (229)

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Lift Capacity (Per SAE J31)

**[A] Rated Lift Capacity
(Over End)-kg (lbs)**

Lift capacities shown are 87 % of maximum lift force, according to SAE definition.

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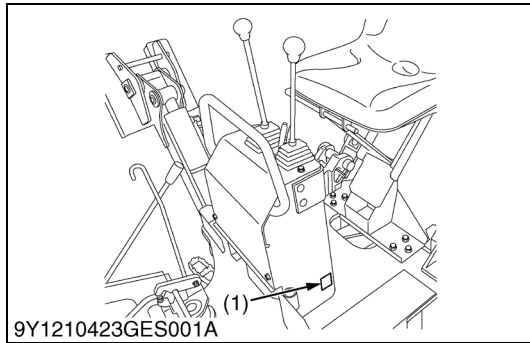
G GENERAL

GENERAL

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1. BACKHOE IDENTIFICATION

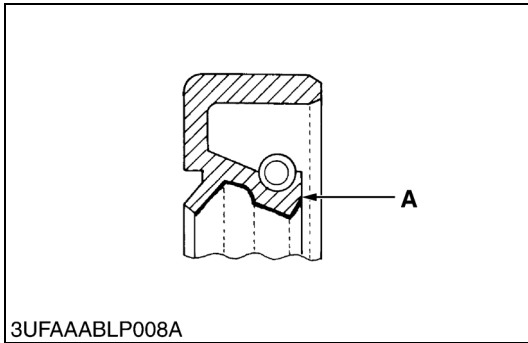


When contacting your local KUBOTA distributor, always specify backhoe serial number.

(1) Serial Number

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2. GENERAL PRECAUTIONS



- 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 backhoe 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.
- Nipples must be tightened to the specified torque. Excessive torque may cause damages hydraulic units or nipples, and insufficient torque will result in oil leaks.
- When using a new hose or pipe, tighten nuts to the specified torque once, then loosen them (approx. by 45 °) to allow hose or pipe to settle before retightening to the specified torque (except sealtaped parts).
- When removing both ends of a pipe, remove the lower end first.
- Use two pliers in removal and reinstallation; one to hold the static side, and the other to turn the side being removed to avoid twisting.
- Check to see that sleeves of flareless connectors and tapered sections of hoses are free of dust and scratches.
- After tightening nipples, clean the joint and apply the maximum working pressure 2 to 3 times to check for oil leak.

A: Grease

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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
	L3240(-3) L3540(-3) L3560	L3940(-3) L4240(-3) L4740(-3) L4060 L4760	L5040(-3) L5240(-3) L5740(-3) L5060 L5460 L6060	L4400 L4600 L4701 L4802	MX4700 MX4800 MX5100 MX5200 MX5400 MX5800 MX6000	
Transmission case	42.0 L 11.1 U.S.gals 9.24 Imp.gals	43.0 L 11.4 U.S.gals 9.46 Imp.gals	45.0 L 11.9 U.S.gals 9.90 Imp.gals	40.0 L 10.6 U.S.gals 8.80 Imp.gals	44.0 L 11.6 U.S.gals 9.68 Imp.gals	KUBOTA UDT or SUPER UDT fluid*
Grease nipples	Until grease overflows					Moly Ep type grease**

* 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 TORQUES

[1] GENERAL USE SCREWS, BOLTS AND NUTS

Tighten screws, bolts and nuts whose tightening torques are not specified in this Workshop Manual 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
M5 (5 mm, 0.20 in.)	–	–	–	–	–	–	5.58 to 6.86	0.569 to 0.699	4.12 to 5.05	–	–	–	–	–	–
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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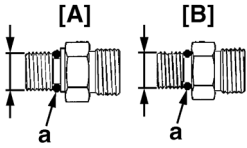
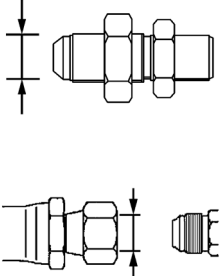
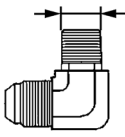
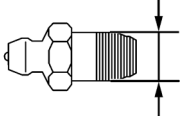
[4] PLUGS

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, Adapter (O-ring port) (UNF)	 [A] Nut Type [B] No Nut Type a: O-ring	7/16	18.0 to 20.0	1.84 to 2.03	13.3 to 14.7
		9/16	37.0 to 44.0	3.78 to 4.48	27.3 to 32.4
		3/4	48.0 to 54.0	4.90 to 5.50	35.4 to 39.8
		7/8	77.0 to 85.0	7.86 to 8.66	56.8 to 62.6
Hose fitting, Flare nut (UNF)		9/16	25 to 28	2.6 to 2.8	19 to 20
		3/4	49 to 53	5.0 to 5.4	37 to 39
		7/8	77 to 85	7.9 to 8.6	57 to 62
		1 1/16	107 to 119	11.0 to 12.1	79.0 to 87.7
Adapter (NPT)		1/4	30.0 to 50.0	3.06 to 5.09	22.2 to 36.8
		3/8	39.0 to 60.0	3.98 to 6.11	28.8 to 44.2
		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
	Retighten the backhoe hardware to torque value	G-8
	Check the hydraulic hoses	G-8
Every 10 hours	Grease all grease nipples	G-9

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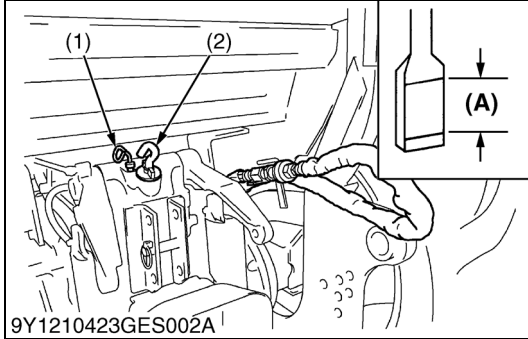
6. CHECK AND MAINTENANCE

CAUTION

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

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[1] CHECK POINTS OF EACH USE OR DAILY



Checking Transmission Fluid Level

1. Check that the tractor hydraulic fluid level.
2. To check the oil level, remove the dipstick (1), wipe it clean, replace it, and remove it again. Check that the oil level is between the two notches.
3. If the level is too low, replenish new oil.

■ IMPORTANT

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

- (1) Dipstick
(2) Oil Filling Port

(A) Oil level acceptable within this range.

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Retightening Backhoe Hardware

1. Check all hardware before daily operation.
2. If the screws, bolts and nuts are loosen, retighten them to the specified torque.

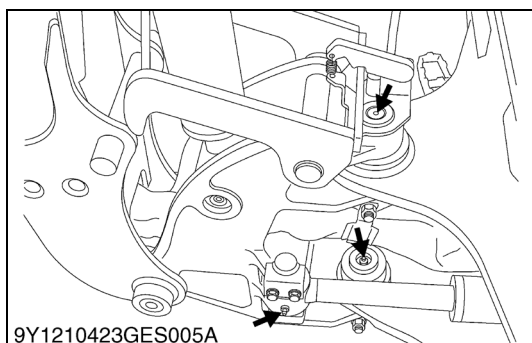
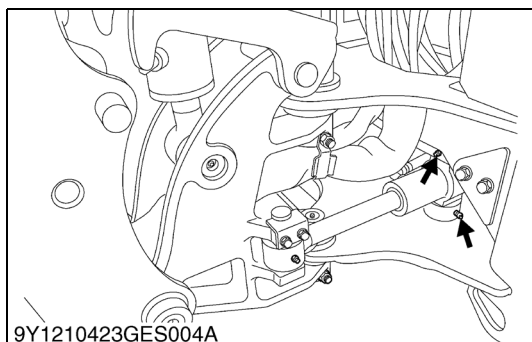
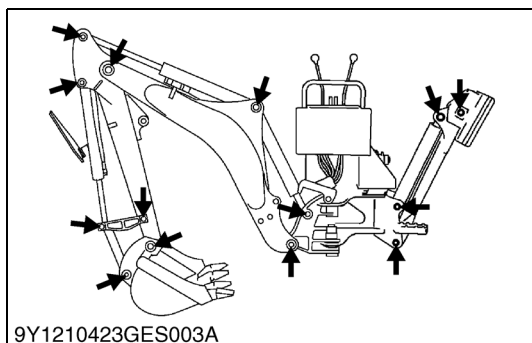
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Checking Hydraulic Hoses

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

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[2] CHECK POINT OF EVERY 10 HOURS

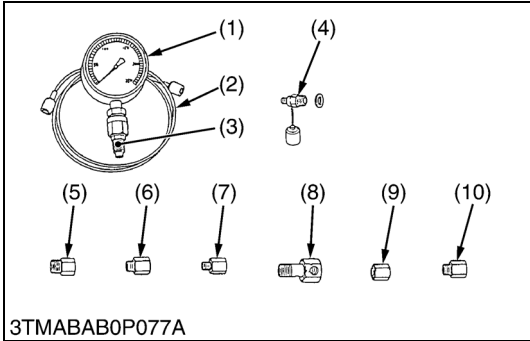


Greasing

1. Inject grease all grease nipples with a hand grease gun.

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7. SPECIAL TOOLS



Relief Valve Pressure Tester

Code No.

- 07916-50045

Application

- This allows easy measurement of relief set pressure.

- | | |
|---|--|
| (1) Gauge (07916-50322) | (6) Adaptor C (PS3/8) (07916-50371) |
| (2) Cable (07916-50331) | (7) Adaptor D (PT1/8) (07916-50381) |
| (3) Threaded Joint (07916-50401) | (8) Adaptor E (PS3/8) (07916-50392) |
| (4) Threaded Joint (07916-50341) | (9) Adaptor F (PF1/2) (07916-62601) |
| (5) Adaptor B (M18 × P1.5) (07916-50361) | (10) Adaptor 58 (PT1/4) (07916-52391) |

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1 BACKHOE

MECHANISM

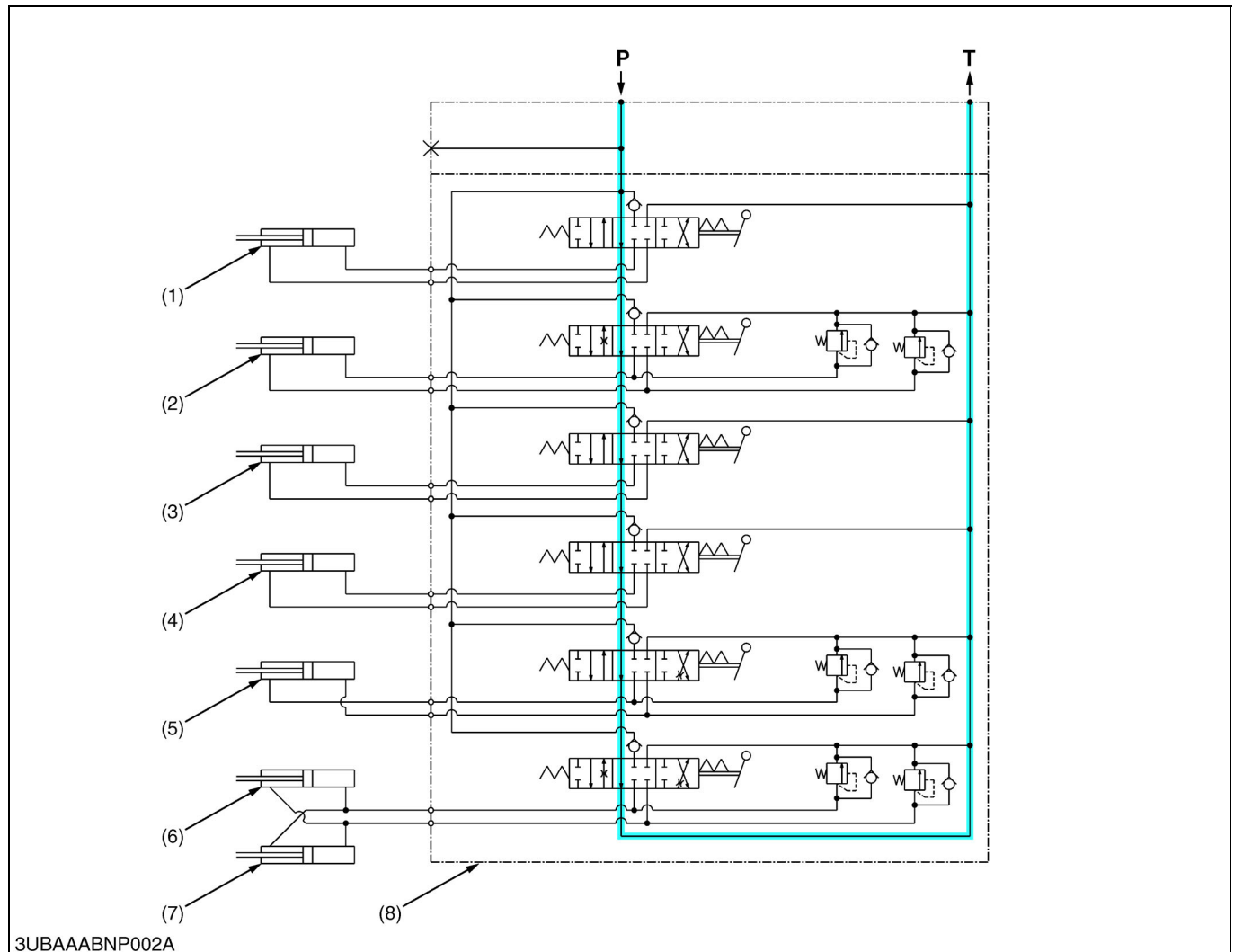
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1. CONTROL VALVE ASSEMBLY

[1] STANDARD

(1) Hydraulic Circuit



- (1) Bucket Cylinder
- (2) Dipperstick Cylinder
- (3) Stabilizer Cylinder RH

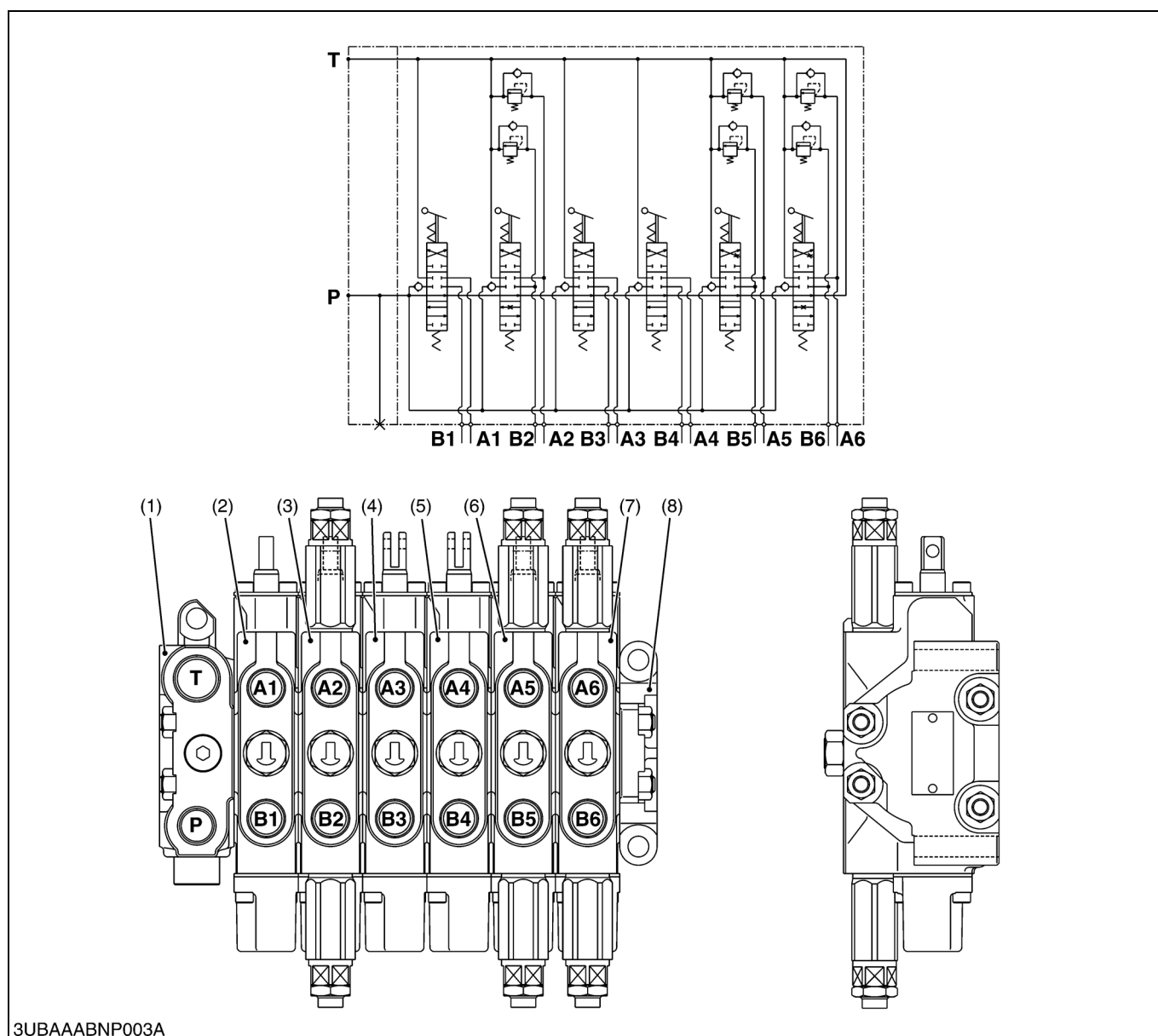
- (4) Stabilizer Cylinder LH
- (5) Boom Cylinder
- (6) Swing Cylinder LH

- (7) Swing Cylinder RH
- (8) Backhoe Control Valve

P: From Hydraulic Pump
T: To Tank Port

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(2) Structure



- (1) Inlet Section
- (2) Bucket Control Valve
- (3) Dipperstick Control Valve
- (4) Stabilizer RH Control Valve
- (5) Stabilizer LH Control Valve
- (6) Boom Control Valve

- (7) Swing Control Valve
- (8) Outlet Section

P: Pump Port
T: Tank Port

A1: A1 Port
A2: A2 Port
A3: A3 Port
A4: A4 Port
A5: A5 Port
A6: A6 Port

B1: B1 Port
B2: B2 Port
B3: B3 Port
B4: B4 Port
B5: B5 Port
B6: B6 Port

(1) Inlet / Outlet Section

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

The **P** port is connected to the **OUTLET** port of tractor connected by the quick coupler.

The **T** port is connected to the **RETURN** port of tractor connected by the quick coupler.

(2) Control Valve Section

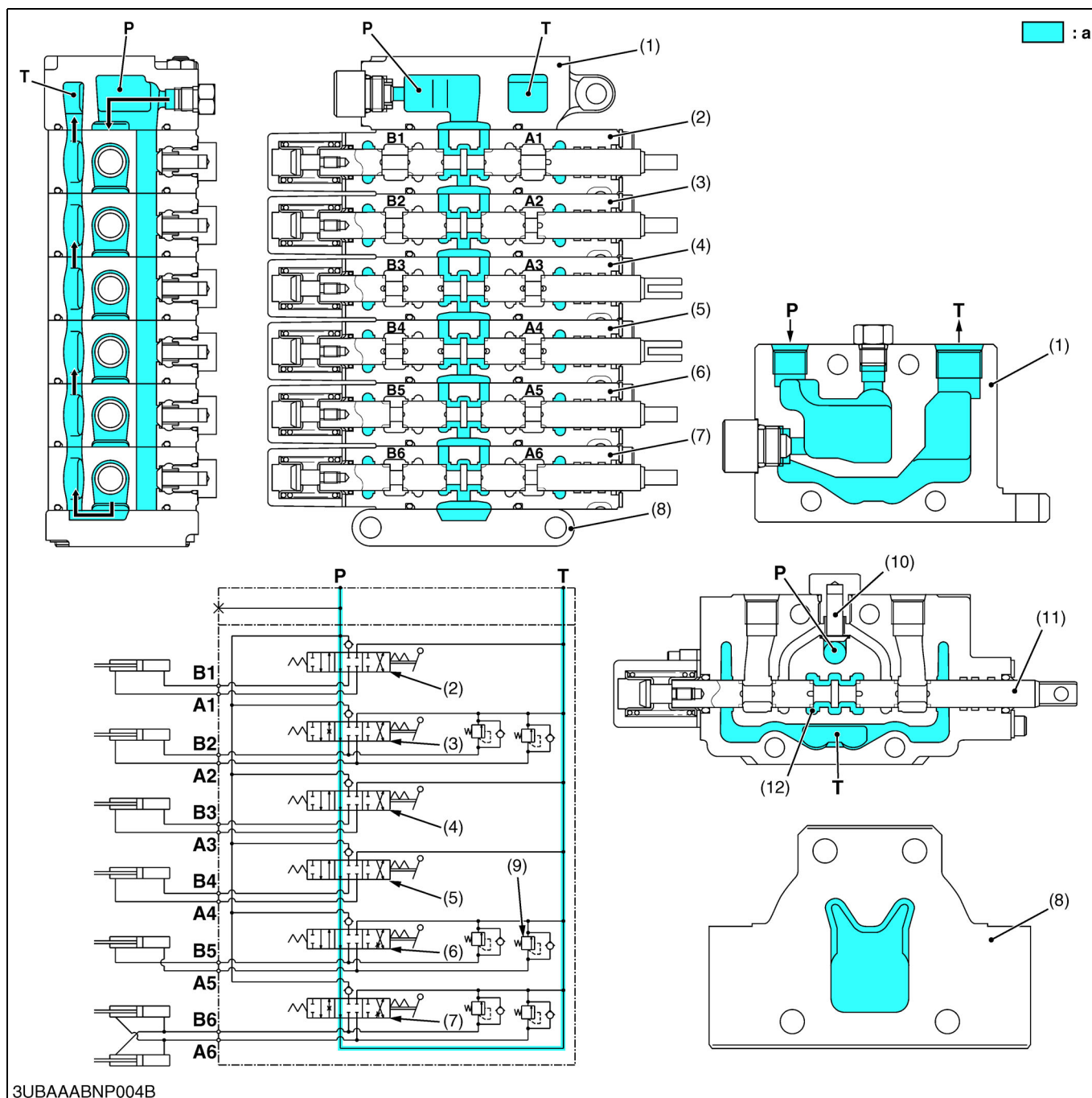
The control valves are 3 positions, 6 connections, no detent and spring center type. These valves have **A** and **B** ports and control oil flow to each cylinders.

These are consisting of a valve housing, spool, load check valve, overload relief valve, etc..

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(3) Operation

[A] Neutral



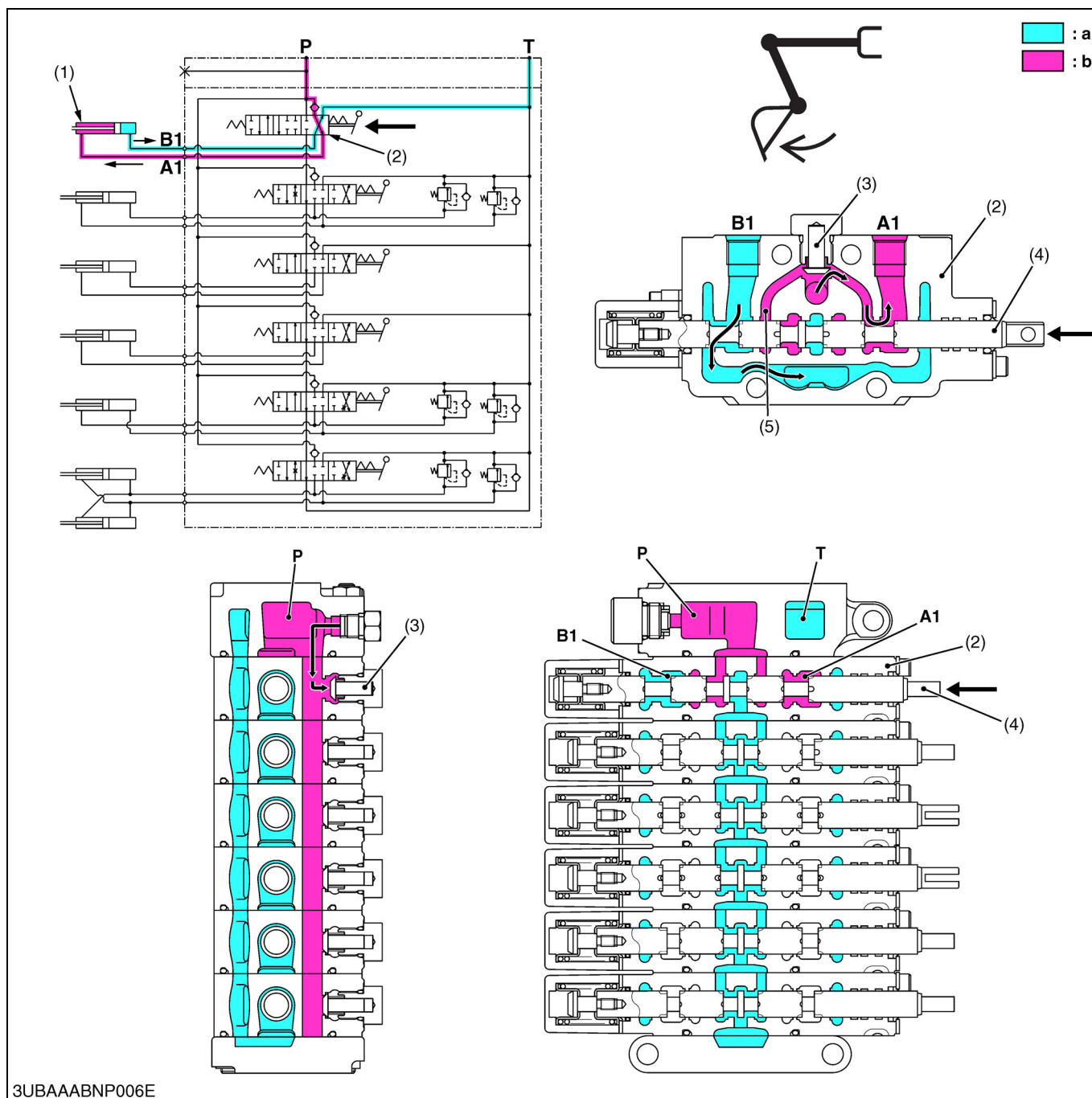
- | | | | |
|---------------------------------|---|--------------------|------------------------|
| (1) Inlet Section | (9) Overload Relief Valve (Port Relief Valve) | A1: A1 Port | B1: B1 Port |
| (2) Bucket Control Valve | (10) Load Check Valve | A2: A2 Port | B2: B2 Port |
| (3) Dipperstick Control Valve | (11) Spool | A3: A3 Port | B3: B3 Port |
| (4) Stabilizer RH Control Valve | (12) Neutral Passage | A4: A4 Port | B4: B4 Port |
| (5) Stabilizer LH Control Valve | | A5: A5 Port | B5: B5 Port |
| (6) Boom Control Valve | | A6: A6 Port | B6: B6 Port |
| (7) Swing Control Valve | | | a: Low Pressure |
| (8) Outlet Section | | | |
- P: Pump Port**
T: Tank Port

Pressure-fed oil from the hydraulic pumps is delivered into **P** port in the inlet section (1).

As the load check valves (10) are kept closed in the neutral position, oil flows along the notched section of the spools (11) to the **T** port through the neutral passage (12).

Then the oil is fed to the transmission case via the return hose and pipe from the **T** port.

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(B) Dump

- (1) Bucket Cylinder
- (2) Bucket Control Valve
- (3) Load Check Valve

- (4) Spool
- (5) Bridge Passage

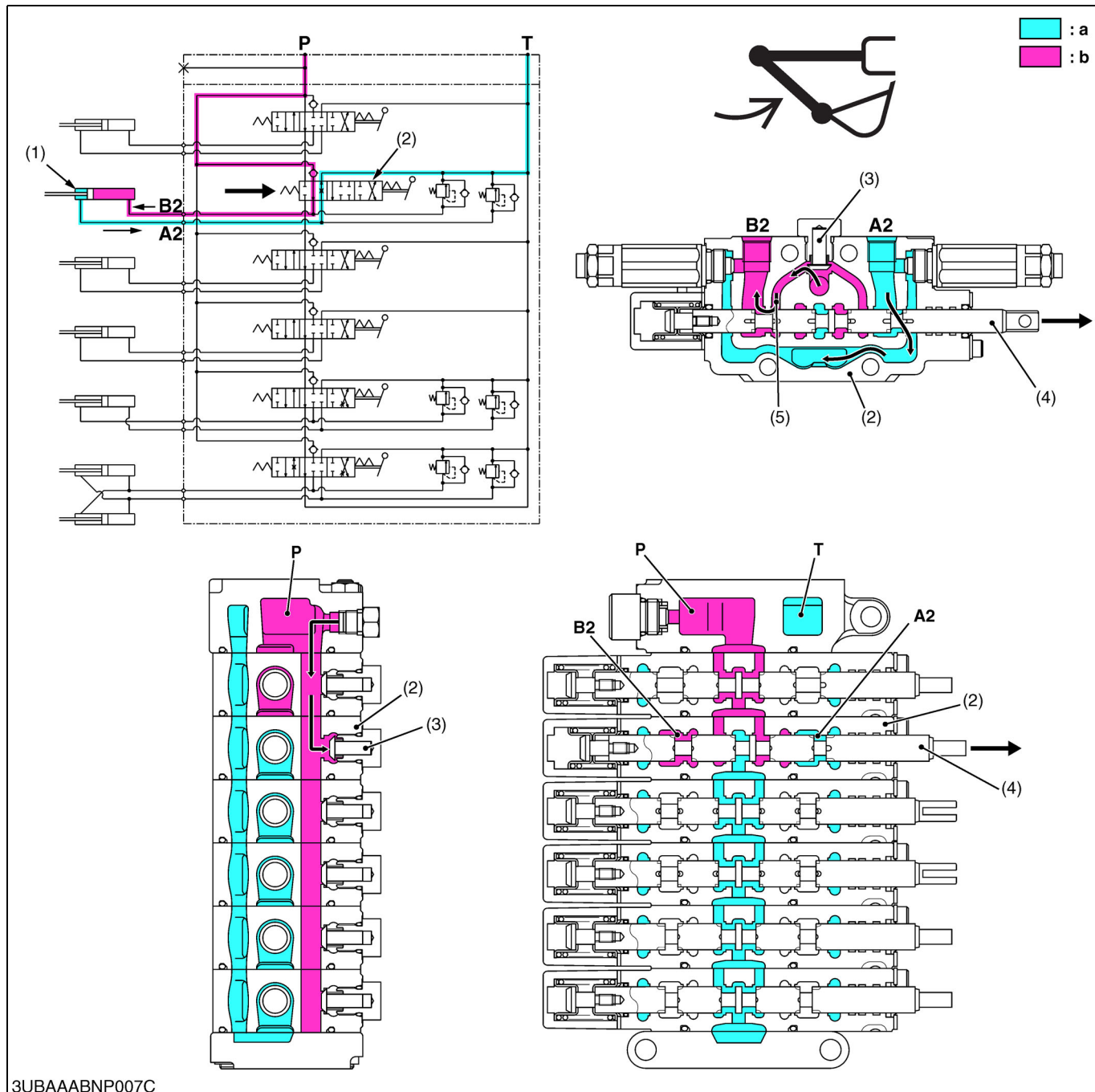
P: P Port
T: T Port
a: Low Pressure
b: High Pressure

A1: A1 Port
(To Bucket Cylinder)
B1: B1 Port
(From Bucket Cylinder)

- When the dipperstick and bucket lever is moved to the right to set to the **"DUMP"** position, the spool (4) of the bucket control valve (2) moves to the left, which forms oil passage between bridge passage (5) and **A1** port, and between **B1** port and **T** port.
- The pressure-fed oil from the **P** port opens the load check valve (3) and flows to **A1** port to retract the bucket cylinder (1).
- Return oil from the bucket cylinder (1) returns to the transmission case through the **B1** port, low pressure passage and **T** port.

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[C] Dipperstick (A) Crowd



3UBAAABNP007C

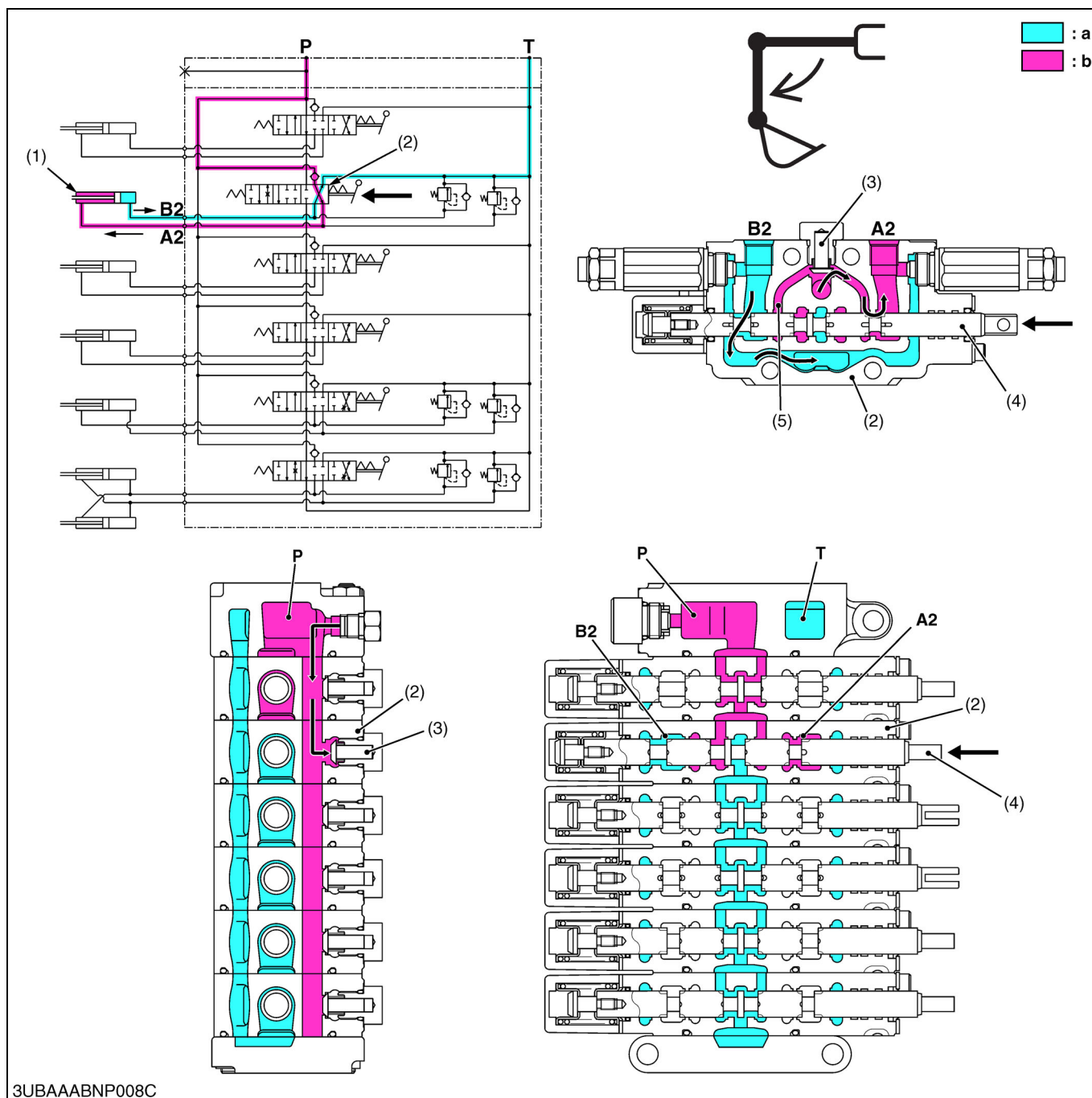
- (1) Dipperstick Cylinder
(2) Dipperstick Control Valve
(3) Load Check Valve
(4) Spool
(5) Bridge Passage

P: P Port
T: T Port
a: Low Pressure
b: High Pressure

A2: A2 Port
(From Dipperstick Cylinder)
B2: B2 Port
(To Dipperstick Cylinder)

1. When the dipperstick and bucket lever is pulled to the backward to set to the "**CROWD**" position, the spool (4) of the dipperstick control valve (2) moves to the right, which forms oil passage between bridge passage (5) and **B2** port, and between **A2** port and **T** port.
2. The pressure-fed oil from the **P** port opens the load check valve (3) and flows to **B2** port to extend the dipperstick cylinder (1).
3. Return oil from the dipperstick cylinder (1) returns to the transmission case through the **A2** port, low pressure passage and **T** port.

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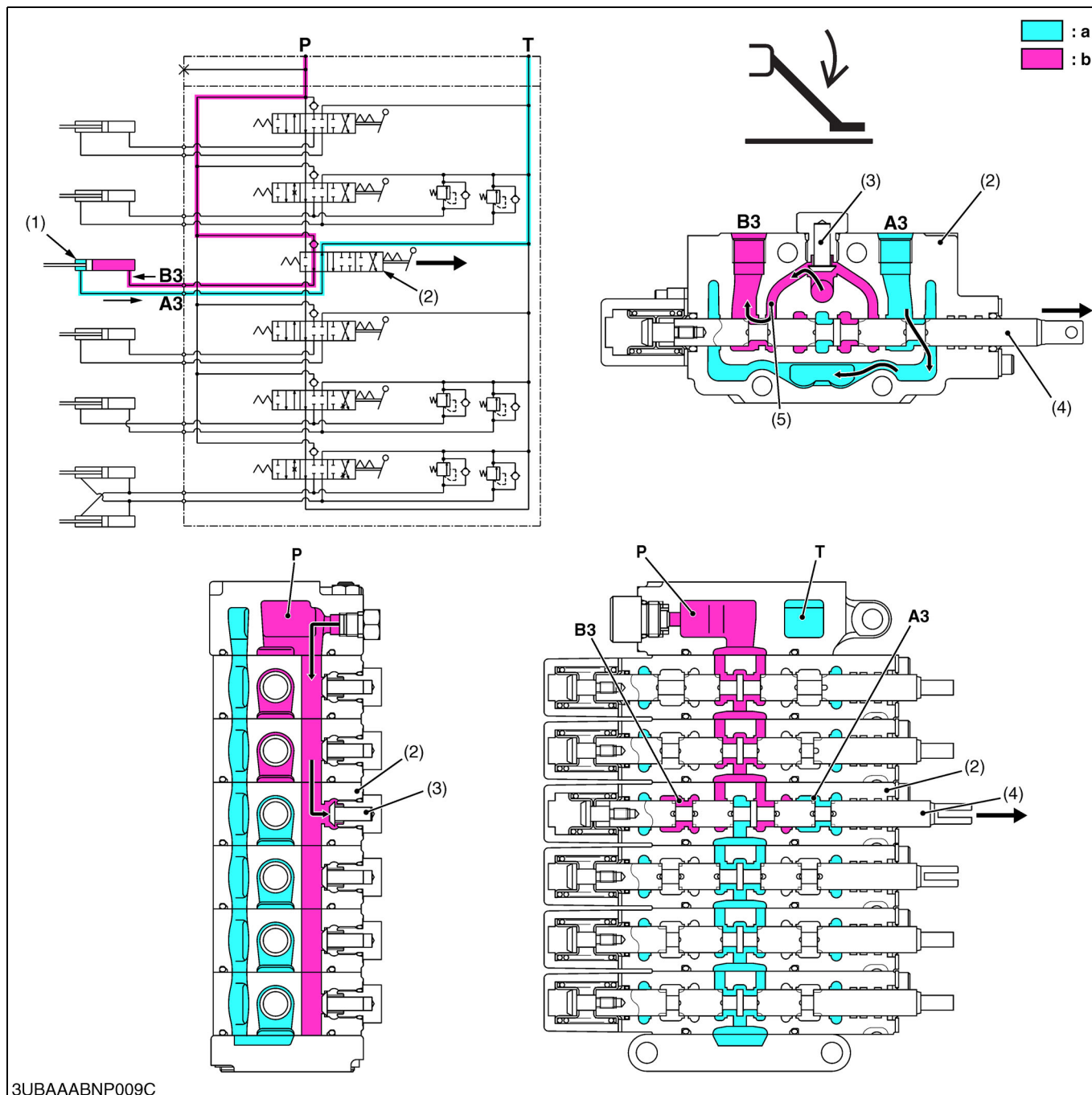
(B) Extend

- (1) Dipperstick Cylinder
 (2) Dipperstick Control Valve
 (3) Load Check Valve
 (4) Spool
 (5) Bridge Passage

P: P Port
T: T Port
a: Low Pressure
b: High Pressure
A2: A2 Port
(To Dipperstick Cylinder)
B2: B2 Port
(From Dipperstick Cylinder)

1. When the dipperstick and bucket lever is pushed to the forward to set to the **"EXTEND"** position, the spool (4) of the dipperstick control valve (2) moves to the left, which forms oil passage between bridge passage (5) and **A2** port, and between **B2** port and **T** port.
2. The pressure-fed oil from the **P** port opens the load check valve (3) and flows to **A2** port to retract the dipperstick cylinder (1).
3. Return oil from the dipperstick cylinder (1) returns to the transmission case through the **B2** port, low pressure passage and **T** port.

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[D] Stabilizer RH**(A) Extend**

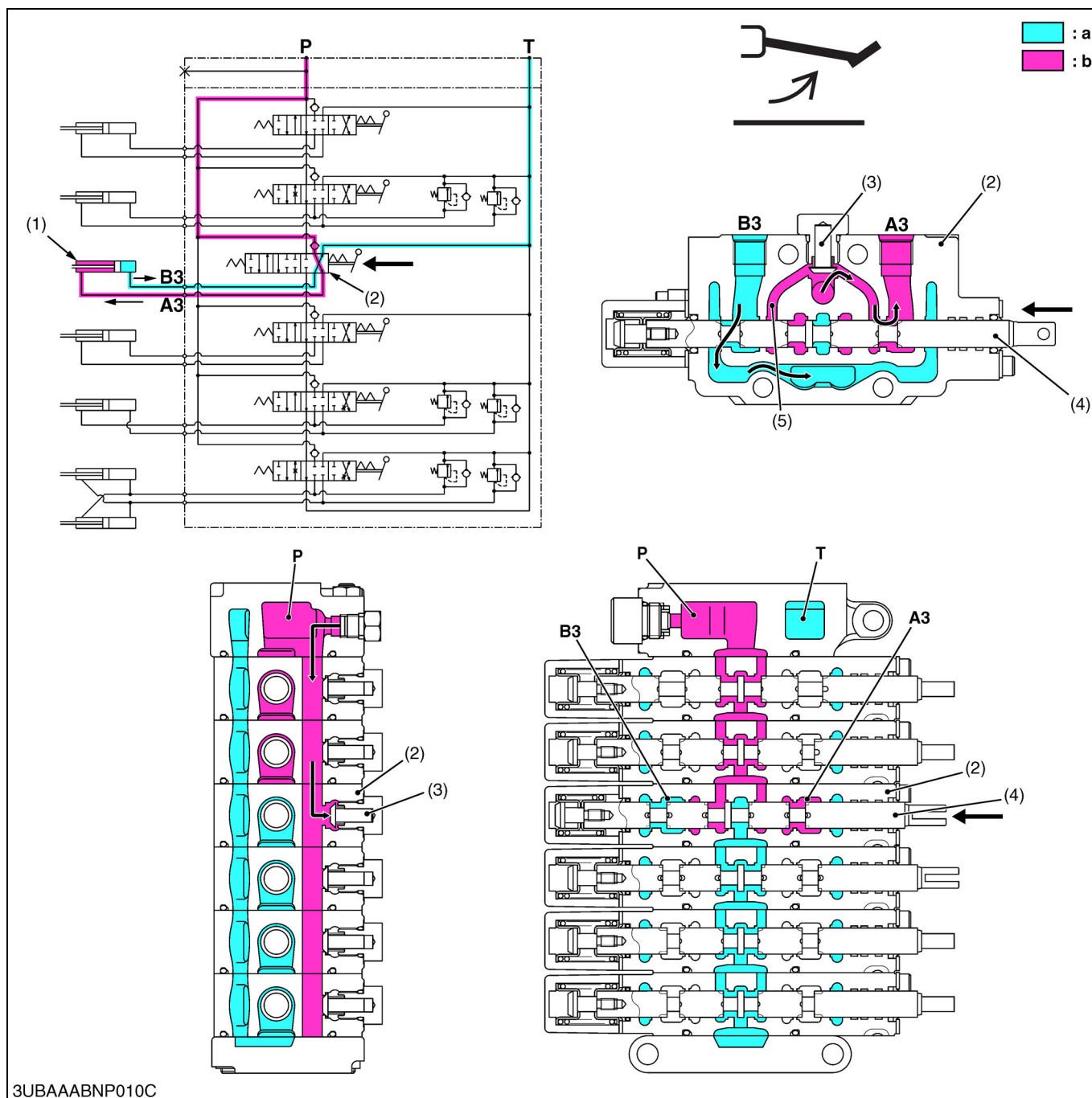
- (1) Stabilizer Cylinder RH
 (2) Stabilizer RH Control Valve
 (3) Load Check Valve
 (4) Spool
 (5) Bridge Passage

P: P Port
T: T Port
a: Low Pressure
b: High Pressure

A3: A3 Port (From Stabilizer RH Cylinder)
B3: B3 Port (To Stabilizer RH Cylinder)

- When the right stabilizer control lever is pulled to the downward to set to the **"EXTEND"** position, the spool (4) of the stabilizer RH control valve (2) moves to the right, which forms oil passage between bridge passage (5) and **B3** port, and between **A3** port and **T** port.
- The pressure-fed oil from the **P** port opens the load check valve (3), and flows to **B3** port to extend the stabilizer cylinder RH (1).
- Return oil from the stabilizer cylinder RH (1) returns to the transmission case through the **A3** port, low pressure passage and **T** port.

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(B) Shrink

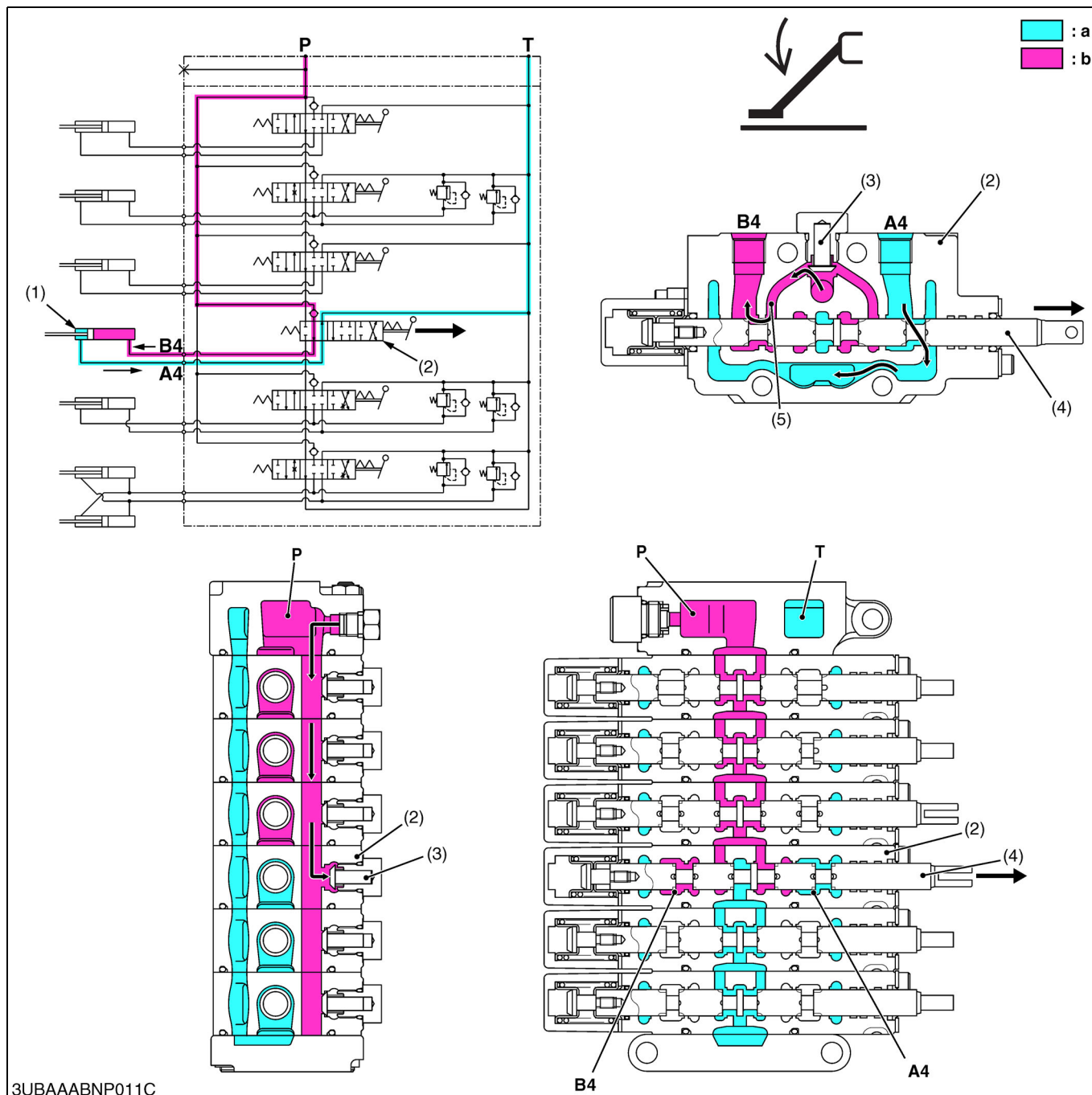
- (1) Stabilizer Cylinder RH
 (2) Stabilizer RH Control Valve
 (3) Load Check Valve
 (4) Spool
 (5) Bridge Passage

P: P Port
T: T Port
a: Low Pressure
b: High Pressure

A3: A3 Port (To Stabilizer RH Cylinder)
B3: B3 Port (From Stabilizer RH Cylinder)

- When the right stabilizer control lever is pushed to the forward to set to the **"SHRINK"** position, the spool (4) of the stabilizer RH control valve (2) moves to the left, which forms oil passage between bridge passage (5) and **A3** port, and between **B3** port and **T** port.
- The pressure-fed oil from the **P** port opens the load check valve (3), and flows to **A3** port to retract the stabilizer cylinder RH (1).
- Return oil from the stabilizer cylinder RH (1) returns to the transmission case through the **B3** port, low pressure passage and **T** port.

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[E] Stabilizer LH**(A) Extend**

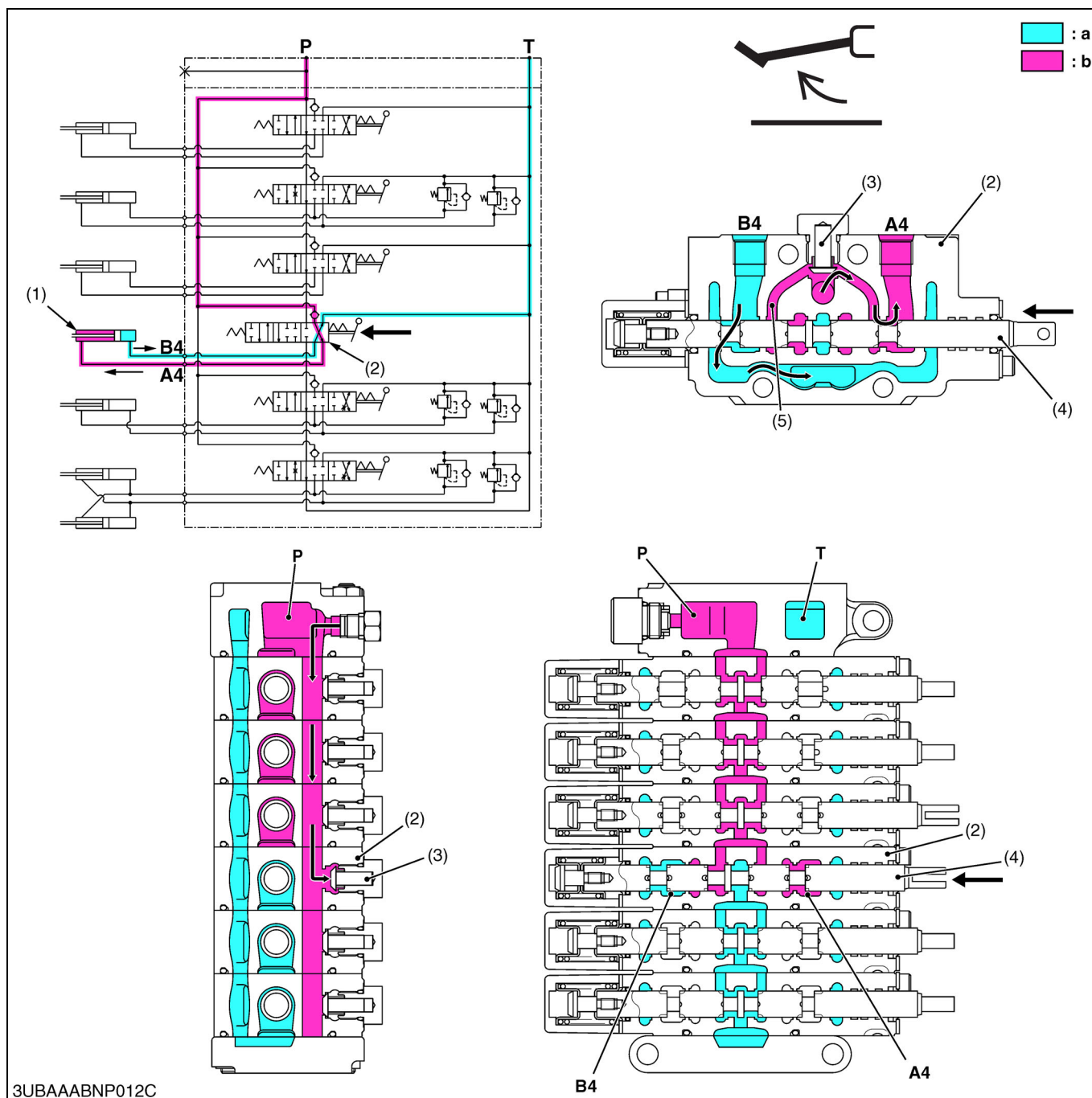
- (1) Stabilizer Cylinder LH
 (2) Stabilizer LH Control Valve
 (3) Load Check Valve

P: P Port
 T: T Port
 a: Low Pressure
 b: High Pressure

A4: A4 Port (From Stabilizer LH Cylinder)
 B4: B4 Port (To Stabilizer LH Cylinder)

- When the right stabilizer control lever is pulled to the downward to set to the **"EXTEND"** position, the spool (4) of the stabilizer LH control valve (2) moves to the right, which forms oil passage between bridge passage (5) and **B4** port, and between **A4** port and **T** port.
- The pressure-fed oil from the **P** port opens the load check valve (3), and flows to **B4** port to extend the stabilizer cylinder LH (1).
- Return oil from the stabilizer cylinder LH (1) returns to the transmission case through the **A4** port, low pressure passage and **T** port.

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(B) Shrink

- (1) Stabilizer Cylinder LH
 (2) Stabilizer LH Control Valve
 (3) Load Check Valve
 (4) Spool
 (5) Bridge Passage

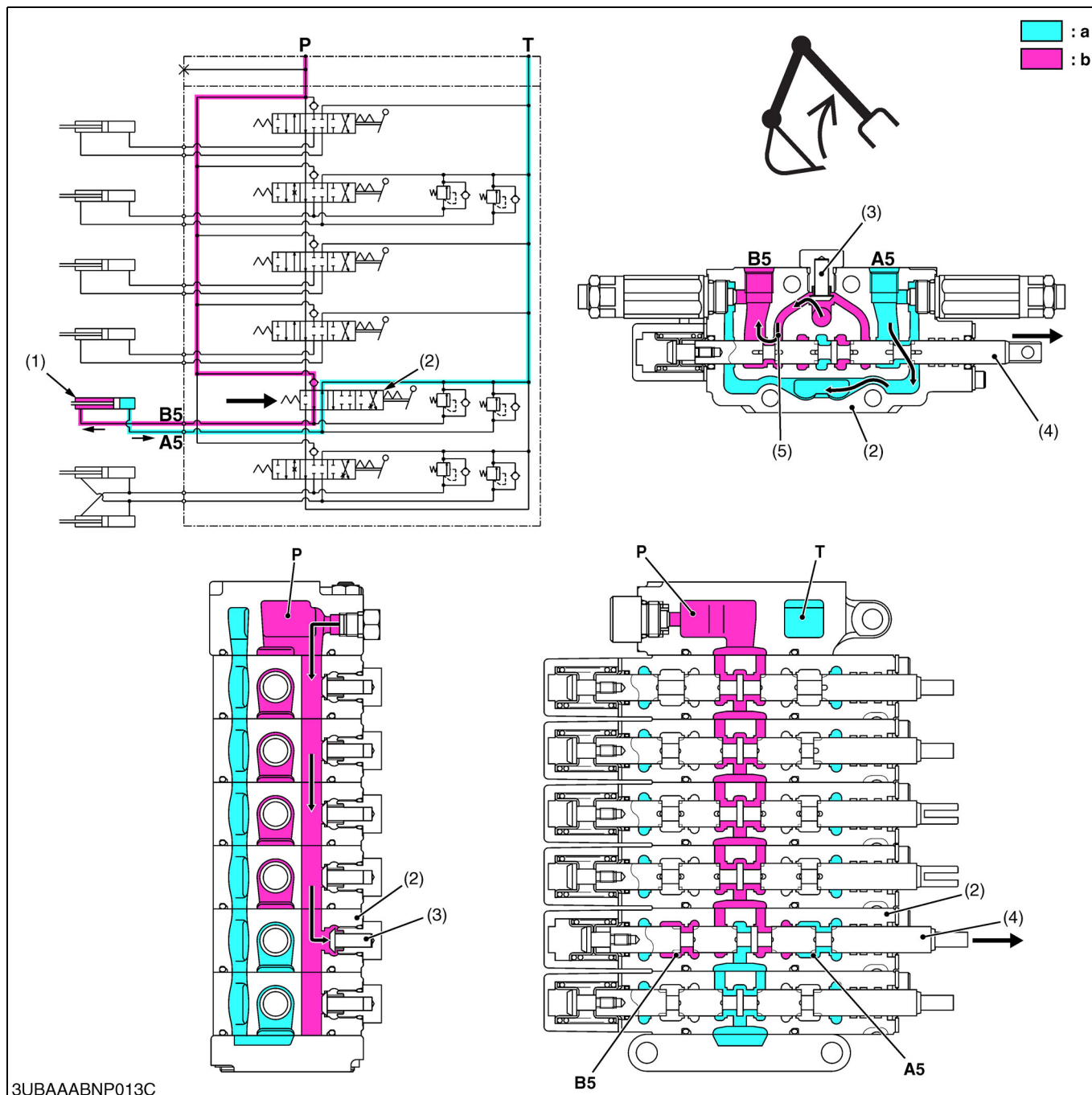
P: P Port
T: T Port
a: Low Pressure
b: High Pressure

A4: A4 Port (To Stabilizer LH Cylinder)
B4: B4 Port (From Stabilizer LH Cylinder)

- When the right stabilizer control lever is pushed to the forward to set to the **"SHRINK"** position, the spool (4) of the stabilizer LH control valve (2) moves to the left, which forms oil passage between bridge passage (5) and **A4** port, and between **B4** port and **T** port.
- The pressure-fed oil from the **P** port opens the load check valve (3), and flows to **A4** port to retract the stabilizer cylinder LH (1).
- Return oil from the stabilizer cylinder LH (1) returns to the transmission case through the **B4** port, low pressure passage and **T** port.

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[F] Boom (A) Up



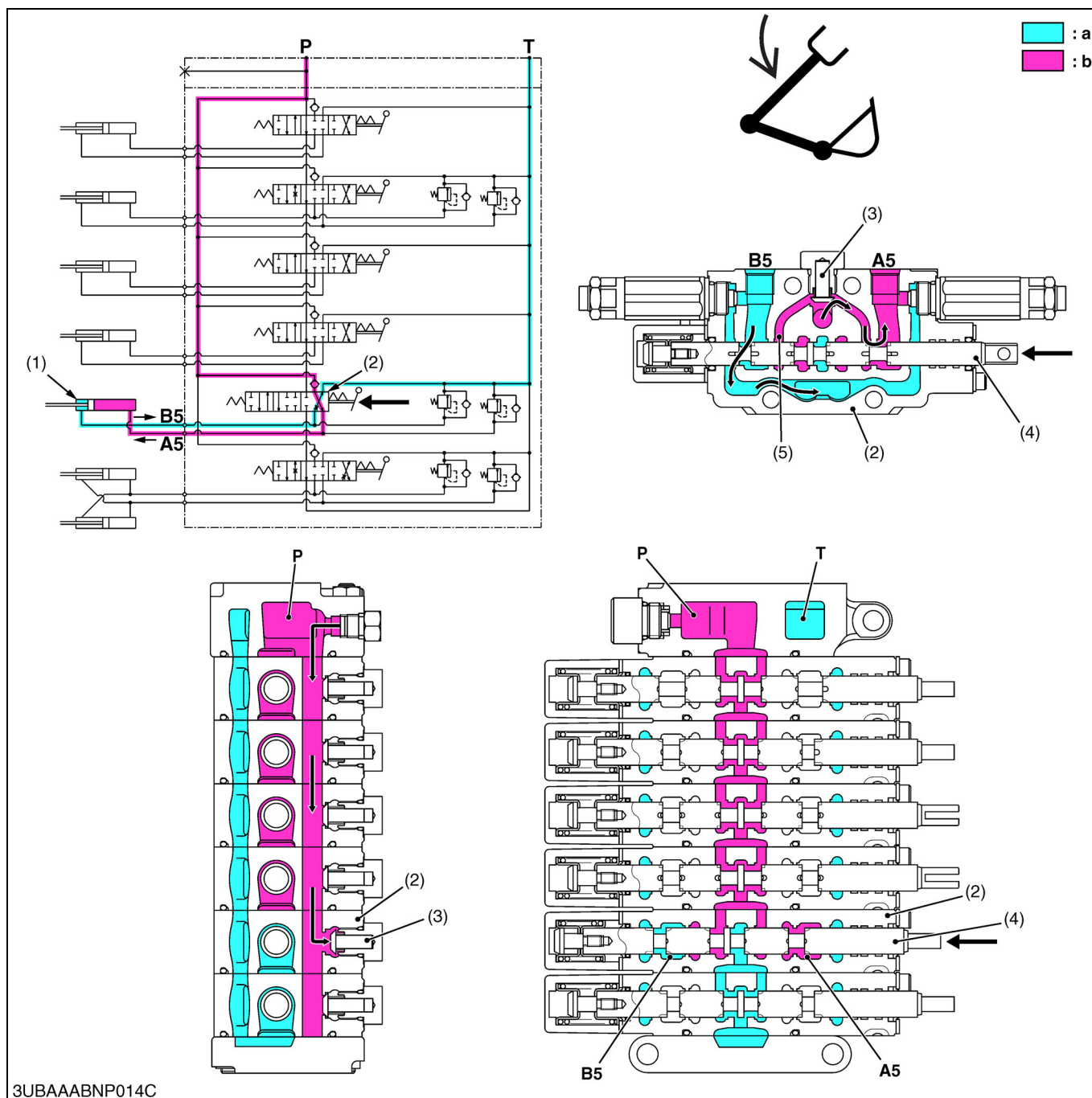
- | | |
|------------------------|--------------------|
| (1) Boom Cylinder | (4) Spool |
| (2) Boom Control Valve | (5) Bridge Passage |
| (3) Load Check Valve | |

P: P Port	A5: A5 Port (From Boom Cylinder)
T: T Port	B5: B5 Port (To Boom Cylinder)
a: Low Pressure	
b: High Pressure	

- When the boom and swing lever is pulled to the backward to set to the "UP" position, the spool (4) of the boom control valve (2) moves to the right, which forms oil passage between bridge passage (5) and **B5** port, and between **A5** port and **T** port.
- The pressure-fed oil from the **P** port opens the load check valve (3) and flows to **B5** port to retract the boom cylinder (1).
- Return oil from the boom cylinder (1) returns to the transmission case through the **A5** port, low pressure passage and **T** port.

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(B) Down



- (1) Boom Cylinder
- (2) Boom Control Valve
- (3) Load Check Valve
- (4) Spool
- (5) Bridge Passage

P: P Port
T: T Port
a: Low Pressure
b: High Pressure

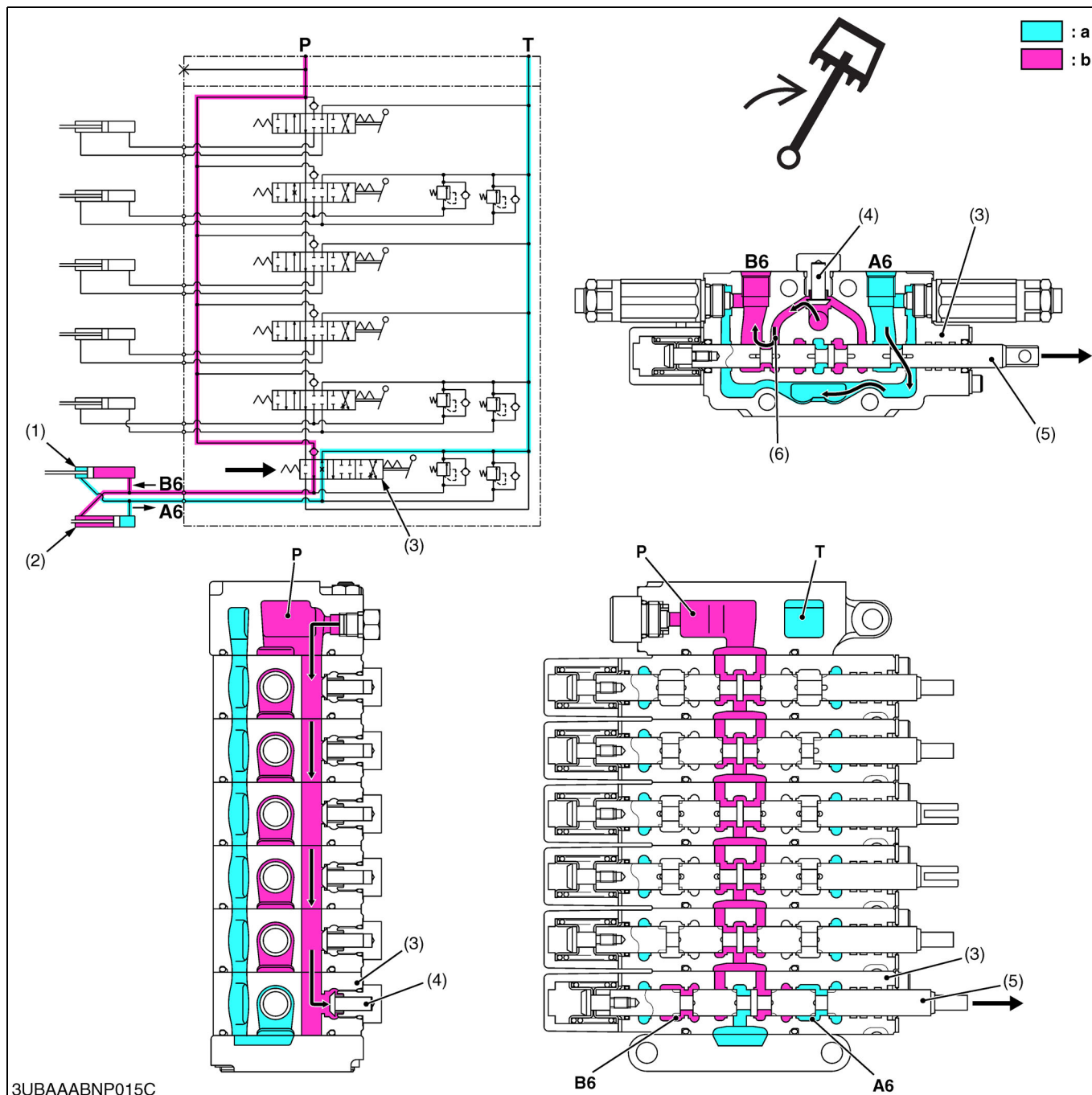
A5: A5 Port
(To Boom Cylinder)

B5: B5 Port
(From Boom Cylinder)

1. When the boom and swing lever is pushed to the forward to set to the **"DOWN"** position, the spool (4) of the boom control valve (2) moves to the left, which forms oil passage between bridge passage (5) and **A5** port, and between **B5** port and **T** port.
2. The pressure-fed oil from the **P** port opens the load check valve (3) and flows to **A5** port to extend the boom cylinder (1).
3. Return oil from the boom cylinder (1) returns to the transmission case through the **B5** port, low pressure passage and **T** port.

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[G] Boom Swing (A) Right



- (1) Swing Cylinder LH
- (2) Swing Cylinder RH
- (3) Swing Control Valve

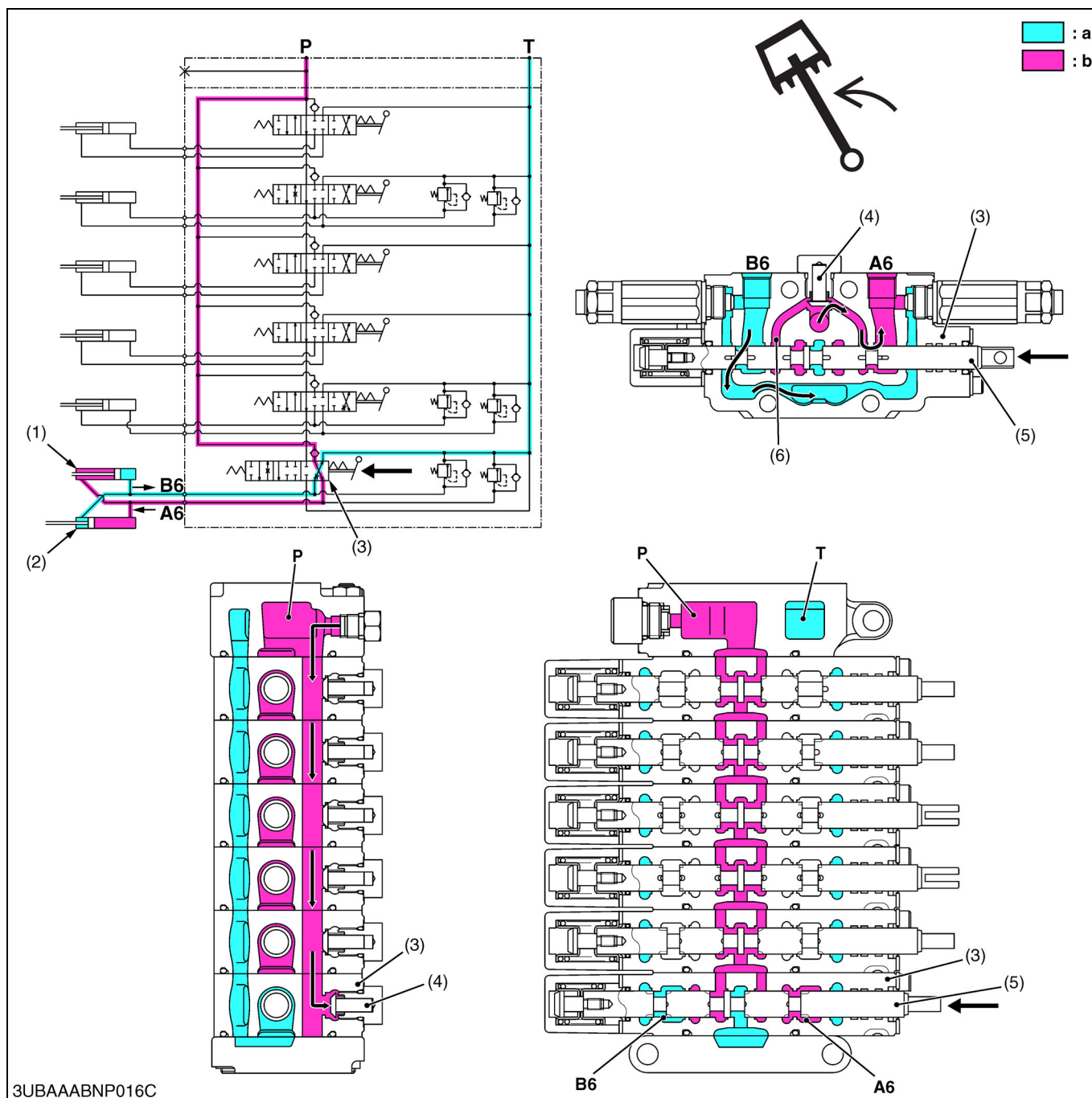
- (4) Load Check Valve
- (5) Spool
- (6) Bridge Passage

P: P Port
T: T Port
a: Low Pressure
b: High Pressure

A6: A6 Port
 (From Swing Cylinder)
B6: B6 Port
 (To Swing Cylinder)

- When the boom and swing lever is moved to the right to set to the "RIGHT" position, the spool (5) of the swing control valve (3) moves to the right, which forms oil passage between bridge passage (6) and **B6** port, and between **A6** port and **T** port.
- The pressure-fed oil from the **P** port opens the load check valve (4) and flows to **B6** port to extend the swing cylinder LH (1) (retract the swing cylinder RH (2)).
- Return oil from the swing cylinders return to the transmission case through the **A6** port, low pressure passage and **T** port.

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(B) Left

- (1) Swing Cylinder LH
- (2) Swing Cylinder RH
- (3) Swing Control Valve

- (4) Load Check Valve
- (5) Spool
- (6) Bridge Passage

P: P Port
T: T Port
a: Low Pressure
b: High Pressure

A6: A6 Port
(To Swing Cylinder)
B6: B6 Port
(From Swing Cylinder)

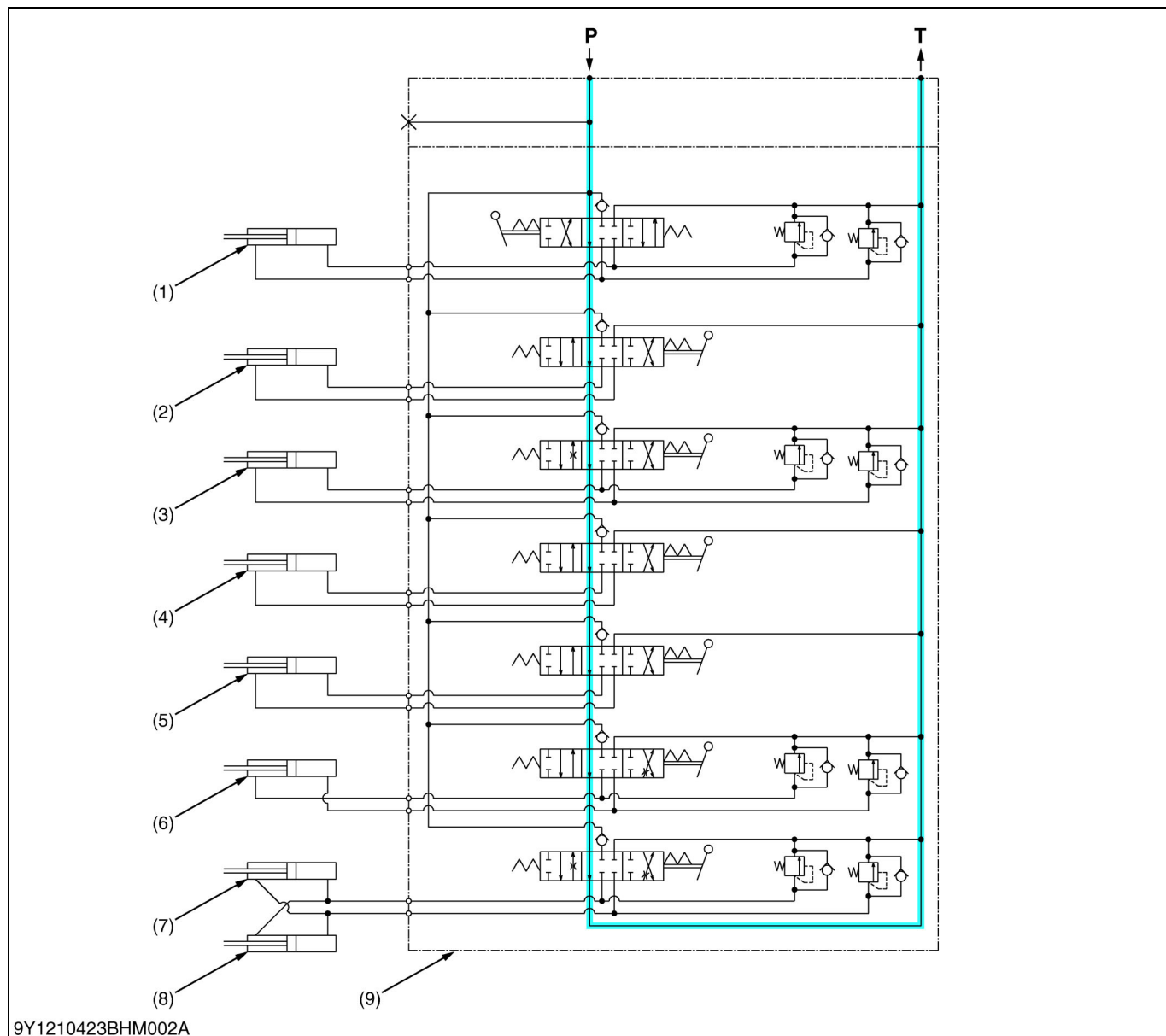
- When the boom and swing lever is moved to the left to set to the **"LEFT"** position, the spool (5) of the swing control valve (3) moves to the left, which forms oil passage between bridge passage (6) and **A6** port, and between **B6** port and **T** port.
- The pressure-fed oil from the **P** port opens the load check valve (4) and flows to **A6** port to extend the swing cylinder RH (2) (retract the swing cylinder LH (1)).
- Return oil from the swing cylinders return to the transmission case through the **B6** port, low pressure passage and **T** port.

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[2] OPTION

(1) Thumb (Hydraulic Type)

[A] Hydraulic Circuit



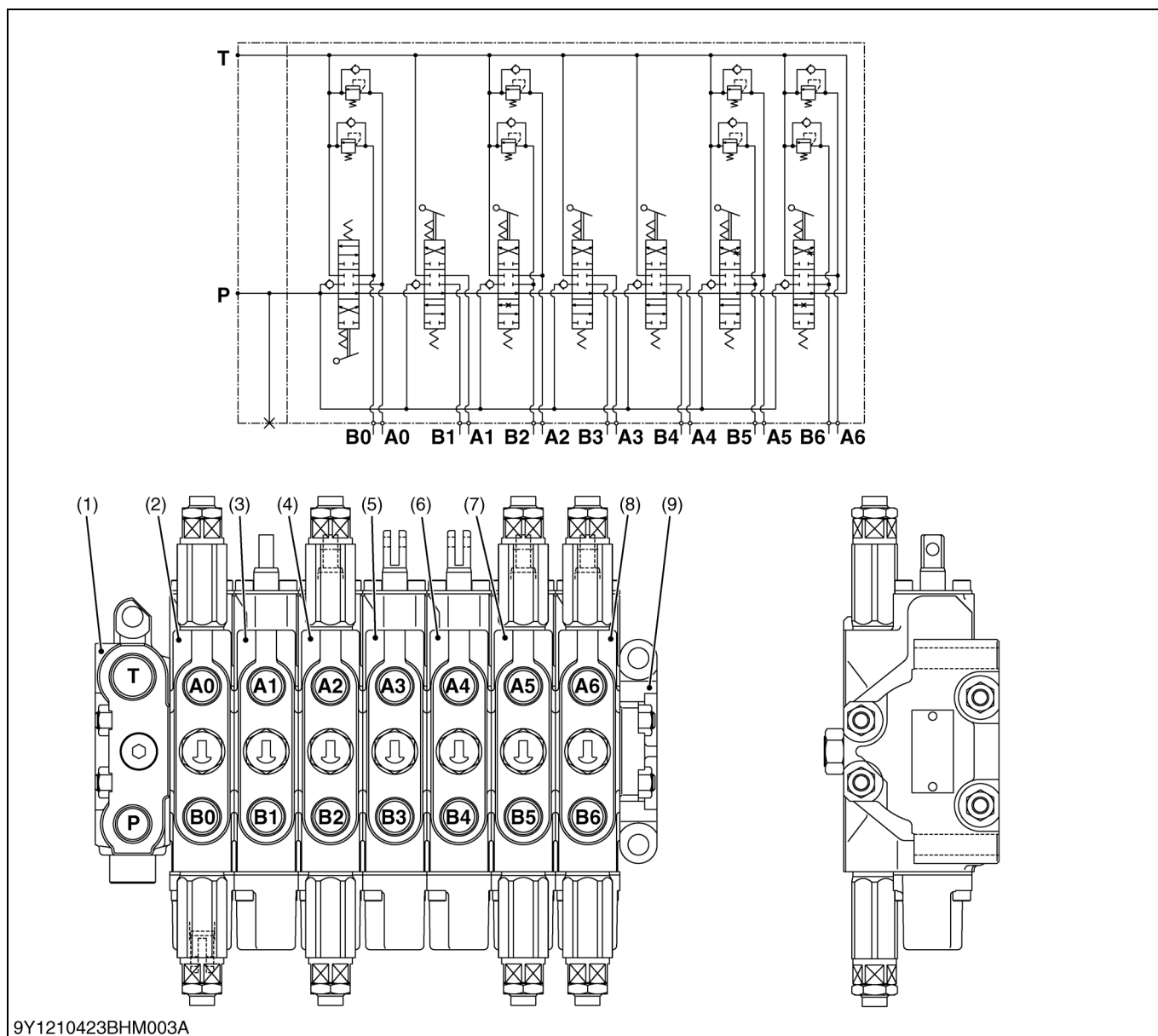
- (1) Thumb Cylinder
- (2) Bucket Cylinder
- (3) Dipperstick Cylinder

- (4) Stabilizer Cylinder RH
- (5) Stabilizer Cylinder LH
- (6) Boom Cylinder

- (7) Swing Cylinder LH
- (8) Swing Cylinder RH
- (9) Backhoe Control Valve

P: From Hydraulic Pump
T: To Tank Port

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[B] Structure

- (1) Inlet Section
- (2) Thumb Control Valve
- (3) Bucket Control Valve
- (4) Dipperstick Control Valve
- (5) Stabilizer RH Control Valve
- (6) Stabilizer LH Control Valve

- (7) Boom Control Valve
- (8) Swing Control Valve
- (9) Outlet Section

P: Pump Port
T: Tank Port

A0: A0 Port
A1: A1 Port
A2: A2 Port
A3: A3 Port
A4: A4 Port
A5: A5 Port
A6: A6 Port

B0: B0 Port
B1: B1 Port
B2: B2 Port
B3: B3 Port
B4: B4 Port
B5: B5 Port
B6: B6 Port

(1) Inlet / Outlet Section

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

The **P** port is connected to the **OUTLET** port of tractor connected by the quick coupler.

The **T** port is connected to the **RETURN** port of tractor connected by the quick coupler.

(2) Control Valve Section

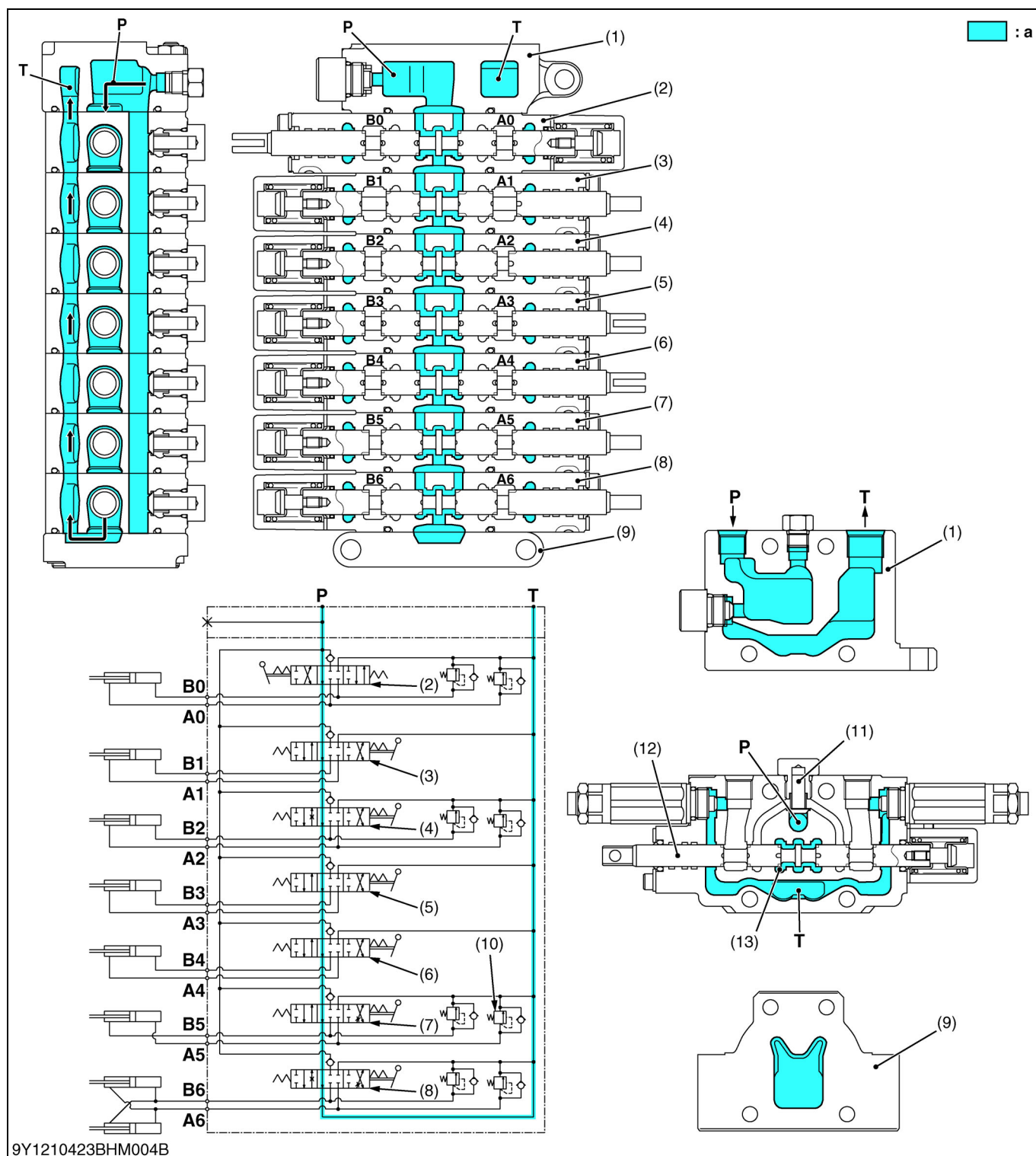
The control valves are 3 positions, 7 connections, no detent and spring center type. These valves have **A** and **B** ports and control oil flow to each cylinders.

These are consisting of a valve housing, spool, load check valve, overload relief valve, etc..

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[C] Operation

(A) Neutral



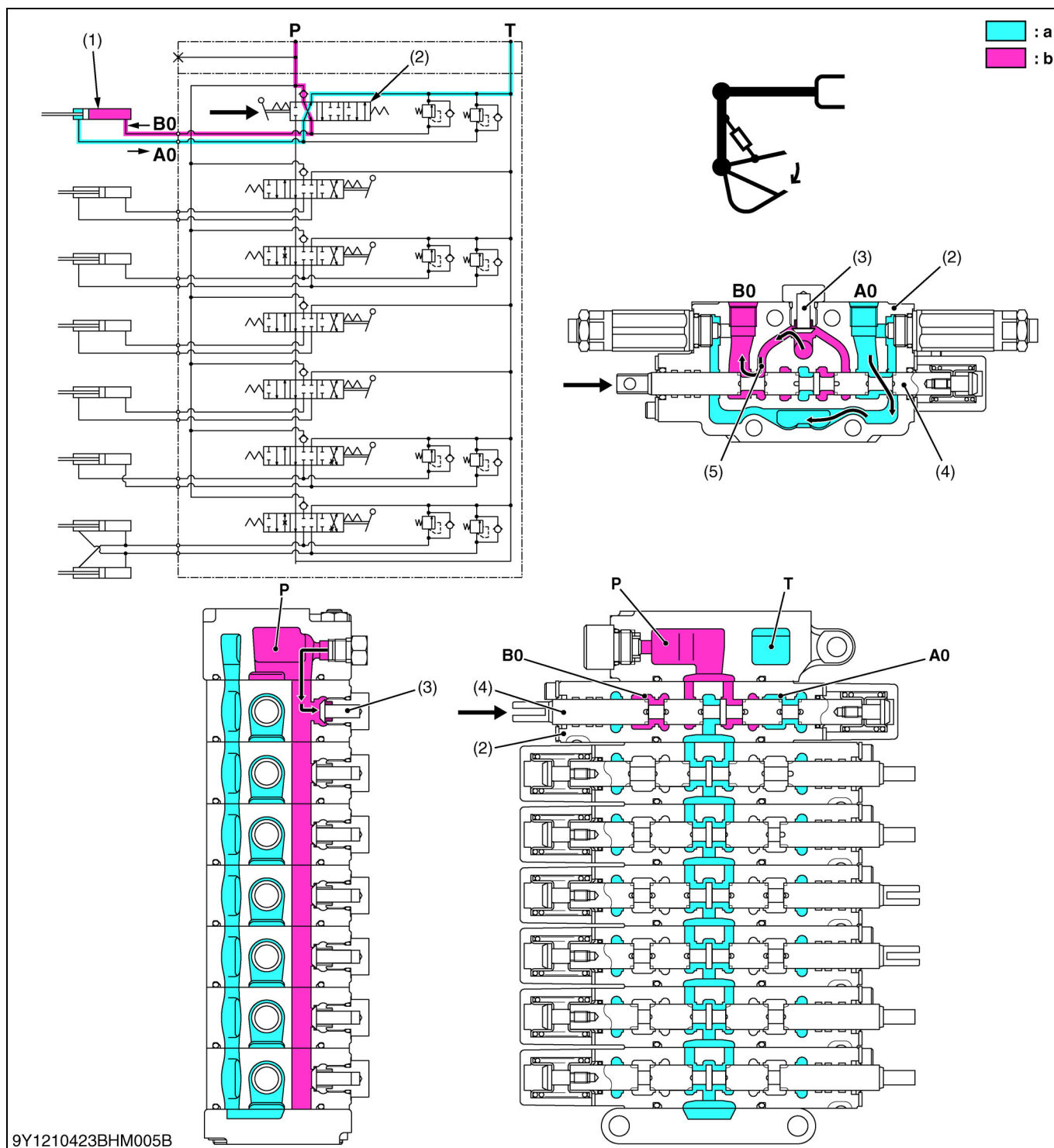
- (1) Inlet Section
- (2) Thumb Control Valve
- (3) Bucket Control Valve
- (4) Dipperstick Control Valve
- (5) Stabilizer RH Control Valve
- (6) Stabilizer LH Control Valve
- (7) Boom Control Valve
- (8) Swing Control Valve
- (9) Outlet Section

- (10) Overload Relief Valve (Port Relief Valve)
- (11) Load Check Valve
- (12) Spool
- (13) Neutral Passage

P: Pump Port
T: Tank Port

A0: A0 Port
A1: A1 Port
A2: A2 Port
A3: A3 Port
A4: A4 Port
A5: A5 Port
A6: A6 Port

B0: B0 Port
B1: B1 Port
B2: B2 Port
B3: B3 Port
B4: B4 Port
B5: B5 Port
B6: B6 Port
a: Low Pressure

(B) Hold (Pedal Forward Position)

- (1) Thumb Cylinder
 (2) Thumb Control Valve
 (3) Load Check Valve

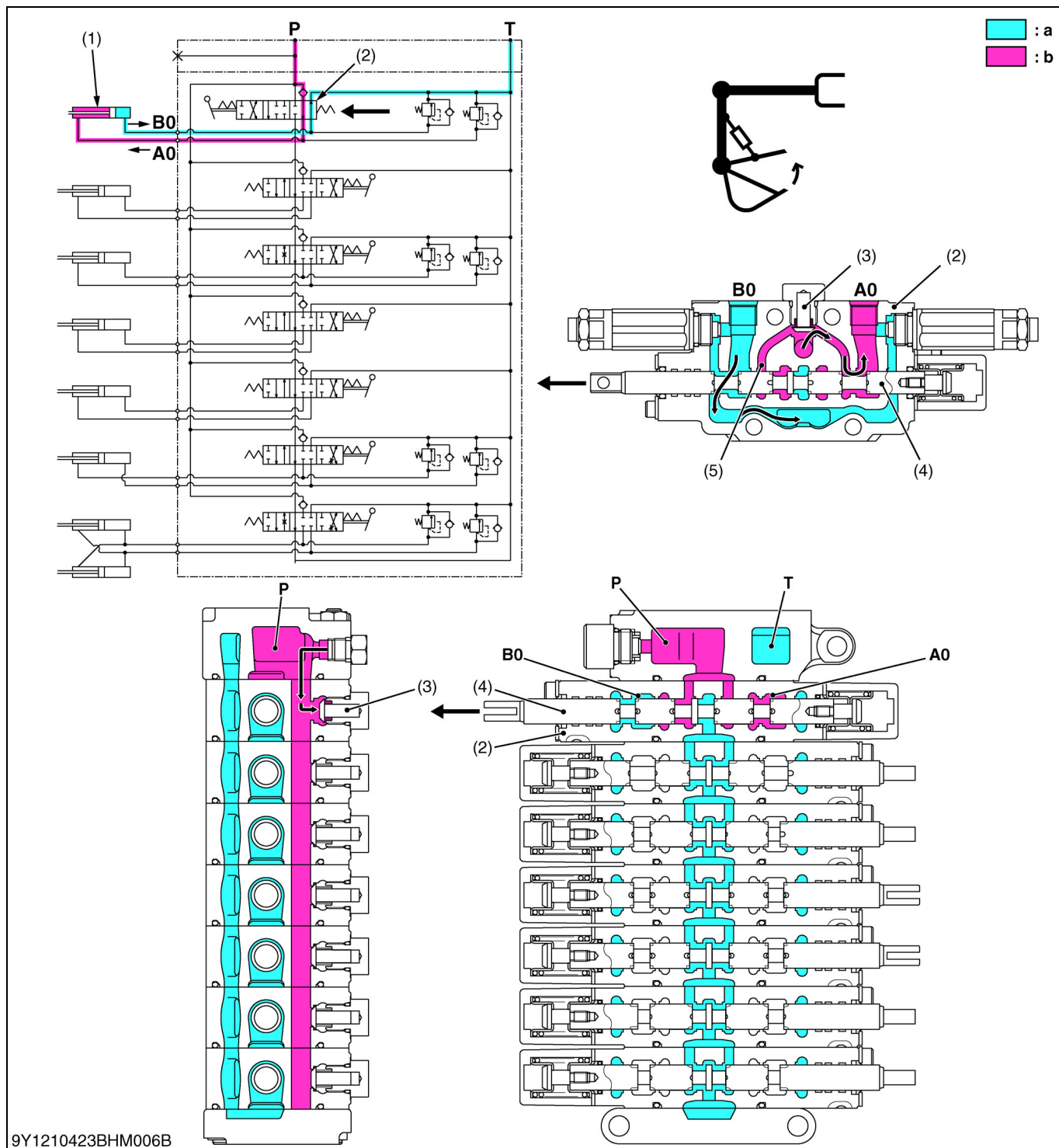
- (4) Spool
 (5) Bridge Passage

P: P Port
T: T Port
a: Low Pressure
b: High Pressure

A0: A0 Port
 (From Thumb Cylinder)
B0: B0 Port
 (To Thumb Cylinder)

1. When the pedal is pushed to the **"FORWARD"** position, the spool (4) of the thumb control valve (2) moves to the right, which forms oil passage between bridge passage (5) and **B0** port, and between **A0** port and **T** port.
2. The pressure-fed oil from the **P** port opens the load check valve (3) and flows to **B0** port to extend the thumb cylinder (1).
3. Return oil from the thumb cylinder (1) returns to the transmission case through the **A0** port, low pressure passage and **T** port.

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(C) Release (Pedal Backward Position)

- (1) Thumb Cylinder
 (2) Thumb Control Valve
 (3) Load Check Valve
 (4) Spool
 (5) Bridge Passage

P: P Port
T: T Port
a: Low Pressure
b: High Pressure

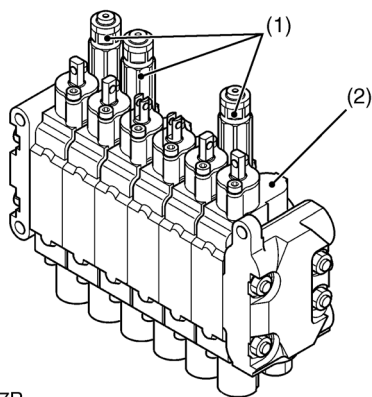
A0: A0 Port
 (To Thumb Cylinder)
B0: B0 Port
 (From Thumb Cylinder)

- When the pedal is pushed to the **"BACKWARD"** position, the spool (4) of the thumb control valve (2) moves to the left, which forms oil passage between bridge passage (5) and **A0** port, and between **B0** port and **T** port.
- The pressure-fed oil from the **P** port opens the load check valve (3) and flows to **A0** port to retract the thumb cylinder (1).
- Return oil from the thumb cylinder (1) returns to the transmission case through the **B0** port, low pressure passage and **T** port.

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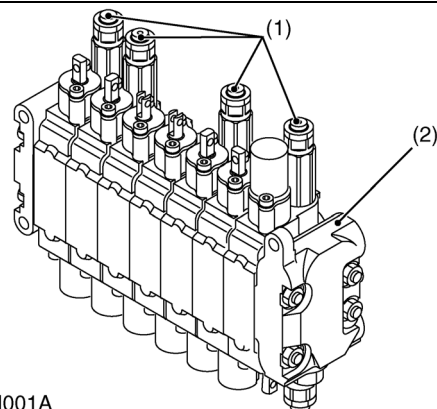
[3] OVERLOAD RELIEF VALVE

[A]



3UBAAABNP017B

[B]



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Overload relief valve in this control valve is a combination valve combining a relief operation and anti-cavitation operation.

Relief Operation

When the control valve is in the neutral position, both cylinder ports of control valve are blocked by the spool. If an external load is imposed on the cylinder, pressure builds in the circuit.

When the pressure exceeds the set level of the overload relief valve, the relief valve opens and the oil returns to tank. In this way, the hydraulic circuit and actuator are protected from excessive pressures.

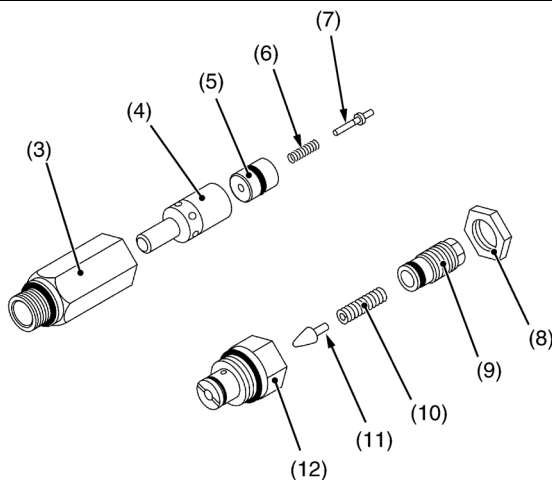
Anti-cavitation Operation

Overload relief valve also has anti-void function. If a negative pressure takes place in the circuit, the oil is fed from the tank to eliminate the negative pressure.

- | | |
|---------------------------|---------------------|
| (1) Overload Relief Valve | (9) Adjusting Screw |
| (2) Control Valve | (10) Pilot Spring |
| (3) Housing | (11) Pilot Poppet |
| (4) Check Valve Poppet | (12) Pilot Section |
| (5) Relief Valve Poppet | |
| (6) Piston Spring | |
| (7) Piston Poppet | |
| (8) Lock Nut | |

[A] Standard
[B] Thumb (Hydraulic Type)
(Option)

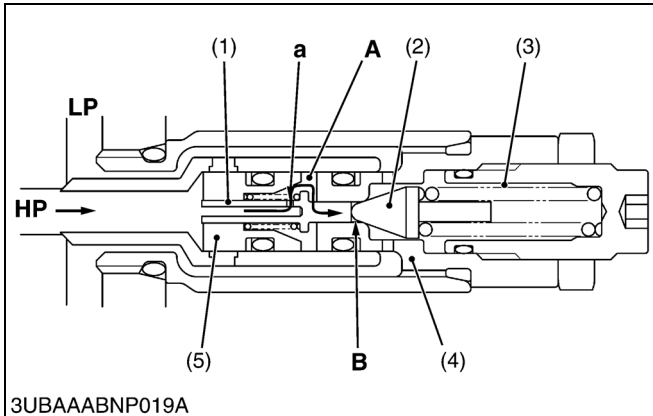
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3UBAAABNP018A

(1) Relief Operation

[A] When the actuator port pressure is lower than the setting



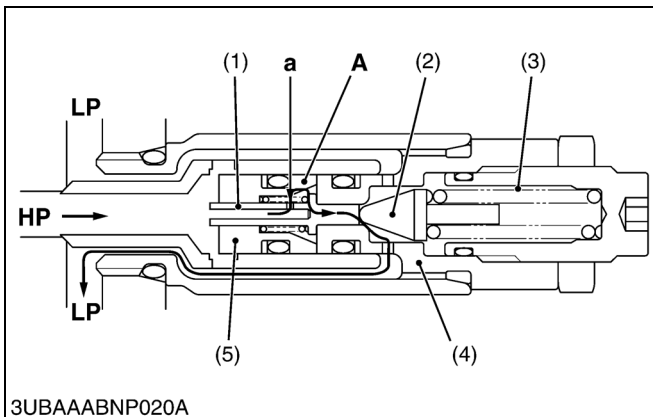
The cylinder port **HP** is applied to the seat **B** in the following route: first through the throttle **a** of the piston poppet (1) built in the relief valve poppet (5), second through the spring chamber **A**, and then through the circular clearance between the adjuster body (4) and the piston poppet (1). This cylinder port **HP** works to open the pilot poppet (2). Because the piston spring (3) has not reached the set pressure, however, the valve stays shut. In this way the seat remains intact and the relief valve poppet (5) stays shut.

- (1) Piston Poppet
- (2) Pilot Poppet
- (3) Piston Spring
- (4) Adjuster Body
- (5) Relief Valve Poppet

HP: High Pressure
LP: Low Pressure
A: Chamber
B: Seat
a: Throttle

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[B] When the actuator port pressure is higher than the setting



When the cylinder port **HP** has reached the set pressure of the piston spring (3), the pressure oil in the spring chamber **A** opens the pilot poppet (2) and flows through the drain passage into the tank passage. This lowers the pressure in the spring chamber **A**, and the pressure difference across the throttle **a** moves the relief valve poppet (5) to the right. Now the seat of the relief valve poppet (5) gets open. The pressure oil flows then from this seat into the tank, and the circuit pressure is kept at the pressure level set by the overload relief valve.

	Relief valve setting pressure
Dipperstick, Boom	23.6 to 24.0 MPa 240 to 245 kgf/cm ² 3420 to 3480 psi
Swing	18.7 to 19.1 MPa 190 to 195 kgf/cm ² 2710 to 2770 psi

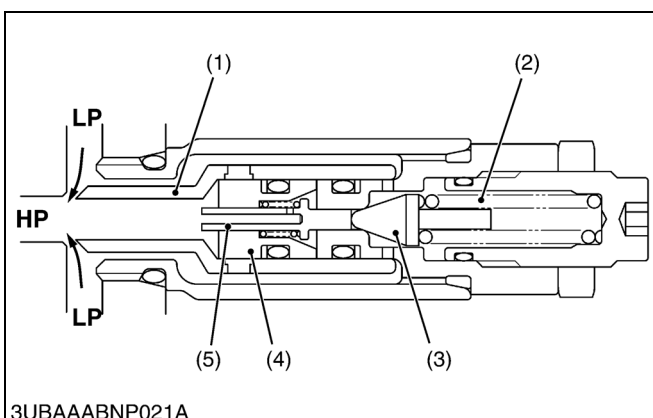
- Oil temperature: 45 to 55 °C (113 to 131 °F)

- (1) Piston Poppet
- (2) Pilot Poppet
- (3) Piston Spring
- (4) Adjuster Body
- (5) Relief Valve Poppet

HP: High Pressure
LP: Low Pressure
A: Chamber
a: Throttle

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(2) Anti-cavitation Operation



This valve, in operation, prevents a condition – so called cavitation – that arises in the cylinder port **HP** where fluid is not entirely filling out.

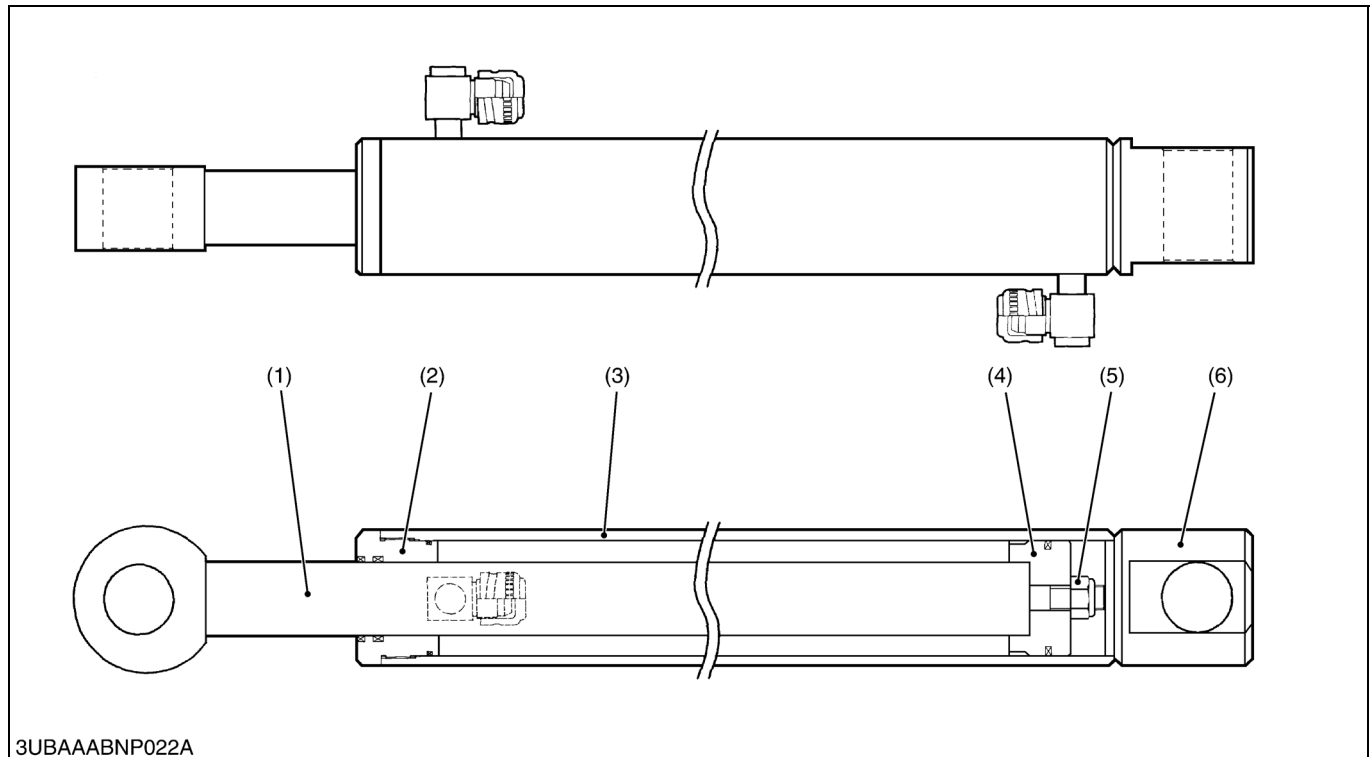
That is, this relief valve is combined an anti-cavitation functions supplying oil.

The pressure oil at the tank port LH opens the check valve poppet, allowing oil to flow through the tank port to prevent negative pressure from being generated in the cylinder.

- (1) Check Valve Poppet
- (2) Piston Spring
- (3) Pilot Poppet
- (4) Relief Valve Poppet
- (5) Piston Poppet

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2. HYDRAULIC CYLINDER



3UBAAABNP022A

- | | | | |
|-------------------|-------------------|---------|--------------|
| (1) Piston Rod | (3) Cylinder Tube | (5) Nut | (6) Tube End |
| (2) Cylinder Head | (4) Piston | | |

Bucket, dipperstick, boom, swing, and stabilizer cylinder consists of cylinder head (2), piston rod (1), cylinder tube (3), piston (4) 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

	Bucket Cylinder mm (in.)	Dipperstick Cylinder mm (in.)	Boom Cylinder mm (in.)	Stabilizer Cylinder mm (in.)	Swing Cylinder mm (in.)
Cylinder I.D.	40.0 (1.57)	40.0 (1.57)	40.0 (1.57)	40.0 (1.57)	35.0 (1.38)
Rod O.D.	65.0 (2.56)	70.0 (2.76)	80.0 (3.15)	70.0 (2.76)	60.0 (2.36)
Stroke	530 (20.9)	490 (19.3)	439.5 (17.70)	374.5 (14.74)	248 (9.76)

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SERVICING

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1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
All Functions Inoperative (Front Loader Is OK)	Quick coupler disconnected	Reconnect	—
All Functions Including Front Loader, Are Inoperative	Insufficient transmission fluid	Replenish	G-8
	Relief valve spring damaged	Replace	1-S21, S19
	Hydraulic pump malfunctioning	Repair or replace	—
	Oil filter clogged	Replace	—
Hydraulic Oil Overheats	Continuous operation against relief	Operate properly	—
	Transmission fluid improper brand and viscosity	Use proper fluid	G-3
	Relief valve misadjusted	Readjust	1-S21, S19
	Insufficient transmission fluid	Replenish	G-8
	Oil filter clogged	Replace	—
Individual Cylinder Circuit Weak or Inoperative (Others OK)	Valve spool not moving fully	Adjust linkage	—
	Valve spool stick (especially when warm)	Repair or replace	—
	Piston seal ring worn or damaged	Replace	1-S24
	Cylinder tube worn or damaged	Replace	1-S23
	Oil leaks from joint	Repair or replace	—
	Hydraulic hose damaged	Replace	—
	Dust in overload relief valve	Flush hydraulic line	—
Excessive Cylinder Movement	Piston seal ring worn or damage	Replace	1-S24
	Excessive valve spool to bore tolerance	Replace	—
	Hydraulic hose or fitting damaged	Replace	—
	Hydraulic hose or fitting loose	Retighten	—
	Cylinder tube worn or damaged	Replace	1-S23
Insufficient Cylinder Speed	Engine rpm too low	Adjust rpm	—
	Hydraulic pump malfunctioning	Repair or replace	—
	Relief valve pressure too low	Readjust	1-S21, S19
	Insufficient transmission fluid	Replenish	G-8

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2. SERVICING SPECIFICATIONS

Item		Service specification	Service limit
Bucket Edge	Height	676 mm 26.6 in.	—
Boom Cylinder	Extension Length	22 mm 0.87 in.	—
Dipper Cylinder	Extension Length	25 mm 0.98 in.	—
Bucket Cylinder	Extension Length	41 mm 1.6 in.	—
Cylinder	Retraction Length	13 mm 0.51 in.	—
Relief Valve Hydraulic Main Circuit	Setting Pressure (L3240(-3), L3540(-3), L3560, L4400, L4600, L4701, L4802) Setting Pressure (L3940(-3), L4240(-3), L4740(-3), L5040(-3), L5240(-3), L5740(-3), MX4700, MX4800, MX5100, MX5200, MX5400, MX5800, MX6000, L4060, L4760, L5060, L5460, L6060)	17.1 to 18.1 MPa 175 to 184 kgf/cm ² 2480 to 2620 psi 18.1 to 19.1 MPa 185 to 194 kgf/cm ² 2630 to 2770 psi	—
Swing Cylinder Trunnion Boss to Cylinder Support Bushing	Clearance	0.13 to 0.21 mm 0.0052 to 0.0082 in.	0.5 mm 0.02 in.
• Cylinder Trunnion Boss	O.D.	38.02 to 38.05 mm 1.497 to 1.498 in.	—
• Bushing	I.D.	38.18 to 38.23 mm 1.504 to 1.505 in.	—
Swing Frame Fulcrum Pin to Bushing	Clearance	0.12 to 0.20 mm 0.0048 to 0.0078 in.	1.0 mm 0.039 in.
• Swing Frame Fulcrum Pin	O.D.	47.55 to 47.58 mm 1.872 to 1.873 in.	—
• Bushing	I.D.	47.70 to 47.75 mm 1.878 to 1.879 in.	—

Item		Service specification	Service limit
Pin to Swing, Bucket, or Dipperstick Cylinder Bushing	Clearance	0.13 to 0.21 mm 0.0052 to 0.0082 in.	1.0 mm 0.039 in.
	• Pin O.D.	31.67 to 31.70 mm 1.247 to 1.248 in.	—
	• Bushing I.D.	31.83 to 31.88 mm 1.254 to 1.255 in.	—
Boom Support Pin to Boom Support	Clearance	0.050 to 0.16 mm 0.0020 to 0.0062 in.	1.0 mm 0.039 in.
	• Boom Support Pin O.D.	38.02 to 38.05 mm 1.497 to 1.498 in.	—
	• Boom Support I.D.	38.10 to 38.18 mm 1.500 to 1.503 in.	—
Boom Cylinder Pin to Bushing	Clearance	0.13 to 0.21 mm 0.0052 to 0.0082 in.	1.0 mm 0.039 in.
	• Boom Cylinder Pin O.D.	38.02 to 38.05 mm 1.497 to 1.498 in.	—
	• Bushing I.D.	38.18 to 38.23 mm 1.504 to 1.505 in.	—
Dipperstick Fulcrum Pin to Bushing	Clearance	0.13 to 0.21 mm 0.0052 to 0.0082 in.	1.0 mm 0.039 in.
	• Dipperstick Fulcrum Pin O.D.	38.02 to 38.05 mm 1.497 to 1.498 in.	—
	• Bushing I.D.	38.18 to 38.23 mm 1.504 to 1.505 in.	—
Bucket Fulcrum Pin to Bushing	Clearance	0.13 to 0.21 mm 0.0052 to 0.0082 in.	1.0 mm 0.039 in.
	• Bucket Fulcrum Pin O.D.	31.67 to 31.70 mm 1.247 to 1.248 in.	—
	• Bushing I.D.	31.83 to 31.88 mm 1.254 to 1.255 in.	—
Bucket Link or Guide Link Pin to Bushing	Clearance	0.13 to 0.21 mm 0.0052 to 0.0082 in.	1.5 mm 0.059 in.
	• Pin O.D.	31.67 to 31.70 mm 1.247 to 1.248 in.	—
	• Bushing I.D.	31.83 to 31.88 mm 1.254 to 1.255 in.	—
Stabilizer Arm Pin to Bushing	Clearance	0.13 to 0.21 mm 0.0052 to 0.0082 in.	1.0 mm 0.039 in.
	• Stabilizer Arm Pin O.D.	31.67 to 31.70 mm 1.247 to 1.248 in.	—
	• Bushing I.D.	31.83 to 31.88 mm 1.254 to 1.255 in.	—

Item		Service specification	Service limit
Stabilizer Pad Pin	O.D.	31.75 mm 1.250 in.	–
Thrust Washer	Thickness	2.36 to 2.96 mm 0.0926 to 0.1166 in.	1.8 mm 0.071 in.
Piston Rod	Bend	–	0.25 mm 0.0098 in.

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3. TIGHTENING TORQUES

Tightening torques of screws, bolts and nuts on the table below are especially specified.
(For general use screws, bolts and nuts: See page G-4.)

Item	N·m	kgf·m	lbf·ft
Pedal support mounting bolt and nut (M10, 7T)	48 to 55	4.9 to 5.7	36 to 41
Control rod assembly mounting bolt and nut (M6, 7T)	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31
Control rod assembly mounting nut (M10, 7T)	48 to 55	4.9 to 5.7	36 to 41
Pedal mounting bolt and nut (M12, 7T)	78 to 90	7.9 to 9.2	58 to 66
Step mounting screw	48 to 55	4.9 to 5.7	36 to 41
Seat mounting screw	7.5 to 10.7	0.8 to 1.0	5.6 to 7.8
Seat support mounting screw	78 to 90	8.0 to 9.1	58 to 66
Swing cylinder support mounting screw	197 to 225	20.0 to 23.0	145 to 166
Cab spacer mounting bolt and nut (M20, 7T)	368 to 431	37.5 to 44.0	272 to 318
Rear wheel mounting screw and nut	215	22.0	160
Connecting plate mounting screw and nut (M16, 7T)	196 to 225	20.0 to 23.0	145 to 166
Frame support mounting screw and nut (M16, 7T)	196 to 225	20.0 to 23.0	145 to 166
Rear bracket mounting screw (M14, 7T)	124 to 147	12.6 to 15.0	91.5 to 108.4
Rear bracket mounting screw and nut (M16, 7T)	196 to 225	20.0 to 23.0	145 to 166
ROPS lower frame mounting screw and nut (M16, 7T)	196 to 225	20.0 to 23.0	145 to 166
Sub frame mounting screw and nut (M16, 7T)	196 to 225	20.0 to 23.0	145 to 166
Front bracket mounting screw and nut (M16, 7T)	196 to 225	20.0 to 23.0	145 to 166
Control valve mounting nut	16.7 to 17.6	1.70 to 1.80	12.3 to 13.0
Cylinder head	250 to 280	25.5 to 28.5	185 to 206
Piston nut	450 to 500	45.9 to 50.9	332 to 368

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4. DISMOUNTING AND MOUNTING

[1] DISMOUNTING BACKHOE

⚠ CAUTION

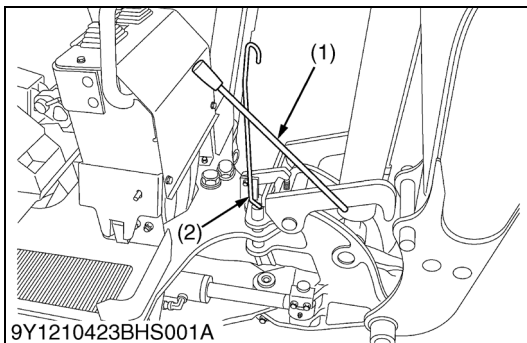
- When starting the engine, always sit in the tractor operator's seat.
- When getting off the tractor, make sure that PTO lever is off and range gear shift lever is in neutral. Then set the parking brake.
- Keep hands, feet and body from between tractor and backhoe. Never allow any part of body under the machine.
- When leaving the backhoe operator's seat, fully lower the boom to the ground.
- When removing the backhoe, set the swing lock pin.

■ IMPORTANT

- When removing the backhoe, set the engine speed low idle.
- For removing the backhoe, locate the tractor / loader / backhoe on a flat level and hard surface, preferably concrete.

If the surface is soft, place a board on the ground for the bucket and stabilizers.

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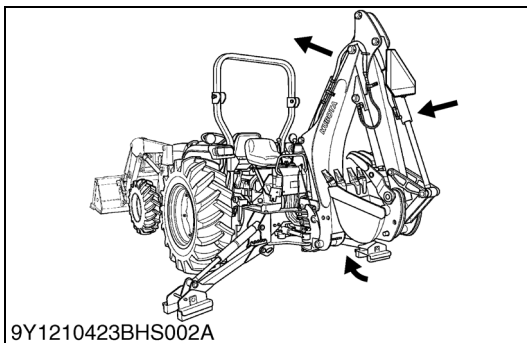
Preparation

1. Start the engine and lower the front loader to the ground.
2. Set the swing lock pin (2) to prevent the pivoting of the boom before removing the backhoe.
3. Stand beside the rear tire, fully close the dipperstick, curl the bucket and lower the boom until the back of bucket contacts the ground.

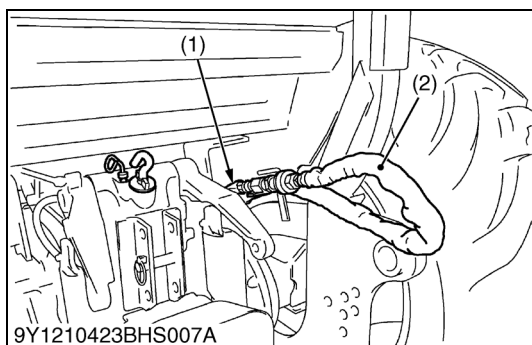
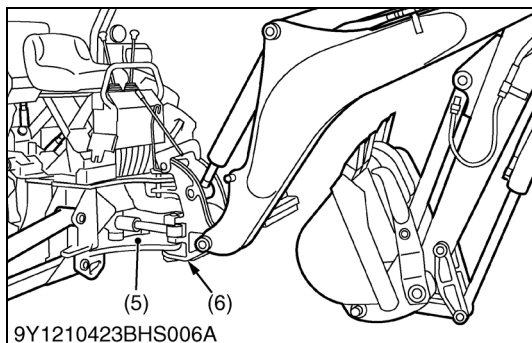
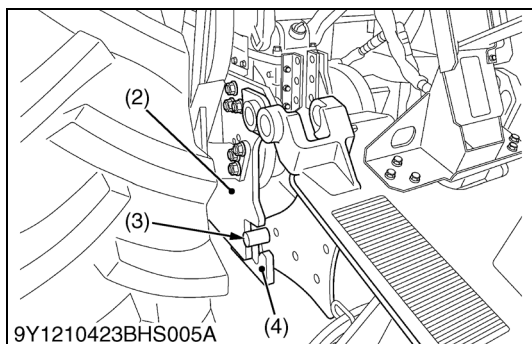
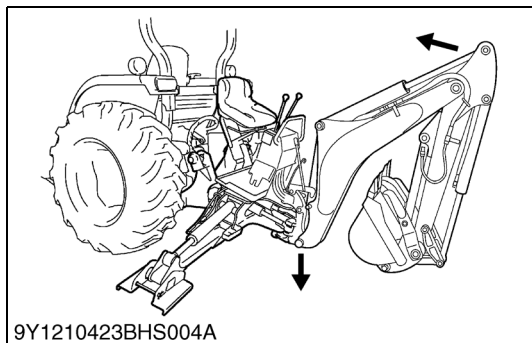
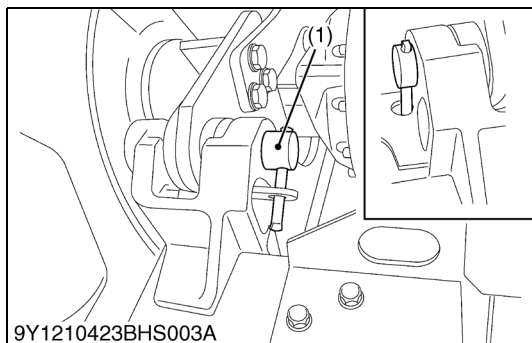
(1) Boom Lock Lever

(2) Swing Lock Pin

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Mounting Pin

1. Raise the rear wheels slightly with the boom and remove the mounting pins (1).
2. Slowly raise the boom to disengage the backhoe from the tractor.
3. Raise the backhoe by operating the stabilizers to the lowering direction until the mount bars (3) hit to the guide stopper (2) on the support hooks (4).
4. Move the tractor forward from the backhoe about 200 mm (8 in.).

■ IMPORTANT

- Be careful not to damage or break the hoses when moving the tractor.
5. Lower the main frame (5) and swing frame (6) onto the ground by operating the boom and stabilizer control levers.
 6. Shut off the engine and set the parking brake.

- | | |
|-------------------|------------------|
| (1) Mounting Pin | (4) Support Hook |
| (2) Guide Stopper | (5) Main Frame |
| (3) Mount Bar | (6) Swing Frame |

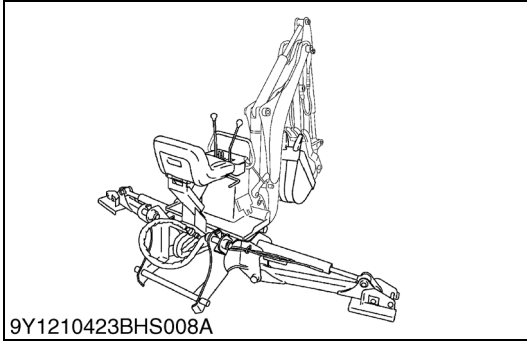
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Hydraulic Hoses

1. Slowly release all hydraulic pressure by moving the backhoe hydraulic control levers in all directions.
2. Disconnect the inlet and outlet hoses from the tractor.
3. Connect tractor outlet hose to the coupler of return hose.

- | | |
|---------------------------|---------------------------|
| (1) Outlet Hose (Tractor) | (2) Return Hose (Tractor) |
|---------------------------|---------------------------|

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Separation

1. Start the engine.
Then drive the tractor / loader slowly from the backhoe.
2. Shut off the engine and remove the key from the tractor. Set the parking brake.

■ NOTE

- The entire three point hitch can now be reinstalled on the tractor for use with other rear mount implements.
- Be sure that there is sufficient ballast in the rear tires and an implement is attached to the three point hitch before using the loader with backhoe removed.

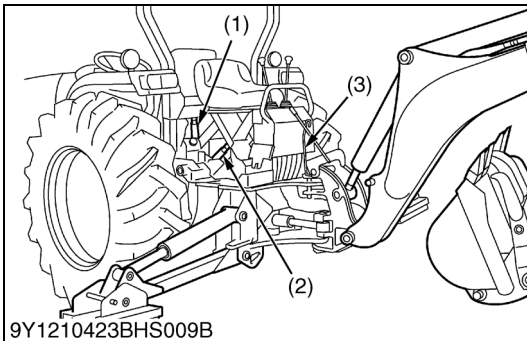
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[2] MOUNTING BACKHOE TO TRACTOR

CAUTION

- When starting the engine, always sit in the operator's seat.
- When getting off the tractor, make sure that PTO lever is off and range gear shift lever is in neutral. Set the parking brake.
- Keep hands, feet and body from between tractor and backhoe. Never allow any part of body under the machine.

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Hydraulic Hose

CAUTION

- Make sure the tractor PTO is disengaged.

■ IMPORTANT

- When mounting the backhoe, set the engine speed to low idle.

1. Remove the 3 point hitch or drawbar from tractor. (If equipped.)
2. Make sure the swing lock pin (3) is installed.
3. Start the engine and move the tractor backward slowly, centering to the backhoe main frame. Stop the tractor 254 to 304 mm (10.0 to 12.0 in.) away from the backhoe.
4. Lower the front loader and shut off the engine, then set the parking brake.
5. Connect the inlet (1) and outlet (2) hoses of the backhoe to the outlet hose and return hose of the tractor.

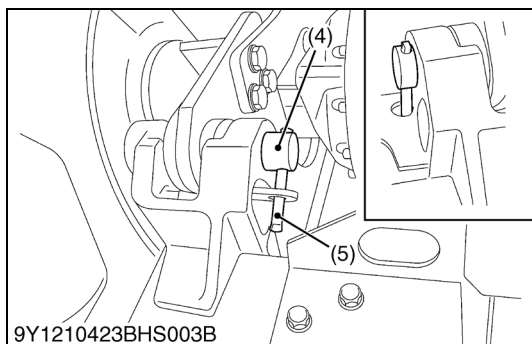
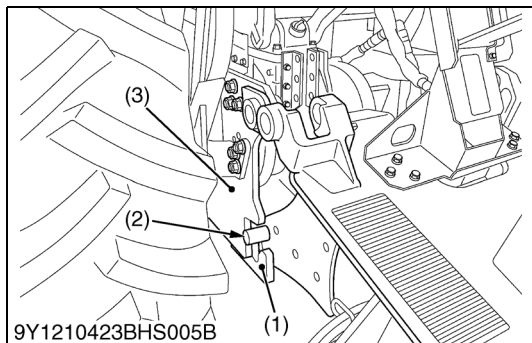
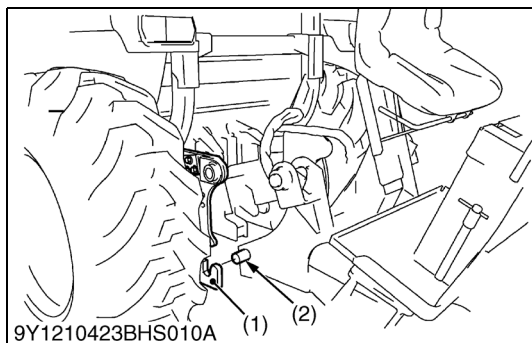
■ IMPORTANT

- Make sure both hoses are firmly connected before starting the engine.

- (1) Inlet Hose
(2) Outlet Hose

- (3) Swing Lock Pin

9Y1210423BHS0010US0



Mounting Pin and Mounting Backhoe

CAUTION

- Do not move the joystick control lever to the swing position.

1. Start the engine.
2. Stand beside the rear wheel. Move the boom to fully raising position and raise the backhoe by operating the stabilizers until the mount bar (2) on the backhoe main frame are slightly higher than the tractor main frame support hooks (1).

■ NOTE

- If the support hooks are not parallel to the mount bars, adjust with the stabilizers.

3. Move the tractor backward until the support hooks (1) on the tractor main frame are just beneath the mount bar (2) on the backhoe main frame.
4. Lower the mount bar (2) onto the support hooks (1) by operating the stabilizer and boom control levers.
5. Move the boom slowly to the lowering position, and engage the guide plates of the main frame to the bosses of sub frame. Then raise the rear wheels slightly by operating the boom to the lowering direction.
6. Shut off the engine. Reinstall the mounting pins (4), and insert the slide bar (5) of the mounting pins (4) to the hole of the main frame.

■ IMPORTANT

- Be careful not to catch the hydraulic hoses between backhoe frame and tractor while mounting the backhoe.

■ NOTE

- Move the tractor / loader / backhoe to an open area and cycle all backhoe functions. This will check their operation.
- If the backhoe has been stored for long period, check and maintain the backhoe.

- (1) Support Hook
(2) Mount Bar
(3) Guide Stop

- (4) Mounting Pin
(5) Slide Bar

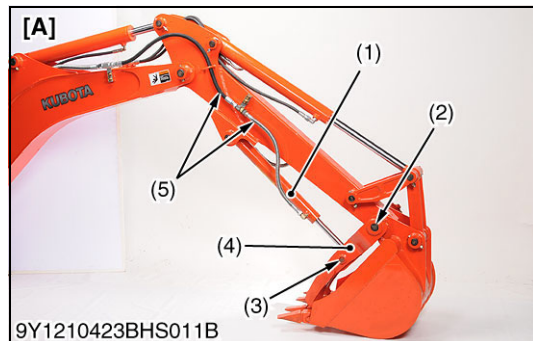
9Y1210423BHS0011US0

[3] DISASSEMBLING BACKHOE

■ IMPORTANT

- When reassembling the pins, bushing and inner rings, apply slight coat of grease to them.
- When tightening the hydraulic hoses, refer to "HYDRAULIC FITTINGS" at "G. GENERAL" section.

9Y1210423BHS0012US0



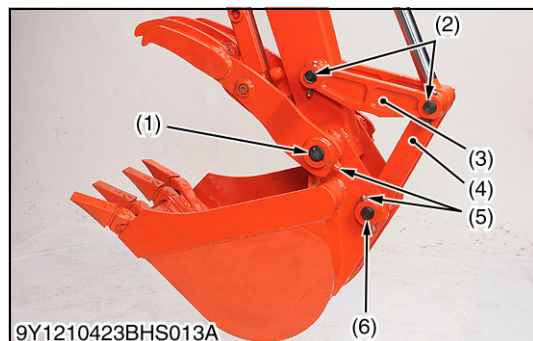
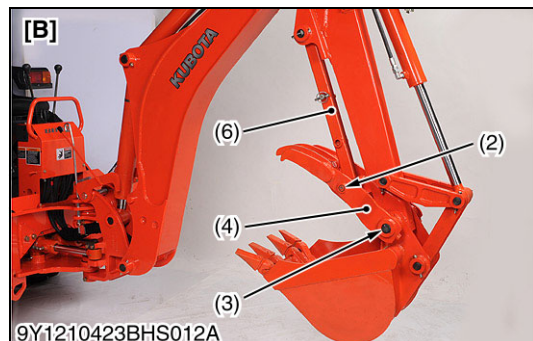
Thumb and Thumb Cylinder (If Equipped)

1. Remove the pins (2) and (3).
2. Remove the thumb (4).
3. Disconnect the hydraulic hoses (5) and remove the thumb cylinder (1). (thumb (hydraulic type))
4. Remove the thumb link (6). (thumb (mechanical type))

- (1) Thumb Cylinder
(2) Pin
(3) Pin
(4) Thumb
(5) Hydraulic Hose
(6) Thumb Link

[A] Thumb (Hydraulic Type)
[B] Thumb (Mechanical Type)

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Bucket

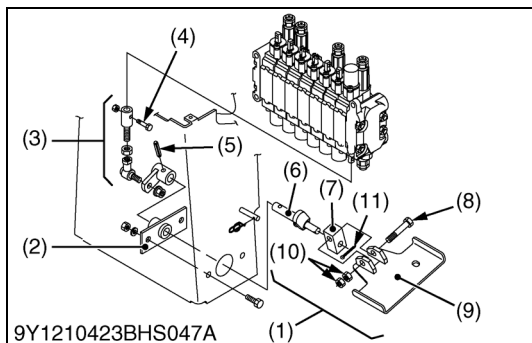
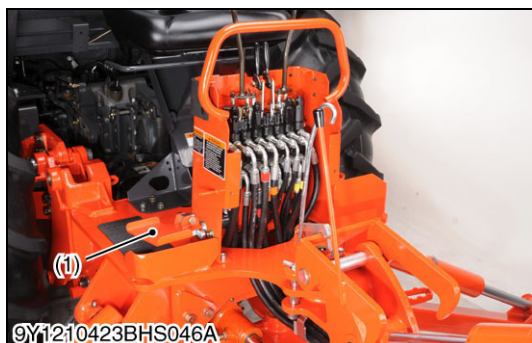
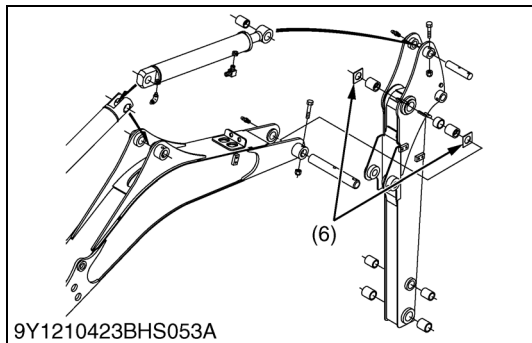
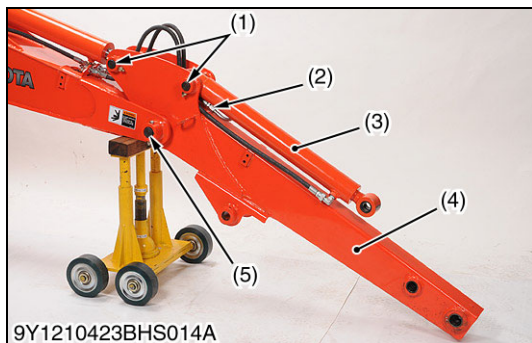
1. Remove the bucket from the dipperstick.
2. Remove the bucket link (4) and guide link (3).

(When reassembling)

- Install locking nuts (5) to setting bolts at position where the setting bolt may still be rotated

- (1) Pin (1.50 x 9.04 in.)
Pin (1.50 x 14.1 in.) (Option)
(2) Pin (1.25 x 7.70 in.)
(3) Guide Link
(4) Bucket Link
(5) Locking Nut
(6) Pin (1.25 x 8.82 in.)

9Y1210423BHS0014US0



Dipperstick and Bucket Cylinder

1. Disconnect the hydraulic hoses (2) and remove the bucket cylinder (3).
2. Remove the pins (1), (5) and remove the dipperstick (4).

(When reassembling)

- Lock the locking nuts to setting bolts at position where the setting bolt may still be rotated.
- Be sure to set the spacers (6) at their original position.

- | | |
|---------------------------|---------------------------|
| (1) Pin (1.25 x 6.16 in.) | (4) Dipperstick |
| (2) Hydraulic Hose | (5) Pin (1.5 x 10.20 in.) |
| (3) Bucket Cylinder | (6) Spacer |

9Y1210423BHS0015US0

Valve Cover

1. Remove the lever grips and rubber covers (1).
2. Remove the valve cover (2).

- | | |
|------------------|-----------------|
| (1) Rubber Cover | (2) Valve Cover |
|------------------|-----------------|

9Y1210423BHS0016US0

Pedal (If Equipped)

1. Remove the roll pin (5) and the pedal assembly (1).
2. Remove the pedal support (2).
3. Remove the bolt (4) and the control rod assembly (3).

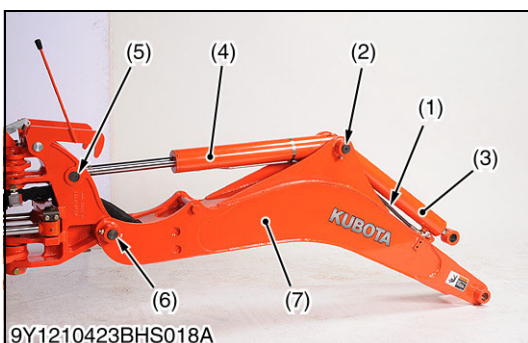
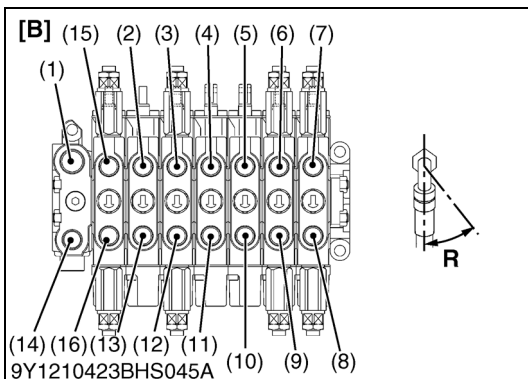
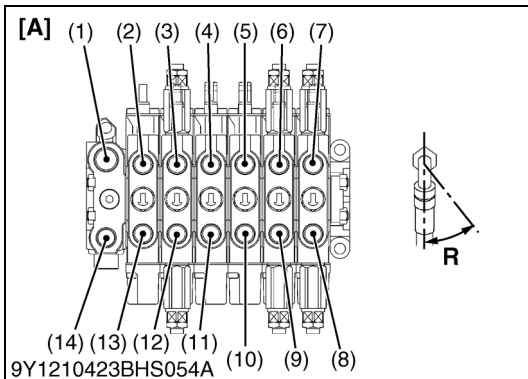
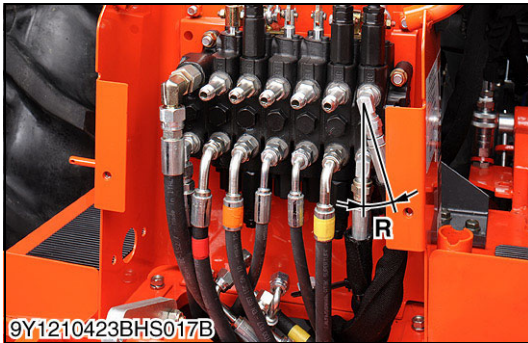
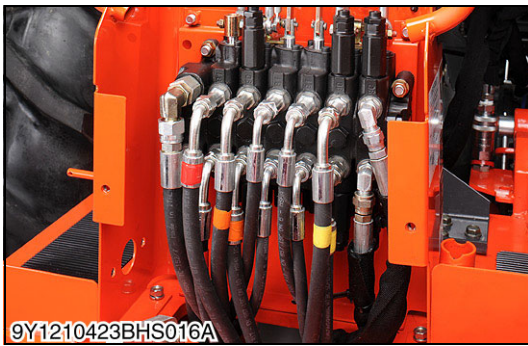
(When reassembling)

- Renew the bolt (4).

Tightening torque	Pedal support mounting bolt and nut (M10, 7T)	48 to 55 N·m 4.9 to 5.7 kgf·m 36 to 41 lbf·ft
	Control rod assembly (3) mounting bolt and nut (M6, 7T)	9.81 to 11.2 N·m 1.00 to 1.15 kgf·m 7.24 to 8.31 lbf·ft
	Control rod assembly (3) mounting nut (M10, 7T)	48 to 55 N·m 4.9 to 5.7 kgf·m 36 to 41 lbf·ft
	Pedal mounting bolt (8) and nut (10) (M12, 7T)	78 to 90 N·m 7.9 to 9.2 kgf·m 58 to 66 lbf·ft

- | | |
|--------------------------|------------------|
| (1) Pedal Assembly | (7) Control Link |
| (2) Pedal Support | (8) Bolt |
| (3) Control Rod Assembly | (9) Pedal |
| (4) Bolt | (10) Nut |
| (5) Roll Pin | (11) Cotter Pin |
| (6) Pedal Shaft | |

9Y1210423BHS0039US0



Hydraulic Hoses

1. Disconnect the hydraulic hoses from the control valve and remove the hydraulic hoses.

(When reassembling)

- Connect the hydraulic hoses at their original positions and be sure to connect the hose angle as indicated table below.

Port	Angle of Bent Tube
A6	R 20 ° (0.35 rad)

(Reference)

- Color of tape

	Color
A1, B1	Red
A2, B2	Orange
A3, B3	White
A4, B4	Green
A5, B5	Yellow

- | | |
|----------------------------------|--------------------------------|
| (1) T Port (Return) | (12) B2 Port (for Dipperstick) |
| (2) A1 Port (for Bucket) | (13) B1 Port (for Bucket) |
| (3) A2 Port (for Dipperstick) | (14) P Port (Pump) |
| (4) A3 Port (for Stabilizer RH) | (15) A0 Port (for Thumb) |
| (5) A4 Port (for Stabilizer LH) | (16) B0 Port (for Thumb) |
| (6) A5 Port (for Boom) | |
| (7) A6 Port (for Swing) | |
| (8) B6 Port (for Swing) | |
| (9) B5 Port (for Boom) | |
| (10) B4 Port (for Stabilizer LH) | |
| (11) B3 Port (for Stabilizer RH) | |

[A] Standard

[B] Thumb (Hydraulic Type) (Option)

R: Installation Angle 20 ° (0.35 rad)

9Y1210423BHS0017US0

Dipperstick Cylinder, Boom and Boom Cylinder

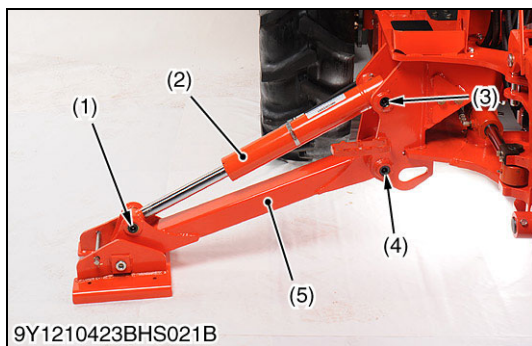
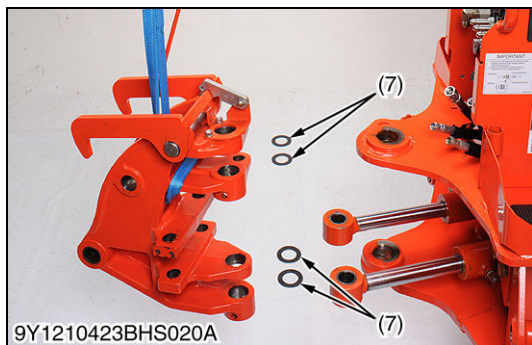
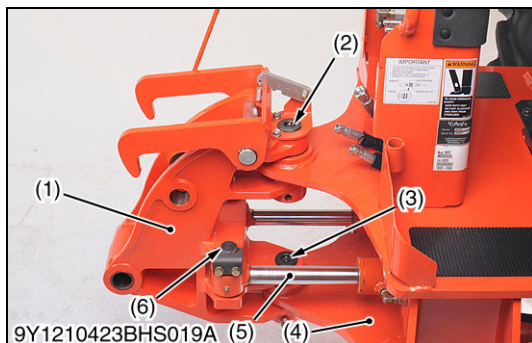
1. Disconnect the hydraulic hoses (1) and remove the dipperstick cylinder (3).
2. Remove the pins (5), (6) and remove the boom (7).
3. Remove the pin (2) and remove the boom cylinder (4).
4. Disconnect the hydraulic hoses from boom cylinder (4).

(When reassembling)

- Connect the hydraulic hoses at their original positions.
- Lock the locking nuts to setting bolt may still be rotated.

- | | |
|---------------------------|---------------------------|
| (1) Hydraulic Hose | (5) Pin (1.5 x 5.24 in.) |
| (2) Pin (1.25 x 6.16 in.) | (6) Pin (1.5 x 10.20 in.) |
| (3) Dipperstick Cylinder | (7) Boom |
| (4) Boom Cylinder | |

9Y1210423BHS0018US0



Swing Frame

1. Disconnect the swing cylinder rods (5) from swing frame (1).
2. Remove the swing frame (1) from main frame (4).

(When reassembling)

- Lock the locking nuts to setting bolt may still be rotated.
- Reinstall the thrust washers at their original positions.

- | | |
|----------------------------|---------------------------|
| (1) Swing Frame | (5) Swing Cylinder Rod |
| (2) Pin (1.875 x 6.48 in.) | (6) Pin (1.25 x 5.25 in.) |
| (3) Pin (1.875 x 5.22 in.) | (7) Thrust Washer |
| (4) Main Frame | |

9Y1210423BHS0019US0

Stabilizers and Stabilizer Cylinder

1. Remove the pins (1), (3) and remove the stabilizer cylinder (2) with hydraulic hoses.
2. Remove the pin (4) and remove the stabilizer (5).

(When reassembling)

- Lock the locking nuts to setting bolts at position where the setting bolt may still be rotated.

- | | |
|---------------------------|---------------------------|
| (1) Pin (1.25 x 4.66 in.) | (4) Pin (1.25 x 8.82 in.) |
| (2) Stabilizer Cylinder | (5) Stabilizer |
| (3) Pin (1.25 x 7.57 in.) | |

9Y1210423BHS0020US0

Control Valve and Step

1. Remove the control valve (1) assembly with control levers.
2. Remove the step (2) from the backhoe main frame.

Tightening torque	Step mounting screw	48 to 55 N·m 4.9 to 5.7 kgf·m 36 to 41 lbf·ft
-------------------	---------------------	---

(1) Control Valve

(2) Step

9Y1210423BHS0021US0

Seat and Seat Support

1. Remove the seat (1) with seat support (2).

(When reassembling)

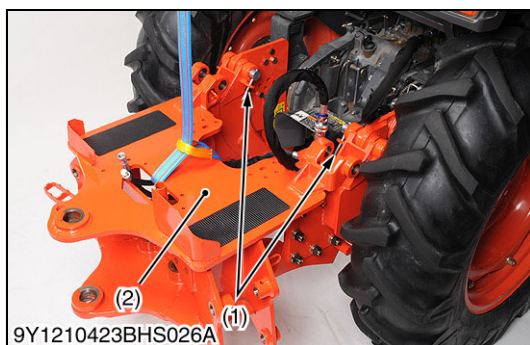
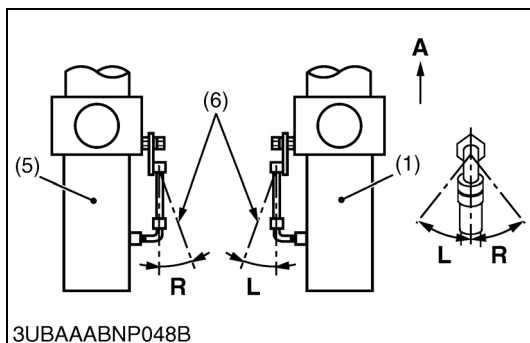
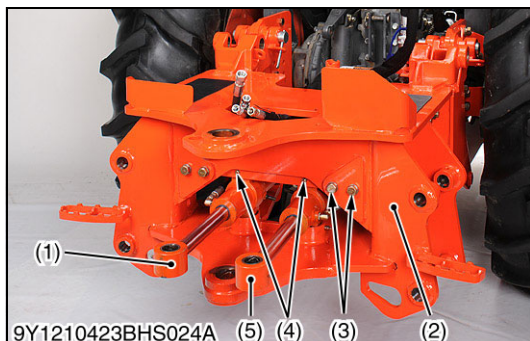
- Tighten to the specified tightening torque.

Tightening torque	Seat mounting screw	7.5 to 10.7 N·m 0.8 to 1.0 kgf·m 5.6 to 7.8 lbf·ft
	Seat support mounting screw	78 to 90 N·m 8.0 to 9.1 kgf·m 58 to 66 lbf·ft

(1) Seat

(2) Seat Support

9Y1210423BHS0022US0



Swing Cylinder and Hydraulic Hoses

1. Remove the hydraulic hoses (6).
2. Remove the grease nipples (4) and swing cylinder support screws (3).
3. Remove the swing cylinder RH (1) and swing cylinder LH (5) from the backhoe main frame (2).

(When reassembling)

- Install hydraulic hoses to swing cylinders as shown figure.

Tightening torque	Swing cylinder support mounting screw	197 to 225 N·m 20.0 to 23.0 kgf·m 145 to 166 lbf·ft
-------------------	---------------------------------------	---

- | | |
|----------------------------------|--------------------------|
| (1) Swing Cylinder RH | A: Forward |
| (2) Backhoe Main Frame | L: 20° (0.35 rad) |
| (3) Swing Cylinder Support Screw | R: 20° (0.35 rad) |
| (4) Grease Nipple | |
| (5) Swing Cylinder LH | |
| (6) Hydraulic Hose | |

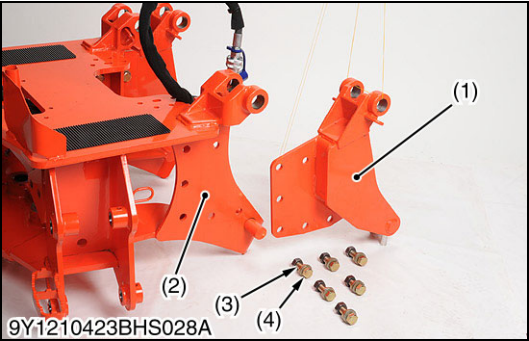
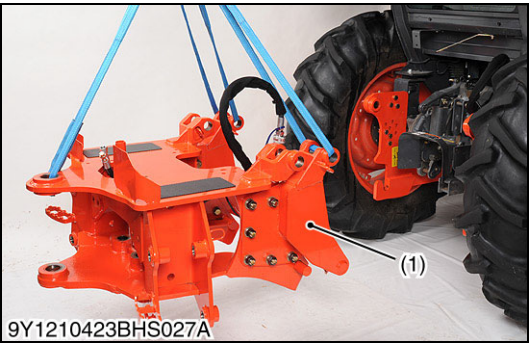
9Y1210423BHS0023US0

Backhoe Main Frame

1. Hoist the backhoe main frame (2) and remove the pins (1) from tractor frame.
2. Disconnect the hydraulic hoses.
3. Separate the backhoe main frame (2) from the tractor frame.

- | | |
|---------|------------------------|
| (1) Pin | (2) Backhoe Main Frame |
|---------|------------------------|

9Y1210423BHS0024US0



Cab Spacer (If Equipped)

1. Remove the cab spacer (1) from the backhoe main frame (2).

Tightening torque	Cab spacer mounting bolt (4) and nut (3) (M20, 7T)	368 to 431 N·m 37.5 to 44.0 kgf·m 272 to 318 lbf·ft
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- (1) Cab Spacer
- (2) Backhoe Main Frame
- (3) Nut
- (4) Bolt

9Y1210423BHS0025US0

[4] DISASSEMBLING AND ASSEMBLING SUB FRAME

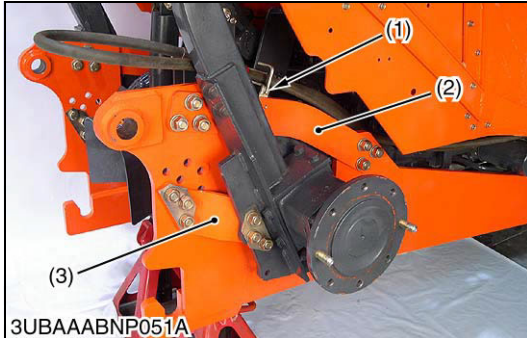
Rear Wheel

1. Place disassembling stand under the tractor frame, and support it with a jack.
2. Remove the rear wheels.
3. After removing the rear wheels, support it on both sides of rear axle by stand.

(When reassembling)

Tightening torque	Rear wheel mounting screw and nut	215 N·m 22.0 kgf·m 160 lbf·ft
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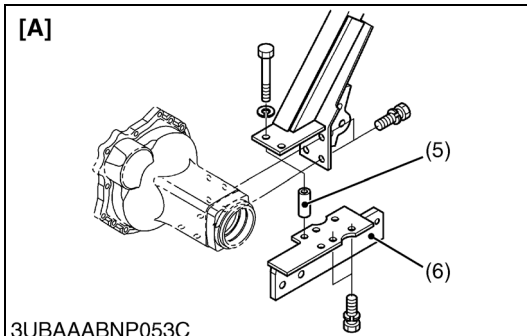
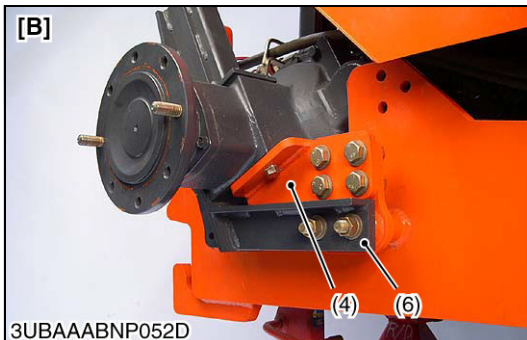
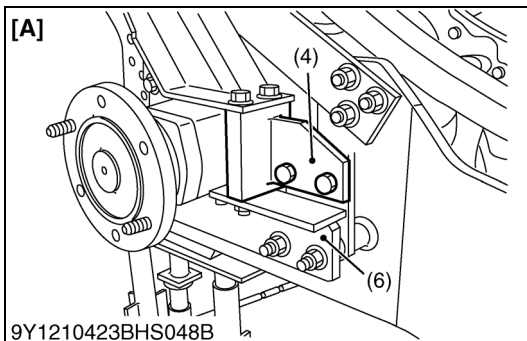
Connecting Plate and Rear Bracket (ROPS Model)

1. Disconnect the coupler joint (1).
2. Remove the connecting plate (2).
3. Remove the frame support (3).
4. Remove the rear bracket (4).

(When reassembling)

■ NOTE

- On the L3240(-3) and L3540(-3), remove the rear bracket, then attach the collar (5).



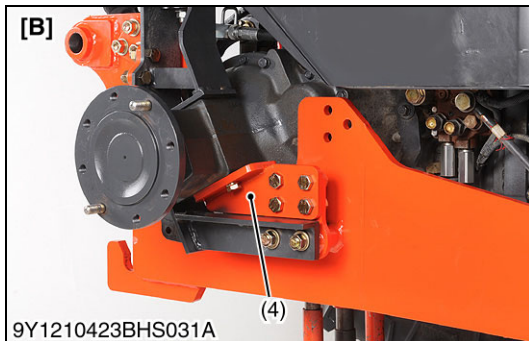
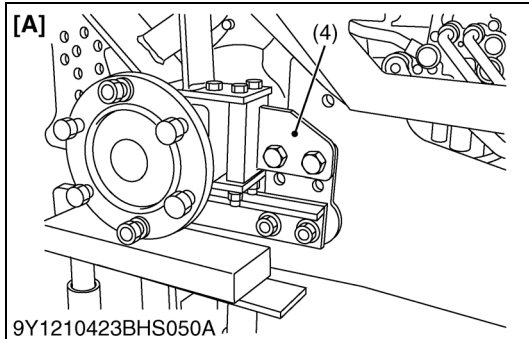
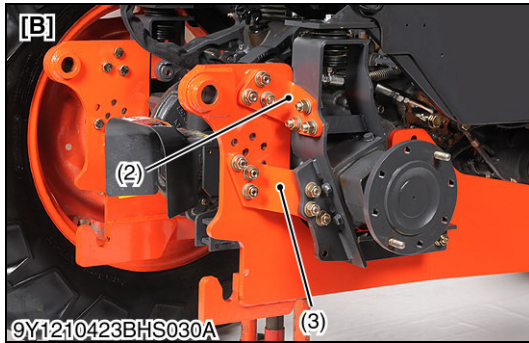
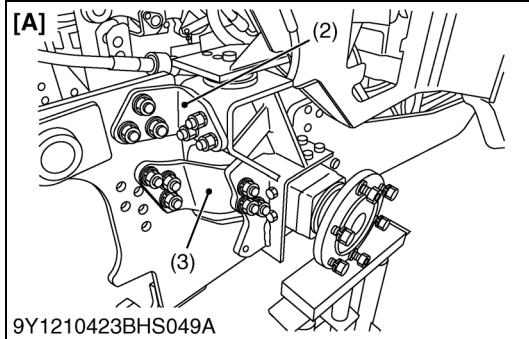
Tightening torque	Connecting plate mounting screw and nut (M16, 7T)	196 to 225 N·m 20.0 to 23.0 kgf·m 145 to 166 lbf·ft
	Frame Support mounting screw and nut (M16, 7T)	196 to 225 N·m 20.0 to 23.0 kgf·m 145 to 166 lbf·ft
	Rear bracket mounting screw (M14, 7T)	124 to 147 N·m 12.6 to 15.0 kgf·m 91.5 to 108.4 lbf·ft
	Rear bracket mounting screw and nut (M16, 7T)	196 to 225 N·m 20.0 to 23.0 kgf·m 145 to 166 lbf·ft
	ROPS lower frame mounting screw and nut (M16, 7T)	196 to 225 N·m 20.0 to 23.0 kgf·m 145 to 166 lbf·ft

- (1) Coupler Joint
- (2) Connecting Plate
- (3) Frame Support
- (4) Rear Bracket
- (5) Collar
- (6) ROPS Lower Frame

[A] L3240(-3), L3540(-3), L3560

[B] L3940(-3), L4240(-3), L4740(-3),
L5240(-3), L5740(-3),
L4400, L4600, L4701, L4802,
MX4700, MX4800, MX5100,
MX5200, MX5400, MX5800,
MX6000,
L4060, L4760, L5060, L5460,
L6060

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Connecting Plate and Rear Bracket (CABIN Model)

1. Disconnect the coupler joint (1).
2. Remove the connecting plate (2).
3. Remove the frame support (3).
4. Remove the rear bracket (4).

(When reassembling)

■ NOTE

- On the L3240-3 and L3540-3, remove the rear bracket, then attach the collar (5).

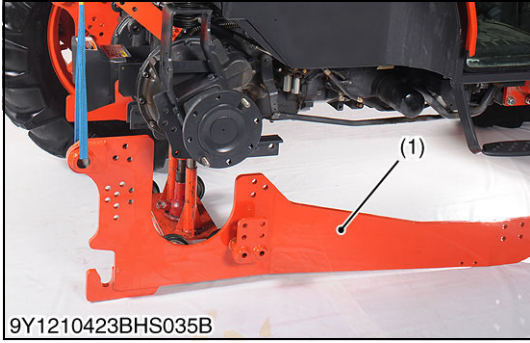
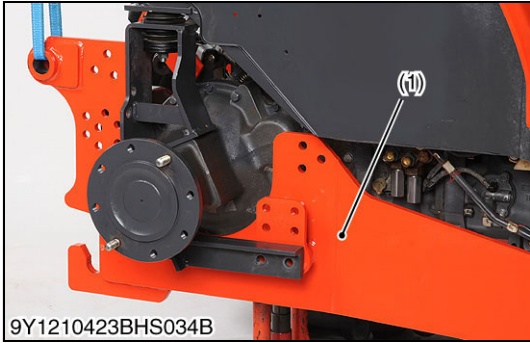
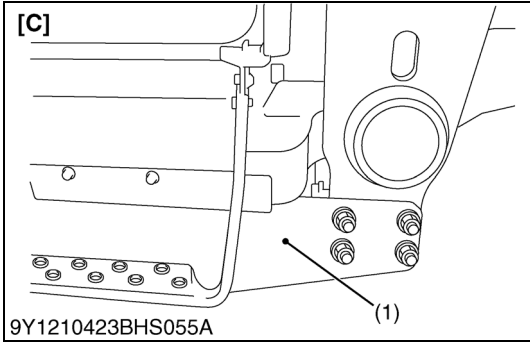
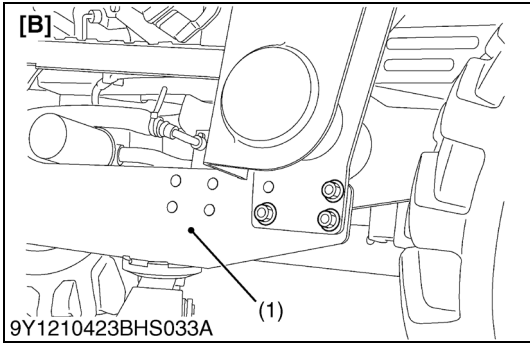
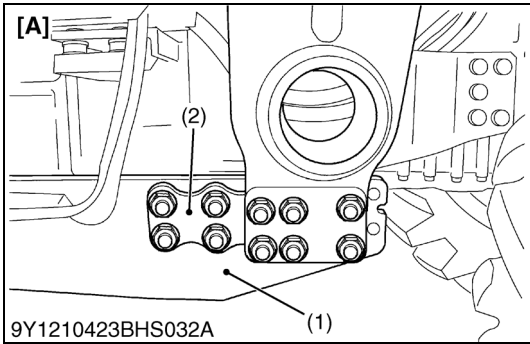
Tightening torque	Connecting plate mounting screw and nut (M16, 7T)	196 to 225 N·m 20.0 to 23.0 kgf·m 145 to 166 lbf·ft
	Frame Support mounting screw and nut (M16, 7T)	196 to 225 N·m 20.0 to 23.0 kgf·m 145 to 166 lbf·ft
	Rear bracket mounting screw (M14, 7T)	124 to 147 N·m 12.6 to 15.0 kgf·m 91.5 to 108.4 lbf·ft
	Rear bracket mounting screw and nut (M16, 7T)	196 to 225 N·m 20.0 to 23.0 kgf·m 145 to 166 lbf·ft

- (1) Coupler Joint
- (2) Connecting Plate
- (3) Frame Support
- (4) Rear Bracket
- (5) Collar

[A] L3240-3, L3540-3, L3560

[B] L3940-3, L4240-3, L4740-3,
L5240-3, L5740-3, L4060, L4760,
L5460, L6060, L4802, MX5400,
MX6000

9Y1210423BHS0040US0



Sub Frame

1. Hoist the rear side of sub frame (1) by jack and place hydraulic jack as shown picture.
2. Remove the front bracket (2).
3. Remove the sub frame mounting bolt and nut.
4. Slowly lower the sub frame by jack and hoist to separate the sub frame (1).

(When reassembling)

Tightening torque	Sub frame mounting screw and nut (M16, 7T)	196 to 225 N·m 20.0 to 23.0 kgf·m 145 to 166 lbf·ft
	Front bracket mounting screw and nut (M16, 7T)	196 to 225 N·m 20.0 to 23.0 kgf·m 145 to 166 lbf·ft

- (1) Sub Frame
(2) Front Bracket

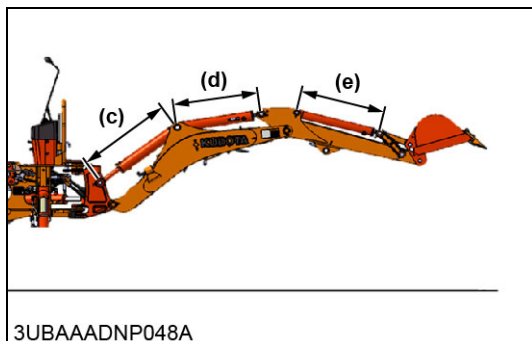
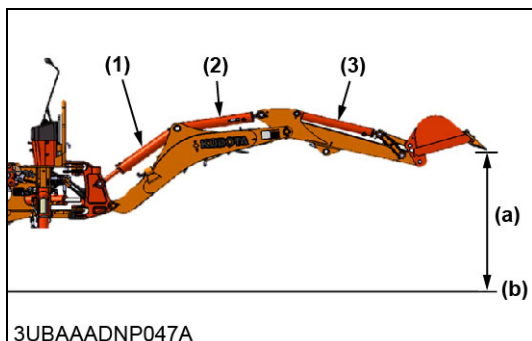
- [A] L3240(-3), L3540(-3), L3940(-3), L4240(-3), L4740(-3), L5240(-3), L5740(-3), MX4700, MX4800, MX5100, MX5200, MX5400, MX5800, MX6000
- [B] L4400, L4600, L4701, L4802
- [C] L5060 (ROPS Model), L3560, L4060, L4760, L5460 and L6060

9Y1210423BHS0028US0

5. CHECKING, DISASSEMBLING AND SERVICING

[1] BACK HOE

(1) Checking and Adjusting



Checking Backhoe Boom, Dipper, Bucket Cylinders and Valve

You will find a simple method for measuring the entire valve and a method focused on each cylinder. Please use the measurement method that fits your purpose.

1. With the gear shift in neutral, turn on the engine and adjust the backhoe to the following table.

Swing	Center
Dipper / Bucket cylinder	Full retract
Boom	Lower till backhoe touches ground

2. Set the engine to the minimum rpm.
3. Turn off the engine.
4. Set the lock on the backhoe swing, and turn on the engine.
5. Lower the loader boom to the ground without lifting the front wheel. (if front loader equipped)
6. Fully retract the stabilizer cylinders.
7. Raise the boom till the bucket floats.
8. Fully retract the dipper and the bucket cylinders.
9. Raise the backhoe boom so that the height of the bucket edge is as shown in the following table.

Height of bucket edge (a)	Service specification	676 mm 26.6 in.
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10. If you want to focus on the cylinder, measure the distance between the centers of the cylinder pins.

Then turn engine off and measure it again in 15 minutes. Calculate the extension length from the two results. If it is less than the value shown in the following table, the valve and cylinders are working normally.

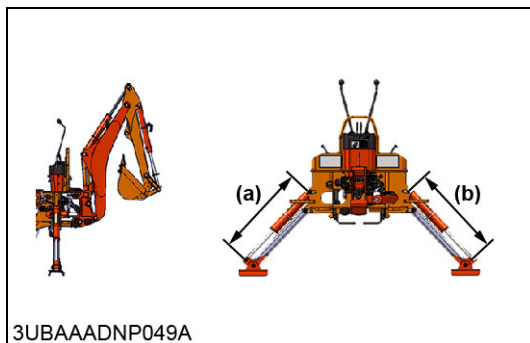
Boom cylinder extension length (c)	Service specification	22 mm 0.87 in.
Dipper cylinder extension length (d)		25 mm 0.98 in.
Bucket cylinder extension length (e)		41 mm 1.6 in.

11. Fully retract the dipper and bucket cylinders again.
12. Turn engine off and wait exactly 15 minutes.
13. If no backhoe parts touch the ground, the backhoe valve and boom / dipper / bucket cylinders are working normally.

- (1) Boom Cylinder
- (2) Dipper Cylinder
- (3) Bucket Cylinder

- (a) Height of Bucket Edge
- (b) Ground
- (c) Length of Boom Cylinder
- (d) Length of Dipper Cylinder
- (e) Length of Bucket Cylinder

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Checking Backhoe Stabilizer Cylinders and Valve

1. With the gear shift in neutral, turn on the engine, adjust the backhoe swing to the center.
2. Set the engine to the minimum rpm.
3. Turn off the engine.
4. Set the lock on the backhoe swing, and turn on the engine.
5. Lower the loader boom to the ground without lifting the front wheel. (If front loader equipped.)
6. Set the engine to the max rpm.
7. Fully extend the stabilizer cylinders while lowering the backhoe boom.
8. Fully retract the boom cylinder.
9. Fully extend the dipper and the bucket cylinders.
10. Fully extend the stabilizer cylinders again.
11. Measure the lengths of the stabilizer cylinders (for example: distance between the centers of the cylinder pins).
12. Turn the engine off and wait exactly 15 minutes.
13. Measure the stabilizer cylinders length again.
14. If the difference between step 11 and 13 is smaller than the following table, the backhoe valve and stabilizer cylinders are working normally.
15. If the movement is greater than the allowable standard, check cylinders and valves.

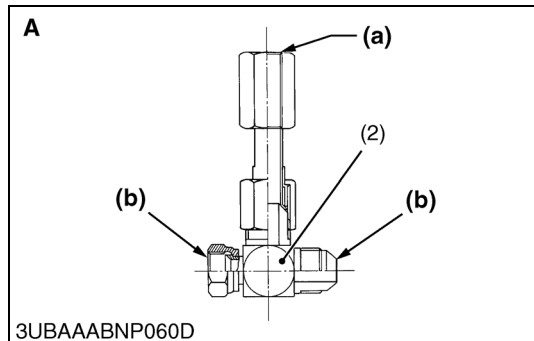
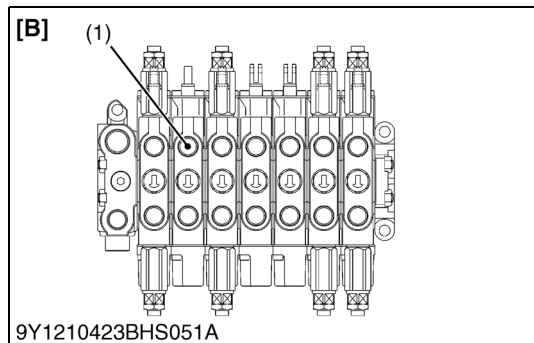
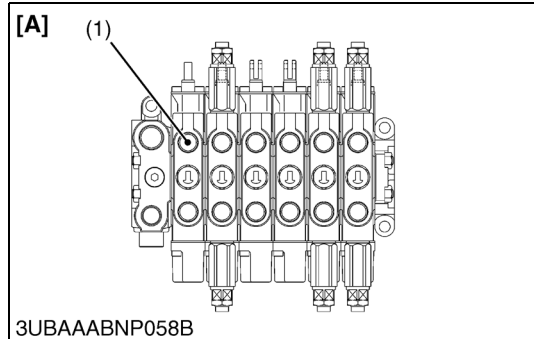
Retraction length of the cylinder	Service specification	13 mm 0.51 in.
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(a) Stabilizer Cylinder Length (Right Side) (b) Stabilizer Cylinder Length (Left Side)

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[2] CONTROL VALVE

(1) Checking and Adjusting



Relief Valve Setting Pressure (for Tractor)

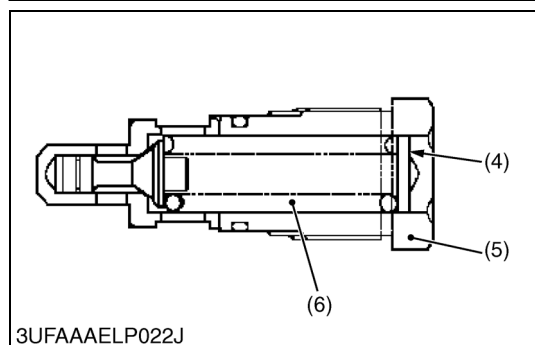
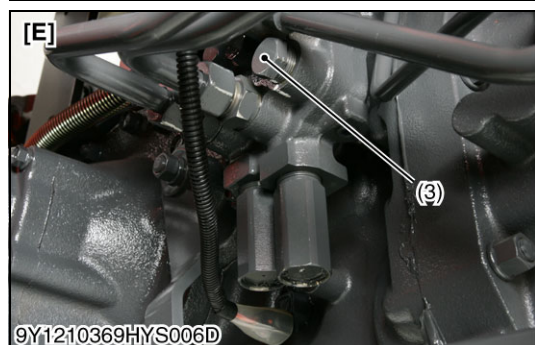
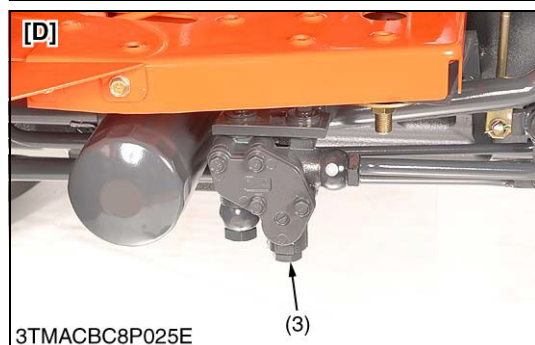
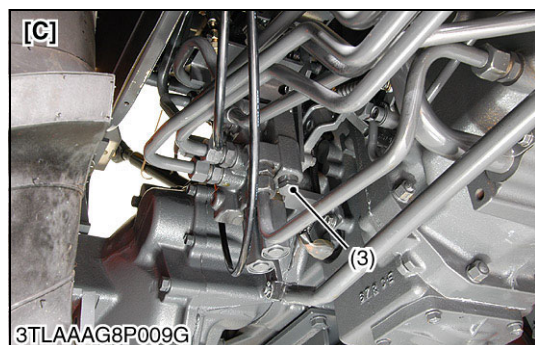
1. Remove the control valve cover.
2. Disconnect the hydraulic hose from **A1** port (1) of the control valve.
3. Install the adaptor **A** between control valve and hydraulic hose.
4. Set the relief valve setting pressure tester (Code No.: 07916-50045) to the adaptor **A**.
5. Start the engine, warm it up and idle, and then set the engine speed at maximum.
6. Move the bucket and dipperstick lever to **"BUCKET-DUMP"** position and read the pressure gauge indication when a sound indicating the relief valve operation is heard.

- (1) **A1** Port
(2) Tee, Swivel

- [A] Standard
[B] Thumb (Hydraulic Type) (Option)
A: Backhoe Adaptor A
(a) Connect Pressure Gauge
(b) Size 9/16-18

(To be continued)

(Continued)



7. If the pressure is not within the service specifications, remove the relief plug (5) of front hydraulic block and adjust with the adjusting shims (4).

■ **NOTE**

- The relief valve of the tractor hydraulic system is used as a relief valve of the backhoe hydraulic system. When the backhoe is not attached onto the tractor, check the relief valve pressure by the method same as the tractor.

Relief valve setting pressure	Service specification	L3240(-3) L3540(-3) L3560 L4400 L4600 L4701 L4802	17.1 to 18.1 MPa 175 to 184 kgf/cm ² 2480 to 2620 psi
		L3940(-3) L4240(-3) L4740(-3) L5040(-3) L5240(-3) L5740(-3) MX4700 MX4800 MX5100 MX5200 MX5400 MX5800 MX6000 L4060 L4760 L5060 L5460 L6060	18.1 to 19.1 MPa 185 to 194 kgf/cm ² 2630 to 2770 psi

Condition

- Engine speed
L3240(-3), L3540(-3), L3940(-3), L4240(-3), L4740(-3), L5040(-3), L5740(-3), MX4800, MX5200, MX5400, MX5800, MX6000
Approx. 2700 min⁻¹ (rpm)
L5240(-3), L4600, L4701, L4802
Approx. 2600 min⁻¹ (rpm)
L4400, MX4700, MX5100
Maximum
- Oil temperature: 40 to 60 °C (104 to 140 °F)

(Reference)

- Thickness of shims (5)
0.10 mm (0.0039 in.)
0.20 mm (0.0079 in.)
0.40 mm (0.016 in.)
- Pressure change per 0.1 mm (0.0039 in.) shim
Approx. 265 kPa (2.7 kgf/cm², 38.4 psi)

- (3) Relief Valve
(4) Shim
(5) Relief Plug
(6) Spring

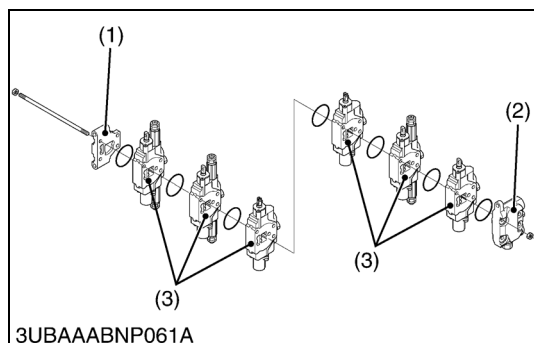
[C] L3240, L3540, L3940, L4240, L4740, L5040, L5240, L5740

[D] L4400, L4600, L4701, L4802, MX4700, MX4800, MX5100, MX5200, MX5400, MX5800, MX6000

[E] L3240-3, L3540-3, L3940-3, L4240-3, L4740-3, L5040-3, L5240-3, L5740-3, L3560, L4060, L4760, L5060, L5460, L6060

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(2) Disassembling and Assembling



Separation of Section

1. Unscrew the nuts, and separate each section.

(When reassembling)

- Take care not to damage the O-ring.

Tightening torque	Control valve mounting nut	16.7 to 17.6 N·m 1.70 to 1.80 kgf·m 12.3 to 13.0 lbf·ft
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(1) Outlet Section

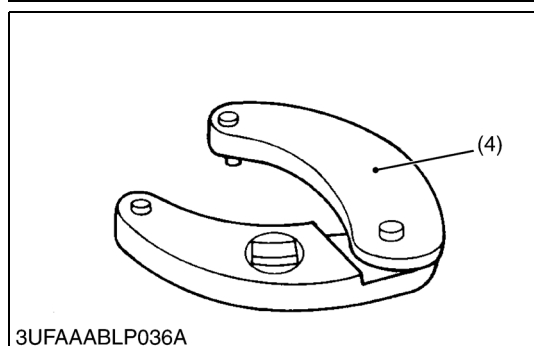
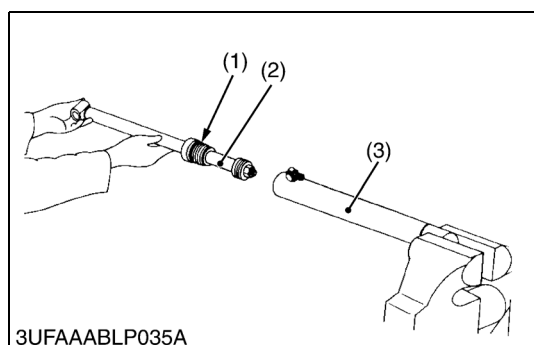
(3) Control Valve Section

(2) Inlet Section

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[3] BOOM, DIPPERSTICK, BUCKET, SWING AND STABILIZER CYLINDER

(1) Checking and Adjusting



Cylinder Rod Assembly

1. Drain hydraulic oil from the cylinder, and secure the tube end of the cylinder in a vise.
2. Unscrew the cylinder head (1) with the adjustable gland nut wrench (4).
3. Pull out the piston rod assembly (2) from the cylinder tube (3).

(When reassembling)

- Visually inspect the cylinder tube for signs of scoring or damage.
- Insert the piston rod assembly to the cylinder tube, taking care not to damage the piston seal on the piston.
- Install the cylinder head to the cylinder tube, taking care not to damage the O-ring on the cylinder head.

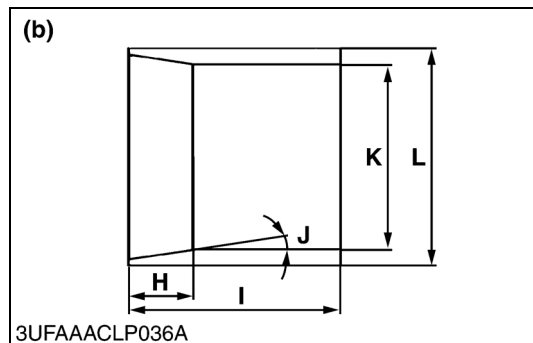
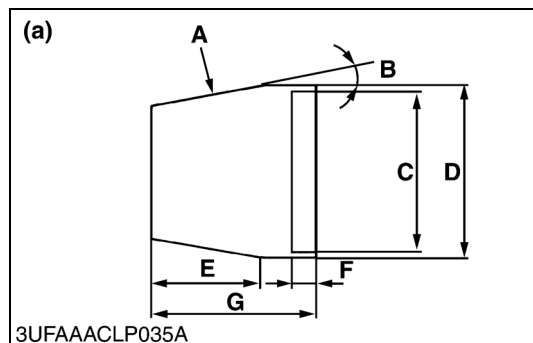
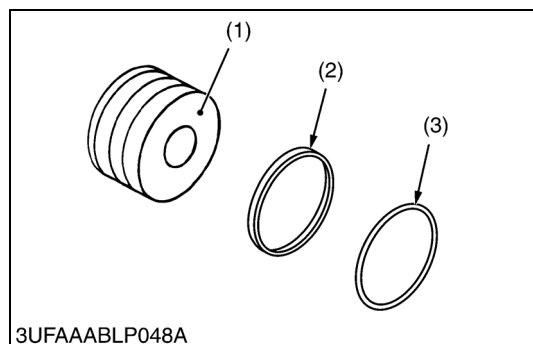
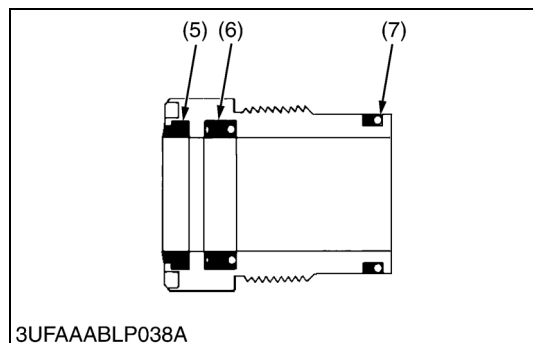
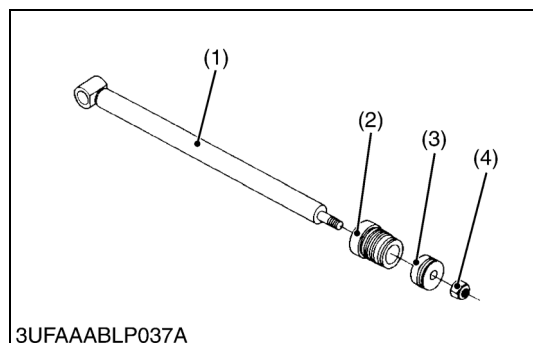
(1) Cylinder Head

(3) Cylinder Tube

(2) Piston Rod Assembly

(4) Adjustable Gland Nut Wrench

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Cylinder Head, Piston and Nut

1. Secure the rod end in a vise.
2. Unscrew the nut (4), and remove the piston (3) and cylinder head (2) from the piston rod (1).

(When reassembling)

- Visually inspect all parts for signs of scoring or damage.
- Insert the piston rod (1) to the cylinder head (2), taking care not to damage the wiper seal (5) and oil seal (6).

Tightening torque	Cylinder head	250 to 280 N·m 25.5 to 28.5 kgf·m 185 to 206 lbf·ft
	Piston nut	450 to 500 N·m 45.9 to 50.9 kgf·m 332 to 368 lbf·ft

- | | |
|-------------------|----------------|
| (1) Piston Rod | (5) Wiper Seal |
| (2) Cylinder Head | (6) Oil Seal |
| (3) Piston | (7) O-ring |
| (4) Nut | |

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Piston Seal and O-ring

1. Remove the piston seal (2) and O-ring (3) from the piston (1).

■ IMPORTANT

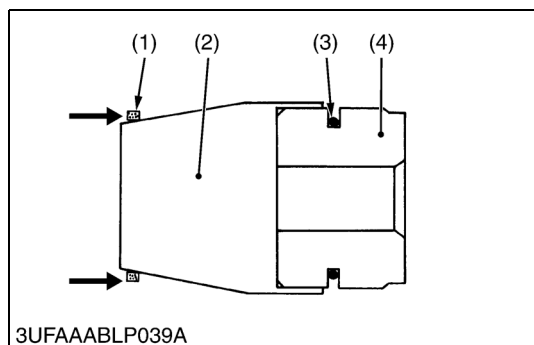
- When installing the O-ring (3) and piston seal (2) to the piston (1), use the slide jig and correcting jig as shown in the figure.

	Boom Cylinder	Dipperstick Cylinder Stabilizer Cylinder	Bucket Cylinder Swing Cylinder
A	80 μm 0.0031 in.	80 μm 0.0031 in.	80 μm 0.0031 in.
B	0.16 rad 9.0 °	0.16 rad 9.0 °	0.16 rad 9.0 °
C	70.028 mm 2.757 in.	65.030 mm 2.560 in.	60.030 mm 2.363 in.
D	71.247 mm 2.805 in.	65.110 mm 2.563 in.	60.110 mm 2.367 in.
E	49.53 mm 1.950 in.	47.60 mm 1.874 in.	47.60 mm 1.874 in.
F	10 mm 0.4 in.	10 mm 0.4 in.	10 mm 0.4 in.
G	66.04 mm 2.60 in.	66.04 mm 2.60 in.	66.04 mm 2.60 in.
H	14 mm 0.55 in.	14 mm 0.55 in.	14 mm 0.55 in.
I	35.1 mm 1.38 in.	35.1 mm 1.38 in.	35.1 mm 1.38 in.
J	0.12 rad 7.0 °	0.12 rad 7.0 °	0.12 rad 7.0 °
K	70.053 mm 2.758 in.	65.046 mm 2.561 in.	60.046 mm 2.364 in.
L	78.74 mm 3.100 in.	76.00 mm 3.071 in.	68.00 mm 2.677 in.

- (1) Piston
- (2) Piston Seal
- (3) O-ring

- (a) Slide Jig
- (b) Correcting Jig

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Installing O-ring and Piston Seal

1. Place the slide jig (2) on the piston (4).
2. Install the O-ring (3) on the piston using the slide jig (2).
3. Install the piston seal (1) over the O-ring using the slide jig (2).
4. Compress the piston seal to the correct size by installing the piston into the correcting jig (5).

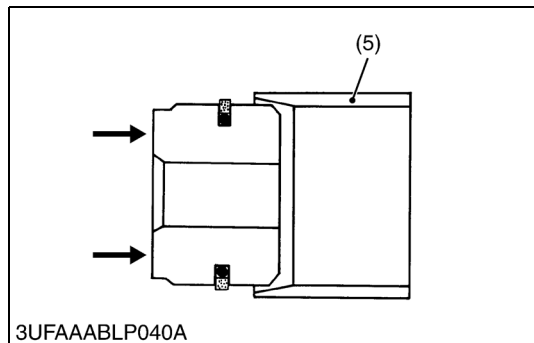
NOTE

- Do not turn (roll) the piston seal as you install it.

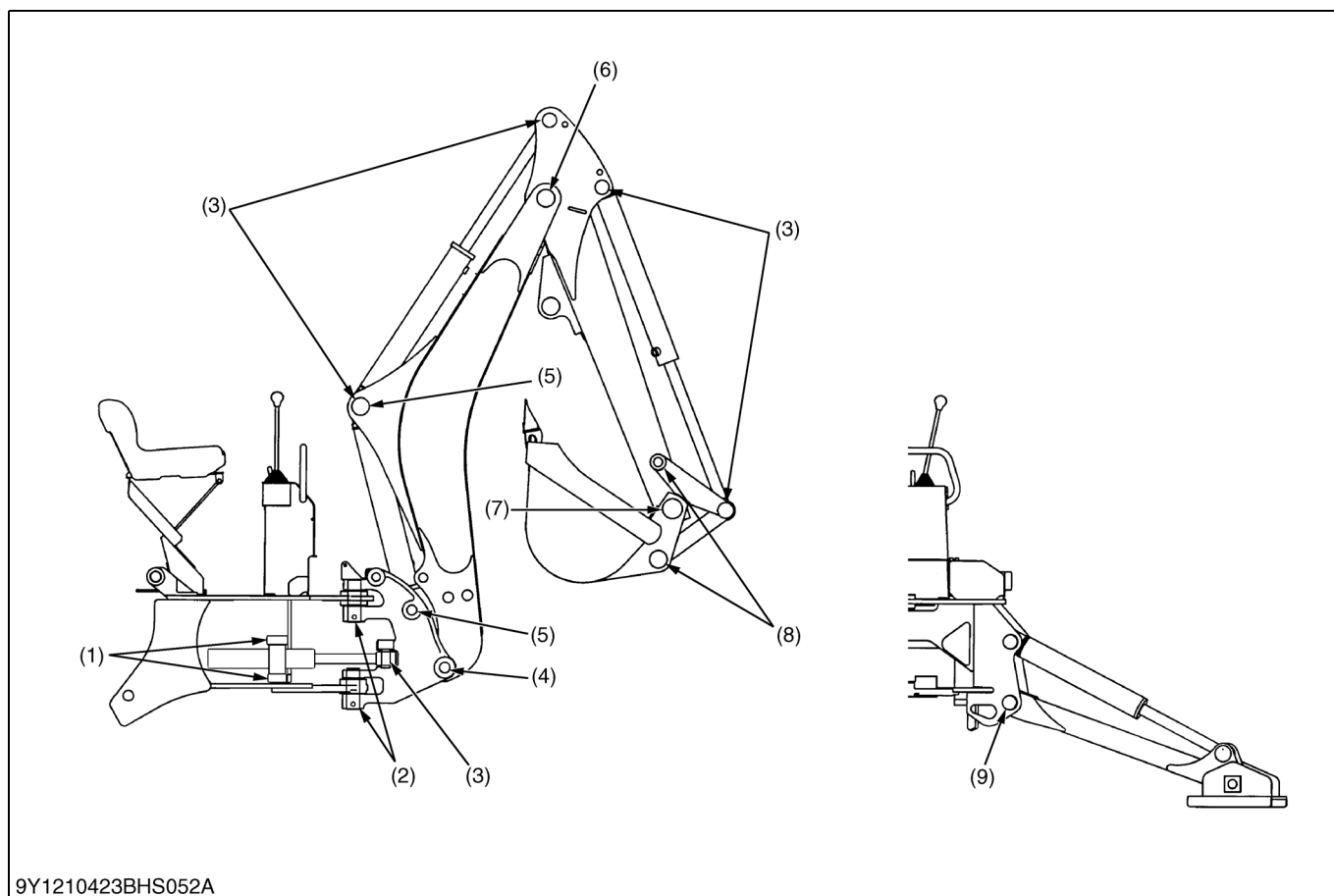
- (1) Piston Seal
(2) Slide Jig
(3) O-ring

- (4) Piston
(5) Correcting Jig

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Clearance between Pin and Bushing



1. Measure the pins O.D. with an outside micrometer.
2. Measure the bushings I.D. with a cylinder gauge.
3. If the clearance exceeds the service limit, replace pin or bushing.

(To be continued)

(Continued)

	Clearance	Service specification	Service limit
(1)	Swing cylinder trunnion boss and cylinder support bushing	0.13 to 0.21 mm 0.0052 to 0.0082 in.	0.5 mm 0.02 in.
(2)	Swing frame fulcrum pin and bushing	0.12 to 0.20 mm 0.0048 to 0.0078 in.	1.0 mm 0.039 in.
(3)	Pins and cylinder bushings (swing, dipperstick and bucket)	0.13 to 0.21 mm 0.0052 to 0.0082 in.	1.0 mm 0.039 in.
(4)	Boom support pin and boom support	0.050 to 0.16 mm 0.0020 to 0.0062 in.	1.0 mm 0.039 in.
(5)	Boom cylinder pin and bushing	0.13 to 0.21 mm 0.0052 to 0.0082 in.	1.0 mm 0.039 in.
(6)	Dipperstick fulcrum pin and bushing	0.13 to 0.21 mm 0.0052 to 0.0082 in.	1.0 mm 0.039 in.
(7)	Bucket fulcrum pin and bushing	0.13 to 0.21 mm 0.0052 to 0.0082 in.	1.0 mm 0.039 in.
(8)	Bucket link / guide link pins and bushing	0.13 to 0.21 mm 0.0052 to 0.0082 in.	1.5 mm 0.059 in.
(9)	Stabilizer arm pin and bushing	0.13 to 0.21 mm 0.0052 to 0.0082 in.	1.0 mm 0.039 in.

Swing cylinder trunnion boss O.D.	Service specification	38.02 to 38.05 mm 1.497 to 1.498 in.
Swing frame fulcrum pin O.D.		47.55 to 47.58 mm 1.872 to 1.873 in.
Cylinder pins (swing / bucket / dipperstick / stabilizer), bucket / guide link pins and stabilizer arm pins O.D.		31.67 to 31.70 mm 1.247 to 1.248 in.
Boom cylinder pins, boom support pin and dipperstick fulcrum pin O.D.		38.02 to 38.05 mm 1.497 to 1.498 in.
Stabilizer pad pins O.D.		31.75 mm 1.250 in.
Swing cylinder support bushing I.D.		38.18 to 38.23 mm 1.504 to 1.505 in.
Swing frame fulcrum bushing I.D.		47.70 to 47.75 mm 1.878 to 1.879 in.
Cylinder bushing (swing / bucket / dipperstick), bucket / guide link bushing and stabilizer arm bushing I.D.		31.83 to 31.88 mm 1.254 to 1.255 in.
Boom cylinder bushing and dipperstick fulcrum bushing I.D.		38.18 to 38.23 mm 1.504 to 1.505 in.
Boom support I.D.		38.10 to 38.18 mm 1.500 to 1.503 in.

(To be continued)

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Thrust Washer Wear

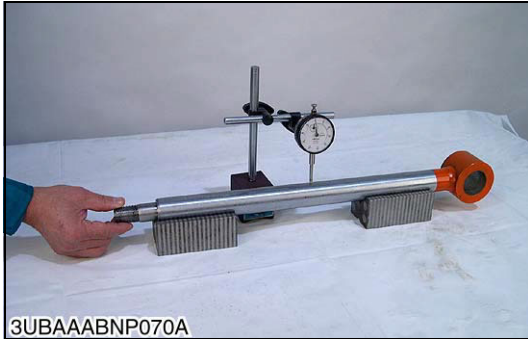
1. Measure the thickness of thrust washer with an outside micrometer.
2. If the wear exceeds the service limit, replace it.

■ NOTE

- Visually inspect the thrust washer for signs of scoring or damage not only on the thrust washer but also on the main frame and swing frame contact surface.

Thrust washer thickness	Service specification	2.36 to 2.96 mm 0.0926 to 0.1166 in.
	Service limit	1.8 mm 0.071 in.

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Piston Rod Bend

1. Place piston rod on V blocks.
2. Set a dial indicator on the center of the rod.
3. Turn the piston rod and read the dial indicator.
4. If the measurement exceeds the service limit, replace it.

Piston rod bend	Service limit	0.25 mm 0.0098 in.
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